



GRANT SUPPORTS RESEARCH OF WOMEN'S INFERTILITY

In his Hubbard Hall protein core laboratory, **George Bousfield**, biological sciences, gives instructions to a student working on an experiment. Approximately 10 years earlier in the same lab, a graduate student had assisted him in making a discovery that changed his research focus and resulted in the receipt this spring of a \$6.6 million, five-year research grant from the National Institutes of Health.

Finding a novel variant of follicle-stimulating hormone probably won't make Bousfield rich or famous, but it has the potential to positively affect the lives of millions of women. One of the roles of FSH is to stimulate the ovary to develop a follicle, a cyst-like structure that holds the egg until it's mature. If the woman doesn't have enough of the appropriate form of FSH, her chances of being infertile increase.

Bousfield and his team have two priorities for studying the new form of FSH.

"Our initial goal is to diagnose reproductive aging in women," says Bousfield, "and the second is to make better FSH preparations for treating infertility."

Each human female is born with a finite number of eggs; no others are produced in her lifetime. Because of hormone production and related aging factors, the prime childbearing years for women are ages 21-24. However, many women wait to have children until they finish college and establish themselves professionally. The older they become, the more FSH they produce in biological response to the decline in number of eggs in their ovaries. Yet the composition of FSH changes and influences their fertility.

Bousfield hopes his research will result in an indicator for fertility. FSH samples will be derived from urine.

"Measuring FSH concentrations in blood is only reliable two to three years before menopause when women are in their late 40s, and long after fertility is lost," Bousfield says. "Because we see changes in the ratio of FSH forms in the late 30s, we hope that measuring this ratio will permit us to gauge reproductive age at the time when fertility is known to decline."



Novel FSH variant



Classic FSH

SOMETHING MINOR BECOMES MAJOR

For many years, scientists believed there was only one form of FSH, one that included two strands of glycans, a type of sugar. The strands were attached to each of the two protein chain subunits, alpha and beta, that made up the hormone.

In 1999, one of Bousfield's graduate students, **Wendy Walton**, conducted an experiment to isolate the protein subunits. Specifically, she was looking for a three-branch strand containing alpha subunits.

She didn't find what she was looking for, but she uncovered something much more significant.

"Wendy found that there are two forms of the beta, or FSH-specific, subunit. One possesses the normal complement of two sugar strands, while the novel form lacks both strands," says Bousfield.

In order for changes to take place within a cell, FSH must orient in the correct shape and have the correct arrangement of proteins and sugars before it can bind to and activate its receptor. A variant of the hormone lacking some of the sugars might bind to the receptor but not necessarily activate it.

"I recognized the importance of that immediately," Bousfield says.

The key to better understanding infertility lay before him.

However, the funding agencies weren't as easily convinced and the NIH rejected his grant applications to research the novel form many times over the next 10 years.

"The problem with what Wendy found was that it was a minor form and biochemists tend to ignore minor forms because they're usually not important," he says.

However, this form was important.

The primary source of FSH production occurs in the pituitary gland, which is located at the base of the brain. Because it cannot be accessed easily, most research involving the gland comes from those donated from autopsies. A pathologist in Arizona gave Bousfield 24 pituitary glands, mostly from females ages 21-81. In testing, Bousfield found that women of ages 21-24 produce more of the two-strand glycan (minor form) than the four-strand (major form). More important, Bousfield found this minor form to be 10- to 25-fold more active than the major form. This signified that in young women the minor form is actually the major form. It also became clear that there is a progressive decline in the abundance of two-strand FSH as a woman ages.

"There is a fundamental change in the hormone as women age," says **Jeff May**, biological sciences. "The sugars on the hormone alter the way it acts."

The main issue, May says, is to determine whether the two-strand glycan is key to better treatments. Bousfield agrees.

"The current FSH treatment formula has worked well for young women, but it doesn't work for older women," says Bousfield. "We're hoping our research will lead to preparations

being more effective in older women, if that's possible. We don't know yet that it is."

The transition of the novel form raises other questions.

"Another key point relates to when the shift from two-strand to four-strand occurs. At peri-menopause, the transitional period preceding menopause?" says May. "There may be a signal from the changing ovary telling the pituitary to produce more of the four-strand form. This may be of diagnostic value for determining the initiation of the peri-menopausal period in women."

Aside from fertility, there may be other applications from the novel form of FSH.

