Katedry genetiky a biochémie Prírodovedeckej fakulty UK v spolupráci s
Ústavom experimentálnej endokrinológie SAV

Vás pozývajú na **43**. prednášku v rámci Kuželových seminárov:

Prof. Ivan Raška

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Hledání vánočních stromečků v jadérku: dvakrát měř, jednou řež

ktorá sa uskutoční

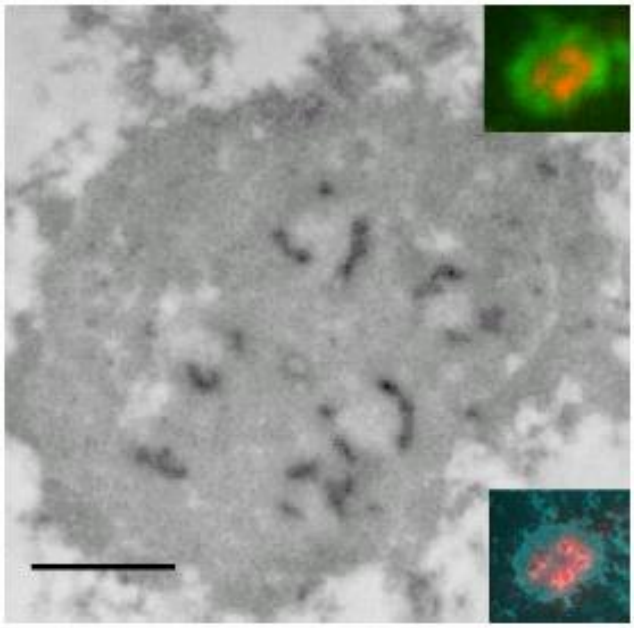
4.5. 2004 (utorok)
o **14:00** v miestnosti B1-501 PriF UK

http://www.fns.uniba.sk/~kbi/kuzela/

Prof. Ivan Raška
http://uemweb.biomed.cas.cz/raska/Raska.htm

The structure and functional organization of the cell nucleus remain subjects of energetic debate today. Understanding in molecular detail the organizing principles of the nucleus, such as the arrangement of chromosomal DNA, or the coordination and regulation of synthesis, processing, assembly and transport of macromolecules are major goals for cell biology. For many years, studies on the cell biology of the nucleus were limited by a relative lack of distinctive substructures revealed by microscopy and amenable to biochemical purification. When a typical mammalian nucleus is observed in the electron microscope, clumps of heterochromatin are visible at the nuclear periphery and the nucleolus is readily identified by virtue of its electrondense appearance, but otherwise the nucleoplasm appears rather featureless and amorphous. However, a very different view is evident when antibody or hybridization probes are used to detect specific nuclear factors or genes. Many nuclear macromolecules are localized to distinct regions and substructures of the nucleus. A specific inquiry into the role of several of these domains and nuclear substructures in RNA metabolism and other nuclear functions is the principal aim of endeavour of the laboratory.

To clarify the localization of transcribing rRNA genes within nucleoli, we have generated an affinity cytochemical picture of the nucleolus. Three kinds of affinity probes have been used: 1) probes to nucleolar chromatin, including rDNA sequences, 2) probes to a number of macromolecules which are directly or indirectly involved in the synthesis and processing of rRNA and the formation of preribosomes (including GFP hybrid proteins); 3) antibodies to base analoques such as bromouridine or biotin-CTP which are used to detect labeled RNA. The results suggest the localization of transcription sites to dense fibrillar components and to the border region between these components and fibrillar centers. Using a permeabilized cell system, we have concluded that the processing factors are assembled on pre-rRNA at the sites of transcription. Our results obtained in living cells showed that the early rRNA processing steps take place in domains of dense fibrillar components which are spatially separated from rDNA transcription sites.



Výber z najnovších publikácií:

Raška, I. (2003). Oldies but goldies: searching for Christmas trees within the nucleolar architecture. *Trends Cell Biol.* **13**: 517-525.

Malinský, J., Koberna, K., Bednář, J., Stulík, J., and Raška, I. (2002). Searching for active ribosomal genes *in situ*: light microscopy in light of the electron beam. *J. Struct. Biol.* **140**: 227-231.

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Grandi, P., Eltsov, M., Nielsen, I., and Raška, I. (2001). DNA double-strand breaks induce formation of RP-A/Ku foci on in vitro reconstituted *Xenopus* sperm nuclei. *J. Cell Sci*. **114**: 3345-3357.

Melčák, I., Melčáková, S., Kopský, V., Večerová, J., and Raška, I. (2001). Prespliceosomal assembly on microinjected precursor mRNA takes place in nuclear speckles. *Mol. Biol. Cell*. **12**: 393-406.