CDB SEMINAR

Masanori Nakayama

Max-Planck-Institute for Molecular Biomedicine

Department of tissue morphogenesis

Wednesday, January 13, 2010

16:30~17:30 A7F Seminar Room

Regulation of VEGF-induced angiogenesis by receptor endocytosis

Summary

In development, tissue regeneration or certain diseases, angiogenic growth leads to the expansion of blood vessels and the lymphatic vasculature. This involves endothelial cell proliferation as well as angiogenic sprouting, in which a subset of cells, termed tip cells, acquires motile, invasive behaviour and extends filopodial protrusions. While it is already appreciated that angiogenesis is triggered by tissue-derived signals, such as VEGF family growth factors, the resulting signaling processes in endothelial cells are only partially understood.

We show that ephrin-B2, a transmembrane ligand for Eph receptor tyrosine kinases, promotes sprouting behaviour and motility in the angiogenic endothelium. We attribute this function to a crucial role of ephrin-B2 in the VEGF signalling pathway, which we have studied in detail for VEGFR3, the receptor for VEGF-C. In the absence of ephrin-B2, the internalisation of VEGFR3 in cultured cells and mutant mice is defective, which compromises downstream signal transduction. Our results show that full VEGFR3 signalling requires receptor internalisation. Ephrin-B2 is a key regulator of this step and thereby controls angiogenic and lymphangiogenic growth.

Host:
Shinichi Nishikawa
Stem Cell Biology, CDB
nishikawa@cdb.riken.jp
Tel:078-306-1893
(ext : 5301)