

## FACILITIES AND OTHER RESOURCES - OVERALL

The necessary infrastructure at the University of Arkansas for Medical Sciences (UAMS; primary performance site) and other participating institutions and organizations (**Table 1**), are available to support the application, *Expanding Translational Research in Arkansas*. The assembled team for this innovative center is comprised of an experienced principal investigator, mentors, and other stakeholders committed to supporting the vision and mission and the Clinical and Translational Science Award (CTSA) consortium. The principal investigator and key personnel have the necessary organization and administrative infrastructure to successfully develop, implement, and evaluate center programs to support national CTSA efforts.

<b>Table 1. Translational Research Institute Facilities and Resources</b>	
<b>Resource</b>	<b>Section</b>
<b>University of Arkansas for Medical Sciences (UAMS)</b>	<b>1</b>
Colleges	1.1
<ul style="list-style-type: none"> <li>College of Health Professions</li> <li>College of Medicine</li> <li>College of Nursing</li> <li>College of Pharmacy</li> <li>College of Public Health</li> </ul>	1.1a 1.1b 1.1c 1.1d 1.1e
Graduate School	1.2
Institutes	1.3
<ul style="list-style-type: none"> <li>Donald W. Reynolds Institute on Aging</li> <li>Harvey and Bernice Jones Eye Institute</li> <li>Jack T. Stephens Spine Institute</li> <li>Myeloma Institute for Research and Therapy</li> <li>Psychiatric Research Institute</li> <li>Translational Research Institute</li> <li>Winthrop P. Rockefeller Cancer Institute</li> </ul>	1.3a 1.3b 1.3c 1.3d 1.3e 1.3f 1.3g
Centers	1.4
<ul style="list-style-type: none"> <li>Arkansas Center for Health Disparities</li> <li>Arkansas Claude Pepper Older Americans Independence Center</li> <li>Arkansas Nanomedicine Center</li> <li>Brain Imaging Research Center</li> <li>Center for Addiction Research</li> <li>Center for Distance Health</li> <li>Center for Diversity Affairs</li> <li>Center for Drug Detection and Response</li> <li>Center for Health Literacy</li> <li>Center for Microbial Pathogenesis and Host Inflammatory Responses</li> <li>Center for Osteoporosis and Metabolic Bone Disease</li> <li>Center for Translational Neuroscience</li> <li>J. Thomas May Center for ALS Research</li> <li>UAMS Cardiovascular Center</li> </ul>	1.4a 1.4b 1.4c 1.4d 1.4e 1.4f 1.4g 1.4h 1.4i 1.4j 1.4k 1.4l 1.4m 1.4n
<b>Additional UAMS Resources</b>	<b>2</b>
Clinical Trials Innovation Unit	2.1
Biosafety Level-3 Facility	2.2
Bioventures	2.3
Core Facilities	2.4
<ul style="list-style-type: none"> <li>Biodosimetry Diagnostic Core</li> <li>Bioluminescent &amp; Fluorescent Imaging Core</li> <li>Biotelemetry &amp; Ultrasound Imaging Core</li> <li>Brain Imaging Research Core</li> <li>Cell Purification/Molecular Biology Core</li> <li>Digital and Electron Microscopy Core</li> <li>DNA Damage &amp; Toxicology Core</li> <li>DNA Sequencing Core</li> <li>Experimental Pathology Core</li> <li>Flow Cytometry Core</li> <li>Genomics Core</li> </ul>	2.4a 2.4b 2.4c 2.4d 2.4e 2.4f 2.4g 2.4h 2.4i 2.4j 2.4k

<ul style="list-style-type: none"> <li>Microscopy/Cellular Imaging Core</li> <li>Molecular Imaging Core</li> <li>Skeletal Phenotyping Core</li> <li>Transgenic Mouse Core</li> </ul>	2.4i 2.4m 2.4n 2.4o
Division of Laboratory Animal Medicine	2.5
Integrated Clinical Enterprise	2.6
Institutional Review Board	2.7
Library for Health Sciences	2.8
Library Video Conference Center	2.9
National Institute of General Medical Sciences (NIGMS)-Funded Institutional Development Award (IDeA) Programs	2.10
<ul style="list-style-type: none"> <li>Arkansas IDeA Network of Biomedical Research Excellence</li> <li>Center for Translational Neuroscience</li> <li>Center for Microbial Pathogenesis and Host Inflammatory Responses</li> <li>Center for Studies of Host Response to Cancer Therapy</li> <li>Initiative for Maximizing Student Diversity</li> </ul>	2.10a 2.10b 2.10c 2.10d 2.10e
Office of Research Compliance	2.11
Performance Excellence	2.12
Proteomics Facility	2.13
Scientific Communication Group	2.14
Tissue Procurement Facility	2.15
<b>UAMS Northwest</b>	<b>3</b>
Center for Pacific Islander Health	3.1
<ul style="list-style-type: none"> <li>Cultural Competency and Linguistic Translation Core</li> <li>Community Engagement Core</li> <li>Methodology Core</li> </ul>	3.1a 3.1b 3.1c
North Street Clinic	3.2
Office of Community Health and Research	3.3
<b>Arkansas Children's Hospital (ACH)/Arkansas Children's Research Institute (ACRI)</b>	<b>4</b>
ACH Northwest Arkansas	4.1
Arkansas Children's Nutrition Center	4.2
Experimental Therapeutics Program	4.3
Human Subjects Protection and Regulatory Compliance Team	4.4
Pediatric Clinical Research Unit	4.5
Physical Activity and Metabolism Laboratory	4.6
Research Coordinator Pool	4.7
Research Participant Recruiting Support Services	4.8
Transgenerational Biorepository	4.9
<b>Additional ACH/ACRI Resources</b>	<b>5</b>
Animal Facility	5.1
Audio Visual/Teleconferencing Capabilities	5.2
Bioanalytical Core	5.3
Research Administrative Support	5.4
Research Laboratories and Laboratory Support	5.5
Security	5.6

Central Arkansas Veterans Healthcare System	6
Center for Mental Healthcare & Outcomes Research	6.1
Geriatrics Research, Education and Clinical Center	6.2
Mental Illness Research, Education and Clinical Center	6.3
Pharmacogenomics Analysis Laboratory	6.4
Quality Enhancement Research Initiative for Team-Based Behavioral Health	6.5

Additional Supporting Institutions and Organizations	7
Arkansas Center for Health Improvement	7.1
Arkansas Department of Health	7.2
National Center for Toxicological Research	7.3
Sam Walton College of Business	7.4

## 1. University of Arkansas for Medical Sciences (UAMS)

UAMS is the state's largest, most comprehensive facility for medical treatment and biomedical research and its only academic health center. UAMS serves a predominately rural state, with a diverse population of over 3 million individuals (79.4% Caucasian/non-Hispanic, 15.7% African-American/non-Hispanic, 7.3% Hispanic/Latino, 0.3% Asian/Pacific Islander, and 1.0% Native American). UAMS provides the only medical and pharmaceutical education in Arkansas, graduating nearly 600 MDs, PhDs, nurses, pharmacists, and allied health professionals each year. The institution comprises 5 colleges (Medicine, Nursing, Pharmacy, Public Health, and Health Professions), a graduate school, a 540,000-square-foot hospital, 7 centers of excellence (Winthrop P. Rockefeller Cancer Institute, Jackson T. Stephens Spine & Neurosciences Institute, Myeloma Institute, Harvey & Bernice Jones Eye Institute, Psychiatric Research Institute, Donald W. Reynolds Institute on Aging, and the Translational Research Institute), 8 Regional Centers, outreach programs operating in every county, and a regional campus in Northwest Arkansas. UAMS is the state's largest public employer, with more than 10,022 employees, including more than 5,000 health professionals. Research space at UAMS totals 500,000 square feet. The University currently has \$85 million in total research funding with \$35 million from the National Institutes of Health. UAMS programs in multiple myeloma, aging, cancer, otolaryngology, and other areas are nationally and internationally renowned.

### 1.1. Colleges

**1.1a. College of Health Professions (CHP).** The UAMS CHP serves the state of Arkansas by offering programs that provide education, service, and research in the allied health professions. CHP was organized as a separate college within UAMS in 1971. However, some of its programs existed long before that. The oldest — the Medical Laboratory Sciences program — celebrates its 100<sup>th</sup> anniversary this year.

*Leadership and Organization.* CHP has been led since January 2018 by Interim Dean Susan Long, EdD, who is also the college's associate dean for academic affairs and associate director for clinical programs for the Center for Dental Education. The college's senior leadership team also includes associate deans for administrative affairs and student affairs. CHP has 12 academic departments and the Center for Dental Education, which offers a General Practice Residency. The 12 departments are: Audiology and Speech Pathology; Dental Hygiene; Dietetics and Nutrition; Emergency Medical Sciences; Genetic Counseling; Health Information Management; Imaging and Radiation Sciences (Diagnostic Medical Sonography, Nuclear Medicine Imaging Sciences, Radiologic Imaging Sciences); Laboratory Sciences (Cytotechnology, Medical Laboratory Sciences); Ophthalmic Medical Technology; Physical Therapy; Physician Assistant Studies; and Respiratory and Surgical Technology. An Occupational Therapy doctoral program is in development with the University of Arkansas at Fayetteville with plans to admit students in the 2019-2020 academic year.

*Education.* The college has approximately 616 students with a freshman class enrollment of 301. Of those, 85 students in the Physical Therapy and Radiologic Imaging Sciences departments are housed at the UAMS Northwest Regional Campus in Fayetteville, AR, hereafter referred to as UAMS-NW. CHP offers a variety of educational and training opportunities for students of the allied health professions. The college curricula coordinates the professional course work with the arts, humanities, and basic and social sciences into a total educational experience that emphasizes life-long learning in the allied health professions. The college is well resourced in financial aid opportunities for students. For fiscal year 2018, 61 61 students were awarded scholarships. The college also maintains agreements with 600 affiliates to allow students to gain clinical experience in real-life settings as part of the education process.

*Faculty.* CHP has 100 faculty members; 65% have a PhD or a professional doctorate in their field.

*Research.* In 2017, CHP faculty research appeared in 70 peer-reviewed publications. The faculty also produced 99 peer-reviewed presentations and posters and submitted 22 grant proposals. Currently, 9 faculty members in the college have active grants. Two of those grants, funded by USDA and HRSA, are research-focused, while the others are education or service grants. Research is an important component of CHP's graduate programs — Genetic Counseling, Physical Therapy, Audiology and Speech Pathology, Clinical

Nutrition and Physical Assistant studies. Of those, Audiology and Speech Pathology and Physical Therapy have research space for faculty in their departments or clinics, while a faculty member in Clinical Nutrition conducts bench research from his lab at the Arkansas Children's Research Institute. All of these researchers also provide valuable mentoring to students in their programs.

**1.1b. College of Medicine (COM).** The UAMS COM has educated and trained the vast majority of Arkansas' physicians since 1879. As part of the state's only comprehensive academic health center, the college prepares clinicians and scientists to make their mark around the world. The college's faculty physicians provide highly specialized, patient and family-centered care at UAMS Medical Center, clinics and patient care and research institutes, Arkansas Children's, the Central Arkansas Veterans Healthcare System, UAMS regional centers and clinics throughout the state.

*Leadership and Organization.* The COM has been led since February 2018 by Interim Dean Christopher T. Westfall, M.D., FACS, Professor and Chair of the Department of Ophthalmology, Director of the Harvey and Bernice Jones Eye Institute, and Director of the Surgical Subspecialties Service Line. Dr. Westfall has served on the faculty since 1997. The senior leadership team also includes executive associate deans for academic affairs, clinical affairs, research, and 7 associate deans. The COM has 22 clinical departments and 7 basic science departments: Biochemistry and Molecular Biology; Biomedical Informatics; Biostatistics; Microbiology and Immunology; Neurobiology and Developmental Sciences; Pharmacology and Toxicology; and Physiology and Biophysics.

*Education.* The COM currently has approximately 690 medical students with a freshman class enrollment of 174. The undergraduate curriculum emphasizes active learning methodologies and interprofessional education. Seven learning communities, called academic houses, provide academic and career advising and support, peer mentoring and a strong sense of community for students. All first-year and second-year medical students are based at the main Little Rock campus. Limited numbers of juniors and seniors (a total of 31 in 2017-2018) are assigned to UAMS-NW for completion of clinical rotations with faculty including local practicing physicians. In 2017, every graduating senior who sought a first-year residency position through the National Resident Matching Program obtained a position, and the 2018 match rate was among the highest in a decade. The COM administers 61 residency and fellowship graduate training programs accredited by the Accreditation Council for Graduate Medical Education (GME), with approximately 685 residents and fellows in training each year. In addition, COM adjunct faculty members currently oversee about 135 residents training at 7 of the 8 UAMS Regional Centers. The college's GME leaders are working with hospitals across the state to establish additional residency programs to help address the state's physician shortages, particularly in rural areas.

*Faculty.* The COM has 1286 full-time faculty members, 1,300 of which are full-time. About 66% of the college's faculty members hold an MD degree and 19% hold PhDs. In FY 2017, faculty physicians oversaw 28,314 inpatients, 485,121 outpatient visits, 19,262 surgical cases, and 60,861 Emergency Department cases at UAMS alone and 159,431 patients at UAMS Regional Centers. Faculty physicians also staff Arkansas Children's, Arkansas State Hospital, and much of the Central Arkansas Veterans Healthcare System.

*Research.* The COM Research Office supports clinical and basic science research, provides leadership in expanding the college's research and creative activities, aligns the COM research agenda with federal agencies and foundations, fosters interdisciplinary research programs and collaborations, and works with the UAMS Office of Institutional Development to further COM research and augment funding. The office administers the college's Intramural Grant Program, providing a wide array of awards including grants for pilot studies, bridging/interim funding, instrumentation, and grants focusing specifically on research relating to stroke and related disorders and diabetes. The office also facilitates a longstanding Honors in Research Program for medical students. The COM administers 8 research cores: Brain Imaging Research Center; DNA Damage and Toxicology; Digital Microscopy Core Laboratory; Experimental Pathology Core; Flow Cytometry Core Facility; Transgenic Mouse Core; the UAMS DNA and Next Generation Sequencing Core Facility; and the UAMS Proteomics Core. UAMS core facilities use iLab Operations Software, an enterprise web-based management tool for managing service requests, sample processing, equipment reservations, usage tracking, billing and invoicing, reporting, lab requisitioning, and spend tracking tools.

**1.1c. College of Nursing (CON).** The UAMS College of Nursing has helped the state meet demands for adept, knowledgeable nurses in the health care industry since its inception in 1953. Every day, the college welcomes a broad spectrum of nursing professionals, from the undergraduate student just beginning the journey to the veteran nurse eager for more learning. It remains the state's most comprehensive nursing school with 7 academic programs, including the only PhD in Nursing program in Arkansas. The college provides service through scholarly participation of faculty and students in academic, professional and

community organizations. Faculty practice as skilled clinicians, consultants and experts in health care organizations and in the community.

*Leadership and Organization.* The CON has been led by Patricia A. Cowan, PhD, RN, Dean and Professor, since November 2016. She holds the Linda C. Hodges Dean's Chair. Her senior leadership team includes associate deans for administration, research, practice and academic programs.

The college's 7 academic programs allow students to learn at one of the region's major academic health centers and engage in activities and learning that promote scholarly excellence, research and service to the university, nursing profession and society.

*Education.* The CON has the largest UAMS college enrollment with approximately 730 students. The college provides exemplary and comprehensive educational programs to prepare professional nurses as generalists and for advanced practice, teaching, research and administrative roles, thereby enhancing health care for Arkansans. The college collaborates with UAMS Regional Campuses, other colleges of nursing, and the health care community to provide degree and continuing education programs to best prepare nurses for advanced health care. It enhances access by offering degree programs and courses for nurses through distance education.

*Faculty.* The CON's faculty and staff are devoted to ensuring each nursing student maximizes the opportunity available to impact health care as a nursing professional. Six faculty are Fellows in the American Academy of Nursing, the highest international honor in the nursing profession, while others are Fellows in their specialty professional organizations. They are sought-after presenters, research collaborators and authors, with their contributions disseminated through peer-reviewed and lay media.

*Research.* The CON advances the body of nursing knowledge through scholarship in research. The college houses national leaders in gerontology, women's cardiovascular disease, and smoking cessation, 3 vitally important health issues in Arkansas. This community of scholars contributes to nursing science through research activities that are theory testing, theory generating and of an applied or basic research nature.

**1.1d. College of Pharmacy (COP).** The UAMS COP has educated and trained the vast majority of Arkansas' pharmacists since 1951. The college is the only pharmacy school in Arkansas and its faculty pharmacists provide highly specialized patient- and family-centered care at the UAMS Medical Center, clinics and patient care and research institutes, Arkansas Children Hospital, the Central Arkansas Veterans Healthcare System, UAMS regional centers, and clinics throughout the state.

*Leadership and Organization.* The COP has been led since November 2015 by Dean Keith Olsen, PharmD, FCCP, FCCM. The senior leadership team includes 5 executive associate deans who are responsible for administrative and academic affairs, student affairs and faculty development, research and experiential education and training at UAMS-NW. The college comprises 2 departments, each with graduate programs:

- Department of Pharmacy Practice, which includes a Pharmaceutical Evaluation and Policy track and the Center for Implementation Research (shared with the College of Medicine).
- Department of Pharmaceutical Sciences, which includes the Division of Radiation Health.

In addition, a number of units provide specialized services, such as the Arkansas Poison Control Center, Arkansas Drug Information Center, Evidence-Based Prescription Drug Program, and the Nuclear Pharmacy Program.

*Education.* The COP currently has 480 PharmD (undergraduate) students, and 15 graduate students, with a freshman class enrollment of 120. The undergraduate curriculum emphasizes active learning methodologies and interprofessional education. All first-year and second-year pharmacy students are based at the main Little Rock campus. Limited numbers of juniors (a total of 30) are assigned to UAMS-NW for completion of 3rd year classes. In 2018, 19 graduating seniors committed to continuing their training through a pharmacy residency or fellowship. Faculty from the College of Pharmacy direct 7 residency and fellowship programs, offering 15 positions to pharmacy graduates. In addition, the COP supports the success of other pharmacy residency programs throughout the state through its Teaching Certificate Program, Research Certificate Program, and additional professional development opportunities for residency preceptors.

*Faculty.* The COP has approximately 80 faculty members, 77 of whom are full-time. About 55% of the faculty hold a PharmD degree, and 41% hold PhDs.

*Research.* The COP Research Office supports clinical and basic science research, provides leadership in expanding the college's research and creative activities, aligns the COP research agenda with federal agencies and foundations, fosters interdisciplinary research programs and collaborations, and works with the

UAMS Office of Institutional Advancement to further COP research and augment funding. The COP administers 4 research areas:

- *Pharmaceutical Evaluation and Policy's (PEP)* mission is to advance and disseminate knowledge of the economic, humanistic, and clinical impact of pharmaceutical products and services and to contribute to medication use and health policy development that benefits society. The PEP Division is housed in the Department of Pharmacy Practice and provides training in large data analysis, informatics, pharmacoconomics, pharmacoepidemiology, health economics, econometrics, statistics, and quality of life evaluations.
- The *Center for Implementation Research (CIR)* was established in 2014 in partnership with the College of Medicine. Its goals are to: 1) Develop and test strategies to facilitate uptake and sustained use of evidence-based practices across a wide range of health care contexts; 2) Support integration of evidence-based practices in community settings and UAMS programs; 3) Evaluate the effectiveness of promising practices while preparing for their future implementation by simultaneously documenting barriers and facilitators to implementation; and 4) Nurture the development of investigators, residents, and students interested in implementation and implementation science.
- The *Division of Radiation Health* conducts basic mechanistic, preclinical, and translational research focused on determining the underlying mechanisms responsible for acute and long-term radiation effects and developing medical countermeasures against such effects. The Division also: 1) Publishes and disseminates research findings to the benefit of cancer patients, cancer survivors, and the general public; 2) Provides professional, graduate and post-graduate education and training in areas related to the effects of radiation on normal tissues as they relate to patients treated with radiation and individuals exposed to radiation in a radiological / nuclear accident or terrorism scenario; 3) Provides expertise and assistance to UAMS, the general public, state and federal agencies, the pharmaceutical and biotechnology industry and others on matters of research and knowledge of radiation health; and 4) Facilitates collaborative partnerships with other colleges and centers at UAMS, other academic institutions in the US and abroad, various state and government agencies, the pharmaceutical and biotechnology industry, and others to promote advances in this area of research. Division faculty also lead the Center for Studies of Host Response to Cancer Therapy, supported by a Centers of Biomedical Research Excellence (COBRE) award from the NIH National Institute of General Medical Sciences. Established in 2015, it is the first center of its kind to address ways to minimize the impact of cancer therapy-related toxicities.
- The *Drug Discovery Program* is a multidisciplinary effort involved in preclinical research that focuses on the design, discovery and development of novel drug entities for the treatment of cancer, pain, neurological diseases, cardiovascular disease, aging, and infectious diseases. This program seeks to develop a strong collaborative and innovative environment involving faculty from other UAMS colleges in the development of translational programs that accelerate entry of promising new drugs into the clinic. It also includes graduate and post-doctoral training programs and federally funded research faculty. Research disciplines include medicinal chemistry, chemical biology, cellular biology, structural biology, microbiology, genetics, pharmacology, toxicology, proteomics and genomics, nanotechnology, and cell and gene therapeutics.

COP research facilities include its Bioanalytical Core, Cellular and Molecular Analytic Core, Experimental Radiation Core, and Irradiation and Animal Core.

**1.1e. College of Public Health (COPH).** The UAMS Fay W. Boozman COPH was established in 2001 through the Tobacco Master Settlement Agreement (MSA) to increase education, research and services in public health. Creation of the college has brought over 160 new jobs to the state of Arkansas. The mission of the COPH is to improve the health and promote the well-being of individuals, families and communities in Arkansas through education, research and service.

*Leadership and Organization.* The COPH was established by Thomas Bruce, MD, Dean *pro tem*, in 2001, and has been led by Dean James Raczynski, PhD, Professor and Founding Dean, Inaugural M. Joycelyn Elders, MD, Chair in Health Promotion and Disease Prevention since 2002. The leadership team also includes associate deans for public health practice, academic affairs and professional programs, and assistant deans for administration, diversity and inclusion, and special projects. The COPH is a multi-disciplinary college with 5 departments – Biostatistics, Environmental and Occupational Health, Epidemiology, Health Behavior and Health Education, and Health Policy and Management. The COPH houses 4 centers – the Arkansas Prevention Research Center, the Arkansas Center for Health Disparities, the Center for the Study of Tobacco, and the Arkansas Center for Excellence in Birth Defects Research and Prevention; and 3 offices – the Office of Community Based Public Health, the Office of Public Health Informatics, and the Office of Student Affairs.

*Education.* The educational programs include post-baccalaureate, graduate, and executive certificates in various public health areas; a Master of Public Health in 6 disciplines; a Master of Health Administration; and 6 combined master's degree programs partnering with different University of Arkansas System universities, a private liberal arts college and the 3 historically black colleges and universities in Arkansas; a Doctor of Public Health in Public Health Leadership and a Doctor of Philosophy program with 3 separate disciplines. Since its first class in January 2002, enrollment has increased from 43 students to 340 students in January 2018. More than 550 students have graduated from the college. Almost all graduates remain in Arkansas, providing public health expertise in both the public and private sectors. Graduates who have left the state work for federal agencies, universities, national public health organizations, major national health centers, state legislatures and as the first public health officer for the US Air Force.

*Faculty.* The COPH was established as an independent unit July 2001 and Dean Raczynski arrived in September 2002 to join the 3 primary full-time faculty and approximately 160 secondary and adjunct faculty. Since then the college has grown to 64 current or committed primary faculty positions and over 100 secondary and adjunct faculty. Many faculty also have official roles with other colleges and departments at UAMS, the Arkansas Department of Health, and other state agencies. The majority of COPH faculty have PhDs, and many have another terminal degree and an MPH. Secondary and adjunct faculty are drawn from different areas within UAMS, other universities, state agencies and private health related organizations.

*Research.* Research in the COPH has always fostered community-based public health to develop relationships with community partners and facilitate community-based, prevention, and translational research particularly among racial and ethnic minority populations. To that end the COPH has 5 centers, 2 internally funded and 3 extramurally funded. The 2 internally funded centers are focused on health issues significant to Arkansas and the nation - obesity prevention and control, and tobacco use prevention and control. The 3 extramurally funded centers are the Arkansas Prevention Research Center (ARPRC) funded by the Centers for Disease Control and Prevention (CDC); the Arkansas Center for Health Disparities (ARCHD) funded by the NIH National Institute on Minority Health and Health Disparities (NIMHD); and the Arkansas Center for Excellence in Birth Defects Research and Prevention funded by the CDC.

The ARPRC is in its second round of funding and is 1 of 26 Prevention Research Centers funded by the CDC. The ARCHD is in its third round of funding and is 1 of 12 Centers of Excellence on Minority Health and Health Disparities funded by the NIMHD. Both of these centers focus on health disparities, translational, and community-based research initiatives. The Arkansas Center for Excellence in Birth Defects Research and Prevention is currently under review for competing continuation funding. It focuses on the reduction of birth defects and their long-term physical, social and economic impact in Arkansas and the US through innovative research, training, prevention and community partnerships.

The research interests of the COPH faculty incorporate a significant focus on partnerships with other public health and health care researchers, public health practitioners, government agencies, and community-based organizations. Research of the COPH embraces the philosophy that public health includes that which allows individuals, families, and communities to be healthy.

**1.2. Graduate School.** UAMS is the only comprehensive biomedical research and health center for the state of Arkansas and is the state's only institution of professional and graduate education devoted solely to the health and biological sciences. The Graduate Program was organized as an extension of the Graduate School of the University of Arkansas at Fayetteville in 1943 and was approved for independent status by the Board of Trustees in 1995. The Graduate School enjoys strong affiliations with UAMS entities across campus, and many faculty from other colleges have dual appointments with the Graduate School. These collaborations add strength to the graduate programs in the basic and clinical sciences and create a remarkable network of opportunities for UAMS graduate students. The UAMS Graduate School is home to several programs leading to Doctor of Philosophy and Master of Science degrees, as well as graduate certificates.

*Leadership and Organization.* The Graduate School is led by Robert E. McGehee, Jr., PhD, who assumed the role in 2004. Dr. McGehee earned his PhD in physiology and biophysics at UAMS, did his postgraduate fellowship training at Harvard Medical School and Massachusetts General Hospital, and returned to UAMS to become a faculty member in 1993.

*Education.* The Graduate School offers 11 programs. The Graduate Program in Interdisciplinary Biomedical Sciences program (MS and PhD) is an umbrella program that offers 6 tracks: Biochemistry and Molecular Biology; Cell Biology and Physiology; Microbiology and Immunology; Neuroscience; Pathobiology; and Pharmacology, Toxicology and Experimental Therapeutics. The new program (2017) in Biomedical Informatics that includes interdisciplinary tracks – Clinical Informatics, Clinical Research Informatics and Imaging

Informatics – which focus on effective uses of biomedical data, information and knowledge for scientific inquiry, problem solving and decision making, motivated by efforts to improve human health. Other programs include Bioinformatics (UAMS/University of Arkansas at Little Rock consortium degree) (MS and PhD), Biomedical Informatics (certificate, MS and PhD), Clinical Nutrition (MS), Communication Sciences and Disorders (UAMS/UALR/University of Central Arkansas consortium degree) (PhD), Clinical Translational Sciences (certificate, MS and PhD), Nursing Science (PhD), Regulatory Sciences (certificate), Pharmaceutical Sciences (MS and PhD), and Pharmaceutical Evaluation and Policy (MS and PhD). The Graduate School also offers a Health Science Innovation and Entrepreneurship Certificate, which was developed in collaboration with the Translational Research Institute and is offered through strong affiliations with the UAMS colleges of Medicine, Pharmacy, Nursing, Health Professions and Public Health, as well as all UAMS institutes and multiple clinical centers at UAMS.

The UAMS Graduate School offers one of the most dynamic academic environments in Arkansas and a nexus for some of the most innovative biomedical research in the nation. Students benefit from exposure to an academic environment that includes the Translational Research Institute (translating science from bench to bedside) and BioVentures (promoting biomedical technology entrepreneurship), both of which place an emphasis on translating science into products or procedures that have an impact on the real world.

*Faculty.* The Graduate School shares faculty with the UAMS colleges of Medicine, Pharmacy, Nursing, Health Professions and Public Health for about 350 total Graduate School faculty.

*Research.* Research at UAMS is officially coordinated through the Office of the Vice Chancellor for Research. For Graduate School students and primary faculty, research is at the core of daily life.

The Graduate School works closely with the principal investigators and faculty of all the NIH training grants at UAMS, including 2 T32s, 5 COBREs, the Arkansas IDEa Network of Biomedical Research Excellence (INBRE), and an Initiative for Maximizing Student Development (IMSD) (for which Dr. McGehee is a Co-PI). The breadth of these training programs provide access to exceptional faculty for graduate students and very unique training opportunities. The Graduate School is also very engaged with the COM Research Office, which supports clinical and basic science research.

### 1.3. Institutes

**1.3a. Donald W. Reynolds Institute on Aging (IOA).** Established through a \$28.8 million gift from the Donald W. Reynolds Foundation, and an additional \$33.4 million gift in 2009, the Reynolds IOA, directed by Dr. Jeanne Wei, is devoted to making the later years of life healthier and more productive. The 8 story IOA includes state-of-the-art clinical care, innovative translational research and top-ranked inter-professional biomedical education. The Institute works to reduce hospital admission and readmission rates, reduce falls, prevent frailty and help people maintain active lifestyles as long as possible. IOA teaches students and health care professionals about the nuances of caring for seniors and their special needs. Current research addresses key questions about Alzheimer's disease, cardiovascular health, longevity, nutritional factors unique to older individuals and other age-related issues. IOA also partners with the Central Arkansas Veterans Healthcare Administration and communities around the state to bring services to those special populations.

UAMS Centers on Aging (COA) is an IOA program that partners with the UAMS Regional Programs, local and regional hospitals, Area Agencies on Aging, local colleges and universities, and local communities to meet the needs of aging generations with the highest standards of service, research and care available today. The mission of the COAs is to improve health outcomes of older Arkansans through interdisciplinary clinical care and innovative education programs by delivering quality health care to older persons, conducting research on aging and age-related diseases, providing educational programs on aging for health care professionals and the public, and influencing public policy on aging issues emphasizing the needs of rural older adults. The UAMS COA includes a network of 7 sites whose mission is to improve the quality of life for older adults and their families in the areas they serve. The COA provides older Arkansans with local access to specialized educational and clinical care.

**1.3b. Harvey and Bernice Jones Eye Institute (JEI).** The JEI specializes in providing caring and compassionate treatment for a wide range of eye conditions and illnesses. Along with state-of-the-art equipment and technology, research and education programs ensure a better state of health now and in the future. JEI offers comprehensive eye care services all under one roof, including treatment for glaucoma, retina disorders, cornea diseases, low vision, eye injuries, and macular degeneration. In addition to clinical services, JEI has an optical shop and contact lens fitting specialists. JEI is one of only 20 free-standing comprehensive centers in the nation devoted to the treatment and study of the eye.

**1.3c. Jack T. Stephens Spine and Neurosciences Institute.** The Jackson T. Stephens Spine and Neurosciences Institute at UAMS is a center for research, education, and clinical care related to the spine. The Institute is the home of the T. Glenn Pait, MD Spine Clinic, University Rehabilitation, and COM Departments of Neurosurgery, Neurology, Physical Medicine and Rehabilitation, Otolaryngology, and related neuroscience programs. The institute's 12-story building, named for philanthropist Jack Stephens of Little Rock whose gift made this center possible, is also home to the Center for the Athletic and Aging Spine, which includes a therapeutic whirlpool and water therapy pool to support mobility and strength training. Multidisciplinary teams care for patients with spine problems, including surgical spine specialists, nonsurgical spine specialists, spine physiatrist, pain management specialist, specialty nurses, and physical therapists. The Institute also offers full service for physical and occupational therapy, hand therapy, speech therapy and physical fitness.

The major research focus of the Institute is the Center for Translational Neuroscience, which facilitates and integrates research on translational aspects of neuroscience across UAMS, bringing basic neuroscience findings to the bedside. The Department of Anesthesiology has ongoing research for pain management, including both basic and clinical research activities involving drug abuse, pediatric anesthesia and hyperglycemia. The Department of Otolaryngology's basic science and clinical researchers strive to find the cure for head and neck cancer, deafness, tinnitus, thyroid cancer, allergy, vascular anomalies, and other otolaryngic diseases.

**1.3d. Myeloma Institute.** The UAMS Myeloma Institute, led by Dr. Gareth Morgan, is the most comprehensive center in the world for research and clinical care related to multiple myeloma and related diseases, such as Castleman Disease and Waldenstrom Macroglobulinemia. This team of leading scientists and clinicians have pioneered many advances that have become standards of care, leading to improved survival rates. The Myeloma Institute is known for its "bench to bedside" approach, continually translating advances in the laboratory into breakthrough clinical treatments. The Institute is committed to: 1) accelerating curative therapies for multiple myeloma and related diseases through an integrated program of innovative research and high-quality, comprehensive patient care; 2) customizing care based on each patient's genetic profile and risk factors for truly personalized treatment; and 3) employing discovery science to understand the biology of multiple myeloma and maximize cure. Current research efforts include identifying the causes of myeloma, myeloma stem cell biology, total treatment approaches to curing myeloma, targeted treatment based on genetics and epigenetics, minimal residual disease, advanced diagnostics for advancing the cure, CyTOF technology, and clinical trials.

