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LABORATORY OF

MOUSE MOLECULAR GENETICS

hybrid sterility, Prdm9, meiotic recombination, mouse chromosome substitution strains

In the picture:
1. Liu Wang | **2.** Václav Gergelits | **3.** Petr Jansa | **4.** Emil Parvanov | **5.** Jana Perlová | **6.** Diana Wiatrowska | **7.** Soňa Gregorová | **8.** Barbora Vališková | **9.** Vladana Fotopulosová | **10. Jiří Forejt**

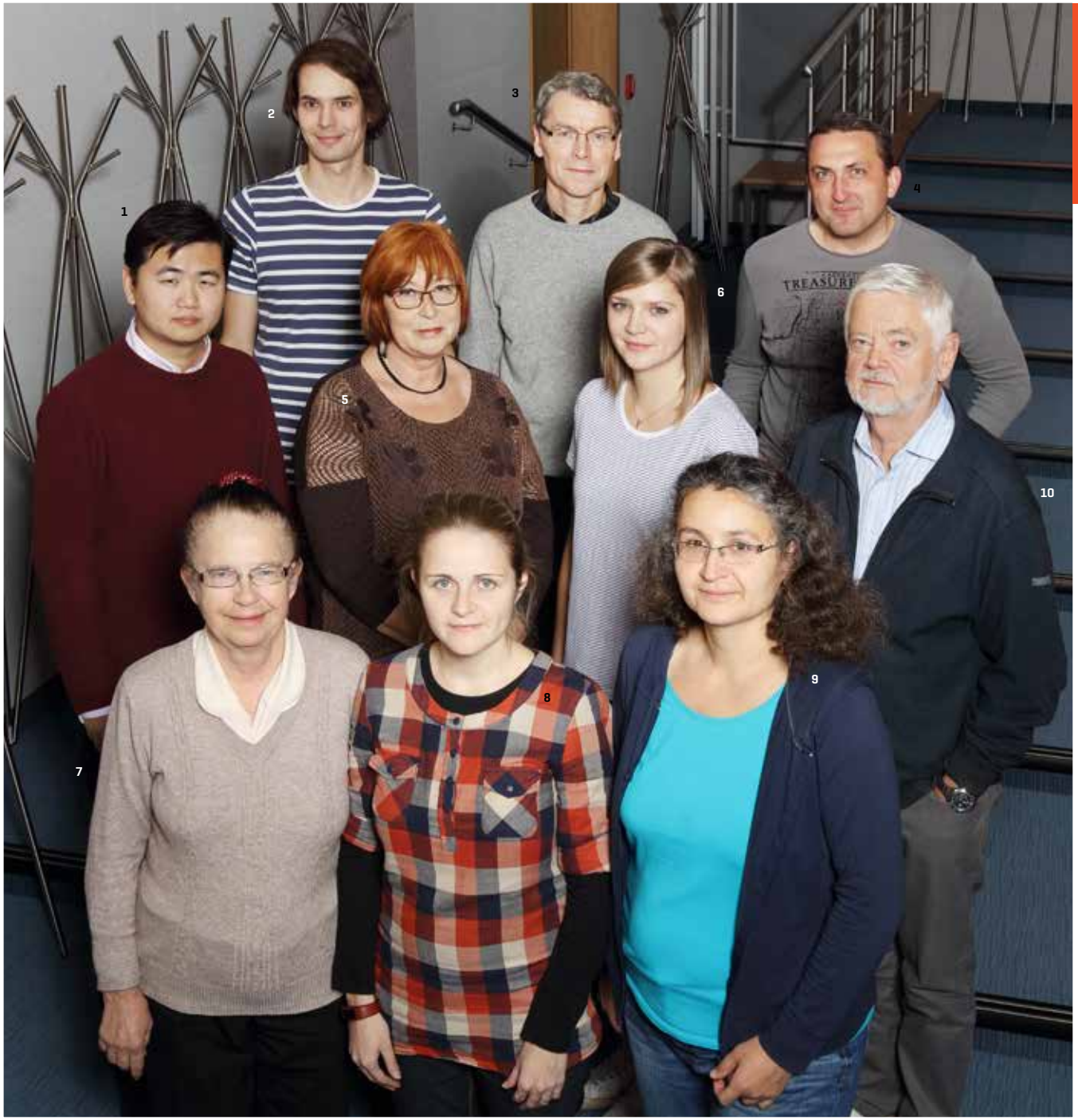
Positional cloning of the first vertebrate hybrid sterility gene Prdm9 (Meisetz), encoding a meiotic histone H3 lysine-4 tri-methyltransferase, revealed a role for epigenetics and meiotic recombination in speciation and opened a window to a systems approach to the hybrid sterility gene network. The second hybrid sterility gene, Hstx2, showing Dobzhansky-Muller incompatibility with Prdm9, was mapped to a 4.7 Mb interval on Chromosome X. The same interval of mouse Chromosome X was shown to carry a major gene regulating meiotic recombination in male but not in female hybrids.
Chromosome substitution, or consomic strains C57BL/6J-Chr # PWD/Ph/ForeJ, constructed in our laboratory are used for dissecting the genomic architecture of the sterility of Mus m. musculus x Mus m. domesticus hybrids and for many other quantitative traits of biomedical significance. Using chromosome substitution strains we have studied meiotic X-chromosome inactivation and pairing, and synapsis of homologous chromosomes in carriers of male-sterile autosomal rearrangements and in male-sterile inter-species hybrids.

Selected recent papers:

Forejt J: Genetics: Asymmetric breaks in DNA cause sterility. **Nature. 2016** Feb 11;530 (7589):167-8.

Balcova M, Faltusova B, Gergelits V, Bhattacharyya T, Mihola O, Trachtulec Z, Knopf C, Fotopulosova V, Chvatalova I, Gregorova S, Forejt J: Hybrid Sterility Locus on Chromosome X Controls Meiotic Recombination Rate in Mouse. **PLoS Genet. 2016** Apr 22;12(4):e1005906.

Forejt J: Hybrid Sterility, Mouse. In: Reference Module in Life Sciences, from Brenner's Encyclopedia of Genetics (Second Edition), **Elsevier** ISBN: xxxx, Pages xx-xx, in press 2016. (e-book).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