Selectivity verification of cardiac troponin monoclonal antibodies for cardiac troponin detection by using conventional ELISA

Abstract - This paper presents preparation and characterization of conventional enzyme-linked immunosorbent assay (ELISA) for cardiac troponin detection to determine the selectivity of the cardiac troponin monoclonal antibodies. Monoclonal antibodies, used to capture and bind the targets in this experiment, are cTnI monoclonal antibody (MAb-cTnI) and cTnT monoclonal antibody (MAb-cTnT), while both cardiac troponin I (cTnI) and T (cTnT) are used as targets. ELISA is performed inside two microtiter plates for MAb-cTnI and MAb-cTnT. For each plate, monoclonal antibodies are tested by various concentrations of cTnI and cTnT ranging from 0-6400 µg/l. The binding selectivity and level of detection between monoclonal antibodies and antigen are determined through visual observation based on the color change inside each well on the plate. ELISA reader is further used to quantitatively measured the optical density of the color changes, thus produced more accurate reading. The results from this experiment are utilized to justify the use of these monoclonal antibodies as bio-receptors for cardiac troponin detection by using field-effect transistor (FET)-based biosensors coupled with substrate-gate in the future.