QUARTZ CRYSTAL MICROBALANCE BASED ON FLOW INJECTION FOR THE HUMAN CARDIAC TROPONIN T DETERMINATION

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The cardiarc troponin (cTnT) is specific biomarker important in establishing diagnosis and predicting prognosis in patients with suspected acute myocardial infarctions(AMI). In this work, a flow injection system quartz microbalance based on the alteration of electric frequency in response to the antigen-antibody interaction was used for determination of the cTnT. The variations of frequencies were registered by a frequency counter coupled to a microcomputer. The specific monoclonal antibody was immobilized on the surface of an electrode quartz crystal by a self-assembled monolayer(SAM). The adsorbate of thiol film was formed by incubating a 2-aminoethanethiol solution(cysteamine) for 2 h, followed by 2.5% glutaraldehyde(v/v). Afterwards, monoclonal antibodies against cTnT(anti-cTnT) were covalently immobilized on the gold electrode of the quartz crystal and 10 mM glycine solution was used as blocking agent. The development of the immunosensor made it possible to measure cTnT concentration with a detection limit of 0.025ng/mL. The effect of the cysteamine concentrations on the SAM coated gold sensor was studied. The surface of the sensor can be regenerated by injection of a solution 1% sodium dodecil-sulphate(w/v). The cTnT determination was accomplished in samples of human serum, that which allows its use in AMI diagnosis.

Supported-by CAPES; FAPESP.