UNMC’S 2010
SCIENTIST LAUREATE
UNLOCKS GENETIC MYSTERIES
ON THE COVER:
Shelley Smith, Ph.D., is the 2010 Scientist Laureate, UNMC's highest honor for an investigator.

SAVING NEWBORNS WITH A SIMPLE BACTERIA
Probiotics may be all newborns in developing countries need to protect them from deadly bacteria.

UNDERSTANDING EDISON
UNMC's new Scientist Laureate identifies genetic mutations that influence learning disabilities, including dyslexia, with which Thomas Edison struggled.
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unmc.edu/discover
I t has been my great pleasure to write the opening letter for each issue of UNMC Discover, but this will be my last. I’ll be stepping down as vice chancellor for research on July 1 after 10 years, and returning to the academic ranks. Both of these are occasions for great joy for me. I am excited to get back to the basic business of this great academic institution. At the same time I feel fortunate to have been a player in the administration during the past decade of unprecedented growth of the UNMC research enterprise. I knew this game was going to be fun from the beginning, when the hand I was dealt by Chancellor Maurer had two big aces: the tobacco settlement funds, and the magnificent Durham Research Centers. I was challenged to design the strategic deployment of both of these. They have proven to be a winning pair.

I am extremely proud that some of my ideas for the research strategic plan have worked out as well as they have, implemented by the excellent work of a truly dedicated team. Achieving new record levels of extramural research support, year after year, is the most obvious result of the success of the strategic plan. But these grants and contracts are a result, not a cause. The causal agent is our ever-expanding corps of outstanding scientists, many of whom already are recognized as the world’s best in their respective fields, and who form the nucleus for critical masses of expertise that attract even more research dollars and the attention of other scientists around the world.

The burgeoning UNMC research culture is rich in innovation, well-endowed with scientists whose names are recognized internationally, and I am extremely optimistic about its future. There will be challenges, to be sure. For example, the National Institutes of Health (NIH), the largest and most successful biomedical research machine the world has ever known, is our major source of support. Currently, the ability of the NIH to continue apace is threatened by the economy and by the need to cut the federal budget. But UNMC scientists already have shown their unique ability to win a disproportionately large share of the available NIH dollars, and there is no reason to expect that this power will disappear suddenly in 2011. UNMC research will continue to grow and prosper. You can bet on it.

Dr. Tom Rosenquist, Ph.D.
UNMC Vice Chancellor for Research
Whether you are researching cures, finding treatments, providing patient care and outreach, or restarting your healthcare career...

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Department of Economic Development
UNMC names Dr. Jennifer Larsen vice chancellor for research

A key cog in UNMC’s thriving research enterprise, Jennifer Larsen, M.D., has been named vice chancellor for research.

“Dr. Larsen provides a new spark for the research enterprise at UNMC,” said Chancellor Harold M. Maurer, M.D. “She’s strong in clinical research, but understands the importance of basic research. She’s very creative. In a short time, she has put together the infrastructure to allow UNMC to better capitalize on federal support.”

Dr. Maurer said one of Dr. Larsen’s first tasks will be to recruit an associate vice chancellor for basic research to work with her to continue to grow basic research.

Dr. Larsen will assume her new duties on July 1. She will succeed Tom Rosenquist, Ph.D., who has headed UNMC’s research program since 1999.

Dr. Larsen joined UNMC in 1987 and has held several key positions. She developed the Clinical Research Center in 1995 and has been its only director. She has served as chief of the section of diabetes, endocrinology and metabolism since 1997. Last year, she was named associate vice chancellor for clinical research.

“This is an exciting time for research,” Dr. Larsen said. “We are beginning to understand how the body works at a cellular and genetic level and are using that information to tailor medical care to our patients.”

A harder look at lung disease in hog farmers

UNMC has received two grants totaling about $3.5 million to look deeper into the cause of lung disease, which plagues workers in hog farms and other agricultural settings. Deb Romberger, M.D., and Jill Poole, M.D., of the UNMC Department of Internal Medicine, received the National Institutes of Health grants to evaluate how the immune system recognizes and responds to organic dust that is commonly encountered by hog farmers.

“A lot of research has been done in this area, but my research shows we might be focused on the wrong problems,” Dr. Poole said. “We want to determine the important agents within the dust; then we can try to reduce exposure to them.”

It’s estimated more than one-third of those who work in animal, swine and dairy facilities, develop lung disease related to dust exposure. Drs. Romberger and Poole hope the research leads to new treatments to reduce airway inflammation before it causes disease in workers.

Listen to Dr. Romberger explain this research.

$9 million to study aging and HIV infection

Howard Fox, M.D., Ph.D., has received a National Institutes of Health Center Grant totaling $9 million to investigate the now chronic nature of HIV infection and its interaction with aging.

Dr. Fox is a professor in the UNMC Department of Pharmacology and Experimental Neuroscience and senior associate dean of research and development for the College of Medicine. He leads a research group that investigates issues of aging and HIV infection.

