



Professor in "Big Data and Integrative Bioinformatics"

The research themes addressed by the professor will integrate the research axis of the Unit of Computational and Quantitative Biology, UMR7238 CNRS-Sorbonne Université (<http://www.lcqb.upmc.fr/>). The position is open to candidates who are computer scientists or mathematicians or physicists and are developing their research in the field of "Big Data and Integrative Bioinformatics" in biology and medicine.

Biology and medicine are increasingly characterized by the production of massive amounts of data that often derive from next-generation sequencing (NGS) applications. These data are often heterogeneous and require the original combination of Big Data analysis methods with integrative approaches. Important, but not restrictive, examples can be found in:

1. the biomedical field with genetic data (SNPs, transcriptomes, epigenetic modifications, immunological repertoires ...) associated with a large number of patients and controls. Bioinformatics analysis and modelling of these data is an essential step towards their use for diagnosis and personalized medicine. In particular, the understanding of complex (multi-factor) diseases requires significant methodological developments on the algorithmic and statistical sides.
2. ecology, with the massive sequencing (metagenomics, metatranscriptomics ...) of entire ecological populations (oceans, soil, human intestine ...). These data allow the inference of the composition of a population in terms of species, but also symbiotic interactions or competition between species, and functions of communities. New approaches to large scale analysis, combining high-performance computing with statistics, machine learning and bioinformatics, are needed.

The professor will lead a research team and will be able to coordinate national and international collaborative programs. We seek for a candidate open to collaborations with experimental teams. The candidate's participation in the past in multidisciplinary projects with experimental groups will be appreciated.

The professor will participate in the activities of the Institutes of Computation and Data Sciences (ISCD) and Sorbonne Center for Artificial Intelligence (SCAI). He will play a key role between the LCQB, ISCD / SCAI and the Faculty of Medicine.

The interactions of Computer Science, Mathematics and Physics with Molecular Biology and Systems Biology fall within the framework of the emerging directions promoted at Sorbonne University (in particular within the ISCD and SCAI in which the laboratory is involved) and of emerging interest for our society. The scientific missions of the Laboratory of Computational and Quantitative Biology and its different roles within the Institute of Biology Paris-Seine, ISCD, SCAI and the "Bioinformatics and Modelling" Master Program in Computer Science at Sorbonne University, asks for the integration of a theoretician working at the interface of Computer Science/Physics/Mathematics with Biology/Medicine.

Local environment. **Sorbonne Université** (SU, www.sorbonne-universite.fr) is a fully multidisciplinary research-intensive university. With more than 53 400 students (among 10 200 international students), 4400 doctoral students and 6300 researchers, SU is one of the leading French universities. It is involved in numerous European and International partnership agreements and has France's largest scientific library and infrastructures. With 8,500 publications per year (approx. 10% of all publications in France), SU is a major player in international knowledge and innovation economy, offering transversal academic and research programs. It counts a large number of FP7 and H2020 projects (ERC grants and industry-sponsored research chairs). SU is part of 4EU+, an alliance of 6 European Universities, recently founded by the EU, for the realisation of joint common teaching and research projects.

The **Unit of Computational and Quantitative Biology (CQB)** CNRS-SU, is the first and only unit in France hosting labs with team leaders in computer science, mathematics, physics, and experimental biology and with a comparable balance of theoretical and experimental groups. The unit has been involved since 2009, year of its creation, in a large number of national (ANR, ANRS, FRM, ARC...) and international projects (HSFP, FP7, H2020, Moore Foundation, IBM-US, France-India/Brazil/China exchanges...). It was also supported by two large grants (“Investissement d’Avenir”) from the French Government for Computational Biology and its applications. The scientific environment at CQB is very active with a number of actions (the organisation of annual international conferences, an international master program in Bioinformatics and Modelling, the recent initiative *‘Living systems’ complexity and evolution’* in the frame of the 4EU+ Alliance in order to foster educational and scientific interactions between the 6 universities,...) that can make very appealing to the new professor to work within the unit and the university. In 2020, the unit will start a new scientific direction in Synthetic Biology aiming to build the first Biofoundry in continental Europe. The CQB unit makes one of the 5 units of the Institut de Biologie Paris-Seine, and depends on both the faculties of Engineering and of Life Science at SU.

Contact as soon as possible:

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