Prof. RNDr. František Marec, CSc.
[1)] Biology Centre ASCR, Institute of Entomology, Lab. Mol. Cytogenetics
[2)] Faculty of Science, University of South Bohemia in České Budějovice
Branišovská 31, 370 05 České Budějovice, Czech Republic
Tel.: +420-387 775 212 (250, 249, 269); Fax: +420-385 310 354
e-mail: marec@entu.cas.cz http://www.entu.cas.cz/

Student evaluation:

Petr Nguyen (2013) Comparative mapping of sex-linked genes in Lepidoptera [Ph.D. Thesis]

It is incredible 10 years since Petr joined our lab as an undergraduate student of the former Faculty of Biological Sciences. During these years he definitely wasn't just a kind of inventory. Petr greatly influenced not only our lab life but also further research direction. He has also left a significant mark on the results of our lab since he contributed as an author or co-author to eight published papers.

Peter's Ph.D. project emerged from our long-standing interest in understanding the evolution of sex chromosomes in Lepidoptera, the largest but less explored group with female heterogamety. And since our previous research showed that the female-sex determining but largely heterochromatic W chromosome is not suitable for evolutionary studies, Petr focused on the gene-rich Z chromosome. His main approach was based on physical mapping of conserved synteny of Z-linked genes between the lepidopteran reference species, *Bombyx mori* with sequenced and assembled genome, and selected species of moths with unexplored genomes. This task included identification of orthologs of *Bombyx* genes and their mapping to chromosomes of selected species by BAC-FISH. Thanks to his abilities and great effort he has isolated several tens of gene orthologs and mastered localization of the genes by multi-colour BAC-FISH with multiple reprobing, including all related procedures. Who tried to search for orthologs in phylogenetically distant species knows well, what obstacles Petr had to face. However, his efforts were rewarded (1) by obtaining a well-covered physical map of the *Biston betularia* Z chromosome, allowing to specify the Z divergence in advanced Lepidoptera, and (2) by discovery of a unique evolutionary novelty, Z-chromosome-autosome fusion in one of the largest and economically significant group of basal Lepidoptera, the Tortricoidea. This discovery is one of the first gene-based evidence on the importance of chromosome rearrangements for radiation of subsequent speciation of the whole group of animals.

Of the strengths of Petr, I want to mention in particular his excellent work with literature including older sources, broad knowledge of the field, the ability to quickly learn advanced tools of genomics and bioinformatics, motivation and ambition to address the key questions of evolutionary biology and genetics. He is also exceptionally good in designing experiments including methodological approaches to answer the questions, in interpretation of data obtained and scientific writing. Last but not least, Petr has been always very helpful in supervising undergraduate students and numerous foreign visitors and also in organising daily life of our lab. He has greatly contributed to the friendly environment in our lab, also thanks to his cooking skills and positive attitude to wine.

To conclude, Petr has exceptional skills and talent for research work, and he is poised to soon become a fully competitive scientist. It is my great pleasure to recommend his Ph.D. thesis for the defence.

Petr, thank you for all your excellent work and for your friendship!

In České Budějovice,
24 October 2013

František Marec
(tutor)