CD163 is expressed and modulated in human pulmonary artery smooth muscle cells: Implications for Pulmonary Artery Hypertension.

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Pulmonary Arterial Hypertension (PAH) is a rare but fatal disease characterised by remodelling of the pulmonary vasculature, increased vascular resistance and right-heart failure. In patients with PAH the iron-regulatory hormone hepcidin is elevated and iron homeostasis compromised. Recent research also highlights the occurrence of sub-clinical haemolysis and the presence of free haemoglobin (Hb) in PAH patients. We hypothesised, that if present on human pulmonary artery smooth cells (hPASMCs), the Hb scavenger-receptor CD163 could aid in proliferation via Hb uptake and further that expression would be modulated by stimuli of relevance to PAH. Confluent hPASMCs were challenged with increasing concentrations of hepcidin, IL-6 or Hb. RT-PCR was performed using extracted mRNA and protein expression studied by immunocytochemistry (ICC). Proliferation was measured independently by cyquant staining and BrdU incorporation. Novel findings indicate basal expression of CD163 mRNA and protein in hPASMCs. A 2-fold increase in CD163 mRNA was observed with IL-6 challenge (10ng/mL; n=3). ICC revealed minimal basal expression of CD163 that increased with hepcidin (500ng/mL) or Hb (10uM) treatment. Exposure to Hb also caused an increase in proliferation of hPASMCs by 11% ($p<0.05$, n=7; cyquant) or 12% ($p<0.01$, n=6; BrdU). This is the first report of CD163 expression and regulation in hPASMCs. Enhanced Hb uptake via CD163 may encourage iron mediated cell proliferation and novel insights into disease mechanism for PAH.