thebattalion ONLINE
The student voice of Texas A&M since 1893

Department receives cutting edge equipment

By Roger Zhang

Published: Monday, July 16, 2012
Updated: Wednesday, July 25, 2012 19:07

Many have taken an X-ray, CT scan or MRI at a hospital to diagnose a broken leg, but the same principle can be used to get a close-up view of individual molecules. Texas A&M University's Department of Biochemistry and Biophysics received a Nuclear Magnetic Resonance spectrometer that will expand macromolecular research.

"We've been working toward this moment for seven or eight years so it's very satisfying to see us finally at the position to realize the potential of the facility and the instrument," said Gregory Reinhart, professor and head of the Department of Biochemistry and Biophysics.

The NMR Building, a wing of the Biochemistry-Biophysics Building, underwent construction from November 2008 to July 2010. The facility accommodates NMR spectrometers with two-story-high ceilings and space to accommodate the strong magnetic fields generated by the spectrometers. Three current medium-field spectrometers along with the new high-field spectrometer are housed in the NMR Building.

An NMR spectrometer works similarly to an MRI, but on a microscopic level.

"An MRI places the whole organism in the magnetic field. Instead of imagining the whole body parts, we are imagining the atoms within macromolecules," Reinhart said.

Applications of NMR spectrometry are primarily within the biomedical field.

Roger Zhang -- THE BATTALION

Doug Lyons, a technician, guides the NMR Spectrometer as it's lowered from the roof.

“NMR is a very sensitive tool for screening drug candidates. You want to see where exactly they bind on the molecule and nuclear magnetic resonance provides a wonderful and convenient way to do that. So if you understand how a given drug candidate interacts with a protein and how it affects the structure and dynamics, then in turn you can design better therapeutic agents,” said assistant professor of biochemistry and biophysics Tatyana Igumenova.

The technique can be used outside biomedical research. It can be used for anything biological from plant growth control to waste management in feedlots.

Students say having state-of-the art tools will benefit undergraduate and graduates at A&M.

“This will be a really great opportunity. We’ll have a cutting edge facility once it’s installed,” said Mikaela Stewart, graduate student pursuing a biophysics doctoral degree.

The NMR spectrometer will take two to three months to become fully operational, as the delivery of the spectrometer is only the beginning.

“It’s not a magnet now. It has to be energized, placed on the legs, reach a steady field so it doesn’t drift. Other parts have to come in like the console,” Igumenova said.

Reinhart said this technology allows countless possibilities for researchers.

“This new magnet will provide new capabilities and put us on par with the best centers in the country.” Reinhart said. “The facility has the capacity for additional instruments of this type or even stronger instruments that are more state of the art, but you got to start with one to justify getting the others.”

Department receives cutting edge equipment

Full story