



Katedry biochémie a genetiky PriF UK
a občianske združenie NATURA



Vás pozývajú na 80. prednášku v rámci Kuželových seminárov:

Prof. Dmitri Maslov
University of California, Riverside, USA

RNA editing and mitochondrial translation in trypanosomes

ktorá sa uskutoční **20. mája 2011** (piatok) o **13:00**

v miestnosti **CH1-222** Prírodovedeckej fakulty UK



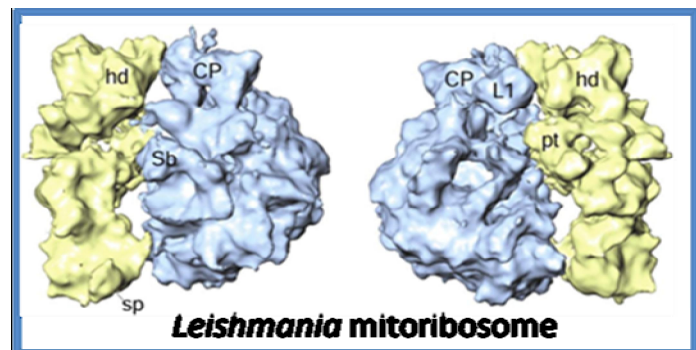
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Hostiteľ: A. Horváth, Katedra biochémie PriF UK

Prof. Dmitri A. Maslov's research of the mitochondrial gene expression includes the aspects of molecular biology, evolution and parasitology. The objects of study, kinetoplastid protozoa, demonstrate a unique organization of kinetoplast-mitochondrial DNA and a highly unusual process of post-transcriptional RNA processing, termed RNA editing. The ongoing research involves characterization of the mitochondrial protein synthesis and characterization of mitoribosomes and translation factors. Another direction of research is aimed at uncovering the biodiversity of kinetoplastids and investigation of their phylogenetic relationships. Dr. Maslov participates in the Cell, Molecular and Developmental Biology graduate program, the Genetics, Genomics and Bioinformatics and also Ecology, Evolution and Organismal Biology graduate programs.



Synopsis of the lecture: U-insertion/deletion RNA editing in trypanosomes creates translatable reading frames from translation-incompetent pre-edited mRNA. The process of editing is mediated by small guide RNAs that perform their role in a highly ordered fashion beginning at the 3' end of a pre-edited transcript and proceeding in the 5' direction. The process of editing is coupled with addition of long poly(A/U) tails which signify translation-competence of the mRNA. Translation is



performed by 50S monosomes which display a unique combination of conserved and derived features. It is hypothesized that in order to recognize the mRNA, the monosomes interact with other protein complexes, particularly those which contain pentatricopeptide repeat (PPR) proteins.

Publications relevant to the lecture:

Maslov, D. A., Sharma, M. R., Butler, E., Falick, A. M., Gingery, M., Agrawal, R. K., Spremulli, L. L., Simpson, L. (2006) Isolation and characterization of Mitochondrial Ribosomes and Ribosomal Subunits from *Leishmania tarentolae*. *Mol. Biochem. Parasitol.* 148:69-78.

Maslov, D.A., Spremulli, L. L., Sharma, M. R., Bhargava, K., Grasso, D., Falick, A. M., Agrawal, R. K., Parker, C. E., Simpson, L. (2007) Proteomics and electron microscopic characterization of the unusual mitochondrial ribosome-related 45S complex in *Leishmania tarentolae*. *Mol. Biochem. Parasitol.*, 152:203-212.

Sharma, M. R., Booth, T. M., Simpson, L., Maslov, D. A., Agrawal, R. K. (2009) Structure of a mitochondrial ribosome with minimal RNA. *Proc. Natl. Acad. Sci. USA* 106: 9637-9642.

Maslov, D. A. (2010) Complete set of mitochondrial pan-edited mRNAs in *Leishmania mexicana amazonensis* LV78. *Mol. Biochem. Parasitol.*, 173:107-114.

Li, F., Herrera, J., Zhou, S., Maslov, Dmitri A., Simpson, L. (2011) Trypanosome REH1 is an RNA helicase involved with the 3'-5' polarity of multiple gRNA-guided uridine insertion/deletion RNA editing. *Proc. Natl. Acad. Sci. USA* 108: 3542-3547

Aphasizheva, I., Maslov, D., Wang, X., Huang, L., Aphasizhev R. (2011) Pentatricopeptide Repeat Proteins Stimulate mRNA Adenylation/Uridylation to Activate Mitochondrial Translation in Trypanosomes. *Molecular Cell* 42: 1-12.