αKG Analogs Increase Glucose-Induced Insulin Secretion, Provide Method of Treating Hyperglycemia in Type II Diabetes

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WARF: PO2201US
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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of increasing glucose-dependent insulin secretion to treat hyperglycemia in individuals with Type II diabetes.

OVERVIEW

Insulin is secreted from pancreatic beta cells in response to elevated blood concentrations of glucose and other "secretagogues," such as amino acids, alpha-ketoacids and mitochondrial metabolites. However, sometimes the beta cells do not respond sufficiently to insulin secretagogues, resulting in Type II diabetes.

THE INVENTION

UW-Madison researchers have developed a method to increase glucose-dependent insulin secretion. They discovered that an analog of alpha-ketoglutarate (alphaKG), which can be converted into the insulin secretagogue succinate, increases glucose-induced insulin secretion both in vitro and in animals, particularly in humans and rodents. AlphaKG analogs directly regulate the activity of ATP-sensitive potassium ion channels (K<sub>ATP</sub>) and enhance the glucose-dependent regulation of K<sub>ATP</sub>, leading to greater insulin secretion at high glucose concentrations than at low concentrations. An alphaKG analog could be administered to an individual with Type II diabetes to treat hyperglycemia (high blood sugar).

APPLICATIONS

• Treating hyperglycemia in individuals with Type II diabetes
• May help prevent the onset of diabetes

KEY BENEFITS

• Improves insulin secretion in response to glucose and other secretagogues in individuals that do not respond adequately to these agents
• The K<sub>ATP</sub> channel is an accessible and safe target for drug development.
• Analogs effectively mimic the natural activity of alphaKG but are not metabolized as quickly or in the same manner.
• Because the effects of alphaKG analogs are glucose-dependent, they reduce the risk of inducing hypoglycemia, a potentially serious side effect associated with the use of sulfonylurea drugs for treating hyperglycemia.

ADDITIONAL INFORMATION

Tech Fields
Pharmaceuticals & Vitamin D - Diabetes
Pharmaceuticals & Vitamin D - Metabolic disorders

CONTACT INFORMATION

For current licensing status, please contact John Nagel at jnagel@warf.org or 608-960-9848.