**1.3e. Psychiatric Research Institute (PRI).** The UAMS PRI has experience in treating all mental health disorders, with a dedicated staff whose primary goal is to help members of the community reach their potential despite any mental health condition they may have. PRI is Arkansas' leader in the research and treatment of psychiatric diseases. Its signature programs include the Helen L. Porter and James T. Dyke Brain Imaging Research Center, the Center for Addiction Research, the Child and Adolescent Psychiatry division, the Division of Health Services Research, the Precision Medicine Program, the PRI Trauma Center, and the Women's Mental Health Program.

Research is an integral part of the evidence-based care provided at PRI. PRI's 5 research divisions are the Center for Addiction Research, the Division of Health Services Research, the Women's Mental Health Program, the Neurocognitive Dynamics Laboratory and the Brain Imaging Research Center. These administrative units are part of the UAMS COM. The Center for Addiction Research is at the forefront when it comes to conducting innovative research designed to improve the prevention and treatment of addictive disorders as well as inform local and national policies regarding the antecedents and consequences of addiction. The Division of Health Services Research is one of the largest and most involved centers of its kind in the country, coordinating numerous projects in and around Arkansas. Arkansas' only training center for physicians and researchers interested in reproductive mental health, the Women's Mental Health Program conducts extensive psychological and physical exams in an effort to identify those at risk for numerous medical issues. The Brain Imaging Research Center has distinguished itself in a short period of time as one of the leading resources for neuroscientific study. The Neurocognitive Dynamics Laboratory utilizes electroencephalography and functional magnetic resonance imaging to explore brain function on the mesoscopic level.

**1.3f. Translational Research Institute (TRI).**

TRI's administrative core is located on the 3<sup>rd</sup> floor of the Donald W. Reynolds Institute on Aging (IOA) building and occupies 8600 ft<sup>2</sup>. The Director and Executive Director have 114 ft<sup>2</sup> offices located adjacent to each other and additional administrative staff occupy 4 114 ft<sup>2</sup> private offices in the same hallway and 7 cubicles. The



remaining space is occupied by TRI's Clinical Trials Innovation Unit (see below). The close proximity of the Director's and supporting staff offices facilitates the spontaneous exchange of ideas and communications to rapidly address hub needs and to communicate with numerous faculty and staff throughout UAMS, ACH, ACRI, and CAVHS. TRI also has access to a 273 ft<sup>2</sup> conference room on the 3<sup>rd</sup> floor, as well as meeting facilities and conference rooms located on the 1<sup>st</sup> floor. These include a 104-seat auditorium, a large conference room with a partition divide, a large atrium to host social events, and multiple classrooms to accommodate smaller engagements. The auditorium was recently updated to include interactive video capabilities, touch screen controls, and a built-in teleconferencing system. TRI's space also includes a Clinical Trials Innovation Unit (see below) that offers participant recruitment assistance, protocol budget development and negotiation, Medicare coverage analyses, research nurse and coordinator support, regulatory support, and dedicated research space for subject visits.

**1.3g. Winthrop P. Rockefeller Cancer Institute.** The Winthrop P. Rockefeller Cancer Institute, directed by Dr. Peter Emanuel, is Arkansas' only comprehensive cancer treatment and research facility. The institute's staff of physicians, nurses, researchers and other health care professionals is dedicated to improving the health of all cancer patients, both from Arkansas and beyond. The institute was renamed in 2007 to honor the memory of the late Arkansas Lt. Gov. Winthrop P. Rockefeller, who died of a rare bone marrow disorder associated with leukemia. In 2010, the Cancer Institute celebrated the grand opening of its 12-story expansion. Filled with natural light, the expansion is an environment designed to promote comfort and convenience for patients and collaboration opportunities for physicians, scientists and other health care professionals.

The Winthrop P. Rockefeller Cancer Institute directs cancer research for UAMS and its affiliated institutions. Cancer Institute scientists are committed to reducing cancer incidence, mortality and morbidity in Arkansas and the surrounding region. The Cancer Institute's approach champions discovery-based science to develop new treatment strategies for delivery to the patients of Arkansas. The Cancer Institute accomplishes its goals through focused research programs, shared resources, and multidisciplinary disease-specific committees. The Cancer Institute research programs provide a collaborative environment for the conceptualization and conduct of basic, translational and clinical cancer-focused research. Each research program is defined by a common research focus, and within each program, individual research themes are identified based on the talent and expertise of its members and for the purposes of strategic planning, optimization of resources and funding opportunities. Each member of the Cancer Institute participates in one of the 3 research programs (Cancer Prevention & Population Sciences, Therapeutic Sciences Program, and Host Response and Radiation Sciences, and members play a vital role in defining the goals of the research programs and identifying opportunities for inter- and intra-programmatic collaborations. Patients of the Cancer Institute have access to cutting-edge prevention strategies and cancer therapeutics through its clinical research program. The Cancer Clinical Trials and Regulatory Affairs (CCTRA) office assists investigators with clinical trial design, regulatory management and data management. The Disease Oriented Committees help cancer researchers identify clinical collaborators, address study feasibility issues, and optimize experimental and statistical design. The Protocol Review and Monitoring Committee provides scientific review of all clinical research at the Cancer Institute and monitors human subject accrual to clinical trials. The Cancer Institute clinical trial portfolio includes therapeutic and prevention trials sponsored by peer-reviewed funding agencies, industry and National Cancer Institute Cooperative Groups.

#### 1.4. Centers

**1.4a. Arkansas Center for Health Disparities (ARCHD).** The NIMHD-funded ARCHD, led by Dr. James Raczynski, was renewed for the third time in 2017 and is housed in the UAMS COPH. The mission of ARCHD is to develop research to improve access to quality prevention and health care programs for racial and ethnic minorities with a goal of reducing health disparities. The Center focuses on chronic disease disparities with an initial emphasis on cardiovascular disease (CVD), diabetes, obesity, and cancer. Arkansas consistently ranks among the worst in the nation in health indicators, particularly for CVD and cancer morbidity and mortality. Arkansas has the fastest growing Latino population in the country and the largest Marshallese community outside of the Marshall Islands, in addition to a substantial African-American population. ARCHD has partnerships with the Arkansas Department of Health and the Arkansas Minority Health Commission, as well as several historically black colleges and universities (HBCUs). The Center provides an infrastructure to develop and implement research to reduce disparities in the state's minority populations including resources such as PHACS (see below).

ARCHD is supporting comparative effectiveness research evaluating a community health worker (CHW) program serving primarily rural African American elderly and adults with physical disabilities as well as a

randomized controlled trial testing the effectiveness of an evidence-based weight loss and maintenance intervention translated for a faith-based, rural, African American population using a community-based participatory approach. Under the recent renewal, new ARCHD supported research is using CHWs to help reduce chronic disease risk factors. One of these projects focuses on the rural Arkansas Delta to reduce tobacco smoke exposure among children and their caregivers and to help African-American women quit smoking. The other project is studying access to Pre-Exposure Prophylaxis (PrEP) for HIV prevention among incarcerated African-Americans re-entering society. ARCHD will also fund pilot studies of early stage investigators to collect preliminary data in multiple areas relevant to health disparities.

**1.4b. Arkansas Claude Pepper Older Americans Independence Center.** The Donald W. Reynolds Institute on Aging received \$5.5 million from the National Institute on Aging in 2012 to establish the Arkansas Claude D. Pepper Older Americans Independence Center, one of 12 such centers in the US. Led by Jeanne Wei, MD, PhD, executive director of the Reynolds Institute on Aging, the center is housed in expanded floors at the institute. The purpose of the grant is to provide a cornerstone for research that will help aging Arkansans remain independent and provide possibilities for regaining independence. The center's mission is to find ways to better maintain or restore independence in older persons by: 1) studying the cause of declining skeletal muscle function and heart performance as people grow older and translating those findings to improve nutritional recommendations and standards of care; 2) introducing state-of-the-art research methods for studying protein metabolism to better enable basic molecular-based studies that result in clinical trials aimed at improving the health of aging Arkansans; 3) using novel interventions in the prevention and treatment of heart and skeletal muscle weakness; and 4) promoting aging research by young scientists, and training new geriatricians and gerontologists to improve functional independence of older Arkansans through targeted therapeutic interventions.

**1.4c. Arkansas Nanomedicine Center (ANC).** Established in 2012, the ANC focuses on application of nanotechnology in biology and medicine for nanodiagnosis, nanogenetics, nanotherapy, drug and gene delivery, and nanotoxicity. The ANC is a hub for innovative multidisciplinary activities including infection, cancer, toxicology, and imaging. Via an expanding network of basic science researchers and associated clinicians, the ANC seeks to investigate and apply advanced nanomedicine techniques and materials to improve current medical diagnosis and treatment options for patient care. The Center gathers nanomedicine efforts and resources from UAMS and statewide collaborators under one umbrella. The mission of the ANC is to collaborate with UAMS departments and institutes and other state institutions with abundant expertise in nanotechnology to improve human health.

**1.4d. Brain Imaging Research Center (BIRC).** The BIRC, led by Clint Kilts, PhD, has a Philips Achieva 3 Tesla magnetic resonance imaging scanner to harness clinical and translational approaches to understand mechanisms of disease in the neuroscience field. The BIRC supports research and clinical imaging by generating detailed functional and anatomic images. Seeking explanations at the neural network level, the BIRC provides clinical neuroscience with a better understanding of the causes of mental illness and the specific brain responses to medication and behavioral therapies. BIRC works in collaboration with the Psychiatric Research Institute's (PRI) Center for Addiction Research (CAR), the Division of Health Services Research (DHSR), and the Women's Mental Health Program to apply imaging neuroscience to existing behavioral research programs, as well as research programs in child health and mental illness, childhood adversity, and women's mental health during and following pregnancy. The BIRC is a neuroscience and neurotechnology resource for UAMS and the state of Arkansas. The long-term goal of the BIRC is to conduct human neuroscientific research that has the greatest potential to improve the treatment of psychiatric disorders and prevent illness in at-risk individuals. The mission of the BIRC is to contribute to an emerging understanding of the complicated relationship between the brain and human behavior, utilizing state-of-the-art imaging technology and a neural network processing approach.

**1.4e. Center for Addiction Research (CAR).** The CAR was established in 2004 and resides within the 5-story, 110,000 square-foot Psychiatric Research Institute. CAR has 5 primary faculty. The overarching goal of CAR is to conduct innovative research that will improve the prevention and treatment of addictive disorders and inform local and national policies regarding the antecedents and consequences of addiction. CAR's current research priorities include abuse liability assessment and human behavioral pharmacology, decision making and cognitive effects of drugs of abuse, drug development and the assessment of putative medications for addictive disorders, understanding marijuana dependence to develop better methods to assist quit attempts, understanding parenting processes and how parent training can be used as a prevention or

intervention tool to reduce substance abuse and mental health problems in children, and examining the cost effectiveness of various aspects of addiction treatment.

**1.4f. Center for Distance Health (CDH).** The CDH is an innovative center within the COM that allows UAMS to respond to the demands for dynamic, contemporary health care. The CDH's mission is to facilitate distance health implementation of educational, clinical, research, and outreach opportunities, including the effective management of needs assessments and efficient resource matches. CDH effectively reduces disparities in health care in Arkansas, while supporting ground-breaking research and cutting-edge programs (**Table 2**).

<b>Program</b>	<b>Description</b>
Antenatal and Neonatal Guidelines, Education and Learning System (ANGELS)	innovative consultative service for a wide range of physicians including family practitioners, obstetricians, neonatologists, and pediatricians
Arkansas Stroke Assistance through Virtual Emergency Support (AR SAVES)	delivers live, telemedicine-based neurology consultation in emergency departments by connecting potential stroke patients with specialists who offer on-the-spot stroke diagnosis and treatment
Arkansas e-Link	statewide telemedicine network
CDH Language Interpreter Video Exchange (LIVE)	interpreters facilitate communication between patients, families, and health care professionals using telemedicine equipment, such as tablet devices and standalone video conferencing systems
Correctional Facility Telemedicine	delivers routine and high-risk obstetrical support for women within the Arkansas prison system
Following Baby Back Home	serves families of high-risk infants post discharge to facilitate immunization compliance, follow-up appointments, and education regarding the needs of their infant
LearnOnDemand	education portal that allows health care providers to obtain continuing education credit
PatientsLearn	education portal provides patients with up-to-date information, education, and resources
Rehabilitative Services for Persons with Mental Illness (RSPMI)	certifies mental health sites for Medicaid reimbursement on required equipment and network connectivity used for telemedicine services
South Central Telehealth Resource Center (SCTRC)	supports telehealth integration in health care settings and classrooms through existing and developing telehealth networks that serve the south's medically underserved rural populations
School-Based Telemedicine in Arkansas (STAR)	uses telehealth technology to deliver behavioral health, obesity prevention, and oral health care in school-based health centers
Trauma Telemedicine	expedites treatment for patients who have suffered a traumatic injury and provides treating physicians with immediate access to patients and injury images to determine treatment options
Adult Sickle Cell Clinical Program	provides resources to primary care physicians in support of quality care for adult sickle cell patients
UAMS ANGEL Eye	delivers real-time video and audio of hospitalized infants directly to their remote family
UAMS Physician's Call Center	provides consultation, transport, and triage services for Arkansas physicians

**1.4g. Center for Diversity Affairs (CDA).** The CDA leads UAMS diversity programs and improves cultural competency across 4 domains of the institutional mission: patient care, education, research, and outreach. The CDA operates to serve all components of the UAMS institution, including the 6 academic units, 7 institutes, and University Hospital, in its efforts to become a more diverse, inclusive, and culturally competent academic health center, through the provision of leadership, programs, and resources, as well as collaboration and partnerships. The CDA focuses on the following:

- **Diversity:** Individual differences (e.g., personality, abilities, and life experiences) and group differences (e.g., race/ethnicity, age, culture, socioeconomic status, sexual orientation, gender identity/expression, language, and country of origin as well as political, religious, or other affiliation).
- **Inclusion:** A sense of belonging: feeling respected, valued for who you are; feeling a level of supportive energy and commitment from others so that you can do your best work.
- **Equity:** Equality, impartiality, justice, and fairness as it applies to opportunity, access, resources or quality of health care.
- **Cultural Competency:** A set of congruent behaviors, attitudes, and policies that come together in a system, agency or among professionals and enables them to work effectively in cross-cultural situations.

**1.4h. Center for Drug Detection and Response.** Led by Dr. Jeffrey Moran, the mission of the center is to establish a multi-dimensional and applied forensic science research program that 1) provides scientific rationale for criminal justice policy decisions regulating synthetic cannabinoids and other drugs of abuse and 2) facilitates the development and standardization of technology, reagents, and standard operating procedures capable of assaying synthetic cannabinoids and other drugs of abuse. The center's commercial collaborator is Cayman Chemical Company, which synthesizes reference standards and develops novel research tools to assist the forensic and academic communities to better understand the epidemic of designer drug abuse.

**1.4i. Center for Health Literacy (CHL).** UAMS' CHL aims to improve health literacy. CHL initially began as a program in 2012 and was expanded to a center in the COM 2 years later. The CHL provides plain language services to make health information easy to understand. The office provides training to health professionals on health literacy best practices and studies health literacy and how it affects health. The CHL is funded by UAMS, National Institutes of Health, and the National Institute of Diabetes and Digestive and Kidney Diseases.

**1.4j. Center for Microbial Pathogenesis and Host Inflammatory Responses (CMPHIR).** Directed by Dr. Mark Smeltzer, the CMPHIR provides an integrated and supportive research infrastructure that significantly enhances the ability of project leaders to establish independent, extramurally funded research programs. CMPHIR offers a scientific and administrative foundation created under this umbrella to recruit additional junior investigators whose research interests are consistent with the underlying scientific theme and whose participation further enhances overall program synergy. The long-term goal is to integrate project leaders with newly recruited junior investigators, as well as with established investigators who can significantly expand their existing research programs, to create the collaborative and translational synergy required for the development of successful program-project applications.

**1.4k. Center for Osteoporosis and Metabolic Bone Disease.** This center was established in 1994 through the support of UAMS and CAVHS. Led by Stavros Manolagas, MD, the center is dedicated to the study of osteoporosis and its treatment. The center has a faculty of 10 and a technical and administrative staff of over 30. The faculty of the center has a combined research experience of almost 200 years, has a collective record of more than 1,000 publications, and it represents a highly synergistic team with complimentary expertise in molecular and cellular biology, molecular genetics, the biology of bone as a tissue, and the clinical diagnosis and treatment of osteoporosis. The center was previously supported by a program project grant (15 years) and now is supported by several grants from the National Institutes of Health, the U.S. Department of Veterans Affairs, and Tobacco Settlement funds from the State of Arkansas. The total extramural funding of the center in the last 15 years has exceeded \$30 million.

The goal of the research of the center is to improve the understanding of the pathophysiology of the bone fragility syndrome of osteoporosis, and develop optimal therapies for its treatment. Through interrelated projects supported by shared cores, the investigators of the center work to elucidate the cellular, molecular and genetic mechanisms that underlie loss of bone and strength, search for the mechanism of existing therapies, and develop novel ones for the prevention and treatment of osteoporosis. The central research theme is that the fundamental problem in osteoporosis is aberrant bone cell number, which depends both on the birth rate, reflecting the frequency of division of the appropriate precursors, and the lifespan, reflecting the timing of death by apoptosis; and that the aging of bone itself and oxidative stress, and acceleration of oxidative stress by the aging of other organs and tissues, are responsible for the development of this condition.

**1.4l. Center for Translational Neuroscience (CTN).** The CTN was established in 2003, as a division of the Department of Neurobiology & Developmental Sciences, with Dr. Edgar Garcia-Rill as the director. CTN's goal is to facilitate and integrate research on translational aspects of neuroscience across UAMS, basically bringing basic neuroscience findings to the bedside. CTN has held Center of Biomedical Research Excellence (COBRE) funding since 2004 and now holds a Phase III award. A highlight of CTN is the Spinal Cord Injury Mobilization Program, designed to provide the most comprehensive therapy program for recovery of movement. Two patented devices developed at UAMS form part of this program.

Other advances at the CTN during the last 10 years include, a) the development of a novel treatment for tinnitus that is effective in a significant (but not all) number of patients, b) the development of a novel treatment for spatial neglect that eliminates the deficit after a few days, c) the development of a promising new treatment for spasticity, d) the discovery of a novel mechanism for sleep-wake control that promises to revolutionize the sleep field and provide new avenues in the field of anesthesia, and e) the development of a telemedicine program in neonatology that provides education and consultation to underserved areas that decreased newborn mortality across the entire State. CTN has generated over \$90 million in new grants for our investigators and published over 500 articles and chapters.

**1.4m. J. Thomas May Center for ALS Research.** The center was established in November 2008 to find readily accessible treatments for Amyotrophic Lateral Sclerosis (ALS). The mission of the center, with Dr. John Marecki serving as interim director, is to develop and rapidly test combinations of FDA-approved drugs, together with nutraceuticals regarded as safe by the FDA, to identify effective and innovative treatments to dramatically slow or halt the progression of ALS. The center is dedicated to understanding the causes of ALS, with the goals of finding new treatments and getting them to patients as quickly as possible. Researchers at the center are actively testing dozens of combinations of FDA-approved drugs and nutraceuticals.

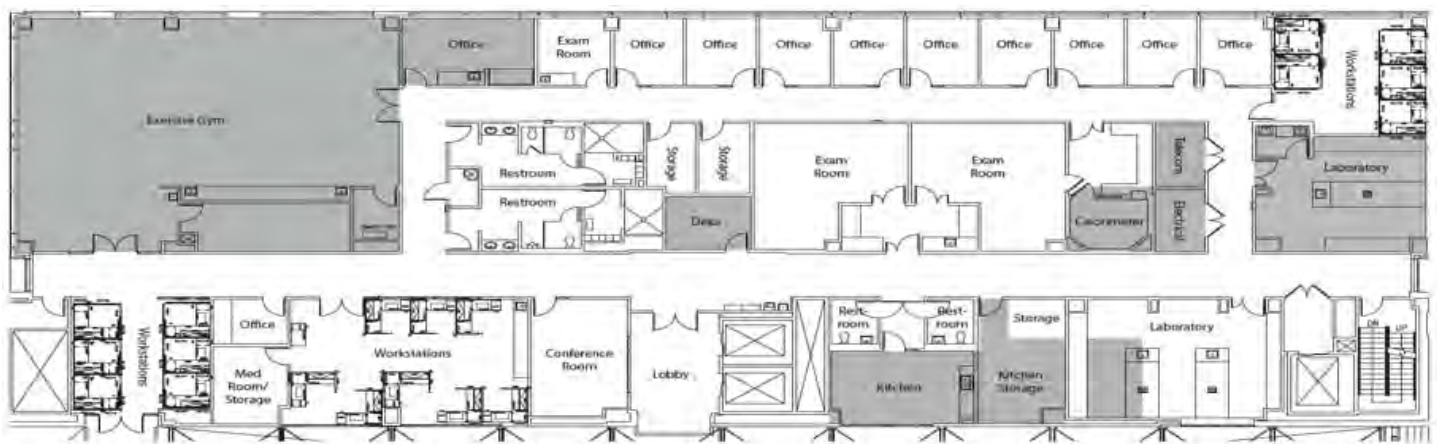
**1.4n. UAMS Cardiovascular Center (UCVC).** The UCVC, directed by Drs. Nancy Rusch, David Rutlen, and Jean McSweeney, serves as a hub for cross disciplinary endeavors in cardiology, imaging, pharmacy, pediatrics, pharmacology, toxicology, distance health, and community outreach. Clinicians and researchers combine efforts to improve patient health through communication, collaboration, and innovation. The UCVC mission is to identify and provide unique opportunities to expand and improve cardiovascular patient care, enable new discoveries, and train the next generation of physicians and scientists at UAMS and its partner institutions.

**2. Additional UAMS Resources**

**2.1. Clinical Trials Innovation Unit.** The purpose of TRI’s Clinical Trials Innovation Unit (CTIU) is to support high quality multi-site clinical research studies and streamline clinical trial start-up processes. The CTIU provides services and support for all types of human-based research studies including CTSA Trial Innovation Network studies, grant-supported investigator initiated studies and industry sponsored studies. The CTIU serves as a liaison between TRI hub researchers and outside entities, including the CTSA Trial Innovation Network, researchers from other institutions, and industry sponsors, to facilitate relationships and identify investigators across a wide range of disease specific expertise. The CTIU staff are led by a Director of Research Administration and a Director of Clinical Trials, and includes an Associate Director for Regulatory Support, Associate Director for Budget/Coverage Review, 2 Regulatory Specialists, 2 Budget and Coverage Specialists, a Recruitment Specialist, a Program Coordinator, 3 Nurse Coordinators, a Study Coordinator, and 5 part-time nurses that assist with evening and weekend studies. CTIU staff guide investigators throughout the clinical trial process to accelerate approvals and contract execution. All CTIU staff are trained in Human Subjects Research Protection and Good Clinical Practices. The CTIU also works collaboratively with other groups on campus, including UAMS research contract attorneys, the UAMS IRB, and the Office of Research Compliance, to create an environment that promotes efficient implementation of clinical trials at UAMS. The CTIU also coordinates protocol submissions to central and local IRBs, providing a single contact point to enhance communication and reduce redundancy.

The CTIU provides the following supporting services: sponsor communications, facilitation of research contract approvals, preparation for and assistance during pre-study visits and site initiation visits, coverage analysis, budget development and negotiations, a suite of study management tools (AR-CRIS), support for protocol development and IRB submission, project management, subject recruitment, and study initiation, conduct, closeout and regulatory activities throughout a clinical trial. CTIU staff provide educational trainings including courses offered for the UAMS Certified Research Specialist Program.

The CTIU is located on the 3<sup>rd</sup> floor of the UAMS Institute on Aging (blueprint below) and includes 4 director/associate director offices, a finance and regulatory suite with 4 private workstations, a coordinator suite with 8 workstations, a conference room, a secure medication and supply room, a secure file storage room, a participant waiting area and research restrooms, 8 outpatient procedure spaces, including exam tables, phlebotomy chairs, and 4 hospital beds, additional space to conduct participant visits, and a specialized lab which includes -20°C and -80°C freezers, refrigerator, fume hood, and general laboratory equipment for sample collection, processing, and shipment (e.g., centrifuges, balances, etc.). The CTIU provides services in



**TRI Space/CTIU**

multiple locations throughout the UAMS Medical Center, any location on the UAMS central campus, Freeway Medical Tower, Recovery Centers of Arkansas, and Central Arkansas Veterans Healthcare System.

**2.2. Biosafety Level-3 Facility.** A fully equipped Biosafety Level-3 facility is available in the Department of Microbiology and Immunology. This facility can accommodate both bench work and animal studies. This facility is located on the first floor of the Biomedical Research Building I.

**2.3. Bioventures.** BioVentures was established as a formal outgrowth of UAMS's interest in promoting a biomedical technology industry for Arkansas and translating its research into products that benefit human health. UAMS established BioVentures to maximize global, industrial interaction with the University of Arkansas faculty, as well as to facilitate technology transfer, the development of startup companies that are based on UAMS technology, and contributions to Arkansas' economic development. BioVentures links the research minds at UAMS to global markets in order to advance Arkansas' scientific and economic development. BioVentures manages UAMS invention disclosures, patenting and licensing activities, and engages UAMS researchers in the founding and growth of local businesses. BioVentures currently manages more than 60 unique license agreements and has a technology portfolio of approximately 250 cases.

The business incubator program at BioVentures provides critical support to the life science startup companies emerging from UAMS technologies. The incubator provides support services such as business planning and market analysis, intellectual property management, funding support services, access to local business community leaders and company formation and equity investments. The incubator facility is designed as a startup incubator for laboratory-based companies and contains approximately 7000 sq ft of leasable laboratory and office space. BioVentures has assisted entrepreneurs in establishing over 50 spin-off companies. Twenty-three of these startup companies have ongoing operations in Arkansas and have generated over 420 jobs in the region.

Collectively, BioVentures and TRI developed and implemented educational programs to develop expanded faculty interest in entrepreneurial sciences, including: 1) Health Science Entrepreneurs: Innovators of Health Care Seminar Series; 2) Health Sciences Entrepreneurship Boot Camp; and 3) a 4-week biomedical commercialization course called fastPACE. In addition, Bioventures offers a large variety of seminars and workshops on specific topics, such as Intellectual Property Basics, How to Get a Startup Started, Searching for Prior Art, and Resources for Entrepreneurs.

**2.4. UAMS Core Facilities.** All core facilities are reviewed annually to assess productivity and usefulness. All existing cores have been judged to be useful and necessary and receive financial subsidy for continued operation. Through this ongoing review process, unproductive and/or nonfunctional cores can be discontinued and replaced with cores that bring new instrumentation or methodology to campus. Core facilities are described below in alphabetical order.

**2.4a. Biodosimetry Diagnostic Core.** Using ultrahigh-performance liquid chromatography–tandem mass spectrometry (UHPLC-MS/MS), the Biodosimetry Diagnostic Core offers high-throughput analytical services for determining diagnostic amino acids and their precursors or metabolic products. Available biomarkers include citrulline and tetrahydrobiopterin. The Core's state-of-the-art analytical equipment include the following: Waters Quattro Premier triple quadrupole mass spectrometer equipped with both electrospray ionization and atmospheric pressure chemical ionization probes; UHPLC system; 2 additional gradient HPLC systems with fluorescence, electrochemical, UV-Vis absorption detection capabilities; Agilent 6890-5890 gas chromatography–mass spectrometry instrument; Waters Quattro micro quadrupole time-of-flight mass spectrometer equipped with Shimadzu 10AVP chromatographic system with two high-performance pumps, high-throughput autosampler, and a column oven.

**2.4b. Bioluminescent & Fluorescent Imaging Core.** The Bioluminescent and Fluorescent Imaging Core offers *in vitro* and *in vivo* biophotonic imaging services using bioluminescence and/or fluorescent molecules as reporters of gene or protein expression. The technology uses luciferases and other fluorescent proteins incorporated into cells, microorganisms, and animals. For example, luminol can be used to image and quantify radiation-induced and other inflammatory processes. The core facility houses a Caliper Life Sciences IVIS 200 Imaging System with a highly sensitive CCD camera optimized for biophotonic imaging. The technology has applications in multiple research areas, including osteomyelitis, oncology, inflammation and metabolism. The core also offers protocol development and data analysis.

**2.4c. Biotelemetry & Ultrasound Imaging Core.** The Biotelemetry & Ultrasound Imaging Core provides invasive *in vivo* monitoring of cardiovascular function and noninvasive *in vivo* monitoring of structure and function in small-animal models. Its Biotelemetry Services offer surgical implantation and explantation of biotelemetry transmitters, including postsurgical monitoring of animals and administration of analgesic and

antibiotics, useful for monitoring blood pressure, heart rate, temperature, circadian activity, and electrocardiogram in conscious, unrestrained animals. The Ultrasound Imaging Service provides noninvasive assessment (including Doppler imaging) of function of the heart, vascular system, intestines, and other internal organs, as well as tumor cell growth and angiogenesis, in lightly anesthetized small animals.

**2.4d. Brain Imaging Research Core.** This Core is a resource to explore the neuroscience of human behavior in healthy and patient populations. Instrumentation includes a Philips Achieva 3T X-series MRI system housed in a custom-designed MRI facility. The short flared-bore magnet offers 50 cm field-of-view (FOV) imaging capability and Quasar dual gradient design with gradient magnitudes up to 80 mT/m and gradient switching speeds (slew rates) up to 200 mT/m/ms. The FreeWave data acquisition system features 32-channel architecture. The scanner room has three custom wave guides, in addition to the primary penetration panel, to permit the MR-shielded and nonferromagnetic application of visual stimulus projection, psychophysiological monitoring, and response acquisition devices. The adjacent control room permits constant visual and auditory contact with subjects in the scanner and contains the imaging control console and computers to manage study stimulus and recording demands.

**2.4e. Cell Purification/Molecular Biology Core.** This core houses a tissue homogenizer and associated Miltenyi Biotec autoMACS Pro Separator, which together enable antibody-based capture of specific underrepresented subpopulations of mammalian cells that contribute to the host immunological and inflammatory responses, a BMG Labtech FLUOstar Omega microtiter plate reader, which can collect data from eight channels simultaneously, two ThermoFisher Scientific StepOnePlus 96-well real-time PCR systems, a Bio-Rad ChemiDoc MP image capture and analysis system, which increases throughput and adds the ability to quantitatively image alternative fluorescent substrates, and two FlowJo workstations for the analysis of flow cytometry data.

**2.4f. Digital and Electron Microscopy Core.** This facility operates and maintains computer-controlled microscope workstations ranging from light to electron microscopy. Samples can be viewed at various scales of resolution from microns to nanometers. Equipment supports both static and time-lapse (e.g., minutes to days) imaging of living cells. Fluorescence imaging and multicolor images from fixed and living samples are generated. Core director and staff provide advice, training, and user support for equipment operation and sample preparation. Available equipment includes Zeiss LSM 880 Airyscan confocal microscope, AxioImager upright microscope, AxioObserver inverted microscope, Zeiss Elyra PS.1 super resolution microscope that supports 3D-structured illumination microscopy and PALM/dSTORM microscopy, and FEI Tecnai F20 200 keV electron microscope with a cryo-chamber for single particle protein work. Sample preparation for electron microscopy is supported by a Leica automated freeze substitution apparatus, a Leica Ultracut 7 microtome, and an FEI Vitrobot for microprocessor-controlled plunge freezing of samples.

**2.4g. DNA Damage & Toxicology Core.** This core provides expertise, services, and instrumentation for DNA damage and toxicology studies related to toxic or hypoxic animal/organ/tissue/cell injury in drug development, diseases, and aging. In addition to offering standard assays for organ toxicity in animals (BUN, SCr, ALT, AST, etc.), tissues (TUNEL, immunohistochemistry), and cells (LDH release, MTT, Comet assays), the facility assists investigators in measuring oxidative damage (catalytic Fe, 8OHdG, SOD1, SOD2, HO1, OGG1, etc.) and quantifying apoptosis and necrosis in cells and tissues by using quantitative cytochemistry, immunocytochemistry techniques, and 3-D imaging. This facility is located in Biomedical Research Building I.

**2.4h. DNA Sequencing Core.** Managed by and located within the Department of Microbiology and Immunology, this core facility makes DNA sequencing available to all researchers. The core offers rapid turnaround and help with troubleshooting. The core has an ABI Prism 3100 Genetic Analyzer (capillary technology) for DNA sequencing of plasmids and PCR products, an Illumina MiSeq next-generation sequencing system and supporting equipment required for its use (e.g., an Agilent Technologies TapeStation for quality-control analysis of DNA, RNA, and protein samples), CLC Genomics Workbench data analysis software, and a ThermoFisher Scientific ProFlex PCR system and additional instrumentation to support conventional Sanger sequencing. Specific MiSeq services currently available include whole-genome sequencing, 16S metagenomics, RNA-seq, chromatin immunoprecipitation sequencing, and bioinformatics support. This facility is located in the Biomedical Research I building.

