Post-doctoral scientist

Comparative population genomics of the evolution of GC-content in angiosperms

POSITION TITLE: Post-doctoral research position
SALARY: Commensurate with qualifications and experience, benefits included. Gross salary around 2400€ (3600$)
PERFORMANCE PERIOD: 18 months from July 2012
APPLICATION DEADLINE: 30 September 2012, or until a suitable candidate is found

POSITION SUMMARY:

The post-doctorate scientist will be part of the ARCAD program (2009-2013), "Agropolis Resource Center for Crop Conservation, Adaptation and Diversity" (www.arcad-project.org). He/She will work on the project "Comparative population genomics in wild and crop plants" and more precisely on the work package 4: "Life history traits and genome evolution".

Nucleotide landscapes strongly vary within and among flowering plants but the underlying causes of these variations and whether they are shared across the angiosperm phylogeny are still poorly known. The aim of the project is to analyse the evolutionary forces affecting GC-content dynamics in several species distributed over the angiosperm phylogeny, including several monocot and eudicot species.

More precisely, the project aims at:
- Testing the respective role of mutation bias, selection, and GC-biased gene conversion, on GC-content dynamics
- Inferring the underlying population genetics parameters (strength of selection and bias conversion, mutation bias)
- Testing the role of genomic parameters (recombination, gene location, expression levels,…) on the dynamics of GC-content
- Testing the role of species characteristics (phylogenetic positions, mating systems,…) on the dynamics of GC-content
- Testing the "Achilles' heel" hypothesis that posits GC-biased gene conversion may lead to the fixation of GC deleterious alleles (see Galtier et al. 2009)

<u>Selected articles</u>

Escobar, J. S., S. Glémin, and N. Galtier. 2011. GC-Biased Gene Conversion Impacts Ribosomal DNA Evolution in Vertebrates, Angiosperms, and Other Eukaryotes. *Mol Biol Evol* 28:2561-2575.

Galtier, N., L. Duret, S. Glémin, and V. Ranwez. 2009. GC-biased gene conversion promotes the fixation of deleterious amino acid changes in primates. *Trends Genet*. 25:1-5.

Glémin, S. 2010. Surprising fitness consequences of GC-biased gene conversion: I. Mutation load and inbreeding depression. *Genetics* 185:939-959.

Muyle, A., L. Serres-Giardi, A. Ressayre, J. Escobar, and S. Glémin. 2011. GC-biased gene conversion and selection affect GC content in the Oryza genus (rice). *Mol Biol Evol* 28:2695-2706.

Serres-Giardi, L., K. Belkhir, J. David, and S. Glemin. 2012. Patterns and evolution of nucleotide landscapes in seed plants. *Plant Cell* 24:1379-1397.

DUTIES:
The candidate will analyze large polymorphism and divergence dataset issued from high-throughput sequencing of transcriptomes. She/he will develop pipelines to test population genetics predictions (mutation bias vs selection vs GC-biased gene conversion) and to infer population genetic parameters (selection/conversion intensity, mutational bias). These analyses will be applied to various species

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DESIRED ABILITIES:
The ideal candidates would have a PhD in population genomics and/or evolutionary genomics with good skills in sequence analyses and statistical analyses. Bioinformatic tools and basic programming will be needed to deal with large datasets. Experience with NGS data will be welcome. Abilities to work ingroup will be necessary to interact with the CIRAD bioinformatic team involved in the project

LOCATION: The post-doctorate will be located both in the ISE-M (Montpellier II university campus) lab and Supagro lab in Montpellier.

ELIGIBILITY CRITERIA OF THE FUNDING AGENCY (AGROPOLIS FOUNDATION)
Outstanding doctoral or post-doc scientist
Post-doc applicants who not have resided or carried out his/her main activity (work, studies, etc) in France for more than 12 months in the last 3 years will be preferred.
Post-doc applicants who have obtained his/her PhD degree for no more than 3 years upon the date of application will be preferred.

APPLICATION:
Please send a detailed CV, a letter of motivation, and 2 referents' names.

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