

论文

缬氨酸Schiff碱金属铜配合物对质粒DNA的切割作用

王常荣¹, 吕健², 高陆¹, 王永梅², 张金红¹

1. 南开大学生命科学学院,
2. 化学学院, 天津 300071

摘要:

缬氨酸Schiff碱金属铜配合物(PBP-L-Val-Cu)是新合成的一类非酶类切割工具, 合成了4种类型样品分别为L-CH₃ Cu, D-CH₃ Cu, L-Ph Cu和D-Ph Cu. 以质粒DNA(pUC18)为材料, 分别对这4种类型化合物进行核酸切割效率的研究, 得出适合的反应体系后, 通过琼脂糖凝胶电泳对反应不同时间后核酸切割产物进行检测, 最终分别得到每种化合物将超螺旋型DNA切割成为开环型DNA和直线型DNA的切割效率, 经比较得出L-CH₃ Cu型的切割效率是最快的. 将直线型DNA切割产物用琼脂糖凝胶回收试剂盒进行回收, 得到的直线型切割产物可以在T4连接酶的作用下重新连接起来. 利用酶切法对切口进行检测, 结果表明, 切割作用是具有特异性的. 另外, 该化合物对质粒pNQ216也具有切割活性.

关键词: 缬氨酸Schiff碱金属铜配合物 质粒DNA 特异性切割

Plasmid DNA Cleavage by Valine-Schiff Base-Cu Complexes

WANG Chang-Rong¹, LÜ Jian², GAO Lu¹, WANG Yong-Mei², ZHANG Jin-Hong^{1*}

1. College of Life Science,
2. College of Chemistry, Nankai University, Tianjin 300071, China

Abstract:

Valine-Schiff base-Cu(PBP-L-Val-Cu), which is a nonenzyme DNA-cleavage complex, contains four different forms: L-CH₃, D-CH₃, L-Ph and D-Ph. To obtain the most efficient activity, we test the cleavage activity of complexes under different conditions using pUC18 from *E. Coli* as DNA sample. Plasmid pUC18 was cleaved by the four certain complexes separately and the products cleaved in variance of time were examined through agarose gel electrophoresis. In this way, we compare the cleavage ability of PBP-L-Val-Cu complexes in cleaving supercoiled DNA into nicked or linear DNA product, and then we find that L-CH₃ has the highest activation in cleaving supercoiled plasmid DNA. Furthermore, we purificate the linear DNA product by TIANGel Midi Purification Kit, and this linear DNA extraction could be connected again by T4 DNA ligase. Finally, we incided the linear DNA extraction with two different kinds of restriction enzyme. The results show that this complex can cleave DNA in a site-specific way. Moreover, PBP-L-Val-Cu can also cleave other plasmid DNA, such as pNQ216 from *Bacillus subtilis*.

Keywords: Valine-Schiff base-Cu complex Plamid DNA Site-specific cleavage

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