**2.4i. Experimental Pathology Core.** The facility provides centralized, comprehensive histological services, with convenient access to all services in one facility. Stringent quality control standards are maintained, and the laboratory is compliant with Good Laboratory Practice (GLP) standards. The laboratory staff have extensive experience in routine histology and immunohistochemistry, involving both human and animal tissues. Services include processing and embedding tissues, sectioning frozen and paraffin-embedded tissues, routine



staining, a wide range of special histochemical staining, immunohistochemistry, and digital slide scanning and analysis with the Aperio ScanScope FL and AperioScanScope CS. The core also contains a Histo-Tek SL automatic slide stainer, a Tissue-Tek TEC embedding center, a Tissue-Tek VIP 300 tissue processor, a Microm HM505E cryostat, Aperio ScanScope FL, and AperioScanScope CS automated digital slide scanners. This facility is located in the Winthrop P. Rockefeller Cancer Institute.

**2.4j. Flow Cytometry Core.** The Flow Cytometry and Cell Sorting Facility is an institutionally supported core that provides expert, high-quality flow cytometry analysis for investigators at UAMS and ACHRI, as well as surrounding campuses. The facility occupies approximately 800 square feet and houses the FACSaria III (cell sorting) instrument, which can sort cells labeled with up to 15 colors, including red fluorescent protein. The facility also includes a BD Biosciences LSRFortessa cell analyzer, which can detect 18 colors simultaneously and has more expansive cell labeling and color detection. Facility Director, Richard P. Morrison, PhD, and Facility Manager, Andrea Harris, each have extensive expertise in current cytometry protocols. This facility is located in the Biomedical Research II building.

**2.4k. Genomics Core.** This facility provides access to state-of-the-art instruments and information-intense data for DNA, RNA (including microRNA), and microarray analysis for human and mouse/rat samples with the use of Expression BeadChips and the Illumina BeadArray Reader. SNP chips are also performed. The core has a dedicated Tecan robot for postprocessing of Infinium SNP Chips. The Illumina Genome Analyzer IIx is a high-end sequencer and can be used for direct sequencing of any genome/cDNA library. The Illumina BeadXpress Reader works with Veracode technology, resulting in high throughput and multiplex detection of SNPs, gene expression, and protein detection from a custom design. A Qiagen QIAextractor robot performs extraction from any Qiagen kit. Other available equipment includes the Agilent Technologies 2100 Bioanalyzer, Illumina iScan and Cluster Station systems, a SpectraMax microplate reader, laser-capture microdissection, and Applied Biosystems 7900 real-time PCR instrument. The Core specializes in pharmacogenomics and is located in the Winthrop P. Rockefeller Cancer Institute.

**2.4l. Microscopy/Cellular Imaging Core.** Instrumentation in this core includes a Nikon Eclipse Ti/CLSi confocal laser scanning microscope, a Nikon Eclipse TS100 LED inverted microscope, an EVOS FL Auto cell-imaging system, and a JEOL scanning electron microscope and associated instrumentation (Leica EM critical point dryer and a Denton Vacuum Desk V sputter coater). This core is located in Biomedical Research Building II.

**2.4m. Molecular Imaging Core.** The Molecular Imaging Core provides comprehensive services for magnetic resonance imaging (MRI) and positron emission tomography (PET) imaging. The instruments can be used to image small animals, biological tissues, phantoms, and many other samples. An on-site cyclotron and a fully staffed radiochemistry laboratory provide a wide range of standard radiolabeled PET imaging probes and can help develop and produce custom probes. The main instruments in this core are a Siemens Focus 220 MicroPET and a Bruker PharmaScan 7T MRI. The system is capable of cardiac/respiratory gating/monitoring to limit the negative effects of motion on image quality. The Siemens Eclipse RD 11 MeV Cyclotron can produce radioactive isotopes to label drugs, metabolites, biochemicals, signal transduction agents, liposomes, nanoparticles, and other carriers to image and measure molecular and metabolic events, pharmacokinetics, and biochemistry.

**2.4n. Skeletal Phenotyping Core.** This Core performs high-resolution skeletal imaging and analysis utilizing bone densitometry (DXA), peripheral quantitated computed tomography (pQCT), microCT, and detailed histological analysis. Skeletons can be analyzed *in vivo* or *ex vivo*. When combined with histological evaluation, detailed insight into skeletal phenotype is obtained.

**2.4o. Transgenic Mouse Core.** The Transgenic Mouse Core Facility serves UAMS, the Central Arkansas Veterans Healthcare System, and Arkansas Children's Hospital. The core consists of dedicated laboratory space with a microinjection suite, cryopreservation lab, and isolator rack animal wards. The Transgenic Mouse Core Facility generates transgenic mice via pronuclear microinjection of DNA constructs supplied by users. Microinjections are performed in embryos obtained from C57BL/6 or CB6F1 (a cross between BALB/c and C57BL/6) mice.

**2.5. The Division of Laboratory Animal Medicine (DLAM)** (Director: Mildred Randolph, DVM, DACLAM) is responsible for the purchase, maintenance, and record keeping (in accordance with PHS and USDA regulations) for all animals used in research at UAMS. The Animal Care and Use Program in the DLAM has been fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC) since 1973 and is committed to maintaining AAALAC accreditation. The program has an approved assurance from NIH and total compliance with the Animal Welfare Act as monitored by the U.S.



Department of Agriculture. All investigators, technicians, and students involved in animal research must review institutional policy and receive training in the proper use of laboratory animals available through the DLAM and the Institutional Animal Care and Use Committee (IACUC). The policy and procedures for reporting violations of animal welfare policies is given to every researcher.

Caging is available in several separate facilities on campus. DLAM staff consult with investigators regarding grant applications, especially in the areas of choice of animal models, special procedures, questions of humane treatment, and budgetary considerations. All protocols utilizing animals, regardless of funding, are approved by the IACUC. The DLAM unit includes special facilities and services for procedures or minor surgery; quarantining of animals; housing of virus-free rodents; projects involving infectious agents, pathogens, toxins, or the isolation of tumor-bearing animals; necropsy and histopathology; management of rodent breeding colonies and related records; specialized training; and veterinary literature searches. All animals are housed and maintained according to NIH-specified guidelines.

**2.6. Integrated Clinical Enterprise.** The Integrated Clinical Enterprise (ICE) is a health center model that reorganizes 15 areas of care (women’s services, behavioral health, primary care, multiple myeloma, neurosciences, surgical specialties,

medical specialties, musculoskeletal, emergency medicine, imaging, pathology, interventional care, pharmacy, therapeutics and nursing) into patient-centered service lines that cross departments (**Table 3**). Staff for the 15 service lines represent 5,591 FTEs which include inpatient and outpatient clinics and off-campus clinics. Led by Dr. Richard Turnage, ICE focuses on better coordination of patient care while better controlling costs and strengthening communications in all areas so that the care of the patient is part of a defined service line team. Service lines also enhance education at UAMS by exposing students to interdisciplinary and inter-professional concepts in the clinical environment by working with individuals in multiple specialties and health care professions. Educating students of medicine, nursing, pharmacy and other health professions to work in teams is key to preparing them to work in a team-based clinical care that is integral part of ICE.

<b>Service Line</b>	<b>Liaison(s)</b>
Behavioral Health	Alison Oliveto, PhD
Cancer	Laura Hutchins, MD
Pediatrics	José Romero, MD, Janet Storment, RN
Emergency Medicine	Steve Michener, MPA
Imaging	Laura Bernock, MS
Interventional	Gentry, W. Brooks, MD; Stacy Jones, MD
Pathology	Kelly Suskie, MHSA
Medical Specialties	Robert Bradsher, MD (infectious disease); Jim Marsh, MD (cardiology and internal medicine); Henry Wong, MD (dermatology); Larry Johnson, MD (pulmonology); John Arthur, MD (nephrology); Stavros Manolagas, MD (endocrinology)
Musculoskeletal	Lowry Barnes, MD; Rebecca Wilson, MS
Myeloma	Faith Davies, MD
Neurosciences	Lee Archer, MD
Nursing	Amy Hester, PhD(c), BSN, RN, BC
Pharmacy & Therapeutics	Mike Parr, PharmD
Primary Care	Charles Smith, MD
Surgical Specialties	Nalini Bora, PhD
Women’s Health	Hari Eswaran, PhD

**2.7. The UAMS Institutional Review Board (IRB)** protects the rights and welfare of subjects involved in the human research that it oversees. The IRB is duly constituted, fulfilling all requirements for diversity and has written procedures for initial and continuing review of human subjects research; prepares written minutes of convened meetings; and retains records pertaining to the review and approval process. The IRB is organized and operates in compliance with DHHS regulations as described in 45 CFR part 46 (i.e., The Common Rule) and FDA regulations as described in 21 CFR Parts 50 and 56. The IRB is registered with OHRP and the FDA, and has been fully accredited by the Association for the Accreditation of Human Research Protection Programs (AAHRPP) since 2005. The IRB administrative office suite is located on the first floor of the UAMS Biomedical Research Center, building 1. IRB meetings are held in conference rooms 205 and 207 on the second floor of this building. There 9 nine IRB staff members including the IRB Chair, IRB Vice Chair, Director, Expedited Reviewer, Program Manager, System Submissions Coordinator, and three Administrators. The UAMS IRB Chair oversees 4 IRB committees consisting of 11-12 members on each committee. The IRB convenes weekly, rotating through each of the 4 committees, and reviews ~420 new submissions and ~1000 study modifications annually. UAMS IRB staff provide a variety of training forums, including weekly posts in a blog for investigators and research staff, a blog for IRB members, presentations on how to utilize the system for submitting research studies, and courses offered for the UAMS Certified Research Specialist Program. In addition, upon request, the IRB provides “Working with the IRB” seminars to a wide audience, including individuals, departments, colleges, doctorate students, and grand rounds. The IRB utilizes the CITI Program

for Human Subjects Research and Good Clinical Practices training requirements. The IRB website offers various research document templates and other training materials. Faculty residing on the ACH campus also use the UAMS IRB.

**2.8. The UAMS Library for the Health Sciences** (Director: Jan Hart, MLS, EdD) has 44,000 ft<sup>2</sup> of space with a variety of study areas, a Learning and Teaching Resource Center, a classroom and online testing rooms, a teleconferencing facility, a lounge with vending machines, a large study area and computer lab available 24/7, and a 2,500-square-foot off-site storage facility. More than 120 fully networked computers are maintained in the library to provide access to information resources and e-mail; wireless access is also available. Staff members provide prompt service when software, printing, or networking problems occur. The library currently has a comprehensive collection of information resources, with over 112,700 total print and non-print volumes including 66,780 e-journal titles, and 45,930 books and four major point-of-care clinical information tools. Material not available on campus can be obtained through the library's interlibrary loan service, which utilizes the National Library of Medicine Docline system to route requests automatically to libraries holding the needed information. Databases, including OVID, TOXMAP, TOXNET, ToxSeek, ChemSpider, EBSCO, Web of Science, Lexi-Comp, and DynaMed databases, are also available to library users through the help of trained online searchers. Additionally, the Historical Research Center acquires, preserves, and provides access to rare and archival materials that document the history of medicine, and is the state's premier repository for medical history with over 6,610 volumes in the History of Medicine book collection.

**2.9. Library Video Conference Center.** The UAMS library's inSORS Access Grid Video Conference Center is a state-of-the-art facility available for faculty use. The inSORS Access Grid uses a suite of hardware, software, and audiovisual tools to facilitate collaborative group experiences over Internet 2. The UAMS Library inSORS Access Grid Video Conference Center allows for participation in video conference events (general meetings, lectures, seminars, tutorials, and conferences) worldwide.

## **2.10. NIGMS-Funded IDeA Programs**

**2.10a. Arkansas IDeA Network of Biomedical Research Excellence (INBRE).** The Arkansas INBRE program has been led by Drs. Lawrence Cornett, PI/Director, and Helen Beneš, Associate Director since September of 2001. The overarching goal of the Arkansas INBRE is to expand biomedical research capacity in Arkansas. Building upon infrastructure developed during the earlier BRIN and INBRE phases, the 3 research-intensive, lead institutions in the state—University of Arkansas for Medical Sciences (UAMS); the University of Arkansas, Fayetteville (UAF); and the University of Arkansas at Little Rock (UALR) – provide scientific leadership under the overall theme of Cellular Signaling, Growth, and Differentiation. Through continued enhancement of the research infrastructure, particularly at undergraduate institutions, the Arkansas INBRE strives to continue to improve the ability of academic researchers to compete for federal funding, increase the number of undergraduate students who choose careers in biomedical research, and stimulate the growth of biotechnical industries in Arkansas.

The program consists of an Administrative Core, a Research Technology Core, a Bioinformatics Core, and the Developmental Research Project (DRP) Program. The DRP Program is designed to expand the number of faculty at predominantly undergraduate institutions engaged in biomedical research through several mechanisms including faculty recruitment packages, competitive research funding and career development opportunities. The Administrative Core provides operational support and coordinates all Arkansas INBRE outreach activities, including an intensive 10-week undergraduate student summer mentored research program and an annual statewide undergraduate conference. The Bioinformatics Core, a major component of the Arkansas INBRE, is a statewide research and educational resource to give undergraduate faculty and students access to the computational tools needed for multidisciplinary biomedical research and plays a central role in training the next generation of bioinformaticists. The Research Technology Core uses a voucher program to provide predominantly undergraduate institution investigators access to sophisticated instrumentation and technical expertise that is difficult to establish at small institutions.

**2.10b. Center for Translational Neuroscience (CTN).** The CTN is a Phase III COBRE Center that has been on the UAMS campus since 2003. The CTN facilitates and integrates research on translational aspects of neuroscience across UAMS. Since its inception, the CTN has made significant scientific advances, including developing novel treatments for tinnitus and spatial neglect, developing a promising new treatment for spasticity, discovering a novel mechanism for sleep-wake control, and developing a state-wide telemedicine program in neonatology. The CTN has graduated a number of Project Leaders who have become successful independent investigators. The CTN's effort to bring physician-scientists into translational research is starting to have a significant impact on the health of Arkansans.

**2.10c. Center for Microbial Pathogenesis and Host Inflammatory Responses (CMPHIR).** The CMPHIR COBRE center at UAMS was established in 2012 and it addresses medically important infectious disease in a therapeutically relevant fashion. The CMPHIR promotes understanding both the microbial virulence factors that contribute to the disease process and how these factors impact the host immunological and inflammatory response to define the clinical outcome. Project Leaders have obtained more than \$8 million in extramural funding total, and CMPHIR pilot grant recipients have obtained nearly \$2 million of that extramural funding. The Center also significantly improved the research infrastructure at UAMS and ACRI during Phase I by 1) establishing two new cores to serve Center investigators' specific needs, 2) enhancing existing, institutionally-supported research cores, 3) facilitating utilization of these research facilities, and 4) providing support for the development of animal use protocols, manuscript and grant preparation, and biostatistics and bioinformatics analysis.

**2.10d. Center for Studies of Host Response to Cancer Therapy.** This Center aims to examine the mechanisms of and prevention strategies for cancer-therapy-induced toxicity and side effects while also assisting junior investigators in establishing themselves as independent scientists through a common research focus. This is the first center of its kind that is dedicated to proactively addressing how to minimize the impact of lasting cancer therapy-related toxicities. The focus of the center is on the mechanisms of side effects of cancer therapy and strategies to prevent such side effects. This focus is justified by the dramatic increase in the number of cancer survivors, currently exceeding 13 million in the US. Many cancer survivors are cured of their malignancy but suffer from treatment-related toxicities. While the importance of achieving cancer cure is duly recognized, comparatively little effort has been directed toward establishing the mechanisms of subsequent side effects of cancer therapy and at developing effective interventions to prevent them. The COBRE Center promotes the initiation and development or expansion of unique, innovative state-of-the-art biomedical and behavioral research centers at UAMS.

**2.10e. UAMS Initiative for Maximizing Student Development (IMSD).** The IMSD Program was developed to increase the number of students from underrepresented groups (African Americans, Hispanic Americans, American Indians, Natives of US Pacific Islands, individuals with disabilities, and individuals from disadvantaged backgrounds) graduating with doctorates in the biomedical sciences. The program provides underrepresented groups with two years of salary/tuition, mentoring, and other student development activities with funds from the National Institute of General Medical Sciences.

The Arkansas INBRE Summer Student Mentored Research Program serves as a pipeline for this IMSD program. Dr. Billy Thomas, IMSD Director, assists the Arkansas INBRE leadership with efforts to increase the participation of underrepresented groups in our programs.

**2.11. The UAMS Office of Research Compliance (ORC)** promotes the responsible conduct of research, the protection of human subjects, and the welfare of animals used in research. The ORC provides a variety of supporting functions for UAMS research faculty and staff, including consultations, reviews/audits, trainings, and a Certified Research Specialist Program (CRS). The ORC has 6 offices located in suite 7C in the UAMS Central Building, rooms 739, 740, 743-746, a file room, and a conference room. The ORC consists of 6 staff members, including a Research Compliance Officer, Research Audit Manager, Education Resource Specialist, and 3 Research Compliance Analysts. ORC staff are available to provide compliance consultations for all UAMS researchers, and are available to coordinate communication with federal oversight agencies. ORC also offers tools and templates to researchers who want to assess their own research processes. The ORC's routine review program allows staff to identify research program strengths as well as areas where additional education or improved procedures may be helpful. Other research activities, such as IRB review procedures, are also subject to ORC review. Investigators may request a New Investigation Consult and Education (NICE) review following IRB approval, but before subject enrollment. During the NICE review ORC staffers provide research compliance feedback on proposed study documentation and processes to help the study team address any compliance issues prior to the conduct of the study. The ORC conducts ~10 NICE reviews annually. Investigators may also request a compliance audit, but the ORC also performs this as both routine (random) and targeted (studies that involve higher risk) audits. During an audit, the ORC assesses research activity's compliance with appropriate federal regulations, UAMS IRB and institutional policies and procedures, and generally accepted standards regarding the conduct of human subject research. Once the audit is complete, ORC staff meet with the study team to discuss the audit report, which lists study strengths, recommendations, findings, and suggested remediation. A copy of the report is sent to the IRB and investigators must respond within a set timeframe. The ORC annually conducts 32 compliance audits on human research and 18 compliance audits on animal research. The ORC website provides researchers with a

variety of tools for conducting research, such as guidance on setting up regulatory binders and organization of study files and source documentation, checklists, and self-assessment tools. The ORC Education Resource Specialist coordinates multiple education training platforms, including online courses/webinars, Responsible Conduct of Research (RCR) training for federally funded trainees to meet new federal requirements, and courses for the CRS program. The CRS program is free for all research staff at UAMS and provides essential training in key areas throughout the research process.

**2.12. Performance Excellence.** UAMS' Performance Excellence team was established at UAMS in 2013 as a campus resource to educate staff on Lean Six Sigma methodology and assist with process Improvement projects. The team addresses the elimination of waste in every area of UAMS to deliver higher quality services in the most efficient, effective and responsive manner possible, while maintaining the economic viability of the organization. Since 2013, over 200 employees had been trained in Lean methods and over 140 projects have been managed by the office. Projects range in scope from single department to campus wide initiatives.

**2.13. Proteomics Facility.** This facility provides protein characterization by mass spectrometry, including identification of unknown proteins, quantitative comparison of proteins in biological samples, and mapping of post-translational protein modifications. The facility's state-of-the-art equipment includes the following: Orbitrap Fusion Tribrid Mass Spectrometer, LTQ Orbitrap Velos Mass Spectrometer, nanoAcquity Ultra Performance Liquid Chromatography (UPLC), UltiMate 3000 Binary Analytical LC System, Computer and Software support.

**2.14. Science Communication Group (SCICOM).** SCICOM was established in 1995 to assist faculty in grant writing to secure extramural funds and strengthen the research enterprise. The office staff comprises science editors and a project coordinator. Editors have experience in the biological sciences, social sciences, and medical writing. SCICOM editors work collaboratively with investigators to produce effective and persuasive scientific documents that have a competitive edge in securing extramural funding.

**2.15. Tissue Procurement Facility.** The Tissue Procurement Facility offers a diverse, high-quality human biospecimen repository with appropriate patient protections, best practice collection methodologies, clinical data capture mechanisms, and integrated information technology. The facility is designed to enhance diagnostic, preventive, and therapeutic research efforts.

### 3. University of Arkansas for Medical Sciences Northwest (UAMS-NW)

In 2007, UAMS established UAMS-NW as a regional campus in Fayetteville. UAMS-NW extends the University's medical education, research, and clinical mission. The UAMS-NW campus is located in a region with a large Hispanic/Latino population and the fastest growing Pacific Islander population in the continental US. The campus provides more than 330,000 square feet of classroom and office space, including 23 group education rooms, 2 large conference rooms that each accommodate more than 200 people, and a 2,200 ft<sup>2</sup> library and computer lab staffed by 2 dedicated research librarians. UAMS-NW offers academic programs through 4 UAMS colleges, including the Colleges of Nursing, Public Health, Medicine, and Pharmacy. Dr. Pearl McElfish serves as Associate Vice Chancellor and has helped develop strong institutional support for numerous programs that integrate community-engaged health disparities research with interprofessional education and service learning at UAMS-NW. These efforts include the Office of Community Health and Research (OCHR), Center for Pacific Islander Health (CPIH), and the North Street Clinic, which provides health screenings and treatment to Pacific Islanders. Both the main UAMS campus and the UAMS-NW campus have the same DUNs number; and both sites operate under a Federal Wide Assurance of the protection of human subjects and comply with 45 CFR part 46 and other NIH human subjects' related policies.

**3.1. UAMS Center for Pacific Islander Health (CPIH).** The CPIH at UAMS-NW is a multi-disciplinary center that focuses on research, community programs, training, and policy to address the health disparities and inequities faced by Pacific Islanders. The CPIH is a reflection of the needs of the growing Pacific Islander population in the Southern and Midwestern US, and builds upon the existing community health and research work UAMS-NW has done, and continues to do, with Pacific Islanders in the region. The CPIH is directed by Dr. Pearl McElfish. The CPIH collaborates with academic and community partners to conduct research projects that engage the Pacific Islander stakeholders as equal partners in research. The CPIH hosts the annual meeting, *Gathering for Pacific Islander Health*, which is attended by more than 250 Pacific Islander researchers, health care professionals, community stakeholders, policy makers, and funding organizations. The purpose of this annual conference is to increase knowledge by sharing research, collaborate to develop and facilitate a broad national research agenda, and develop academic and community capacity to conduct community-engaged research through trainings and workshops focused on documenting best practices and

protocols for culturally-grounded research with Pacific Islanders. In addition, the CPIH employs and trains Marshallese study coordinators, health educators, and community health workers (CHWs), and provides cultural competency training to clinical and research stakeholders.

The CPIH offers unique resources that will facilitate the success of TRI's engagement of Pacific Islanders in research. The CPIH has a Cultural Competency and Linguistic Translation Core, a Community Engagement Core, and a Methodology Core that will provide services that are critical to the project's success. The CPIH contributes to the proposed TRI's success by providing: 1) an existing infrastructure with shared cores and highly qualified staff to support research projects; 2) expert academic and community co-investigators that have produced prior research and needs assessments on Pacific Islander health; and 3) strong collaborative relationships with Pacific Islanders and multi-sector stakeholders throughout the region.

**3.1a. Cultural Competency and Linguistic Translation Core (CLT Core).** The CLT Core within the CPIH works to integrate Pacific Islanders' input and cultural values into clinical treatment and research projects to help ensure the integration of cultural and scientific expertise. The CLT core includes 5 full-time bilingual Pacific Islander project managers and research coordinators, 2 academic researchers, a dietitian and registered nurse, and 2 bilingual Pacific Islander CHWs. The CLT Core advises project investigators on appropriate community members to approach regarding specific issues and facilitate stakeholder relationships and communication. The CLT Core works with the Methodology Core and Community Engagement Core to integrate stakeholder involvement in the development of culturally-appropriate recruitment, retention, data collection, and dissemination strategies.

**3.1b. Community Engagement Core (CE Core).** The CE Core within the CPIH is committed to nurturing productive partnerships with a broad group of academic and community stakeholders that are committed to using a collaborative approach to prevent chronic disease and improve health equity in Pacific Islander communities. The CE Core is led by Dr. McElfish and includes 3 full-time Pacific Islander project managers and coordinators and two Pacific Islander community co-investigators. The CE Core works closely with the community advisory board (CAB) and will help keep stakeholders engaged in all phases of TRI research. The CE Core will help coordinate and support effective communication between the community, investigators, and study staff. CE Core communication strategies are based on a commitment to transparency and inclusive dialogue.

**3.1c. Methodology Core.** The Methodology core within the CPIH consists of 6 highly qualified academic and community investigators who provide ongoing methodological support and expertise in health literacy, data management, biostatistics, community-engaged research methods, social network analysis, and qualitative methods. Members of the Methodology Core are responsible for data management, IRB processes, and evaluation. The team works closely with the CLT Core and CE Core to ensure that research teams select culturally relevant variables and measures to ensure meaningful data, and they work to implement strategies to protect study participants and communities from unintended harm and stigma.

**3.2. North Street Clinic.** The North Street Clinic is a primary care clinic on the UAMS-NW campus that accepts insurance and also sees patients regardless of their ability to pay. The North Street Clinic opened in November 2014 specifically to offer health care services to underserved patients (including Marshallese). Three primary care providers, 3 Marshallese CHWs, 3 nurses, and a certified diabetes educator treat patients in the clinic four days each week. The clinic has more than 3,000 square feet and includes 8 exam rooms, a conference room, a break room, and a waiting room and reception area. The clinic directors have designated a private room in the clinic for research activities.

**3.3. The Office of Community Health and Research (OCHR).** The OCHR at UAMS-NW focuses on addressing health disparities in minority populations and rural communities using a community-engaged research approach. The OCHR has worked extensively with the Hispanic/Latino and Marshallese communities in Arkansas and is currently implementing several community-based projects to address pressing needs that have been prioritized by the communities. These efforts include health screenings and education at faith-based organizations and worksites, cultural competency trainings for diverse audiences, and extensive work with food pantries, school districts, and community-based organizations serving special populations throughout Arkansas. The OCHR is directed by Dr. Pearl McElfish and is supported by 34 staff members, including academic and community researchers, project managers, a communications manager, an evaluation manager, an administrative assistant, and a budget manager.

#### **4. Arkansas Children's Hospital (ACH)/Arkansas Children's Research Institute (ACRI)**

Arkansas Children’s Hospital (ACH) is a state-of-the-art full-service medical facility, offering a complete array of clinical services ranging from well-baby care to the medical management of critically ill children. ACH serves a predominately rural state, with a diverse population of over 2.8 million persons (75.9% Caucasian/non-Hispanic, 15.4% African-American/non-Hispanic, 5.3% Hispanic/Latino, 0.6% Native American, and 1.2% Asian/Pacific Islander). ACH, established in 1910, is a 370-bed, private, non-profit hospital with over 4,000 employees and an active medical staff of more than 500. Currently ACH, which is located centrally within the state in Little Rock, is the only health care facility in Arkansas dedicated exclusively to children and one of the largest pediatric hospitals in the nation. ACH services a large pediatric population within a 6-state catchment area, serving a population base of approximately 5 million people. ACH provides excellent platforms for potential clinical research, recruiting through its clinics, pediatric outreach program, daycare center, website, and social network.

ACH is home to the UAMS Department of Pediatrics. Medical students, residents, and other health-related professionals receive their primary pediatric training at ACH. UAMS faculty comprises most of the physicians on the ACH staff.

ACH’s main campus covers 32 city blocks (over 64 acres) and has a floor space totaling over 2,050,000 ft<sup>2</sup>.

Inpatient specialty units include cardiovascular, newborn, and pediatric intensive care units; orthopedics; hematology/oncology; renal dialysis; extracorporeal membrane oxygenation and many others.

To provide a statewide system of health care for children needing subspecialty and developmental care, ACH and UAMS jointly operate clinics in Arkansas’ Northwest (Lowell, AR) and Northeast (Jonesboro, AR) corners. These clinics bring pediatric subspecialty health care closer to families for clinic visits and follow-up medical care.

During 2017, over 400,000 visits were

made by patients aged 0 to 19 to Arkansas Children’s Hospital’s 80+ general and pediatric specialty facilities in Little Rock, Lowell, and Jonesboro, AR. There were more than 9,000 admissions to the hospital and over 50,000 visits made to the Emergency Department. A summary of patient characteristics are provided in **Table 4**.

**4.1. ACH Northwest Arkansas.** This new facility opened in February 2018, is located on a 37-acre campus located in Springdale, AR. The 225,000-ft<sup>2</sup> facility includes 24 inpatient beds, emergency department/urgent care center with 21 exam rooms, 30 clinic exam rooms, five operating rooms, imaging capabilities (MRI, CT and routine x-ray), and diagnostic services (infusion, PFT, EEG, echo, neurophysiology, audiology,

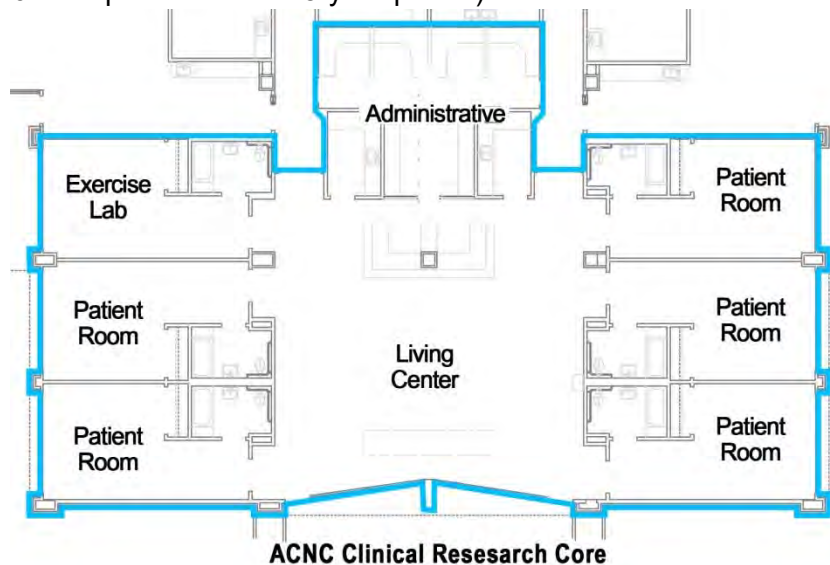
Patient Type	Encounters	% Total			
Clinic	248,306	58.0%			
Emergency	50,821	11.9%			
Inpatient	9,773	2.3%			
Observation	5,584	1.3%			
Recurring	164	0.0%			
Referred (Outpatient Testing)	102,833	24.0%			
Same Day Surgery	10,682	2.5%			
Clinic	248,306	58.0%			
Emergency	50,821	11.9%			
Inpatient	9,773	2.3%			
Observation	5,584	1.3%			
Recurring	164	0.0%			
Referred (Outpatient Testing)	102,833	24.0%			
Same Day Surgery	10,682	2.5%			
<b>Total</b>	<b>428,163</b>	<b>100%</b>			
Total Age Group	Encounters	% Total	Clinic Age Group	Encounters	% Total
Under 1	57,429	13.4%	Under 1	33,056	13.3%
1-11	236,692	55.3%	1-11	139,598	56.2%
12-17	103,916	24.3%	12-17	62,446	25.1%
18 and Over	30,126	7.0%	18 and Over	13,206	5.3%
<b>Total</b>	<b>428,163</b>	<b>100%</b>	<b>Total</b>	<b>248,306</b>	<b>100%</b>
Total Race/Ethnicity	Encounters	% Total	Clinic Race/Ethnicity	Encounters	% Total
African American	132,470	30.9%	African American	69,563	28.0%
American Indian-Alaska Native	455	0.1%	American Indian-Alaska Native	247	0.1%
Asian	4,154	1.0%	Asian	2,878	1.2%
Caucasian	218,018	50.9%	Caucasian	129,209	52.0%
Hispanic	51,181	12.0%	Hispanic	34,213	13.8%
Native Islander	728	0.2%	Native Islander	478	0.2%
Unknown	2,282	0.5%	Unknown	6	0.0%
Other	18,875	4.4%	Other	11,712	4.7%
<b>Total</b>	<b>428,163</b>	<b>100%</b>	<b>Total</b>	<b>248,306</b>	<b>100%</b>

rehabilitation). The population of Northwest Arkansas recently reached 500,000 residents. It is estimated that the pediatric population in the region is growing two- to three-times faster than in any other part of the state. Further, at least 27% of the children in the region live in poverty and half grow up in low-income households.

**4.2. Arkansas Children’s Nutrition Center (ACNC).** ACNC, directed by Sean Adams, PhD, is a national Human Nutrition Research Center established as a partnership between ACH and the United States Department of Agriculture-Agricultural Research Service (USDA-ARS). The ACNC is one of the 7 centers in the USDA’s National Human Nutrition Research Centers Program and one of only two devoted exclusively to pediatric nutrition. Since its inception in 1994, the ACNC has become a premier research venue for the study of maternal-child health and early childhood development. Its location in Little Rock enables ACNC to benefit from a supportive community and to build strong collaborative ties with the ACH Research Institute (ACRI) and UAMS. ACNC research focuses specifically on diet and nutritional status of human development, using state-of-the-art procedures, equipment, and facilities to determine how dietary factors and nutrition can affect development, learning, and attention span, as well as how early dietary intervention can prevent diseases of development and aging. The faculty and scientific staff are dedicated to discovering the fundamental biology of childhood brain and metabolic processes, and the mechanisms by which diet and physical activity (both maternal and child) impact these networks.

