Jim Bann, chemistry, and members of his research group at Wichita State may have found the key for developing an effective, widely available anthrax vaccine.

An ancient disease noted by Hippocrates, Homer and Virgil, some believe anthrax is the sixth plague described in the Book of Exodus. More traditionally, it has been a serious agricultural disease mostly associated with sheep, particularly in developing countries.

“Anthrax is a bacterium that normally does not cause infections in people, but it can cause infections in animals,” said Bann. “It used to be a major problem in the late 1800s and was called ‘woolsorter’s disease.’”

However, in the wrong hands, Bacillus anthracis becomes one of the most lethal agents of bacterial warfare. Without effective treatment, infection leads to a high mortality rate. Currently, vaccines are available to military personnel, but carry the potential for serious side effects.

ANTHRAX AS AN AGENT OF DISEASE
There are two forms of anthrax bacterium, one of which resides within a spore that may lie dormant for decades. This is the more common form. An anthrax infection begins in one of three ways: by spores entering the body through the skin, ingestion or inhalation.

“When once in your body, the spore germinates and releases the bacterium, which can then release a toxin,” said Bann. “The toxin helps the bacterium in its main purpose to kill the host. Its sole goal is to kill the host body.”

After exposure to the spores, treatment for anthrax must begin early. Antibiotics are administered and kill the bacterium, but they don’t minimize the power of the toxin.

“Scientists have been trying to develop ways to stop the action of the toxin,” said Bann. “That is what we are trying to do.”

TOXIN AND PROTEINS
Anthrax toxin is made of three proteins: protective antigen (PA), the edema factor (EF) and the lethal factor (LF). PA assists with the process of introducing EF and LF in the fluid found within cells (known as cytosol). In order for this to occur, PA, as a signaling molecule, binds to a host cell receptor and starts to transform into a pre-pore molecule. This process is necessary for the production of the anthrax toxin, which is actually composed of two toxins.

“The pre-pore binds to EF or LF,” Bann said. “PA-EF is edema toxin and PA-LF is lethal toxin. When the pH measures at a certain acidic level, the pre-pore converts into a pore or hollow tube.”

This pore acts as a transport mechanism for the toxin.

“The pore allows entry of EF or LF into the cell cytosol,” Bann said, “where the enzymatic activities of EF and LF are manifested, ultimately killing the host.”

Bann and his group realized that manipulating PA, and thus preventing pore formation, could be key to designing an effective vaccine.
Their research is centered on a modified PA protein partly built with the chemically synthesized amino acid 2-fluorohistidine.

“Our group showed that a modified PA containing 2-fluorohistidine blocked the formation of the pore when bound to the host cell receptor,” Bann said.

In other words, when the pore formation is blocked, toxins cannot enter the cell, and an infection is thwarted.

**IMPROVING ANTHRAX PREVENTION AND TREATMENT**

It may be several years before an effective anthrax vaccine with few side effects is created. There is much yet to learn about PA attachment and pore formation, as well as prevention and treatment of the disease.

“Our goals,” said Bann, “are to use the structural information on the PA molecule to help design therapies against anthrax or develop an improved anthrax vaccine.”

Bann wants to figure out how PA attaches to the cell receptor and what happens structurally to allow the binding.

“I also want to understand how PA forms a pore inside of cells,” Bann said.

Several individuals are involved in Bann’s research: three doctoral students, Kiran K. Andra, Fatemeh Chadenagi and Alex Williams, and postdoctoral researcher Shyamali Wimalasena.

Williams has been fascinated by the research because it functions as a platform for several other potential applications.

“The most exciting thing about doing research with Dr. Bann has been not the improvement of our understanding of the anthrax protein interactions,” said Williams, “but rather seeing where the project could proceed.”

The work could reach beyond therapeutic and preventive options for anthrax.

“It is possible that my research project could lead to an improvement in anthrax vaccines, a treatment for the anthrax toxin and even spin off into a cancer therapeutic,” said Williams. “This would allow my project not only to improve our knowledge of anthrax, but to lay the foundation of several other projects that would affect countless lives.”

