

アダプター(AP)複合体ファミリーによる細胞内蛋白質輸送の制御機構

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2001 Fiscal Year Final Research Report Summary

Mechanisms for regulation of intracellular protein sorting mediated by the adaptor protein (AP) complex family

Research Project

Project/Area Number

12480178

Research Category

Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

Structural biochemistry

Research Institution

Kanazawa University

Principal Investigator

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Project Period (FY)

2000 – 2001

Keywords

epithelial cells / selective sorting / μ 1B / poliovirus receptor / axis of cell division / μ 3B / seizure

Research Abstract

Plasma membrane (PM) of epithelial cells is physically divided by the tight junction into apical and basolateral domains, and distinct subsets of membrane proteins are expressed on the two domains. We cloned a new μ homologue, μ 1B, which is expressed exclusively in epithelial cells. AP-1B, containing μ 1B, mediates selective sorting of newly synthesized proteins to the basolateral PM. There are two isoforms for poliovirus receptor (PVR), α and δ . We have found that PVR α interacts with μ 1B and expressed basolaterally, whereas PVR δ is not recognized by μ 1B and randomly expressed on both PM domains. We also found that μ 1B- deficient epithelial cells divide randomly, causing multi-layer morphology instead of monolayer characteristic to epithelial cells. In order to investigate the roles of μ 1B in organisms, we established ES cell lines for making μ 1B knockout mice.

We also established mice lacking μ 3B, a subunit of the neuron-specific AP-3B complex. μ 3B KO mice suffer from epileptic seizure. In these mice, KCl-stimulated release of GABA, an inhibitory neurotransmitter, from hippocampal slices decreased to one-half of that of wild-type mice, suggesting that break down in inhibitory synaptic transmission cause the seizure.

Research Products (12 results)

All Other
All Publications

[Publications] Aguilar, R.C.: "Signal-binding specificity of the μ 4 subunit of the adaptor protein complex, AP-4"J. Biol. Chem. 276. 13145-13152 (2001) ▼

[Publications] Ohka, S.: "Basolateral sorting of human poliovirus receptors involves an interaction with the μ 1B subunit of the clathrin adaptor complex in polarized epithelial cells"Biochem. Biophys. Res. Commun.. 278. 941-948 (2001) ▼

[Publications] Blumstein, J.: "The neuronal form of AP-3 is required for synaptic vesicle formation from endosomes"J. Neurosci.. 21. 8034-8042 (2001) ▼

[Publications] Uekita, T.: "Cytoplasmic tail dependent internalization of membrane-type 1 matrix metalloproteinase (MT1-MMP) is important for its invasion-promoting activity"J. Cell Biol.. 155. 1345-1356 (2001) ▼

[Publications] Eskelinen, E.-L.: "The polarized epithelia specific μ 1B-adaptin complements μ 1A-deficiency in fibroblasts"EMBO report. (in press). ▼

[Publications] Sugimoto, H.: "Differential recognition of tyrosine-based basolateral signals by the AP-1B subunit μ 1B in polarized epithelial cells"Mol. Biol. Cell. (in press). ▼

[Publications] Aguilar, R. C.: "Signal-binding specificity of the μ 4 subunit of the adaptor protein complex, AP-4"J. Biol. Chem.. 276. 13145-13152 (2001) ▼

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