Taken together, the *Arabidopsis* SET protein is a potent inhibitor of animal and plant phosphatases and may have a role in heat shock tolerance as indicated by its altered (nuclear) localization in response to a 1h 45°C treatment. Thus, in the light of our results we can presume that the investigation of SET can be of practical importance, since it might have a role in the stress tolerance of plants. This hypothesis is currently investigated in SET-overexpressing transgenic plants.

Johansen KM, Johansen J (2006) Regulation of chromatin structure by histone H3S10 phosphorylation. Chromosome Res 14(4):393-404.
Li M, Makkinje A, Damuni Z (1996) The myeloid leukemia-associated protein SET is a potent inhibitor of protein phosphatase 2A. J Biol Chem 19:11059-11062.
Nowak SJ, Pai CY, Corces VG (2003) Protein phosphatase 2A activity affects histone H3 phosphorylation and transcription in Drosophila melanogaster. Mol Cell Biol 17:6129-6138.
Park YJ, Luger K (2006) Structure and function of nucleosome assembly proteins. Biochem Cell Biol 4:549-558.

Supervisor: Attila Fehér
E-mail: bzsulesz@gmail.com

Cross-talk between cannabinoid CB_1 and $GABA_B$ receptors in rat brain hippocampus

Resat Cinar[1], Tamas F. Freund[2], Istvan Katona[2], Ken Mackie[3], and Maria Szucs[1]

[1]Institute of Biochemisty, Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary, [2]Institute of Experimental Medicine, Hungarian Academy of Sciences, Budapest, Hungary, [3]Department of Psychology and Brain Sciences, Indiana University, Bloomington, IN, USA

Cannabinoid CB_1 and the metabotropic $GABA_B$ receptors have been shown to display similar pharmacological effects and co-localization in certain brain regions. Previous studies have reported a functional link between the two systems. As a first step to investigate the underlying molecular mechanism, here we show cross-inhibition of G-protein signaling between $GABA_B$ and CB_1 receptors in rat hippocampal membranes. The CB_1 agonists R-Win55,212-2 displayed high potency and efficacy in stimulating Guanosine-5'-*O*-(3-[^{35}S]thio)triphosphate, [^{35}S]GTPγS binding. Its effect was completely blocked by the specific CB_1 antagonists AM251 suggesting that the signaling was via CB_1 receptors. The $GABA_B$ agonist baclofen and SKF97541 also elevated [^{35}S]GTPγS binding by about 60%, with potency values in the micromolar range. Phaclofen behaved as a low potency antagonist with an an $ED_{50} \approx 1$ mM . However, phaclofen at low doses (1 and 10 nM) slightly but significantly attenuated maximal stimulation of [^{35}S]GTPγS binding by the CB_1 agonist Win55,212-2. The observation that higher concentrations of phaclofen had no such effect rule out the possibility of its direct action on CB_1 receptors. The pharmacologically inactive stereoisomer S-Win55,212-3 had no effect either alone or in combination with phaclofen establishing that the interaction is stereospecific in hippocampus. The specific CB_1 antagonist AM251 at a low dose (1 nM) also inhibited the efficacy of G-protein signaling of the $GABA_B$ receptor agonist SKF97541. Cross-talk of the two receptor systems was not detected in either spinal cord or cerebral cortex membranes. It is suggested that the interaction might occur via an allosteric interaction between a subset of $GABA_B$ and CB_1 receptors in rat hippocampal membranes. Supported by NKTH DNT 08/2004 and OTKA TS 049817 research grants.

Supervisor: Maria Szucs
E-mail: szucsm@brc.hu

Functional analysis of *Drosophila melanogaster* histone H4 specific acetylase complex and its role in regulating chromatin structure

Anita Oriana Ciurciu

Institute of Biochemisty, Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary

Numerous enzymes and protein complexes are known to bring about changes in the state of chromatin by different mechanisms with resultant effects on gene expression. One class of complexes including the yeast SWI/SNF and a number of others from various organisms, alter the DNA packaging in an ATP-dependent manner. Another class of chromatin structure regulating factors acts by covalently modifying histone proteins. The various modifications include phosphorylation, ubiquitination, ADP-ribosylation, methylation, sumoylation and frequently acetylation, catalyzed by histone acetyltransferases (HATs). In many cases HAT enzymes are components of complexes which also contain among others, ADA-type adaptors.

Recently our laboratory, in parallel with several others, has showed that contrary to the single ADA2 adaptor protein present in *Saccharomyces cerevisiae*, different GCN5-containing HAT complexes of *Drosophila melanogaster* cells contain two related ADA2 proteins encoded by genes referred to as *dAda2a* and *dAda2b*. In several other metazoan organisms, including mouse, human and Arabidopsis, there