Peri- and post-menopausal women experience an accelerated rate of bone loss as they age. May says that for years scientists believed decreased estrogen production by the aging ovary was the fundamental defect underlying bone loss, that is, osteoporosis. However, studies in mice indicate there is no bone loss when estrogen is low or absent from the body if FSH is also absent. Thus, he says, FSH may be the active factor underlying osteoporosis. Two-strand FSH is active at the ovary in young women and has low bone impact, but the four-strand form is active on bone in older women and has less impact at the ovary. May postulates that it is the dramatic rise of four-strand FSH that influences bone loss.

Although five years may seem to be a long time for research projects, it is not. Bousfield and his team have several projects under way now, and Bousfield has already started the process of getting the grant renewed.

NEXT STEPS

The NIH grant covers three related projects involving researchers at three institutions. At WSU, Bousfield will study how FSH glycoforms intersect with receptors and study glycoform levels in young, middle-aged and post-menopausal women. **John Davis**, University of Nebraska-Omaha, will study the signaling pathways inside cells the glycoforms activate. **Rajendra Kumar**, University of Kansas Medical Center-Kansas City, will create mouse models to test the hypothesis that both FSH forms are required for reproduction.

Other collaborators in the grant-funded research include **Joe Murray**, a former Wichita State faculty member, and current WSU scientists **Bin Shuai**, **Vladimir Butnev** and May. Additionally, at WSU three graduate students, three undergraduate students and three technicians will provide laboratory support and data collection.



GEORGE BOUSFIELD

INFERTILITY STATISTICS

- Number of women ages 15 - 44 with impaired ability to have children: 7.3 million
- Percent of women ages 15 - 44 with impaired ability to have children: 11.8
- Number of married women ages 15 - 44 who are infertile: 2.1 million
- Percent of married women ages 15 - 44 who are infertile: 7.4

Source: Centers for Disease Control and Prevention: www.cdc.gov/

In his sophomore year at the University of Michigan, **George Bousfield** participated in a multi week introductory biology lab experiment that involved the in vitro fertilization of frog eggs. He followed the development of the frog embryos over several weeks, and noticed the lab handouts included information about hormones that were used to mature the frog eggs at a time of year when frogs in the wild were buried in the mud. This lab series began his interest in reproductive research, and when he was a senior at Saginaw Valley State College he took a course in endocrinology to find out what these hormones were. He realized then he wanted to work with reproductive hormones. The professor of the course, Walt Rathkamp, was a reproductive endocrinologist.

"He was so enthusiastic that he got me fascinated with gonadotropins," Bousfield says. When Bousfield worked on his doctorate at Indiana University, he trained in the same lab as Rathkamp had, and under the same Ph.D. mentor, Frank Zeller.

After leaving Indiana, Bousfield spent 13 years at MD Anderson Cancer Center in Houston working with glycoprotein hormones. The exacting lab work would pay great dividends for him at Wichita State.

"Of George's lengthy record of successful research initiatives at WSU, particularly spectacular is his newest accomplishment as a grant-funded scientist," says **William Hendry**, chair of biological sciences. "It was the product of vast experience, extremely sound and innovative scientific insight, and dogged leadership, team-building and administrative skills."

Born in the Canadian province of Saskatchewan, Bousfield moved to the Midwest as a young child and completed his education here. Much of his time outside of teaching and research is dedicated to his wife, Helen, and their 14-year-old twins, Sarah and George. It was the twins who introduced him to his main hobby: ice skating. On a 104-degree July day several years ago, he signed up the twins for skating lessons at the Wichita Ice Center. Before long, he and Helen were enrolled in lessons for adults and skating is something he still enjoys.

Bousfield came to WSU in 1991. He earned his doctoral and master's degrees in zoology from Indiana University and a Bachelor of Science in chemistry and biology from Saginaw Valley State University.

STUDENT ACCOLADES

GRADUATE STUDENTS

Two students from the School of Community Affairs, **Kimberly Grimes** and **Deepika Kumar**, received Dora Wallace Hodgson Summer Research Grants to further their research. Grimes investigated the prison experiences of deaf inmates incarcerated in Kansas penal institutions and interviewed several inmates housed in Kansas prisons. Kumar's research centers on the dental needs of juveniles incarcerated in the Sedgwick County Juvenile Detention Facility.

Mindy Slimmer, School of Community Affairs, recently presented a paper, "Impact of the First Step to Active Aging on Older Adults' Functional Fitness, Balance, and Daily Activity," at the Capitol Graduate Research Summit in Topeka. This annual event is organized through collaborative efforts between Wichita State University, Kansas State University, University of Kansas and University of Kansas Medical Center.

