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Centre de Recherche en Biologie Cellulaire de Montpellier



CRBM external seminar

Thursday Sept 28th 11:00 am Salle Marcel Dorée

The atypical meiosis, Y chromosome and mitochondrial genome at *Mesorhabditis* nematodes

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Marie is a cell biologist, group leader at the LBMC, Lyon. After a PhD Evo/Devo in 2001 under the supervision of Marie-Anne FELIX in Paris, she moved to Switzerland for a post-doc in the lab of Pierre GONCZY. She was recruited at the CNRS in 2006 and became PI in 2009 at LBMC in Lyon. She uses nematodes to explore flexibility and constraints in cell biological processes over the course of evolution.

Abstract

Asexual animal species are composed of females, which produce daughters without paternal genome contribution. Transitions from sexuality towards asexuality have happened multiple times independently over the course of evolution. It requires many cellular modifications, including rewiring of the female meiosis in order to produce unreduced oocytes. However, the cellular modifications at the origin of new asexual species are poorly understood. We are exploring these questions using *Mesorhabditis* nematodes, which represent an interesting case of transition, with a progressive loss of males and sexuality [1, 2].

I will present our recent findings on the mechanisms of meiosis in *Mesorhabditis*. Using a combination of genomics, genetics and cytology, we found that only one meiotic division-equational division- occurs during female meiosis, during which the recombinant chromatids co-segregate in the oocytes. Our study reveals an unprecedented example of asymmetric chromatid segregation in a natural system. We propose that such modified meiosis has been favored and fixed in this pseudosexual species, because it prevents homozygosity of the genome, despite the maintenance of recombination.

I will also discuss our findings that pseudosexuality within the *Mesorhabditis* genus is accompanied by the emergence of a neo-Y chromosome and a rearranged mitochondrial genome.

Selected publications:

[1] M. Grosmaire*, C. Launay*, & al., M. Delattre. Males as somatic investment in a parthenogenetic nematode. [Science. 363, 1210–1213 \(2019\).](#)

[2] C. Launay, M-A. Félix, J. Dieng, M. Delattre. Diversification and hybrid incompatibility in auto-pseudogamous species of *Mesorhabditis* nematodes. [BMC Evol Biol 20, 105 \(2020\).](#)