



Mg²⁺对Bloom综合症解旋酶与G4DNA结合的影响研究

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Study on the effects of Mg²⁺ on the binding between Bloom syndrome helicase and G4DNA

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摘要 利用荧光偏振技术检测了Mg²⁺对G4DNA、BLM-G4DNA复合物和BLM 642-1290 解旋酶与G4DNA结合的影响。结果表明, G4DNA荧光偏振值随着Mg²⁺浓度的增加而增加(《WTBX》P《WTBZ》< 0.01); BLM-G4DNA复合物的荧光偏振值随着Mg²⁺浓度的增加出现下降—升高—下降的变化趋势(《WTBX》P《WTBZ》<0.01); G4DNA与BLM 642-1290 解旋酶结合的荧光偏振值随着Mg²⁺浓度的增加而逐渐下降(《WTBX》P《WTBZ》<0.01); 分析不同Mg²⁺浓度下两种分子结合的《WTBX》K d《WTBZ》值, 发现Mg²⁺浓度为3.0 mmol/L时, BLM 642-1290 解旋酶与G4DNA最容易结合, 表明适量Mg²⁺浓度会促进BLM 642-1290 与G4DNA的结合, 但会引起两种分子结合的形状、流动性和电荷等性质的改变。这些结果可为进一步研究BLM解旋酶对G4DNA的作用机理提供相关资料。

关键词: BLM解旋酶 G4DNA Mg²⁺ 荧光偏振技术

Abstract: This paper studied the effects of Mg²⁺ on G4DNA, BLM-G4DNA complex, and the binding of BLM 642-1290 helicase and G4DNA using fluorescence anisotropy technology. The results indicated that the fluorescence anisotropy of G4DNA increased with Mg²⁺ concentration (《WTBX》P《WTBZ》<0.01); The anisotropy of BLM-G4DNA complex showed varied tendency of decrease-increase-decrease with Mg²⁺ concentration (《WTBX》P《WTBZ》<0.01); The anisotropy of the binding between the helicase and G4DNA gradually declined following Mg²⁺ concentration (《WTBX》P《WTBZ》<0.01); The binding was most likely to occur between the helicase and G4DNA when Mg²⁺ concentrations was 3.0 mmol/L, which suggested that the suitable amount of Mg²⁺ could promote the binding of the helicase and G4DNA but that could lead to the change of the binding properties of two molecules including the shape, flow ability, and charge. These results provided useful data for studying the interaction mechanism between BLM helicase and G4DNA.

Key words: BLM helicase G4DNA Mg²⁺ fluorescence polarization technology

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