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[Lab. of Molecular Biology]

Microsphere Embolism-induced Elevation of Nerve Growth Factor Level and Appearance of Nerve Growth Factor Immunoreactivity in Activated T-Lymphocytes in the Rat Brain.

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Changes in nerve growth factor (NGF) level and type of cells producing NGF were investigated in the rat brain after sustained cerebral embolism. The cerebral cortex, striatum, and hippocampus of the embolized hemisphere maximally contained 2.4-, 2.4-, and 1.7-times higher NGF levels than the corresponding regions of the nonembolized hemisphere. A significant increase was transiently observed for 1 week in the cerebral cortex and striatum, whereas the increase was longer lasting, at least of 4 weeks' duration, in the hippocampus. NGF-like immunoreactivity (NGF-LI), which was localized in neurons of the normal or non-embolized hemisphere, was reduced, and on the embolized side new signals emerged in small non-neuronal cells having a round shape. NGF-LI and CD3 were colocalized in a substantial number of the cells, suggesting that some activated T-lymphocytes produce NGF for neuronal regeneration after sustained cerebral embolism.

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[Lab. of Molecular Biology]

Impairments of Long-term Potentiation in Hippocampal Slices of Beta-amyloid-infused Rats.

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In this study, we investigated the neuronal activity of hippocampal slices from the beta-amyloid protein-infused (300 pmol/day for 10-11 days) rats using the extracellular recording technique. Perfusion of nicotine (50 microM) reduced the amplitude of electrically evoked population spikes in the CA1 pyramidal cells of the vehicle control rats, but not in those of the beta-amyloid protein-infused rats, suggesting the impairment of nicotinic signaling in the beta-amyloid protein-infused rats. Long-term potentiation induced by tetanic stimulations in CA1 pyramidal cells, which was readily observed in the vehicle control rats, was also impaired in the beta-amyloid protein-infused rats. Nicotinic blockade by adding hexamethonium into the perfused solution inhibited long-term potentiation induction. Taken together, our previous and present results suggest that beta-amyloid protein infusion impairs the signal transduction mechanisms via nicotinic acetylcholine receptors. This dysfunction may be responsible, at least in part, for the impairment of long-term potentiation induction and may lead to learning deficits.

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[Lab. of Microbiology]

Acid-fast Bacteria Detected from Porous Filtrating Materials and Bath Tab Waters of 24h-home Bath Systems.

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Contamination due to acid-fast bacteria of 72 samples from porous filtrating materials and bath tab waters of 24h-home bath systems were tested. Thirty-two samples of them were positive for acid-fast bacteria. Percentages of detections were high in samples from porous filtrating materials and bath tab waters used for more than 3 days; especially those from the former were higher than the latter. This finding suggests that porous filtrating materials are hotbeds for acid-fast bacteria. Six strains from 32 isolates were identified: 22 isolates as strains of *Mycobacterium avium*, 4 as *M. szulgai*, 2 as *M. fortuitum*, 2 as *M. kansaii*, one as *M. intracellulare*, and one as *M. gordonae*.

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[Lab. of Herbal Garden]

Two New Erythrina Alkaloids from *Erythrina x bidwillii*.

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Two new erythrinan alkaloids, 10,11-dioxyerythraline (1) and 8-oxyerythraline epoxide (5) have been isolated from flowers of *Erythrina x bidwillii*. Their structures were elucidated by spectroscopic analyses and chemical evidences. 8-Oxyerythraline epoxide is the first alkaloid possessing an epoxy ring.