



SmartInsulin™

It automatically regulates the blood-glucose levels in diabetic patients.— Once-a-day, self-regulating insulin delivery for diabetics. Technology uses new a kind of biodegradable polymer to produce stimuli-responsive nanoparticles for controlled drug delivery.

SmartInsulin contains nanoparticles that release insulin in proportion to blood-glucose levels. These particles will start to slowly break down and release insulin into the bloodstream, regulating (the) blood-sugar level. Once the blood sugar is at normal levels, the particles close back up, resolidify and then stop releasing insulin.

A team of 5 students, called SmartCells, won the \$30,000 grand prize earlier this week in the annual MIT \$50K Entrepreneurship Competition for its work on a new monitoring device. SmartCells uses a ground-breaking technology that combines nanostructured processing and intelligent biomaterials to produce stimuli-responsive nanoparticles for controlled drug delivery. SmartInsulin, addresses the \$98 billion diabetes market by providing insulin release in proportion to blood sugar levels thereby achieving auto-regulation of blood glucose. Insulin dependent Diabetics and those that should be on Insulin will want the revolutionary product because SmartInsulin will minimize insulin dosages, decrease pain due to blood sugar monitoring, dramatically improves diabetic blood sugar control, and should drastically reduce diabetic complications.

The team, made up of students from MIT and Harvard Business School, beat out a field of 118 teams.

SmartCells team member Todd Zion invented the technology as part of his Ph.D. research in chemical engineering at MIT. He's been working on the project for about four years.

The product is a once-a-day injection. Currently, monitoring glucose levels can be cumbersome and painful for diabetics who prick their fingers multiple times daily to test blood-glucose levels. Those who depend on insulin -- Type 1 diabetics and a small percentage of Type 2 diabetics -- must give themselves shots several times a day.

"It's well known that you can measure your blood sugar and then monitor your diet to control your blood sugar, but that whole process is not nearly as good as (how) a nondiabetic controls their blood sugar," Zion said. "You really need that real-time response to fluctuations and changes in blood sugar. That's essentially what we've built into SmartInsulin."

SmartInsulin contains nanoparticles that release insulin in proportion to blood-glucose levels, according to team member John Hebert, a second-year student at MIT Sloan School of Management.

"These particles will start to slowly break down and release insulin into the bloodstream, regulating (the) blood-sugar level," Hebert said. "Once the blood sugar is at normal levels, the particles close back up, resolidify and then stop releasing insulin."

Zion had an additional incentive for researching this disease.

"Type 1 runs in my family. There's a genetic predisposition for it," Zion said. "I also have family members who have Type 2 diabetes. It hits home a little bit closer when someone you know has the disease."

The SmartCells team members will use their winnings to help launch the company. They have filed a preliminary application for a patent.

Hadzima said the strong lab research seems to indicate the product could make it to market within a few years. Of course, there's no guarantee, he added.