The grant allows researchers to study how the aging process interacts with HIV and treatments in the now prolonged lifespan of infected individuals.

“Fortunately current therapy allows those who are infected with HIV to lead a relatively normal life,” Dr. Fox said. “However, we are finding that many people are not having trouble with the immune effects of viral infection, rather they are affected by other disorders that are associated with aging, such as cardiovascular and neurodegenerative diseases.”

While HIV-infected individuals are living longer, damaging effects of HIV persist in the brain and may interact with other neurodegenerative disorders. Researchers will investigate new ways to diagnose, predict, treat and prevent brain damage induced by HIV using a systems-biology approach.

The research may lead to new ways to prevent and treat HIV-induced neurodegenerative disorders and other neurodegenerative ailments.

Learn more about Dr. Fox’s research group.

Research climbs in U.S. News rankings

UNMC’s research program moved up in the 2012 U.S. News & World Report rankings of the nation’s top graduate schools. In the latest rankings, research tied for 66th, up from 71st last year.

In addition, UNMC’s primary care program ranked seventh, up from 14th last year, and rural medicine tied for 15th, up from 17th last year.

“These are three of our most important programs and it’s gratifying to see them move up in these rankings,” said UNMC Chancellor Harold M. Maurer, M.D.

Read the story in UNMC Today.
Link to U.S. News & World Report
New technology provides protection from periodontitis

A drug delivery system that, in the form of a mouthwash, provides long-lasting protection from cavities, periodontal disease and bad breath has caught the attention of the pharmaceutical industry.

The system delivers an antimicrobial drug that swiftly coats the teeth and prevents harmful bacteria from taking hold.

Dong Wang, Ph.D., associate professor of pharmaceutical science, collaborated on the tooth-binding micelle technology with Richard Reinhardt, Ph.D., D.D.S., professor and co-director of undergraduate periodontics at the UNMC College of Dentistry, Ken Bayles, Ph.D., professor of pathology and microbiology and Director of the Center for Staphylococcal Research (CSR), and Kelly Rice, Ph.D. assistant professor of University of Florida, also a former member of the Bayles’ group.

This technology became one of three core technologies for a spin-off company, Versalion. The company was formed by Jack Hartwigsen, Ph.D., and a former pharmaceutical executive Carroll “Bo” Allen. Hartwigsen, chief operating officer of Versalion, also is an adjunct consultant with UNeMed, UNMC’s technology transfer arm. Allen is president and CEO of the company.

Formed in Delaware, Versalion will be reincorporated in Nebraska, Hartwigsen said, to be closer to UNMC. The company now seeks investors who will support the development of the technology and make it more attractive for licensing by industry.

UNMC study looks at brain inflammation

A UNMC research team has determined that brain inflammation disrupts the ability of cells to communicate in large groups and may enhance neuron death and lead to worse disease outcomes.

The study was reported in a recent issue of The Journal of Neuroscience, one of the leading neuroscience journals. The research team included Nikolay Karpuk, Ph.D., Maria Burkovetskaya, Teresa Fritz, Amanda Angle and Tammy Kielian, Ph.D., all in the department of pathology and microbiology.

The research found that brain inflammation leads to disturbances in the normal properties of astrocytes, which maintain equilibrium in the brain and are beneficial to the survival of neurons.

“If we can understand the molecular events responsible for how cells communicate in the brain, we may be able to harness this information to devise novel treatments that could impact the course of neurodegenerative diseases,” Dr. Kielian said.

Dr. Vennerstrom helps develop single-dose malaria drug

Jonathan Vennerstrom, Ph.D., professor in UNMC’s College of Pharmacy, has helped lead the discovery of a single-dose oral antimalarial drug candidate.

The drug — OZ439 — tested well in Phase I clinical trials and now moves into Phase II trials. Other comparable drug candidates must be taken three times daily, but a single dose is more convenient and helps ensure patients get the right amount of medicine. Also, the cost to manufacture OZ439 is about half that of a comparable candidate.

Dr. Vennerstrom’s research on the drug was supported by Medicines for Malaria Venture, a nonprofit organization based in Geneva, Switzerland, which receives 60 percent of its funding from the Bill and Melinda Gates Foundation.

Dr. Vennerstrom worked with team members from Monash University in Australia and the Swiss Tropical Institute in Basel, Switzerland.

The discovery of OZ439 recently was reported in the science journal Proceedings of the National Academy of Sciences.

Read the journal articles.
Everyone knows Thomas Edison was a brilliant scientist. Most people don’t know he was dyslexic.

Kicked out of school because he was “dumb,” the inventor of the phonograph, motion picture camera and light bulb also struggled with words and speech.

UNMC’s Shelley Smith, Ph.D., has studied the relationship between genetics and learning disabilities, including dyslexia, and she may have the answer as to why Edison struggled.

A few years ago, Dr. Smith and her collaborators discovered a link between a particular gene and language impairment. The “KIAA0319” gene on chromosome 6 previously had been associated with reading disability. The finding, which has since been replicated by others, shows it can affect both reading and language.

