

Abstract Submitted
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Expanding Cancer Detection Using Molecular Imprinting for a Novel Point-of-Care Diagnostic Device YINGJIE YU, MIRIAM RAFAILOVICH, YANTIAN WANG, State University of New York- Stony Brook, ALINA RANJBARAN, Garden City High School, TOM WANG, The Wheatley School, DAVID NAM, Monta Vista High School — We propose the use of a potentiometric biosensor that incorporates the efficient and specific molecular imprinting (MI) method with a self-assembled monolayer (SAM). We first tested the biosensor using carcinoembryonic antigen, CEA, a biomarker associated with pancreatic cancer. No change in detection efficiency was observed when detection was performed in the presence of 100% serum albumin, indicating that the sensor is able to discriminate for the template analyte even in concentrated solution of similar substances. Computer simulations of the protein structure were performed in order to estimate the changes in morphology and determine the sensitivity of the biosensor to conformational changes in the proteins. We found that even small changes in PH can generate rotation of the surface functional groups, without significant change in the morphology. Yet, the results show that only when the detection and imprinting conditions are similar, robust signals occurs. Hence we concluded that both morphology and surface chemistry play a role in the recognition.

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