

New form of insulin can be inhaled rather than injected

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This new, quick acting insulin inhaler uses a powder (AFREZZA™) to deliver the medication. Credit: The MannKind Corporation

Scientists today described a new ultra-rapid acting mealtime insulin (AFREZZA™) that is orally inhaled for absorption via the lung. Because the insulin is absorbed so rapidly, AFREZZA's profile closely mimics the normal early insulin response seen in healthy individuals. AFREZZA is awaiting approval by the U. S. Food and Drug Administration (FDA). This presentation took place at the 239th American Chemical Society National Meeting, being held here this week.

Andrea Leone-Bay, Ph.D. and colleagues at MannKind Corporation said that the new [insulin](#) product, uses the Technosphere technology, a delivery technology that is applicable to a wide variety of other drugs

that are currently injected. Like insulin, these medications are proteins that would be digested and destroyed in the stomach if taken by mouth.

One such product, MKC-180, is a Technosphere formulation of a natural hormone that controls appetite and is under investigation as a therapy for obesity using pulmonary delivery. "In nonclinical studies remarkable reductions in [food intake](#) have been observed," Leone-Bay said.

MannKind is also evaluating Technosphere technology with drugs that treat pain and osteoporosis.

"Our proprietary Technosphere Technology platform is based on particles formed by the self-assembly of a small molecule," Leone-Bay explained. "Drugs can be loaded onto these particles, which are then dried to form a dry powder. Using a thumb-sized device, patients inhale a small amount of the powder, roughly equivalent to a pinch of salt. This powder dissolves immediately after inhalation and the drug is absorbed into the patient's [bloodstream](#). Most importantly, the drug is absorbed ultra-rapidly so it becomes effective much more quickly than an injection of the same drug. For some drugs, ultra-rapid systemic delivery provides distinct clinical advantages over injection, including profiles that match the body's natural responses in processes like [hormone secretion](#)."

AFREZZA (insulin human rDNA origin) Inhalation Powder is an ultra-rapid acting insulin intended for use at mealtime to control the rapid rise in blood sugar levels that occurs in people with diabetes immediately after a meal. At other times, people with diabetes would take injections of other kinds of insulin.

Leone-Bay said AFREZZA controls glucose as well as current state-of-the-art treatments, poses a lower risk of hypoglycemia than that typically associated with mealtime insulin therapy, and leads to less weight gain compared to other insulin treatments," according to Leone-Bay.

"Additionally, and importantly, AFREZZA provides the unique benefit of a small, discreet, and easier-to-use inhalation device."

Provided by American Chemical Society

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