

MSU faculty awarded grant from the Juvenile Diabetes Research Foundation



Dr. Erdem Topsakal

Dr. Erdem Topsakal, assistant professor at the Bagley College of Engineering, in collaboration with Dr. Elaine C. Moreland, assistant professor at UAB's department of endocrinology, have been awarded an Innovative Grant of \$100,000.00 for one year from the Juvenile Diabetes Research Foundation for research that will result in ways to improve the daily lives of many diabetic patients through alternative glucose monitoring technology. According to MSU's Sponsored Program's Office, this is the first grant awarded to an MSU faculty member from the Juvenile Diabetes Research Foundation.

Juvenile Diabetes Research Foundation (JDRF) is an international organization dedicated to support research aiming to develop techniques and methods to treat and cure diabetes. The Innovative Grant Program supports highly innovative basic and clinical research. Proposals submitted to this program go through an extensive review by the Science Review Committee, Lay Review Committee, and JDRF's board of directors.

Dr. Topsakal explains, "The main objective of our research is to offer an alternative continuous glucose monitoring technology to the current biosensors in the form of a miniaturized antenna."

Due to degradation and fouling of the sensor and the changes in the tissue surrounding the sensor such as fibroses and inflammation, current biosensors can only remain functional in the body for up to ten days after their implantation. Unlike biosensors that require direct contact with the interstitial fluid in order to trigger necessary chemical reactions to operate, antennas work on an electromagnetic energy propagation principle. Meaning they do not need direct interface with the interstitial fluid and can be encased in biocompatible materials such as silicone or polyurethane resin, allowing them to remain functional in the body for years. This research will also contribute in the development of a future artificial close loop pancreas system.

"Dr. Topsakal's research project with the Juvenile Diabetes Research Foundation is an exciting new application of his research in antenna design. The marriage of miniaturized antennas with implanted biosensors can provide doctors, patients, and clinical researchers with a new source of information that can be used in the development of treatments for diabetes and its complications," said Dr. Roger King, associate dean of the Bagley College of Engineering.

Dr. Erdem Topsakal is an assistant professor within the electrical and computer engineering department and prior to joining MSU in August 2003, he was a research scientist at University of Michigan. His interests are in implantable antennas, wide and ultra-wideband antennas, frequency selective surfaces and volumes, numerical techniques and electromagnetic theory. He is the associate Editor in Chief of Applied Computational Electromagnetic Society Journal, vice Chair of the Engineering and Physics Division of the Mississippi Academy of Sciences and senior member of Institute of Electrical and Electronics Engineers (IEEE).