“It had been thought that reading disability, language impairment and speech disorder...
were entirely separate conditions, and they are usually diagnosed separately and treated separately,” Dr. Smith said. “The finding confirms that there are common factors. It also helps explain why some kids have problems in more than one area.”

The director of developmental neuroscience at UNMC’s Munroe-Meyer Institute, Dr. Smith localizes and identifies genetic mutations that influence developmental disorders, primarily language disorders such as dyslexia. This spring, she was named the 2010 Science Laureate, the highest honor for a UNMC investigator.

“Dr. Smith’s diligence and hard work are inspiring and have led to her achieving a global reputation as a leader in 21st-century genetics,” said Tom Rosenquist, Ph.D., vice chancellor for research. “She truly embodies the characteristics we seek in a Scientist Laureate.”

While language involves vocabulary and grammar, and speech involves accuracy of sound production, both contribute to a child’s ability to read. The finding that a certain gene could influence all three abilities suggests a common pathway contributes to overlapping strengths or weaknesses across speech, language and reading.

“Some thought it was impossible to find anything because so many genes influenced these disorders,” she said. “We, and others, continue to show we can find these genes.”

Redefining the conditions to recognize the overlaps could lead to more effective treatment, she said, whether it is through clinical therapy or medication.

Previous studies had not found such overlap. Reading disability genes appeared on certain chromosomes, and language impairment genes had been localized to other chromosomes.

“It made us think that maybe there were fundamental differences between the two disorders, but that seemed unlikely since they were often seen in the same kids,” Dr. Smith said. “Our finding helps to clarify things. We’ve shown that in some cases there really are genetic overlaps between the two disorders.

“We also found some association with speech problems. To test that completely, we are studying a population of kids who are primarily diagnosed with speech disorder.”

As the genes that influence learning disabilities are defined and the cognitive overlaps between disorders worked out, genetic studies will be able to confirm which diagnoses have common genetic effects and which are distinct.

“It’s likely that the current diagnostic criteria may be modified,” Dr. Smith said. “A better definition of the three disorders should lead to optimal treatment procedures based on deficits that are closer to the underlying causes than clinical symptoms alone.”

Dr. Smith believes other genes will be found that account for all three disorders. She hopes to do further studies to determine how the genes interact in order to better understand how the brain handles reading and language information.

“Next, basic science researchers can determine exactly what these genes do and how they really interact, which will tell us about normal brain development and what goes wrong in these disorders.”

Dr. Smith’s interest in genetics grew out of a thesis project involving a Swedish family with significant dyslexia. “It looked like a dominant trait and in those days those were the types of traits you could find genes for,” she said. “We naively went into this thinking we could find these dominant families and the gene localization would be easy. We actually did find some families and they serendipitously led us to the right place.”

They published a linkage in 1983, but also realized that the inheritance of dyslexia was much more complex than a simple dominant trait. It wasn’t until technology and computing power advanced that they were able to discover the more-difficult-to-find quantitative trait genes. “Now, everyone is interested in complex genetic traits.”

As technology advanced, so did her research. In the mid-90s, better DNA markers further propelled her work and her group identified a region on chromosome 6, which was quickly replicated by researchers at Yale and Oxford Universities. “Everything just broke loose,” she said. “The work remains intriguing. I’m lucky to have a fantastic group of people in the laboratory (Judy Kenyon, Denise Hoover and James Askew) and great collaborators across the country.”

Dr. Smith also oversees a $10.4 million Center of Biomedical Research Excellence (CoBRE) grant that provides research opportunities as well as career-development and mentoring for junior faculty to jumpstart their careers. She also co-directs the M.D./Ph.D. program, which has grown to 26 students.

While she enjoys traveling, rock climbing and gardening, Dr. Smith’s passion lies with the research and the families being served including one that sends the lab cookies each year.

“I think of science as being really elegant,” she said. “There’s a constant challenge of wanting to see how it works because the answers are lovely.”

“Dr. Smith’s diligence and hard work are inspiring and have led to her achieving a global reputation as a leader in 21st-century genetics.”

Tom Rosenquist, Ph.D., vice chancellor for research

Dyslexia is the most common learning disability with a prevalence of about 9 percent in American school children. Language impairment is the second most common at about 7 percent. Speech disorders rank high as well.
Each day, UNMC researchers identify and study critical questions that lead to new knowledge and, in the long term, life-changing therapies.

This year, 23 researchers were recognized as Distinguished Scientists and New Investigator award winners for 2010. An unexpected Honorary Scientist Laureate award was presented to Tom Rosenquist, Ph.D., vice chancellor for research, in recognition for his achievements as a scientist of congenital heart defects and as one of UNMC’s foremost research leaders.

The researchers study some of the world’s most complex health issues from cancers to infectious diseases to aging to HIV/AIDS.

