

# 電子科学研究所学術講演会

主催：北海道大学 電子科学研究所

共催：北海道大学 GI-CoRE (GSS)、高分子学会 北海道支部、  
物質・デバイス領域共同研究拠点、人・環境と物質をつなぐ  
イノベーション創出ダイナミック・アライアンス

講演者：**Dr. Javier Barroso Lázaro**

(MICROFLUIDICS CLUSTER UPV/EHU)

タイトル：**Different approaches to biosensing**

会場：北海道大学 電子科学研究所

(北キャンパス総合研究棟 5号館) 1階会議室

日時：平成31年2月15日(金) 16:00~17:00

概要：

Nowadays, the progress on nanotechnology enables the synthesis of nanoparticles (NPs) with customized physical, chemical, and/or biological activities. Recent works have underlined the modulation of semiconductor nanoparticles (SNPs) on determining their optical, electrochemical and photoelectrochemical response. The emission of light by these SNPs is explained by quantum effect. Hence, they are referred to as quantum dots (QDs). Here, I will present the last advances of the modulation of the shape of CdS QDs in aqueous reaction mixtures triggered by trace amount of analytes.

Firstly, it was showed photoelectrochemical detection of enzymatically grown CdS QDs applied to development of immunoassay. Secondly, It was demonstrated new optical and photoelectrochemical (PEC) immunoassay for detection of tumor biomarkers such as superoxide dismutase (SOD2). Finally, it was described modulation of growth of cysteine-capped CdS QDs with enzymatically produced  $H_2O_2$  and reported modulating growth of CdS QDs with redox process catalyzed by copper ions ( $Cu^{2+}$ ).

These proposed analytical assays will be more sensitive than the previously published assays in which sulphide ions ( $S^{2-}$ ) are generated in the presence of analytes. Instead of fluorescence spectroscopy, less pricey UV-vis spectroscopic, electrochemical and photoelectrochemical detection can be applied due to unique properties of CdS QDs formed in assay mixtures.



連絡先：電子科学研究所  
生体分子デバイス研究分野  
居城・三友・与那嶺 (内線 9370)  
E-mail: mitomo@poly.es.hokudai.ac.jp