

论著

低氧诱导大鼠肺泡巨噬细胞产生TNF- α 的机制

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摘要 目的: 研究低氧诱导肺泡巨噬细胞低氧诱导因子-1 α (HIF-1 α)的表达及HIF-1 α 对肺泡巨噬细胞产生肿瘤坏死因子- α (TNF- α)的影响。方法: 应用HIF-1 α 诱骗法(HIF-1 α decoy)抑制低氧(3%O₂, 5%CO₂, 92% N₂)培养的肺泡巨噬细胞中HIF-1 α 的作用, 并用免疫组织化学、Western blot、半定量RT-PCR、酶联免疫吸附法(ELISA)分别检测HIF-1 α 蛋白、mRNA的表达和TNF- α 的产生。结果: HIF-1 α 在常氧对照组肺泡巨噬细胞核中表达呈阴性, 在低氧组和HIF-1 α decoy组表达呈阳性; 低氧组和HIF-1 α decoy组中HIF-1 α 蛋白的含量显著高于常氧对照组(P<0.05)。HIF-1 α mRNA的含量在低氧组和HIF-1 α decoy组明显高于常氧对照组(P<0.05); 培养的巨噬细胞上清液中TNF- α 的含量在低氧组(115 \pm 17 ng/L)明显高于常氧对照组(69 \pm 13 ng/L, P<0.05)和HIF-1 α decoy组(81 \pm 15 ng/L, P<0.05)。结论: 低氧可明显诱导肺泡巨噬细胞HIF-1 α 的表达和活性增强, 后者能促进TNF- α 的产生, 提示在可导致肺部低氧的炎症性疾病如COPD中HIF-1 α 可能发挥重要作用。

关键词 [低氧](#); [肿瘤坏死因子](#); [巨噬细胞,肺泡](#)

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Mechanisms of hypoxia-induced tumor necrosis factor- α production in rat alveolar macrophages

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Abstract

AIM: To study the effect of hypoxia inducible factor-1 alpha (HIF-1 α) on tumor necrosis factor alpha (TNF- α) production in rat alveolar macrophages cultured under hypoxic condition. METHODS: Using HIF-1 α decoy inhibiting its function, Immunohistochemistry, Western blot, semiquantitative RT-PCR and ELISA were used to determine the expression of HIF-1 α protein and mRNA and the production of TNF- α in rat alveolar macrophages cultured under hypoxic condition (3% O₂, 5% CO₂, 92% N₂), respectively. RESULTS: Expression of HIF-1 α was positive in cultured macrophage nucleoli in hypoxia group and HIF-1 α decoy group but it was negative in normoxic control group. The content of HIF-1 α protein in hypoxia group and HIF-1 α decoy group were significantly higher than that in normoxic control group (P<0.05). The content of HIF-1 α mRNA in hypoxia group and HIF-1 α decoy group were markedly higher than that in normoxic control group (P<0.05), respectively. The content of TNF- α in hypoxia group (115 \pm 17 ng/L) was higher than that in control group [(69 \pm 13) ng/L, P<0.05] and HIF-1 α decoy group [(81 \pm 15) ng/L, P<0.05] . CONCLUSION: Hypoxia can increase significantly expression and activity of HIF-1 α , which can promote the production of TNF- α in rat alveolar macrophages. It suggests that HIF-1 α plays an important role in the pathogenesis of chronic inflammation-related diseases that can give rise to lung hypoxia such as COPD.

Key words [Anoxia](#) [Tumor necrosis factor](#) [Macrophages](#) [alveolar](#)

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