 A MAGYAR TUDOMÁNYOS AKADÉMIA

AKADÉMIAI SZÉKFOGLALÓRA

MEGHÍVÓ

**KÉMIAI TUDOMÁNYOK OSZTÁLYA**

tisztelettel meghívja Önt

**SHIROH FUTAKI**

az MTA tiszteleti tagja

**Peptide-based approaches for delivering
exogenous molecules into cells**

címmel tartandó székfoglaló előadására

## **Az előadás ideje: 2019. december 10. (kedd), 12.00 óra**

## Az előadás helye: MTA Székház Nagyterem

(1051 Budapest, Széchenyi István tér 9.)



AKADÉMIAI SZÉKFOGLALÓRA

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Professor Shiroh FUTAKI

**Peptide-based approaches for delivering
exogenous molecules into cells**

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One of the major research interests in our research group is to design peptides for intracellular delivery of biomacromolecules, based on the understanding of molecular interplay between peptides and membranes. Arginine-rich peptides, including HIV-1 TAT peptide and octaarginine (R8), are known as representative cell-penetrating peptides (CPPs), which internalize into cells via endocytosis or direct penetration through cell membranes [1]. Peptide adsorption on cell membranes has been considered as a crucial factor to initiate the membrane penetration, where importance of lipid packing has been suggested by our studies [2]. We also developed a spider toxin-derived peptide, L17E, capable of delivering antibody (IgG) into cells [3]. L17E stimulates actin polymerization and induces a dynamic structural alteration of cell membranes. This raises the possibility that the transient permeabilization of ruffled cell membranes may be the crucial mechanism for facile cytosolic translocation of biomacromolecules by L17E [4]. Not only physicochemical but also physiological aspects should thus be considered to facilitate peptide-mediated delivery of exogenous molecules into cells.

[1] S. Futaki, I. Nakase, Acc. Chem. Res. 2017, 50, 2449-2456; [2] T. Murayama et al., Angew. Chem. Int. Ed. 2017, 56, 7644-7647; [3] M. Akishiba et al., Nature Chem. 2017, 9, 751-761; [4] M. Akishiba, S. Futaki, Mol. Pharm. 2019, 16, 2540-2548.