

Exploring the altered metabolism of multiple sclerosis using mass spectrometry data

Master's degree project available at Uppsala University, CARAMBA group

Background:

In our research group, we work with mass spectrometry data, mainly metabolomics and lipidomics data, in order to characterize multiple sclerosis (MS) and disease progression. MS is an autoimmune disease affecting the central nervous system, with an onset between the ages of 20 to 40 and a female-to-male ratio of 3:1. In 2020 it was estimated that more than 2.8 million people were affected by this disease worldwide. The disease course is unpredictable and affects each person differently. A large number of genetic and environmental factors have been identified as risk factors for developing MS.

Metabolomic studies can give great insight into disease mechanisms by identifying altered or affected metabolic pathways. In addition, these types of studies may identify new markers for disease progression or treatment response, which may aid in personalizing treatment. Moreover, studies have shown that metabolites play a critical role in the function of the immune system, and can act as signaling molecules and directly impact cells in the immune and nervous systems. When it comes to MS, previous studies have shown associations between MS and metabolites and metabolic pathways, and the ability to separate progressive MS from relapsing-remitting MS. Furthermore, metabolomic studies have also been able to predict new disease activity as well as disability worsening over time; however, further studies are needed within this field.

Project aims:

The project aim is to characterize the metabolism of MS compared to healthy controls. Another aim is to explore any metabolomic differences which can be associated with the different types of MS, and disease progression (if there is time).

What we can offer you?

Here we offer you an interesting project focused on MS metabolism, which is part of a larger research project, and the possibility to work with metabolomics mass spectrometry data. There is a lot that can be done within this field and if you have the drive and interest there is the possibility to alter or add other aims to the project as well (coordinated with the supervisor).

Requirements:

- Basic programming skills in R

If you are interested, please contact:

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