Human Biliverdin Reductase Peptide for the Treatment of Diabetes

The present invention provides a human Biliverdin Reductase (hBVR) based peptide therapy for the treatment of diabetes.

Problem Solved by This Technology
Diabetes is a highly prevalent heterogeneous group of disorders characterized by high blood glucose levels. It affects an estimated 285 million people worldwide and this number could reach to 438 million by 2030. Diabetes may result from an inability of the pancreas to produce insulin (type 1) or the body may develop resistance to Insulin (type 2). Current disease management options are limited to insulin therapy for type 1 and insulin and/or oral drugs for type 2. However, all these treatments are unable to control disease progression and all have adverse side effects.

Applications
Dr. Maines has discovered a seven-amino acid peptide, KYCCSRK, that mimics insulin and IGF-1 (insulin-like growth factor-1) to increase cellular glucose uptake independent of insulin. This peptide can also increase the activities of IRK (insulin receptor kinase) and IGF-1R (receptor). The mechanism of action of this peptide is independent of insulin and hence will be effective in treating both forms of diabetes. Of note, this hBVR peptide acts synergistically with insulin, IGF and IGF-1. Thus it can be used as a standalone agent or in combination with Insulin and other drugs that are currently in use for the treatment of diabetes.

This discovery has been confirmed in various in vitro cell culture models, such as human skeletal muscle cells, pulmonary artery smooth muscles cells and hepatocytes. Effective route of delivery as well as the efficacy of this hBVR peptide will be further investigated in a genetic rat model of diabetes.

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