Katedry genetiky a biochémie
Prírodovedeckej fakulty Univerzity Komenského
Ústav experimentálnej onkológie SAV
a občianske združenie *NATURA*
v spolupráci so
Slovenskou spoločnosťou pre biochémiu a molekulárnu biológiu

Vás pozývajú na 60. prednášku v rámci Kuželových seminárov:

Dr. Jan Paleček

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Dynamika chromatinových struktur - funkce SMC proteinů

ktorá sa uskutoční 9. marca 2007 (PIATOK) o 14:00

V PREZENTAČNOM CENTRE J.A. KOMENSKÉHO (u Amosa)
PRÍRODOVEDECKEJ FAKULTY UK (B1 – 313)

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Research and academic positions:

1985-1991: M.Sc., Dept. of Biochemistry, Faculty of Science, Masaryk University of Brno, Czech Republic
1991: Dept. of Biology, Med. Faculty of Masaryk University of Brno, Czech Republic
1992-98: Ph.D. student, Dept. of Biochemistry and Molecular Cell Biology, Biocentrum of University of Vienna, Austria
1998-2002: postdoc, Institute of Biophysics, Brno, Czech Republic
2002-2006: senior postdoc, University of Sussex, Genome Damage and Stability Centre, Brighton, East Sussex, UK
2006-current: assistant professor, Dept. of Functional Genomics and Proteomics, Masaryk University, ILBIT, Brno, Czech Republic

1990, 2000, 2001 – short term visits at Department of Molecular Biology, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany

Abstract of the lecture

Structural maintenance of chromosomes (SMC) proteins are highly conserved from bacteria to humans as they play fundamental roles in many aspects of higher-order chromosome organization and dynamics. In eukaryotes, SMC1 and SMC3 act as the core of the **cohesin** complexes that mediate sister chromatid cohesion, whereas SMC2 and SMC4 function as the core of the **condensin** complexes that are essential for chromosome assembly and segregation. Another complex containing **SMC5 and SMC6** is implicated in multiple processes like DNA repair and checkpoint responses. Our recent studies of yeast *S. pombe* SMC5/6 complex point to key similarities in the architecture all SMC complexes. We have shown that like cohesin and condensin complexes the SMC5/6 complex contains kleisin-like subunit (Nse4) and may form closed tripartite structures. Such structures are critical for mechanistic action of these SMC machines. The SMC5/6 complex may function in posttranslational modification of specific proteins as two of the non-SMC elements (Nse) of the complex include ubiquitine (Nse1) and SUMO E3 ligases (Nse2). The Nse2 sumoylation activity plays a role in DNA damage responses. Human orthologues of yeast Nse3 protein constitute large superfamily (MAGE; melanoma antigen) with diverse functions.

Recent publications:

Sergeant, J. *, Taylor, E.*, Palecek, J.*, Fousteri, M., Andrews, E.A., Sweeney, S., Shinagawa, H., Watts, F.Z., Lehmann, A.R.: Composition and architecture of the *Schizosaccharomyces pombe* Rad18 (Smc5-6) complex, *Mol Cell Biol* 25: 172-84, 2005; *First three authors (JS, ET and JP) contributed equally to this work.

Andrews, E.A., Palecek, J., Sergeant, J., Taylor, E., Lehmann, A.R., Watts, F.Z.: Nse2, a component of the Smc5-6 complex, is a SUMO ligase required for the response to DNA damage, *Mol Cell Biol* 25: 185-96, 2005;

Palecek, J., Vidot, S., Feng, M., Doherty, A.J., Lehmann, A.R.: The Smc5-Smc6 DNA repair complex: Bridging of the Smc5-Smc6 heads by the kleisin, Nse4, and non-kleisin subunits, *J Biol Chem* 281: 36952-9, 2006