

## 3rd Global Experts Meeting on **Chemistry and Medicinal Chemistry**

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### **Title: Liposomes-based Immunoassay for the Detection of Cardiac Troponin I —A Gold-Standard Biomarker for the Diagnosis of Myocardial Infarction**

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Cardiovascular diseases (CVDs) are the leading causes of death in intensive care units worldwide, particularly in UAE and Mediterranean countries. The World Health Organization stated that by 2030, almost 23.6 million people will die from CVDs. The buildup of plaque and blockage of arteries leads to potentially deadly acute myocardial infarction (MI), known as “heart attack”. Electrocardiography (ECG) is one of the common diagnostic tools for spotting and triaging MI patients however more than 40% of MI cases show normal ECG profile while testing. The measurement of certain biomarkers in the patient blood could provide a more accurate diagnosis of MI. Cardiac troponin I (cTnI), the central key element of cardiac muscle regulation and contraction, is considered the standard biomarker for the diagnosis of MI. This study reports the development of an efficient fluorescent immunoassay for the detection and quantification of cTnI using liposome-based fluorescent signal amplification. The assay is based on capturing cTnI molecule between a surface-immobilized capturing antibody and a biotin-conjugated secondary antibody (detection antibody). Signal development was achieved by subsequent addition steps of streptavidin and biotin-conjugated liposomes which are loaded with a fluorescent dye. The fluorescent signal is greatly enhanced upon the release of loaded dye from the liposomes. The standardized assay is sensitive and selective towards cTnI both in physiological buffer solutions and human serum samples and provides a wide linear dynamic range relevant to clinical concentrations.