Now in its fifth year, the chancellor-sponsored awards recognize UNMC researchers who have been among the most productive scientists in the country over the past five years. Each are recognized leaders in their field and, this year, represent the UNMC colleges of medicine, nursing, pharmacy and the Eppley Institute for Cancer Research.

Distinguished Scientist recipients must lead an outstanding research program, publish research results in journals of the highest quality and show an ability to attract and retain extramural funding.

New Investigator awards go to outstanding UNMC scientists who, in the past one to three years, have secured their first funding from the National Institutes of Health, the Department of Defense or other federal sources. New Investigators also must demonstrate scholarly activity such as publishing their research and/or presenting their findings at national conventions.

Distinguished Scientists and New Investigators receive merit-based salary supplements of $10,000. As Scientist Laureate, Shelley Smith, Ph.D., director of developmental neuroscience at UNMC’s Munroe-Meyer Institute, received a $20,000 supplement. Named a Distinguished Scientist in 2006, Dr. Smith localizes and identifies genetic mutations that influence developmental disorders, primarily language disorders such as dyslexia.

Honorary Scientist Laureate
Tom Rosenquist, Ph.D.

2010 Scientist Laureate
Shelley Smith, Ph.D.

Michael (Tony) Hollingsworth, Ph.D.*
Eppley Institute
Pancreatic cancer

Tahir Tahirov, Ph.D.
Eppley Institute
HIV

Youri Pavlov, D.Sc., Ph.D.
Eppley Institute
Mutations and cancer

* denotes two-time Distinguished Scientists
2010 Distinguished Scientist Award Winners

Surinder Batra, Ph.D.*
College of Medicine
Pancreatic cancer

Shilpa Buch, Ph.D.
College of Medicine
NeuroAIDS

Wing (John) Chan, M.D.*
College of Medicine
Lymphoma

Samuel Cohen, M.D., Ph.D.
College of Medicine
Carcinogenesis, toxicology

Polina Shcherbakova, Ph.D.
Eppley Institute
Mechanisms of mutagenesis

Karen Gould, Ph.D.
College of Medicine
Autoimmune disease, cancer

R. Lee Mosley, Ph.D.
College of Medicine
Parkinson’s disease

Matthew Zimmerman, Ph.D.
College of Medicine
Hypertension

Wing (John) Chan, M.D.*
College of Medicine
Lymphoma

Samuel Cohen, M.D., Ph.D.
College of Medicine
Carcinogenesis, toxicology

Polina Shcherbakova, Ph.D.
Eppley Institute
Mechanisms of mutagenesis

Karen Gould, Ph.D.
College of Medicine
Autoimmune disease, cancer

R. Lee Mosley, Ph.D.
College of Medicine
Parkinson’s disease

Matthew Zimmerman, Ph.D.
College of Medicine
Hypertension

2010 New Investigator Award Winners

Jing (Jenny) Wang, Ph.D.
Eppley Institute
Cancer metastasis

Stephen Bonasera, M.D., Ph.D.
College of Medicine
Aging of the brain

Yulong Li, M.D., Ph.D.
College of Medicine
Heart failure / diabetes

Hui Peng, M.D.
College of Medicine
HIV associated dementia

Gary Cochran, Pharm.D.
College of Pharmacy
Medication safety

Jered Garrison, Ph.D.
College of Pharmacy
Radiopharmaceuticals for cancer

Huangui Xiong, M.D., Ph.D.
College of Medicine
NeuroAIDS

Carol Pullen, Ed.D.
College of Nursing
Health promotion of at risk, rural women

Matthew Zimmerman, Ph.D.
College of Medicine
Hypertension

Gary Cochran, Pharm.D.
College of Pharmacy
Medication safety

Jered Garrison, Ph.D.
College of Pharmacy
Radiopharmaceuticals for cancer
SAVING NEWBORN LIVES WITH SIMPLE BACTERIA

by Jo Giles
In their first days of life, babies in developing countries often acquire sepsis — infections in the bloodstream and the respiratory tract.

Almost 50 percent of neonatal deaths in resource-poor nations are due to this condition. In the western world, sepsis continues to be a major cause of morbidity and mortality of preterm infants.

Differences in technology, access to hospitals and advanced health care factor into the devastating outcomes, said Pinaki Panigrahi, M.D., Ph.D., director of UNMC’s Center for Global Health and Development in the College of Public Health.

A $4.5 million grant, co-funded by the National Institutes of Health (NIH) and the Bill and Melinda Gates Foundation, supported the first, large-scale surveillance of neonatal infections in India.

Dr. Panigrahi and his research team trained community workers to go into rural villages, look for symptoms of sepsis and educate mothers and caregivers to bring sick babies to field hospitals.

By using these rural sites, hospitals and sophisticated analyses at the attached hospitals, his team showed that the infection did not come from perinatal practice or from the mother as conventionally thought. Rather bacteria present in the baby’s own gut flora were the culprit.

In a novel approach, Dr. Panigrahi’s team used probiotics — friendly bacteria found in yogurt — to prevent infections in the neonatal period.

