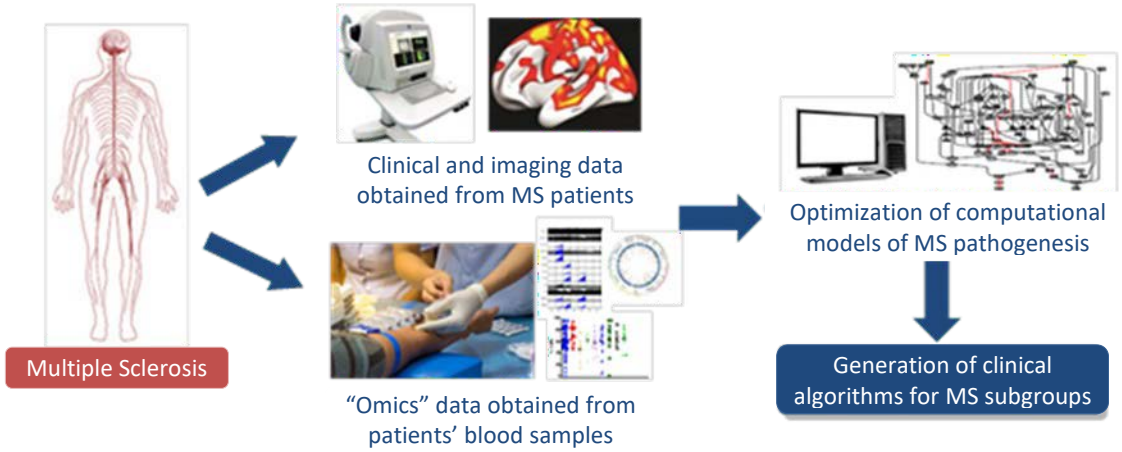
Sys4MS

Personalizing health care in Multiple Sclerosis using systems medicine tools

The Sys4MS project is executed by a multidisciplinary collaboration which enrolled nearly 400 patients with Multiple Sclerosis (MS) and 100 healthy controls. The patients' clinical data will be integrated with "omics" data (i.e. phosphoproteomics, cytomics, and genomics) obtained during the analysis of blood samples from these patients. Together, autoimmune diseases (e.g. type 1 diabetes, rheumatoid arthritis, lupus, asthma) represent the fourth group of diseases in terms of prevalence and health costs. The outcomes of the Sys4MS project will improve the treatment of many autoimmune diseases.

Currently, therapeutic decision-making is based on the application of medical expertise to the patient's clinical history and evidence-based medicine. The main goal in this project is to identify prognostic biomarkers that will allow the recognition of patients with more severe autoimmune diseases. This information will subsequently support the identification of the best therapeutic approach, enhancing the certainty of personalised predictions and, as a consequence, help patients and physicians to accept the risks of high-potency drugs.



In addition, but of equal importance, is that this "omics" approach aims to help better understand the response to given therapies, thereby optimizing their use.

The primary indication addressed in this project is Multiple Sclerosis (MS) but nevertheless it is feasible to imagine extending the research to many other autoimmune diseases that share similar genetic and environmental factors and that are treated with immunotherapies. The therapies studied are those currently approved to treat the disease. The aim is to enhance their use by tailoring therapies to patients, based on disease severity. There is still much uncertainty when offering patients advice as to the long and short-term risks involved in the progression of the disease, making it difficult to choose the most appropriate therapy and to decide which potential adverse events may or may not be acceptable. These tools will help physicians to better inform and advise patients.

Through “omics” monitoring and by providing clinical decision support systems, patients and physicians will be empowered to make more informed decisions.

The investigators are also planning to carry out a health economic analysis of their intervention. In the short term, the impact will be limited as it will not have an immediate effect on health services nor will it alter patient disability. However, in the long term, it will produce important economic benefits.

The research consortium carrying out this project is in contact with local/national MS patient associations, stakeholders in this EU project (GAEM Foundation), as well as with the international MS and NMO (Neuromyelitis Optica) patient associations.

PROJECT DURATION > 36 Months

Onset project: May 2016

Project ends: June 2019

Multiple sclerosis (MS) is a potentially disabling disease of the brain and spinal cord (central nervous system). In MS the immune system attacks the protective sheath (myelin) that covers nerve fibers and causes communication problems within the brain and between the brain and the rest of the body.

“Omics” approach: innovative technology platforms, such as genetics, genomics, proteomics and metabolomics. These recently developed techniques enable us to detect and identify many different molecules among the millions that are present and expressed in the body.

Click here to watch the Sys4MS movie

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