

OR113

Repeated evolution of a derived feature: insights from complementary sex determination

Martin Beye, Marianne Otte, Vasco Koch, Inga Nissen, Bjorn Schmitt

Complementary sex determination is shared among many social hymenopteran insects and determines femaleness (workers and queens) by heterozygosity and maleness by homo-/hemizyosity. This mechanism couples the control of sexual development in fertilized and unfertilized eggs (enabling a female biased sex ratio) and the promotion of outbreeding. I will present our findings on the evolutionary trajectory of complementary sex determination in honeybees and some other hymenopteran insects showing a repeated evolution of the complementary sex determination process. In detail I will present our findings on the mechanisms underlying the evolutionary origin of the complementary sex determiner gene and single alleles in honeybees. I will also show studies which link the evolutionary signatures with the molecular functioning of the gene which is regulating the switch between male or worker/queen development. Our comprehensive understanding of this derived feature in hymenopteran insects highlights the limits of comparative genomics and emphasizes the requirement to study the function of homologous genes in different species and major hymenopteran lineages.