

Abstract Submitted  
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**Biosensors and Biofuel Cells based on Vertically Aligned Carbon Nanotubes for Integrated Energy Sensing, Generation, and Storage (SGS) Systems** ARCHANA PANDEY, ABHISHEK PRASAD, YOKE KHIN YAP — Diabetes is a growing health issue in the nation. Thus *in-situ* glucose sensors that can monitor the glucose level in our body are in high demand. Furthermore, it will be exciting if the excessive blood sugar can be converted into usable energy, and be stored in miniature batteries for applications. This will be the basis for an integrated energy sensing, generation, and storage (SGS) system in the future. Here we report the use of functionalized carbon nanotubes arrays as the glucose sensors as well as fuel cells that can convert glucose into energy. In principle, these devices can be integrated to detect excessive blood glucose and then convert the glucose into energy. They are also inline with our efforts on miniature 3D microbatteries using CNTs [1]. All these devices will be the basis for future SGS systems. Details of these results will be discussed in the meeting. [1] Wang et al., in 206<sup>th</sup> Meeting of the Electrochemical Society, October 3-8, Honolulu, Hawaii (2004), Symposium Q1, abstract 1492. Y. K. Yap acknowledges supports from DARPA (DAAD17-03-C-0115), USDA (2007-35603-17740), and the Multi-Scale Technologies Institute (MuSTI) at MTU.

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