9-2012

Arkansas Catalyst, September 2012

University of Arkansas, Fayetteville

UNIVERSITY OF ARKANSAS
THE YOU OF A

The Arkansas Catalyst

September 2012

Researchers Simplify Protein Purification

Ellen Brune, doctoral student and entrepreneur

Engineering researchers at the University of Arkansas have developed a method to simplify the pharmaceutical production of proteins used in drugs that treat a variety of diseases and health conditions, including diabetes, cancer, arthritis and macular degeneration.

With assistance from the National Science Foundation Innovation Corps program, Ellen Brune, the primary researcher and inventor of the technology, has started a company to shorten development time so that new drugs can get to patients faster. Current protein pharmaceutical development is a complicated, time-consuming and expensive process because manufacturers must separate and extract contaminant proteins.

Brune, a doctoral student in chemical engineering, created a series of custom strains of the bacteria *Escherichia coli* that express minimized sets of contaminants or "nuisance" proteins. Brune then sought assistance to commercialize the technology. In an entrepreneurship class taught by Carol Reeves, associate vice provost for entrepreneurship and management professor in the Sam M. Walton College of Business, Brune created Boston Mountain Biotech LLC, a research and biotechnology firm that will save significant time by preparing the proteins for the manufacturing process.

Read entire story Watch team video

IN THIS ISSUE

Greetings!

James Rankin

Greetings from the Vice Provost for Research and Economic Development!

I hope that you enjoy The Arkansas Catalyst, the first monthly newsletter from the Office of Research and Economic Development. The newsletter will be used to highlight exciting research and economic development activities on the University of Arkansas campus as well as alert you to potential new opportunities.

This first issue features an entrepreneurial team, introduces you to the new director of the High Performance Computing Center and updates you on a way to learn about new gran opportunities.

Each month will feature university researchers, new research funding awards and faculty receiving patents. The newsletter will introduce you to staff in different office departments, including Research Support and Sponsored Programs, Research Compliance, the Technology Licensing and the Arkansas Research and Technology Park. We will also use the newsletter to announce new researcher tools.

The Office of Research and Economic Development is working to enhance the university research enterprise, including multi-disciplinary research. Last year, the campus focused on health research through campus wide meetings. Notices about future meetings, upcoming workshops, brown bag lunches and collaborative opportunities will be included in our newsletter.

We hope that this newsletter will be useful to the research community. If you have suggestions on topics that should be included, please let us know.

Sincerely,

Jim Rankin
Vice Provost for Research and Economic Development

Arkansas High Performance Computing Center

Rick McMullen, former director of research computing at the University of Kansas, has been appointed director of the High

IN OTHER NEWS

HELPFUL LINKS

New Director Takes the Helm

Performance Computing Center.

At the University of Arkansas, McMullen will also serve as a faculty member in the College of Engineering's department of computer science and computer engineering.

"The University of Arkansas has a strong high-performance computing program that supports science and engineering research important to the state and nation," McMullen said. "I am very pleased to join this team of accomplished researchers and computing experts."

Read entire story

Research and Sponsored Programs

New Service Offers Help for Grant Writers

Need some help with that next grant? The University of Arkansas now works with Hanover Grants to provide specialized assistance to faculty in writing, editing and reviewing grant proposals. These limited services are offered in a first-come, first served basis. To request this service, send a query to rsspdir@uark.edu along with a solicitation to secure a position in the Hanover Queue. Please contact Dennis Brewer, the RSSP director, for more information.

Read entire story

CONTACT US

Vice Provost for Research and Economic Development
205 Administration Building
1 University of Arkansas
Fayetteville, AR 72701
479-575-2470

email us

University of Arkansas Arkansas Newswire

Researchers Develop Method to Simplify Production of Proteins Used in Many Types of Drugs

Technology inventor starts biotech firm

Tuesday, August 28, 2012

FAYETTEVILLE, Ark. – Engineering researchers at the University of Arkansas have developed a method to simplify the pharmaceutical production of proteins used in drugs that treat a variety of diseases and health conditions, including diabetes, cancer, arthritis and macular degeneration.

Ellen Brune, doctoral student in chemical engineering and chief scientific officer of Boston Mountain Biotech, LLC.

With assistance from the National Science Foundation Innovation Corps program, Ellen Brune, the primary researcher and inventor of the technology, has started a company to shorten development time so that new drugs can get to patients faster. Current protein pharmaceutical development is a complicated, time-consuming and expensive process because manufacturers must separate and extract contaminant proteins.

Brune, a doctoral student in chemical engineering, created a series of custom strains of the bacteria *Escherichia coli* that express minimized sets of contaminants or "nuisance" proteins. Brune then sought assistance to commercialize the technology. In an entrepreneurship class taught by Carol Reeves, associate vice provost for entrepreneurship and management professor in the Sam M. Walton College of Business, Brune created Boston Mountain Biotech LLC (http://bostonmountainbiotech.com/) , a research and biotechnology firm that will save significant time by preparing the proteins for the manufacturing process.