“We have shown positive results in two hospital-based clinical trials that probiotics made a difference,” he said. “This led to the launch of a large field trial testing the effects of probiotics in 3,600 infants.”

An additional $2.5 million grant funded by the NIH supports that research project. If this simple and inexpensive treatment becomes standard practice, it could save the lives of millions of children worldwide.

However, the treatment isn’t just for the developing world, Dr. Panigrahi said. The same therapy can be applied in the intensive care units in the western world to save millions of dollars in the treatment of sepsis in preterm infants.

That is the benefit of global research. "We isolate a problem, develop and test a low-cost intervention and share our results," Dr. Panigrahi said. “Our world is so connected that what we learn in rural India can impact the health of a community in Nebraska.”

Nearly 23 percent of the people in the United States smoke, which means that about 23 percent of the people are at higher risk of heart attack and stroke.

This makes cigarette smoking the No. 1 preventable cause of death in this country and a major public health problem.
Cigarette smoking damages the lungs of the smoker and seriously affects people who live or work with them—a result commonly called secondhand smoke.

The link between smoking and lung disease is a classic example of the benefit of public health research. Investigators from multiple disciplines tackle health issues in an effort to improve community wellness.

For example:

- An epidemiologist looks for the link between smoking and negative health outcomes in a certain population;
- A basic science researcher isolates a chemical to study the environmental cause and health effects of the exposure;
- A health behavior researcher considers how to encourage people to quit smoking;
- A biostatistician ensures the studies are correctly designed to achieve clear results and analyzes the data; and
- A health services researcher examines how health care is delivered to a community.

“Our researchers seek to understand a disease and its cause,” said Jim Anderson, Ph.D., associate dean for research in the College of Public Health. “Our mission is to assess the health of populations, study interventions and test those interventions to make sure they have a positive impact on the public’s health.”

From lab to clinic to community

It may be genetic or a result of exposure to a certain chemical or both. Either way, the lungs of children who have asthma can have certain biomarkers.

Understanding the link between the environmental cause and the effect on health outcomes can go beyond lab science.

“With controlled experiments, we can establish a cause and effect and discover why diseases progress,” said Sandra Wells, Ph.D., assistant professor in the environmental, agricultural and occupational health department. “As part of public health research we can take those findings, share them with clinicians to look for similar effects and collaborate to develop prevention strategies and disease interventions.”

Dr. Wells’ research into lung injuries from asthma and secondhand methamphetamine smoke complements the research focus of Todd Wyatt, Ph.D., associate professor in the environmental, agricultural and occupational health department.

He studies the ramifications of tobacco and alcohol on lung disease.

“Chronic lung disease is now the third highest cause of death in the U.S.,” Dr. Wyatt said. “Basic science research — where we identify environmental or occupational causes of lung injury — can inform the public and have a positive impact on improved health.”

Dr. Wyatt examines what exposures cause lung injury and why innate lung defenses failed to prevent the injury.

Laboratory research is a critical part of public health, he said.

“Our goal isn’t to develop and patent a new drug. Our goal is to understand why prevention goes wrong and develop strategies to address disease in large populations. We are all focused on the health of the public and prevention of disease.”

Working with community partners — “They don’t call it research”

When it comes to underserved communities, partnership building is the foundation of any “research” project. That is the goal of the Northern Plains Comprehensive Cancer Control Program which is operated by the Great Plains Tribal Chairman’s Health Board. It is designed to focus on the disparities in cancer outcomes of Native American populations in Nebraska, Iowa, North Dakota and South Dakota.

The community — not academic researchers — drives the program, said Shinobu Watanabe-Galloway, Ph.D., associate professor in the epidemiology department.

“It’s our mission to serve the community,” she said. “We don’t do research on them. Everything starts with the people in mind and has the blessing of the tribal council.”

In 2005, the group appointed Dr. Watanabe-Galloway to serve as program director. Since then, she has worked with program staff at the health board to develop a grassroots approach to reduce cancer disparities.

Native Americans in the Northern Plains region have disproportionate cancer disparities and have the highest cancer death rates among Native American populations nationally. Also, when compared to their white counterparts, they have an elevated risk of developing and/or dying from lung, colorectal, breast, cervical and prostate cancers.

Cervical cancer is a high priority for the community.

Native American women are more likely to be diagnosed in the late stages of cancer and die than women of other racial or ethnic groups.

“Cervical cancer is a preventable disease so this shouldn’t happen,” Dr. Watanabe-Galloway said. “The program decided to take on this issue, promote the HPV
(human papillomavirus) vaccine and provide community education.

“Because the community is involved, they take ownership of developing interventions that can improve health outcomes,” she said.

As an epidemiologist, Dr. Watanabe-Galloway examines data to create a picture of the health of a community. However, there is not much data on the health issues of Native Americans. One of her research projects involves this disparity of information and addresses tribal sovereignty and ownership of health data collected in tribal communities.

“Talking about data isn’t very exciting but it is critical to obtain, analyze and share with the tribal council. They then use the information to advocate for resources to treat cancer patients,” Dr. Watanabe-Galloway said.