ACNC, which is adjacent to ACRI, has a ~25,000 ft<sup>2</sup> clinical research facility. The facility is fully equipped to accommodate large longitudinal studies. It includes 5 overnight rooms with fully equipped bathrooms; a lounge with TV/DVD/computer games; a playroom; a large nursing station; two clinic rooms dedicated to the measurement of food intake and diet evaluation; five clinic rooms dedicated to the evaluation of body composition; five anthropometric and phlebotomy rooms; one indirect calorimetry room; two nursing rooms; three data collection rooms dedicated to the Licensed Psychological Examiners; a laboratory to process and store all biological samples; a dining room and a kitchen; and office space for nutritionists and dieticians. The clinical research facility also has a Recruiting Program; Body Composition Laboratory equipped with equipped with the best available techniques and equipment to measure growth and body composition in participants, including Air Displacement Plethysmography (ADP), Dual X-ray Energy Absorptiometry (DXA), and quantitative Nuclear Magnetic Resonance (qNMR) techniques; Clinical Nutrition Laboratory; Psychological Testing Laboratory; and Brain Function Laboratory; and Diet Assessment Laboratory that uses the best available techniques to evaluate dietary intake in infants, children and adults, including the use of daily weighted records, 3-day food records analyzed using the state of the art Nutrient Data System for Research from the University of Minnesota as well as block food frequency questionnaires. The core is staffed by 1 clinical coordinator, 2 full-time recruiters, 5 nutritionists (2 registered dieticians), 2 psychological examiners, a registered nurse, 2 research assistants and a full time data manager.

During the past five years (Jan 2010 to Jan 2016), the ACNC successfully recruited/enrolled a total of 806 families (157 fathers; 412 mothers, and 646 children under age 10 years; **Table 5**) and completed almost 10,000 study visits. Of those 806 families, 157 (61 children) have dropped from the study (which represents a 20% drop rate over the 5-year period).



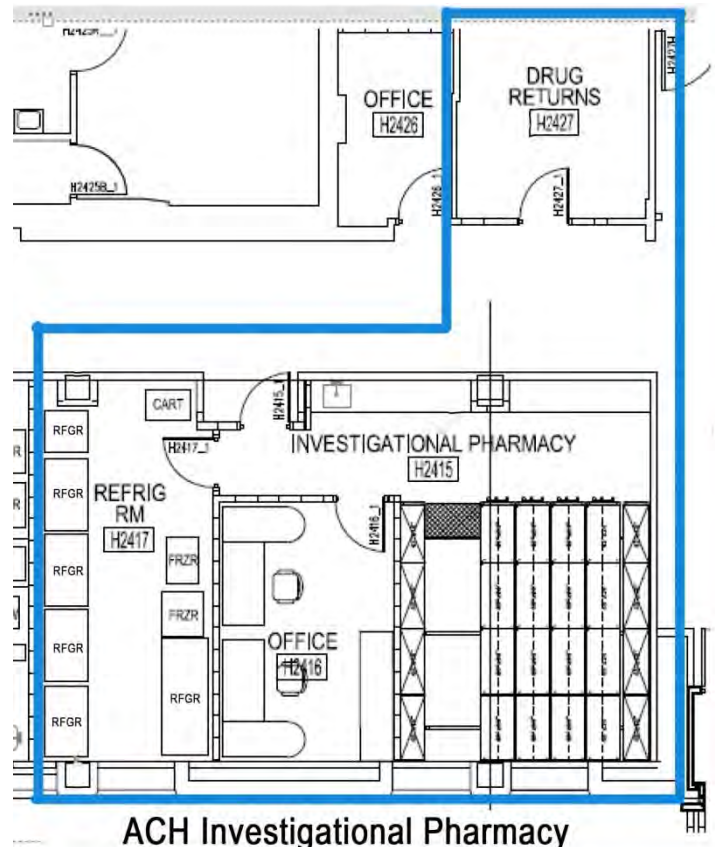
Male	340
Female	306
African American	94
White	521
Asian	1
American Indian or Alaska Native	2
Other	26
Unknown	2
Hispanic	24
Non-Hispanic	614
Unknown Ethnicity	8
Total enrolled in 2010	87
Total enrolled in 2011	126
Total enrolled in 2012	90
Total enrolled in 2013	117
Total enrolled in 2014	121
Total enrolled in 2015	104



**4.3. ACRI Experimental Therapeutics Program.** The ACRI Experimental Therapeutics Program, under the direction of Kathleen Neville, MD, was established in 2016 to support early phase (Phase I) clinical trials at ACH. The program aims to test novel therapeutic agents related to cancer and other rare diseases. In addition to pediatric cancer and rare diseases, the ACH Experimental Therapeutics Program is prepared to conduct early phase (phase I or II) clinical investigations for any drug/device that is being developed for potential use in children. In addition to Dr. Neville, who is trained in both Pediatric Hematology/Oncology and Clinical Pharmacology, this Unit has dedicated research coordinator staff (2.0 FTE) with experience in the regulatory aspects of early phase clinical trials. This program allows access to experimental treatments for children with no other options. Additionally, this program provides expertise in clinical trials and experimental therapeutics to clinicians in the surrounding area – further designating ACH as the regional/national leader in this area. This program will allow ACH to provide comprehensive care even when standard treatments have failed, allow ACH patients to receive treatment locally, and allow patients and families to “try everything possible” and be a part of helping future patients.

**4.4. Human Subjects Protection and Regulatory Compliance Team.** ACRI employs a full-time Regulatory Compliance Specialist who is responsible for the administration and facilitation of the regulatory compliance and research integrity (ethics) assurance efforts associated with the human research enterprise of the institution and serves as an educator and advisor to ACRI and ACH, as well as to individual investigators, research staff, and the UAMS Institutional Review Board (IRB). The Regulatory Compliance Specialist’s primary focus is the day-to-day management and overall coordination of the human research regulatory compliance environment of the institution. The primary concern of these efforts is compliance with federal and state laws, rules and regulations governing human subject research, the rules of the IRB, and research integrity assurance.

ACRI’s Legal and Human Protections Administrator is available to review and negotiate biomedical research agreements, such as clinical trial agreements and amendments, material transfer agreements, and confidential disclosure agreements. ACRI has a full-time Human Research Auditor who conducts clinical research audits and reviews to assure compliance with institutional review board (IRB) policies and procedures, federal regulations, institutional policies, and state laws related to the conduct of clinical trials performed on the ACRI campus. The auditor provides on-site audits on case report forms, source documents, and regulatory documents; assesses the maintenance and security of study records, test articles, and study specimens; reviews and may observe the informed consent process; participates in external audits and inspections; assists ACRI support investigational drug studies for ongoing studies in Allergy, Autism, Cystic Fibrosis, Endocrinology, Epilepsy, Hemophilia, Immunology, Infectious Disease, Neonatology, Neurology, Pain Control, Pharmacology, Renal, Rheumatology, Surgery and Oncology including our newest area of research emphasis, The Experimental Therapeutics Program. These studies cover the full range of sponsoring sources including the NIH, NCI, the Pediatric Trials Network, the Idea States Pediatric Clinical Trials Network, Children’s Oncology Group, Neuroblastoma and Medulloblastoma Translational Research Consortium, the Pediatric Oncology Experimental Therapeutics Investigator’s Consortium, and industry-sponsored clinical trials.



**ACH Investigational Pharmacy**

ACRI currently has about 70 clinical trials with active subjects. In addition, 30 new trials are awaiting IRB approval or drug arrival. Greater than 200 children’s lives are currently touched every day by ACRI drug research. The growth of the Institute is exponential and we are rapidly bringing on board many new and



creative researchers. ACRI recently expanded its pharmacy facilities to accommodate the growth of ACRI drug-oriented studies. The Investigational Drug Pharmacy is devoted entirely to investigational drug research. All storage, records, drugs, and other functions required to perform the Investigational Drug Services are housed in a dedicated secure space. The floor plan and allocated space foster improved efficiency of the Investigational Drug Pharmacy Service and provide an optimal environment for everyday processes, while allowing opportunities for growth and creativity. All inpatient and outpatient drug research functions are performed in this state-of-the-art facility. All procedures are in place for receipt, record-keeping, storage, and dispensing of research-related study drugs under conditions specified by Good Clinical Practices (GCP) guidelines.

#### 4.5. ACRI Pediatric Clinical Research Unit (PCRU).

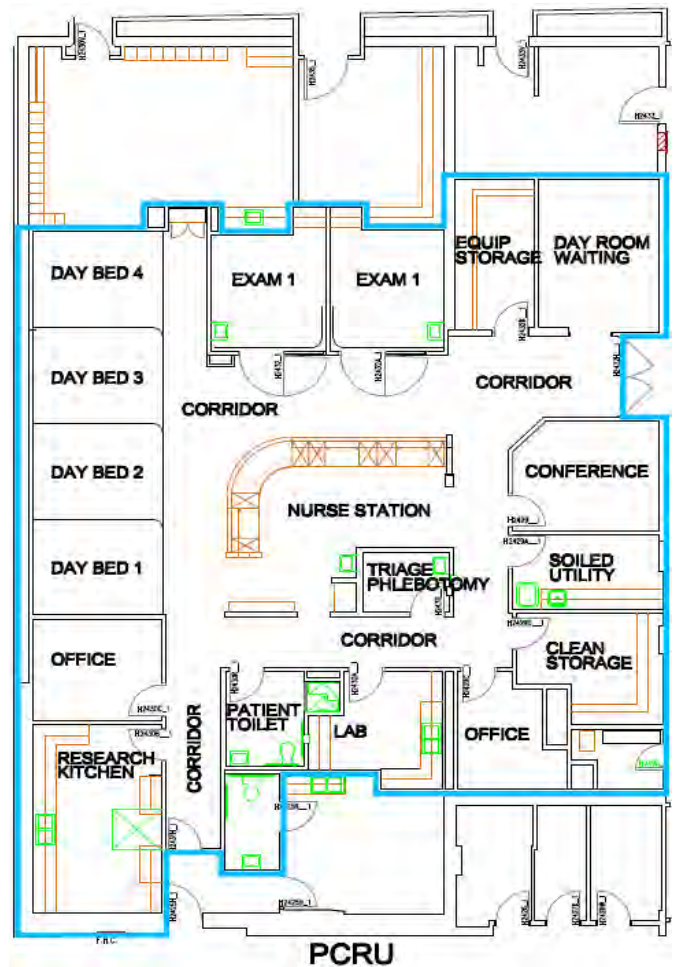
The Pediatric Clinical Research Unit (PCRU) is located within ACH's main hospital building to support pediatric research. Available 24 hours a day, 7 days a week, the PCRU provides a 4,000-ft<sup>2</sup> facility for high-quality clinical pediatric research. The PCRU has 4 semi-private and 2 private beds; a large coordinator work area; a phlebotomy room, a small wet laboratory, a kitchen, 2 offices, adequate storage for clinical research supplies, restrooms, a family waiting area, and a conference room. Over the past five years (Jan 2011 to Jan 2016), 4,177 research study visits were completed in the PCRU; of these, 873 were completed in 2015.

The PCRU can accommodate a minimum of 6 patients simultaneously and allows the clinical investigators working at ACH to not only separate research activity from standard of care activity but also ensure that research subjects are separated from acutely ill hospitalized patients. The unit is located centrally within the hospital where it is in close proximity to ancillary hospital services (e.g., radiology, pharmacy) that are often utilized in clinical trials and is easy accessible to the research subjects and their families.

ACRI researchers can use the PCRU for phase I through phase IV clinical trials. The PCRU has been used for studies in pharmacology, infectious disease, nephrology, general pediatrics, endocrinology, neurology, gastroenterology, asthma/allergy, rheumatology, pulmonology, neonatology, otolaryngology, psychiatry and anesthesiology/pain (**Table 6**).

**4.6. ACRI Physical Activity and Metabolism Laboratory.** A ~2,000 ft<sup>2</sup> physical activity and metabolism laboratory was recently built at the ACRI. Various exercise machines and equipment are positioned in the gymnasium alongside research instruments. The gym equipment includes four treadmills, four elliptical machines, four recumbent bicycles, and resistance exercise machines. Some free weights and barbells are also present. In addition, the gymnasium also contains floor space dedicated for small exercise classes. A music system is in place, and the performed training is recorded directly using the myWellness® system. A suite for interviews and metabolic studies of research participants adjoins the gymnasium. The suite is outfitted with a treadmill and a bike for specific testing along with research equipment. The equipment measures air inhaled and exhaled and oxygen taken up by the study participant to determine aerobic performance and energy expenditure. Equipment to test lung function is also present. Single acute exercise bouts and prolonged training programs for healthy and obese children, pregnant women, and other populations can be performed in the center. The room has a hospital bed and an adjacent full bathroom. The facility is for testing of aerobic fitness and muscular strength in children and adults, in addition to metabolic studies including collection of biological samples for determination of substrate and energy metabolism.

**4.7. ACRI Research Coordinator Pool.** ACRI employees a pool of qualified research coordinators who are



registered nurses with special training in clinical trial research. The ACRI Coordinator Pool is a core resource for investigator's conducting clinical research on the ACH/ACRI campus. The support provided is based upon the investigators' needs and ranges from full coordinator support to minimal clinical support to assist an already existing research team. The coordinators are available to assist in the conduct of research activities according to the appropriate federal and state regulations governing the research study and in accordance with research good clinical practices. These research coordinators possess knowledge, skill and competence in clinical research activities and have training in research design, planning and quality control. They may assist investigators with pre-site visits, IRB submissions, and day-to-day operations of their clinical studies.

This resource began in 2001 with 2 zero-based RN's and has grown to 5 part-time nurses and 6 zero-based RN's. Of the 11 members of the Coordinator Pool, 4 are nationally certified through the Society of Certified Research Administrators.

#### 4.8. ACRI Research Participant Recruiting Support Services.

*Research Participant Database:* ACRI has a recruitment database for individuals and families who are interested in research at ACH. To date there are over 2,000 unique households in the database with ~5,000 household members who have self-reported specific ailments and provided permission to be contacted by for clinical trial opportunities. Ages of individuals in household, DOB, areas of interest, and ethnicity are recorded in the database along with contact information. Individuals may sign up online to participate in the database through the ACRI website. All information is prominently displayed in English and Spanish. ACRI staff members also attend numerous outreach events (e.g., community health fairs) to recruit participants to the database. With appropriate IRB approval, ACRI researchers may query the database for potential candidates who may be contacted and provided with information regarding currently recruiting clinical studies. To date, this registry contains information from >5000 children and adolescents and >2000 families.

*Social Media Posting:* ACRI has staff dedicated to assisting clinical researchers with study participant recruitment. Researchers may request postings of that ACRI staff post their IRB approved study announcements through the following. Through ACH's **Facebook** page, ACRI manages posts announcements and news concerning pediatric research and clinical trials participation. Posts relating to specific clinical trials are IRB approved. Generally, ACRI posts twice a week to the ACH Facebook page. The ACH Facebook page has >137,000 followers and >148,000 likes.

Table 6. ACH Clinical Trial Activity 2016-2017			
Funding Source	Study	Specialty	# Enrolled 2016-2017
Industry	Ababtcept	Rheumatology	10
USDA	ACNC	Child Nutrition	57
Industry	ARC8	Allergy	4
NIH	ATS18	Ophthalmology	2
NIH	BABYTAPE	Pharmacology	283
Industry	CEFAZOLIN	Anesthesiology	2
Industry	CEMPRA 1B	Pharmacology	9
Industry	CEMPRA 203	Pharmacology	3
Industry	CL-1402	Pulmonology	57
NIH/NIAID	COFAR6- EPIT	Allergy	23
NIH/NIAID	COFAR7	Allergy	29
Industry	DALBAVANCIN	Pharmacology	1
Industry	DIVNB401	Hematology/Oncology	1
PCORI	EoE1 vs 4 PCORI	Allergy	12
Industry	EPITOPE	Allergy	9
Industry	FLUSWAB2	Infectious Disease	14
NIH	GEIR	Epidemiology	1
NIH	Gene Expression	Rheumatology	9
Industry	GWEP1521	Neurology	1
NIH	INCITE2	Asthma	34
Industry	MATRIX	Allergy	1
Industry	MILES	Allergy	11
Internal	MITO	Autism	29
NIH	ORBISPK	Pharmacology	12
Industry	OTO201OL	Otolaryngology	6
NIH	PALAT	Child Nutrition	24
Industry	PALISADES (ARC3)	Allergy	15
Industry	PALISADES2 (ARC4)	Allergy	5
Industry	PASCAL	Rheumatology	4
Industry	PEPITES	Allergy	22
Industry	PERRIGO	Allergy	4
NIH	PTN POPS	Pharmacology	39
Industry	RAMSES (ARC7)	Allergy	10
Industry	REALISE	Allergy	13
Industry	SENTINEL 1	Infectious Disease	6
NIH	SCAMP	Neonatology	11
Industry	SICKLE CELL	Hematology/Oncology	2
Industry	SICKLE CELL II	Hematology/Oncology	1
NIH	SRMET	Endocrinology	1
Industry	STRIVE	Rheumatology	20
Industry	SUC1131	Autism/Gastroenterology	8
Industry	TAPENTADOL	Anesthesiology	1
Industry	TOCILIZ	Rheumatology	1
Internal	TOS	Autism	5
Industry	XELJANZ	Rheumatology	4
Industry	XELJANZ LTF	Rheumatology	2
Industry	ZORVOLEX	Surgery	3

ACHRI releases two tweets weekly through ACH's **Twitter** account. The tweets encourage enrollment in ACRI's clinical trials participant database or highlight a currently enrolling clinical trial. Tweets relating to specific clinical trials are IRB approved. ACH's Twitter account has >16,000 followers.

ACRI uses **text messaging** to contact subscribers about currently enrolling clinical trials. Trial-specific messages are IRB approved. This is accessed by texting "411247" and typing the word "research". A "bounce-back" message is then sent which initiates engagement. To date, >400 individuals participated in this particular research initiative.

ACRI shares videos about pediatric research through **YouTube**. At the website, the institute provides recorded interviews with pediatric researchers leading clinical trials, laboratory research, and community-based research. Shared videos also include testimonials from families that have participated in clinical trials. ACRI's "Help Children's Help Children" commercial can also be viewed. Viewers are directed to ACRI's website, text messaging subscription, and clinical trials enrollment.

*Community Event Advertising and Public Service Announcement Videos:* Members of ACRI staff frequently attend local health fairs and other community events (e.g., sporting events) to engage community members in clinical trial activities. Booths are set up for distribution of information about ACRI's Research Participant Database and clinical research studies actively recruiting participants. For the past five years, ACRI has partnered with the Arkansas Travelers (Little Rock's AA Minor League baseball team) as a venue for advertising clinical research. This season a public service video featuring former ACRI clinical research participants will be shown at each home game (video available online at <https://youtu.be/v26JqwWc9xA>). The video is also distributed through the ACRI institutional newsletter that is distributed throughout the ACH campus employees and UAMS Department of Pediatric faculty members on a monthly basis.

*ACRI Website:* ACRI maintains a website with an entire section of pages tailored for individuals interested in participation in clinical research ([www.archildren.org/research](http://www.archildren.org/research)). The following are examples pages on ACRI's website devoted to clinical research: About Clinical Research, Frequently Asked Questions about Participating in Clinical Research; ACRI Currently Enrolling Studies; ACRI Study Participant Recruiting Database Signup. Content on the website is updated on a weekly basis.

**4.9. ACRI Transgenerational Biorepository.** ACRI recently established the Transgenerational Biorepository to gather and provide biological samples and data for researchers. Dr. Greg Kearns is the director of the repository, which includes samples from parents and children who have expressed interest in participating in research. The institutional biorepository allows sharing of samples across research programs, thus promoting team science and providing researchers with access to a greater number of samples than could be collected by one research program alone. Upon IRB approval, a researcher in need of samples to complete a project may obtain biospecimens from the biorepository. The biorepository is of value to researchers by providing samples and data without the costs associated with obtaining new samples. In addition, early stage investigators with limited funding for pilot projects may find the data and samples from this resource useful. With oversight from the Biorepository Committee, procedures for sample and data collection and tracking will be IRB approved and will ensure reliability and stability of samples for participating researchers.

Located on ACRI's second floor, this ~700 ft<sup>2</sup> facility consists of a storage room with brand new, state-of-the-art -80° C storage freezers and two offices. Sample collection is overseen by a project coordinator who oversees collection of biological samples from ACH and the General Pediatric Clinic and from UAMS at the Women's Clinic and Psychiatric Research Institute. ACRI supports two coordinators who recruit participants in the ACH Emergency Room. To date the biorepository houses 150 blood and saliva samples.

## 5. Additional ACH/ACRI Resources

**5.1. ACRI Animal Facility.** ACRI's has a state-of-the-art, AAALAC accredited, small- and large-animal facility, including facilities for transgenic and knock-out animals. This BSL-2 animal facility (35,000 ft<sup>2</sup>) is located on the first floor of the ACRI building with no windows to the outside. Each room has card reader controlled access. Three veterinarians are responsible for veterinary care at ACRI's animal facility. In addition to rounds and on call availability, the veterinarians provide consultation to ACRI investigators and staff concerning animal care, housing, surgical procedures, and IACUC protocols.

**5.2. Audio Visual/Teleconferencing Capabilities.** The ACH/ACRI campus has over 30 IAV (interactive video) units (also known as telemedicine units, video codecs or video conferencing units). All of the units are either Cisco C-series or Tandberg video codecs. They utilize H.323 encoding for connecting over IP. The calls can also be encrypted. ACH/ACRI partners with UAMS Video Support to connect multiple endpoints in one call

utilizing their video bridge and call scheduling, allowing connections nationally and even internationally (if the other sites have proper equipment and bandwidth).

**5.3. ACRI Bioanalytical Core.** ACRI's Bioanalytical Core was established in July 2016. This facility, located on ACRI's 2<sup>nd</sup> floor, includes 977 ft<sup>2</sup> laboratory space and two 100 ft<sup>2</sup> offices. This new ACRI core will provide state-of-the-art technology, experience and capacity in the quantitation of a host of small molecules (e.g., therapeutic drugs) and biologics. The Core's analytical instrumentation consists of a high mass accuracy Perkin Elmer AxION 2 Time of Flight mass spectrometer coupled with a PerkinElmer Flexar high-performance liquid chromatography system and a newly-installed Agilent 6420 Triple-Quad mass spectrometer coupled with an Agilent 1260 Infinity high-performance liquid chromatography system. Each of these systems is equipped with a Parker NitroFlow Lab nitrogen generator and a Powervar Security Plus uninterruptible power supply. Sample preparation is performed robotically on a PerkinElmer Zephyr liquid handling station and/or a Biotage Extrahera sample preparation system. In addition to this major equipment, the laboratory has calibrated and certified single- and multi-channel pipets. Other support equipment includes an Isotemp refrigerator, -20°C laboratory freezer, Millipore water purification system, Biotage SPEDry-96 sample evaporator, Isotemp Shaking Incubator, and a 96-well plate heat-sealer. This equipment is required to maintain DEA, CLIA, and ISO17025 licensure and accreditation requirements.

**5.4. Research Administrative Support.** ACRI's research support staff acts as facilitators to ease the administrative burden of sponsored research. At the same time, the staff provides an array of unique services outside the general area of research administration.

ACRI provides various research support services for researchers pursuing clinical trials, including contract review and budget negotiation, support for research accounting, research pricing for many hospital services, a proprietary system for tracking study subjects to ensure that billing to study accounts is separated from billing for routine clinical care, and writing and editing support for grant and manuscript preparation.

The office provides pre- and post-award assistance. This includes services such as proposal development assistance, acting as liaison between the researcher and the sponsoring agency while ensuring the research complies with the agency guidelines and administrative requirements, assisting with the preparation of appropriate internal and external application forms, auditing of studies to ensure compliance with federal guidelines, and determining the accuracy of proposal budgets. Grant and science writing and editing services are also available free of charge to investigators. The writing staff assists investigators with grant proposal preparation as well as providing developmental and substantive editing of manuscripts. A Legal and Human Protections Administrator is available to review and negotiate biomedical research agreements, such as clinical trial agreements and amendments, material transfer agreements, and confidential disclosure agreements. Research Compliance Specialists assist with issues of compliance to federal regulations.

**5.5. ACRI Research Laboratories and Laboratory Support.** The ACRI Research Facility is a free-standing, 4-story, 115,000-ft<sup>2</sup> building that houses state-of-the-art wet laboratories for a number of established pediatric research programs in areas such as birth defects, food allergy, asthma, drug toxicity, environmental toxicants, surgery and organ transplants.

The laboratories are on levels II and IV. All bench tops are impervious to water and resistant to acids, alkalins, organic solvents, and heat. All the labs have controlled card reader access. All biohazard waste is collected daily from all laboratories and rooms. Eyewash devices are provided throughout the facility. Appropriate personal protective equipment is required for handling infectious material or contaminated surfaces or equipment. Face protection is used for anticipated splashes or sprays. All wet laboratories are equipped with 6' chemical fume hoods which are evaluated and certified annually by an outside contractor.

A multitude of shared resources are available to ACRI researchers, such as tissue/cell culture facilities; shared equipment room; and dark room. Shared equipment includes ABI 9700 PCR cycler for cDNA synthesis, ABI 7900HT real-time PCR cycler for microRNA real time PCR assays, HPLC-ECD Coulochem III and MS-LC analytical systems for oxidative stress biomarker testing, and upright -80° C freezers equipped with temperature monitoring and remote alarm systems.

**5.6. Security.** ACH's Building Automation department continually monitors security, fire, and equipment alarms for ACRI. Upon an alarm, Building Automation immediately notifies appropriate ACH and ACRI personnel. ACRI has building-wide intercom systems to notify personnel during emergencies. ACRI provides such unique services as an electronic proposal routing system, electronic purchasing and real-time accounting, design and maintenance of institute websites, and assistance with the location of funding opportunities and policy information. A Grant Post Award Systems Administrator maintains online systems for accounting, grant

tracking, and electronic ordering. Research Computing Staff provides support services such as data management, data entry support, database design and programming, and computing support.

## 6. Central Arkansas Veterans Healthcare System (CAVHS)

CAVHS is a tertiary care center with two locations, Little Rock and North Little Rock, and 8 Community-Based Outpatient Clinics (CBOC). It has an active research program with a Research and Development Office and its own Institutional Review Board. All research committees utilize IRBNet for review infrastructure, which makes research documents available to investigators via the internet and tracks continuing review deadlines, even for VA Central IRB protocols. CAVHS provides significant support to the research program by providing space, administrative services, and salary support to ensure protected research time for clinician investigators and other key personnel. CAVHS also has an excellent medical library staff who are readily available to assist researchers. Most medical journals are available online, and interlibrary loan services are also provided. Research activities are conducted in approximately 115,000 square feet of dedicated research space, including nearly 88,000 square feet in the Little Rock medical center building and 27,000 square feet on the North Little Rock campus. Little Rock space includes over 53,000 square feet of wet lab space and a Veterinary Medical Unit occupying 11,900 square feet. The VA Pharmacogenomics Analysis Laboratory (PAL), which performs genetic assays and analysis for the VA Cooperative Studies Program (see below), is located within the wet lab space. There is also approximately 17,000 square feet dedicated to clinical research in Little Rock. North Little Rock research space includes about 14,000 square feet of clinical research space and administrative offices for the Veterans Integrated Service Network (VISN) 16 Geriatrics Research, Education and Clinical Center (GRECC) and 13,000 square feet of space devoted to research conducted by investigators affiliated with three other CAVHS-based research centers: the Center for Mental Healthcare & Outcomes Research (CeMHOR), a Health Services Research & Development (HSR&D) Center of Innovation; the South Central (VISN 16) Mental Illness Research, Education and Clinical Center (MIRECC); and the Quality Enhancement Research Initiative (QUERI) for Team-Based Behavioral Health. These centers are described in more detail below.

**6.1. The Center for Mental Healthcare & Outcomes Research (CeMHOR)** is located in Building 58 at CAVHS. Richard R. Owen, MD, is the Center Director. This VA Center of Innovation (COIN) is focused on advancing knowledge and addressing the gaps in access to and engagement in evidence-based mental healthcare and suicide prevention. Current research priorities include enhancing access to and engagement in evidence-based mental health care in rural settings (e.g., CBOCs); enhancing and evaluating VA suicide prevention efforts, and improving treatment and outcomes of opioid use disorders. A current set of projects funded through the HSR&D CREATE (“Collaborative Research to Enhance and Transform Excellence”) mechanism is using and testing a conceptual framework for access to care that was developed during the 2010 VA State-of-the-Art Conference on Access to Care.

CeMHOR’s infrastructure consists of 17 core investigators; 40 research and support staff; an external Steering Committee that functions as a policy and operational advisory board; an Internal Advisory Committee; a Veterans’ Council that provides input about strategic planning and individual projects; as well as many UAMS and VA collaborators. The infrastructure also includes a data group with expertise in accessing and manipulating large data sets from multiple VA repositories, and in data cleaning and analysis. Software expertise includes working with SAS, STATA, SPSS, R, Microsoft Access, and computer-assisted telephone interview (CATI) software. This group is also responsible for ensuring that all data are managed and stored in a manner that complies with all VA regulations regarding data security, privacy, and confidentiality. The Center has staff devoted to helping investigators ensure that they adhere to all human subjects’ regulations and that research is conducted while maintaining privacy and confidentiality. The Center also provides staff for grants management to help researchers manage grant funds.

**6.2. The VISN 16 Geriatrics Research, Education and Clinical Center (GRECC)** aims to advance scientific knowledge regarding medical, psychological and social needs of older veterans; to develop improved and innovative models of clinical services for older veterans; to advance the quality of education in geriatrics and gerontology throughout the VA health care system. Since its inception, the GRECC has been a pioneer in developing and evaluating new clinical care models for elderly veterans, including the first Geriatric Evaluation Unit (GEU) and Geriatric Evaluation and Management (GEM) programs adopted by the VA health system. GRECC investigators have contributed novel research findings in the areas of nutrition, Alzheimer’s disease, and osteoporosis, and have developed innovative clinical programs that are disseminated throughout the region and the nation. GRECC investigators have led several projects funded by the VA Office of Rural Health

to improve health for older veterans living in rural areas. The GRECC also trains clinical and research fellows through a VA Special Fellowship Program in Advanced Geriatrics.

The GRECC space, within the Eugene J. Towbin Healthcare Center on the North Little Rock campus, contains the offices of a number of investigators and their research staff. There are 14,000 square feet of space for the geriatrics research, education, and clinical unit. There are also two clinical procedure rooms, a state of the art exercise training room, and a specimen processing and storage laboratory. The clinical procedure rooms contain two beds and restroom/showers and sitting areas.

**6.3. The South Central (VISN 16) Mental Illness Research, Education and Clinical Center (MIRECC)** (Mark Kunik, MD, Director) is a multi-site, regional center with a mission to improve access to evidence-based practices for rural and other underserved populations, especially returning war veterans, veterans experiencing natural disasters, and vulnerable elderly Veterans. The MIRECC research pipeline includes observation, intervention and implementation studies. Content areas for research include: evaluating technologies to deliver care at a distance, tele-psychotherapy, partnering with communities to serve recently returning veterans, combat and disaster related trauma, and family/caregiver education and support. The South Central MIRECC operates in one of the largest and most rural VA networks in the nation, encompassing parts of 7 states (Alabama, Arkansas, Florida, Louisiana, Mississippi, Missouri, and Texas). The MIRECC has three anchor sites: VA Medical Centers in Houston, Little Rock, and New Orleans, and is affiliated with four medical schools: Baylor College of Medicine (Houston), University of Arkansas for Medical Sciences (Little Rock), Tulane University School of Medicine (New Orleans), and Louisiana State University Health Sciences Center (Shreveport). Mental health services research is a strength and focus of the South Central MIRECC, and the MIRECC works closely with the VISN 16 Mental Health Product Line to improve the quality of mental health care delivered at the network's 8 VA facilities and the 48 CBOCs serving rural Veterans.

**6.4. The Pharmacogenomics Analysis Laboratory (PAL)** comprises a 1200 sq. ft. laboratory divided into Pre- and Post-Amplification areas for a Microarray core. PAL has an 800 sq. ft. Next-Generation Sequencing and Mass Spectrometry laboratory. PAL also has a 400 sq. ft. Molecular Biology laboratory (GC146, CAVHS Research Service) and a 50 sq. ft. office for our servers (GC142, CAVHS Research Service). PAL is a fully operational state-of-the-art research laboratory created to support pharmacogenomics and clinical trials within the Cooperative Studies program (CSP), VA Office of Research & Development. PAL, directed by Dr. Steven A. Schichman since 2007, has partnered with CSP and VA investigators to determine genetic associations in diseases prevalent in veterans such as cardiovascular disease, diabetes, oncology, HIV, and Amyotrophic Lateral Sclerosis. PAL is equipped to analyze moderate-to-large scale whole-genome methylation, genotyping, copy number variants, gene expression, and miRNA projects. The laboratory is equipped with a Life Technologies Personal Genome Sequencer and Ion Chef, Illumina MiSeq, Illumina Laboratory Information System (LIMS), Illumina iScan microarray system with an Autoloader 2, Sequenom MassARRAY system and NanoDispenser, an Illumina BeadXpress System, 3 Tecan Robots, an ABI TaqMan 7900 Real-Time PCR Instrument, NanoDrop Spectrophotometer, Biotek Synergy 4 Plate Reader, Beckman NXP Automated Liquid Handling Workstation, Agilent 2100 Bioanalyzer, Water purification systems, and miscellaneous laboratory equipment.

