



Front Line

news from the Department of Pharmacology and Experimental Neuroscience



Translational Medicine

From the Bench to the Bedside

Taking ideas developed in a laboratory and moving them quickly to patients is the shared goal of researchers, clinicians and patients.

How do we move bench research to the clinic? Traditionally, basic research and clinical research are separate and divergent in both direction and scope. They are housed in separate departments, have independent governing bodies and commonly don't talk to one another. Simply put, each group is very separate.

But, a new approach – translational medicine – is changing the landscape of such interactions, and the University of Nebraska Medical Center is, as always, leading the way.

It starts with dialogue, discussion and a new vision. Open collaboration between clinicians and researchers lead to faculty recruitments, graduate training, technology development and better results for patients. Importantly, it leads to new inventions that will improve the quality of life of people stricken with neurologic disorders.

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2011 Community Pride Honorees

For the past six years, members of the Omaha community have been honored at the annual Community Pride in Neuroscience dinner for their behind-the-scenes support of research.

This year we were pleased to honor those most affected by diseases – patients and their caregivers.

In Alzheimer's disease to Parkinson's, HIV, multiple sclerosis, muscular dystrophy and other maladies, millions of people are diagnosed or affected by neurological diseases each year. Patients and caregivers rely on

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Letter from the Chair



Newsletter

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Yes, another amazing year!

I am pleased to stop and reflect on all the fantastic accomplishments seen through our works here at the University of Nebraska Medical Center (UNMC). Collaboration and synergy are the buzzwords for this year and now fit squarely with the theme of this issue of “Front Line” in translational neuroscience.

First and foremost, we welcome our new and old colleagues in behavioral and clinical neurosciences and the partnership forged with the Munroe-Meyer Institute, the Department of Neurological Sciences and others at UNMC.

The Nebraska Neuroscience Alliance is a wonderful accomplishment and builds on an already active and strong foundation in translational neuroscience from biomarker discovery (Howard Fox, M.D., Ph.D.); to nanomedicine (Alexander “Sasha” Kabanov, Ph.D.); to international bridge building (Jialin Zheng, M.D.); and to unraveling how nerve cells are damaged or protected from a host of noxious exposures (Shilpa Buch, Ph.D.). Notwithstanding the leadership in science, technology has solidly built the department to a stature not previously thought possible.

Clinical scientists actively engaged in neuroscience pursuits include Ken Follett, M.D., Ph.D., Daniel Murman, M.D., Tony Wilson, Ph.D., Diego Torres-Russotto, M.D., and Pam Santamaria, M.D., to name a few. Their leadership is seen beyond Nebraska boundaries.

The Department of Pharmacology and Experimental Neuroscience has emerged among the top ten federally funded research powerhouses in the United States. Such evolution has made us, arguably, an envy of many top institutions.

While the department is dedicated, in equal measure, to teaching health care providers and future scientists, its soul remains in discovery. Clearly, we face considerable challenges as our population ages; the prevalence for stroke, multiple sclerosis, neuromuscular disease, and neurodegenerative diseases will increase.

We stand at the very edge to seize opportunities to make real differences in the treatment of neurologic disorders. These are staggering, as is our quest to turn disease on its head. Our goal is simple - to seek a full life of joy and meaning for our patients.

Let us pause for a moment to look towards the future with excitement and anticipation. We thank our collaborators for their scientific efforts and the community for their continued support. The best is yet to come!

Howard E. Gendelman, M.D.

Chair, Department of Pharmacology and Experimental Neuroscience
Larson Professor of Internal Medicine and Infectious Diseases
Director, Center for Neurodegenerative Disorders

Bedside

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To meet such a pressing need, the Nebraska Neuroscience Alliance (NNA) was formed. NNA was created through our shared vision to remove barriers towards multi-disciplinary works and to drive clinical scientific advancements in neuroscience here in Nebraska and beyond. Personalized medicine, disease biosensors, tissue and cell specific drug delivery, theranostics, nanomedicine, brain regeneration, and immunization-based nerve cell repair are just a few directives ongoing right here in Nebraska, at our very own UNMC.

Our expectations are high for NNA. Predicted outcomes will target neurodevelopment, cognitive, behavior and movement disorders that include, but are not limited to, Alzheimer's and Parkinson's diseases, autism, brain tumors, amyotrophic lateral sclerosis, multiple sclerosis, viral infections of the brain, spinal cord, stroke and other genetic diseases.

Community support has and continues to be instrumental in providing basic and applied researchers funds for new innovative projects. This support has already reached international acclaim and laid the groundwork for developing better means to repair damaged brain cells for Parkinson's disease.

With a permanent endowment, the NNA will be in a position to fund pilot studies, both at the bench and in the clinic, in infectious and degenerative diseases of the nervous system. The idea is to take the most successful translational research and compete for federal support, subsequently moving them to clinical trials where discoveries change our patients' lives for the better.

