Fall 9-26-2012

Brennan Receives NIH Grant for Sickle Cell Research

Kim Hill
Illinois Wesleyan University

Brennan Receives NIH Grant for Sickle Cell Research

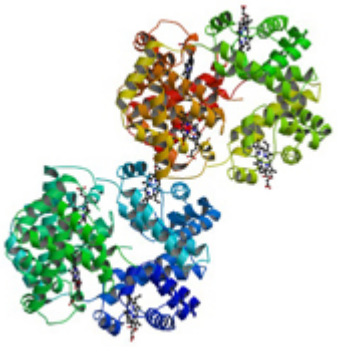
Sept. 26, 2012

Brian Brennan

BLOOMINGTON, Ill. – For the first time, Illinois Wesleyan University is the sole recipient of a grant from the National Institutes of Health (NIH). IWU is the only small liberal arts institution in Illinois to receive an NIH Academic Research Enhancement Award in the last two years.

Brian Brennan, assistant professor of chemistry at IWU, will use the $285,189 grant in the direction of a project that will focus on the identification of molecules that can lead to new treatments for sickle cell disease. The award will fund research supplies, a new fluorimeter, and stipends for four students to work with Brennan in the lab during each of the next three summers. Funding will also allow IWU students to attend national conferences to present their research findings. "The funding greatly expands the type of research I can do with students," Brennan said. "The multidisciplinary approach of this research gives students a unique opportunity to use their chemistry skills to solve a biological problem."

A debilitating hereditary blood disorder with few treatments, sickle cell disease is relatively rare in the United States, affecting fewer than 100,000 people, according to Brennan. In West and Central Africa, however, approximately 25 percent of the population has the sickle cell trait and one to two percent of all babies are born with a form of the disease, according to the World Health Organization. The only cure for the disorder is a bone marrow transplant—a procedure that is not feasible in the parts of the world where sickle cell disease is largely prevalent, Brennan said. Current treatments for sickle cell disease typically focus only on relieving the symptoms.



Sickle Cell Hemoglobin
Photo courtesy of: PDB ID:2HBS

Sickle cell disease is caused by a mutation in the gene that codes for hemoglobin, the oxygen transport protein in the body. Brennan explained that the mutation in hemoglobin results in the malformation of red blood cells and eventually leads to tissue and organ damage. "When deprived of adequate oxygen supply, a conformational change enables the sickle-cell hemoglobin to polymerize into long strands, which misforms the red blood cell into a sickle-cell shape," he said. The discovery of molecules that bind to the mutated hemoglobin, thereby preventing strand formation, represents a novel method for the treatment of the disease.

Brennan, a bio-organic chemist, is especially interested in studying disorders that large pharmaceutical firms have all but ignored. "My training in graduate school largely involved developing methods to inhibit protein-protein interactions,"

Brennan said. "Because sickle cell disease is caused by interactions of hemoglobin, a protein, it seemed like a perfect fit for my research." Brennan said the disease's relative rarity in the U.S. offers little financial incentive for pharmaceutical companies to focus attention on sickle cell disease.

The three-year award is supported by the National Institute of Diabetes and Digestive And Kidney Diseases of the National Institutes of Health under Award Number R15DK098109.

*Contact: **Kim Hill**, (309) 556-3960*