PAL staff has access to 2 Dell T7910 and 2 Dell Precision T7500 64-Bit computers for data analysis and manuscript preparation. The Dell computers contain Illumina's GenomeStudio v2009.1 Software and are linked to our dedicated 24 TB and 15 TeraByte Dell Servers, automated with a PowerVault 124T Tape Library system. They have microarray and sequencing data analysis software including Partek Genomics Suite 6.6, NextGENe v2.2.0, and DNASTAR 5. They also have standard word processing, spreadsheet, and virus protection software, along with SAS 9.1 Utilities. A Dell Precision T7400 Server Computer equipped with SigmaPlot 10.0.1, SigmaStat 3.5, SAS 9.1 Utilities, Adobe Photoshop CS3, Endnote X2, and other standard word processing software is available to PAL staff. The T7400 Computer has internet access and is connected to a laser printer. Dr. Schichman has two desktop computers located in his office for data analysis and manuscript preparation. The laboratories have 12 workstations used for instrument operation.

PAL has collaborated with CSP investigators at Durham, NC; Seattle, WA; Palo Alto, CA; Boston, MA and Salt Lake City, UT. Non-VA affiliated collaborations are ongoing with investigators at Mayo Clinic (Rochester, MN), University of California (San Diego, CA), University of Arkansas Medical Sciences (Little Rock, AR), City of Hope (Duarte, CA), and Duke University School of Medicine (Durham, NC).

**6.5. The Quality Enhancement Research Initiative (QUERI) for Team-Based Behavioral Health (Behavioral Health QUERI)** (JoAnn Kirchner, MD, and Mark Bauer, MD, PIs) is one of 15 QUERI centers funded nationwide. This QUERI center focuses on improving the health and care of veterans by supporting the



application of critical evidence into practice. Using common facilitation techniques and common measures, the Behavioral Health QUERI will enhance and inform team-based care for veterans with behavioral health conditions. Specifically, this program will advance VA's knowledge of how team-based behavioral healthcare can be improved through the use of implementation facilitation strategies, with anticipated improvements in patient outcomes. Data will be relevant to care within VA and VA/non-VA shared care, since team-based care for veterans occurs beyond the bricks and mortar of the VA healthcare system—an issue of increasing importance in the era of the Veterans Choice Act. Program investigators will collect common measures pertaining to organizational context, team development, health-related quality-of-life and Veteran satisfaction, and will aggregate these data across projects. Program investigators will develop a new facilitation fidelity tool and produce an updated Implementation Facilitation Training Manual that can be used by VA Operations personnel and researchers. The presence of the Behavioral Health QUERI in North Little Rock continues a long tradition of collaboration among VA and UAMS mental health services researchers, as the Mental Health QUERI (JoAnn Kirchner, PI) Coordinating Center was located at CAVHS and fostered a highly productive collaborative research environment that continues to benefit investigators at both institutions as well as nationally.

## 7. Additional Supporting Institutions and Organizations

**7.1. Arkansas Center for Health Improvement (ACHI).** ACHI was formed in 1998 as a nonpartisan, innovative solution to the health crisis faced by Arkansas. ACHI believes that Arkansans' poor health status will not improve until root causes are addressed and health policies and initiatives that allow our citizens to alter behaviors and that measurably improve health are established statewide. Working with public- and private-sector partners, ACHI is a catalyst for improving the health of Arkansans through evidence-based research, public issue advocacy, and collaborative program development. ACHI's activities are centered in three areas of focus that influence the health of Arkansans—population health policy, access to quality care, and health care system transformation—with supporting infrastructure of health data and research.

**7.2. Arkansas Department of Health (ADH).** The ADH is a unified health department, with a main office in Little Rock and 94 local health units in each of the state's 75 counties. Centers oversee all activity:

- The Center for Health Advancement has among its many branches Chronic Disease, Tobacco Prevention and Control, Family Health, Women Infants and Children (WIC), and Oral Health.
- The Center for Health Protection has branches for Infectious Disease, Preparedness and Emergency Response, and Health Systems.
- The Center for Local Public Health is at the heart of the department. The local health units provide services to communities across the state. The Hometown Health Improvement Initiative is a process that takes a close look at the issues in local communities. It is coordinated through our local health units in partnership with community stakeholders. Through this collaboration, health strategies are developed and implemented to improve these local health issues.
- The Center for Public Health Practice includes branches for Vital Records, Health Statistics, and Epidemiology.

The Public Health Laboratory tests and reports on samples from all over the state – water samples, human samples for disease, even samples for rabies. This state-of-the-art laboratory is prepared for a pandemic flu or a bioterrorist event, as well.

Supporting the various service programs throughout ADH is Administration, which includes finance, human resources, information technology, legal, minority health, community support, health communication and marketing, tobacco prevention and cessation, policies and procedures and facilities support.

The mission of the Department is to protect and improve the health and well-being of all Arkansans. ADH has over 2,100 dedicated employees and public and private partners.

**7.3. National Center for Toxicological Research (NCTR).** In 1969, President Richard Nixon announced the closing of the chemical warfare unit at the Pine Bluff Arsenal, and in 1971 the National Center for Toxicological Research (NCTR) was established on the site. The National Center for Toxicological Research (NCTR), is the only FDA Center located outside the Washington D.C. metropolitan area. The one-million square foot research campus in Jefferson, Arkansas plays a critical role in the missions of FDA and the Department of Health and Human Services to promote and protect public health.

NCTR's physical facilities are located in central Arkansas and occupies 30 buildings spanning 1,000,000 square feet of floor space. NCTR facilities include:

- 132 general or special purpose research labs
- AAALAC-accredited Animal Facilities including 82 animal rooms accommodating: 1) conventional housing, 2) an SPF (specific pathogen free) rodent production colony, 3) isolators for germ-free rodents, and 4) quarantine
- 23 specialized labs for pathological processing and evaluation
- On-site full-service pathology services contractor
- BioSafety Level-3 (BSL-3) laboratory complex containing 10 individual BSL-3 laboratories
- Nonhuman primate research center
- Phototoxicology research center
- Imaging Center including microPET, MRI, and CT scanner
- Scientific and technical library available to NCTR staff
- Diet preparation facilities
- On-site housing unit for visiting scientists with eight two-person units and a commons building

**7.4. Sam M. Walton College of Business.** As part of the University of Arkansas system, the Sam M. Walton College of Business is the second-largest college in the University of Arkansas system with over 5,000 undergraduate students. Created in 1926, the college continually ranks among the top 30 public business schools with 88% of job-seeking graduates employed by their day of graduation with an average starting salary of over \$52,000 per year. And, Walton graduates received an average of 3 job offers during their job search. The Information Systems Department is ranked 1<sup>st</sup> in the world for research productivity and consistently recognized among the top 5 Information Systems departments in the country. Additional departments include; entrepreneurship, finance, health care administration, marketing and supply chain management/logistics. Strategically located in the heart of the global retail industry in Northwest Arkansas, students and faculty interact with business and industry partners daily providing unparalleled access to job opportunities both in Arkansas and throughout the world. With nine outreach centers located on the campus, industry and government work together to identify and address important educational and economic issues. Promoting student interest in the study of information technology, the Information Technology Research Institute advances the state of research and practice in the development and use of IT to enhance the performance of individuals and organizations. The McMillon Innovation Studio is designed to be the first interactive and open-to-the-public university retail lab. The studio works with corporate partners, students and faculty to conduct research on various projects such as new technologies focusing on a new ground delivery system. The Sam W. Walton College of Business continues Sam Walton's legacy of excellence demonstrated by the school maintaining the AACSB accreditation since 1931. Founded in 1916, the AACSB International is the longest serving global accrediting body for business schools offering undergraduate, master's and doctoral degrees in business and accounting.



## FACILITIES AND OTHER RESOURCES – ADMINISTRATIVE CORE

The Translational Research Institute’s (TRI) Administrative Core is supported by faculty and staff from the three participating sites: University of Arkansas for Medical Sciences (UAMS), Arkansas Children’s Hospital (ACH)/Arkansas Children’s Research Institute (ACRI), and Central Arkansas Veteran’s Healthcare Administration (CAVHS). All Resources and Other Facilities described in Overall are available to support the central administration of the Clinical and Translation Science Award (CTSA). Additionally, the following resources are available (**Table 1**).

Resource	Section
<b>Academic</b>	<b>1.0</b>
Data Coordinating and Operations Center	1.1
Office of Educational Development	1.2
<b>Computer</b>	<b>2.0</b>
ServiceNow	2.1
<b>Office</b>	<b>3.0</b>

### 1.0 Academic

**1.1 Data Coordinating and Operations Center (DCOC).** UAMS serves as the DCOC for the IDeA States Pediatric Clinical Trial Network (ISPCTN) as part of NIH’s Environmental influences on Child Health Outcomes (ECHO) initiative. ECHO investigates how exposure to a range of environmental factors in early development - conception through early childhood - affects the health of children and adolescents. The UAMS DCOC exists as a central unit within the ISPCTN that provides data coordination, technical instruction, data standards, quality control and assurance and operational coordination for the clinical trials. Drs. Fred Prior and Meredith Zozus are members of the DCOC and also key personnel for TRI’s Informatics Component.

**1.2 Office of Educational Development (OED).** The UAMS OED focuses on improving the academic experience at UAMS by providing consultation and services in **teaching skills and scholarship, eLearning, instructional design, and evaluation**. Staffed by 13 employees, the office supports Blackboard, Blackboard Collaborate, GoSignMeUp, Impatica, Respondus, SoftChalk Cloud Create 10, StudyMate Author, StudyMate Class, and TurningPoint. The group also partners with faculty and staff to create instructional experiences in the classroom and online that make teaching and learning more efficient, effective, and appealing through:

- Assessing learner and faculty satisfaction with course design.
- Aligning learning objectives, instructional strategies, and assessments.
- Developing curricula, courses, and lessons.
- Creating strategies to increase interactivity, engagement, and active learning.
- Designing instructional media and learning objects, such as video, interactive online activities, and narrated presentations.
- Building templates for instructional materials and online course shells.
- Recommending resources and tools.

### 2.0 Computer

**2.1 ServiceNow.** ServiceNow is a Service Management System designed to help IT service users in an institution connect with the IT service infrastructure of that institution. Users can submit requests for services (referred to as “tickets”) via email, or via an online interface. Users self-manage the urgency and impact of their particular ticket to better help the IT team to prioritize the issues the institution is facing. Tickets can be escalated to “Enhancements” or “Projects” in accordance with the level of effort required. This escalation is done by the IT service team and not the user, ensuring that user needs are addressed and time is allocated fairly for the development to address those needs. At UAMS, ServiceNow is used to manage IT services and also research services provided by TRI. When users visit the TRI Portal they are presented with a list of services to select. A user can select one or many services before submitting, after which the relevant points of contact for each service are alerted via an email from ServiceNow. From there the point of contact for those services can reach out to the user to get them the help they need. This system quickly connects users to services, but is kept separate from the traditional IT structure of ServiceNow so those providing research support aren’t required to track time or be assigned a time card. ServiceNow is supported by 5 staff members. They gather feedback and analyze usage data to make changes to the ServiceNow system based on the needs of the users to ensure continuing efficiency of the system.

### 3.0 Office

TRI's administrative core is located on the 3<sup>rd</sup> floor of the Donald W. Reynolds Institute on Aging (IOA) building and occupies 8600 ft<sup>2</sup>. The Director and Executive Director have 114 ft<sup>2</sup> offices located adjacent to each other and additional administrative staff occupy 4 114 ft<sup>2</sup> private offices in the same hallway and 7 cubicles. The remaining space is occupied by TRI's Clinical Trials Innovation Unit (see Facilities and Other Resources – Overall). This close proximity allows for the spontaneous exchange of ideas and communications to respond to the needs of our CTSA hub and to communicate with numerous faculty and staff throughout UAMS, ACH, ACRI, and CAVHS. TRI also has access to meeting facilities and conference rooms located on the first floor. These include a 104-seat auditorium, a large conference room with a partition divide, a large atrium to host social events, and multiple classrooms to accommodate smaller engagements equipped with audio/visual equipment. The auditorium was recently updated to include interactive video capabilities, touch screen controls, and a built-in teleconferencing system, which are essential for building research collaborations across institutions and with stakeholders around Arkansas. All faculty and staff have office space furnished with a desktop and/or laptop computer(s) owned and maintained by UAMS and/or ACH/ACRI.

## FACILITIES AND OTHER RESOURCES – INFORMATICS (INF)

The Translational Research Institute (TRI) has access to broad institutional and external resources to incorporate the use of informatics tools in clinical and translational research locally and across the CTSA network (**Table 1**).

Table 1. informatics Facilities and Resources	
Resource	Section
<b>Laboratory</b>	<b>1.0</b>
<b>Academic Resources</b>	<b>2.0</b>
Department of Biomedical Informatics	2.1
Information Resources	2.2
Population Health Data Resources	2.3
Telemedicine	2.4
<b>Computer</b>	<b>3.0</b>
UAMS Center for High Performance Computing	3.1
<b>Office</b>	<b>4.0</b>

### 1.0 Laboratory

Laboratory resources to CTR are largely provided by cores associated with the 5 Centers of Biomedical Research Excellence (COBRE) located at UAMS and ACH. DBMI bioinformatics faculty and staff provide consultative and analytic services in genomics, proteomics, metabolomics and microbiomics through the cores lead by Drs. Tackett and O'Brien (see Admin Table A2).

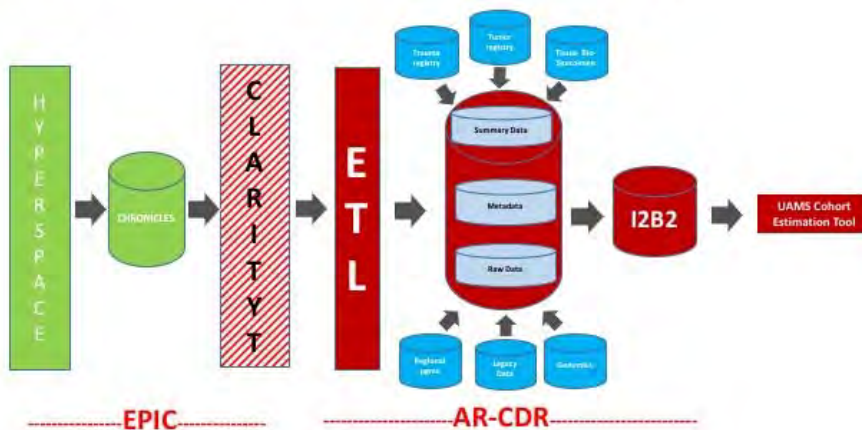
### 2.0 Academic Resources

**2.1 Department of Biomedical Informatics.** Chaired by Dr. Fred Prior, DMBI facilitates UAMS' increased focus on advanced medical information technologies. BDMI's faculty and staff are engaged in collaborative research that spans the primary BMI areas of bioinformatics, clinical informatics, imaging informatics and computational biology. A graduate program that confers masters and PhD degrees in biomedical informatics was established in 2004 with support from an Arkansas IDeA Networks of Biomedical Research Excellence (INBRE) award. Under Dr. Prior's leadership DMBI has launched an aggressive program to optimize training efforts relevant to building a strong translational research workforce, including redesign and expansion of the graduate program's curriculum. This new expanded curriculum has been approved by the State of Arkansas and was launched in Fall 2017 with an initial class of 18 graduate students.

**Collaborative Arrangements:** It is the nature of biomedical informatics to work collaboratively with faculty and staff across campus. The Department of Biomedical Informatics has developed significant collaborations with several key research programs, including the Translational Research Institute and Winthrop P. Rockefeller Cancer Institute. DBMI faculty and staff support CIRC and the COBRE cores. In conjunction with the UAMS research Information Technology group developed CLinical Research Administrator (CLARA) to submit and track human subjects research protocols and the Arkansas Comprehensive Research Informatics Suite (AR-CRIS) an integrated informatics platform that supports clinical trials and a broad spectrum of basic and translational research.

**Institutional Support:** Recognizing the key role of biomedical informatics to the continued development of outstanding research programs, the UAMS administration has provided significant institutional support to build the Department of Biomedical Informatics. The institution provides administrative and

### AR-CDR (Arkansas Clinical Data Repository)





Education Research — Arkansas Research Center (ARC)
Area Resource File (ARF)
Arkansas Reproductive Health Monitoring System (ARHMS) [Arkansas Center for Birth Defects Research and Prevention]
Chronic Condition Data Warehouse (CCW)
Centers for Disease Control Databases (6)
Comparative Effectiveness Research Public Use Data Pilot Project - Chronic Conditions
Comparative Effectiveness Research Public Use Data Pilot Project - Inpatient Claims
Cost-Effectiveness Analysis Registry [Center for the Evaluation of Value and Risk in Health (CEVR) - Tufts Medical Center]
Medicare National Coverage Determinations (NCDs) [Center for the Evaluation of Value and Risk in Health - Tufts Medical Center]
Arkansas Children's Research (CR)
HMO Cancer Research Network (CRN)
Informatics & Research Tools [Cancer Research Network (CRN)]
Community Tracking Study -- Household Survey
Community Tracking Study -- Employer Survey
Community Tracking Study -- Physician Survey
Cardiovascular Research Network Databases (5)
Annual Statistical Reports [Arkansas Department of Human Services (DHS)]
Arkansas Medicaid Program Overview (by State Fiscal Year (SFY)) [Arkansas Department of Human Services (DHS) – Arkansas Division of Medical Services (DMS)]
Food and Drug Administration Databases (4)
MedMining [Geisinger Health Systems]
Health Care Cost and Utilization Project Databases (6)
Hispanic Health and Nutrition Examination Survey (HHANES)
Health Indicators Warehouse (HIW)
Medicare Health Outcomes Survey (HOS)
Health and Retirement Survey (HRS)
HSC Health Tracking Physician Survey
Inter-university Consortium for Political and Social Research (ICPSR)
ISPOR International Digest of Databases [International Society for Pharmacoeconomics and Outcomes Research (ISPOR)]
Long-term Care: Facts on Care in the US (LTCfocus)
Medicare Current Beneficiary Survey
Long Term Care Minimum Data Set (MDS)
Medicare Databases (6)
Medical Expenditure Panel Survey (MEPS)
National Ambulatory Medical Care Survey (NAMCS)
National Birth Defects Prevention Study (NBDPS) Notable Studies 2007 - 2012
National Epidemiological Survey of Alcoholism and Related Conditions (NESARC)
National Hospital Ambulatory Medical Care Survey (NHAMCS)
National Health and Nutrition Examination Survey (NHANES)
The Third National Health and Nutrition Examination Survey (NHANES III)
National Health and Aging Trends Study (NHATS)
National Human Adipose Tissue Survey (NHATS) [U.S. Environmental Protection Agency (EPA) – National Center for Environmental Assessment (NCEA)]
National Hospital Discharge Survey (NHDS)
National Home Health Aide Survey (NHHAS)
National Home and Hospice Care Survey (NHHCS)
National Health Interview Survey (NHIS)
Alcohol Epidemiologic Data Directory [National Institutes of Health (NIH) - National Institute on Alcohol Abuse and Alcoholism (NIAAA)]
National Immunization Survey (NIS)
National Longitudinal Alcohol Epidemiology Survey (NLAES)
National Maternal and Infant Health Survey (NMIHS)
National Nursing Assistant Survey (NNAS)
National Nursing Home Survey (NNHS)
National Survey of America's Families (NSAF)
National Survey of Ambulatory Surgery (NSAS)
National Survey on Drug Use and Health (NSDUH)
National Survey of Residential Care Facilities (NSRCF)
Home Health Outcome and Assessment Information Set (OASIS)
Optum Databases (5)
Robert Wood Johnson Foundation Databases (4)
Surveillance Epidemiology and End Results (SEER) Public-Use Data
State and Local Area Integrated Telephone Survey (SLAITS)

TRI - CER: IMS PharMetrics LifeLink Health Claims
GIS Applications Laboratory [University of Arkansas (UALR) - ARGIS]
Population Estimates and Projections [Institute for Economic Advancement - University of Arkansas at Little Rock (UALR)]
Publications [Institute for Economic Advancement - University of Arkansas at Little Rock (UALR)]
US Census Bureau Databases (15)
national Veterans Healthcare Administration healthcare databases
National School-Based Youth Risk Behavior Survey (YRBS)
AR-Department of Public Health DBs
Arkansas State Health Alliance for Records Exchange (SHARE)
ATN Patient Registry Database
Behavioral Risk Factor Surveillance System
Cardiothoracic Surgery Research Data [Society of Thoracic Surgeons (STS) National Database]
Current Population Survey
Dartmouth Atlas of Healthcare
DARTNet Institute Datasets
Data Management Core [Center for Rehabilitation Research using Large Datasets (CRRLD)]
Drug Abuse Warning Network (DAWN) [Substance Abuse and Mental Health Services Administration (SAMHSA)]
Electronic Data Methods (EDM) Forum
Fairhealth
Marketscan Research Databases
National Longitudinal Study of Adolescent Health (Add Health)
National Longitudinal Survey of Youth (NLSY79 and NLSY97)
National Survey of Child and Adolescent Well-being
National Survey of Children with Special Health Care Needs
National Survey of Children's Health
National Survey of Family Growth
National Survey of Residential Care Facilities
Pasitos (Baby Steps) Cohort Study
Pasto, Colombia Cohort Study
Pediatric Research in Inpatient Settings (PRIS)
PHIS+: Augmenting the Pediatric Health Information System (PHIS) with Clinical Data [Children's Hospital Association]
Spit for the Cure Cohort
Survey of Income and Program Participation
Types of ALLHAT Data Available [The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)]
US Disability Statistics [Cornell University - Employment and Disability Institute]
US Mortality Data

**2.4 Telemedicine.** See Facilities and Other Resources – Community and Collaboration.

**3.0 Computer**

**3.1 UAMS Center for High Performance Computing.** UAMS has made a significant investment in high performance computing and petabyte scale storage to support both basic and translational research. While the resources are all in place and operational the center organization is still being put in place. All high performance computing resources are made freely available to UAMS, ACH and VA researchers. Advanced open source software packages (including packages developed by the UAMS DBMI) to support genomic, metagenomic, proteomic, metabolomics, microbiomic and image analyses are installed on the system. Additional packages can be installed or investigators can run pipelines implemented in Docker or Singularity containers.

UAMS has three geographically separated data centers. The primary data center has approximately 3,500 square feet of raised floor space and redundant air handlers, uninterrupted power supplies (UPSs), connectivity to the Internet and Internet 2, and backup power generators. The primary data center houses the UAMS High Performance Computing resource and a majority of servers and storage for the UAMS private cloud computing resource. The previous primary data center has become a load-balanced secondary data center. It has approximately 2,400 square feet of raised floor space and is equipped with 91 tons of cooling equipment, three UPSs with a total of 440 kVA of power, water monitoring, and fire suppression. Power in both the primary and secondary data centers is guaranteed by redundant generators (primary and backup). The third data center is the disaster recovery data center, which houses backup storage, COLD secondary servers, and passive nodes of active/passive clusters. It is equipped with cooling, two UPSs, and an emergency

generator. UAMS has implemented network and SAN redundancy across three core network switches (one per data center).

The UAMS high performance compute cluster is composed of 96 traditional Xeon CPU nodes each with 28 cores and 128 GB of memory (2688 CPU cores), 96 Xeon Phi nodes each with 64 cores, of which 80 have 384 GB of memory and 16 have 192 GB of memory (6144 Phi cores total), 4 Xeon nodes with 24 cores and 128 GB of memory plus 2 NVIDIA GPUs (96 CPU cores, 8 GPUs with 27,264 total cores), 6 management/login/storage interface nodes and 1.9 PB of high speed storage (DDN Gridscaler). All components are interconnected via 100Gbps Omnipath interconnects and attached to external storage and the Internet (both commercial and I2) with redundant 10Gbps Ethernet interfaces. Intermediate storage is provided by a 350TB NAS and long term/backup storage is provided by a 4.2 PB object storage system (Dell/EMC ECS appliances).

#### **4.0 Office**

All faculty and staff have office space furnished with a desktop and/or laptop computer(s) owned and maintained by UAMS and/or ACH/ACRI. Additionally, all faculty and staff have access to teleconference phones, printing services, meeting space, and conference rooms.



## FACILITIES AND OTHER RESOURCES – COMMUNITY & COLLABORATION

The Translational Research Institute’s (TRI) Community & Collaboration team provides resources and services to support investigators including assistance with developing partnerships; conducting community review boards on specific research projects; loaning equipment needed to conduct community engaged research; providing one-on-one consultation; convening meetings to facilitate networking, team or partnership development, collaboration, idea-generation, or project development; assistance with grant development; and training (**Table 1**). **Table 2** illustrates specific contributions to extramural awards of over \$54 million obtained by investigators and research teams.

### 1.0 Academic Resources

#### 1.1 Antenatal and Neonatal Guidelines, Education, and Learning System (ANGELS) High-Risk Telemedicine Program.

ANGELS is an innovative consultative service for physicians, including family practitioners, obstetricians, and neonatologists in Arkansas. Dr. Curtis Lowery, Chair, Department of Obstetrics and Gynecology and Dr. Whit Hall, Department of Pediatrics, Section of Neonatology lead ANGELS, which receives significant support from the Arkansas Department of Human Services to provide evidence-based guidelines for maternal-fetal and neonatal care.

UAMS physicians and physicians across Arkansas developed the guidelines. ANGELS uses interactive compressed video to conduct weekly telemedicine conferences in which Arkansas physicians confer with maternal-fetal medicine specialists in real time about individual cases. In addition, ANGELS provides support for training local technicians on prenatal ultrasounds and evaluations of ultrasounds. Clinical telemedicine consultations allow patients, local physicians, and UAMS physicians to talk together and see each other, bringing subspecialty support directly to local communities. The ANGELS Call Center provides 24/7 triage support to UAMS obstetric patients throughout Arkansas and facilitates high-risk maternal transports by air or ground from rural and urban hospitals across the state. In 2017, the Call Center facilitated 171,845 obstetric triage calls from pregnant women in Arkansas. The hotline is staffed by >50 full-time experienced maternal-fetal medicine nurses who have access to a maternal-fetal medicine physician for providing services that include telephone triage and advice based on evidence-based guidelines, physician referral, scheduling appointments, utilization management, case management, disease and wellness management, and education. The Call Center nurse triages the caller through a telephone assessment based on a report of symptoms voiced by the patient, and standardized clinical algorithms supported by specially designed software guide assessments for both providers and patients. Each nurse in the ANGELS Call Center has a private computer and phone to communicate with participants.

**1.2 Arkansas Center for Health Disparities (ARCHD).** See Facilities and Other Resources – Overall.

**1.3 Arkansas Center for Telehealth (ACT).** ACT compliments Arkansas e-Link (see below) and identifies training and services needs to maintain the required infrastructure to promote statewide broadband adoption through telemedicine. ACT is housed within the UAMS Center for Distance Health (CDH) and led by Dr.

Table 1. Community & Collaboration Facilities and Resources	
Resource	Section
<b>Academic Resources</b>	
Antenatal and Neonatal Guidelines, Education, and Learning System High-Risk Telemedicine Program	1.1
Arkansas Center for Health Disparities	1.2
Arkansas Center for Telehealth	1.3
Arkansas Children's Hospital Telehealth	1.4
Arkansas e-Link	1.5
Arkansas Prevention Research Center	1.6
Community Review Boards	1.7
Community Scientist Academy	1.8
Community-Engaged Research Training	1.9
Dos and Don'ts of CE Workshop	1.10
Health Care Educational Portal for the Community	1.11
Office of Interprofessional Education	1.12
Public Health in Arkansas' Communities Search	1.13
South Central Telehealth Resource Center	1.14
TRI's Community Advisory Board	1.15
TRI Community Engaged Researchers Network	1.16
<b>Partnerships with Special Populations</b>	
Faith Community	2.1
• Faith-Academic Initiatives for Transforming Health in the Delta	2.1.a
Marshallse Community	2.2
Rural African American Community	2.3
Transgender Community	2.4
<b>Community Organizations</b>	
Arkansas Community Health Workers Association	3.1
Arkansas Community Institute/Arkansas Community Organizations	3.2
Arkansas Department of Health	3.3
Tri-County Rural Health Network	3.4
<b>Office</b>	
<b>Other</b>	
Equipment Library	5.1



Lowery. It was created through a Sustainable Broadband Adoption grant from the National Telecommunications and Information Administration's Broadband Technology Opportunities Program. The grant promotes broadband health adoption through outreach, education, and awareness initiatives for healthcare providers, administrators, and the public residing in the south's vulnerable populations, such as rural Arkansans.

ACT addresses problems directly related to the under-usage of broadband-assisted technologies in the clinical, research and educational activities of Arkansas's healthcare organizations. ACT delivers technology training, needs-based curricula, an educational website, awareness campaigns and 24/7 technical support. Funding of \$823,080 was granted in partnership with Connect Arkansas, a governor-appointed organization charged with expanding broadband usage throughout the state, and was provided by the National Telecommunications and Information Administration, the same government agency that awarded CDH \$102M for a statewide broadband initiative involving more than 400 partners.

**1.4 Arkansas Children's**

**Hospital (ACH) Telehealth.** The ACH Telehealth Department, established in July 2015, brings pediatric health care services closer to home for families across Arkansas, including provider-to-provider consultations, speech therapy, scheduled and acute medical visits, as well as follow-up care for chronic conditions. Arkansas' rank as

Table 2. Extramural Funding Obtained with TRI Community Engagement (CE) Support			TRI Support Provided								
Principal Investigator Award Source, Amount	College Site	Medical Condition/ Population(s)	Partnership Dev.	Community Review Board	Equipment Library	CE Consultation	Pilot Grant	KL2 Scholar	Meeting Support	Resource Dev.	Capacity Building
Mary Aitken, MD, MPH - NICHD, \$2,358,539; CJ Foundation, \$18,000	COM ACRI	Sudden Infant Death Syndrome/Teen mothers			x	x					
Kristie Hadden, PhD - NIH, \$2,900,000	COM UAMS	Diabetes and health literacy/Rural communities			x				x		
Tiffany Haynes, PhD/Karen Yeary, PhD - NIMHD, \$2,100,000	COM UAMS	Depression/Rural African Americans (AA)			x	x		x			
Justin Hunt, MD - DOD/NIMH/VA Office of Rural Health, \$2,022,449	COM UAMS	Mental health/Veterans and rural communities				x					
Peter O. Kohler, MD/Pearl McElfish, PhD - NIH/PCORI/CDC, \$8,140,000	COM UAMS-NW	Diabetes/Hispanics and Marshallese	x	x	x	x	x				
Dennis Kuo, MD - HRSA, \$900,000	COM ACRI	Children with medical complexity				x					
McElfish, Pearl A, PhD - PCORI, \$2,100,000; CDC, \$1,900,000	COM	Diabetes/Pacific Islander (PI) Sodium intake/ Hispanic, PI	x		x		x			x	x
Kate Stewart, MD, MPH - NIMHD/PCORI, \$1,033,505	COPH UAMS	Minorities in research/rural AA, Healthcare research priorities/ transgender community				x			x	x	x
J. Greer Sullivan, MD, MSPH - PCORI, \$631,063	COM UAMS	Mental health/Rural AA	x			x					
Taren Swindle, PhD - NIDDK, \$442,583	COM UAMS	Obesity/Early childhood educators and children		x	x	x		x			
Judith Weber, PhD, RD - NIGMS, \$9,411,401	COM ACRI	Obesity/Children		x				x			
Leanne Whiteside-Mansell, EdD - USDA, \$5,000,000	COM UAMS	Obesity/Children				x			x		
Pam Williams, RN, PhD - PCORI, \$562,564	CON UAMS	Rare diseases/Patient groups	x		x				x		
Karen Yeary, PhD - NIH, \$749,853	COPH UAMS	Obesity/rural AA & faith-based			x	x				x	x
James Raczyński, PhD - NIMHD, \$7,046,544; CDC, \$5,502,876	COPH UAMS	Tobacco cessation, PREP/ rural and racial/ethnic minorities, incarcerated Hypertension control, CHWs/ rural AA	x			x			x	x	
Keneshia Bryant-Moore, PhD, RN/Tiffany Haynes, PhD - PCORI/Eugene Washington \$249,990	COPH UAMS	Development of the FAITH Network Faith communities, rural racial/ethnic minorities	x			x					x
Keneshia Bryant, PhD, RN - PCORI Pipeline to Proposal award, \$50,000; PCORI Eugene Washington Award, \$110,940 ; PCORI/HRSA, \$1,115,000	COPH UAMS	Impact of homelessness on maternal/child health Housing insecure pregnant women in Central AR Partnership Disparities conf. Faith communities, rural, racial/ethnic minorities			x	x		x	x	x	
Kristin Zorn, MD - Arkansas Cancer Coalition, \$54,554	COM UAMS	Cancer genetics, community/underserved		x							
Barbara Fuhrman, PhD - Arkansas Breast Cancer Research Program, \$53,398	COPH UAMS	Hispanic women/breast cancer		x							
<b>TOTAL Funding: \$54,453,259</b>											

46<sup>th</sup> in child health in the US demands that innovative solutions are employed to improve pediatric health outcomes. ACH telehealth programs support a statewide system of health care for children needing primary and subspecialty pediatric services. Currently operating in 18 counties within 23 total sites (e.g., clinics, schools, and the new hospital, and Arkansas Children’s Northwest), the department is continually expanding access and services offered via telehealth. Planned expansion in 2018 will bring pediatric telemedicine to a total of 24 counties and 35 total sites (**Figure 1**). Current programs include general pediatrics, asthma, cardiology, child maltreatment, endocrine/diabetes, genetics, neonatal intensive care, speech pathology, transport, and urology. Upcoming clinical projects include remote patient monitoring, physical medicine and rehabilitation, hospital-to-hospital, direct-to-patient and mHealth solutions. In addition to these clinical programs, planned research projects will assess utilization patterns, patient satisfaction and health outcomes of patients receiving telemedicine services at ACH.

