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The Right Niche

Informatics Track, First in U.S., Has Key CTSA Role

Amy Jones, M.S., often studies at a back table at Cheers in the Heights restaurant in Little Rock, where she also waitresses. Over the years she's come to know the regulars, who include UAMS physicians and researchers.

Amy Jones (left) chats with Meredith Zozus, Ph.D., before the start of a Clinical Research Informatics program class.

They've watched her grow up there, she said, and they have always encouraged her scholarship. Last summer when she mentioned her plans to apply for UAMS' new Clinical Research Informatics Certificate program, she got an enthusiastic response from a UAMS faculty physician based at Arkansas Children's.

"You need to run, not walk towards that opportunity," he told Jones.

The demand for clinical research informaticists is exploding, and UAMS last fall became the first in the United States to offer a full curriculum in clinical research informatics, with the certificate and master and doctorate degrees.

The degree program is offered by the Department of Biomedical Informatics in the College of Medicine with support by the UAMS Translational Research Institute (TRI).

Today Jones is part of the seven-student inaugural graduate certificate class.

"We're excited," said Meredith Zozus, Ph.D., who led development of the curriculum as associate professor and vice chair for academic programs at the Department of Biomedical Informatics in the College of Medicine. "It's a really big deal at UAMS, and it's an advance for TRI – our CTSA (Clinical and Translational Science Award) Program."

The NIH's National Center for Advancing Translational Sciences (NCATS) has tasked its 62 CTSAs with making the translational research cycle spin faster. CTSAs are also looking for ways to improve reproducibility of study findings, an issue that received negative publicity nationally in 2015.

Clinical research informaticists could play key roles on both counts. Graduates of the program will learn to design data collection and management processes for clinical studies. Their efforts are a large part of:

- Ensuring that data are of sufficient quality to support study conclusions
- Ensuring data are documented and archived properly so study findings are reproducible
- Integrating clinical research with ongoing clinical care
- Ensuring data quality control in compliance with federal regulations

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Message from Dr. James

Dear Colleagues,

When it comes to harnessing data, our mission at TRI aligns well with that of the Department of Biomedical Informatics (DBMI). With TRI support of some key initiatives, DBMI, led by Dr. Fred Prior, is helping move the needle in health improvement.

In this issue of the TRIbune, we highlight two fruitful DBMI/TRI partnerships with national significance.

The main story is about the Clinical Research Informatics degree track - the first degree program of its kind in the U.S. The program can help address several priorities for the NIH National Center for Advancing Translational Sciences (NCATS), such as reproducibility of study findings and integrating research with clinical care.

Our TRIbutary features an important national Clinical and Translational Science Awards Program (CTSA) workshop hosted at UAMS. While here for two days, this international group of researchers, hosted by DBMI's Dr. Mathias Brochhausen, will be applying a form of artificial intelligence to help researchers overcome the absence of biomedical language standards across institutions.

We have reported previously on the DBMI/TRI initiative offering a new, more user-friendly way for researchers to query and identify study cohorts in the Arkansas Clinical Data Repository (AR-CDR). We have enjoyed this partnership with Dr. Ahmad Baghal, who directs the program and is the subject of our TRI & Me feature.

Sincerely,

Laura James, M.D.
Director, UAMS Associate Vice Chancellor for Clinical and Translational Research

The Right Niche *(Continued from page 1)*

A Dance

The clinical research informatics program trains professionals to work with investigators to identify the best data source and to design a data flow and a work flow to best capture and clean that information in a way that keeps the translational research cycle turning. It also trains how to integrate clinical care and clinical research.

For example, a clinical research informaticist would work with researchers and clinicians to devise data capture within routine care through Epic or devices so that one capture of data serves multiple purposes.

"Patients in trials are people in health care, and the research cycle has to operate within health care," Zozus said. "There's a dance that has to be choreographed between the data flow and the work flow and between the processes needed for the clinical study and the processes ongoing anyway in the health care environment."

Wild, Wild West

Zozus said a wake-up call came in 2015 when the journal Nature reported that over half of psychology studies failed reproducibility tests. In addition to the fact that most researchers aren't trained in data handling, she said the story put a spotlight on another issue in academic research.

"It's kind of the wild, wild West because the authority and autonomy of individual investigators is so respected in academia, very few institutions have set expectations or standards for documenting or managing research data," she said. "And today, these activities are undertaken by individuals with varied education and skills."

Few universities have policies for archiving and maintaining study data, Zozus said. "I think NCATS would like to see its CTSAs fix the research reproducibility issues, and there are now efforts to do so."

