New Northwestern Center Targets Brain Disorders

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Evanston, Ill. — Northwestern University has received $8 million from the Falk Foundations to establish the Falk Center for Molecular Therapeutics, an interdisciplinary research center within the Robert R. McCormick School of Engineering and Applied Science.

"Our mission is to use innovative molecular biology techniques to identify and evaluate genes responsible for neurological disorders such as brain tumors, learning and memory disorders, depression and epilepsy," said Joseph Moskal, center director and research professor in the department of biomedical engineering at McCormick. "This understanding will lead to the development of effective new drugs."

The Falk Center will act, in part, as a "bench-to-bedside" bridge between center scientists and University biomedical engineers and Nyxis Neurotherapies Inc., a biotechnology company founded by Moskal and Jan Leschyna, M.D., a former associate professor of neurology and pathology at Northwestern's Feinberg School of Medicine.

Translational research at the Falk Center will move important discoveries from the laboratory to the marketplace. Falk, which currently has a staff of seven, will drive the center's own research objectives as well as facilitate collaborations with University researchers.

At present, two therapeutic developments are approaching the proofstage. One is a gene-based therapy for the treatment of malignant brain tumors in both children and adults.

"Discovering genes specific to brain tumors and their invasive behavior is one of the major thrusts of the Falk Center's work," said Moskal, who also has an appointment in neurological surgery at Feinberg.

"The current treatment for malignant brain tumors is not very effective. One of the big hurdles in brain cancer research is learning how to effectively deliver drugs to cancerous cells that may remain after surgery. By aligning the Falk Center with McCormick's biomedical engineering department, we are combining molecular biology and gene discovery with the pragmatism of engineering in order to solve this problem and others."

The second potential therapy is based on the discovery by Moskal and colleagues of a family of molecules called glykins that appear to enhance learning and memory. The Food and Drug Administration recently approved the glykins for human phase I trials.
"The glyxins also may have an impact on attention deficit hyperactivity disorder, memory loss associated with the early stages of Alzheimer’s disease as well as normal aging, damage due to stroke, and neuropathic pain,” said Moskal. He has collaborated for years with John Distelhöft, professor of physiology at Feinberg, in evaluating the compounds.

Recently, another longtime collaborator, Jaak Panksepp, an emeritus professor in the psychology department at Bowling Green State University, joined the Falk Center as head of its affective neuroscience research program.

The Falk Center puts state-of-the-art gene chip technology — the same used to discover the glyxins and the brain tumor therapy — into the hands of Northwestern faculty and students. This technology, used to identify gene targets for new therapeutics, is more often found in the private sector than in universities.

"Very few universities in the country have direct access to gene chip technology of this caliber,” said Roger Kores, chief of molecular neuro-oncology at Falk and assistant research professor of biomedical engineering. "In the Chicago area, only a handful of programs in academia and the private sector combined have facilities equivalent to the Falk Center’s."

Moskal and his staff build their own microarrays from scratch and are continually evolving the technology. Now they can train faculty, undergraduate and graduate students, and visiting scholars to build customized microarrays for their own discoveries. Moskal and his staff already have taught a class in advanced molecular and cellular biology techniques, which has led to new collaborations with Northwestern biomedical engineers.

"Our department is expanding its presence in biotechnology and neuroscience, and the molecular biology expertise and equipment of the Falk Center is invaluable to this effort,” said Robert Lienenmeier, professor of biomedical engineering, who was instrumental in establishing the Falk Center. "Nationally, biomedical engineering is moving more and more to the level of cells, molecules and genes. Adding the Falk Center to biomedical engineering at Northwestern adds a range of capabilities we did not have before."

The center is building on its initial Falk Foundation gift by seeking additional funding from other foundations, philanthropic individuals, the private sector and government agencies. Such diverse support will enable Falk and its programs to grow and flourish.

The Falk Center is located in Northwestern’s ITEC (Illinois Technology Enterprise Corporation) building at 1801 Maple Ave. in Evanston.