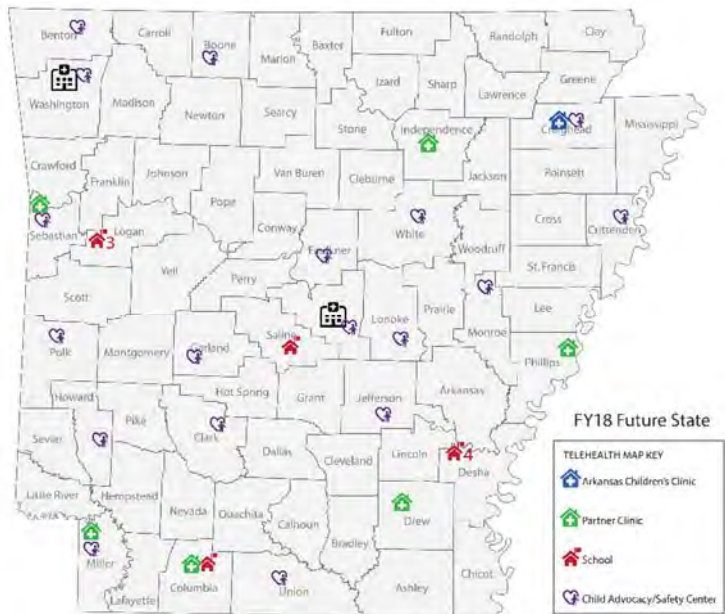


Figure 1. ACH Telehealth Sites

**1.5 Arkansas e-Link.** The \$102M Arkansas e-Link (formerly the Arkansas Healthcare, Higher Education, Public Safety, & Research Integrated Broadband Initiative) is funded through the NTIA Broadband Technology Opportunities Program. This project aims to upgrade, expand, and integrate fragmented, limited bandwidth broadband networks by offering 474 community anchor institutions substantial broadband upgrades, added broadband equipment and connectivity to a fiber backbone to meet broadband needs in healthcare, higher education, public safety, and research in unserved, underserved, and economically distressed areas in Arkansas. This program is managed by CDH (described above) through 12 professionals who manage, plan, and implement Arkansas e-Link.

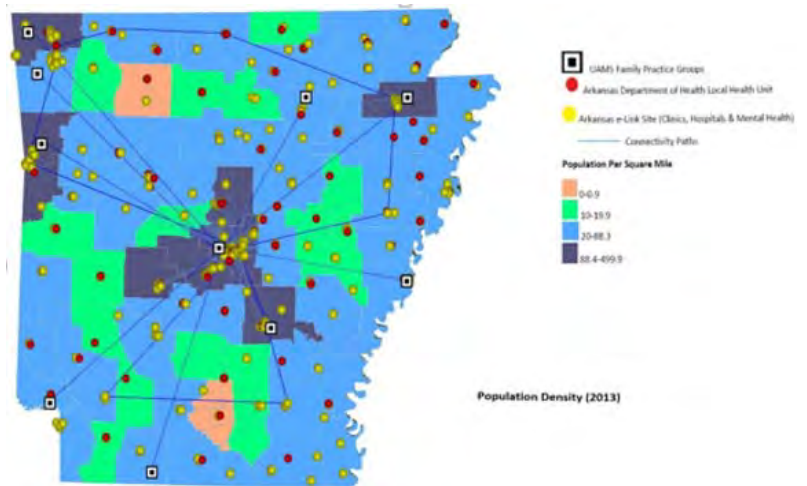


Figure 2. Arkansas e-Link

Program managers work with vendors, end-users, and UAMS Network Management to establish or upgrade broadband for installation of interactive video equipment. They also build relationships with end-users to encourage utilization of the interactive video equipment by making site visits, providing additional training, and offering application recommendations. The Arkansas e-Link network includes over 365 connected sites, including 77 hospitals, 71 medical clinics, 108 Health Department clinics, 46 behavioral health clinics, 11 occupational/physical/speech therapy clinics, 10 UAMS Pediatrics Kids First locations, 8 Centers on Aging, 5 Pathfinder facilities, 21 community colleges, and 4 universities (**Figure 2**).

**1.6 Arkansas Prevention Research Center (ARPRC).** Dedicated to better health for all Arkansans, the Centers for Disease Control and Prevention (CDC)-funded ARPRC, directed by Dr. James Raczynski, was established in 2009 (renewed in 2014) at the Fay W. Boozman College of Public Health (COPH) at UAMS. The ARPRC is part of the CDC’s national network of 26 Prevention Research Centers (PRCs). The PRCs develop effective health promotion and disease prevention strategies to bring long-term benefits to individuals, families, and communities. PRCs also offer training and technical assistance to public health practitioners. ARPRC has strong partnerships with the Arkansas Department of Health (ADH) and community organizations in the Arkansas Delta.

ARPRC’s mission is to find better ways to prevent and treat chronic diseases, such as heart disease, diabetes, and stroke, and to serve as a resource for public health practitioners and communities. Through education and research, the ARPRC and its partners develop and apply effective health promotion and disease prevention programs and strategies at the community level. Its programs are especially focused on the state’s racial and ethnic minorities, who bear the greatest burden of disease, as well as people living in rural areas, where access to health care is more difficult and there are often fewer resources to help people stay healthy. The *Take Control Project* of the ARPRC is testing a community health worker stepped intervention to identify and manage uncontrolled hypertension in African Americans in the rural Delta.

**1.7 Community Review Boards (CRBs).** TRI’s Community Engagement (CE) team also provides CRBs as a service to investigators to improve their research. This service, based on the Community Engagement Studio model from Vanderbilt’s CTSA, involves community and/or patient experts, who are recruited for each specific project to advise investigators through a one-time, facilitated session on issues relevant to the research question, recruitment strategies and marketing materials, intervention design, and dissemination. CE has conducted 21 CRBs for 13 researchers since 2013, with such topics as: home smoke-free policies among rural African American women, diabetes self-management in the Marshallese, early childhood nutrition education, breast cancer among Hispanic women, and pediatric asthma self-management in rural African Americans.

**1.8 Community Scientist Academy (CSA).** The CSA was developed by TRI and the TRI CAB in response to CAB suggestions to offer education about research to the community. Piloted in 2016, the TRI now offers this 6-week program to the public twice yearly to increase community understanding about the research process and expand research decision making opportunities to communities, patients, and other stakeholders. These opportunities include reviewing grants; advising on research projects; serving on community review boards, CABs, patient and family advisory councils; and assisting with ARresearch, our research registry. CSA topics, included in this interactive, introductory program include 1) Basic definitions related to research, overview of the research process, different types of research, research partnerships, how research questions are formed, research ethics and the IRB; 2) Study design; 3) Research funding and the grant review process; 4) Study implementation and dissemination; and 5) Research engagement. The sixth week is a “graduation celebration” where a hot meal is served, a guest speaker gives an inspirational talk, and participants network and receive certificates of completion. A key feature of the academy is the inclusion of researchers invited each week to talk about their research in the context of that week’s topic. Early results indicate the CSA is an effective approach to create a pool of community members with the capacity and interest to assist in TRI decision making activities. CSA graduates have participated in pilot grant reviews (11 graduates), served as consultants on community research training videos (9 graduates), and reviewed components of this application (10 graduates).

**1.9 Community-Engaged Research Training (CERT)**

TRI’s Community Academic Partnership Research Initiative (CAPRI), our pipeline program for community-based participatory research (CBPR), will be modelled on CERT (**Table 3**). UAMS-NW developed CERT to address the needs articulated by both the community stakeholders and academic researchers. The goal of CERT is to build the capacity of both academic researchers and community stakeholders to conduct patient-centered outcomes research (PCOR) to address the health disparities of Pacific Islander communities. CERT is a 2-year training program with the first year focused on interactive training and the second focused on implementing mentored group research projects. The training is comprised of 8 modules covering the following topics: 1) Pacific Islander/Marshallese culture and history 2) introduction to CBPR and PCOR, 3) overview of research design and analysis, 4) community perspectives/wisdom and how they improve research, 5) patient-centered outcomes research methodology standards, 6) ethics in research, 7) disseminating results, and 8) facilitating qualitative interviews. During the third module, community stakeholders and academic researchers develop specific projects.

CERT is led by a community co-investigator and an academic co-investigator/presenter. CERT participants include 11 community researchers and 11 academic researchers who meet once a month, for 3 hours for the training and to work on their projects. Among the 3 projects developed, 2 resulted in grant funding and 1 led to publication.

Inclusion criteria for researchers to participate in the CERT program are 1) expertise in 1 of the priority areas identified by community stakeholders, 2) commitment to work in the community on CBPR projects for at least 5 years after the program, and 3) commitment to attend all training sessions and spending at least 6 hours per

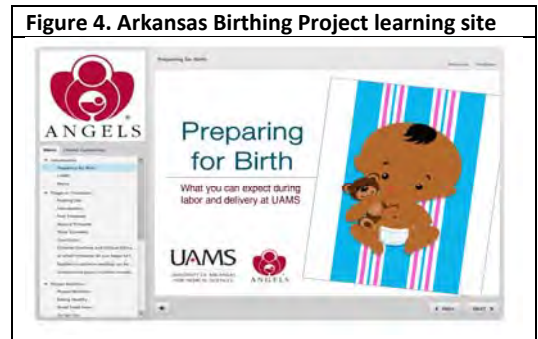
Table 3. Key Topics for CAPRI Training
Introduction to Community-Based Participatory Research and PCOR
Overview of Research Design and Analysis
Community Perspectives/Wisdom: How They Improve Research
PCOR Methodology Standards
Ethics in Research
Disseminating Results
Facilitating Qualitative Interviews

month engaged in research planning and execution with their community partners during the 2-year training period.

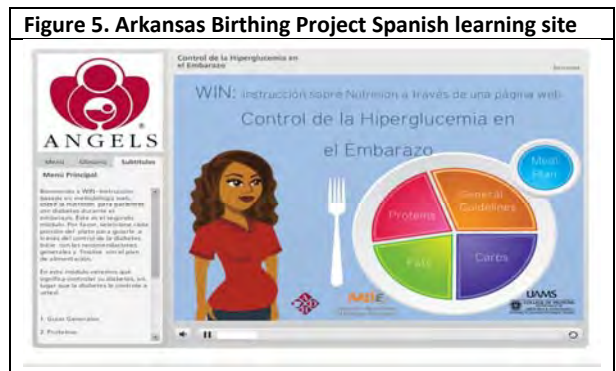
Inclusion criteria for community stakeholders are 1) interest in learning about research, 2) commitment to work with academic researchers for at least 5 years after the program, and 3) commitment to attending all training sessions and spending at least 6 hours per month engaged in research planning and execution with their community partners during the 2-year training period.

**1.10 Dos and Don'ts of CE Workshop.** This workshop was developed by the CAB of ARPRC (above) to increase researchers' understanding of how to engage communities in research. Anna Huff Davis, a community representative on TRI's Leadership Council, leads the interactive, highly praised 4-hour training and provides community perspectives on research, including video testimonials and facilitated discussion of group-based, reverse-role-plays of community research scenarios. TRI has disseminated the workshop to other translational researchers, including more than 100 researchers and staff at the University of California at Riverside in 2016.

**1.11 Health Care Educational Portal for the Community.** Patientslearn.org is an educational portal for evidence-based educational materials, interactive modules, and videos created by UAMS health care providers, accessible through the internet and mobile devices (Figure 3). Arkansans can access information about health, wellness, and certain health conditions through these interactive and engaging courses. For example, The Arkansas Birthing Project, a community partner, uses the portal to provide educational resources for pregnant women about childbirth, breastfeeding, safe sleep as well as other important topics during pregnancy and the first year of her baby's life (Figure 4). All modules are closed-captioned and some are available in Spanish (Figure 5).



**1.12 Office of Interprofessional Education (OIPE).** In 2012, UAMS developed a comprehensive approach to IPE and developed an office to design initiatives to meet the Triple Aim: improving the patient experience, improving the health of populations, and decreasing the cost of care. OIPE is housed within the UAMS Division of Academic Affairs and uses a 5-pillar approach to have institutional perspective and influence in creating, designing, implementing and evaluating models, programs and activities that support the UAMS mission. The 5 pillars are: curriculum, collaborative practice, development, faculty development, and research/scholarship. OIPE contributes to curriculum development, scholarship productivity, research infrastructure and collaborative practice across all 5 UAMS colleges and the graduate school. The office coordinates an interprofessional curriculum that is a graduation requirement for all UAMS students.



**1.13 Public Health in Arkansas' Communities Search (PHACS).** PHACS is a one-stop-shop for community health data itemized by county in Arkansas, developed and maintained as a collaboration among TRI, COPH, ARPRC, ARCHD, ADH, and Arkansas Minority Health Commission (AMHC). This web-based repository of maps and reports allows community members to visualize social-economic and behavioral factors for health, access to health care, and chronic disease outcomes prevalent in Arkansas. It focuses on public health indicators by county and other local regions that can be used for program planning and finding health care resources. PHACS was created in 2010 and has been used by hundreds of individuals across Arkansas to locate county level public health data. It is designed for community groups, college and high school students, researchers, and the lay community and provides maps for over 100 health indicators and includes demographics, social or economic factors, access to care, preventive behavior, health outcomes, and health profiles reports for each county in Arkansas. The system includes over 3,000 health care facilities across the state. The goal is not only to display health related conditions geographically to



identify disparities, but also to relate the same information for access to health care facilities provided in those areas. People within the communities can use this resource to find providers that offer free or sliding scale services, accept Medicare or Medicaid, or offer interpreters.

**1.14 South Central Telehealth Resource Center (SCTRC).** SCTRC is housed within the CDH and provides technical assistance via on-site training and a telehealth training center. It also coordinates the South Central Telehealth Forum (SCTF). On-site technical assistance is available for individuals and organizations to learn about telehealth by interacting with equipment and resources. The SCTRC team travels throughout the state to provide on-site training to all organizations receiving telehealth equipment through Arkansas e-Link. The SCTRC has a 1,063 square foot education/instructional center, centrally located in Little Rock, where hands-on, interactive training is conducted. The South Central Telehealth Forum is a regional, rotating conference for telehealth stakeholders in Arkansas, Mississippi, and Tennessee. The SCTF partners with telehealth experts throughout the region and nation to offer up-to-date presentations, outreach, and hands-on technical assistance. It provides social networking and a variety of telehealth equipment for hands-on training, one-to-one support, and technical assistance. The Society for Education and the Advancement of Research in Connected Health (SEARCH) Telehealth Research Symposium Conference, an effort led by the SCTRC in conjunction with the CDH, supports rigorous research studies related to connected health (e.g., telehealth, telemedicine, remote patient monitoring, mobile health applications). The SEARCH planning committee includes members of telehealth resource centers from 4 regions, including SCTRC. The Regional Technology Expo is a new collaborative event between SCTRC, telehealth resource centers from 3 other regions, and the National Telehealth Resource Center for Technology. It will provide a vendor-free environment for hands-on assessment, comparison, and evaluation of telehealth technology and equipment. The **LearnTelehealth.org** website hosts webinars and social media tools to facilitate engagement with patients and clinicians, administrators, and technicians seeking telehealth expertise in rural regions (**Figure 6**). It is a gateway for all visitors interested in using or expanding their efforts in clinical or educational telehealth. One of the educational videos on the site, Jennifer’s Story: A Telemedicine Tale, has had over 38,000 views and is widely used to explain the impact of telehealth on patients and families (**Figure 7**).



**1.15 TRI’s Community Advisory Board (CAB)**

TRI’s statewide CAB was established in 2011 to advise TRI on issues important to various constituencies in the state. The CAB assists in prioritizing research initiatives and increases local visibility and understanding about TRI and research in communities. CAB members represent all regions of the state and are selected because of their recognized leadership within their communities. Many of the members are experienced community research partners on projects with TRI researchers. For example, Ms. Naomi Cottoms is the Executive Director of Tri-County Rural Health Network (see below), a long-term partner of UAMS’ College of Public Health with which Dr. Kate Stewart and many other faculty have worked on research projects. Mr. Steve Sullivan is a pastor who runs the Mental Health Clergy Partnership Program of the Department of Veterans Affairs in Arkansas in



partnership with many VA researchers. Pastor Jerome Turner has served as community co-investigator on multiple faith-based CBPR projects funded by the National Institute on Minority Health and Health Disparities with Dr. Karen Yeary, Dr. Tiffany Haynes (KL2 recipient), and Dr. Keneshia Bryant-Moore (KL2 recipient). Marshallese members (Walter Clanre and Yoshi Tobey) have served on the Marshallese Pastors Community Advisory Board for the Center for Pacific Islander Health and are involved in multiple research projects at UAMS-NWA campus with Dr. Pearl McElfish. partners and hub researchers gather for a recognition dinner honoring the valuable contributions made by partnering organizations, advisory boards, and individuals to support TRI's mission. TRI's CAB members also serve on focus groups to advise on the development of the TRI's recruitment registry and website, ARresearch.org. Three CAB members served on the planning committee for development and implementation of the Community Scientist Academy, a key resource for building community understanding about research. TRI's CAB developed the Community Partner Celebration, an event where an average of 100 community

**1.16 TRI Community Engaged Researchers Network.** In 2012, the CE Core completed a scan within our hub to identify community engaged researchers and held a retreat to bring them together to identify how the TRI could best support their work. We subsequently began to sponsor meetings for researchers to network, worked jointly to identify barriers to CE research, conducted surveys to identify interest areas, and developed a listserv for sharing issues, funding opportunities, educational and other resources, and notification of events. Over the past 3 years, TRI has sponsored lunch and organized a quarterly noon seminar featuring CE research for the CE Researchers Network. Active members of this network include senior UAMS researchers such as Dr. Leann Whiteside-Mansell, a professor in the department of family and preventive medicine, who directs the department's Research and Education Division (RED) and Dr. Judy Weber, professor in the department of pediatrics who directs an obesity prevention COBRE at ACRI. RED conducts studies to target services to women with addiction and their children, school-based studies, and develops Family Map Inventories. The CE Network also supports and engages junior CE researchers and provides a venue for discussions about how to address challenges more common in CE research and development of relationships that help build interdisciplinary research teams and community partnerships.

## 2.0 Partnerships with Special Populations

UAMS investigators have developed strong partnerships with members of special populations experiencing health disparities. These partnerships form a strong infrastructure for TRI activities designed to increase participation of these populations in research.

### 2.1 Faith Community.

**2.1.a Faith-Academic Initiatives for Transforming Health (FAITH) in the Delta,** led by Dr. Keneshia Bryant-Moore, UAMS College of Public Health, was established in 2013 through a grant funded by NIMHD. TRI's CE team provided consultation for the grant application. Community pastor co-investigators, including TRI CAB member Pastor Jerome Turner, used audience response devices to survey church members about health concerns and select a research topic. The academic-community team, comprised of 3 KL2 Scholar alumni (Bryant, Kuo, and Haynes), tested the feasibility of *REJOICE*, a faith-based, evidence-based intervention to address depression in rural African Americans, using tablets from TRI's equipment library. This work led to an NIMHD U01 grant, funded in 2016 as a CBPR project with Drs. Tiffany Haynes, Karen Yeary, Keneshia Bryant-Moore, and Geoffrey Curran, and Pastors Jerome Turner and Johnny Smith to address depression in rural African Americans.



The FAITH Network, established in 2016 through a PCORI engagement award, is led by Dr. Keneshia Bryant-Moore. The FAITH Network seeks to combat health inequities and disparities, particularly among vulnerable populations, through partnerships with the faith community, academic institutions, and other organizations. The strong influence of religion within Arkansas, coupled with the state's poor health rankings, highlights the need for innovative and non-traditional approaches, such as engaging the faith community, to improve access to

care and health outcomes among Arkansans. Places of worship are one of the most trusted institutions in communities, with a long-standing history of shaping values and community norms. Places of worship have served as community “gateways” or venues through which advances in healthcare have been translated into real world settings. In addition, places of worship are available in nearly every community and because of the mission of service and caring for others, they have served as the site of a variety of health promotion programs. This can be a particular advantage for under-resourced, rural, and lower socioeconomic communities.

The FAITH Network is a partnership between communities of faith, community-based organizations, and researchers that focuses on improving the health of underserved communities in Arkansas. The FAITH Network has Research, Educational Outreach, and Unity goals. Research goals are to 1) increase the participation of communities of faith in Arkansas in health related research, 2) provide training in patient-centered research, and 3) to connect members of the faith community to researchers nationwide. The FAITH Network conducts, supports, and engages diverse groups in faith-based research through: recruitment of research participants; identification of partners in health research; dissemination of research findings; translation of evidence-based interventions/programs (Implementation Science); and capacity building in research through the FAITH Network Research Advocate Training Program. Additionally, the network provides resources, educational trainings and networking opportunities to faith communities across Arkansas, regardless of geographic location, race/ethnicity, religious beliefs, socioeconomic status or congregation size. It also partners with government agencies, non-profit organizations, businesses and any other groups with the shared mission to improve the health status of Arkansans.

The FAITH Network CAB reflects the value the FAITH Network places on the needs and interests of Arkansas communities. It represents a diverse range of faith leaders who have frequent interactions with the community and a broad range of expertise in community concerns. The Faith Network CAB advises on a range of programmatic and operational matters, ensuring that everything we do supports, strengthens and helps our communities. CAB members are Rev. Gregory C. Nettles—Chair, Rev. Bryant Whitted, Chaplain Steve Sullivan, Rev. Natasha Murray, Rev. Johnny Moore, Rev. William Givens, Pastor Alberto Alcacio, Rev. William Robinson, Pastor Rick I. Iban, and Rev. Edward Richardson.

**2.2 Marshallese Community.** Dr. Pearl McElfish, Associate Vice Chancellor, UAMS-NW, co-directs the Center for Pacific Islander Health and co-directs TRI’s CE team. She travels to the Little Rock campus monthly to maintain and expand communication and collaboration. Based on participatory research partnerships with the Marshallese, she and her partners have established an ongoing initiative to address diabetes among the Marshallese. She and Dr. Peter Kohler, faculty member in the department of Endocrinology, have used CBPR to adapt an Extended Family Model of Diabetes Self-Management Education for the Marshallese community to improve diabetes outcomes. Study results are guiding new interventions in the Marshallese community across the lifespan. The **Center for Pacific Islander Health** (See Facilities and Other Resources – Overall), a multi-disciplinary center focusing on research, community programs, training, and policy, works with Pacific Islander communities in the US, the US territories of American Samoa, Guam, and the Northern Mariana Islands, and the US-affiliated Compact of Free Association nations of the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau.

**2.3 Rural African American Communities.** The COPH has been partnering with African American communities in the rural Arkansas Delta and other parts of Arkansas since it was established in 2001. The COPH was initially funded through resources from the Tobacco Settlement Proceeds Act (Initiated Act I) which mandated that all monies received by Arkansas under the Tobacco Settlement Agreement would be used for health-related programs, particularly those that were prevention-oriented and addressed important health issues in Arkansas. The COPH occupies 3 2/3 floors of a 6-story structure (approximately 20,000 gross sf/floor) built in 2003. This facility offers state-of-the-art offices, classrooms and meeting rooms for faculty, staff and students to address educational, research, and services components of the overall mission.

The COPH overarching mission is “to improve the health and promote the well-being of individuals, families, and communities in Arkansas through education, research, and service.” COPH was established with an underlying orientation to Community-Based Public Health (CBPH) approaches, which is supported by COPH’s Office of Community-Based Public Health (OCBPH) detailed below. To fulfill its mission, the COPH has adopted a strong commitment to a community-based, participatory approach to health promotion. The COPH has made a commitment to collaborate with the ADH in the development of education, research, and service activities intended to apply this philosophy. A Joint Oversight Committee has been established to coordinate these complementary efforts. In addition to prevention, research and service, programs to eliminate health



disparities remain among the highest priorities for the COPH, given the significant health disparities evidenced in Arkansas.

TRI works closely with COPH's Office of Community-Based Public Health, led by Dr. Kate Stewart. The OCBPH is a COPH-wide resource to promote community-based public health and community-based participatory research. This office has developed and maintains close partnerships with selected communities which are serving as model programs of community-based participatory public health programs. In addition, it provides resources for faculty, students, and staff on CBPH theories and methods; assists in the development of new community-based education, service, and research programs, and supports development and implementation of community-based participatory research grant projects. Examples of long-term COPH partnerships working with the TRI are listed below.

**2.4 Transgender Community.** The Arkansas Transgender Equality Coalition (ArTEC) is a statewide, transgender-led, non-profit organization established in 2014 to advance equality, justice and inclusiveness for transgender and gender non-binary Arkansans by educational awareness, resources and gender-inclusive communities within the state. ArTEC is led by a transgender majority board of directors that works together to carry out its mission. ArTEC has been a community partner of the COPH since 2014 through its members providing education through workshops and guest lectures and panels and through the **Transform Health Arkansas initiative**. Transform Health is an initiative started through an ArTEC – COPH partnership in May 2015 with Tier I Pipeline to Proposals funding from the Patient-Centered Outcomes Research Institute (PCORI) to engage transgender/non-binary individuals in Arkansas in identifying their greatest health and healthcare concerns. ArTEC received Tier II and Tier III awards from PCORI and a small grant from the Fred E. Darragh Foundation. Dr. Dani Smith Archie and Dr. Stewart co-lead Transform Health with an interdisciplinary Research Working Group that meets regularly. Through Transform Health, they engaged trans Arkansans across the state in defining access to affirming care as a high priority issue in the transgender community. In collaboration with Geoff Curran, PhD, director of TRI's optional module in Implementation Science and director of the UAMS Implementation Science Core and primary care practices across the state, Dr. Stewart submitted an R21 application to NIMHD in February 2018 to study implementation strategies for improving access to affirming care quality for transgender Arkansans. Transform Health has also identified gaps in the hubs' clinical environment, such as the lack of lesbian, gay, bisexual, transgender, and queer/questioning (LGBTQ) patient representation. This partnership led to the inclusion of transgender individuals on institutional bodies (e.g., educational panels for health professions students, and patient and family advisory councils) and obtained intramural funding from UAMS' Interprofessional Education small grants program to develop a training program with a video including trans and provider actors simulating trans patient interactions to teach about how to provide affirming care. TRI's CE team also supports UAMS' annual application for National Healthcare Equality Leadership status and is assisting with UAMS' plans and staff-training for the collection of sexual orientation and gender identity information in EPIC.

### 3.0 Community Organizations

**3.1 Arkansas Community Health Workers Association (ARCHWA).** ARCHWA is a state-wide non-profit organization that is led by and serves community health workers across Arkansas. Founded in 2013, ARCHWA's mission is to support Arkansas community health workers in promoting improvements in health and health care. The main objectives are to: provide training, continuing education and career advancement opportunities; advocate for steady and reliable funding for community health worker programs; increase public and professional recognition of community health worker knowledge, skills and contributions; and convene community health workers to share resources and offer mutual support. ARCHWA has a majority community health worker (CHW) member board of directors. It hosted its 5th annual community health worker summit in June 2017 with supporting sponsorship from TRI. Mrs. Anna Huff-Davis, TRI's Community Liaison, serves as chair of ARCHWA's board, providing TRI with an important linkage for community-based research. ARCHWA is currently developing a certificate training program for CHWs.

**3.2 Arkansas Community Institute (ACI) / Arkansas Community Organizations (ACO).** ACI's mission is to empower low to moderate-income residents economically through 1) Asset building activities such as home ownership counseling, financial literacy, and outreach and education on programs such as the Earned Income Tax Credit (EITC); 2) Leadership development; 3) Research and advocacy on policies; and 4) Education about existing policies that address barriers to economic empowerment and advancement. ACO is one of Arkansas' largest grassroots organizations, organizing low-income and working families from across the state to enable them to work for social and economic justice. ACO has been a major community-based service learning

organizational partner for the COPH’s racial and ethnic health disparities course for the past 6 years. This partnership has allowed COPH masters and doctoral students to participate in projects that allow them to see how issues contributing disparities play out in the real world in the policy arena at both the state and local level. These projects have focused on the Medicaid expansion, tenants’ rights, incarceration, threats to neighborhood schools, and neighborhood displacement through gentrification. ACO is led by Mr. Neil Sealy and a strong, engaged board of directors from the community.

**3.3 Arkansas Department of Health (ADH).** See Resources and Other Facilities – Overall. ADH is home to surveillance systems and registries that monitor the health status of Arkansans. While these data systems are primarily used for public health surveillance, they can be useful research datasets. With the proper approval, these datasets are available for research in collaboration with ADH scientists. See **Table 4** for examples.

**Table 4: Examples of Arkansas Department of Health Data**

Database	Purpose	Annual # Records	Latest Year of Data	Notable Variables
Arkansas Central Cancer Registry	To serve as a data repository for those requesting information on cancer	16,000	2014	Demographics, cancer site, histology, stage of disease, and first course of treatment
Arkansas Emergency Medical Services Registry	To capture all prehospital encounters in the state	300,000	2016	Response times for prehospital providers (call, dispatch, arrive/departure scene times), demographics, call type
Arkansas Pregnancy Risk Assessment Monitoring System	To collect information from new mothers about their experiences and behaviors before, during, and after pregnancy that might impact the health of their baby	1,800	2015	Unintended pregnancy, contraceptive use, multivitamin use, prenatal care, smoking and drinking status during pregnancy
Arkansas Trauma Registry	To capture traumatic injuries that meet inclusion criteria	19,000	2017	Demographics, injury severity score, patient outcomes, patient vitals
Arkansas STI Management Information System	To track cases of sexually transmitted diseases occurring in the state	25,000	2016	Demographics, disease
Behavioral Risk Factor Surveillance System	To monitor the health behaviors and health practices of Arkansas adults, ages 18 and older	5,200	2016	Health insurance, chronic disease status, immunization status, and physical activity
Hospital Discharge Database (Emergency Department)	To capture all emergency department visits	1.2 M	2016	Diagnosis and procedure codes, admission and discharge dates, demographics, costs
Hospital Discharge Database (Inpatient)	To capture all inpatient hospital admissions	390,000	2016	Diagnosis and procedure codes, admission and discharge dates, demographics, costs
Vital Statistics Database (Birth)	To capture all live births in Arkansas	37,000	2016	Demographics of mother/child, birthweight, tobacco use, method of delivery
Vital Statistics Database (Death)	To capture all deaths in Arkansas (resident and occurrence)	30,000	2016	Demographics of decedent, autopsy performed, occupation of decedent, pregnancy status

**3.4 Tri-County Rural Health Network (TCRHN)** is a non-profit community-based organization serving primarily low income, rural African Americans with a long and productive history with the COPH. TCRHN initially developed the Community Connector Program (CCP) with funding from HRSA (through the Mid-Delta Community Consortium’s Delta Rural Network Development Program) and the Foundation for the Mid-South in response to findings from an asset mapping project using the methodology of deliberative democracy. The asset map documented that low-income minorities were underutilizing existing community health and social services due to lack of knowledge, understanding, and trust, and documented other challenges in navigating formal service delivery systems. The CCP was piloted as a “linking service” to address these community-identified access-related needs. After successfully initiating the pilot, the COPH Office of Community-Based Public Health helped TCRHN obtain funds from the Arkansas Department of Human Services and Robert Wood Johnson Foundation to focus CCP efforts on addressing barriers faced by adults with physical disabilities and elderly in need of long-term care in accessing home- and community-based services (HCBS). These barriers included lack of information and counseling about HCBS, mistrust of existing formal informational sources, and difficulties navigating the fragmented HCBS system. In addition, COPH faculty have formally evaluated the CCP’s work on Medicaid savings achieved through decreased use of institutional care. The overall evaluation documented Medicaid cost savings with a return on investment of almost three dollars per dollar invested. The CCP model was adapted to develop the Patients Advancing Their Health (PATH) in the Delta program in which connectors are integrated into primary care practices in the Delta to serve the most complex patients. TCRHN also partnered with COPH on an NIMHD project to employ connectors to increase minority participation in research in Jefferson County in the Arkansas Delta. Through this project, 85% of rural African Americans engaged by connectors were willing to be contacted about research opportunities and numerous investigators were supported in CBPR partnerships. Ms. Naomi Cottoms is TCRHN’s Executive Director and chairs TRI’s Community Advisory Board.

#### **4.0 Office**

All faculty and staff have office space furnished with a desktop and/or laptop computer(s) owned and maintained by UAMS and/or ACH/ACRI. Additionally, all faculty and staff have access to teleconference phones, printing services, meeting space, and conference rooms.

#### **5.0 Other**

**5.1 Equipment Library.** TRI's CE team has a variety of research equipment available for short-term use. The typical loan period is 14 consecutive days, but extended loans are possible. Requests for equipment are made through the TRI Portal. This equipment facilitates field research and includes the following: Electronics equipment (includes 60 iPads); 2 iPad docks; 4 iPad charging stations; 8 Dell Latitude ST tablets; 5 Dell Latitude laptops; 4 Microsoft Surface tablets; 10 wireless keyboards; 2 wireless pointers; 2 wireless hotspots; Portable public address (PA) system; DVD burner and duplicator; 2 LCD projectors and screens; and a 22-inch TV/DVD combo. Other equipment includes 36 Otter boxes, folding tables with wheels, tri-fold display boards, bulletin boards, pop-up tents, room partitions, and high-pressure misting fans.

## FACILITIES AND OTHER RESOURCES – TRANSLATIONAL ENDEAVORS

The Translational Research Institute (TRI) has resources available to support the breadth of activities described in the Translational Workforce Development and Pilots Translational and Clinical Studies Programs (**Table 1**).