**NEXT STEPS**

Bann’s group is also working with Russ Middaugh’s research group at the University of Kansas. Middaugh’s group is responsible for conducting biophysical tests on potentially new anthrax vaccines and will develop formulations to test the protective antigen for injection into animals.

Bann’s work is significant not only for the potential vaccine but also for the patent he holds, number 7,731,979 by the U.S. Patent and Trademark Office. The patent, “Protective Antigen Having Fluorinated Histidine Residues,” prevents others from using the 2-fluorohistidine PA as a therapeutic agent in the prevention of an anthrax infection. This is the first patent awarded to WSU since 2002.

If vaccines based on Bann’s research become commercially available, WSU will receive a portion of the profits.
Jim Bann, chemistry, hasn’t always been interested in anthrax research. When he was working as a post-doctoral student, his advisor Scott Hultgren asked him to write a review in Nature about anthrax and its crystal structure. “I had to learn what anthrax did and the conformational change really interested me,” Bann said. It became a new research area for him.

Bann and his wife, Jodie, have six children; the youngest is 6 and the oldest is 17. His hobbies include his children, bicycling and running. He is also involved in the Kansas Science Olympiad and is current chair of the Wichita chapter of the American Chemical Society.

Bann came to Wichita State in 2004. He earned a bachelor’s of science in chemistry/biochemistry from Ft. Lewis College in Durango, Colo., and a PhD in biochemistry from Oregon Health and Science University, in Portland.

Julianne Burton, philosophy, has been named a Wichita State University Scholar for Washburn University’s School of Law. The $57,000 award will pay for three years of tuition at the law school.

Carrie Chambers, graduate student, biological sciences, won first prize in the 2010 Graduate Research and Scholarly Projects Symposium oral presentation for “Analysis and FSH glycosylation pattern through genetic engineering.” George Bousfield and Bin Shuai served as her faculty mentors. Krysta Cole, Elliott School of Communication, won second place for “Rhetoric, Identity, and the Obama Racial Phenomenon: Exploring Obama’s title as the ‘First Black President.’” Deborah Ballard-Reisch was her faculty mentor.

Viet Le, graduate student, chemistry, won first prize for Wichita State at the annual Capitol Graduate Research Summit in Topeka. The title of his poster was “Dopaminergic toxicity of 1-methyl-4-phenylpyridinium (MPP+): Model for Parkinson’s Disease.” Le works in Kandatege Wimalasena’s laboratory.

Daniel Papsdorf, former WSU graduate student, history, has been recognized by the Midwest Association of Graduate Schools with a Distinguished Master’s Thesis Award for his work, “Trade, Diplomacy and War Along the Waters: The Mississippi During the American Revolution.” While at WSU, he won the Dora Wallace Hodgson Award for his thesis, which led to his nomination for the MAGS award. He is currently a Ph.D. student at Duke University. Robert Owens, history, was his faculty mentor.

Angela Sager, philosophy, has been selected to participate in the Young Scholars Summer Program sponsored by the Hong Kierkegaard Library at St Olaf College. The nationally competitive award, which includes expenses and a stipend, provides exceptional undergraduates the opportunity to participate in a month-long research intensive seminar at St Olaf College in Northfield, Minn.

The following corrections are offered for the Fall 2010 LAS Newsletter:

Twyla Hill, sociology, is the interim regional representative to Alpha Kappa Delta, the sociology honor society. Stacy Tiemeyer, who won fourth place in the Graduate Research and Scholarly Projects poster competition in spring 2010, is a sociology grad student. Hill served as her faculty mentor for the project.

**STUDENT ACCOLADES**

The department of anthropology awarded four David and Sally Jackman Graduate Research Assistantships to students studying areas of anthropology: Chris Herriage, archaeology; James Simmerman and Ivy Davis, biological anthropology; and Gwen Herrin, cultural anthropology.

**JACKMAN FUND UPDATE**

The National Institutes of Health has approved a $2.2 million WSU Combined Core Facility Renovation Project to significantly upgrade four research laboratories at Wichita State. About $700,000 will be used to purchase new equipment. The renovation project in Hubbard Hall is scheduled to begin June 2011, and be completed by March 2012. The laboratory upgrade will complement a $6.6 million, five-year, multi-investigator, multi-institutional project, “The Aging Pituitary/Gonadal Axis” led by biologist George Bousfield, the Dr. Lawrence M. Jones Distinguished Professor in theFairmount College of Liberal Arts and Sciences.

