

## **Biostatistician Position in Statistical genomics on multilevel integration data context (20 months, INRA)**

**City:** Saint-Genès-Champanelle

**Hosting lab:** INRA – Joint Research Unit on Herbivores - BioMarkers team

**Contact:**

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**Deadline:** 30 may 2018

**Expected recruitment:** June – July 2018

**Job description:**

The proposed studies in the Smart Specialisation Strategy (Region-FEDER) project “Biomarkers of animal products” are dedicated to the identification of new biomarkers of ruminant products quality (meat and milk) for a better management of livestock breeding. This project has 3 interconnected parts. The first part of the project aims to identify biomarkers in blood or milk. This objective will be reached through the contribution of 2 PhD students. One student examines the bovine meat quality and the other one is working on the milk quality experiment. The second objective of the project is the integration of the data obtained by the PhD students and concerns the present proposal. A third part will be dedicated to method development for biomarkers measurement for industry application.

*Omic*s data have provided and still provide large-sized data sets which remain insufficiently mined. In particular, the integration of various sets of variables constitutes a bottleneck in the field of post-genomics. Indeed, the extraction of the maximum information from *omics* data (transcriptomics, proteomics or miRNomes and their analysis) together with physiological (blood metabolites, circulating hormones), animal production (milk yield, growth rate,...) or breeding (energy balance, average daily gain) data requires new algorithms or models. Some are being developed (sparse PLS, rCCA, rGCCA, ...), but their appropriateness for *omics* data with few biological observations is still not convincing. Thus, the challenge will consist in the integration of multiple data sets and their interpretation in terms of biological processes.

The PostDoc fellow will identify the relationships between *omics* variables and product quality parameters for each experiment of the project. Depending on the experiment, the quality parameters will concern bovine meat quality, or health and metabolic status of cows during lactation. To achieve this goal, the postdoctoral fellow will develop integration methods for more than two data sets with much fewer observations than variables and will apply these methods to the data sets of the project in collaboration with the PhD students. Finally the last action will consist in discussing the results with biologists in order to get a biological interpretation of the data and share statistical expertise and programs with statisticians and biologists.

**Qualifications:**

Applicants should have :

- a PhD degree in statistics.
- a good knowledge in multidimensional data analysis on correlated data, and be proficient in R language or any other language required for the development in a free software.
- a strong interest in biology as it is crucial to understand issues raised by the data integration.
- an ability to work and interact with many scientists, good interpersonal skills, a great rigor and independence.

Strong quantitative background in analysis of “omics” data of various natures will be appreciated.

**Interested applicants** should send an email with curriculum vitae, contact information (email and phone) of two references and a research statement to Dr. Isabelle Cassar-Malek ([isabelle.cassar-malek@inra.fr](mailto:isabelle.cassar-malek@inra.fr)) and Anne de la Foye ([anne.delafoye@inra.fr](mailto:anne.delafoye@inra.fr)).