CDB SEMINAR

Speaker: Toshihide Yamashita

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Title:

"Axon growth inhibition signals from p75NTR"

Date:	Wednesday, June 16
Time:	16:00 P.M.～ 17:00 P.M.
Place:	1F Auditorium of Building C, CDB

Summary:

Injury to the adult CNS is devastating because of the inability of central neurons to regenerate correct axonal and dendritic connections. It is now well established that axons of the adult central nervous system are capable of only a limited amount of regrowth after injury, and that an unfavorable environment plays major roles in the lack of regeneration. Much of the axon growth inhibitory effects is associated with myelin. Identification of the myelin-derived inhibitors leads to a spurt in our knowledge about the molecular mechanisms of the biological activities. The neurotrophin receptor p75NTR, which has long been known as a receptor for neurotrophins that promote survival and differentiation, transduces the signal from all of the myelin-derived inhibitors found to date. We now know that $p75^{NTR}$ has the ability to elicit bi-directional signals, that result in the inhibition as well as the promotion of the neurite outgrowth. Neurotrophins binding to $p75^{NTR}$ promotes neurite outgrowth by inactivating small GTPase Rho, which is one of the key regulators of actin cytoskeleton. Contrary to this finding, $p75^{NTR}$, in response to myelin-derived inhibitors, releases Rho from Rho guanine nucleotide dissociation inhibitor (Rho-GDI), thus eliciting activation of Rho. Activation of Rho is required for axon growth inhibition *in vitro* as well as *in vivo*. These findings establish Rho as a key player in inhibiting the regeneration of the central nervous system, and launched a new wave of studies that aim to promote regeneration of injured axons by modulating this inhibitory pathway. I will review recent findings that uncover the signaling mechanisms of axon growth inhibition in the central nervous system.

Host: Hideki Enomoto **Neuronal Differentiation and Regeneration, CDB**

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