



Katedry genetiky a biochémie PriF UK  
a občianske združenie *NATURA*



Vás pozývajú na 93. prednášku v rámci Kuželových seminárov:

**Dr. David Staněk**

Ústav molekulární genetiky AV ČR, Praha

## **Surveillance of spliceosomal snRNP assembly**

ktorá sa uskutoční **8. novembra 2013** (piatok) o **14:00**

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

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## Dr. David Staněk

### Education:

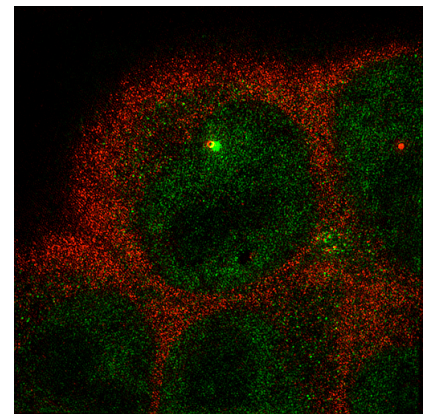
- 1994 - 1999 PhD.: Cell biology and pathology, Charles University in Prague, First Medical Faculty (Supervisor: Professor Ivan Raška).  
1989 - 1994 Undergraduate study: Biochemistry, Charles University in Prague, Faculty of Sciences (Supervisor: Dr. Vladimír Vilím).



### Professional experience:

- 2013 Habilitation (Cell and developmental biology, Faculty of Science, Charles University in Prague)  
2007-present Group-leader, Institute of Molecular Genetics, Academy of Sciences of the Czech Republic, Prague  
2005-2006 Research fellow, Department of Cellular Biology and Pathology, First Medical Faculty, Charles University in Prague, Prague  
2001-2005 Postdoctoral fellow, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany  
2000-2001 Postdoctoral fellow, Department of Neurology, University of Washington, Seattle, U.S.A.  
1999-2000 Research fellow, Department of Cell Biology, Institute of Experimental Medicine, Academy of Sciences of the Czech Republic, Prague.

Cajal bodies (CBs) were identified more than 100 years ago by Ramon y Cajal in vertebrate neurons. The function of these 0.5-1  $\mu$ m spherical structures, which like other cellular subcompartments (PML bodies, P bodies, P granules, stress granules, nucleoli) lack membranes, has been mysterious. Do these bodies have functions per se? Or are they just sticky places where molecules collect? Using live-cell imaging, we have shown that assembly of the macromolecular splicing complexes – the spliceosomal snRNPs – occurs in CBs. Measurements of snRNP dynamics together with mathematical modeling predicted that snRNP assembly is ~10-fold more efficient when CBs are present; this suggested that CBs increase the efficiency of gene expression by facilitating splicing. Our recent data show that Cajal bodies appear as a cell reaction to an imbalance in snRNP assembly pathway to proofread final steps of snRNP assembly, sequester assembly intermediates and maintain nucleoplasmic snRNP levels in homeostatic balance.



### Selected publications:

- Novotný I., Blažíková M., Staněk D., Heřman P. & Malínský J. (2011) In vivo kinetics of U4/U6•U5 tri-snRNP formation in Cajal Bodies. **Mol Biol Cell**. 22: 513-523.  
Staněk D., Přidalová J., Novotný I., Huranová J., Blažíková M., Wen X., Sapra A.K., & Neugebauer K.M. (2008) Spliceosomal snRNPs repeatedly cycle through Cajal bodies. **Mol. Biol. Cell** 19:2534–2543.  
Klingauf M., Staněk D. & Neugebauer K.M. (2006) Enhancement of U4/U6 snRNP Association in Cajal Bodies Predicted by Mathematical Modeling. **Mol. Biol. Cell** 17:4972-81.  
Staněk D., & Neugebauer, K.M. (2006) Cajal bodies: a meeting place for snRNP in the nuclear maze. **Chromosoma** 115:343-54. (review)  
Staněk D., & Neugebauer, K.M. (2004) Detection of snRNP assembly intermediates in Cajal bodies by FRET. **J. Cell Biol.** 166:1015-25.  
Dundr. M, Hebert, M.D., Karpova, T.S., Staněk, D., Xu, H., Shpargel, K.B., Meier, T.U., Neugebauer, K.M., Matera, A.G., & Misteli, T. (2004) In vivo kinetics of Cajal body components. **J. Cell Biol.** 164:831-842.