CENTRE DE RECHERCHES DE RENNES

UNITE MIXTE DE RECHERCHE INRA – AGROCAMPUS OUEST – UNIVERSITE DE RENNES 1
INSTITUT DE GENETIQUE, ENVIRONNEMENT ET PROTECTION DES PLANTES (IGEPP)

Post-doctoral position in epigenomics and recombination

Job description
A post-doctoral position (18 months) is available in the team 'Biodiversity and Polyploidy' at the INRA Rennes to work with Anne-Marie Chèvre (website_Chevre) and Mathieu Rousseau-Gueutin (website_Rousseau-Gueutin). The research performed in the team notably focuses on investigating the role of polyploidy on the evolutionary dynamic of *Brassica* genomes and on the regulation of meiotic recombination. This research is achieved using a broad array of tools: cytogenetics, comparative genomics, genetic mapping and functional genetics.

Context and Objectives
In plants, recombination is strictly controlled, with 1 to 3 crossovers (COs) per homologous chromosomes. In the lab, we recently showed that we could increase this number by 3.4x times in allotriploid hybrids (Pelé et al. 2017). More surprisingly, we demonstrated that the distribution is affected, with crossovers even in the vicinity of centromeres (normally deprived of crossovers). The successful candidate will explore the role of the epigenome in modifying the recombination landscape in *Brassica* allotriploids. Using *Brassica* species with contrasted ploidy levels (as described in Leflon et al. 2010 or Pelé et al. 2017), the candidate will compare methylation levels (BS-Seq) and chromatin structure (ChIP-Seq) in association with transcriptomic and phenotype (crossover frequency and distribution) datasets. In addition to major basic knowledge obtained through this project, a novel way to improve *B. napus* (oilseed rape) breeding strategies will be proposed to agro-economic players.

Minimum qualifications
We are looking for a post-doc having completed a Ph.D. in Biology or Bioinformatics. The applicant should have strong skills in bioinformatics (analysis of NGS data), in programming (Unix, python or perl) and in statistics. Candidates with prior experience in analyzing NGS epigenetics datasets are encouraged to apply. However, knowledge on plants, polyploidy and recombination is a plus but not a requirement. All the datasets required to successfully achieve the objectives will have been obtained before the post-doc contract begins, via current ANR and France Genomique projects. To be eligible, the applicant should have spent at least 18 months out of France between the 28th of May 2015 and 28th of May 2018. The applicant can be of any nationality or gender. He/she will necessary have to start his/her contract before the 5th of December 2019.

Salary
Depending on prior experience, the post-doc gross salary will vary between 2340 and 2920 euros, including health insurance.

Applications
Applications (CV + references to contact) should be sent to Anne-Marie Chèvre (anne-marie.chevre@inra.fr) and Mathieu Rousseau-Gueutin (mathieu.rousseau-gueutin@inra.fr) before the 21st of September 2019.

Related articles from the lab

- Pelé, A., Falque, M., Trotoux, G., Eber, F., Nègre, S., Gilet, M., Huteau, V., Lodé, M., Jousseaume, T., Dechaumet, S., Morice, J., Poncet, C., Coriton, O., Martin, O., Rousseau-Gueutin, M., Chèvre, A.M. (2017). Amplifying recombination genome-wide and reshaping crossover landscapes in Brassicas. **PLOS Genetics** 13, e1006794. 10.1371/journal.pgen.1006794.
- Pelé, A., Rousseau-Gueutin, M., and Chèvre, A.-M. (2018). Speciation success of polyploid plants closely relates to the regulation of meiotic recombination. **Frontiers in Plant Science** 9. 10.3389/fpls.2018.00907.
- Belser, C., Istace, B., Denis, E., Dubarry, M., Baurens, F.-C., Falentin, C., Genete, M., Berrabah, W., Chèvre, A.-M., Delourme, R., Deniot, G., Denoued, F., Duffé, P., Engelen, S., Lemainque, A., Manzanares-Dauleux, M., Martin, G., Morice, J., Noel, B., Vekemans, X., D'hont, A., Rousseau-Gueutin, M., Barbe, V., Cruaud, C., Wincker, P., Aury, J.M. (2019). Chromosome-scale assemblies of plant genomes using nanopore long reads and optical maps. **Nature Plants** 4, 879. 10.1038/s41477-018-0289-4.
- Leflon, M., Grandont, L., Eber, F., Huteau, V., Coriton, O., Chelysheva, L., Jenczewski, E., and Chèvre, A.-M. (2010). Crossovers get a boost in Brassica allotriploid and allotetraploid hybrids. **The Plant Cell** 22(7):2253-64 tpc.110.075986. 10.1105/tpc.110.075986