We look forward to joining with you in making NNA a dream realized.

Howard E. Gendelman, M.D.
Professor and Chair
Department of Pharmacology and Experimental Neuroscience

J. Michael Leibowitz, Ph.D.
Hattie B. Munroe Professor
Director, UNMC's Munroe-Meyer Institute

Daniel Murman, M.D.
Associate Professor and Interim Chair
Department of Neurological Sciences



J. Michael Leibowitz, Ph.D, Daniel Murman, M.D. and
Howard E. Gendelman, M.D.

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Patients and Caregivers

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clinicians to guide them through the range of treatment options. Clinicians rely on researchers to develop new strategies to treat patients.

Many people, not only in the Midwest but also throughout the country and internationally, turn to the University of Nebraska Medical Center for treatment. Several patients and caregivers share how they got to UNMC and what the future holds for them.



Two years after her diagnosis of multiple sclerosis, Kim Kozelichki's physician said there was no more he could do for her.

Multiple sclerosis, a chronic disease of the central nervous system, affects over 400,000 people in the United States with 200 new cases each week. Symptoms include loss of balance, muscle spasms, numbness, weakness in extremities, double vision, slurred speech and many other symptoms.

"This was like a kick in the gut," said Kim.

However, her physician didn't stop there; he directed her to UNMC where they specialize in MS. Rifaat Bashir, M.D. took over Kim's care, followed by Rana

Zabad, M.D. and nurse practitioner Kathi Healey, Ph.D. Wanting to be as active in her treatment as she could, Kim supports clinical trials. She currently is one of five patients at UNMC in the University of Wisconsin PoNS unit study.

"We want to tell researchers and clinicians - thank you for hope and not forgetting about the people who have these diseases."

Kim and Todd Kozelichki

"Developed by the Tactile Communication & Neurorehabilitation Laboratory at UW-Madison, the PoNS (Portable Neuromodulation Stimulator) unit delivers millions of pulses of energy on the tongue that then stimulates the brain stem," said Max Kurz, Ph.D., study leader at UNMC Munroe-Meyer Institute. "The preliminary results show large improvements in the standing and walking balance of the participants."

Kim and Todd, her husband, agree that research is important. It provides critical knowledge about the disease and hope for patients.

"We want to tell researchers and clinicians at UNMC thank you for hope and not forgetting about the people who have these diseases," said Kim and Todd.



When a father hears his daughter say, "Dad, something is wrong with mom," he takes notice. This comment from Allan Shur's daughter was the motivation Shur needed to make a doctor's appointment for his wife, Sharon. That appointment, here at UNMC, led to Sharon's true diagnosis - Alzheimer's disease.

Alzheimer's is the most common form of dementia causing problems with memory, thinking and behavior. It affects 4.5 million people in the United States and their 15 million caregivers. It is the sixth leading cause of death in the U.S.



Todd Kozelichki monitoring Kim during her PoNS exercise.

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Allan and Sharon had heard of Alzheimer's; but since she was only 54 years old, Sharon was "too young." After scouring bookstores and libraries for information, the Shur's now rely on Daniel Murman, M.D., Interim Chair, Neurological Sciences at UNMC and the Alzheimer's Association for Sharon's care. Through them, Sharon is in a clinical trial of a new cutting-edge drug, bapineuzumab.



Sharon Shur, with husband, Allan, checks in for an appointment at UNMC.

"Bapineuzumab is a targeted form of immunotherapy designed to selectively remove a toxic form of amyloid from the brains of patients with Alzheimer's disease as a method to slow the progression of the disease," said Dr. Murman, principal investigator at the UNMC site. "Clinical trials of treatments such as this could never proceed without the selfless research subjects and their families that agree to participate."

"We don't expect a cure," said Shur. "We just know the clinical trial is a step, a step in the right direction. Being at UNMC is very positive. Everyone is dedicated in their work and to their patients."



In 2006, Susan Stewart was sick, really sick. She knew something was wrong. After several doctors and clinic visits and many vials of blood draws, Susan received a diagnosis; she was HIV positive.

"I didn't know if I was going to live or die," said Stewart.

Today, over 1.1 million people in the U.S. are living with HIV/AIDS and over 33.3 million worldwide. The human immunodeficiency virus or HIV damages the immune system and left untreated a person's immune system will no longer be able to fight off infections.

A year after her diagnosis, someone directed Stewart to the Nebraska AIDS Project in Omaha, Nebr.

"Thank goodness for the Nebraska AIDS Project. They directed me to UNMC and Dr. Susan Swindells," Stewart said.

While HIV-infected individuals are living longer, damaging effects of HIV may persist in the brain and may interact with other neurodegenerative disorders. Researchers at UNMC are investigating new ways to measure brain damage induced by HIV, including a new neuroimaging technique. Drug levels in infected individuals are being measured and the role of "host genetics" in drug metabolism is being investigated.