A new effort to partner with South Omaha community members to answer their leading health questions is underway with a grant from the National Institutes of Health.

Led by Magda Peck, Sc.D., principal investigator and associate dean for community engagement and public health practice, and Christopher Fisher, Ph.D., project director, the goal is to build trusted relationships with the Hispanic community, analyze its top health concerns and prepare the public to partner in research projects.

The end result is not only better health but initiatives with lasting community value.

Health behavior - What causes people to do…?

Someone has to ask the question, “Why do people who have financial stress continue to spend money on tobacco?” That person is Mohammad Siahpush, Ph.D., professor in the health promotion, social and behavioral health department. He examines the link between social aspects of health and the resulting behavior.

In one study, Dr. Siahpush compared the quit rates of smokers in the United States, Canada, United Kingdom and Australia.

He found:

- Smokers who have financial stress are more likely (than other smokers) to want to quit smoking.
- Despite their interest in quitting, they are less likely to actually try or succeed in quitting.

“They realize that smoking is costing them money and if they quit it may help alleviate some of their financial problems. So, they are very interested in quitting smoking. They just don’t take the next step and make an attempt,” Dr. Siahpush said.

This is where the unique nature of financial stress contributes to the outcome.

“Many people smoke to relieve stress or sadness. And financial problems are stressful situations. When people face potential job loss, home loss or divorce, they use smoking as a coping mechanism for their stress,” he said.

It is a vicious cycle. Smokers want to quit but don’t — and the habit causes more financial stress, making it harder to quit.

That is why Dr. Siahpush and his colleagues recommend smoking cessation counselors routinely assess the financial stress of their clients and provide additional counseling on money management to help ease stress.

As another study shows once their bottom-line improves…so does their ability to give up cigarettes and live healthier.ﬁ
Nebraska Coalition for Lifesaving Cures believes in research. That is who we are. That is what we support.

We invite you to join us. Help support and protect lifesaving research in Nebraska.

For more information, visit www.nebraskacures.org.

Cures save lives.
Narrow, hot pink sticky tabs peak out from the pages of the Grant Application Writer’s Workbook.

Always within reach, the 195-page manual — the self-proclaimed Bible used by Editorial Grants Associate Jessica Mercer, Ph.D. — is littered with tabs, each a shortcut for how to build a winning grant proposal.

Since opening the new Research Editorial Office in March 2010, Dr. Mercer has reviewed more than 60 grant proposals. She also has educated researchers on the new National Institutes of Health (NIH) grant guidelines and polished her technical skills on an array of grants from R01s (NIH Research Project Grant Program) and R03s (NIH Small Grant Program) to STTRs (Small Business Technology Transfer Program) and NSF (National Science Foundation) applications.

“The best part of the job is when you get good news that a project is funded,” she said.

The office, a new support service offered by the vice chancellor for research, provides investigators with editorial support, proposal development and assistance to improve the grant’s clarity, fluidity, consistency, organization and style.

“I provide another set of eyes,” Dr. Mercer said.

Dr. Mercer’s experience with scientific writing began as a UNMC graduate student studying HIV-associated dementia. Her mentor often asked her to read and edit the lab’s grants and manuscripts.

After graduating in 2007 with her doctoral degree, she taught biology courses at Creighton University and the University of Nebraska at Omaha, but wanted a new challenge. Then, she learned of the UNMC position. The opportunity to be a resource for researchers appealed to her science background and her love of writing and editing.

“There was a large learning curve,” she said. “I thought I knew how to write an NIH proposal, but then I learned the format changed.”

The NIH had shrunk the requirements for an R01 proposal from 25 pages to 12 and revised its review process. So, Dr. Mercer immersed herself in strong proposals, talked with reviewers on study sections and brushed up on her grammar skills and the mechanisms for writing successful grants.

“Grant writing is a learned skill,” she said, “but once you understand what reviewers look for they’re more likely to be your advocate.”

Today, her calendar fills quickly as researchers — from all departments and all levels of experience — contact her. She electronically reviews the various proposals and tracks proposed changes. And, she contributes to science in a way she never imagined.

Did you know, Dr. Mercer is:

- The granddaughter of Paul Gardner, Ph.D., a longtime anatomy professor at UNMC.
- Fond of animals (owns a cat and two dogs), bird watching, cooking and the outdoors.
- Only a few offices away from her husband, Aaron Mercer, a graduate research assistant in pharmacology and experimental neuroscience.
- Intellectually curious in many areas. In college, she studied chemistry and French (which included a six-month stay in France), psychology and statistics — not all at the same time. In the end, she graduated with a bachelor of arts degree in psychology from St. Olaf College in Northfield, Minn.
Regeneration of organs and tissue has been, until now, strictly the reality of science fiction — growing a new heart or liver in a petri dish or injecting stem cells to restore damaged tissue has long been a dream for many scientists.

Now, medicine is catching up with the imagination as researchers around the world use regenerative medicine therapies to help people live longer, healthier lives.

