Human micro- and macrovessel-derived endothelial cells: a comparative study on the effects of adrenaline and a selective adenosine A₂-type receptor agonist under normoxic and hypoxic conditions

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Abstract:
Adrenaline is a highly effective stimulator of cyclic AMP (cAMP) production in microvascular endothelial cells (ECs) – HMEC-1, showing only a moderate activity in macrovascular ECs – HUVEC. In both EC preparations, adrenaline acts via β-type receptors. Selective stimulation of adenosine A₂-type receptors resulted in comparable increases in cAMP formation in ECs lining micro- and macrovessels. Hypoxia largely suppressed the cAMP effects resulting from stimulation of both β-adrenoceptors and adenosine A₂-type receptors in ECs of microvessels (HMEC-1). In contrast, hypoxia had only slight effect on these responses in ECs of macrovessels (HUVEC). The present data provide further evidence of functional differences between microvessel- and macrovessel-derived ECs.

Key words:
human microvascular endothelial cells (HMEC-1), human umbilical vein endothelial cells (HUVEC), cyclic AMP, β-adrenoceptor, adrenaline, adenosine, hypoxia