

## 论文

### 神经鞘磷脂合成酶基因沉默对细胞凋亡的影响

石渊渊, 李志强, 谷敬丽, 王玉兰

河南大学医学院, 河南大学神经生物研究所, 开封 475004

#### 摘要:

以HEK293细胞为模型, 利用RNA干扰技术, 将神经鞘磷脂合成酶(SMS)的同工酶(SMS1和SMS2)的siRNA分别联合、转染HEK293细胞. 通过薄层层析法评价SMS酶活性, 同时测神经酰胺(Cer)、卵磷脂(PC)及神经鞘磷脂(SM)的水平, 并以流式细胞仪和Annexin V-FITC、PI双染法检测细胞凋亡. 结果显示, 与对照组相比, SMS基因沉默后SMS表达水平降低(分别降低17%, 20%, 49%); SM水平显著性降低( $P < 0.05$ ); Cer水平显著性升高( $P < 0.05$ ); TNF- $\alpha$ 诱导的凋亡显著性升高[分别为58%( $P < 0.01$ ), 24%( $P < 0.05$ ), 77%( $P < 0.01$ )]. 这些结果提示, SMS基因沉默能降低SM水平并升高Cer水平, 明显增加TNF- $\alpha$ 诱导的HEK293细胞凋亡. 由于SM是动脉粥样硬化形成的独立危险因素, 因此本研究有可能为动脉粥样硬化的治疗找到新的靶点和有效途径.

关键词: 神经鞘磷脂合成酶; 薄层层析; 神经酰胺; 神经鞘磷脂; 细胞凋亡

## Influence of Sphingomyelin Synthase Knockdown on Cell Apoptosis

SHI Yuan-Yuan\*, LI Zhi-Qiang, GU Jing-Li, WANG Yu-Lan

Medical College of Henan University, Institute of Neurobiology, Henan University, Kaifeng 475004, China

#### Abstract:

HEK293 cells were used to investigate the relationship between sphingomyelin synthase(SMS) activity and cell apoptosis. SMS1siRNA and SMS2siRNA were transfected HEK293 cells, respectively, or simultaneously. SMS activity was monitored by thin layer chromatographic assay. Sphingomyelin, ceramide, and phosphatidylcholine levels were determined by an established method. Cell apoptosis was measured by flow cytometry. The results show that SMS1 and SMS2 knockdown reduces SMS activity(17%, 20%, 49%, respectively), sphingomyelin levels were significantly reduced( $P < 0.05$ ), ceramide was significantly increased( $P < 0.05$ ), compared with control group. We then performed cell apoptosis, and found that SMS1, SMS2, and SMS1/SMS2 knockdown significantly induced by TNF- $\alpha$  mediated apoptosis[58%( $P < 0.01$ ), 24%( $P < 0.05$ ), 77%( $P < 0.01$ ), respectively], suggesting monitoring SMS activity plays an important role on cell apoptosis, thus may have impact on the development of atherosclerosis.

Keywords: Sphingomyelin synthase; Thin layer chromatographic; Ceramide; Sphingomyelin; Cells apoptosis

收稿日期 2009-03-20 修回日期 网络版发布日期

DOI:

基金项目:

国家自然科学基金(批准号: 30670688)、河南省教育厅项目(批准号: 2006180004)和河南大学校内基金(重点理工科)(批准号: 04ZDZR010)资助.

通讯作者: 石渊渊, 女, 副教授, 从事脂代谢与动脉粥样硬化研究. E-mail: syy5161@henu.edu.cn

作者简介:

#### 参考文献:

- [1]Huitema K., van den Dikkenberg J., Brouwers J. F.. EMBO J.[J], 2004, 23: 33—44
- [2]van der Luit A. H., Budde M., Zerp S., et al.. Biochem. J.[J], 2007, 401: 541—549
- [3]Ding Tin-bo, Li Zhi-qiang, Hailemariam Tiruneh, et al.. Journal of Lipid Research[J], 2008, 49: 376—385

扩展功能

本文信息

Supporting info

PDF(332KB)

[HTML全文]

[\({article.html\\_WenJianDaXiao}\)](#)  
KB)

参考文献[PDF]

参考文献

服务与反馈

把本文推荐给朋友

加入我的书架

加入引用管理器

引用本文

Email Alert

文章反馈

浏览反馈信息

本文关键词相关文章

神经鞘磷脂合成酶; 薄层层析; 神经酰胺; 神经鞘磷脂; 细胞凋亡

本文作者相关文章

PubMed

- [4]Separovic D., Hanada K., Maitah M. Y., *et al.*. *Biochem. Biophys. Commun. Res.*[J], 2007, 358: 196—202
- [5]Li Z., Hailemariam T. K., Zhou H., *et al.*. *Biochim. Biophys. Acta*[J], 2007, 1771: 1186—1194
- [6]Hojjati M. R., Jiang X. C.. *J. Lipid Res.*[J], 2006, 47: 673—676
- [7]Preiss J. E., Loomis C. R., Bell R. M., *et al.*. *Methods Enzymol.*[J], 1987, 141: 294—300
- [8]Meng A., Luberto C., Meier P., *et al.*. *Cell Res.*[J], 2004, 292: 385—392
- [9]SHI Yuan-Yuan(石渊渊), WANG Yu-Lan(王玉兰), LI Zhi-Qiang(李志强). *Chem. J. Chinese Universities (高等学校化学学报)*[J], 2008, 29(10): 1982—1985
- [10]Kolesnick R.. *J. Clin. Invest.*[J], 2002, 110: 3—8
- [11]Ross R.. *Nature*[J], 1993, 362: 801—808
- [12]Tabas I.. *Arterioscler. Thromb. Vasc. Biol.*[J], 2005, 25: 2255—2264

本刊中的类似文章

文章评论

序号	时间	反馈人	邮箱	标题	内容
					META http-equiv Type content="t charset=unic Appreciation for star hee