JOB POSITION

PhD position: Combining genetic and modelling approaches to develop new non-invasive biomarkers of resilience based on milk metabolites

The French National Research Institute for Agriculture, Food and Environment (INRAE) is a public institution with more than 10,000 agents across the French territory. INRAE is the first European agricultural research institute and produces scientific knowledge and works for economic and social innovation in the areas of food, agriculture and environment.

WORKING ENVIRONMENT AND ACTIVITIES

- The PhD fellow will join an interdisciplinary team of researchers from two INRAE Units working within two European projects; SMARTER (Small Ruminant Breeding for Efficiency and Resilience) and ADAPT-HERD (Management strategies to improve herd resilience and efficiency by harnessing the adaptive capacities of small ruminants). These provide strong scientific networking opportunities. The PhD is also funded by an industry consortium called APIS-GENE that provides the animal breeding industry context. Within this broader research landscape, the PhD will be hosted by the GeSPR team of the INRAE research unit GenPhySE based in Toulouse. This group has expertise in genetics and genomics including elaboration of the underlying mechanisms associated with health and resilience and genomic selection. An example of this that is relevant to the PhD is https://doi.org/10.3168/jds.2017-13479. The second INRAE research unit directly involved in the PhD is MoSAR, based in Paris. This group has expertise in biological and statistical modelling applied to ruminant livestock. An example of the type of challenge and approaches for characterizing animal responses relevant to the PhD is http://dx.doi.org/10.3168/jds.2015-10162. The PhD will be based at GenPhySE in Toulouse with extended stays at MoSAR in Paris (circa 3 months per year).

- The objectives of the PhD are to i) develop an index of animal resilience based on measures of metabolites in milk, coupled with data on the immune responsiveness, ii) quantify the influence of the genetic background of these animals on the resilience responses. This PhD study will make a strong contribution to developing non-invasive markers of resilience that can be used a selection proxy and also on the methodology for integrating multivariate time-series data.

The PhD will benefit from a unique on-going experimental programme at two INRAE sites carrying out nutritional and sanitary challenges using dairy goats of contrasted genetic background in terms of their longevity, providing the student with the opportunity to experience the research process from the animal through to the creation of data-driven tools for evaluating animal resilience. The modelling work will have to combine dynamic modelling components with quantitative genetic approaches. As such the study will contribute to reinforcing animal resilience, i.e. the capacity to respond appropriately to environmental perturbations, that are increasingly needed as livestock production faces the challenges of remaining sustainable in a context of the impacts of climate change.

- Website of hosting units

http://www6.jouy.inrae.fr/mosar_eng
https://genphyse.toulouse.inra.fr/

TRAINING AND SKILLS REQUIRED

- Master or equivalent in biology/agricultural sciences
- Good knowledge and/or strong motivation in modelling and data analysis
- Excellent communication skills to interact in an interdisciplinary environment (geneticists, animal scientists and modellers)
- Experience with programming and analytical software would be an asset
- Previous experience in quantitative genetics or genomics will be a plus

↘ Reception conditions

- Research unit and location: UMR GenPhySE (31326 Toulouse) as main location with periods at UMR MoSAR (75005 Paris)
- Type of contract: PhD
- Gross salary: 1700 euros/month (depending on experience)
- Duration: 36 months
- Anticipated Start date: Sept 2020

↘ How to apply

Send a motivation letter and a CV to : Rachel RUPP **and** Nicolas FRIGGENS

By e-mail: rachel.rupp@inrae.fr and nicolas.friggens@agroparistech.fr

✖ Deadline for applications:
Applications will be accepted until 15th May 2020 but the position may be filled prior to this date if a suitable candidate presents.