HAL open science

Genetic variations are involved in the bioavailability of antioxidant vitamins and micronutrients: towards personalized recommendations in antioxidant intake.

Patrick Borel

▶ To cite this version:

Patrick Borel. Genetic variations are involved in the bioavailability of antioxidant vitamins and micronutrients: towards personalized recommendations in antioxidant intake.. 6. International Conference on Food Factors (ICoFF-6), Nov 2015, Seoul, South Korea. hal-01594758

HAL Id: hal-01594758

https://hal.science/hal-01594758

Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Distributed under a Creative Commons Attribution - ShareAlike 4.0 International License

Genetic variations are involved in the bioavailability of antioxidant vitamins and micronutrients: towards personalized recommendations in antioxidant intake.

Patrick Borel

"Nutrition, Obesity and Risk of Thrombosis", UMR 1062 INSERM/1260 INRA/Aix-Marseille University, Marseille, France.

Purpose – Antioxidant vitamins (A, C and E) and antioxidant micronutrients (carotenoids and polyphenols), are assumed to diminish the incidence of several degenerative diseases. However, absorption efficiency of these compounds is very variable among individuals. We hypothesized that this inter-individual variability is due to genetic variations between individuals. We thus dedicated a clinical study to identify genetic variants associated with fat-soluble antioxidant bioavailability.

Methods – 40 healthy male adults consumed, at a miminum 3 wks intervals, meals that contained either a supplement of vitamin E, a supplement of lutein or a tomato purée (as a source of lycopene and β-carotene). Volunteers were genotyped using whole-genome microarrays. Antioxidant concentrations were measured in plasma chylomicrons (CM) isolated at regular time intervals over 8 h postprandially. The association of single nucleotide polymorphisms (SNPs), in or near candidate genes, with the postprandial CM antioxidant responses was assessed by partial least squares (PLS) regression.

Results - The postprandial CM antioxidant responses to the antioxidant rich test-meals were highly variable among the subjects (CV > 80%). Data obtained allowed us to generate validated significant PLS models, which usually included 20-40 SNPs, and which explained a significant part of the variance of the postprandial CM antioxidant responses.

Conclusions – Minor genetic variants are associated with bioavailability of the studied antioxidants. This partly explains the huge interindividual variability in absorption efficiency of these compounds. Our results allow us to propose genetic scores that may predict the ability of a subject to accurately absorb these antioxidants. This is a first step toward personalize recommendations in antioxidant vitamin and micronutrient intake.