Institute of Molecular and Cell Biology
A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Dr. Nicolas Plachta:

Date: 17 October 2018, Wednesday
Time: 11:00AM – 12:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Dr. Marie-Hélène Verlhac & Dr. Marie Emilie Terret, Center for Interdisciplinary Research in Biology, Collège de France, France
Title: Influence of oocyte mechanics on chromosome positioning

The position of the nucleus in a cell can instruct morphogenesis, conveying spatial and temporal information. In mammals, the oocyte nucleus is actively centered. This is surprising since oocytes subsequently undergo two extremely asymmetric divisions in terms of size of the daughter cells, requiring an off-centering of their chromosomes. In addition, oocytes lack canonical centres of microtubule nucleation, namely centrosomes, which in somatic cells position organelles such as nuclei or spindles. Using multidisciplinary approaches, we have identified mechanisms regulating the positioning of meiotic chromosomes in oocytes, depending on the same molecular actors but achieving opposite functions. The first one is a non-specific activity gradient of actin positive vesicles that centers the nucleus. The second one is a specific off-centering of the meiotic spindle via pulling forces exerted by Myosin II at spindle poles and through tightly gated cortical softening. These actin-based processes are less robust than microtubule-dependent ones and might have their share in the innate susceptibility of the female gamete to produce errors in chromosome segregation.

Biography:
Marie-Hélène Verlhac, DR1 CNRS in the CIRB (Centre for Interdisciplinary Research in Biology) in the Collège de France, is interested in the end of oogenesis in mammals. Student from the École Normale Supérieure de Lyon, after a PhD at the University Pierre et Marie Curie (UPMC) followed by a post-doctoral internship at the University of California in San Francisco (UCSF), she started her own team with the objective to decipher the processes controlling the last stages of female gametogenesis in mammals, namely the asymmetry in size of meiotic divisions in the absence of canonical centrosomes. Her team joined the CIRB in 2011 and she became deputy director of the structure in 2013. She was elected EMBO member in 2018.

Marie-Emilie Terret, recruited as a Junior faculty at INSERM in 2010 after a 5 years post-doctoral position at Memorial Sloan Kettering Cancer Center in New-York, is an expert in the field of meiotic divisions. She is co-directing the team “Oocyte Mechanics and Morphogenesis” located in the CIRB (Centre for Interdisciplinary Research in Biology), at Collège de France, Paris. Her goal aims at understanding how a female gamete turns into a viable embryo, using

morphological and biophysical approaches of meiotic divisions. Her strength has been to develop biophysical approaches of meiotic divisions, contributing to define a novel field for this model system.