UNDERGRADUATE STUDENTS

Wichita State's debate team of **Eric Robinson** and **Brian Box**, both political science majors, won the Pflaum Debate Tournament hosted by Emporia State University, defeating Kansas State in the finals on a 3-0 decision. They also defeated the University of Missouri-Kansas City, the University of Central Oklahoma and the University of North Texas in other elimination rounds. Robinson was named the top speaker at the tournament; Box was sixth.

Several students enrolled in Eth St 331, The Black Family, created a banner representing Fairmount College in the All-Student Convocation. Their entry earned fourth place.

Marché Fleming-Randle, assistant dean, served as their adviser.



Regionally and nationally, the Elliott School of Communication is recognized for its integrated academic program that prepares students to work in a variety of settings.

Until 1989, students pursuing degrees in communication could choose from one of three media-specific tracks: speech communication, journalism or radio-television-film. Now students complete a multi-pronged curriculum that strengthens all facets of communication skills.

"We are deeply committed to developing well-rounded communication professionals who can think critically, plan strategically and communicate effectively in multiple communication contexts," says **Susan Huxman**, ESC director.

All ESC students, regardless of emphasis area, take courses in writing, speaking, visual communication, theory, history, law and ethics, and research and problem-solving. They also complete a senior portfolio. Students may choose a curricular core of integrated marketing communications, strategic communications, print journalism, broadcast journalism and electronic media, or maintain an open emphasis.

It's a model that other schools try to emulate, recognizing its value and freshness.

"Twenty years later, while more and more schools are adopting this model," says Huxman, "it is still considered 'radical.' Our curriculum remains a model of communication integration around the country."

The change in the program can be traced back to then-president **Warren Armstrong's** leadership. In 1985, a task force composed of faculty, administrators and off-campus communications professionals met to discuss ways to reshape and enhance WSU's communication program. Because of Wichita's market size, task force members were sure that an integrated approach to prepare multi skilled graduates was the best route for structuring the program.

Longtime ESC faculty member **Les Anderson** joined Wichita State in 1977. A print journalist for much of his career, early on he saw the value of an integrated approach.

"What's interesting is that as other schools have switched to an integrated approach to communication, it shows how far reaching the thinking was back then when we merged speech and journalism."

The Kansas Board of Regents also endorsed the idea. The major breakthrough, however, came from a generous gift from **Oliver and Betty**

Elliott. An entrepreneur, Elliott credited his highly successful career to the skills and knowledge he gained as a journalism major and working on *The Sunflower*, WSU's student newspaper.

"The Elliotts were fantastic benefactors," says Huxman, "because they were supportive not just in a financial sense. They were always interested in our research, our students and our successes, both professionally and personally."

Anderson agrees.

"Oliver and Betty were wonderful people, not just for what they did for the school, but they were the type of people who make a difference, whose influence has continued long after they've been gone."

It also shows in the alumni base.

"We've continued to build the program and it's reflected in the kind of people we graduate and how they perform professionally," Anderson says.

The support from the hiring community continues.

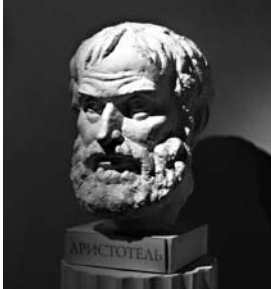


**FORMER AND CURRENT ESC FACULTY AND STAFF
PHOTO COURTESY OF TRAVIS HEYING.**

"We have a loyal and supportive communication and media advisory board composed of publishers, editors, general managers and the like who tell us this is the way to go," says Huxman. "They want students who can communicate well in multiple contexts and platforms. They don't want a trade school or a J-school mentality where the educational mix is far more narrowly prescribed."

To celebrate the anniversary, the ESC held several programs that acknowledged the role of the school and its many successes. Featured speakers included **John Stossel**, longtime ABC co-host of "20/20"; **Vernon Keel**, ESC's founding director; **Sara Quinn**, visual leadership director at the Poynter Institute for Media Studies and 2009 ESC Outstanding Alum; and **Lee Whitman**, 2006 graduate and Emmy-winning filmmaker.

BARRIER RECIPIENT REFLECTS ON TEACHING CAREER



Daniel Russell, philosophy, is the 2009 recipient of the John R. Barrier Distinguished Teaching Award. This award is presented to a faculty

member in the humanities or behavioral sciences who has been cited by peers and students for his or her excellence in teaching, ability to influence the lives and career choices of students, and ability to enliven teaching and enrich student understanding.

