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研究论文

# 牛血清白蛋白与Indo-1相互作用的荧光光谱法研究

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摘要 以牛血清白蛋白(Bovine serum albumin, BSA)与荧光探针Indo-1为蛋白质和配体模型, 基于Indo-1的荧光强度与BSA的分析浓度间的关系, 建立了计算二者相互作用位点数的方法, 并利用荧光共振能量转移及各种荧光技术对Indo-1和BSA的相互作用进行了研究. 结果表明, Indo-1在BSA中有3个作用位点, 这3个作用位点与BSA中的212位色氨酸(Trp 212)间的距离分别为2.93, 2.57和2.40 nm; Indo-1通过疏水性作用进入到BSA的3个疏水性空腔. 在荧光猝灭实验中, 通过Microlab 500 系列进样器和PTI荧光仪的联用实现了荧光强度的自动和实时记录.

关键词 牛血清白蛋白 荧光探针Indo-1 结合位点数 相互作用 荧光光谱法

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# Studies on Interaction of Bovine Serum Albumin with Indo-1 by Fluorescence Spectroscopic Method

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**Abstract** The binding-site number was calculated by using fluorescence spectroscopic method with bovine serum albumin(BSA) and Indo-1 as protein and ligand models, respectively. The method for calculating binding-site number in BSA for Indo-1 was developed based on the relationships between the changes of Indo-1 fluorescence intensity and the analytical concentration of BSA. And the interaction of BSA with Indo-1 was investigated comprehensively by using fluorescence techniques as well as fluorescence resonance energy transfer, and the thermodynamic parameters were calculated according to the changes of enthalpy on temperature. Three binding sites in BSA for Indo-1 were revealed, and the distances from Trp212 in BSA to the three binding sites were 2.93, 2.57 and 2.40 nm, respectively. It was also proved that Indo-1 embedded into the three hydrophobic cavities of BSA by hydrophobic association. This paper provided a use for reference on calculating the binding-site number in protein for ligand and studying their interactions by fluorescence spectroscopic methods. In fluorescent quenching experiments, fluorescence changes were automatically recorded in real time by combining Microlab 500 Series Dispenser and PTI fluorescence apparatus.

**Key words** Bovine serum albumin Fluore scence probe Indo-1 Binding-site number Interaction Fluorescence spectroscopic method

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