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Ohio University College of Arts & Sciences

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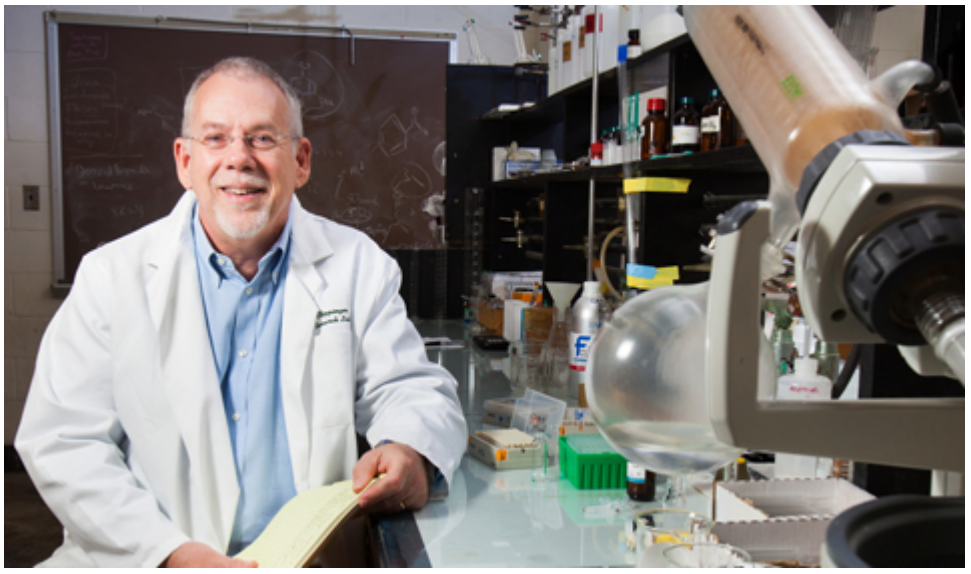

Dr. Stephen Bergmeier, Professor and Chair of Chemistry & Biochemistry.
Photo by Ohio University / Jonathan Adams.

Dr. Jennifer Hines

By Megan Reed

A chemical engineering professor in the Russ College of Engineering and Technology has received a nearly $450,000 grant from the National Institutes of Health to fund research that could potentially help mitigate serious diseases such as Alzheimer's.

Professor of Chemical and Biomolecular Engineering **Dr. Douglas Goetz** will lead an interdisciplinary team including: **Dr. Stephen Bergmeier**, Professor and Chair of Chemistry & Biochemistry; **Dr. Jennifer Hines**; **Dr. Kelly McCall**, Associate Professor of Specialty Medicine; and several graduate and undergraduate students on the project. All four faculty members are also part of the Molecular and Cellular Biology Interdisciplinary Graduate Program.

Their research focusses on glycogen synthase kinase-3 (GSK-3), a protein kinase, or enzyme, in the body that, when overactive, has been connected to a variety of diseases.

"You have 500 different kinases in the body, and all of them are very important for your wellbeing. But if one of them starts to behave over actively, that can lead to disease," Goetz said. "The question is, can you make a compound that will

block the activity of one particular kinase out of 500 and not inhibit any of the other kinases?"

The team believes it has done just that – they've identified a set of novel organic compounds that potently inhibits GSK-3 activity while minimally affecting the other kinases. Now, the team plans to determine just how these compounds inhibit GSK-3 and see what specific effects they have on cellular GSK-3 activity.

Ultimately, the researchers hope their work will lead to a new treatment or drug for numerous diseases including pathologies of the central nervous system, pathological inflammation and metabolic disorders.

The collaborative effort began in the fall, with each faculty member's lab responsible for an aspect of the project. Bergmeier synthesizes the compounds, Hines runs simulations to see how compounds bind to GSK-3, and McCall and Goetz complete cell-based studies to see how the compounds might affect a particular disease.

"This is a great set of people to work with," Goetz said. "The grant reviewers noted the high quality of my colleagues' scientific achievements and that each brings something unique and important to the table. The grant wouldn't have been funded without this."

Students are also gaining valuable, hands-on experience facilitating experiments in the lab. **Mahboubeh Noori**, a chemical engineering doctoral student working with Goetz, said the project has "opened a new door" for her by teaching her how to work with compounds.

"Dr. Goetz lets us develop the procedures and think out of the box," she said. "Whenever we're coming up with a new idea, he'll let us include it in that project. He does not say, 'This is the line that you should follow.'"