



发光学应用及交叉前沿

改进荧光法研究氟洛芬与牛血清白蛋白的相互作用

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引用本文

摘要：为解决经典荧光光谱法在研究药物与蛋白结合机理中存在的缺陷,以蛋白与兽用氟洛芬(FF)的结合为例,在生理条件(pH=7.40的Tris-HCl缓冲溶液)下,以氟洛芬为荧光检测对象、牛血清白蛋白(BSA)为猝灭剂,通过改进荧光研究方法研究了药物与蛋白结合机理。结果表明,FF与BSA之间发生了静态猝灭,主要通过静电引力结合,其结合位点数约为1,Hill系数 n_H 略大于1,表现为弱的正协同作用。同时运用紫外吸收光谱法对该方法进行了验证,表明改进荧光法能更准确和全面地表征蛋白和药物的相互作用。

关键词：荧光光谱法 牛血清白蛋白 氟洛芬 紫外吸收光谱 相互作用

Modification on The Interaction Between Bovine Serum Albumin and Fluprofen by Improved Fluorescence Spectroscopy

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Abstract: In the Tris-HCl buffer solution which pH was 7.40, the interaction of bovine serum albumin with fluprofen was investigated by classical fluorescence spectroscopy and improved fluorescence spectroscopy at 293, 303 and 310 K, the conclusions of the two methods were consistent. The results showed that fluprofen could quench the intrinsic fluorescence of bovine serum albumin, and the quenching mechanism was a static quenching process. The static electricity forces attraction played an important role on the conjugation reaction between BSA and fluprofen, the number of binding site (n) in the binary system was approximately to 1. The values of Hill's coefficients were more than 1, which indicated very weakly positive cooperativity in bovine serum albumin-fluprofen system. The binding constant (K_a) that obtained by improved fluorescence spectroscopy was much larger than the one obtained by classical fluorescence spectroscopy, which indicated that it was more accurate and reasonable when regarding the drug as the research object. At last, the scientificity of the new method based on improved fluorescence spectroscopy was verified by ultraviolet spectroscopy.

Keywords: fluorescence spectroscopy bovine serum albumin fluprofen ultraviolet spectroscopy interaction

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