**ERRATA**
Hundreds of years ago, Friedrich Schiller and Ludwig van Beethoven certainly were aware of how literature, language and music were intertwined and interrelated, but they probably didn’t foresee modern technology melding their works. Wilson Baldridge, Modern and Classical Languages and Literatures-French, recognized the relationships and the ability of technology to bring all three to life. He became a champion to make these kinds of works more accessible to students in a comfortable, contemporary setting.

As a result, the newly created Music and Languages Innovation Center will provide students high-tech access to foreign language media and music. It is an outcome of merging the Savaiano-Cress Language Laboratory and Thurlow Lieurance Memorial Music Library.

“The humanities are grounded in language and thinking,” said Baldridge, “and language in turn is grounded in a sort of verbal music. In the case of the new facility, both language and music dovetail with technology and innovation.”

MCLL’s language lab was established in 1979. At that time it was considered an ultra modern facility using ancillary media, such as cassette tapes and films, to help students learn foreign languages. Central to teaching pedagogy and learning, the lab filled the west side of the third floor of Jardine Hall and included tape decks for listening, a lab classroom for film projection and a studio for recording dialogue and newscasts.

However, to bring the lab into the 20th century, significant renovations needed to occur in order to deliver material in ways students expect to receive it.

“Students expect cutting edge technological delivery systems for all areas of learning,” said Baldridge. “The common denominator is innovation and using cutting edge technology to the max.”

Ravi Pendse, associate provost, approached Baldridge and several colleagues in MCLL and the School of Music about combining the language lab and music library. As part of the university’s reshaping initiative, the merger would benefit both departments and many students.

Baldridge said there was opportunity for the makeover of one unit, but not both. A merger would improve both entities as a combined unit.

“It’s about the students—maximizing use of space for their benefit,” said Baldridge. “We’re very pleased to share this space with the music library.”

Rachel Crane, music and fine arts librarian, agreed.

“The combined music library and language lab will provide increased access to specialized resources, in support of music and language arts, with an aim to promote exchange between the disciplines,” said Crane. “Additionally, the remodeled facility will provide a welcoming study space for students to gather.”

The center in Jardine Hall will allow international TV broadcasts, use Blu Ray technology and include a PC deck at each seat in the lab classroom. It also will house foreign language CDs and DVDs catalogued by Ablah Library and made available for checkout at the center. Of course, music recordings and printed scores also will be available.

The next phase of upgrading includes obtaining a satellite link to access real time news from resources such as Al Jazeera, Toute La Presse - Français and Deutsche Presse. This accessibility will enhance classroom discussions and help students actively apply what they are learning.

*Excerpt from ”Ode to Joy” by Friedrich Schiller used by Ludwig van Beethoven (1770-1827): Symphony no. 9 in D minor, opus 125.
As the director of the Region 7 Environmental Finance Center, Angela Buzard supports its role in assisting government entities with issues regarding environmental resources. The Environmental Protection Agency awarded Wichita State $190,000 in April 2010 to establish the center and made the grant renewable for six years, with yearly awards of $400,000 possible.

The EFC, one of 10 nationwide, provides services to Kansas, Iowa, Missouri, and Nebraska and is part of Wichita State’s Hugo Wall School for Urban and Public Affairs.

As might be expected, different areas of the United States have distinct environmental and financial resource needs. Each EFC region is known for its niche area; for example, the EFC based at Dominican University in California focuses on clean, renewable energy, economic independence, and needs of Native American tribes.

Buzard is working to identify a niche area for Region 7 and early indications point towards water resources.

“The EPA has asked us to look at aging water infrastructure resource models and find economical ways to replace or repair them,” said Buzard. “A lot of the infrastructure in place is well past its useful life. Nationally there is a $540 billion unfunded liability in aging water and wastewater infrastructure. People can see crumbling bridges and roads, but a lot of times people don’t understand water and wastewater infrastructure unless their water stops running.”

