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论文

巴罗沙星与DNA的相互作用及Mg^{2+}的影响

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摘要：

目的研究巴罗沙星与DNA的分子作用机制和Mg^{2+}对巴罗沙星与DNA相互作用的影响。方法利用荧光光谱研究巴罗沙星与DNA的作用强度并计算热力学数据ΔH；利用紫外光谱、黏度测定、竞争实验、与变性DNA作用的比较等方法确定巴罗沙星与小牛胸腺DNA的相互作用方式；利用荧光光谱考察Mg^{2+}对巴罗沙星与小牛胸腺DNA相互作用的影响。结果DNA对巴罗沙星的荧光猝灭常数为$(5.43\pm0.07)\times10^3$ $L\cdot mol^{-1}$，ΔH=-8.03 $kJ\cdot mol^{-1}$；Mg^{2+}使巴罗沙星与DNA的作用增强。结论巴罗沙星以沟槽键合方式与DNA相互作用；Mg^{2+}对巴罗沙星与DNA的结合有中介作用。

关键词： 巴罗沙星 小牛胸腺DNA 沟槽键合 Mg^{2+}

Interaction between balofloxacin and DNA and the influence of Mg^{2+} on the interaction

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Abstract:

AimTo study the binding mode of balofloxacin with DNA and evaluate the influence of Mg^{2+} on the binding between balofloxacin and DNA. MethodsFluorescent spectroscopy was used to study the interaction of balofloxacin with DNA and to calculate the thermodynamic constants. UV-Vis spectra, DNA viscosity titration, competition experiment and the effect of dsDNA and ssDNA on the fluorescense intensity were used to identify the binding mode. ResultsBalofloxacin interacted with CT-DNA with a quenching constant of $(5.43\pm0.07)\times10^3$ $L\cdot mol^{-1}$. The interaction was exothermic with a Van't Hoff enthalpy of -8.03 $kJ\cdot mol^{-1}$. Mg^{2+} cation could enhance the quenching constant between balofloxacin and DNA. ConclusionBalofloxacin interacted with CT-DNA in the mode of groove binding and Mg^{2+} could mediate the binding of balofloxacin to DNA .

Keywords: CT-DNA groove binding Mg^{2+} balofloxacin

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