



CDB SEMINAR

Speaker: **Yosuke Mukoyama**

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Title: “Neuro-angiogenesis: cellular and molecular studies of cross-talk between the nervous system and vascular system“

Date: **Tuesday, November 2**

Time: **16:00 P.M. ~ 17:00 P.M.**

Place: **7th floor Conference Room of Building A, CDB**

Summary

Our recent studies have shown that in the embryonic skin, vascular branching and arterial differentiation from primitive capillaries appear to be controlled by peripheral nerves. As a result, the arteries run along the nerves (Mukoyama, Y et al. Cell 109, 693-705, 2002). The facts that nerves secrete vascular endothelial growth factor-A (VEGF)-A which stimulates arterial differentiation in vitro, and neuropilin-1 (NP1), a co-receptor for VEGF-A, is preferentially expressed by artery, suggest that nerve-derived VEGF-A may function to induce arteries via NP1.

We have addressed the requirement for VEGF-A signalling in the nerve-dependent arterial differentiation in vivo, using the Cre-loxP recombination system to specifically inactivate *Vegf-A* in peripheral nerves or *Np1* in endothelial cells. The failure of arterial differentiation is seen in these mutants. These results imply an important role for VEGF-NP1 signal in arterial differentiation. However, alignment with peripheral nerves and formation of proper vascular branching appear to be maintained in these mutants.

Our results provide the first in vivo evidence that VEGF is necessary for arterial differentiation from a primitive capillary plexus, and show that in limb skin the nerve is indeed the principal source of this signal. Our results also imply that nerve-vessel alignment can occur without arterial differentiation, likely reflecting the involvement of distinct nerve-derived signals in these patterning and differentiation processes. Taken together, how the nervous and vascular systems with distinct functions but similar anatomical architecture are established during development will be discussed.

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