Genetic variability in psychiatric disorders and ageing: a population-genetic approach

Description of the project.
In the context of a collaboration with the team of Prof. Leboyer (genetic psychiatry, Paris) and the team of Prof. Zagury (genomics/bioinformatics of human diseases), the project aims to analyse genomic data from large cohorts of psychiatric patients (bipolar disorders, schizophrenia, autism) and identify the genetic variants and genes involved in the molecular etiology of these diseases. Given recent evidence indicating that psychiatric patients exhibit accelerated brain ageing, the present project aims to investigate the genetic overlap between these psychiatric disorders and the ageing process.

He will thus have to impute the genomic data, perform case-control GWA studies as well as quantitative GWA studies, impute the HLA genes to look for HLA class 1 and class 2 genetic associations, look for large CNV associations, and perform an analysis of gene/pathways with a particular focus on the genes involved in inflammation and immunity.

Population-specific analyses will be performed to assess the impact of population structure on the identified signals. Additionally, methods that account for the role of diverse ancestries will be employed

Expectations regarding the candidate:
- good experience of genome-wide association studies
- familiarity with bioinformatics tools related to genomic analysis including Plink and SNPtest
- master the imputation techniques and in particular the software ShapeIT and impute 2
- master HLA imputation tools (SNP2HLA, Hibag)
- familiarity with CNV analysis software
- familiarity with pathway analysis from genomic data using the GSEA approach.
- good knowledge of biology, especially the fields of genetics and immunology
- keen interest in understanding the molecular mechanisms of human diseases, population varations, and especially psychiatric diseases.

The bursary should be able to produce at least one communication (congress or publication) during the first year of work.