

Open Ph.D. projects

1.

Announcer: Csaba Tömböly

Doctoral School: Faculty of Medicine, University of Szeged, Theoretical Medicine Doctoral School

Title of the research topic: Semisynthesis of fluorescent protein derivatives for studying membrane proteins

Description of the research topic: GPI-anchored proteins are special membrane associated proteins containing a complex glycolipid that anchors the attached protein to the outer leaflet of the cell membrane. The responsibility of the candidate includes the preparation of protein conjugates containing lipid moieties with small molecule fluorophores, fluorescent microscopy of the resulting fluorescent lipidated proteins, and the investigation of protein-protein interactions of the semisynthetic proteins. After optimizing the protein – lipid conjugation, NMR structural studies will be conducted on membrane anchored N-15 labelled proteins. This way the structural features of proteins in their native environment will be described. Further task of the candidate is the investigation of the structural and kinetic properties of the cyclodextrin inclusion complexes of cholesteryl lipoproteins.

2.

Announcer: Csaba Tömböly

Doctoral School:

Title of the research topic: Preparation and in vitro pharmacological investigation of G-protein coupled receptor ligands

Description of the research topic: The endocannabinoid system is involved in numerous physiological and pathological processes in the central nervous system and in the periphery. Synthetic compounds that interact with the cannabinoid receptors (CBRs) or modulate the effects of cannabinoids have therapeutic potential in the treatment of neurological diseases, psychiatric disorders, neuropathic pain and obesity. Based on our in vitro and in vivo results it is hypothesized that the members of the endocannabinoid peptide family pepcans and their structurally modified derivatives are excellent lead compounds for the development of therapeutic agents acting at the cannabinoid receptors without significant psychoactive side effects. During the proposed research project (i) the biological significance of the endogenous cannabinoid peptides, and (ii) the structural modification of the pepcan family toward therapeutic compounds will be addressed.

3.

Announcer: Attila Borics

Doctoral School: Faculty of Medicine, University of Szeged, Theoretical Medicine Doctoral School,

Title of the research topic: Design, synthesis and characterization of peptide ligand probes targeting specific pharmacophore interactions with G protein-coupled receptors.

Description of the research topic: Beyond investigation of the structural dynamics of G protein coupled receptors, analyses of structure-activity relationships of various GPCR ligands are intended. Our investigations are based on experimentally derived receptor structures as well as pharmacological characterization of specifically designed peptide ligand probes and receptor mutants, following principles of receptor-ligand interactions revealed to date.