Buzard foresees no shortage of work.

“Our biggest internal challenge,” said Buzard, “is sifting through all the requests for assistance and prioritizing what we are able to provide. It’s mainly smaller communities that need the help because they just don’t have the resources. We’ll help direct them to other sources of funding. We’ll also help government bodies better understand the continually changing regulations and requirements they are subject to.”

Brad Mears, director of operations for Kansas Municipal Utilities, sees the EFC as a key partner in their work with utility systems.

“For example, the EFC is working with the City of Wellington to beta-test a new energy audit tool for water and wastewater utilities,” he said. “Once the energy audit tool is completed and released, it should be valuable to help water and wastewater systems, even small systems, evaluate their energy use and determine ways that they can use energy more efficiently to help control costs.”

**ENHANCING THE ROLE OF HUGO WALL SCHOOL**

Being housed within the Hugo Wall School has provided invaluable support to the EFC.

“One of our strengths is being part of the school,” said Buzard, “as it lends to building upon existing relationships and training for folks in local government.”

Nancy McCarthy Snyder, HWS director and associate professor, agreed.

“We have a long history of working with state and local governments to enhance the quality of public affairs and administration,” said McCarthy Snyder. “The EFC is a perfect fit for the Hugo Wall School because it is designed to provide applied research, training, technical assistance and analytic tools to assist communities with addressing issues of water supply, waste disposal, infrastructure development, air quality, renewable energy, green building and land conservation.”

“One of the most pressing issues facing communities today,” said McCarthy Snyder, “is determining how to grow and thrive in environmentally and financially sustainable ways.”

The EFC is staffed by Buzard; David Poynter, program manager; and Anna Meyerhoff, graduate assistant.

For more information, visit:
http://www.epa.gov/efinpage/efcn.htm
http://hws.wichita.edu/efc.html

**JEAN ELLIOTT RETIRES**

After providing academic advising to thousands of students, Jean Elliott has retired following more than 29 years of service. The academic advisor and associate director of the Liberal Arts and Sciences Advising Center began her career advising students in the Emory Lindquist Honors Program. She also taught ethnic studies courses and helped create the course Dealing with Diversity, which is required for some undergraduate degree programs. Elliott’s plans are to spend more time with her husband Larry, attend Shocker athletic events, and enjoy her children and grandchildren.
FACULTY & STAFF

Wilson Baldridge, Modern and Classical Languages and Literatures-French, gave an invited paper, “Reprise de jumelages,” on the work of Michel Deguy at the Regional Association of Aquitaine meeting in France. The association, in cooperation with the University of Bordeaux, awarded its annual Grand Prize for Literature to Deguy. The International Colloquium on his work, organized to celebrate this award, involved leading specialists from the Sorbonne, the University of Bordeaux, and international scholars from Japan and the United States. Baldridge is a recognized Deguy scholar.

Misty Bruckner, Center for Urban Studies, received the Bronze Medal of Outstanding Service from the Sedgwick County Sheriff’s Office for her work involving the new Oaklawn Activity Center in southeast Wichita. The medal is the fourth highest award given and is reserved for individual accomplishments that further the mission of the Sedgwick County Sheriff’s Office and reflect tenacity, outstanding inventiveness, intelligence or diligence.

Doris Chang, women’s studies, was an invited distinguished speaker for the Weatherhood East Asian Institute seminar on modern Taiwan at Columbia University. Chang lectured on “Feminist Movement and Changing Role of Women” as part of this prestigious lecture series.

Francis D’Souza, chemistry, was featured in a video on the American Chemical Society website highlighting his research on the application of carbon nanotube hybrid materials for light-harvesting applications. The video is based on his article “SWNT-Based Supramolecular Nanorarchitectures with Photosensitizing Donor and Acceptor Molecules” in the Journal of Physical Chemistry Letters.

Mary Liz Jameson, biological sciences, has been invited to teach a course on scarab beetles at La Pampa Hermosa Sanctuary, a biological field station in Peru.

Maite Kilpatrick, MCLL-Spanish, organized a meeting of the Mid-America Chapter of the American Translators Association for those interested in professional translation and interpretation, including a discussion of the processes for becoming certified for court or medical interpreting.

