

PKC ϵ regulates vessel formation by peri-vascular adipose tissue (PVAT) cells

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Vessel formation is crucial in tumour growth and tissue regeneration. Protein kinase C (PKC) ϵ has a well-known role on hematopoietic and mesenchymal progenitor cell differentiation and proliferation (Gobbi et al. 2013). Although PKC ϵ has a demonstrated role in vascular restenosis, data on PKC ϵ and vascular progenitor differentiation are still lacking. The aim of this work was to study the role of PKC ϵ in vessel formation by adult adipose tissue cell progenitors. We, first, isolated the vessel progenitors from the adipose tissue localized between aortic arch and pulmonary artery of adult mice by collagenase/elastase digestion followed by magnetic immunoselection of Sca1+ cells (Passmann et al. 2008). We, then, tested their capability to form vessels in collagen gels and to differentiate to endothelial and smooth muscle lineage after treatment with PKC ϵ specific activator and inhibitor peptides. The functional experiments showed that the pharmacological activation of endogenous PKC ϵ abrogated tubule formation with a concomitant decrease of smooth alpha-actin (SMA) and platelet endothelial cell adhesion molecule (PECAM) together with the up-regulation of p-PAK1 expression. *In vivo* transient over-expression of PKC ϵ significantly reduced SMA and PECAM expression levels in vessel wall cells. Together our data suggests that PKC ϵ may affect vessel wall remodelling balancing the “phenotypic switching” (Salmon et al. 2013) between the proliferative and the differentiated state of smooth muscle and endothelial progenitor mesenchymal cells.

References

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Keywords

Peri-vascular adipose tissue (PVAT), vascular progenitors, PKC ϵ .