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Body: Bone-marrow–derived endothelial progenitor cells (EPCs) might play a key role in the formation of new vessels. Endothelin-1 (ET-1) is known to modulate different stages of neovascularisation. We investigated a potential link between the ET system and EPCs in pulmonary hypertension (PH). EPCs were isolated from Sprague-Dawley rats and rat pulmonary artery (paECs) endothelial cells served as positive control. ET-A and B receptor expression and detection of prepro-ET and ET converting enzyme (ECE) mRNA were performed by RT-PCR. In calcium (Ca2+) flux assays EPCs loaded with FURA-2 were exposed to ET-1 [10-6M and 10-8M]. For selective inhibition of receptor subtypes, EPCs were pre-incubated with ETRA (BQ123) or ETRB (BQ788) antagonists for 20 min before stimulation with ET-1. EPCs express both ET-receptor subtypes. Both prepro-ET-1 and ECE encoding mRNA could be detected in EPC. In Ca2+ flux experiments addition of ET-1 elicited a significantly increased intracellular Ca2+ flux which could be inhibited by BQ123 (96%) and BQ788 (45%). We proved for the first time the expression of both ETRA and ETRB and detected mRNA of prepro-ET and of ECE on EPCs. We also found that ET-1 activates Ca2+ flux in EPCs. In summary, our data reveal for the first time a link between EPC and the ET system.