Stanford

Chloe Girard

Postdoctoral Research Fellow, Developmental Biology

NIH Biosketch available Online

Curriculum Vitae available Online

Bio

BIO

I am a postdoc in Anne Villeneuve's lab in the Department of Developmental Biology working on meiosis and recombination in C.elegans. I am mostly interested in how recombination is regulated to ensure genome stability. I previously conducted a PhD thesis at INRA de Versailles (France) under the direction of Raphaël Mercier on new genes controlling meiotic recombination level in Arabidopsis. I am interested in genetics, epigenetics, evolution but also in popularization of science.

HONORS AND AWARDS

- Young Researcher Prize, Bettencourt-Schueller Foundation (2015)
- "CJS" PhD Grant recipient, for a 3-year PhD thesis and a 2-year postdoctoral program, French National Institute for Agricultural Research (10/2011)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Co-organizer, Bay Area Worm Meeting (2016 - 2016)
- Volunteer - Teacher Recruitment, Stanford SPLASH (2016 - 2017)
- Co-organizer, Bi-weekly research forum of the C. elegans groups at Stanford (2016 - present)

PROFESSIONAL EDUCATION

- PhD, Universite Paris Sud (Orsay, France) , Biology (2014)
- Master of Science, Universite Paris Sud (Orsay, France) , Plant Biology (2011)
- Master of Science, AgroParisTech (Paris, France) , Agronomy (2011)

STANFORD ADVISORS

- Anne Villeneuve, Postdoctoral Faculty Sponsor

COMMUNITY AND INTERNATIONAL WORK

- Screening to decipher meiosis in C. elegans

PATENTS

- Mercier R., Girard C., Crismani W. - Froger N.. "France Patent WO2015001467 A1 Increased meiotic recombination in plants by inhibition of the fidg protein", INRA, Jan 8, 2015
- Mercier R., Crismani W. - Girard, C., Froger N.. "United States Patent US20140289902 A1/ WO2013038376A1 Increase in meiotic recombination in plants by inhibiting the fancm protein", INRA, Sep 25, 2014

LINKS

- ResearchGate Profile: https://www.researchgate.net/profile/Chloe_Girard

- Professional Twitter Feed: https://twitter.com/Chl0e_Girard

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Meiotic crossovers (COs) are critical for the balanced segregation of homologous chromosomes at meiosis I. Crossover recombination events between DNA molecules of homologous chromosomes, together with sister chromatid cohesion, establish a physical connection between homologs (chiasmata), which in turn ensures their correct orientation toward oppotiste poles of the meiosis I spindle.

Crossover (CO) formation at meiosis relies on the formation and repair of numerous double-strand DNA breaks (DSBs). Most species make very few COs per chromosome pair despite a substantial excess of DSBs, and C.elegans stands at one hand of this spectrum with one, and only one, CO formed per chromosome pair. We are using direct genetic screening approaches to elucidate and decipher the mechanisms underlying meiotic CO formation and its regulation.

Our goal is to identify factors that normally function in antagonizing CO formation; as part of our strategy, we are conducting a genetic screen for suppressors of a temperature-sensitive mutation affecting the conserved CO-promoting complex MSH-4/MSH-5. The msh-4(ts) mutant is characterized by a decrease in CO formation at the restrictive temperature of 24°C, associated with a small brood size. We will report on the first 4 suppressor lines identified with a clear rescue of the progeny viability and number of CO per meiosis.

LAB AFFILIATIONS

- Anne Villeneuve, Villeneuve Lab (11/3/2014)

Publications

PUBLICATIONS

- **Interdependent and separable functions of Caenorhabditis elegans MRN-C complex members couple formation and repair of meiotic DSBs** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Girard, C., Roelens, B., Zawadzki, K. A., Villeneuve, A. M.
  2018; 115 (19): E4443–E4452
- **RMI1 and TOP3 alpha limit meiotic CO formation through their C-terminal domains** *NUCLEIC ACIDS RESEARCH*
  Seguela-Arnaud, M., Choinard, S., Larcheveque, C., Girard, C., Froger, N., Crismani, W., Mercier, R.
  2017; 45 (4): 1860-1871
- **AAA-ATPase FIDGETIN-LIKE 1 and Helicase FANCM Antagonize Meiotic Crossovers by Distinct Mechanisms** *PLOS GENETICS*
  Girard, C., Chelysheva, L., Choinard, S., Froger, N., Macaisne, N., Lehmemdi, A., Mazel, J., Crismani, W., Mercier, R.
  2015; 11 (7)
- **FANCM-associated proteins MHF1 and MHF2, but not the other Fanconi anemia factors, limit meiotic crossovers** *NUCLEIC ACIDS RESEARCH*
  Girard, C., Crismani, W., Froger, N., Mazel, J., Lemhemdi, A., Horlow, C., Mercier, R.
  2014; 42 (14): 9087-9095
- **Tinkering with meiosis** *JOURNAL OF EXPERIMENTAL BOTANY*
  Crismani, W., Girard, C., Mercier, R.
  2013; 64 (1): 55-65
- **OSD1 Promotes Meiotic Progression via APC/C Inhibition and Forms a Regulatory Network with TDM and CYCA1;2/TAM** *PLOS GENETICS*
  Cromer, L., Heyman, J., Touati, S., Harashima, H., Araou, E., Girard, C., Horlow, C., Wassmann, K., Schnittger, A., De Veylder, L., Mercier, R.
  2012; 8 (7)
- **FANCM Limits Meiotic Crossovers** *SCIENCE*
  Crismani, W., Girard, C., Froger, N., Pradillo, M., Luis Santos, J., Chelysheva, L., Copenhaver, G. P., Horlow, C., Mercier, R.
  2012; 336 (6088): 1588-1590

- **The CYCLIN-A CYCA1;2/TAM Is Required for the Meiosis I to Meiosis II Transition and Cooperates with OSD1 for the Prophase to First Meiotic Division Transition** *PLOS GENETICS*
  d'Erfurth, I., Cromer, L., Jolivet, S., Girard, C., Horlow, C., Sun, Y., To, J. P., Berchowitz, L. E., Copenhaver, G. P., Mercier, R.
  2010; 6 (6)