Katedry Biochémie a Genetiky
Prírodovedeckej fakulty Univerzity Komenského

Vás pozývajú na 48. prednášku v rámci *Kuželových seminárov*:

Dr. Peter Pavlík

Bioscience Division of Los Alamos National Laboratory, Los Alamos, New Mexico, USA

Development of High Throughput Technologies for Selections of Antibodies from Phage Display Libraries

ktorá sa uskutoční vo štvrtok 7. apríla 2005
o 14:00 v miestnosti **B1-501**

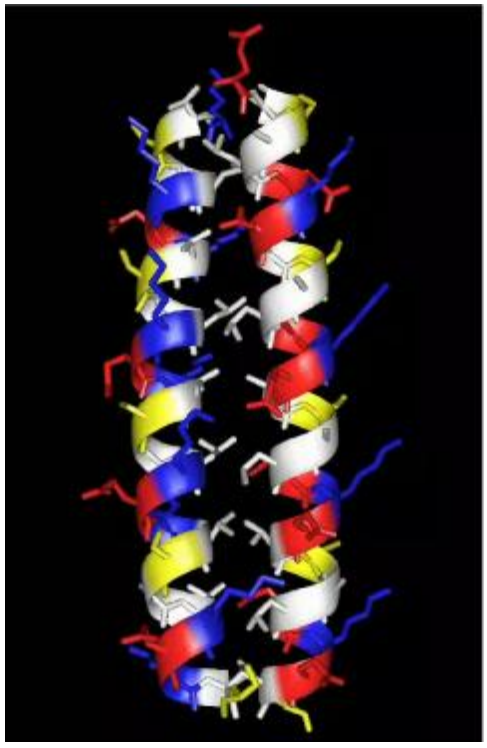
Dr. Peter Pavlík

2001 Technical Staff Member, Bioscience Division of Los Alamos National Laboratory, Los Alamos, NM, USA; *Project:* Development of affinity ligands for use in biosensors.

1998 Postdoctoral Fellow in Functional Genomics thrust at Bioscience Division of Los Alamos National Laboratory, Los Alamos, NM, USA; *Project:* Development of high throughput selection procedures of phage-displayed single-chain antibodies against gene products.

1996 Ph.D. in Biochemistry, Institute of Biochemistry and Molecular Cell Biology, Vienna Biocenter, University of Vienna, Austria; *Thesis:* Studies of regulation of peroxisome proliferation in the yeast *Saccharomyces cerevisiae*.

1991 M.Sc. in Biochemistry with honors, Department of Biochemistry, Faculty of Natural Sciences, Comenius University, Bratislava, Slovakia; *Thesis:* Transposition of mini-Mu derivates of bacteriophage Mu *in vitro*.



Outline of the lecture: The explosion in genome sequencing, and in subsequent DNA array experiments, has provided extensive information on gene sequence, organization and expression. This has resulted in a desire to perform similarly broad experiments on all the proteins encoded by a genome. Panels of specific antibodies will be essential tools in this endeavour. Because traditional immunization will be unlikely to generate antibodies in sufficient quantity, and of the required quality and reproducibility, high throughput in vitro selection methods are being developed. As it become obvious at the very beginning of our studies, high throughput does not simply mean to do the same thing many times, as we had to re-designed antibody libraries, selection protocols, screening approaches, sub-cloning etc. Various approaches to develop an automated antibody pipeline, which is capable of producing panels of antibodies against thousands of antigens per year, will be discussed.

Figure: Universal functionalization of recombinant antibodies. Leucin zipper-like coiled-coil heterodimerization domains can be used to heterodimerize two proteins as well as to interface biology and chemistry.

Relevant publications:

Bradbury, A., Velappan, N., Verzillo, V., Ovecka, M., Chasteen, L., Sblattero, D., Marzari, R., Lou, J., Siegel, R., and Pavlik P. (2003). Antibodies in proteomics I: generating antibodies. *Trends Biotechnol*. **21**, 275-281.

Bradbury, A., Velappan, N., Verzillo, V., Ovecka, M., Chasteen, L., Sblattero, D., Marzari, R., Lou, J., Siegel, R., and Pavlik, P. (2003). Antibodies in proteomics II: screening, high-throughput characterization and downstream applications. *Trends Biotechnol*. **21**, 312-317.

Pavlik, P., Siegel, R.W., Marzari, R., Sblattero, D., Verzillo, V., Marks, J.D. and Bradbury, A. (2003). Predicting antigenic peptides suitable for antibody generation by phage display. *Human Antibodies* **12**, 99-112

Siegel, R.W., Allen, B., Pavlik, P., Marks, J., and Bradbury, A. (2000). Mass Spectral Analysis of a Protein Complex using Single-chain Antibodies Selected on a Peptide Target: Applications to Functional Genomics. *J. Mol. Biol*. **302**, 285-293.