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Student evaluation:

Martina Dalíková (2017)

Mechanisms of molecular differentiation of sex chromosomes in Lepidoptera and their evolution
[Ph.D. Thesis]

Martina is the soul and heart of our lab. She knows most methods, takes care of all equipment, keeps our lab running, and is always ready to help others, including colleagues, students, and foreign visitors. I'm sorry to say that I was not very helpful by the topic I have given her. Based on her excellent wet lab skills, I thought it might be a good idea to focus on chromatin modulation and meiotic pairing of sex chromosomes using combination of methods of immunocytogenetics and molecular cytogenetics. Unfortunately, it wasn't a good idea. In lepidopteran models, no specific antibodies against chromosomal proteins are available and the antibodies commonly used across various organisms work well only against highly conserved proteins such as histones. Martina therefore spent a lot of time testing the laborious techniques without conclusive results, which caused a considerable delay in her PhD programme. However, during this time she participated in other projects, and as seen from her publication list, she has greatly contributed to the research performance of our lab. And thanks to her great enthusiasm and effort, she has successfully completed her doctoral work.

At the beginning of her PhD study, Martina has established FISH with probes prepared from bacterial artificial chromosomes (BACs), the so-called BAC-FISH, which proved to be a very important step for further direction of our research. Using BAC-FISH Martina has solved an unanswered question of orientation of lepidopteran sex chromosomes during meiotic pairing, physically localized the *carbonaria* mutation in the peppered moth, a model of industrial melanism, and obtained new data about molecular degradation of the W chromosome. Since then, we use BAC-FISH routinely as an excellent tool for chromosomal mapping in moths and butterflies. In our lab, Martina also pioneered the research on repetitive components of lepidopteran genomes and has greatly contributed to identifying two of the five so far described satellite DNAs in Lepidoptera. In addition to her major contribution to understanding molecular differentiation and evolution of sex chromosomes, I would like to emphasize her unique yet unpublished results on histone modifications, which on lepidopteran models clearly disprove the dogma about the necessity of meiotic inactivation of sex chromosomes.

Last but not least, Martina is very talented for teaching. During the entire PhD study she prepared, conducted and often led many practical courses in Genetics and Cytogenetics. She also participated in teaching high school students and teachers in summer schools organized by the Faculty of Science USB. Her teaching and communication skills were also very useful in our lab, where she was always willing to train new students and frequent foreign visitors in molecular methods and various techniques of molecular cytogenetics.

In conclusion, Martina has done a great job in our lab throughout her doctoral study. It gives me great pleasure to recommend her PhD thesis for the defence. Martina, THANK YOU for all your work and friendship and wish you happiness and success in your life!

In České Budějovice,
1 June 2017

František Marec
(tutor)