# Role of hypoxia inducible factor-1α in remote limb ischemic preconditioning.

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| Résumé en anglais | Remote ischemic preconditioning (RIPC) has emerged as a feasible and attractive therapeutic procedure for heart protection against ischemia/reperfusion (I/R) injury. However, its molecular mechanisms remain poorly understood. Hypoxia inducible factor-1α (HIF-1α) is a transcription factor that plays a key role in the cellular adaptation to hypoxia and ischemia. This study's aim was to test whether RIPC-induced cardioprotection requires HIF-1α upregulation to be effective. In the first study, wild-type mice and mice heterozygous for HIF1a (gene encoding the HIF-1α protein) were subjected to RIPC immediately before myocardial infarction (MI). RIPC resulted in a robust HIF-1α activation in the limb and acute cardioprotection in wild-type mice. RIPC-induced cardioprotection was preserved in heterozygous mice, despite the low HIF-1α expression in their limbs. In the second study, the role of HIF-1α in RIPC was evaluated using cadmium (Cd), a pharmacological HIF-1α inhibitor. Rats were subjected to MI (MI group) or to RIPC immediately prior to MI (R-MI group). Cd was injected 18 0min before RIPC (Cd-R-MI group). RIPC induced robust HIF-1α activation in rat limbs and significantly reduced infarct size (IS). Despite Cd's inhibition of HIF-1α activation, RIPC-induced cardioprotection was preserved in the Cd-R-MI group. RIPC applied immediately prior to MI increased HIF-1α expression and attenuated IS in rats and wild-type mice. However, RIPC-induced cardioprotection was preserved in partially HIF1a-deficient mice and in rats pretreated with Cd. When considered together, these results suggest that HIF-1α upregulation is unnecessary in acute RIPC. |

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[27] http://dx.doi.org/10.1016/j.yjmcc.2013.10.001
[28] http://www.ncbi.nlm.nih.gov/pubmed/24140799?dopt=Abstract