

论著

## 预适应和前胡丙素对缺氧肥厚血管平滑肌胞内钙离子浓度及NO含量的影响

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**摘要** 观察了预适应和前胡丙素对缺氧肥厚血管平滑肌胞内钙离子浓度 ( $[Ca^{2+}]_i$ ) 及NO含量的影响。①建立两肾一夹肾血管性高血压大鼠模型, 分离培养主动脉血管平滑肌细胞 (VSMC), 以fura-2/AM为钙指示剂。测得前胡丙素 ( $20 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ , 术后第9周起ig 9周) 治疗和缺氧预适应 (5 min  $N_2$ , 5 min 95% $O_2$ +5% $CO_2$ 混合气体, 循环3次) 对缺氧 (30 min  $N_2$ ) 所致肥厚VSMC对KCl和去甲肾上腺素刺激反应性升高 ( $[Ca^{2+}]_i$ 升高) 有明显的拮抗效应。

②用血管紧张素II刺激致VSMC肥厚, 前胡丙素 ( $10 \mu\text{mol} \cdot \text{L}^{-1}$ 温育24 h) 和缺氧预适应合用使缺氧肥厚VSMC的NO含量恢复至正常VSMC水平。结果提示前胡丙素与缺氧预适应对肥厚VSMC缺氧损伤有协同性的保护作用。

**关键词** [前胡丙素](#) [缺血预适应](#) [肌, 平滑, 血管](#) [细胞, 培养的](#) [钙, 细胞内](#) [一氧化氮](#)

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## Effects of preconditioning and praeruptorine C on intracellular free calcium level and NO content in hypertrophied vascular smooth muscle cells with hypoxia

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### Abstract

Effects of preconditioning(PC) and praeruptorine C(Pra-C) on intracellular free calcium level ( $[Ca^{2+}]_i$ ) and NO content in hypertrophied vascular smooth muscle cells (VSMC) with hypoxia were studied. ①The aorta VSMC of rats with renovascular hypertension induced by two-kidney-one-clip(2K1C) were isolated and cultured. Fura-2/AM was as a calcium fluorescent indicator. It was seen that Pra-C( $20 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ , ig, for 9 weeks from week 9 after 2K1C) and PC (3 cycles of 5 min pure  $N_2$  and 5 min 95% $O_2$ +5% $CO_2$ ) antagonisted the elevated activities(higher  $[Ca^{2+}]_i$ ) induced by KCl and norepinephrine in VSMC with hypoxia (30 min pure  $N_2$ ). ② In hypertrophied VSMC stimulated by angiotensin II, combination of Pra-C( $10 \mu\text{mol} \cdot \text{L}^{-1}$  for 24 h) and PC enhanced NO content to the normal level in hypertrophied VSMC with hypoxia. The results suggest that combination of Pra-C and PC have cooperative protection for hypertrophied VSMC with hypoxia injury.

**Key words** [praeruptorine C](#) [preconditioning](#) [muscle](#) [smooth](#) [vascular](#) [cells](#) [cultured](#) [calcium](#) [cytosolic](#) [nitric oxide](#)

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