

SCIENTIFIC REPORT - SHORT TERM SCIENTIFIC MISSION (STSM)

(COST Action FA1403, POSITIVE)

STSM topic: Training in meta-analysis tools and guidelines to assess the impact of bioactive compounds on cardio-metabolic markers.

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Host: Dr. Emilie Combet (The University of Glasgow, Glasgow, UK)

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- **Background and purpose of the STSM**

The main objective of this STSM was to advance in the complex data analysis needed for the completion of the systematic review looking at the impact of various bioactive compounds on a range of cardio-metabolic biomarkers and their variability. This is one of the activities that are being developed in the Working Group 2 (WG2) of the COST Action FA1403 POSITIVE, One of the main objectives of this COST Action is to analyse and to understand the inter-individual variability in the response to flavanols intake of specific cardio-metabolic biomarkers and to elucidate which factors affect this variability. Before this STSM, an extensive literature search was conducted. The WG2 was divided into several groups and each one searched for randomized clinical studies that examined the effects of the consumption of flavanols on selected cardio-metabolic biomarkers. Next, each working group extracted all the data and information from those studies as requested for the analysis and included them in an Excel template designated for this purpose.

The aim of this STSM was to gain knowledge on how to perform meta-analyses as well as hands-on training on the specific software needed for this type of analysis. This STSM was carried out under the supervision of Dr. Emilie Combet from the University of Glasgow. This STSM comprised of two clearly defined objectives:

- 1) To acquire skills and knowledge of the tools needed for meta-analysis that will be applied for the analysis of all the data prepared by the WG2 members to complete current and future objectives planned within this COST Action (i.e. Ellagitannins, Anthocyanins).
- 2) To contribute to the current meta-analysis under development specifically evaluating the effects of flavanols and the assessment of inter-individual variability on specific cardio-metabolic biomarkers.

- **Description of the work carried out during the STSM and description of the main results obtained**

A. Meta-analysis flavonols/cardio-metabolic markers

1. Review and complete the data extraction process performed by each partner (total number of 355 studies included in this step) prior to:

- check the suitability of the data extracted in each study. After this process, 191 studies were finally included in the analysis.
- stratify each study based on the specific outcome (biomarker) reported, as well as prepare a summary for each factor (age range, BMI, gender, ethnicity, health status, smoking, menopausal status, diet during the intervention, flavonols source, duration, etc.)
- measure the quality of the study using the JADAD method.
- standardize the units for each outcome (biomarker). We carried out the conversions to the same estimators and units (mean and standard deviation, and preferably mmol/L for specific cardio-metabolic risk biomarkers).

2. Data entry for each outcome in the Comprehensive Meta-Analysis program including different data format:

- sample mean, SD pre and post, N, in each group, Pre/Post Corr.
- sample mean change, SD pre and post, N, in each group, Pre/Post Corr.
- sample size and *p*-value.

3. Run the analysis using the software Comprehensive Meta-Analysis V3 for each specific cardio-metabolic biomarker and make different comparisons between all selected factors in order to evaluate the effects of flavanols and the assessment of inter-individual variability.

During this period, we completed successfully the objectives 1 and 2 and started the analysis of some of the specific cardio-metabolic biomarkers such as BMI and Waist Circumference (WC). The analyses of the remaining biomarkers are in progress and will be completed after the next meeting in Bucharest and once we discuss the initial results.

B. Future meta-analysis (other bioactive compounds)

Preliminary steps: To provide transparency in the review process as well as to improve quality and increase confidence of a systematic review, we have now been working on an initial draft to register the meta-analysis protocol of Ellagitannins and Anthocyanins in Prospero (www.crd.york.ac.uk/Prospero, an international database of prospectively registered systematic reviews in health and social care). We are currently waiting for the feedback from the meta-analysis support group within the WG2 of this COST Action so that we can proceed with its registration.

- **Future collaboration with the host institution and foreseen publications/articles resulting from the STSM**

This STSM has strengthened the collaboration between CEBAS-CSIC and University of Glasgow within the COST Action POSITIVE to progress with the data analysis of some of the proposed systematic reviews as well as for the specific completion and dissemination of the results of the flavanols, ellagitannins and anthocyanins meta-analyses. The analyses carried out at CEBAS-CSIC will be supported by Dr. Emilie Combet from the University of Glasgow (host institution).

Foreseen publications resulting from the STSM will be discussed in the next COST meeting in Bucharest.