Special Issue

The Evolution of Sexual Development in Arthropods

Message from the Guest Editors

The genetic control of insect sexual development, first uncovered in Drosophila, is now beginning to be elucidated in other, distantly related lineages. Investigations in a number of insect orders have shown that sexual differentiation is based on a deeply conserved regulatory module that functions via sex-specific alternative splicing of three genes: transformer, doublesex, and fruitless. However, this module responds to different upstream sex determination signals, controls different target genes, and generates different sex-specific traits in different insect species. Research in non-insect arthropods suggests that the splicing-based mechanism of sexual differentiation may be unique to insects, and that other arthropod groups rely on different mechanisms. These observations raise a number of evolutionary questions. Why is there such a diversity of sex determining primary signals? How did the insect sexual differentiation pathway evolve? What are the key features of sexual development in non-insect arthropods? Experts in the fields of arthropod development and evolution are invited to contribute original articles, reviews, and hypothesis papers to this special issue.

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