FLUORESCENCE-BASED DETECTION OF HUMAN CARDIAC TROPONIN I USING A CHEMICALLY-ATTACHED MUTANT ANTIBODY MODIFIED QUARTZ SLIDE

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Human cardiac troponin I (cTnI) is the main biomarker released in the blood stream after a myocardial infarction episode. Our work is related to the detection of cTnI using a monoclonal mutant IgG antibody immobilized onto a quartz slide and labeled with fluorescein isothiocyanate (FITC). The detection method is based on the fluorescence enhancement of FITC upon binding of cTnI to the chemically-attached antibody, caused by the change in the pH of the microenvironment of FITC. Surface modification by means of amino- groups using appropriate silane derivatives allowed us to detect 0.4 ng/mL cTnI in as little as 20 min. We don't need a secondary antibody for detection/signaling, whereas ELISA, a commercially available bioassay, does. We plan on utilizing a thiol- modified surface in future work to explore any advantages/disadvantages over an amino- modified surface. These results are very promising in developing a bioassay to detect cTnI in blood serum.