

COLLOQUIA IN CELLULAR SIGNALLING

Venue: Medical University Vienna, Center for Physiology and Pharmacology,
Institute of Pharmacology, Waehringerstrasse 13a, 1090 Vienna, "**Leseraum**".

(Harald Sitte, Tel.: (01) 40160 31323, harald.sitte@meduniwien.ac.at,

Hannes Todt, Tel.: (01) 40160 31250, Hannes.todt@meduniwien.ac.at)

Friday **14.03.2014 11:00 s.t.** **Andras Malnasi- Csizmadia**
(host: H. Todt)
Dept. of Biochemistry,
Eötvös Loránd University, Budapest
Pázmány Péter sétány 1/C,
Budapest, H-1117
HUNGARY

"Molecular tattooing in live zebrafish"

Andras Malnasi- Csizmadia (malna@elte.hu)

Abstract:

Miklós Képiró¹, Boglárka Várkuti¹, Katalin Kis Petik³, Miklós Z. Kellermayer³, Máté Varga⁴, **András Málnási-Csizmadia**^{1,2}

¹Department of Biochemistry, Eötvös University

²Eötvös University, ELTE-HAS Molecular Biophysics Research Group,

³Department of Biophysics and Radiation Biology, Semmelweis University

⁴Department of Genetics, Eötvös University

Until now the greatest limitation in the application of bioactive compounds was the inability of confining them specifically to single cells or subcellular components within the organism. Recently we synthesized photoactive forms of bioactive compounds which can be covalently attached to their target enzymes, thus resulting in prolonged effects. Furthermore, we showed that photoactivation can be initiated by two-photon excitation, thereby confining the effect to femtoliter volumes and well-controlled spatial locations. As a test, we halted the migration of specific cells of zebrafish embryos by activating a photoactive inhibitor of myosin using a two-photon microscope. The role of cell migration and cell-cell interactions in the development of zebrafish lateral line organ could thus be revealed with unprecedented spatial and temporal control and detail. In another test system, we specifically inhibited myosin 2 in subcellular regions of M2 human cell and investigated how local myosin inhibition affects membrane blebbing of the cell. Our results indicate that molecular tattooing opens fundamentally new prospects in optopharmacology.