

PROGRESS REPORT Grant COST-STSM-FA1403-37556

STSM Title: **Inter-individual variability of quercetin ADME in humans**

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Quercetin is a prominent food bioactive flavonol whose daily intake has considerably increased due to its use as food supplements. In recent decades, quercetin has been the subject of a large number of biological studies displaying a wide range of biological effects including anti-inflammatory and neuroprotective activities. However, human studies often failed to show clear associations between quercetin dietary intakes and health outcomes, possibly due to inter-individual variation in quercetin ADME.

A review was conducted by POSITIVE WG 1 members A. Filipa Almeida, Grethe Iren Borge, Mariusk Piskula, Adriana Tudose, Liliana Tudoreanu, Kateřina Valentová, Gary Williamson, and Cláudia N. Santos using Web of Science and PubMed search that includes all original research articles written in English, published between January 1990 and March 2015, on the relationship between interindividual variation and quercetin ADME in humans and 298 abstracts were retrieved. An updated search was performed on March 2016 and retrieved 20 additional abstracts. After a 2 stage retrieving of non-relevant papers, the information derived from the full-texts was summarized in tabulated form. Data extracted from each article were summarized in a tabulated summary that contains the following descriptors: bibliographic data, study design, intervention description (ingested dose, form, duration, and food source), analytic methodology (sample treatment, hydrolysed vs native metabolites; type of chromatographic and detection method), human data relevant to interindividual variation in ADME (qualitative vs quantitative data; kinetic data, type of parameters, type of data collected (mean/median or individual)), characteristics of population group (age, sex, body weight, dietary habits, life style and health status when available),

sample size. The tabulated summary of all studies was finally revised by Cláudia Nunes dos Santos and Kateřina Valentová in order to harmonize its content.

Before the STMS all relevant data were extracted and respective tables, i.e. Table 1: Characterization of studies using food, Table 2: Characterization of studies using quercetin and derivatives as pure compounds, Table 3: Characterization of studies with mixtures or combinations of fruits/vegetables with pure compounds, Table 4: Variations in ADME studies for quercetin bioavailability from onions (details for each study in Table 1) in hydrolyzed samples with mean data, Table 5: Variations in ADME studies for quercetin without individual data (details for each study in Tables 2 and 3) administered as pure compound, Table 6: Variations found in ADME studies for quercetin glycosides without individual data (details for each study in Tables 2 and 3), Table 7: List of quercetin main metabolites identified in non hydrolyzed samples and information about abundance when available (presence indicated by +, ND-not detected) and Table 8: Variability in kinetic parameters for quercetin metabolites based in studies with non-hydrolyzed samples with quantitative data presented with means were prepared. Also the Introduction and Experimental section were ready.

The close contact between the main authors, i.e., Claudia Nunes dos Santos and Kateřina Valentová including regular consultations with Gary Williamson by skype during this STSM allowed to focus on the manuscript and finalize all the tables, Results and discussion, Conclusion and References sections of the manuscript. The complete draft will be circulated among the remaining authors, i.e., A. Filipa Almeida, Grethe Iren Borge, Mariusk Piskula, Adriana Tudose, Liliana Tudoreanu for final remarks and the paper should be prepared for submission of the manuscript to Food and Function before the end of summer in order to accomplish the main goal of the WG 1 - Inter-individual variation in bioavailability.

Kateřina Valentová



Claudia Nunes dos Santos