<b>Resource</b>	<b>Section</b>
<b>Laboratory</b>	<b>1.0</b>
<b>Clinical</b>	<b>2.0</b>
<b>Computer</b>	<b>3.0</b>
TRI Pilot and KL2 Award Software	3.1
<b>Office</b>	<b>4.0</b>
<b>Other</b>	<b>5.0</b>
BioVentures	5.1
Enhancing Clinical Research Professionals' Training and Qualifications Competencies	5.2
Good Clinical Practice Training	5.3
Graduate School	5.4
Office of Research Compliance	5.5
Sam M. Walton College of Business	5.6
Society of Clinical Research Associates	5.7

### 1.0 Laboratory

Applicable depending on pilot projects awarded. See Facilities and Other Resources – Overall.

### 2.0 Clinical

Applicable depending on pilot projects award. See Facilities and Other Resources – Overall.

### 3.0 Computer

**3.1 TRI Pilot and KL2 Award Software.** TRI uses a custom built software program to manage and conduct its Pilot Review Process. In 2015 the Development Systems group in the Information Technology Department at UAMS worked with TRI's Pilot Program leadership to develop a web-based system to manage our pilot awards process. The system covers all portions of the process: applicants submit their projects into the system; Program leadership use the system to assign reviewers; reviewers access their assigned applications through the system and upload completed reviews back into it; and Program leadership uses the system to manage voting procedures and record and average scores during the study section. The system also has the ability to archive data from previous sections (rounds) and to quickly produce statistical reports and spreadsheets that detail basic data from each round or across rounds.

### 4.0 Office

All faculty and staff have office space furnished with a desktop and/or laptop computer(s) owned and maintained by the University of Arkansas for Medical Sciences (UAMS) and/or Arkansas Children's Hospital (ACH)/Arkansas Children's Research Institute. Additionally, all faculty and staff have access to teleconference phones, printing services, meeting space, and conference rooms.

### 5.0 Other

**5.1 Bioventures.** See Facilities and Other Resources – Overall.

### **5.2 Enhancing Clinical Research Professionals' Training and Qualifications (ECRPTQ) Competencies.**

TRI participated in the CTSA's ECRPTQ initiative to develop competency based standards for principal investigators and clinical research coordinators (**Table 2**). This framework is used to guide our local educational selections as well as to inform future online learning development.

<b>Domain</b>	<b>Competency Statements</b>
Scientific Concepts and Research Design	(1) Demonstrate knowledge of the foundational science behind interventional and diagnostic approaches. (2) Identify important scientific questions derived from prior knowledge that are potentially testable clinical research hypotheses. (3) Explain elements of study design.

	<p>(4) Design a clinical trial that operationalizes a testable hypothesis.</p> <p>(5) Critically analyze study results.</p>
Ethical and Participant Safety Considerations	<p>(1) Differentiate between standard of care and clinical trial activities.</p> <p>(2) Define the concepts “clinical equipoise” and “therapeutic misconception” as related to the conduct of a clinical trial.</p> <p>(3) Apply relevant principles of human subject protections and privacy throughout all stages of a clinical trial.</p> <p>(4) Define vulnerable populations and additional safeguards needed for protection of those populations.</p> <p>(5) Explain how inclusion and exclusion criteria are included in a clinical trial protocol to assure human subject protection.</p> <p>(6) Summarize the principles of distributive justice through selection and engagement with clinical trial participants.</p>
Investigational Products Development and Regulation	<p>(1) Describe the regulatory responsibilities of the various institutions participating in the investigational product development process.</p> <p>(2) Summarize the legislative and regulatory framework that supports the development and registration of investigational products and ensures their safety, efficacy, and quality.</p> <p>(3) Assess and apply manufacturing, chemistry, and engineering studies combined with preclinical study data to evaluate risk, effects, and use of an investigational product.</p> <p>(4) Describe appropriate control, storage, and dispensing of investigational products.</p> <p>(5) Describe specific processes and phases that must be followed to satisfy regulatory requirements.</p> <p>(6) Explain the safety reporting requirements of regulatory agencies.</p> <p>(7) Appraise the issues generated and the effects of global expansion on the approval and regulation of investigational products.</p> <p>(8) Differentiate the roles and responsibilities of the sponsor, investigator, and supporting study team for investigational product development.</p>
Clinical Trial Operations	<p>(1) Explain how the design, purpose, and conduct of individual clinical trials fit into the goal of achieving a new intervention.</p> <p>(2) Describe the roles and responsibilities of the clinical investigation team as defined by GCP guidelines.</p> <p>(3) Evaluate the conduct and documentation of clinical trials as required for compliance with GCP guidelines.</p> <p>(4) Compare and contrast the regulations and guidelines of global regulatory bodies relating to the conduct of clinical trials.</p> <p>(5) Describe appropriate control, storage, and dispensing of investigational products.</p> <p>(6) Differentiate the types of AEs that occur during clinical trials, understand the identification process for AEs, and describe the reporting requirements to IRBs/IECs, sponsors, and regulatory authorities.</p> <p>(7) Describe how international regulations and guidelines assure human subject protection and privacy during the conduct of clinical trials.</p> <p>(8) Describe the reporting requirements relating to clinical trial safety.</p> <p>(9) Describe the purpose and process for monitoring clinical trials.</p> <p>(10) Describe the purpose and process of clinical trial audits.</p> <p>(11) Describe the various methods by which safety issues are identified and managed during the phases of clinical trials.</p>
Study and Site Management	<p>(1) Describe the methods utilized to determine whether or not to sponsor, supervise, or participate in a clinical trial.</p> <p>(2) Develop and manage the financial, timeline, and personnel resources necessary to conduct a clinical trial.</p> <p>(3) Recognize the management and training approaches to mitigate risk to improve clinical trial conduct.</p> <p>(4) Develop strategies to manage participant recruitment, study activities, and track progress.</p> <p>(5) Identify the legal and regulatory responsibilities, liabilities, and accountabilities that are involved in the conduct of clinical trials.</p> <p>(6) Identify and explain the specific procedural, documentation, and oversight requirements of PIs, sponsors, contract research organizations, and regulatory authorities.</p>
Data Management and Informatics	<p>(1) Describe the role of statistics and informatics.</p> <p>(2) Describe the flow and management of data through a clinical trial.</p> <p>(3) Describe and assess best practices and the importance of informatics for standardizing data collection, capture, management, and analysis.</p> <p>(4) Describe and develop processes for data quality assurance.</p>
Leadership, Professionalism, and Team Science	<p>(1) Apply the principles and practices of leadership in management and mentorship.</p> <p>(2) Identify, analyze, and address ethical and professional conflicts associated with the conduct of clinical trials.</p> <p>(3) Identify and apply professional guidelines and codes of ethics as they relate to the conduct of clinical trials.</p> <p>(4) Recognize the potential effects of cultural diversity and the need for cultural competency in the design and conduct of clinical trials.</p> <p>(5) Describe the methods necessary to work effectively with multidisciplinary and interprofessional research teams.</p>
Communication	<p>(1) Discuss the relationship and appropriate communication between sponsor, contract research organizations, and clinical research site.</p> <p>(2) Describe the component parts of a traditional scientific publication.</p> <p>(3) Effectively communicate the content and relevance of clinical trial findings to colleagues, advocacy groups, and the non-scientist community.</p>

**5.3 Good Clinical Practice (GCP) Training.** UAMS provides various options for researchers to obtain GCP training. GCP training is tracked by the Office of Research Compliance and proof of completion of any of the following programs is acceptable. GCP training expires must be completed every 3 years.

- Collaborative Institutional Training Initiative programs for GCP training for both biomedical and social-behavioral researchers.

- NIH-developed GCP training.
- GCP training obtained through an industry sponsor.
- Completion of Good Regulatory Practices course in the UAMS graduate school.
- Professional clinical trials certification through the Society of Clinical Research Associates or Association of Clinical Research Professionals.

**5.4 Graduate School.** See Facilities and Other Resources – Overall for general description. Specifically, the following programs will support Translational Endeavors:

*Biomedical Informatics.* The Department of Biomedical Informatics, within the College of Medicine, at the University of Arkansas for Medical Sciences is home to graduate degree programs in biomedical informatics. The graduate degree programs in Biomedical Informatics includes a Doctorate of Philosophy, Master of Science, a Professional Master's degree and a Graduate Certificate. The four specialty tracks include:

- Clinical Informatics – Generating, managing and using information and information systems in health care settings.
- Clinical Research Informatics – The use of data to design, conduct and report clinical studies.
- Imaging Informatics – The acquisition, management and processing of clinical images in healthcare and research.
- Translational Bioinformatics – Leveraging information at the molecular and cellular levels to improve human health.

The educational goals of the program are specific to each educational level. At the certificate level, the goals are to deepen knowledge and increase skills, ability to apply biomedical informatics principles and methods within an area of practice and to conceptualize, plan, conduct and report an applied Biomedical Informatics project. At the professional level, the educational goals include those at the certificate level and expand on them to include the ability to productively work as a member of an interdisciplinary team and to continue professional career development. Students completing the professional master's degree will possess the knowledge and skills necessary to sit for the relevant professional certification exam. The Master of Science educational goals include those at the professional master's level plus gaining the ability to participate in and manage research processes in the relevant area of Biomedical Informatics. Educational goals at the doctoral level include those at the Master of Science level and add to them the ability to pose compelling scientific questions and new methods in Biomedical Informatics and to design, conduct and report the research that answers them.

*Clinical and Translational Science Program.* UAMS is working to close the gap between biomedical research and the application of that research by offering advanced MS or PhD graduate training in the Clinical and Translational Sciences (CTS) through the Interdisciplinary Biomedical Sciences Graduate Program. Students in the CTS track take coursework designed to build a strong foundation in clinical and translational sciences including biostatistics, epidemiology, data management and analysis, clinical research methodology, clinical trials design, drug development, responsible conduct of research, grant writing and scientific communications. Courses are offered in the College of Medicine, College of Nursing, College of Public Health and College of Pharmacy. MS students can complete the non-thesis pathway, or collaborate with CTS Faculty to conduct thesis research in a variety of clinical research areas. PhD students conduct much more in depth research under the guidance of their dissertation mentor. The CTS track is designed for students holding an advanced degree in a biomedical or health sciences field (e.g., MD, RN, PharmD, MPH, DPH or PhD), but is also available to others having significant clinical research management or clinical experience.

*Health Systems and Services Research.* The UAMS College of Public Health offers a program of instruction leading to a PhD in Health Systems and Services Research. The program provides students with the theoretical and methodological foundations necessary to conduct creative and independent research on health systems, with the ultimate goals of identifying pathways to improved health system performance through evidence-based policy and management. The curriculum involves intensive and focused study in the theoretical perspectives and methodological strategies relevant to research on the organization, financing, and delivery of health services, including issues of quality, accessibility, efficiency, and equity within systems of care. Students will develop scholarly expertise in these areas of study, advanced skills in quantitative research methods, confidence in their teaching, and a high standard of scientific integrity and professionalism. The program requires students to select one of three possible discipline areas in which to pursue concentrated study: (1) health economics; (2) quality and health outcomes research; or (3) comparative effectiveness research. The health economics concentration will allow students to master the body of theory and methods for studying the economic behavior of health care providers, insurers and consumers and for evaluating the

economic impact of health policies and health care interventions. The concentration in quality and health outcomes research will allow students to develop expertise in the theory and methods for evaluating quality of care and analyzing the outcomes that result from health services and interventions, including disparities in health care and health outcomes. The concentration in comparative effectiveness research allows students to develop expertise in the theory and methods of realistic evaluation to compare health care delivery systems and services in real world settings with an emphasis on patient-centered outcomes and stakeholder engagement.

Additionally, students are required to select a substantive research or policy area in which to focus their studies. These substantive areas are defined principally by areas of expertise held by members of the program faculty, and include health insurance, access to care, long-term care, aging, rural health care, nutrition policy, health disparities, community-based public health, public health policy and law, child health, and mental health. Students will gain experience in their chosen substantive area primarily through three semester-long rotations (nine hours) of directed research study with program faculty. A student's chosen disciplinary concentration and substantive area will combine to form a coherent theoretical, institutional, and methodological knowledge base that the student will use to pursue dissertation research.

**Regulatory Sciences Program.** The Regulatory Sciences program at UAMS was born from long-standing collaborations between UAMS and the FDA's National Center for Toxicological Research in Jefferson, AR. UAMS faculty and FDA scientists worked in partnership to develop the curriculum for the Graduate Certificate in Regulatory Sciences. Scientists from the private sector and FDA join UAMS faculty to teach the courses in the program. Most of the students who have enrolled in the Graduate Certificate program already possess a graduate degree but still wish to better understand how basic research is applied in the regulatory decision-making process. The UAMS Graduate Certificate program provides these credentials without the cost and time commitment required of a full master's degree program. The program is comprised of four 3-hour courses that provide a competitive edge to launch a successful career in a regulatory agency or in the regulated industries that strive to provide safe and effective products regulated by the FDA. In order to make the program more accessible to career-minded scientists who want to enhance their knowledge in regulatory science, out-of-state tuition is waived for all students in the program, regardless of where they reside, so the new online-only approach gives students both great value and significant flexibility around busy work schedules. The program is a campus-wide initiative involving the Colleges of Medicine, Pharmacy, and Public Health, offered through the UAMS Graduate School and administered by the Department of Environmental and Occupational Health.

**5.5 Office of Research Compliance.** See Facilities and Other Resources – Overall.

**5.6 Sam M. Walton College of Business.** See Facilities and Other Resources – Overall.

**5.7 Society of Clinical Research Associates (SOCRA).** SOCRA is a non-profit, charitable and educational membership organization committed to providing education, certification, and networking opportunities to all persons involved in clinical research activities. SOCRA is the leading educational organization for clinical researchers in all therapeutic areas, supporting industry, government and academia. The organization is committed to devoting a tremendous effort to developing and providing new and innovative approaches to learning. Local SOCRA Chapters are designed to offer colleagues a way to acquire continuing education credit for SOCRA CCRP recertification and to become involved with SOCRA's educational programming. Such programming is of no cost to SOCRA members. SOCRA chapters epitomize peer to peer learning for the benefit of continuing education. A SOCRA chapter's membership consists of current members of SOCRA who are located within a non-exclusive geographic area defined by the local chapter. The chapter's "active" membership will then consist of those who are interested in developing and participating in continuing education programs to assist the membership in securing continuing education (CE) related to the regulations and guidelines that govern clinical research. All such educational programs will be of benefit to clinical research professionals and other parties who might be interested in clinical research. SOCRA's Arkansas Chapter resides at UAMS and has offered more CE opportunities each year than any other chapter worldwide since 2011.



## FACILITIES AND OTHER RESOURCES – RESEARCH METHODS

The Translational Research Institute's (TRI) Research Methods team provides resources and services to support researchers, primarily through providing one-on-one consultations, assistance with grant development, and training. **Table 1** shows information about extramural funding totaling over \$130M obtained by researchers and their teams that have been assisted by the Biostatistics, Epidemiology, and Research Design (BERD) core. Additional institutional resources are available to support Research Methods activities (**Table 2**).

Table 1. Extramural funding obtained with TRI BERD support 2014-2018		
Principal Investigator; Site, College	Grant Title**	Award Source; Award Amount®
Karen Abbott, PhD; UAMS, COM	Glycomics Laboratory for the Development of Ovarian Cancer Biomarkers	NIH/NCI; \$3,840,505
Marjan Boerma, PhD; UAMS, COP	Center for Research on Cardiac and Vascular Effects of Space Radiation	NASA/NSBRI; \$4,450,026
Marjan Boerma, PhD; UAMS, COP	The Protein C Pathway in Mitigation of Radiation-Induced Endothelial and Vascular Dysfunction	NIH/NIAID; \$3,124,280
Richard Dennis, PhD; CAVHS, GRECC	Immune Function and Muscle Adaptations to Resistance Exercise in Older Adults	VA Merit; \$1,097,217
Hari Eswaran, PhD; UAMS, COM	Non-Invasive Prenatal Assessment using Optically Pumped Magnetometers	NIH/NICHHD; \$412,700
Martin Hauer-Jensen, MD, PhD; UAMS, COP	Center for Studies of Host Response to Cancer Therapy	NIH/NIGMS; \$10,581,280
Tiffany Haynes, PhD/Karen Yeary, PhD; UAMS, COPH	Reducing depressive symptoms among rural African Americans	NIH/NIMHHD; \$2,144,860
Jessica Snowden, MD/Jeanette Lee, PhD; UAMS, COM	Data Coordinating and Operations Center (DCOC) for the IDeA States Pediatric Clinical Trials Network	NIH; \$41,720,000
Peter Kohler, MD/Pearl McElfish, PhD; UAMS, COM and COPH	Reach out and Connect to Reduce Health Inequalities and Health Disparities in the Hispanic and Marshallese Communities in Northwest Arkansas	PCORI; \$2,096,416
Reid Landes, PhD; UAMS, COM	Algorithms to Generate Designs of Potency Experiments that Use Far Fewer Animals	NIH/NCI; \$356,483
Pearl McElfish, PhD; UAMS, COM and COPH	Healthy Bodies, Healthy Souls	NIH/NIMHD; \$537,280
Grover Miller, PhD; UAMS, COM	Improving Pediatric Anticoagulant Therapy Through Metabolic Profiling of Patients	AHA; \$140,000
Mayumi Nakagawa, MD, PhD; UAMS, COM	Understanding and Enhancing T-Cell Responses to High Risk Human Papillomaviruses	NIH/NCI; \$3,456,341
Charles O'Brien, PhD; UAMS, COM	Center for Musculoskeletal Disease Research (CMDR)	NIH/NIGMS; \$11,308,771
Charles O'Brien, PhD; UAMS, COM	Osteocyte Control of Bone Remodeling	NIH/NIAMS; \$1,639,000
Sallie Sherrod Oliphant, MD; UAMS, COM	Magnetomyography of Levator Muscle Complex in Pregnancy and Postpartum: Adaptation, Injury, and Recovery Patterns	NIH/NICHHD; \$372,500
Alison Oliveto, PhD; UAMS, COM	Improving Treatment Outcomes for Prescription Opioid Dependence	NIH/NIDA; \$2,868,289
Prasad Padala; CAVHS, GRECC	Transcranial Magnetic Stimulation for Apathy in Mild Cognitive Impairment	VA Merit; \$1,098,000
Snehalata Pawar, PhD; UAMS, COM	Role of C/EBP Delta in Ionizing Radiation-Induced Sepsis	DOD/CDMRP; \$1,438,080
Paul L. Prather, MD; UAMS, COM	Synthetic Cannabinoid Toxicity: Role of Biotransformation	NIH/NIDA; \$2,729,025
James Raczynski, PhD; UAMS, COPH	Arkansas Prevention Research Center for Cardiovascular Risk (HTN) Reduction	CDC/NCCDPHP; \$3,750,000
James Raczynski, PhD; UAMS, COPH	Arkansas Center for Health Disparities (ARCHD): An NIMHD COE	NIH/NIMHD; \$7,107,340
Mark Smeltzer, PhD; UAMS, COM	Center for Microbial Pathogenesis and Host Inflammatory Responses	NIH/NIGMS; \$10,769,230
Taren Swindle, PhD; UAMS, COM	Developing and Testing Implementation Strategies for Evidence-Based Obesity Prevention in Childcare	NIH/NIDDK; \$428,679
Judith Weber, PhD; ACRI, COM	Center for Childhood Obesity Prevention	NIH/NIGMS; \$9,411,401
Pam Williams, RN, PhD; UAMS, CON	Dissemination and Implementation in Rare Cancer Community: PCORI Pilot Work Shared Across Rare Disease Populations	PCORI; \$50,000
Vladimir Zharov, PhD; UAMS, COM	In vivo real time detection of circulating melanoma cells	NIH/NCI; \$1,681,210
Daohong Zhou, MD; UAMS, COP	Cancer Therapy-induced Long-term bone marrow injury	NIH/NCI; \$1,481,507
<b>TOTAL</b>		<b>\$130,090,420</b>

®Total award amounts are presented. Abbreviations. COP, College of Pharmacy; COPH, College of Public Health; COM, College of Medicine; GRECC, Geriatric Research, Education, and Clinical Center

### 1.0 Institutional Resources

**1.1 Center for Health Literacy (CHL).** UAMS' CHL aims to improve health literacy. It started in 2012 as a program at the UAMS Center for Rural Health and became a center two years later. The CHL provides plain language services to make health information easy to understand. The office provides training to health professionals on health literacy best practices and studies health literacy and how it affects health. The CHL is funded by UAMS, National Institutes of Health, and the National Institute of Diabetes and Digestive and Kidney Diseases.

**1.2 Department of Biomedical Informatics.** See Facilities and Other Resources – Network Capacity.

**1.3 Department of Biostatistics.** The UAMS Department of Biostatistics is jointly administered by the College of Medicine and the College of Public Health (COPH). While administered by two colleges, the unit functions as one department with Dr. Paula K. Roberson serving as the Chair. The Department’s eleven primary faculty members and seven experienced research staff members (MS degrees in biostatistics/statistics) collaborate with investigators and research programs in all the UAMS Colleges, as well as the Central Arkansas Veteran’s Healthcare System. The department assists investigators with varied research interests, including cancer, neurosciences, pediatrics, psychiatry, aging, ophthalmology, pharmacology, cardiology, and all public health disciplines. Broad specialized statistical expertise exists among the faculty, including clinical trials design and analysis, Bayesian methods, missing data, longitudinal models, structural equation and multilevel modeling, propensity scoring, etc. Faculty members in Biostatistics serve on both the IRB (Selig) and the IACUC (Landes). The Department offers coursework leading to a Biostatistics concentration in the COPH Masters of Public Health (MPH) program. Courses offered by the Department are also taken as requirements or electives in multiple other programs. Offices are located on the 3rd floor of the Rahn Interprofessional Education Building in Suite 3215. The department faculty membership is augmented by a secondary appointment for a professor in Family and Preventive Medicine and by 3 adjunct appointments (1 each from University of Arkansas at Little Rock, National Center for Toxicological Research (retired) and Arkansas Department of Health (retired)). These individuals are available to serve on student committees and provide lectures in departmental classes as requested.

Resource	Section
<b>Institutional Resources</b>	<b>1.0</b>
Center for Health Literacy	1.1
Department of Biomedical Informatics	1.2
Department of Biostatistics	1.3
Department of Epidemiology	1.4
Institutional Review Board	1.5
Office of Educational Development	1.6
Office of Research Compliance	1.7
Office of Research Regulatory Affairs	1.8
TRI’s Video Library	1.9
<b>Computer</b>	<b>2.0</b>
<b>Office</b>	<b>3.0</b>

**1.4 Department of Epidemiology.** The focus of the UAMS COPH Department of Epidemiology is to contribute to improving the health and promoting the well-being of Arkansans and the global community, by applying the principles and practices of epidemiology in education, research, and service. The department currently includes a diverse and strong group of faculty members (10 primary, 7 secondary, and 9 adjunct) actively involved in research, teaching, and public health practice. Eight of the adjunct faculty members are employees of the Arkansas Department of Health, with which the Department of Epidemiology (as well as the COPH overall) has strong ties. While faculty activities in research and practice address a broad range of public health issues, the department has particular strength in the areas of chronic disease, infectious disease, cancer, molecular epidemiology, and childhood obesity. The department offers 2 degree programs, including a Master of Public Health with Concentration in Epidemiology and a PhD in Epidemiology.

**1.5 Institutional Review Board.** See Facilities and Other Resources – Overall.

**1.6 Office of Educational Development (OED).** See Facilities and Other Resources – Administrative Core.

**1.7 Office of Research Compliance (ORC).** See Facilities and Other Resources – Overall. **Table 3** shows examples of regulatory training opportunities offered through the Certified Research Specialist Program in 2017. 167 faculty and staff attended these events in 2017.

**1.8 Office of Research Regulatory Affairs (ORRA).** The UAMS ORRA provides assistance with regulatory submissions to the FDA (IND, IDE), quality assurance (GLP, GMP, GTP), clinical trial monitoring, and clinical trial registration (ClinicalTrials.gov). The office offers complete regulatory support for investigator-initiated drug or device studies. UAMS acts as the sponsor for all INDs and IDEs filed on behalf of investigators. ORRA, in concert with other UAMS regulatory compliance departments, ensures that IND and IDE studies remain in compliance as required under Title 21 of the Code of Federal Regulations. Monitors (4) are responsible for monitoring all UAMS-sponsored investigator-

<b>Face-to-Face</b>
Advanced Research Ethics
Adverse Event & Serious Adverse Event Management
C3PR - Common Questions
Developing a Research Protocol
Developing Standard Operating Procedures
Documentation of Informed Consent Discussion
Essentials of Quality Human Subject Research Bootcamp
Genetic and Genomic Research
Informed Consent Process Workshop
Practical Aspects of Study Design and Sample Size
Privacy and Confidentiality in Human Subjects Research
Protocol Deviations
Reportable New Information and the IRB
Research Misconduct
<b>Webinars</b>
Working with Industry
Cracking the Code for Clinical Trial Recruitment
Cyber Threats and Cyber Security - Are You Prepared?
FDA Oversight and IRB Review of In-Vitro Diagnostics
Using FDA Warning Letters to Stay Audit Ready
Laboratory-Developed Tests
Reporting Failed Trial Data: New Rules for ClinicalTrials.gov

initiated IND/IDE research studies. In addition to conducting periodic monitoring visits throughout the course of a study, they provide assistance with the preparation of essential study documents (regulatory binders, source documentation, case report forms, etc.), site initiation visits, closeout visits, and audit preparations. The quality assurance function maintains a quality program that ensures UAMS compliance with all federal, state, and local regulations governing the manufacture of human cells, tissues, and cellular and tissue-based products.

**1.9 TRI’s Video Library.** Located on TRI’s website, the video library provides convenient access to recorded lectures and webinars in the areas of biomedical informatics, biostatistics, entrepreneurship, grants, implementation science, regulatory compliance, and research conduct. Recorded webinars from the CTSA Trial Innovation Network are also included. TRI continually adds to the site as new training becomes available. **Table 4** shows examples of specific topics included in the library.

<b>Table 4. Examples of Topics Found in Video Library</b>
Bioinformatics for Genomic and Proteomics
Data Warehousing
Data Fusion and Visual Analytics
Medical Data & Text Mining
How Low Power and Poor Quality Bias the Research Record
Billing for Recruitment Services
Measuring the Impact of Recruitment Efforts
Innovating in Healthcare: Idea Formation to Revenue Generation
Leveraging Small Research Awards Into Larger Funding
Budgeting for Grant Applications
The Changing Regulatory Landscape and Genetic Research
Ethics & Social Justice in Health Research Involving Vulnerable Adolescents
Problem Solving in Public Health Informatics
Data Collection
Research Ethics

**2.0 Computer**

Statistical software used in the Department of Biostatistics includes SAS®, SPSS, R, NCSS, StatXact®, and LogXact® for data analysis; PASS and nQuery for power/sample size calculations; East 6.3® for clinical trial design and monitoring of adaptive, group sequential, and survival clinical trials; JMP® Genomics; Statistical Analysis of Microarrays (SAM); and PLINK.

**3.0 Office**

All faculty and staff have office space furnished with a desktop and/or laptop computer(s) owned and maintained by UAMS and/or ACH/ACRI. Additionally, all faculty and staff have access to teleconference phones, printing services, meeting space, and conference rooms.

## FACILITIES AND OTHER RESOURCES – HUB RESEARCH CAPACITY

Hub Research Capacity is enhanced by unique facilities and resources that support research in special populations (Table 1). Figure 1 shows the current distribution of research participants in Epic throughout the state.

Table 1. Hub Research Capacity Facilities and Resources	
Resource	Section
<b>University of Arkansas for Medical Sciences</b>	<b>1.0</b>
Arkansas Center for Health Disparities Research	1.1
Arkansas Prevention Research Center	1.2
Center for Distance Health	1.3
Center for Diversity Affairs	1.4
Center for Health Literacy	1.5
Clinical Trials Innovation Unit	1.6
Data Coordinating and Operations Center	1.7
Donald W. Reynolds Institute on Aging	1.8
Faith-Academic Initiatives for Transforming Health	1.9
Office of Community Health and Research	1.10
Transform Health Arkansas	1.11
Winthrop P. Rockefeller Cancer Institute Biorepository	1.12
<b>Arkansas Children’s Hospital/Arkansas Children’s Research Institute</b>	<b>2.0</b>
Arkansas Center for Birth Defects and Prevention	2.1
Arkansas Children’s Nutrition Center	2.2
Arkansas Children’s Research Institute (ACRI) Biorepository	2.3
Pediatric Clinical Research Unit	2.4

### 1.0 University of Arkansas for Medical Sciences (UAMS)

#### 1.1 Arkansas Center for Health Disparities Research.

See Facilities and Other Resources – Community & Collaboration.

**1.2 Arkansas Prevention Research Center.** See Facilities and Other Resources – Community & Collaboration.

**1.3 Center for Distance Health (CDH).** See Facilities and Other Resources – Overall.

**1.4 Center for Diversity Affairs.** See Facilities and Other Resources – Overall.

**1.5 Center for Health Literacy.** See Facilities and Other Resources – Overall.

**1.6 Clinical Trials Innovation Unit.** See Facilities and Other Resources – Overall.

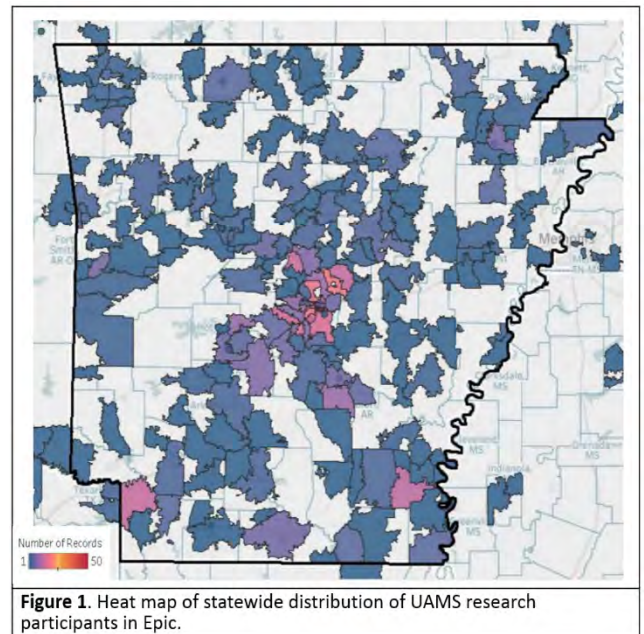
**1.7 Data Coordinating and Operations Center (DCOC).** See Facilities and Other Resources – Administrative Core.

**1.8 Donald W. Reynolds Institute on Aging.** See Facilities and Other Resources – Overall.

**1.9 Faith-Academic Initiatives for Transforming Health (FAITH).** See Facilities and Other Resources – Community & Collaboration.

**1.10 Office of Community Health and Research.** See Facilities and Other Resources – Overall.

**1.11 Transform Health Arkansas.** Transform Health Arkansas is an initiative of the Arkansas Transgender Equality Coalition (ArTEC) implemented in partnership with the Office of Community Based Public Health in the UAMS College of Public Health and many other stakeholders focused on improving the health and healthcare of trans Arkansans. Through engagement funding from the Patient Centered Outcomes Research Institute, this project is identifying the issues of highest priority among trans Arkansans and working together to address them through research, education, and improved quality and access to care.



**1.12 Winthrop P. Rockefeller Cancer Institute (CI) Biorepository.** The CI has a biorepository of 8666 diseased and 3331 non-diseased tissues and samples available for research. The samples are tracked using caTissue within AR-CRIS. See Facilities and Other Resources – Overall for detailed information on the CI.

Sample Description	# Samples
Saliva	150
Plasma	322
DNA (formed elements or whole blood)	251
Serum	231
<b>Totals</b>	
<b>Stored saliva samples and blood product aliquots</b>	<b>954</b>
<b>Blood product aliquots</b>	<b>804</b>
<b>Blood participants</b>	<b>102</b>
<b>Participants</b>	<b>161</b>

Sample Description	# Samples
Plasma	55
Formed elements of blood	29
Whole blood	26
<b>Totals</b>	
<b>Aliquots</b>	<b>110</b>
<b>Participant primary samples</b>	<b>28</b>
<b>Participants</b>	<b>38</b>

**2.0 Arkansas Children’s Hospital (ACH)/Arkansas Children’s Research Institute (ACRI)**

**2.1 Arkansas Center for Birth Defects and Prevention.** The Arkansas Center for Birth Defects Research and Prevention (Arkansas Center) was established in 1997 and is one of eight Centers for Disease

Control and Prevention (CDC) Centers for Birth Defects Research and Prevention (CBDRP). The Arkansas Center is a collaborative effort of the faculty and personnel from the Arkansas Reproductive Health Monitoring System (ARHMS), University of Arkansas for Medical Sciences (UAMS), Arkansas Children's Hospital (ACH), Arkansas Children's Research Institute (ACRI), and the Arkansas Department of Health. Current research projects include the National Birth Defects Prevention Study, Genetic and Metabolic Determinants of Congenital Heart Defect Risk, Maternal Smoking: DNA Repair Polymorphisms and the Risk of Septal Heart Defects, and the Neural Tube Defect Prevention

DNA Repair Polymorphisms and the Risk of Septal Heart Defects, and the Neural Tube Defect Prevention

Program. The Genomics Laboratory located at ACRI plays a key role in all major studies at the Arkansas Center for Birth Defects Research and Prevention. Work in the laboratory is aimed at identifying associations between the risk of congenital heart defects (CHD) and previously identified polymorphisms in genes that affect oxidative stress, as well as folate and homocysteine metabolism. The Arkansas Children's Hospital Research Institute and the Pamela D. Stephens Endowed Chair in Birth Defects provided funds to purchase the laboratory's Illumina Beadstation 500G Genotyping Station and a Dell Precision Workstation 670 Intel Xenon to enhance genotyping and analytical capabilities of the Hobbs Birth Defects Genomics Laboratory. This state-of-the-art facility and its talented faculty and staff comprise an invaluable asset, reinforcing the competitive position of the Center for Birth Defects Research and Prevention's continued acquisition of long-term research funding.

