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Researchers discover protein that may represent new target for treating type 1 diabetes

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Researchers at Wake Forest Baptist Medical Center's Institute for Regenerative Medicine and colleagues have discovered a new protein that may play a critical role in how the human body regulates blood sugar levels. Reporting in the current issue of *Pancreas*, the research team says the protein may represent a new target for treating type 1 diabetes.

"This data may change the current thinking about what causes type 1 diabetes," said Bryon E. Petersen, Ph.D., professor of regenerative medicine and senior author. "Much more research is needed to understand exactly how the protein functions, but its discovery opens a new door to better understand and hopefully develop new treatments for this currently incurable disease."

The protein, which the scientists have named Islet Homeostasis Protein (IHoP), has so far been isolated in the pancreas of both humans and rodents. It is located in the pancreatic islets, clusters of cells that secrete the hormones insulin and glucagon that work together to regulate blood sugar. In healthy individuals, glucagon raises blood sugar levels and insulin helps lower gluocose levels by moving sugar from the blood into the body's cells. In people with type 1 diabetes, which affects about 5 percent of people with diabetes, the pancreas does not produce enough insulin and blood sugar levels are too high.

The researchers determined that IHoP is found within the glucagon-

producing cells of the islets. In both humans and mice that haven't yet developed diabetes, the researchers found high levels of IHoP. But after the onset of diabetes, there was no expression of IHoP, suggesting that the protein may work to regulate blood sugar levels by regulating the balance between insulin and glucagon.

When the researchers inhibited production of the protein in rodents, there was loss of glucagon expression, which caused a chain of events that led to decreased insulin, increased levels of glucagon and death of insulin-producing cells.

"In a nutshell," said lead author Seh-Hoon Oh, Ph.D., "IHoP appears to keep blood sugar regulation in check. When IHoP isn't present, it throws the pancreas into a critical state and starts the process that results in type 1 diabetes." Oh is an instructor of regenerative medicine at Wake Forest Baptist.

It is currently believed that type 1 diabetes is caused by a viral or environmental trigger in genetically susceptible people that results in the body's white cells mistakenly attacking the insulin producing cells. Within 10 to 15 years of diagnosis, the insulin-producing cells are completely destroyed.

The current research supports the idea that cell death plays a role in type 1 diabetes, but the results suggest that IHoP may influence the process. Next steps in the research will be to explore how IHoP controls the interaction of insulin and glucagon.

Provided by Wake Forest Baptist Medical Center

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