

## 论文

### 聚乙烯醇与葡激酶的相互作用及其对葡激酶二级结构的影响

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#### 摘要:

在生理条件下, 使用凝胶过滤色谱、荧光光谱、差示扫描量热分析、傅里叶变换红外光谱(FTIR)和葡激酶的纤溶活性分析研究了聚乙烯醇(PVA)和葡激酶的相互作用及其对葡激酶高级结构的影响. 凝胶过滤色谱研究结果表明, PVA与葡激酶之间形成了复合物; 荧光光谱和差示扫描量热分析结果提示, 葡激酶与PVA之间的相互作用没有破坏葡激酶的高级结构; 进一步使用红外光谱法结合可增强分辨率的傅里叶去卷积技术和高斯曲线拟合技术, 用于对葡激酶与PVA复合物冻干粉中葡激酶酰胺 I 带的定量分析发现, 复合物冻干粉葡激酶分子中易导致蛋白质变性的分子间 $\beta$ -折叠组分含量明显减少. 纤溶活性分析结果进一步确认, PVA与葡激酶的相互作用未影响葡激酶的活性, 并对蛋白质的活性起保护作用.

关键词: 聚乙烯醇; 葡激酶; 傅里叶变换红外光谱; 凝胶过滤; 荧光光谱

### Interaction Between PVA and Staphylokinase and Its Influence on the Secondary Structure of Staphylokinase

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#### Abstract:

Gel filtration chromatography, fluorescence spectrophotometry, differential scanning calorimetry(DSC), Fourier transform infrared spectrophotometry(FTIR) and fibrinolytic activity analysis were used to investigate the interaction between polyvinyl alcohol(PVA) and staphylokinase under physiological conditions. The results show that staphylokinase can form complex with PVA. The results of fluorescence spectrophotometry and DSC suggested that the interaction of PVA with staphylokinase did not destroy advanced structures of staphylokinase. FTIR was combined with resolution enhancement technique Fourier deconvolution and Gaussian curve-fitting procedures to quantitate the spectral information from the amide I bands of staphylokinase within the freeze-dried mixture of PVA and staphylokinase. The results show that the interaction of PVA with staphylokinase decrease  $\beta$ -sheet content which is associated with intermolecular interaction and protein denaturation. Analysis of fibrinolytic activity of the staphylokinase show that interaction of PVA with the staphylokinase do not destroy the tertiary structure of the staphylokinase.

Keywords: Polyvinyl alcohol; Staphylokinase; Fourier transform infrared spectrometry(FTIR); Gel chromatography; Fluorescence spectrometry

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- [1]DeMerlis C. C., Schoneker D. R.. Food Chem. Toxicol.[J], 2003, 41: 319—326
- [2]Hassan C. M., Peppas N. A.. J. Adv. Polym. Sci.[J], 2000, 153: 37—65
- [3]Van de Weert M., Hoehstetter J., Hennink W. E., *et al.*. J. Control. Release[J], 2000, 68: 351—359
- [4]He J. T., Su H. B., Li G. P., *et al.*. Int. J. Pharm.[J], 2006, 309(1/2): 101—108
- [5]HE Jin-Tian(贺进田), TAO Xian-Mei(陶贤梅), MO Wei(莫炜), *et al.*. Acta Pharm. Sin.(药学学报)[J], 2006, 41(1): 12—18
- [6]Collen D., Lijnen H. R.. Thromb. Haemost.[J], 2005, 93(4): 627—630
- [7]Collen D.. Nat. Med.[J], 1998, 4(3): 79—284
- [8]He J. T., Di J. F., Xu R. G., *et al.*. Biotechnol. Appl. Bioc.[J], 2008, 50(Pt 1): 17—23
- [9]HE Jin-Tian(贺进田), WANG Gai-Zhen(王改珍), SONG Hou-Yan(宋后燕). Spectrosc. Spect. Anal.(光谱学与光谱分析)[J], 2006, 26(8): 1209—1212
- [10]HE Jin-Tian(贺进田), WANG Gai-Zhen(王改珍), FENG Mei-Yan(冯美艳), *et al.*. Chem. J. Chinese Universities(高等学校化学学报)[J], 2009, 30(1): 68—71
- [11]Hillgren A., Alden M.. Int. J. Pharm.[J], 2002, 244: 137—149
- [12]Elkordy A. A., Forbes R. T., Barry B. W.. Int. J. Pharm.[J], 2002, 247: 79—90
- [13]Dornberger U., Fandrei D., Backmann J., *et al.*. Biochim. Biophys. Acta[J], 1996, 1294(2): 168—176
- [14]Yang T. H., Dong A., Meyer J., *et al.*. J. Pharm. Sci.[J], 1999, 88: 161—165
- [15]Carrasquillo K. G., Costantino H. R., Cordero R. A., *et al.*. J. Pharm. Sci.[J], 1999, 88: 166—173

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