Russell began teaching at Wichita State in 2000, regularly offering courses in ancient philosophy, ethical theory, political philosophy and applied ethics. He was awarded WSU's Young Faculty Scholar Award in 2003.

In nominating him for the award, a student wrote, "Dr. Russell came across as knowledgeable regarding his subjects, but also as one who recognizes the difficulties that face students. My fellow classmates and I always had the utmost respect for Dr. Russell and were appreciative and honored at the level of work he expected from us."

Another student wrote, "There is never a dull moment in Dr. Russell's classes because there is so much interaction between the students and him. In his classes there have been such great philosophical discussions that continue to stimulate my passion for philosophy."

Below Russell answers some questions about teaching and academia.

What makes for an effective teacher? What's most important for the classroom is to be prepared and

be ready every time. The material is new to students and the only time they may get it. If you have an active research program, that is where your energy comes from. Get students engaged. There's a big difference between passing along information and being an active contributor to what you're teaching. Set expectations early and give messages consistently.

What have students taught you? Students may look at material from a completely different point of view and in ways it had not occurred to me. You hope that happens and when it does, it's very nice. Because of technology, access to material has changed, but the written content hasn't. Students still have to do all the work. It's the same set of tasks but different approach to completion. I choose material based on rigor and my expectations, so they are well prepared later on.

What do you enjoy most as a faculty member? I enjoy the research aspect. The obvious benefit is that the material I'm engaged in is translated to the classroom. It's nice to see students take hold of something right away.

What brought you to your academic career? I knew early on I wanted to work in academia. In high school one of my teachers recognized my interests and abilities, particularly in regard to essay writing, and she encouraged that passion with alternative assignments.

Russell specializes in the works of Plato, Aristotle and Epicurus. His most recent book, "Practical Intelligence and the Virtues," was published by the Oxford University Press in 2008.

ESC TIMELINE

- 1985** - Task force begins meeting to create plans for an integrated communication program.
- 1989** - Oliver and Betty Elliott give donation to WSU for the program.
 - Kansas Board of Regents approves the program.
 - Founding director Vernon Keel hires 10 new faculty in first three years to make the program a reality.
- 1995** - Groundbreaking for new building takes place; it is named after the Elliotts.
- 2005** - Kansas Health Foundation gives donation for endowed distinguished chair, faculty fellowship, graduate student assistantships and visiting professorship.
- 2009** - Elliott School celebrates 20-year anniversary.

IN MEMORIAM

John Ballar Breazeale, 83, retired WSU administrator, died June 6 in Houston. Breazeale's career at WSU included serving as chairman of the physics department, dean of the graduate school, vice president for academic affairs and director of the Institute for Aviation Research and Development. Memorials may be made to the American Parkinson Disease Association or the American Diabetes Association.

Photo courtesy of Special Collections and University Archives, Wichita State University Libraries.



FACULTY & STAFF

Les Anderson, Elliott School of Communication, received the Kansas Press Association's Clyde M. Reed Jr. Master Editor Award. Anderson, former owner of The Ark Valley News in Valley Center, was recognized for a lifetime of contributions to the newspaper industry.

Dinorah Azpuru, political science, was an invited panelist at the Conference on Ethics in Democracy organized by the Ministry of Foreign Affairs of Canada, in El Salvador in November.

The League of Women Voters selected **Pat Dooley**, Elliott School of Communication, to be a member of "The Open World" delegation to Russia, May 11-23.

Albert Goldbarth, Adele Davis Distinguished Professor of Humanities-English, has been made an honorary member of Harvard's chapter of Phi Beta Kappa as part of providing this year's commencement poems for the chapter. Read the article and hear his speech at <http://harvardmagazine.com>.

Kevin Hager, Elliott School of Communication, was named Best of Champion in the News Division by the Broadcast Educators Association.

William Hendry, biological sciences, served as a member of the Cellular, Molecular and Integrative Reproduction Study Section review committee for research grant applications submitted to the National Institutes of Health.

The Arts Council presented **Jerry Martin**, anthropology, with the Arts Advocate Award.

Sal Mazzullo, geology, received the Planalp Award for best poster-session presentation at the American Association of Petroleum Geologists convention in October. His co-authors on this research, which focuses on Mississippian-age petroleum reservoir rocks in subsurface Kansas, are **Brian Wilhite** and **I. Wayne Woolsey**.

Cheryl Miller, assistant dean, received first-place honors from the National Federation of Press Women 2009 Communications Contest.

