

Biotechnology Newswatch

September 17, 2001

Pg. 1

Chemical engineers developing biological sensors for diabetes

By Bruce Sylvester

Researchers at **Purdue University** are working on a biological sensor for glucose that could help create intelligent drug delivery devices to be implanted in the body.

"I'd be the first one to say that we have a lot of work to do, but our findings so far are very encouraging," said chemical engineering doctoral student Mark Byrne, who presented his work at the American Chemical Society's annual meeting in Chicago.

The **Purdue** researchers created a "biomimetic" gel containing glucose molecules. They used an acidic chemical to remove the glucose from the gel.

This left spaces where the glucose had been. When placed in a liquid, like blood, glucose from the host liquid diffused into the gel. It "bound" to the empty spaces. The gel was, therefore, successfully "imprinted" for glucose molecules.

Purdue has patented the gel.

"Our next step is incorporating the gel into a device that can release a drug," Byrne told *Biotechnology Newswatch*.

"We've made a material that can bind glucose and can recognize it. So the next step is incorporating this into an implantable device, a polymer network that expands and contracts to release the medication inside of it. Think of it like a screen. When glucose is absent the screen is very tight, and it can't release anything or virtually nothing. When glucose shows up, it will expand and release medication. This is all on a molecular level. It's a molecular mesh, essentially, signalled by the gel we have created."

Byrne works with Nicholas A. Peppas, Showalter Distinguished Professor of Chemical and Biomedical Engineering at **Purdue**, and Kinam Park, a professor of pharmaceuticals and biomedical engineering.

"There is a lot of interest in glucose sensing for diabetes research," Byrne said. "And that has been the main focus of this work. However, we are also working on systems that bind other molecules that are important for the treatment of other conditions." The team predicts that it will be at least five years before an implantable device will be developed.

URL: <http://www.platts.com>