

Erythropoietin modulates bone marrow stromal cell differentiation

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Abstract

Erythropoietin is important for bone marrow biological process and glycoprotein receptor on non-erythroid cells as well as bone marrow stromal cells suggests general effects of glycoprotein. Tg6 mice with chronic glycoprotein overexpression have a high hematocrit, reduced trabeculate and plant tissue bone and bone marrow adipocytes, and shriveled bone morphogenic supermolecule a pair of driven position bone and adipocyte formation. glycoprotein treatment (1 200 IU•kg⁻¹) for ten days equally exhibit raised hematocrit, reduced bone and bone marrow adipocytes while not raised osteoclasts, and reduced bone morphogenic supermolecule sign within the bone marrow. apparently, endogenous glycoprotein is needed for traditional differentiation of bone marrow stromal cells to osteoblasts and bone marrow adipocytes. ΔEpoRE mice with corpuscle restricted glycoprotein receptor exhibit reduced trabeculate bone, raised bone marrow adipocytes, and shriveled bone morphogenic supermolecule a pair of position bone formation. glycoprotein treated ΔEpoRE mice achieved hematocrit kind of like wild-type mice while not reduced bone, suggesting that bone reduction with glycoprotein treatment is related to non-erythropoietic glycoprotein response.

Erythropoietin (EPO), a protein made in foetal liver and adult kidneys, is needed for production of red blood cells. EPO binds to its receptor, EPOR, expressed on corpuscle progenitors and promotes survival, proliferation, and differentiation. Mice with targeted deletion of Epo or Epor die in utero of severe anemia., Bone marrow contains 2 distinct kinds of stem cells: hematogenic stem cells that produce to any or all kinds of blood cells and skeletal stem cells (SSCs), a set of bone marrow stromal cells (BMSCs) that differentiate into chondrocytes, osteoblasts, biological process supporting stroma and adipocytes. whereas RUNX2 and OSTERIX square measure vital for osteogenesis. many cytokines gift within the bone marrow niche additionally preferentially regulate SSC/BMSC differentiation. Impaired SSC/BMSC differentiation leads to imbalance of adipocyte and bone-forming cell differentiation in marrow and clinical studies show

enlargement of marrow fat is related to reduced bone density

Bone is metabolically active and undergoes continuous transforming processes whereby osteoclasts of hematogenic origin digest previous bone and osteoblasts of BMSC origin lay down new bone matrix. we tend to used transgenic ΔEpoRE-mouse model with Epor expression restricted to corpuscle cells to assess the role of endogenous EPO sign in regulation of osteogenic cells.

To analyze the result of elevated EPO on bone design, we tend to used the transgenic Tg6 mice with overexpression of human EPO. The Tg6 mice have mouse EPO levels kind of like their littermate controls however have high levels of human EPO in their circulation.