Other Informatics Tracks

The clinical research informatics track is one of four tracks in the new biomedical informatics graduate degree program offered at UAMS. Other new tracks are:

- Translational bioinformatics
- Imaging informatics
- Clinical informatics

Fred Prior, Ph.D., who chairs the Department of Biomedical Informatics, said the beefed-up curriculum is helping fulfill his vision for a nationally recognized graduate program. It also addresses key clinical and research workforce issues in Arkansas, benefiting students like Jones.

Jones said she's excited to see where her new clinical research informatics skills will lead. She envisions working in clinical trials in a collaborative environment.

"I have a strong biology background, and some students have strong computational backgrounds," she said. "That's the way the real world works, too, especially in science and research. You have to collaborate and use people's strengths, and the UAMS faculty have been encouraging us to do that."

More information about the specialty tracks is available on the Department of Biomedical Informatics website, **dbmi.uams.edu/education/graduate-programs.**

TRI's External Advisory Council *came to UAMS on Feb. 12 to review TRI's Clinical and Translational Science Awards (CTSA) Program application. TRI's leadership appreciated the thoughtful critiques of each member, pictured l-r: Ronald Sokol, M.D., Univ. of Colorado – Denver; Joel Tsevat, M.D., Univ. of Texas School of Medicine at San Antonio; Harold P. Lehmann, M.D., Ph.D., Johns Hopkins Univ.; Timothy S. Carey, M.D., Univ. of North Carolina – Chapel Hill; Timothy F. Murphy, M.D., Univ. at Buffalo; Philip Kern, M.D., Univ. of Kentucky; and Council Chair Julian Solway, M.D., Univ. of Chicago Medicine. Not pictured: George A. Mashour, M.D., Ph.D., Univ. of Michigan.*

TRIBUTARY

TRI Co-Sponsored CTSA Workshop Using AI to Mine Research Data

Mathias Brochhausen, Ph.D., (right) with Jonathan Bona, Ph.D., has led organization of the ontology workshop.

As an ontologist, UAMS' Mathias Brochhausen, Ph.D., teaches computers the meaning of words. He takes a term, such as "informed consent," and writes a definition in language the computer can interpret.

"Here's something about ontologies that is very cool: Ontologies are actually an artificial intelligence product," he said.

Brochhausen's expertise and enthusiasm for ontology/AI solutions will be in play Feb. 26 and 27. He will be hosting and collaborating with a national group of researchers to create semantically-enabled products that support access to more data across research institutions.

The work will be performed during the **2018 Clinical and Translational Science Ontology Group Spring Workshop,** "Ontology of Informed Consent: An Approach to Specimen and Data Sharing."

The workshop is supported by Department of Biomedical Informatics, where Brochhausen is an associate professor, the UAMS Translational Research Institute (TRI), and the NIH National Center for Advancing Translational Sciences (NCATS) Clinical and Translational Science Awards (CTSA) Program.

As a piece of code or software, an ontology can use logical inferences to bypass barriers caused by the absence of agreement in biomedical data representation. For example, Brochhausen said, consider the wide variation in informed consent language that tells researchers whether they may re-contact participants.

"Using ontologies, we can define re-contacting, and everything that falls under that definition the computer will automatically sort into re-contacting," he said.

The field of ontology has strong roots at UAMS and the Department of Biomedical Informatics. The discipline has also continued to grow along with the department; Brochhausen now oversees the research group Biomedical Ontologies Arkansas (BOAR).

"It's an exciting time for UAMS to host this workshop," he said. "The spirit of collaboration with clinical scientists, which is so strongly emphasized by the TRI, really makes UAMS stand out."

TRI & me

Ahmad Baghal, M.D., Assistant Professor, Director, Arkansas Clinical Data Repository (AR-CDR), Department of Biomedical Informatics, UAMS College of Medicine

"I learned about the Translational Research Institute (TRI) soon after I arrived at the Department of Biomedical Informatics in 2016. We quickly became partners in making clinical data resources more accessible to all UAMS researchers. Together we established a new, self-service user interface for researchers to query and identify study cohorts from the Arkansas Clinical Data Repository (AR-CDR). With TRI as our partner, we were able to streamline the process of requesting clinical data for research studies and have enabled UAMS researchers and faculty to conduct high quality, timely and efficient clinical and translational research. More information about the AR-CDR is available at: **AR-CDR.uams.edu** or **TRI.uams.edu.**"

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Website

TRI.uams.edu
Email: TRI@uams.edu

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Editor
David Robinson
Designer
Leslie Norris
TRI Director
Laura James, M.D.

UAMS Translational Research Institute

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4301 W. Markham St., #577
Little Rock, AR 72205-7199

TRIbutes

The following UAMS researchers cited the Translational Research Institute (TRI) in publications after utilizing TRI resources or funding:

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