“Millions of people across the globe are suffering from treatable diseases because manufacturers cannot afford to make the drugs they need,” Brune said. “These companies have to spend too much time and money getting rid of stuff that doesn’t work to get to the stuff that does. Our work addresses this problem. Our cell lines reduce the garbage, so to speak, before the manufacturing process begins.”

Current protein pharmaceutical manufacturing involves separating or cleaning up “background” contamination to reach the target protein – a long and expensive process. Background contamination is undesirable and unnecessary proteins that are prohibited by the U.S. Food and Drug Administration in the final drug product. The FDA requires that the final product be 99 percent pure.

Drug companies spend roughly $8 billion a year trying to clean up these contaminants during production. Brune compares the process to making orange juice by blending the peel and seeds along with the meat of an orange. Once the juice is made, producers would then have to filter out the chunks of seeds and peel.

In the laboratory, Brune worked under the direction of chemical engineering professor Bob Beitle, one of several researchers who have been investigating this problem for more than a decade. Brune designed custom strains of “Lotus” *E. coli*. Lotus refers to a suite of cell lines optimized to work with specific separation techniques and characteristics. She accomplished this through bio-separation and genetic manipulation, specifically by removing the sections of DNA that code for the contaminant regions. Her work simplifies the purification process on the front end of protein pharmaceutical production, so that the cell line is specifically developed for manufacturing. Current cell lines used for protein production look nothing like what has to be achieved for large-scale manufacturing, Brune said.

Brune serves as chief scientific officer at Boston Mountain Biotech. In addition to the assistance from Reeves and the entrepreneurship program, the company has received significant support from the NSF I-Corps Program, including $50,000 in marketing and operational funding and participation in an innovative, start-up training program that provided a foundation for connecting with potential investors. Boston Mountain Biotech has also won a total of $50,000 from business plan competitions, mostly due to Brune’s persuasive presentation skills. The company is seeking additional investors and is currently working with two manufacturers on pilot testing.

Brune has produced two videos about the company, an informational video (http://www.youtube.com/watch?v=iLpil5XfFLc&feature=youtu.be) for the I-Corps grant and a second video intended for investors (http://www.youtube.com/watch?feature=endscreen&v=coveLOVFs_s&NR=1) .

NSF I-Corps is a set of activities and programs that prepare scientists and engineers to extend their focus beyond the laboratory. The primary goal of the program is to foster entrepreneurship that will lead to the commercialization of technology that has been supported previously by NSF-funded research.

Since 2006, the Walton College entrepreneurship program, which Reeves directs, has produced six companies that employ more than 100 people, most of whom work and live in Arkansas. The college offers a Master of Business Administration with an emphasis in entrepreneurship and a certificate in the same for graduate students, such as Brune, in other colleges and schools. Reeves has served as director of the program since its inception in 2006 and has mentored business-plan teams in competitions since 2002. Brune won first place in the graduate competition of this year's Donald W. Reynolds Governor's Cup, Arkansas' largest business plan competition.

Contacts:

Ellen Brune, chief scientific officer
Boston Mountain Biotech, LLC
314-954-2047, ebrune3@gmail.com (mailto:ebrune3@gmail.com)

Matt McGowan, science and research communications officer
University Relations
479-575-4246, dmcgowa@uark.edu (mailto:dmcgowa@uark.edu)

University of Arkansas Arkansas Newswire

Rick McMullen Appointed Director of the Arkansas High Performance Computing Center

Scientist also to serve as faculty member in College of Engineering

Tuesday, July 31, 2012

FAYETTEVILLE, Ark. – Rick McMullen, former director of research computing at the University of Kansas, has been appointed director of the Arkansas High Performance Computing Center. His appointment begins Aug. 13.

Rick McMullen becomes director of the Arkansas High Performance Computing Center Aug. 13, 2012.

McMullen replaces Jack Cothren, associate professor of geosciences, and Douglas Spearot, associate professor of mechanical engineering. Cothren and Spearot served as interim co-directors of the center after former director Amy Apon accepted an administrative position at Clemson University.

“We are thrilled to have Dr. McMullen as our new director of high performance computing at the University of Arkansas,” said Jim Rankin, vice provost for research and economic development. “His research and leadership experience in many facets of research computing at both KU and Indiana University, as well as the Great Plains Network, ensure that we will continue to build upon the many great things we’ve accomplished in high performance computing at the University of Arkansas. Speaking for myself and all faculty

members and students associated with the center, we look forward to working with Dr. McMullen."

