



Katedry biochémie a genetiky
Prírodovedeckej fakulty Univerzity Komenského
v spolupráci so
Slovenskou spoločnosťou pre biochémiu a molekulárnu biológiu

Vás pozývajú na 54. prednášku v rámci Kuželových seminárov:

Alan MAJERNÍK, PhD.

Ústav genetiky a biochémie živočíchov
Slovenská akadémia vied

Initiation of DNA replication in *Archaea*, the third domain of life:
How eukaryotic-like machinery functions in these prokaryotic organisms

ktorá sa uskutoční 7. apríla 2006 (piatok) o 14:00
v miestnosti B1-320 Prírodovedeckej fakulty UK

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

Alan MAJERNÍK, PhD.

Educational history and research positions

2005 – till present Institute of Animal Biochemistry and Genetics, SAS, Ivanka pri Dunaji,

2004 – 2005 Department of Biology, University of York, UK

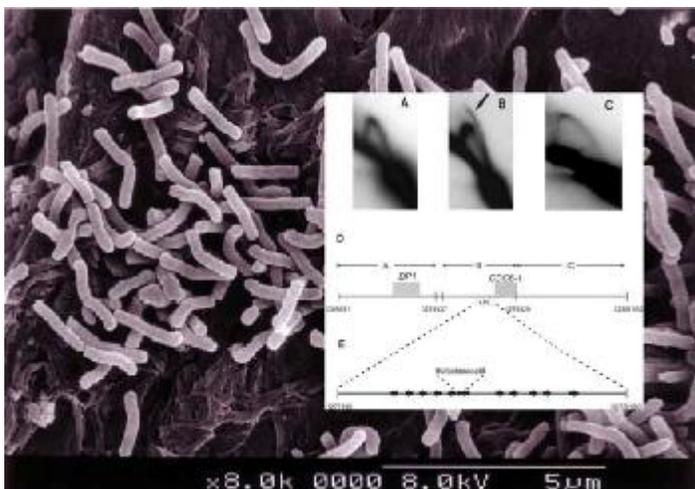
2001 – 2003 Department of Biology and Biochemistry, University of Bath, UK

1999 – 2000 six months study stays, the Institute of Microbiology and Genetics, Göttingen University, Göttingen, Germany

1997 – 2001 Institute of Animal Biochemistry and Genetics, SAS, Ivanka pri Dunaji

1997 – PhD degree, Comenius University, Bratislava and Institute of Animal Biochemistry and Genetics, SAS, Ivanka pri Dunaji

1992 – Master degree in Biochemistry, Comenius University, Bratislava



Fellowships and awards

2002 – 2003 the Leverhulme Trust postdoctoral research fellowship UK., University of Bath, UK

1999 – 2000 Union of German Academies of Sciences fellowship

1998 – DFG postdoctoral fellowship, Göttingen University, Germany

Synopsis of the lecture

The third domain of life consists exclusively of the group of prokaryotic microorganisms originally identified as archaebacteria, and now called Archaea. Genomic sequencing of these organisms has led to considerable analysis of the protein content therein. Many of the metabolic pathways and constituent genes are more related to those found in bacteria. In addition,

there are a number of genes involved in information processing, such as DNA replication, repair and transcription that are more closely related to eukaryotic ORFs. Interestingly, the complement of genes likely to be involved in these processes is significantly reduced compared to what is known to be required in eukaryotes, suggesting that the Archaea may make good models for some eukaryotic processes.

In my talk, I will briefly introduce a recent progress in DNA replication in Archaea. In particular, I will focus on mapping and identification of replication origins in different archaeal species and depiction of specific protein/DNA interactions in *M. thermoautotrophicus*. Elucidation of possible functions for the archaeal initiator protein CDC6/ORC1 will be discussed.

Recent publications

Majerník, A.I., Lundgren, M., McDermott, P., Bernander, R. and Chong, J.P.J. (2005) Content and nucleoid distribution in *Methanothermobacter thermoautotrophicus*. *J. Bacteriol.* 187, 1856-1858.

Guy, C.P., Majerník, A.I., Chong, J.P.J. and Bolt E.L. (2004) A novel nuclease -ATPase (Nar71) from archaea is part of a proposed thermophilic DNA repair system. *Nucleic Acids Res.* 32, 6176-6186.

Majerník, A.I., Jenkinson, E.R. and Chong, J.P.J. (2004) DNA replication in thermophiles. *Biochem. Soc. Trans.* 32, 236 -239.

Čuboňová, L., Šurin, S., Majerník, A. and Šmigáň, P. (2004) Isolation and characterization of an uncoupler-resistant mutant of *Methanothermobacter thermoautotrophicus*. *FEMS Microbiol. Lett.* 233, 23-28.

Majerník, A., Čuboňová, L., Polák, P., Šmigáň, P. and Greksák, M. (2003) Biochemical analysis of neomycin-resistance in the methanoarchaeon *Methanothermobacter thermoautotrophicus* and some implication for energetic processes in this strain. *Anaerobe* 9, 31-38.

Majerník, A., Daniel, R. and Gottschalk, G. (2001): Screening of environmental DNA libraries for the presence of genes conferring Na⁺(Li⁺)/H⁺ antiporter activity on *E. coli*: Characterisation of the recovered genes and the corresponding gene products. *J. Bacteriol.* 183, 6645-6653.