UPDATE FROM THE CUTTING EDGE

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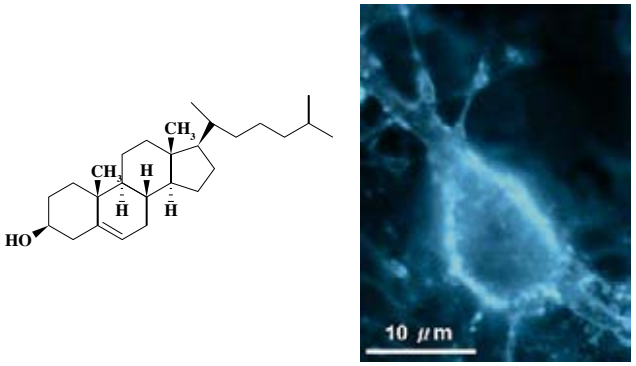
**The abstracts of the recent research information appearing in Vol.7 No.10–12 of "AIST TODAY" are introduced here, classified by research area.
For inquiry about the full article, please contact the author via e-mail.**

Life Science & Technology

Brain-derived neurotrophic factor regulates cholesterol metabolism for synapse development

Brain-Derived Neurotrophic Factor (BDNF) exerts multiple biological functions in the Central Nervous System (CNS). Although BDNF can control transcription and protein synthesis, it still remains open to question whether BDNF regulates lipid biosynthesis. We found that BDNF elicits cholesterol biosynthesis in cultured CNS neurons. Importantly, BDNF elicited cholesterol synthesis in neurons, but not in glial cells. BDNF-induced cholesterol increases were prevented by specific inhibitors of cholesterol synthesis, mevastatin and zaragozic acid, suggesting that BDNF stimulates *de novo* synthesis of cholesterol. An electrophysiological study revealed that BDNF-dependent cholesterol biosynthesis plays an important role for the development of a Readily Releasable Pool (RRP) of synaptic vesicles. Taken together, these results suggest a novel role for BDNF in cholesterol metabolism and synapse development.



Molecular structure of cholesterol (left) and fluorescence image of cultured neuron labeled by a cholesterol-binding dye Filipin (right)

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