

Abstract Submitted  
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**Observation of an electrical signal from a single molecule** AROOJ ASLAN, NOOR SHAHEEN, KYLE DOBISZEWSKI, ALOKIK KANWAL, REGINALD FARROW, GORDON THOMAS, NJIT Physics — We have attached a folded protein molecule to the tip of a carbon nanotube using electrophoresis. We have then measured the electrons produced when the protein catalyzes a series of reactions. As an initial example of the reactions, we have used the catalysis by glucose-oxidase of glucose. We can show that the characteristic dynamic signals from the molecule scale with the glucose concentration. The molecule on the carbon nanotube tip is stable with respect to time under controlled conditions. The signals also indicate the glucose diffusion as its concentration is locally depleted at the nanotube by the catalysis. We use a second carbon nanotube with a laccase molecule on its tip to complete the circuit with an oxygen reaction. In a previous stage of this process, the other end of the nanotube is attached with a low-impedance electrical connection to a Ti thin film and the measuring circuitry. This work is an early step toward investigating the feasibility of an implantable glucose monitor to help treat diabetes.

Gordon Thomas  
NJIT Physics

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