In addition to his primary academic and administrative positions at the University of Kansas, McMullen has served as a research associate at the university's Biodiversity Institute. He is also senior research associate with the Great Plains Network, a large consortium of Midwestern universities that work together to connect each institution to the National Research and Education Network infrastructure, including Internet2, and to facilitate the use of advanced infrastructure across the network. The University of Arkansas is a member of the Great Plains Network.

As both a scientist and strategist, McMullen has spent more than 20 years in high performance computing research and technical management. His positions have included work on strategic technology evaluation and planning in both the private sector and higher education. He has focused his career on developing and applying novel information and communication technologies to solve problems in computationally intensive and data-intensive research.

At the University of Kansas, McMullen led the effort to develop research computing, communications and storage services to provide a university-wide, research computing infrastructure. At Indiana University, he spearheaded first- and second-generation technology exploration and development. His efforts there focused on high-performance computing, visualization, storage and high-performance networking for research applications.

McMullen has devoted much attention during his career to setting the agenda for adoption and deployment of new technologies and services for research and teaching based on emerging technologies. He has been heavily involved in state and regional high-performance networks for research and education and has helped build state and regional high performance computing centers to support multi-institutional collaborations for economic growth.

At the University of Arkansas, McMullen will also serve as a faculty member in the College of Engineering's department of computer science and computer engineering.

"The University of Arkansas has a strong high performance computing program that supports science and engineering research important to the state and nation,"

McMullen said. “I am very pleased to join this team of accomplished researchers and computing experts.”

The Arkansas High Performance Computing Center (http://hpc.uark.edu/hpc/) supports research in computer science, integrated nanoscience, computational chemistry, computational biomagnetics, materials science and spatial science. Faculty and students from several departments at the university use high performance computers at the center for a wide array of research, including exploring the fundamental properties of chemicals and nanomaterials, developing new methods of detecting breast cancer and organizing large sets of spatial data. The center is funded by grants from the National Science Foundation and the Arkansas Science and Technology Authority.

In early 2011, the center activated Razor, a new supercomputer acquired through National Science Foundation funding. Razor joined Star of Arkansas, a supercomputer the center has operated since 2009.

Contacts:

Jim Rankin, vice provost for research and economic development
Academic Affairs
479-575-2470, rankinj@uark.edu (mailto:rankinj@uark.edu)

Rick McMullen, director,
Arkansas High Performance Computing Center
785-864-7245, mcmullendf@gmail.com (mailto:mcmullendf@gmail.com)

Matt McGowan, science and research communications officer
University Relations
479-575-4246, dmcgowa@uark.edu (mailto:dmcgowa@uark.edu)

Proposal Preparation (Pre-Award)

Grant-Writing Services

The University of Arkansas has contracted with Hanover Grants (http://www.hanovergrants.com/) to provide comprehensive, discipline-based proposal writing, editing and review services for a limited number of grant proposals. Notice of intent to request this service along with the solicitation to be addressed must be sent to the RSSP Director rsspdir@uark.edu (mailto:rsspdir@uark.edu) as early as possible to secure a position in the Hanover queue. The complete proposal must be available to RSSP at least two weeks before the sponsor deadline to allow time for a comprehensive review. Shorter reviews may sometimes be accommodated if a Hanover reviewer is available. Contact the RSSP Director for more information.

Proposal Preparation and Review Services

Please use the Investigator's Toolbox (http://vpred.uark.edu/250.php) for required and sample proposal and budgeting forms.

The Office of Research and Sponsored Programs Pre-Award Staff provides important services to help principal investigators prepare, review and submit competitive proposals for external funding. Below is a description some common services, depending on the nature of the proposal and potential sponsor:

- Analyze the solicitation and review conditions and agreements;
- Provide assistance with on-line registration;
- Provide training on electronic submission portals;
- Address guidelines and requirements with the principal investigator;
- Facilitate the review of any contract requirements and negotiations;
- Complete required agency application forms and related administrative forms;
- Help prepare or review budgets for accuracy;
- Ensure commitment letters have been obtained for required matching funds, services or support, including subcontract commitments;
- Ensure subcontract documents are received and accurate;
- Assemble the proposal and review the text;
- Check proposals for compliance with federal, state, university, and agency guidelines and finalize for review/approval;
- Document institutional compliance requirements;
- Ensure receipt of completed and signed internal Routing, Disclosure and Cost Share Request forms;
- Implement the review and signature process and obtain institutional approval signatures;
- Prepare the appropriate number of proposal copies for agency, individual investigators and file;
- Transmit the proposal package to the agency. If applicable, track the courier service to ensure timely delivery of the proposal at its destination; and
- Send electronic copies of proposal and internal approval forms to PI, Co-PIs, Dept. Head and Dean.

Please allow 5 working days for completion of the preparation, review and submission process of proposals without special requirements.