



MCG selected as RNA laboratory for worldwide diabetes study

Toni Baker - 2007 December 17

The Medical College of Georgia Center for Biotechnology and Genomic Medicine has been selected to isolate RNA and DNA from the blood of thousands of children involved in a worldwide study of the causes of type 1 diabetes.

MCG also is enrolling children in the mammoth study that will eventually follow 8,000 at-risk babies from four

states and three countries for 15 years, collecting blood every three months as they go.

The TEDDY – The Environmental Determinants of Diabetes in the Young – study is keeping tabs on many aspects of the children’s lives – from emergency room visits to over-the-counter medicines – in an effort to identify environmental triggers for diabetes in children with known high-risk genes.

“Once you know the risk factors, you can modulate the risk factors to prevent diabetes,” says Dr. Jin-Xiong She, center director and Georgia Research Alliance Eminent Scholar in Genomic Medicine.

Dr. She was among the scientists who conceived the idea of TEDDY and successfully applied for National Institutes of Health funding to pursue it in 2003.

He recently was named principal investigator on the additional five-year, \$5 million contract to isolate RNA and DNA from the regularly collected blood.

About 20,000 samples already are awaiting the process. The MCG Center developed a robotic automation that processes 96 samples in about two hours – compared to the standard of a few samples in about six hours – to handle the huge and growing volume.

Gene expression over time is a new area of research, says Dr. She. The newly established infrastructure enables MCG to isolate nucleic acids for similar large-scale studies.

Isolated nucleic acids will be stored at the National Institute of Diabetes and Digestive and Kidney Diseases Repository. TEDDY scientists will eventually analyze the impact of environmental triggers on the body’s basic building blocks with an eye toward identifying biomarkers that give an early heads up that the body is headed toward diabetes.

“These two different types of genetic material contain different information,” Dr. She explains. “The basic information of DNA does not change. What changes in DNA is how it may or may not allow expression of genes. RNA changes all the time.”

“Think about when you get the flu and your body starts to increase the number of immune cells to fight it,” says Dr. Richard A. McIndoe, associate center director and co-principal investigator. “That requires an expansion of your cells, which requires an expansion of proteins, which requires an expansion of RNA. Infection is an environmental trigger. Your RNA changed because you had an infection.”

“When you are getting diabetes, your RNA expression also changes,” says Dr. She. Changes may or may not be permanent, but the goal is to connect the pieces and see which changes amount to type 1 diabetes, he says.

MCG’s TEDDY Clinical Center is screening newborns in nine hospitals, including MCG Medical Center, University Hospital, Trinity Hospital of Augusta; Northside, Piedmont and Kennestone Hospitals in Atlanta; and three hospitals in Gainesville, Fla. Additional centers include Barbara Davis Center at the University of Colorado; Pacific Northwest Research Institute in Seattle; the University of Turku in Finland; Lund University in Sweden; and the Diabetes Research Institute in Munich, Germany. The University of South Florida in Tampa serves as the TEDDY data coordinating center and MCG’s new contract with the NIDDK for nucleic acid isolation is through that university.

To date, MCG’s center has enrolled about 500 children. An additional 800 to 1,000 enrollees in the next two-and-one-half years are planned.

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