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**Review**

## Platelet interaction with progenitor cells: vascular regeneration or injury?

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**Abstract :**

Increasing evidence supports the role of stem and progenitor cells in vascular regeneration or injury. Following tissue ischemia, progenitor cells are mobilized from their bone marrow or peripheral niches into circulation, adhere at sites of vascular lesion and differentiate into a variety of mature cell types according to their origin and the local environment. Impairment in this pathophysiological process due to either low numbers of circulating progenitor cells or dysfunctional progenitor cells leads to inadequate vascular repair and upon co-existence with different cardiovascular risk factors to vascular injury and atherosclerosis. Vascular repair is a complex process which includes mobilization, chemotaxis, adhesion, proliferation and differentiation of progenitor cells. The common cardiovascular risk factors can impair this process resulting into inhibition of vascular healing and enhancement of inflammatory pathways which ultimately leads to atherosclerosis. Although homing of progenitor cells into bone marrow has been extensively studied, domiciliation of precursor cells into peripheral tissues and differentiation into mature cells are poorly understood so far. Recently, the role of platelets in domiciliation and subsequent differentiation of progenitor cells has been highlighted. Adherent platelets recruit circulating progenitor cells *in vitro* and *in vivo* and induce differentiation of the latter into endothelial cells or macrophages and foam cells. Although further studies are needed to describe the mechanisms that lie underneath these observations, it seems that platelet interaction with progenitor cells is an essential step in both vascular regeneration and injury.

**Key words:**

progenitor cells, platelets, regeneration, atherosclerosis

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