Researchers at UNMC have been pioneers in the use of peripheral stem cells and bone marrow transplantation to treat patients, but Chancellor Harold M. Maurer, M.D., gave this area of research a boost in November when he named Nora Sarvetnick, Ph.D., the founding director of the Nebraska Regenerative Medicine Project.

“I’m hopeful this will become a new center of excellence at UNMC, allowing us to make an impact on a variety of diseases and lead to increased research funding from the National Institutes of Health,” Dr. Maurer said.

As a stem cell researcher and professor of surgery and transplant immunology, Dr. Sarvetnick will move UNMC rapidly into regenerative medicine, one of the most important new fields in 21st-century medicine, said Tom Rosenquist, Ph.D., vice chancellor for research.

The field of regenerative medicine involves innovative medical therapies that enable the body to repair, replace, restore and regenerate damaged or diseased cells, tissues and organs. It encompasses a variety of research areas including cell therapy, tissue engineering, biomaterials engineering, growth factors and transplantation science.

Dr. Sarvetnick has identified four areas of growth for this program:

Diabetes — islet cell replacement or regeneration therapy may offer therapeutic benefit and perhaps a cure for people with diabetes. UNMC researchers want to understand cell growth response and develop pathways to make new beta cells, which are depleted in both type 1 and type 2 diabetes.

Intestinal cell biology — many children die each year waiting for a small bowel transplant. Intestines could be grown and used as a temporary fix for children waiting for a transplant.

Cardiovascular — more than 1.5 million people in the United States suffer from a heart attack each year. Tissues for heart valves and prosthetic patches for the aorta could be grown using the person’s own stem cells, which would lessen the chance of transplant rejection.

Liver — chronic hepatitis C is the 10th leading cause of death among adults in the United States and one of the most common reasons for liver transplants. Even then, the virus may attack the new organ. Hepatic cells that are resistant to viruses like hepatitis could be engineered to protect the new liver.

“We’ll take a collaborative, interdisciplinary focus group approach to identify critical problems in different organs or diseases and work out ways to solve them,” Dr. Sarvetnick said.

“I’m excited about doing clinically relevant research. We can make a difference.”
Parkinson’s disease literally wiped the smile from Nellie Faye Hagberg’s face.

Her smile had greeted thousands of East Africans, some of whom she tutored in English while she and husband, Ray, were missionaries for 36 years in Tanzania.

It had given hope and courage to her three children, all born and educated through high school in Africa.

Then, about 20 years ago, Parkinson’s disease began to mask her gregarious nature. “I was under the age of 60, so thought I was going through menopause,” she said.

Her face deadpanned, as muscles grew taut. Pain in her neck and shoulder lead her to a neurologist, who diagnosed the disease.

Now, her smile has returned thanks to an experimental drug taken since April through a clinical trial at UNMC.

“I feel like my old self again,” said Hagberg, 74. “I have more energy, more life. I’m smiling, joking around — even ornery. This medicine has allowed me to regain my sense of self.”

Parkinson’s disease, a degenerative disorder that kills dopamine-producing brain cells, causes tremors, stiffness, slowness and impaired balance.

About one million Americans live with Parkinson’s and there is no cure — though medications provide some relief.
At UNMC, Hagberg is one of two participants in a multi-institutional clinical trial to test the effectiveness and safety of a gel form of the drug levodopa-carbidopa. Although not accepting more patients at UNMC, the trial eventually will enroll 320 people from around the world. John Bertoni, M.D., professor of neurological sciences, is the principal investigator at UNMC.

The oral tablet form of levodopa-carbidopa is the primary drug prescribed in the United States, but may not be absorbed efficiently, said Carolyn Peterson, nurse coordinator of the trial. The gel form, which is marketed in Europe but not in the U.S., is pumped directly into the small intestine for 16 hours a day where it is absorbed into the bloodstream.

For the trial, Hagberg had a tube inserted into her stomach. She carries the pump and medicine in a pouch the size of a videotape slung over her neck and shoulder.

Every 40 days, she travels four hours from her Spencer, Neb., home to get a supply of medicine at UNMC. This will continue for the next four years or until the drug gains approval in the U.S.

Ray, her husband of 55 years, is her driver, companion and caregiver. “He keeps track of all my medicines, helps me all day and night and is there for me all the time. He helps me through the rough spots. There’s no way I could be in this study without his help. Care givers are unsung heroes.”

Hagberg looks forward to continuing in trials for this medication. “We can only make advances in medical care when people are willing to take a risk. Without participation, there won’t be progress,” Hagberg said.

“Somebody has to do it, why not me?”

Clinical trials pave way for new medicines

Before a new drug comes on the market, it must first pass through rigorous cellular, animal and finally human testing — or clinical trials.

Clinical trials determine how well new medical approaches work in people. Each study attempts to answer scientific questions and tries to find better ways to prevent, screen for, diagnose or treat a disease. Clinical trials also may compare a new treatment to a treatment already available.

