

## 基于等离子体聚合膜的日本血吸虫压电免疫传感器的研究

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**摘要** 提出了一种测定日本血吸虫抗体的可逆压电免疫传感器。先在石英晶振上沉积正丁胺等离子体聚合膜,再自组装聚电解质,用以静电吸附固定日本血吸虫抗原。然后采用BSA和NRS作封闭剂,以封闭晶振上非特异必吸附位点,实现对日本血吸虫感染兔血清的测定。探讨了聚电解质(PSS和AASS)自组装、抗原包被和免疫反应等实验条件的影响;考察了该传感器的响应特性与再生性能,并与采用戊二醛共价键合固定法进行比较。发现该传感器具有灵敏度高、重现性好、非特异性吸附低、再生简便等优点。将它用于测定一系列不同感染程度的兔血清样本,结果表明,该传感系统是临床定性和定量诊断日本血吸虫病的一种有效工具。

**关键词** [等离子体](#) [聚合物膜](#) [聚电解质](#) [固定化](#) [传感器](#) [日本血吸虫](#)

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## Studies on a novel piezoelectric immunosensor based on plasma polymerized film for the schistosoma-japonicum

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**Abstract** A reproducible piezoelectric immunosensor has been developed for the antibody of Schistosoma-Japonicum (SjAb). The surface of quartz crystal microbalance (QCM) is prepared first with plasma polymerized film of butyl amine by glow-charge and then covered with polyelectrolyte by self-assembling. Through strong electrostatic attraction, opposite-charged SjAg is incubated on it by controlling the pH value. Subsequently, the nonspecific sites on the immunosensor are sealed by BSA and NRS in order to detect SjAb in the infected rabbit serum (IRS). The effects of experimental conditions including the self-assembling of polyelectrolyte, the incubation of SjAb, the test of immunoreaction and the properties of immunosensor are all investigated, respectively. Furthermore, the determination and reproducibility of this self-assembling approach by polyelectrolyte are illustrated with obvious advantages over those of the binding approach by glutaraldehyde. It is demonstrated that this immunosensor is perfect in sensitivity, selectivity, and reproducibility. In the optimal experimental conditions, the QCM technique has been used to determine a series of IRS with different infected extent, implying that it is a practical tool for qualitative and quantitative detection of Schistosoma-Japonicum in clinical laboratory.

**Key words** [PLASMAS](#) [POLYMER FILMS](#) [POLYELECTROLYTE](#) [FIXATION](#) [SENSORS](#) [SCHISTOSOMA JAPONICA](#)

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