

# A Novel Population of Mesenchymal Progenitors with Hematopoietic Potential Originated from CD14<sup>-</sup> Peripheral Blood Mononuclear Cells

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### **Abstract :**

Hematopoietic system derived progenitor cells with mesenchymal features have been identified including CD14<sup>+</sup> monocyte-derived progenitors. However, it is unclear whether there are mesenchyme derived progenitors with hematopoietic potential. Herein, we identified a novel CD14<sup>-</sup> cell-derived population with both mesenchymal and hematopoietic features in rat peripheral blood, and this cell population is different from the CD14<sup>+</sup> monocyte-derived progenitors but designated peripheral blood multipotential mesenchymal progenitors (PBMMs). Phenotype analysis demonstrated expression of mesenchymal markers in PBMMs including BMPRs, Endoglin/CD105, Fibronectin (Fn), Vimentin (Vim), Collagen (Col) I/II/III along with hematopoietic marker CD34. CD14<sup>+</sup> cell-derived population shared the same characteristics with CFs. In mixed culture of CD14<sup>+</sup> and CD14<sup>-</sup> cells, PBMMs were a predominant component and expressed CD29<sup>high</sup>, CD73<sup>high</sup>, CD34<sup>high</sup>, CD45<sup>low</sup> and CD90. Except for the value of mixed T lymphocytes and CD14<sup>+</sup> cell-derived population, hematopoietic characters of cultured PBMMs were indicated by CD14<sup>-</sup>/CD34<sup>+</sup>/CD45<sup>-</sup>/CD90<sup>+</sup>. The mesenchymal origin was further confirmed by comparing PBMMs with bone marrow stromal cells. Finally, we transplanted PBMMs into a skin wound model, and results showed the specific potential of PBMMs in not only extracellular matrix secretion but epidermal regeneration. This study provides evidence that peripheral blood contains common hematopoietic-mesenchymal progenitors from both hematopoietic and mesenchymal lineages, and CD34<sup>+</sup> mesenchymal progenitors are a possible alternative source of epidermal cells in wound healing.

### **Key Word :**

Peripheral blood stem cells, Mesenchymal stem cells, Hematopoietic stem cells, Stem cell plasticity, Common progenitor, Wound healing

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