

SCIENTIFIC REPORT OF THE SHORT TERM SCIENTIFIC MISSION (COST-STSM-ECOST-STSM-FA1403-020516-079054)

Development of methodology for plasma samples in the study of metabolic phenotyping

The main objective of this Short-Term Scientific Mission was to develop a series of processing methods and data analysis in the development of metabolomics methodology for small volume plasma samples using nuclear magnetic resonance (NMR) spectroscopy.

The STSM was located at Department of Food Science at the BioCenter of the Swedish University of Agricultural Sciences, in collaboration with Dr. Cristina Andres-Lacueva (University of Barcelona) and Rikard Landberg (Swedish University of Agricultural Sciences).

The main objectives of this STSM were:

1. To optimize the volume required for plasma/serum NMR-based metabolomics:
 - a. To determine and check different approaches for plasma/serum protein removing.
 - b. To select and develop the methodology optimizing the volume used.
 - c. To apply this methodology for the study of individual phenotyping.
2. To design the statistical analyses according to the study of individual phenotyping.
3. To write the procedure and methodology for publishing.

During this period, we checked the methodologies available in the literature for protein removing in serum/plasma samples.

We selected protein precipitation as the methodology most stable and reproducible. During the period of this STSM, we treated and analyzed the serum samples from a set of an intervention with pulses for the NMR-based metabolomic study.

In this sense, the cooperation helped in their work on the development of automatization of the data management and data analysis workflows, which are important steps because of the huge number of samples processed in common metabolomics analysis. Following this, we performed several statistical approaches for the study of individual behavior and phenotyping of individuals and later pulses biomarkers discovering.

Finally, we deliberated to write a first draft of the study including the procedure and analyses for publishing.

In addition, this STSM brought the opportunity to foster the collaborations between the University of Barcelona and the Swedish University of Agricultural Sciences, as well as strengthen this network. As a result of this short-term scientific mission, a collaboration with a high NMR institute has been formed allowing the cooperation in the framework of the JPI-FOODBALL project.