At UNMC, clinical research has been expanding the past few years to improve patient care, safety and health outcomes. Two people at the forefront of this movement are Jennifer Larsen, M.D., associate vice chancellor for clinical research, and Chris Kratochvil, M.D., assistant vice chancellor for clinical research. Dr. Larsen was recently named the new vice chancellor for research effective July 1.

“We’re further developing our infrastructure for clinical research, integrating operations, and bringing together such partners as The Nebraska Medical Center, Children’s Hospital and Medical Center and affiliated institutions to provide increased resources and opportunities for clinical trials,” Dr. Kratochvil said.

UNMC is the home for the Center for Clinical and Translational Research and The Great Plains Center for Clinical and Translational Research, which is committed to innovative clinical and translational research that reduces rural health disparities and improves rural health.

Drs. Kratochvil and Larsen have created a number of research education seminars, symposia and workshops for faculty and staff to learn about different aspects of clinical trials. This fall, a six-part series will be offered to investigators on issues related to clinical research.

UNMC has specifically reached out to partner with pharmaceutical companies on new drug development and clinical trials. Recently, Quintiles, the largest clinical research organization in the world, named UNMC a prime site through which to conduct clinical trials. Dr. Kratochvil was named chief medical officer for UNeHealth to administer these agreements and connect researchers to externally sponsored study opportunities.

“This is exciting for the medical center and the region,” Dr. Kratochvil said. “We expect to eventually conduct an additional 30 to 50 new clinical trials per year at UNMC. These trials will involve a wide spectrum of patients, ranging from oncology and endocrinology to psychiatry and pediatrics.”

Drs. Larsen and Kratochvil developed a database of clinical trials being performed at UNMC available on the UNMC web site. Health care providers or patients themselves can search to find a study specific to a particular condition or disease. This clinical trials database can be found at: unmc.edu/clinicaltrials.

“Translational research links the expertise we have in the laboratory with our clinicians,” Dr. Kratochvil said. “It’s a growing area for UNMC and the National Institutes of Health.”

The ultimate goal: Move new medicines from the laboratory to the clinic more quickly to help patients.
Opportunity knocks for military families dealing with autism

Only one out of four adults with autism has a friend — less than 5 percent live independently. Without early intervention, long-term outcomes for the one in 91 children who have autism remain bleak. Applied behavior analysis — better known as ABA therapy — is a common and effective treatment method. But there are not enough practitioners to meet the need. This is especially problematic for military families stationed overseas in countries where opportunities for early diagnosis and treatment aren’t knocking.

Knock. Knock. It’s Wayne Fisher, Ph.D.

The director of the Center for Autism Spectrum Disorders at UNMC’s Munroe-Meyer Institute (MMI) has a plan to train 40 adults to treat autism and all that’s required is a high school diploma. Here’s the punch line: he’ll do it using the web, which means anyone near a military base anywhere in the world is eligible.

Thanks to a recently approved $1.5 million grant from the United States Army, Dr. Fisher and his team will recruit participants to educate via telemedicine as well as on site at MMI. The curriculum will include

- 40 hours of coursework;
- Web-based video clip observations of ABA therapy sessions conducted at MMI;
- Recorded role-play sessions with other trainees; and
- Corrective feedback on role-play performance by UNMC experts.

Dr. Fisher predicts even those with no formal training will conduct therapy sessions with 90 percent accuracy and master ABA concepts. Completion of the training would make them eligible for certification as an ABA tutor with Tricare, the health care program for active duty military.

“This project will directly impact the care available to military children with autism by increasing access to services,” he said. “And hopefully, it will lessen the overall stress on these families as they continue to serve our country.”

While the grant project is designed to test the effectiveness of telemedicine training, 20 children with autism from military families, including children of personnel stationed at Offutt Air Force base in Omaha, will benefit from ABA treatment. According to Dr. Fisher, such therapy lowers the average lifetime cost of caring for an individual with autism by $1.6 million.

In addition, Dr. Fisher believes those who are treated via telemedicine will progress just as much as children who receive traditional, in-person treatment.

“We’ll see a reduction in autistic symptoms and behaviors and improvements in communication and social skills,” he said.

Social skills that may lead four out of four adults with autism to have someone to call a friend.
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UNMC ranked No. 7, primarily speaking

Primary care is the foundation for all health care in the United States. At the University of Nebraska Medical Center in Omaha, our novel approaches to primary care medicine are recognized nationally. The US News & World Report ranks UNMC’s primary care program seventh, among prestigious universities such as Washington, North Carolina-Chapel Hill, Oregon Health and Science University, California-San Francisco, Colorado-Denver and Minnesota. At UNMC, we believe that teamwork—among our physicians, physician assistants, nurses, pharmacists, public health workers and others—ensures that our patients receive the best and most innovative care possible. We continually explore new models of team care and how to best educate the next generation of health care professionals, ensuring a healthier future for patients in Nebraska and across the nation. UNMC. Breakthroughs for life.