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Functional relation between the enzymes Glucose oxidase and Laccase with the blood glucose to signify current as a measurement of glucose concentration. SHACHI YADAV, ANDREW OJEDA, ALOKIK KANWAL, GORDON A. THOMAS, REGINALD C. FARROW, NJIT, DR FARROW GROUP TEAM — As we enter the fifth decade of intense research on glucose monitoring to fight the war against diabetes, we designed a biosensor to catalyze the glucose oxidation by exploiting the geometry of two enzymes on the single nanoscale device. A novel method of depositing single walls CNTs at predefined locations on the metal was used to facilitate the direct electron transfer between the enzymes and the glucose in the biological environment. A microfluidic platform was reported to gain control over the experiments to get repeatable results in glucose tracking at the physiological levels. The proposed approach enabled tissue-size-dependent, real-time monitoring of blood glucose in micro tissues. Furthermore, glucose oxidase consumption and laccase reduction were monitored in parallel, and the impact of different flow rates on the device was recorded in real-time. This novel approach is an effort towards the development of chronically implanted devices for glucose monitoring in future.

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