

## Ad hoc support : JOBIM

### Open Day Biology, Informatics, Mathematics 2020

#### ABSTRACT

JOBIM is THE French-speaking bioinformatics conference, although many papers are also given in English. It gathers the whole French community each year, as well as a good part of the French-speaking community, coming from Belgium, Switzerland, Quebec and Maghreb for the most part, but also from other countries. It is an international conference, with a large proportion of presentations in English (about half, often given by foreign researchers) and prestigious invited speakers, mainly non-French speakers. JOBIM thus has a unique place in the world scientific landscape. The first JOBIM was organised in Montpellier in 2000. It played a major role in structuring the French and French-speaking bioinformatics community in general. Ten years later, JOBIM was again organised in Montpellier, which was a very positive symbol for the whole community and its actors coming from different backgrounds, bringing together mathematics, computer science and biology. Bringing JOBIM back to Montpellier for its twentieth anniversary will once again make a mark. Indeed, Montpellier is a major centre for biology, with applications in various fields:

environment, ecology, agronomy, human, animal and plant health. All of these disciplines are undergoing profound changes, with a massive influx of data and the indispensable use of mathematical models and high-performance computer procedures.

In this context, the regional scientific community, which brings together Montpellier's players in these different disciplines, is particularly concerned. This congress is a direct extension of its recent actions for the development of interdisciplinarity between mathematics, computer science, biology, ecology, health, society and the environment. This will allow the Montpellier community to be mobilised (see already the strong participation in the organising committee), and to show to a large panel of national and international scientists the achievements, teams, laboratories and infrastructures of Montpellier.

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**Flagship project :** no

**Project leader :** Francois Sabot

**Project leader's institution :** IRD

**Project leader's RU :** DIADE

**Budget allocated :** 2500 €

**Total budget allocated ( including co-financing ) :** 117500 €

**Funding :** labex

#### GOAL

Large-scale biology is the source of a considerable amount of data that concerns all levels of life:

- genes, proteins and their interactions, omics data, their dynamics and evolution
- cells, their organisation and the underlying molecular mechanisms,
- organs and their functioning, organisms and their physiology,
- species and populations, ecological systems and their evolution. The exploitation of these data is at the heart of JOBIM.

It requires both models representing the complex laws of life, and computer science work to simulate or estimate these models, to search the data, and to integrate all these heterogeneous sources of

information into databases and knowledge. The aim is to gain a better understanding of living organisms, with issues at stake in all fields, whether environmental, agronomic, medical or pharmaceutical. This interface work has developed in an extraordinary way in recent years (the most cited articles today, all sciences combined, are linked to the computer exploitation of omics data). This trend is currently continuing, particularly due to the acceleration of high-speed data acquisition technologies. This considerable acceleration now makes it possible to carry out studies that would have been unthinkable only a few years ago. Examples include the "1000 human genomes" project, which was completed in two years, whereas the sequencing of the first human genome took fifteen years, and the 3000 rice genomes project, in which the IRD and CIRAD are partners. Thanks to this data, the scientific community has an almost inexhaustible source of information, which can be used to answer many questions, such as the origin of domestication and agro-ecological diversity, the migration of human populations, or the predisposition to genetic and non-genetic diseases. These and other examples show very clearly that biology is undergoing a revolution, with the rise of "dry" biologists, modellers and/or bioinformaticians, in complementarity with "wet" biologists working at the bench. The objective of JOBIM is to promote this multidisciplinary research, by highlighting methodologically innovative work that addresses important biological questions. In connection with the Labex Agro, advances in bioinformatics and the biology/computing/mathematics association have led to significant developments in agronomy (genomic selection, high-throughput genotyping analysis), digital agriculture, modelling of leaf development, etc.). The support of JOBIM 2020 by the labex will enable this type of interaction between the agronomy community and very fundamental researchers to be increased.