

论著

## PI3K-ERK信号在胰岛素诱导的血管平滑肌细胞增殖中的作用

于长青,张晔,傅春江,王旭开<sup>△</sup>

第三军医大学大坪医院心内科,重庆 400042

收稿日期 2008-12-18 修回日期 2009-6-9 网络版发布日期 2010-3-11 接受日期 2009-6-9

**摘要** 目的: 探讨胰岛素促血管平滑肌细胞增殖的分子机制。方法: 原代培养的SD大鼠血管平滑肌细胞为研究对象, [3H]-TdR掺入实验观察胰岛素刺激后血管平滑肌细胞的增殖, 免疫印迹分析PI3K-ERK信号在平滑肌细胞增殖中的作用。结果: 胰岛素明显促进血管平滑肌细胞增殖, 该作用呈现剂量依赖性关系, PI3K抑制剂LY294002、MAPK抑制剂PD98059可抑制胰岛素的促增殖作用, [3H]-TdR掺入分别下降48.8%、43.6%, 抑制PI3K可下调胰岛素刺激的磷酸化ERK1/2蛋白表达和ERK活性, 分别下降112%、127%。结论: PI3K-ERK1/2信号通路参与了胰岛素促平滑肌细胞增殖过程。

**关键词** [磷脂酰肌醇3激酶](#); [细胞外信号调节激酶类](#); [胰岛素](#); [血管平滑肌细胞](#); [细胞增殖](#)

分类号 [Q253](#)

## Inducing vascular smooth muscle cell proliferation by insulin involves in phosphatidylinositol 3-kinase and ERK1/2

YU Chang-qing, ZHANG Ye, FU Chun-jiang, WANG Xü-kai

Department of Cardiology, Daping Hospital, The Third Military Medical University, Chongqing 400042, China. E-mail: wangxuk@163.com

### Abstract

<FONT face=Verdana>AIM: To investigate the effect of insulin on vascular smooth muscle cells (VSMCs) proliferation and to evaluate the intracellular signaling pathways involved. METHODS: VSMCs separated from Sprague-Dawley rats were used in this study. The proliferation of VSMCs induced by insulin was assayed by [3H]-thymidin incorporation. The protein expression and activity of p-ERK1/2 were determined by immunoblot and [ $\gamma$ -32P] ATP incorporation. RESULTS: Insulin induced cell proliferation in a concentration-dependent manner. The proliferative effect of insulin on VSMCs was inhibited partly by LY294002 (48.8%), an inhibitor of PI-3 kinase, and the ERK1/2 inhibitor PD98059 (43.6%), respectively. Moreover, phosphorylation of ERK1/2 and activity of ERK1/2 induced by insulin were also inhibited partly by LY294002. CONCLUSION: PI-3 kinase and ERK1/2 are involved in insulin induced VSMCs proliferation.</FONT>

**Key words** [Phosphoinositide 3-kinase](#) [Extracellular signal-regulated kinases](#) [Insulin](#) [Vascular smooth muscle cells](#) [Cell proliferation](#)

DOI: 1000-4718

通讯作者 王旭开 [wangxuk@163.com](mailto:wangxuk@163.com)

### 扩展功能

#### 本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(2120KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [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](#)
- ▶ [复制索引](#)
- ▶ [Email Alert](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

#### 相关信息

- ▶ 本刊中 包含“[磷脂酰肌醇3激酶](#); [细胞外信号调节激酶类](#); [胰岛素](#); [血管平滑肌细胞](#); [细胞增殖](#)”的 [相关文章](#)
- ▶ 本文作者相关文章

- [于长青](#)
- [张晔](#)
- [傅春江](#)
- [王旭开](#)