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CXCR7: A potential target for anti-angiogenesis treatment

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Tumor development and metastases require angiogenesis, and anti-angiogenesis treatment is effective strategy for tumor therapy. Endothelial progenitor cells (EPC) is the trigger of tumor angiogenesis. During angiogenesis, EPC are mobilized from bone marrow, recruited to angiogenic site, incorporate and finally form neo-vessel. In those processes, stromal cell-derived factor-1 (SDF-1) is a main regulator. For a long time, SDF-1 was considered to act via its unique receptor CXCR4. CXCR7 is a recently-identified alternative receptor of SDF-1. The fact that CXCR7 is high expressed in endothelium of tumor blood vessels but low in normal vessels suggests there might be some correlation between CXCR7 and tumor angiogenesis.

To investigate the role of CXCR7 in angiogenesis, we detected CXCR7 expression in human EPC derived from cord blood and studied roles of CXCR7 in EPC by treating EPC with CXCR7 antagonist CCX733. Western blotting and flow cytometry assay results showed that considerable intracellular CXCR7 was expressed in human EPC. Multiple functional assays revealed that CXCR7 mediated human EPC survival exclusively, mediated tube formation and matrix metalloproteinase-2 (MMP-2) production along with CXCR4. Blocking CXCR7 with CCX733 impaired EPC adhesion to active HUVEC and trans-endothelial migration induced by SDF-1, but had no effect on EPC migration, proliferation or nitric oxide (NO) production. These results indicated that CXCR7 plays a critical role in EPC homing and participating in angiogenesis, and may be a potential target molecule in anti-angiogenesis therapy for cancer.

Biography

Yan Xiaoqing is a Ph.D candidate in Chongqing University. He has published more than 10 papers in reputed journals.

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