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Patients and Caregivers

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Dr. Swindells, Medical Director, UNMC HIV Clinic, participated in the international study that showed HIV infection in the HIV-negative person can be prevented by giving antiretroviral therapy to the HIV-positive person.

“The results were 97% effective in preventing the spread of HIV, which is great news for HIV-infected patients and their relationships,” said Dr. Swindells. “There is still work ahead, but this is an example of translational research - researchers and clinicians working together.”

Stewart is now living a “full, happy, healthy life” thanks to research and clinical care at UNMC.



Susan Stewart and her granddaughter.



After receiving a diagnosis of Parkinson’s disease, Colleen Wuebben and her husband, Ted, traveled to the University of Kansas Parkinson’s Clinic to discuss her treatment options. They turned her back around on Interstate 29 and directed her to UNMC and John Bertoni, M.D., in the Department of Neurological Sciences.

“The Kansas doctor said, ‘I’m not sure why you want to come all the way to Kansas City when you have a Parkinson’s specialist in Omaha,’” said Colleen.

A chronic and progressive movement disease, Parkinson’s disease affects nearly one million people in the U.S. Over 60,000 Americans are diagnosed with Parkinson’s disease each year. Symptoms vary from tremors, bradykinesia (slow movement), rigidity and postural instability.

UNMC has made neurosciences a priority recruiting Dr. Bertoni, a Parkinson’s specialist and Diego Torres-Russotto, M.D., a movement disorders specialist.

Continued advances in Parkinson’s care from deep brain stimulation to better drug options are available. Dr. Bertoni has participated in over 50 clinical research studies, most of them for Parkinson’s disease, and has made Parkinsons’ disease the focus of his research as well as his clinical care.

“The University of Nebraska Medical Center has three clinician-specialists in Parkinson’s disease, Dr. Murman, Dr. Torres-Russotto and myself; together, we are now involved in several Parkinsons’s disease studies at UNMC,” said Dr. Bertoni.

“Having a facility right here in our state and region is important to people with chronic neurological illnesses.”

Colleen Wuebben

“Having a facility right here in our state and region is important to people with chronic neurological illnesses,” Colleen said.

The Nebraska Neuroscience Alliance was created to remove barriers to multi-disciplinary works and to drive clinical and scientific advancements in neuroscience.

“Bringing researchers and clinicians together benefits all patients dealing with diseases,” said Dr. Howard E. Gendelman, Professor and Chair, Department of Pharmacology and Experimental Neuroscience. “It brings all three groups – researchers, clinicians and patients – together, working as one.”

Along with patients and caregivers, Anne Rutkowski, M.D., was honored for her work in rare diseases, specifically congenital muscular dystrophy. Dr. Rutkowski, an emergency medicine physician at Kaiser Permanente Harbor City Emergency Medicine, Harbor City, Calif., is the co-founder and chairmain of Cure CMD.



Promotion and Tenure

James Haorah, Ph.D., Associate Professor
 Tomomi Kiyota, Ph.D., Instructor
 Jianuo Liu, Ph.D., Assistant Professor
 Honghong Yao, Ph.D., Assistant Professor
 Sowmya Yelamanchili, Ph.D., Instructor

Graduates

Theodore Bartoletti, Ph.D.
 Post-Doctoral Research Fellow
 Hotchkiss Brain Institutes, Calgary, Alberta, Canada

Stephanie Kraft-Terry, Ph.D.
 Post-Doctoral Research Associate
 University of Hawaii, Manoa

Aaron Mercer, Ph.D.
 Post-Doctoral Research Fellow
 University of Michigan

Ari Nowacek, Ph.D.
 3rd year medical student
 University of Nebraska Medical Center

Awards

Distinighed Scientists

Shilpa Buch, Ph.D. Huangui Xiong, M.D., Ph.D.

New Investigators

R. Lee Mosley, Ph.D. Honghong Yao, Ph.D.
 Hui Peng, M.D.

Society on NeuroImmune Pharmacology Young Investigator Travel Award

Shantanu Balkundi, Ph.D. (Howard Gendelman, M.D., mentor)
 Crystal Bethel-Brown (Shilpa Buch, Ph.D., mentor)
 Ming Duan (Shilpa Buch, Ph.D., mentor)
 Upal Roy, Ph.D. (Howard E. Gendelman, M.D., mentor)
 Jun Wang (Huangui Xiong, M.D., Ph.D., mentor)

Bernice & Norman Harris Graduate Student Alzheimer's & Lewy Body Research Fellowship

Qiang Chen Jianxun Xia
 Amrita Datta Chaudhuri Gang Zhang
 Lisa Kosloski
 Max Kuentling
 Jessica Hutter Saunders (honorable mention)

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Nebraska Neuroscience Alliance



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