

## UCSB Engineer to Receive Honors

By [Vanessa Angiuli](#) Published on January 19, 2012

The Santa Barbara Chamber of Commerce named Chemical Engineering Professor Frank Doyle Innovator of the Year this week for his work on artificial pancreas technology.

Doyle collaborated with medical professionals and type 1 diabetes patients for the past 20 years to create an “invisible, automatic” method of insulin delivery and founded the Artificial Pancreas Research Program in 2003. The Chamber will present the award on Friday at a luncheon in Doyle’s honor.

Doyle said the technology provides a unique opportunity to improve people’s lives with his work.

“Most of us in engineering are lucky if we’re able to design a new widget or a more efficient way for a company to do something,” Doyle said. “It’s really humbling to think about the role of an engineer working with doctors to do something that will really impact the quality of life for many, many people.”

The new device is comprised of three parts — a pump that emits insulin, a sensor that measures blood sugar and an algorithm that integrates the other two components.

According to Doyle, the machine functions similarly to an air conditioning system, pumping insulin into the body when blood sugar becomes too high to decrease levels back to a state of equilibrium.

“At the heart of this is a feedback control algorithm. ... You can think of it in terms of an air conditioning system or a thermostat in your home,” Doyle said. “If the temperature gets too high, your air conditioner comes on and that lowers the temperature of the room. That device, the thermostat on the wall that’s doing that, has a [mathematical] algorithm that’s computing where the temperature is, what rate of change is occurring and decides the optimal amount of air conditioning to leave you at your set point — your target.”

The Juvenile Diabetes Research Foundation and National Institutes of Health awarded Doyle’s research team \$4.5 million in 2007. To avoid federal research regulation hurdles, Doyle ran preliminary clinical trials in Israel. After receiving encouraging results, Doyle submitted his proposal for a U.S.-based trial.

Doyle is currently testing different versions of his algorithm in multiple locations worldwide including Italy, France, Virginia, Denver and Santa Barbara.

According to Dr. Eyal Dassau, Senior Investigator and Diabetes Team Research Manager at the Sansum Diabetes Research Institute, a strong relationship between medical professionals and engineers is vital to the research’s success.

“One of the reasons for our success at Santa Barbara is the collaboration between the engineering department and medical [professionals],” Dassau said. “Sometimes it’s a daily collaboration sitting together, learning the language of the other partner. We teach them engineering, they teach us medicine.”

Dr. Howard Zisser, Director of Clinical Research and Diabetes Technology at the Sansum Diabetes Research Institute, said working alongside Doyle for 10 years provided a fruitful experience.

“Frank has been the ideal collaborator to work with on the Artificial Pancreas Project. His success is not that surprising if you know him well,” Zisser said in an email. “I can honestly say that I don’t know of anyone who is more dedicated to both his family and his life’s work.”