Les Anderson, Elliott School of Communication, received an honorable mention.

Michael Palmiotto, School of Community Affairs, was awarded a summer Fulbright Specialist

Award to Serbia, where he lectured to University of Belgrade Law and Security faculty, met with American Embassy officials, gave three lectures at the University of Kragujevac and attended and presented a paper at an international police conference in Macedonia.

Chris Rogers, biological sciences, was appointed associate editor for *The Auk*, the world's top-ranked scientific journal in avian biology.

Carolyn Shaw, political science, was an invited speaker at the Headline Seminar on the Regional and Global Dimensions of Conflict and Fragility sponsored by the World Bank in Addis Ababa, Ethiopia in October. The seminar was designed to seek the guidance of global leaders and practitioners and to stimulate debate and inform the World Bank's strategic and operational thinking on various aspects of fragility and conflict. Shaw's presentation addressed the conflict resolution efforts of the Organization of American States.

Wan Yang, geology, was an invited speaker for the meeting of the Chinese Academy of Sciences in Beijing in August.

RESEARCH GRANTS & AWARDS

Victoria Shaffer, psychology, was awarded \$99,999 by the Foundation for Informed Medical Decision Making to examine the effectiveness of informational videos about breast cancer treatment options designed to improve breast cancer treatment decisions.

Louis Medvene, psychology, is a recipient of the Gridley Hoover Pilot Research Program Award through WSU's Regional Institute on Aging. It is a one-year, \$20,000 research award.

Wan Yang received \$65,000 from the American Chemical Society Petroleum Research Fund for "Anatomy of a half-graben, NW China."

NEW HIRES

Jodie Beeson, School of Community Affairs
Eric Wilson, Elliott School of Communication

RETIREMENTS

Judith Johnson, history
Phillip Thomas, history and former dean

Dear alumni and friends,

Much attention is given to the state of the environment, and last October the Kansas Board of Regents asked state institutions to give annual reports about sustainability programs. To develop the document for the college, I asked the departments to report their relevant activities and compiled the results.

Most college departments have dramatically cut paper use by moving to electronic versions of syllabi, some examinations and scholarship applications. Not surprisingly, our biological sciences department took the lead with course offerings, research, programs and volunteer efforts. The department offers seven sustainability-themed courses, and eight other departments offer 13 courses.

Our faculty turned in many interesting activity reports, some of which follow.

This May, **Les Anderson**, Elliott School of Communication, took a class of communication students to Greensburg, Kan., to cover the rebuilding effort ongoing since the devastating EF5 tornado on May 4, 2007. **Chuck Koeber**, associate dean and sociologist, researches the recovery and economic development efforts of the town, which is working to rebuild itself into a model of community sustainability.

Karen Brown, biological sciences, researches deleterious impacts of agricultural chemicals on survivorship/reproduction of aquatic organisms, with the intent of identifying factors that might help in efforts to understand the alarming rate of species loss and aquatic habitat destruction. She also conducted research with the Kansas Department of Health and Environment that examined different "best management practices" for golf courses intended to maintain surface water quality.

Collette Burke, geology, directs the Center for Environment and Human Health, dedicated to serving Kansas environmental groups, community coalitions, networks of community members and non-profit health and human service organizations working to improve the environment of Kansas and the health of Kansans.

Francis D'Souza and **Paul Rillema**, chemistry, study artificial photosynthesis and alternative energy production.

Greg Houseman, biological sciences, conducts research on the processes that control the development and maintenance of ecological communities with emphasis on species diversity, invasion and ecosystem production in prairie communities.

In 2008, the **Hugo Wall School of Urban and Public Affairs** hosted many workshops and meetings that addressed sustainability issues, several of which focused on water use and conservation.

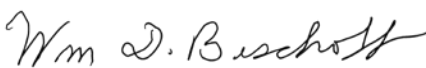
Mary Liz Jameson, biological sciences, researches relationships between biodiversity and genomics.

Chris Rogers, biological sciences, conducts research on the demography and conservation of the cerulean warbler, including the effects of forest conservation, deforestation and reforestation.

Bill Stevenson and **Dennis Burns**, chemistry, research corrosion-free carbon-based composite materials that have an indefinite lifespan.

As a geologist, I am concerned with the environment and am grateful for the work our departments do toward conservation, research and sustainability. A small improvement made many times from several points leads to overall change for the better.

Sincerely,



William D. Bischoff, dean



WILLIAM D. BISCHOFF

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