**2.2 Arkansas Children's Nutrition Center.** See Facilities and Other Resources – Overall.

**2.3 Arkansas Children's Research Institute (ACRI) Biorepository.** ACRI has developed an institutional biorepository as a core resource for investigators working at Arkansas Children's. This facility is located on the second floor of ACRI and is comprised of Room R2108 (freezer bank, 693 ft<sup>2</sup>) and R2030 (sample processing, 497 ft<sup>2</sup>). The freezer bank consists of eight (8), upright -80°C units, one (1) -20°C freezer, one (1) 4°C laboratory refrigerator and one (1) -70°C chest freezer used as backup space. Each piece of equipment in R2108 is connected to emergency power which is sourced from a separate generation facility on the Arkansas Children's campus. As well, all freezers are continuously monitored and in the case of equipment failure, both the Repository and Facility Managers receive real time notifications. The sample processing facility (R2030)

<b>Sample Description</b>	<b># Samples</b>
DNA (original)	16,803
DNA (WGA)	29
DNA (original) – Cytobrush	1
DNA (Bisulfite converted) – Unspecified	3
DNA – Human adult heart	19
DNA – Human infant heart	15
CA Local DNA (Buccal)	748
Blood (whole) - Lavender top tube (EDTA)	742
Blood (whole) - Green top tube (Heparin)	9
Blood (whole) - Yellow top tube (ACD)	715
Blood (whole) - Dk Blue top tube (EDTA)	3
Blood (whole) - Lt Blue top tube (Citrate)	193
Blood (whole) - 1.2mL cryovial tubes	100
Blood (whole) - lavender top 3.0mL	48
Blood (plasma) - Lt Blue top tube (Citrate)	867
Blood (plasma) - Dk Blue top tube (EDTA)	89
Blood (plasma) – Unspecified	675
Blood (plasma) - Green top tube (Heparin)	189
Blood (plasma) - Lavender top tube (EDTA)	3865
Blood (plasma) - Yellow top tube (ACD)	1
Blood (lymphocytes) - Dk Blue top tube (EDTA)	210
Blood (lymphocytes) - Green top tube (Heparin)	2
Blood (lymphocytes) - Lavender top tube (EDTA)	215
Blood (packed RBC) - Green top tube (Heparin)	81
Blood (packed RBC) - Lavender top tube (EDTA)	1925
Blood (packed RBC) - Lt Blue top tube (Citrate)	248
Saliva	804
Tissue	65
Tissue – Foreskin	1517
Tissue – Thymus	203
Tissue – Heart	73
Urine	564
Newborn infant bloodspot	783
Unknown	52,347
<b>Totals</b>	
<b>Available samples</b>	<b>84,151</b>
<b>Participants</b>	<b>34,996</b>

contains a laminar flow hood, a refrigerated (4°C) centrifuge (Sorvall ST 16R) and a micro-centrifuge (Accuspin Micro 17), in addition to all other small equipment (e.g., Eppendorf micropipettes) required for safe sample handling and preparation.

The ACRI Biorepository has 2 dedicated fulltime positions approved, an Administrative Specialist and a Technical Specialist. All samples deposited for general use are tracked using a custom built database program. The repository has an existing governance structure managed by the Sample Repository Executive Committee. This mechanism provides for managing requests to utilize biospecimens for IRB-approved research and chain-of-custody regarding sample use and disposition. Two prospective protocols have been operational, the *Transgenerational Studies in Infant and Child Health* protocol (**Table 2**), operational from 2014-2018, and the *Arkansas Children's Research Institute Sample Repository* protocol (**Table 3**), which was initiated in 2018. Additionally, the repository houses samples from the Arkansas Center for Birth Defects and Prevention (**Table 4**).

**2.4 Pediatric Clinical Research Unit.**

See Facilities and Other Resources – Overall.

## FACILITIES AND OTHER RESOURCES – NETWORK CAPACITY

The Translational Research Institute (TRI) has access to broad institutional resources to facilitate recruitment and the performance of clinical trials initiated by the Trial Innovation Network (TIN) or local researchers (Tables 1, 2).

Table 1. Network Capacity Facilities and Resources	
Resource	Section
<b>University of Arkansas for Medical Sciences</b>	<b>1.0</b>
ARresearch.org	1.1
Center for Health Literacy	1.2
Clinical Trials Innovation Unit	1.3
Community Advisory Boards and Community Review Boards	1.4
Department of Biomedical Informatics	1.5
Institutional Review Board	1.6
Office of Communications & Marketing	1.7
Office of Translation and Interpreting Services	1.8
<b>Arkansas Children’s Hospital/Arkansas Children’s Research Institute</b>	<b>2.0</b>
ACRI Research Participant Recruiting Support Services	2.1
ACRI Experimental Therapeutics Program	2.2
Human Subjects Protection and Regulatory Compliance Team	2.3
Institutional Review Board	2.4
ACRI Pediatric Clinical Research Unit	2.5
ACRI Research Coordinator Pool	2.6
Research Administrative Support	2.7
<b>Computer</b>	<b>3.0</b>
Arkansas Clinical Data Repository	3.1
<b>Office</b>	<b>4.0</b>
<b>Other</b>	<b>5.0</b>
ARresearch Equipment	5.1

### 1.0 University of Arkansas for Medical Sciences (UAMS)

#### 1.1. ARresearch.org.

ARresearch.org (Figure 1) is TRI’s volunteer registry that provides researchers with access to more than 4,500 potential research participants located primarily in Arkansas. The registry database is available to all UAMS faculty, including those at Arkansas Children’s Hospital and its Research Institute and the Central Arkansas Veterans Healthcare System. The online, or paper, registration form contains demographic and contact information and registrant research interests (e.g., health volunteer or specific diseases of interest). All data is maintained in a secure data set within AR-CRIS. Researchers interested in utilizing the registry may submit a request through the TRI Services Portal or during CLARA submission of research protocols. Table 3 demonstrates the depth of community stakeholder support for ARresearch.org. The registry’s growth (currently ~4,500) has been sustained with low-cost promotions and outreach to a diverse cross-section of Arkansans. Email, videos, posters, flyers, table tents and brochures are used to reach internal and external audiences. Branded giveaways such as pens, stickers,

Table 2. Examples of Institutional Support for ARresearch.org	
Resource	Support
Center for Health Literacy	Plain language consultation on website
Center for Pacific Islander Health	Marshallese translations of materials
College of Nursing	Venues for promotion, Spanish-speaking faculty for Hispanic audiences, Spanish translation of materials
Information Technology Department	Technical development, data management and surveys
Office of the Chancellor	Internal video promotions and supplemental funding
Office of Communications & Marketing	Art, graphics, website development, press releases, advertising
Office of Translation & Interpreting Services	Spanish translation of materials
TRI Community Advisory Board	Feedback on website development, name of registry and other promotional materials
UAMS Patient Advisory Boards	Feedback on website development and registry name



Figure 1. ARresearch.org Homepage



fans, bags and hand sanitizer are part of the ARresearch booth display.

**1.2 Center for Health Literacy (CHL).** See Facilities and Other Resources – Overall.

**1.3 Clinical Trials Innovation Unit.** See Facilities and Other Resources – Overall.

**1.4 Community Advisory Boards (CABs).** In addition to TRI’s CAB, UAMS has 11 Patient and Family Advisory Councils, including for its hospital, family medicine, neighborhood clinic, longevity clinic, Psychiatric Research Institute, and women’s health. The groups are available to provide advice and feedback to the recruitment team on matters such as website and advertisement content, including images, colors, and diversity.

**1.5 Department of Biomedical Informatics (DBMI).** See Facilities and Other Resources – Informatics.

**1.6 Institutional Review Board.** See Facilities and Other Resources – Overall.

**1.7 Office of Communications & Marketing.** The UAMS Office and Communications & Marketing has 45 employees (including a vice chancellor, marketing director, communications director, media manager, social media manager, internal communications manager, creative services manager, videographers, photographers, web developers and artists). In these roles, they assist and collaborate with TRI in pitching stories to media, coordination of free and paid traditional media and social media advertising, website development and maintenance, and the production of most promotional materials. TRI’s communications manager, David Robinson, remains

affiliated with the office, allowing for seamless collaboration. The office was instrumental in the successful launch of ARresearch.org in April 2016 with the facilitation of two central Arkansas television stations and one radio station airing stories about the registry. They subsequently amplified the stories through UAMS and TRI social media channels, which helped drive registry signups to more than 1,100 within the first three months.

Another significant accomplishment supported by the Office of Communications & Marketing is an illustrated video that promotes ARresearch.org, which is posted on the site and has been used as a television advertisement/public service announcement. Since fall 2016, the advertisement has aired on television and

<b>Event/# Attendees</b>	<b>Target Audience</b>	<b>Setting</b>	<b># TRI Staff</b>
College of Nursing Student Research Day/400	Diverse	Urban	2
Hispanic Women's Organization of Arkansas Cinco de Mayo Festival/10,000	Hispanics	Urban	2
UAMS Nursing Week Fair/100	Diverse	Urban	2
UAMS East Women's Health Conference/50	Diverse	Rural	1
Cancer Moon Shot Summit/100	Diverse	Urban	2
Our Community Our Health/50	Diverse	Urban	1
Institute on Aging/100	Older Adults	Urban	1
AR Minority Health Commission Community Forum & Health Fair/100	Minorities	Rural	2
Advanced Nurse Practitioner Meeting/100	Diverse	Urban	1
UAMS Cafeteria/100	Diverse	Urban	1
Arkansas Travelers Baseball Games/2000	Diverse	Urban	4
Outpatient Center/50	Diverse	Urban	3
Cancer Institute/100	Diverse	Urban	1
Guatemalan Consulate/300	Hispanics	Urban	1
UAMS Student Resource Fair/100	Diverse	Urban	2
Arkansas Senior Expo/1500	Older Adults	Urban	2
Recovery Jam/100	Diverse	Urban	1
Arkansas State Fair/450,000	Diverse	Urban	9
Equal Care for Equal Lives/50	LGBTQ	Urban	1
Saline County Big Top Health & Wellness Fair/100	Diverse	Rural	2
Arkansas Children's Hospital Benefits Fair/100	Diverse	Urban	1
UAMS Benefits Fair/500	Diverse	Urban	2
UAMS Shorey Building/150	Diverse	Urban	1
UAMS Outpatient Center/100	Diverse	Urban	1
University of AR at Little Rock Basketball Game/400	Diverse	Urban	3
Rare Disease Day at State Capitol/100	Diverse	Urban	2
National Minority Health Month Fair/120	Minorities	Urban	1
Arkansas Blood Institute/50	Diverse	Urban	1
Pulaski Technical College Health Fair/100	Diverse	Urban	1
Community-Campus Partnerships Conference on Health Disparities/200	Minorities	Urban	2
Arkansas Nursing Research Conference/100	Diverse	Urban	2
Tour de Rock/200	Diverse	Urban	2
Arkansas Community Health Workers Association/50	Diverse	Urban	1
Science Café/100	Diverse	Urban	1
Ask Me About My Research/50	Diverse	Urban	1
Hot Springs Community Resource Fair	Diverse	Urban	2
TRI Open House	Diverse	Urban	2
Faith Network Summit	Diverse	Urban	2
UAMS Biometric Screening/40	Diverse	Urban	1
UAMS ASG Student Resource Fair	Diverse	Urban	1
Hispanic's Women Organization Conference/200	Hispanics	Urban	1
Central Arkansas Pride Festival/1000	LGBTQ	Urban	1
Showcase of Medical Discoveries	Diverse	Urban	1
University of AR at Pine Bluff Football Game/5000	Minorities	Urban	2
High School Playoff Football Game/5000	Diverse	Urban	2
Little Rock Marathon Expo/15,000	Diverse	Urban	4
Education Can Make a Healthier You-Health Fair/100	Diverse	Urban	1

radio stations across Arkansas at no cost to TRI. This unique resource is made possible by UAMS' membership contract (\$75,000 annually) with the Arkansas Broadcasters Association. Prior to the ARresearch ad, the Association aired a TRI/Communications & Marketing-produced advertisement for ResearchMatch.org.

**1.8 Office of Translation and Interpreting Services.** The UAMS Office of Translation and Interpreting Services provides services to translate patient education materials and hospital forms and also provides one-on-one interpreting services to communicate with non-English speaking or limited English proficiency patients. The office is staffed by four interpreters available Monday through Friday from 7:00 a.m. to 11:00 p.m. The services are for Spanish only. Upon request, Office Supervisor Mariella Hernandez has assisted TRI with translation of materials.

## **2.0 Arkansas Children's Hospital (ACH)/Arkansas Children's Research Institute (ACRI)**

**2.1 ACRI Research Participant Recruiting Support Services.** See Facilities and Other Resources – Overall.

**2.2 ACRI Experimental Therapeutics Program.** See Facilities and Other Resources – Overall.

**2.3 Human Subjects Protection and Regulatory Compliance Team.** See Facilities and Other Resources – Overall.

**2.4 Institutional Review Board (IRB).** The UAMS IRB serves as the local IRB for ACRI.

**2.5 ACRI Pediatric Clinical Research Unit (PCRU).** See Facilities and Other Resources – Overall.

**2.6 ACRI Research Coordinator Pool.** See Facilities and Other Resources – Overall.

**2.7 Research Administrative Support.** See Facilities and Other Resources – Overall.

## **3.0 Computer**

**3.1 Arkansas Clinical Data Repository (AR-CDR).** See Resources and Other Facilities – Informatics.

## **4.0 Office**

All faculty and staff have office space furnished with a desktop and/or laptop computer(s) owned and maintained by UAMS and/or ACH/ACRI. Additionally, all faculty and staff have access to teleconference phones, printing services, meeting space, and conference rooms.

## **5.0 Other**

**5.1 ARresearch Equipment.** Equipment purchased and dedicated for use for participant recruitment efforts includes:

- 4 iPads to facilitate ARresearch registrations at recruiting events.
- 2 WiFi hotspot devices for offsite connection to online registry.
- 1 large ARresearch banner displayed at all recruiting events.
- 2 large table coverings with the UAMS/TRI logo.
- 3 ARresearch promotional posters and easels.
- UAMS/TRI- and ARresearch-branded shirts for recruiters.

## FACILITIES AND OTHER RESOURCES – OPTIONAL MODULE (IMPLEMENTATION SCIENCE)

The Implementation Science (IS) Optional Module is the product of an ongoing collaboration between the Translational Research Institute (TRI) and the University of Arkansas for Medical Sciences (UAMS) Center for Implementation Research. With the continued funding of the TRI and specifically of the IS Optional Module, this collaboration will grow into one of the most innovative well-resourced implementation research groups in the nation. TRI has access to broad resources to support this function (**Table 1**).

Table 1. Implementation Science Facilities and Resources	
Resource	Section
<b>Clinical/Academic Resources</b>	<b>1.0</b>
Center for Implementation Research	1.1
Division of Health Services Research	1.2
HSR&D Center of Innovation	1.3
South Central (VISN 16) Mental Illness Research, Education and Clinical Center	1.4
Team-Based Behavioral Health Quality Enhancement Research Initiative	1.5
Washington University CTSA Dissemination and Implementation Research Core	1.6
<b>Partners in the Rural Implementation Research Network</b>	<b>2.0</b>
Arkansas Children’s Care Network	2.1
Community Health Centers of Arkansas	2.2
UAMS Regional Programs Network	2.3

### 1.0 Clinical/Academic Resources

Below we describe the resources from which will draw to support the proposed IS Module. Some entities are existing scientific and educational resources, others are collaborative partners from which we are drawing participating clinics for the proposed **Rural Implementation Research Network (NIRN; Aim 3)**. See also enclosed letters of support from these partners.

**1.1 The Center for Implementation Research (CIR)** was created as a joint entity between the Colleges of Pharmacy (COP) and Medicine (COM) at UAMS in 2014. The center is physically located in the COP but has strong collaborations across the UAMS campus. The work of the Center has expanded into the College of Public Health and the College of Nursing as well as clinical services of the hospital. The Center's goals are to 1) Develop and test strategies to facilitate uptake and sustained use of evidence-based practices across a wide range of healthcare contexts, 2) Support integration of evidence-based practices in UAMS Programs and community, 3) Evaluate the effectiveness of promising practices while preparing for their future implementation by simultaneously documenting barriers and facilitators to implementation, and 4) Nurture the development of investigators, residents, and students interested in implementation and implementation science.



Center investigators are striving for a nationally recognized, extramurally funded program with a dual focus on developing generalizable knowledge from research and conducting demonstration projects in high priority implementation areas. The Center is grounded in the principles of community-based participatory research, with "community" being broadly defined. Projects are developed and enacted in partnership with multiple stakeholders-- e.g., patients, healthcare practitioners, healthcare managers, payers, and/or policy makers. The mix of partners vary by scope and needs of each project.

The Center has a strong focus on education, training, and mentoring. The Center's Director, Dr. Curran, currently teaches a graduate-level course in implementation and implementation research (COM Graduate school/COPH PhD Program in Health Services Research). Students and residents interested in quality improvement/ implementation are supported by Center faculty in pursuing projects. Junior faculty in the Center receive close mentoring from the Director, and Center faculty work collaboratively, across disciplines and Colleges, on developing, writing, and submitting projects for funding. **Table 2** represents recent/current funding of CIR core/affiliated investigators and grants supported by CIR mentoring currently pending/under review.

<b>Table 2: Funded Grants Supported by CIR</b>					
<b>Title</b>	<b>PI</b>	<b>UAMS College</b>	<b>Mechanism</b>	<b>Agency</b>	<b>Funded Amount</b>
Reducing Depressive Symptoms Among Rural African Americans: REJOICE	Haynes, Yeary	COPH	U01	NIMHD	\$2,100,000
Developing and Testing Implementation Strategies for Evidence-Based Obesity Prevention in Childcare	Swindle	COM	K01	NIDDK	\$500,000
Risk Stratified Enhancements To Clinical Care: Targeting Care For Patients Identified Through Predictive Modeling As Being At High Risk For Suicide	Landes	VA	SDR	VA	\$1,228,131
Prescribers, Pharmacists, & the Opioid Dilemma: a Multi-Site Qualitative Study	Edlund (RTI) Curran (UAMS)	COP	R01	NIDA	\$1,324,430
Partnership for Implementation of Evidence-Based Practices in Rural Primary Care	Curran	COP	R24	NIMH	\$2,498,000
Testing Implementation Strategies to Support Community Pharmacist-Initiated Prescription and Distribution of Naloxone to Reduce Overdose by Opioids	Teeter	COP	CTSA Pilot	NIGMS	\$47,263
Implementation of clinical pharmacy services delivered via telehealth to Federally Qualified Healthcare Centers	Thomas	COP	CTSA Pilot	NIGMS	\$50,000
An Implementation Strategy to Increase Appropriate Referrals for Genetic Counseling and Testing Among Patients at High Risk for Hereditary Cancer Syndromes	Zorn	COM	CTSA Pilot	NIGMS	\$49,924
QUERI Field Program in Team-Based Behavioral Health Care Implementation	Kirchner (UAMS) Bauer (Harvard)	COM		VA	\$4,631,455
<b>Submitted/pending UAMS grants supported by CIR</b>					
<b>Title</b>	<b>PI</b>	<b>UAMS College</b>	<b>Mechanism</b>	<b>Agency</b>	
Reducing and Understanding HIV Disparities among Impoverished Female Survivors of Violence Living in Domestic Violence Shelters	Montgomery	COPH	R01	NIMHD	
Supporting Implementation of HPV Vaccines in Rural and Urban Primary Care	Montgomery	COPH	K07	NCI	
Towards Implementation and Sustainability of an Infant Safe Sleep Intervention	Nabaweesi	COM/ACH	K01	AHRQ	
Smartphone Safe Sleep	Nabaweesi	COM/ACH	Supplement	NIMHD	
Developing Tailored Safe Sleep Interventions for Rural Underserved Communities	Nabaweesi	COM/ACH		American SIDS Institute	
Uptake of Four-Step Plan to Increase CRC Screening Rates in FQHC Settings	Preston	COM	K01	NIMHD	
Leveraging Implementation Science to Increase Access to Trauma Treatment for Incarcerated Drug Users	Zielinski	COM	K23	NIDA	
The Effectiveness of Family Model of Diabetes Self-Management Education among Marshallese with Type 2 Diabetes in Faith-Based Organizations	McElfish	COM	R01	NIDDK	
Transdisciplinary Collaborative Centers for Health Disparities Research	McElfish	COM	R01	NIMHD	
Comparing Family DSME and Standard DSME among Diverse Populations	McElfish	COM/CON	R01	NINR	

Evaluating Family Diabetes Self-Management Education (Family-DSME) as an Alternative Model of Care: Benefits to Patients and their Family Members compared to Standard DSME	McElfish	COM	R01	PCORI
De-implementation of Detrimental Feeding Practices in Childcare	Swindle	COM	R03	NIDDK
Building Partnerships with First Responders to Explore Strategies to Improve Delivery and Access of Mental Health Services	Jones	CON	R21	NIMH
Improving HPV Vaccination using Implementation Strategies in Community Pharmacies	Teeter, Curran	COP	R21	NCI
Influences upon the decision to adopt office-based buprenorphine treatment in rural settings: A qualitative study	Drummond, Zaller	COM/COPH	R21	NIDA
Developing Implementation Strategies to Increase Pre-Exposure Prophylaxis (PrEP) Delivery in Primary Care and Reduce Racial HIV Disparities in the Southern U.S.	Woodward	COM	R21	NIMH
CARED: The CARing Emergency Department Contacts Study	Landes	COM	R34	NIMH

**1.2 Division of Health Services Research (DHSR).** The UAMS DHSR in the COM, Department of Psychiatry, focuses on health services research for mental health and illness, with an emphasis on drug use disorders. DHSR's successful research program includes 18 faculty (*including CIR core faculty Drs. Kirchner and Landes, and numerous affiliated faculty members*), and postdoctoral fellows, 41 research assistants/associates and programmers, and administrative staff. DHSR includes three distinct VA research centers (HSR&D Center of Innovation, Team-Based Behavioral Health QUERI, and the South Central MIRECC) all designed to be developmental centers stimulating further research in health services for mental health and substance use disorders. The Division has well established, collaborative relationships with many state organizations including the Arkansas Department of Health, the Arkansas Department of Human Services, the Division of Behavioral Health Services and Community Mental Health Centers, and the Arkansas National Guard. DHSR serves as a "pipeline" for IS research and researchers, in conjunction with the CIR. CIR core faculty Drs. Kirchner and Landes have primary academic appointments within DHSR, and they are able to draw upon DHSR resources to support their salaries and to support grant submissions, research assistant help, and IRB support as needed. DHSR also provides mentoring to junior faculty members who are either core or affiliated members of CIR (Landes, Woodward, Drummond).

DHSR is a part of the UAMS Psychiatric Research Institute (PRI), which consolidates the Department's clinicians, educators, and researchers into one facility. PRI is one of six designated Centers of Excellence on the UAMS campus. In addition to the 40 inpatient psychiatry beds and outpatient clinics, the PRI features cutting-edge research in the Fred and Louise Dierks Translational Research Laboratories, including the Center for Addiction Research and a medication-assisted treatment clinic that promotes more convenient and safe access for patients and guests, and innovative work studying the intricate brain functions of individuals addicted to various substances, including cocaine, tobacco, and alcohol. Some of PRI's specialty programs currently include the Chemical Dependency Outpatient Program, Neuropsychology Service, the Eating Disorders Clinic, the Disruptive Behavior Disorders Program, and the Developmental Disorders Program. PRI occupies 110,000 square feet of space in the heart of the UAMS campus. At the North Little Rock VA, the Division also occupies an additional 22,688 square feet, which houses the VA-funded HSR&D Center of Innovation, Behavioral Health Quality Enhancement Research Initiative (QUERI) Center, and the South Central Mental Illness Research, Education and Clinical Center (MIRECC).

**1.3 HSR&D Center of Innovation.** The HSR&D Center of Innovation (Richard Owen, MD, PI) is focused on developing and testing interventions that impact treatment for veterans with mental illnesses. Its focus is developing and testing interventions to improve care for patients with depression, dementia, schizophrenia, and substance use disorders. When interventions are found to be effective, investigators develop and test implementation strategies to facilitate their adoption in routine VA care. Current priority areas for research include collaborative care interventions for mental health in primary care settings, adherence to treatment, interventions for PTSD, and engaging OEF/OIF veterans with mental health needs. CIR core faculty members Kirchner and Landes are affiliated with this center as well, and this center support their VA IS grant

submissions. An additional CIR affiliate faculty member, Jacob Painter, PharmD, PhD, MBA, is affiliated with this center and has submitted a IS-focused large grant to the VA under Dr. Curran's mentorship.

**1.4 South Central (VISN 16) Mental Illness Research, Education and Clinical Center (MIRECC).** Operating in the largest rural VA network, the South Central (VISN 16) MIRECC (Mark Kunik, MD, MPH, Director) is a VA-funded multisite, regional center with a mission to improve access to evidence-based practices for rural and other underserved populations, especially returning war veterans, veterans experiencing natural disasters, and vulnerable elderly veterans. The MIRECC research pipeline includes observational, intervention, and implementation studies. Content areas for research include evaluating technologies to deliver care at a distance, tele-psychotherapy, partnering with communities to serve recently returning veterans, combat and disaster-related trauma, and family/caregiver education and support. The South Central MIRECC includes two fellowship programs in health services research, one based in Houston and a second based in Little Rock. Numerous MIRECC fellows have taken Dr. Curran's IS course, and currently one such fellow (Woodward) has been hired as an assistant professor in DHSR. Drs. Curran and Kirchner supported a recent R21 submission to NIMH for Woodward, which will be resubmitted in fall 2018. The MIRECC is another "pipeline" for IS researchers at UAMS. Dr. Curran also consults with this group for fellows and junior faculty members at the Houston VA and their affiliate Baylor College of Medicine.

**1.5 Team-Based Behavioral Health Quality Enhancement Research Initiative (QUERI).** A nation-wide center for focused on testing facilitation strategies for uptake of team-based care, the Team-Based Behavioral Health QUERI (JoAnn Kirchner, MD, and Mark Bauer, MD, PIs) is one of 15 QUERI centers nationwide focused on improving the health and care of Veterans by supporting the application of critical evidence into practice. Using common facilitation techniques and common measures, the Behavioral Health QUERI enhances and informs team-based care for Veterans with behavioral health conditions. Specifically, this program advances VA's knowledge of how team-based behavioral healthcare can be improved through the use of implementation facilitation strategies, with anticipated improvements in Veteran outcomes. Data are relevant to care within VA and VA/non-VA shared care, since team-based care for Veterans occurs beyond the bricks and mortar of the VA healthcare system—an issue of increasing importance in the era of the Veterans Choice Act. CIR Core faculty member Dr. Kirchner directs this center. Her experiences as director and her grant-supported work therein are values CIR assets that are manifest in CIR didactics (current and proposed) and in her mentoring at UAMS for IS projects. Dr. Kirchner's implementation facilitation intervention was born in the precursor center to the current QUERI center, and her current multi-day facilitation training program (and manual) will be adapted in the proposed IS Module into a highly innovative online training course.

**1.6 Washington University CTSA Dissemination and Implementation Research Core (DIRC).** The DIRC provides methodological expertise to advance translational research to inform and move efficacious health practices from clinical knowledge into routine, real-world use. The DIRC works with scientists to move forward scientific agenda and grant writing related to dissemination and implementation (D&I) of health care discoveries, and develops tools and methods for studying D&I. Sponsored by the CTSA at Washington University, DIRC offers a range of consultation and mentorship services for investigators, including a formal and extensive consultation service known as "WUNDIR" (Washington University Network for Dissemination and Implementation Research). The WUNDIR group was established in 2010. The group is a network of researchers with a common interest in dissemination and implementation science in a variety of different settings and sectors (e.g. mental health services, public health, acute care, emergency medicine, cancer, tobacco). Multiple hours of group consultation are offer to each project. The DIRC is directed by Enola Proctor, PhD, a leader in the field of since its inception. She is also the PI of the Implementation Research Institute (IRI), a 2-year training program in IS funded by NIH (NIMH and NIDA) and the VA. Drs. Curran and Kirchner with the UAMS CIR have provided mentoring and didactics to IRI since its inception and Dr. Kirchner is a core faculty member. The Associate Director of DIRC is Ross Brownson, PhD, another leader in IS for many years. He is the former Chair of the NIH D&I grant review study section. He is the PI and Director of a cancer-focus IS training program, Training in Dissemination and Implementation Research in Cancer (TIDIRC). In the proposed faculty sharing program in the IS module, CIR and D IRC faculty collaborate closely on didactics and mentoring of their respective trainees, building on current levels of collaboration. Faculty members from each institution will travel for face-to-face consultations and mock grant reviews yearly and provide additional consultation over the phone/televideo. We will also establish joint projects across the institutions.

## **2.0 Partners in the Rural Implementation Research Network**

**2.1 Arkansas Children's Care Network (ACCN)** is fundamentally transforming healthcare delivery for the children of Arkansas through a **Clinically Integrated Network (CIN)** comprised of health care professionals

who provide coordinated and accountable pediatric care supported by a sustainable financial model. This network will improve quality, access, patient/family experience, and affordability of health care while also increasing physician engagement and satisfaction. ACCN will be the nation's first statewide pediatric CIN, promoting collaboration among primary care and specialty providers who treat children across Arkansas. ACCN will enable its partners to work together in a clinically integrated manner, using common health protocols and pathways so that each child receives quality care at the most appropriate location. As this network has only been in existence since January of 2018, the IS Module is pleased to have such enthusiastic support for participation in the proposed **RIRN**. We are excited about the opportunity to add pediatrician clinics to the proposed network, a new context for CIR investigators.

**2.2 The Community Health Centers of Arkansas (CHCA Inc)** is a non-profit organization established in 1985 to expand access to affordable quality care in Arkansas, and to create a unified voice for Federally Qualified Community Health Centers (FQHCs) and the patients they serve. For more than 30 years, CHCA has received funding to provide training/technical assistance to FQHCs for improving care delivery. CHCA By-Laws reflect that it is governed by a Board of Directors, comprised of the Executive Directors from each member FQHC. CHCA's mission is to advocate for and facilitate the success of CHCs and promote access to health care in Arkansas. Their vision is to be an innovative leader, promoting improved health care outcomes and equal access to the highest quality health care for all Arkansans. CHCA serves 12 CHC organizations and their 100+ service locations across Arkansas. The services offered by CHCA help Arkansas CHCs provide effective and efficient care to their patients, further their goals of improving access to care and reducing health disparities; and improved health outcomes. CHCA has over the years successfully served as a conduit for new programs, projects and funding that supports greater access to comprehensive services for underserved populations throughout Arkansas. CHCA collaborates with local, state and federal partners, organizations and policy makers to positively influence changes to policies, regulations, and legislation aimed at strengthening the health centers' ability to provide affordable, accessible, comprehensive, quality health care services to the uninsured and underserved patient in Arkansas. CHCA, Inc. has partnered with Dr. Curran on a recently completed NIMH-funded R24 "Partnership for Implementation of Evidence-Based Practices in Rural Primary Care." That grant was built upon previously funded NIH grants focusing on individual mental health intervention studies facilitated by CHCA, Inc. and partnering FQHCs. CIR Core faculty member Dr. Thomas has a currently-funded TRI pilot grant with CHCA, Inc.-affiliated FQHCs to develop and pilot an implementation strategy to support the implementation of clinical pharmacy services by tele-video. This long-standing partnership will be expanded by the proposed **Rural Implementation Research Network** which seeks to replicate and extend the partnership model established in Dr. Curran's R24. While that grant focused on promoting mental health practices in PCMHs, the proposed **RIRN** will support implementation of a wide array of evidence-based practices across disease states and conditions.

**2.3 The UAMS Regional Programs Network** includes eight centers—six sites with existing primary-care clinics, and two educational sites with clinics under construction. Each center serves a multicounty area and a few centers have more than one clinical or administrative location within the region. These eight regional centers are housed in >230,000 square feet of clinical/education space, comprising a statewide network of more than 200 exam rooms, five clinical labs, five X-ray rooms, 13 procedure rooms, six libraries, 22 conference rooms, 125 administrative offices, approximately 450 computers/laptops, and about 30 interactive video or e-Link units. Regional Programs have successfully operated Family Medicine Residency Programs and Family Medicine Clinics for four decades, while developing, implementing, and/or evaluating numerous federal health care initiatives, research grants, and training grants. Each center determines the projects in which they choose to participate, using the UAMS central grants accounting and campus regulatory resources through standard negotiated indirect rates. Regional Programs has a statewide reach that includes a large general patient population with specific vulnerable populations and has unique infrastructure and affiliation with our academic medical center, which makes these centers ideal for numerous research projects with a variety of targeted patient populations. The IS Module is very happy to have UAMS Regional Programs as enthusiastic participants in the proposed **RIRN**. These clinics are already highly-interdisciplinary centers for clinical care and learning, and we look forward to working with them closely on advancing implementation targets of their explicit interest.