

2<sup>nd</sup> Annual National Academies Keck *Futures Initiative* Conference  
*Designing Nanostructures at the Interface  
between Biomedical and Physical Systems*  
Arnold & Mabel Beckman Center, Irvine, California  
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**Build a Glucose Sensor to Circulate (Implant) in vivo in Humans and Regulate Insulin  
Focus Group Description**

**Background**

The continuous monitoring and maintenance of near normal blood glucose levels could save diabetic patients from serious complications. The development of reliable long term functional implantable biosensors for continuous glucose monitoring has become of interest in the development of optimum treatment of diabetics.

**The Problem**

- Development of novel biocompatible implantable materials, which can be processed using micro and nano processing techniques for fabricating glucose sensors.
- Development of novel micro and nano fabrication techniques to fabricate implantable devices as glucose sensors.
- Development of novel surface modification techniques for biomolecule immobilization / to improve biocompatibility and functionality of implantable glucose sensors.
- Development of novel methods with high specificity and reliability for rapid and continuous detection of glucose level in vivo.
- Development of novel techniques to couple smart insulin delivery systems to implantable nano or micro glucose sensors.

**Initial References**

- Abel PU, Woedtke von T, Biosensors for In Vivo Glucose Measurement: Can We Cross the Experimental Stage. *Biosensors and Bioelectronics*, 2002. **17**, p. 1059-1070.
- Robert JJ., Continuous Monitoring of Blood Glucose. *Hormone Research*, 2002. **57**, p. 81-4.