MedBioinformatics

Creating medically-driven integrative bioinformatics applications focused on oncology, CNS disorders and their comorbidities

Progress in biomedical research and healthcare requires taking advantage of the huge amount of clinical data and biological knowledge that already exists and that grows exponentially. The management and exploitation of this wealth of information requires the development and implementation of adequate informatics resources and computational approaches, which are usually labelled as bioinformatics. The scientific advancement in bioinformatics methods and applications during the last years has been impressive, but their practical impact in the medical field is still limited for several reasons, which include: 1) the deficit of integrative approaches that effectively combine different types of data from different sources; and 2) the lack of active involvement of the end-users that are not experts in bioinformatics in the design of the applications, with the aim of making them easily usable and actionable.

The primary aim of MedBioinformatics is to develop integrative bioinformatics tools and software applications useful and autonomously usable by translational scientists and clinical practitioners for analysing the huge amount of data and knowledge generated in healthcare and biomedical research in order to facilitate translational research and precision medicine.

Both cancer and neuropsychiatric disorders are extremely important in terms of citizens' wellbeing, especially in the aging population, and can clearly benefit from MedBioinformatics for progressing in the diagnosis and treatment of such diseases.

The applications that will be developed in the MedBioinformatics project will focus on two key medical specialties, oncology and neuropsychiatry, which cover an important percentage of the burden of chronic diseases that have a big impact in terms of citizens' wellbeing. Moreover, these diseases show several comorbidities that constitute an active area of research that involves a wide range of molecular and network biology approaches. Among the applications to be developed there is a new generation of tools to study the relationship between genotype and phenotype, browsers of disease biomarkers and disease trajectories, tools to study comorbidities, and applications to support molecular diagnostics and personalized treatment of cancer. Identifying the bioinformatics needs of the two considered medical specialties will facilitate the identification and design of applications that will meet the needs of biomedical professionals from other areas. To accomplish its objectives, MedBioinformatics has assembled a multidisciplinary team made up of bioinformatics and translational and clinical researchers, which will clearly contribute to overcome the existing communication barriers between them, which are due to differences in expertise and academic background, professional objectives, and even to language and cultural differences

The MedBioinformatics consortium is constituted by the following institutions and research groups

- Hospital del Mar Medical Research Institute in Barcelona (Spain)
  - *Research Group on Integrative Biomedical Informatics*
  - *Oncology Group*
  - *Psychiatry Group*
- University of Copenhagen (Denmark)
- European Bioinformatics Institute, with is part of the European Molecular Biology Laboratory (UK)
- Institute for Molecular Medicine Finland of the University of Helsinki (Finland)
- University of Oxford (UK)
- BMD Software Lda. (Portugal)
- Universitat Pompeu Fabra (Spain)
  - *Computational Genomics Group*
  - *Biomedical Genomics Group*
  - *Neurobiology of Behaviour Research Group*
- Vall d´Hebron Institute of Oncology (Spain)
- Synapse Research Management Partners S.L. (Spain)

Furthermore, the project will benefit from the involvement of independent and renowned experts external to the project that will assess the consortium on the scientific, ethical and strategic grounds.

MedBioinformatics started on May 1st 2015, and will have a duration of 36 months.

Project website: **www.medbioinformatics.eu**

Contact: **info@medbioinformatics.eu**

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