Paul Rillema, chemistry, served as program chair for the 45th Midwest Regional Meeting of the American Chemical Society. More than 750 chemists, including students, professors and industrial chemists, attended the meeting.

Jennifer Roberts, LAS Advising Center, received the Building Bridges Award during the 2011 National TRIO Day celebration. The award is given in appreciation and recognition for commitment to educating students.

Christopher Rogers, biological sciences, presented his invited paper, “Season-long Fecundity, Brood Parasitism and Nest Predation in the Cerulean Warbler in Southwestern Michigan,” at the joint meeting of the Association of Field Ornithologists, Cooper Ornithological Society and Wilson Society for Ornithology. His paper was part of a symposium session, “Our Expanding Understanding of Cerulean Warbler Breeding Biology and Migratory Behavior.”

Erach Talaty, chemistry, was honored by his colleagues with the naming of the Erach Talaty Organic Chemistry Teaching Lab in McKinley Hall.

Shang-You Yang, biological sciences, was the invited keynote speaker at 2010 Jinan International Symposium on Minimal Invasive Spine Surgery in Jinan, China. He presented “Gene Therapy in Orthopaedic Spine Surgery.”

RECENT GRANT ACTIVITY

Andi Bannister, School of Community Affairs, received a $650,000 grant from the U.S. Department of Justice for research, evaluation and implementation of the Safe Schools initiative.

Greg Houseman, biological sciences, procured a $39,900 grant from the National Science Foundation Experimental Program to Stimulate Competitive Research for “Can Spatial Variability Created by Dispersal Explain the Accumulation of Biodiversity?”

Rhonda Lewis, psychology, procured a $300,000 three-year grant from the Office of Minority Health for “Youth Empowerment Implementation Project.”

Kyoung Lee, Brien Bolin and Fred Besthorn received a $5,000 Multidisciplinary Research Project Award for “Bereavement, coping, and depression among older Korean adult immigrants.”

Jenny Pearson, sociology, received a $34,594 grant from the American Education Research Association to study “The Long-Term Educational Attainment of Same-Sex Attracted Students: The Role of High School Performance, School Context, and Educational Pathways.”
Dear alumni and friends,

Part of Wichita State University’s mission is to provide teaching, scholarship and public service to students and the larger community. This issue of the newsletter exemplifies Fairmount College’s role in facilitating these activities:

**Teaching.** The Music and Languages Innovation Center will use technology to enhance the delivery of curricular and research materials to students and members of the WSU community.

**Scholarship.** Jim Bann’s research and work to develop an effective anthrax vaccine involves doctoral students and has the potential to benefit millions of people worldwide.

**Public service.** The Region 7 Environmental Finance Center will provide services and assistance to local governments in Kansas, Iowa, Missouri and Nebraska.

As alumni and friends of the college, you know firsthand the quality of our teaching, scholarship and service. You are a testament to our success. Thank you for your continued support.

Sincerely,

William D. Bischoff, dean

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**HUXMAN NAMED PRESIDENT OF CONRAD GREBEL UNIVERSITY COLLEGE**

Susan Schultz Huxman, director of the Elliott School of Communication, has been named president of Conrad Grebel University College, Waterloo, Ontario, Canada.

She will become president of the Mennonite Church-related college July 1, after 20 years of teaching and administrative responsibility at Wichita State, including seven as director of the Elliott School.

Lou Heldman will serve as interim director while a national search is conducted for a new director. He will continue as distinguished senior fellow in media management and journalism. In that role, he teaches courses on the impact of the Internet on media and society. He also created and serves as executive producer of the monthly television series “Wichita State & The World,” concluding its third season.

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**COLLEGE AND UNIVERSITY AWARDS**

Deborah Ballard-Reisch, Elliott School of Communication, Community Research Award

Brien Bolin, School of Social Work, Leadership in the Advancement of Teaching

John Dreifort, history, John R. Barrier Award for Distinguished Teaching in the Humanities and Social Sciences

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**NEW HIRES**

Shaunna Millar, field practicum associate, School of Social Work

Ryan Alexander, assistant professor, School of Community Affairs