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RESEARCH AREA

Transcription of eukaryotic genes is a multistep process that involves a large number of functionally different proteins and requires the ordered assembly of giant multiprotein complexes. In recent years the important role of chromatin structure in transcription regulation has been recognized and new directions in transcription research have been initiated. It is hoped that a better understanding of the roles of functionally distinct classes of transcription regulatory proteins and chromatin modifiers will provide keys to decipher why and how can these drive development and can be de-regulated in diseases like cancer.

In joint laboratories located at the BRC and at the Biochemistry and Molecular Biology Department of SzU we use combined approaches to characterize proteins which modify chromatin structure. In one area of research we focus our studies on histone proteins used only under specific conditions for example at the very early stage of embryonic development. For these studies we use *Drosophila* model, as this permits us to combine genetic and cell- and molecular biology methods. Another research approaches we study gene expression changes in cancer cells. For this we use clinical samples and are primarily interested in identifying the genetic alterations that contribute tumor formation.

TECHNIQUES AVAILABLE IN THE LAB

The techniques we use regularly to study different aspects of gene expression consist of a very broad range of genetic, biochemical, cell biology and molecular biology methods. That means daily use of techniques of genetic engineering including the classic ways of DNA manipulations and cloning and also the latest methods of targeted genome editing, chromatin immunoprecipitation and next generation sequencing. In addition to DNA we work extensively with proteins and use diverse methods for purify proteins from different sources and analyze protein-protein interactions.

SELECTED PUBLICATIONS

Majoros, H.; Ujfaludi, Zs.; Borsos, B.N.; Hudacsek, V.V.; Nagy, Z.; Coin, F.; Buzas, K.; Kovács, I.; Bíró, T.; **Boros, I.M.** (2019) et al. SerpinB2 is involved in cellular response upon UV irradiation. **Scientific Reports 9**: 1 Paper: 2753.

Ujfaludi, Zs.; Tuzesi, A.; Majoros, H.; Rothler, B.; Pankotai, T.; **Boros, I.M.** (2018) Coordinated activation of a cluster of MMP genes in response to UVB radiation. **Scientific Reports 8**: 1 Paper: 2660, 10 p.

Borsos, B.N.; Huliak, I.; Majoros, H.; Ujfaludi, Z.; Gyenis, A.; Pukler, P.; **Boros, I.M.**; Pankotai, T. (2017) Human p53 interacts with the elongating RNAPII complex and is required for the release of actinomycin D induced transcription blockage. **Scientific Reports 7** Paper: 40960, 11 p.

Pahi, Z.; Borsos, B.N.; Vedelek, B.; Shidlovskii, Y.V.; Georgieva, S.G.; **Boros, I.M.**; Pankotai, T. (2017) TAF10 and TAF10b partially redundant roles during *Drosophila melanogaster* morphogenesis. **Transcription 8**: 5 pp. 297-306., 10 p.

Borsos, B.N.; Pankotai, T.; Kovacs, D.; Popescu, C.; Pahi, Z.; **Boros, I.M.** (2015) Acetylations of Ftz-F1 and histone H4K5 are required for the fine-tuning of ecdysone biosynthesis during *Drosophila* metamorphosis. **Developmental Biology 404**: 1 pp. 80-87., 8 p.

Vedelek, B.; Blastyak, A.; **Boros, I.M.** (2015) Cross-Species Interaction between Rapidly Evolving Telomere-Specific *Drosophila* Proteins. **Plos One 10**: 11 p. e0142771 , 16 p.

Gyenis, A.; Umlauf, D.; Ujfaludi, Z.; **Boros, I.M.**; Ye, T.; Tora, L. (2014) UVB Induces a Genome-Wide Acting Negative Regulatory Mechanism That Operates at the Level of Transcription Initiation in Human Cells. **Plos Genetics 10**: 7 Paper: e1004483 , 18 p.

Sike, A.; Nagy, E.; Vedelek, B.; Pusztai, D.; Szerémy, P.; Venetianer, A.; **Boros, I.M.** (2014) mRNA Levels of Related Abcb Genes Change Opposite to Each Other upon Histone Deacetylase Inhibition in Drug- Resistant Rat Hepatoma Cells. **Plos One 9**: 1 Paper: e84915, 12 p.

Villanyi, Z.; Ribaud, V.; Kassem, S.; Panasenko, O.O.; Pahi, Z.; Gupta, I.; Steinmetz, L.; **Boros, I.M.**; Collart, M.A. (2014) The not5 subunit of the ccr4-not complex connects transcription and translation. **Plos Genetics 10**: 10 Paper: e1004569, 15 p.