SANOFI Research & Development

POSTDOCTORAL POSITION
BIOSTATISTICS AND MACHINE LEARNING

MISSION

Within the Biostatistics and Programming department at Sanofi, the successful applicant will work in a group of expert statisticians in the Translational Medicine Statistics team. This team is dedicated to the statistical analysis of biomarkers to support Research and Clinical Development.

Given the heterogeneity of diseases and the various genetic profiles of patients, response to treatment could potentially be highly variable from one patient to another. High-throughput technologies allow to generate molecular profiles of patients containing millions of biomarkers: gene expression (transcriptomics), genetic (genomics), metabolites (metabolomics) and proteins (proteomics).

In this context, the aim of the post-doctoral project is to develop algorithms for integrative analysis of omics data - transcriptomics, genomics, metabolomics, proteomics - in combination with clinical data to better understand the mechanisms of drug response and identify the patients who will benefit most to the treatment. State-of-the-art machine learning methods will be used such as, but not limited to, causality analysis, penalized regressions and bayesian networks. Specific methods focusing on the integration of heterogeneous types of omics data will be also considered.

The algorithms will be developed keeping in mind the significance of the generated results from a statistical point of view (control of false discovery rate, use of cross-validation technics to avoid overfitting) and the computing performance. Furthermore the algorithms will be trained and validated using a large panel of public and internal clinical projects. Finally, the developed algorithms will be open source and shared through the organization to ensure reproducibility, transparency, tight control of the parameters and future improvements.

A complementary objective of the project will be to publish the findings in scientific journals.

PROFILE

Expected Qualification / Experience:
- MS in mathematics/statistics or computer science
- PhD in statistics, biostatistics or computer science

Skills required:
- Expertise in high-dimensional statistical technics: penalized regression, cross-validation, multiple testing correction…
- Strong knowledge of statistics and proficiency in one or more languages R, C/C++ or python
- Knowledge of omics technologies
- Excellent verbal and written communication skills are required (English); French speaking is a plus
- Innovation, creativity, analytical thinking
- High degree of autonomy, intellectual curiosity and scientific rigor

Contact : Caroline PACCARD - Biostatistics & Programming Department – Head of Translational Medicine Statistics - Chilly-Mazarin : caroline.paccard@sanofi.com
Contract : Postdoctoral position for 18 months
Start date : September-December 2018
Site : Chilly-Mazarin (91), France