

# Human plasma levels of vitamin E and carotenoids are associated with genetic polymorphisms in several genes involved in lipid metabolism

Patrick Borel, Myriam Moussa, Emmanuelle Reboul, Bernard Lyan, Catherine Defoort, Richard Planells, Stéphanie Vincent, Michel Darmon, Henri Portugal, Denis Lairon

► **To cite this version:**

Patrick Borel, Myriam Moussa, Emmanuelle Reboul, Bernard Lyan, Catherine Defoort, et al.. Human plasma levels of vitamin E and carotenoids are associated with genetic polymorphisms in several genes involved in lipid metabolism. 10. European Nutrition Conference, Jul 2007, Paris, France. hal-02815879

**HAL Id: hal-02815879**

**<https://hal.inrae.fr/hal-02815879>**

Submitted on 6 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.

# Postprint

Version définitive du manuscrit publié dans / Final version of the manuscript published in : *Annals of Nutrition and Metabolism*, 2007, no.51, supplement 1

## Human plasma levels of vitamin E and carotenoids are associated with genetic polymorphisms in several genes involved in lipid metabolism

Patrick Borel <sup>1</sup>, Myriam Moussa <sup>1</sup>, Emmanuelle Reboul <sup>1</sup>, Bernard Lyan <sup>2</sup>, Catherine Defoort <sup>1</sup>, Richard Plannels <sup>1</sup>, Stéphanie Vincent <sup>1</sup>, Michel Darmon <sup>1</sup>, Henri Portugal <sup>1</sup>, and Denis Lairon <sup>1</sup>

<sup>1</sup> *INSERM, U476 « Nutrition Humaine et Lipides », Marseille, F-13385 France; INRA, UMR1260, Marseille, F-13385 France; Univ Méditerranée Aix-Marseille 2, Faculté de Médecine, IPHM-IFR 125, Marseille, F-13385 France.*

<sup>2</sup> *INRA, UMR1019 « Nutrition Humaine », Saint-Genes-Champanelle, F-63122 France.*

Vitamin E and carotenoids are fat-soluble micronutrients carried by plasma lipoproteins. Their plasma concentration is governed by several known factors (dietary intake, bioavailability...) including genetic factors. Scarce data are available on this topic. We hypothesized that genes involved in lipid metabolism are, directly or indirectly, implicated in the intestinal uptake, intracellular trafficking and lipoprotein distribution of these microconstituents, and consequently can regulate their plasma concentration. We therefore assessed whether key genes involved in lipid metabolism were related to the plasma status of these micronutrients. Fasting plasma vitamin E (alpha and gamma-tocopherol) and carotenoids (alpha and beta-carotene, lutein, lycopene, beta-cryptoxanthin and zeaxanthin) concentrations were measured by HPLC in 169 male and female volunteers involved in the Medi-RIVAGE study. Genotyping of several genes involved in lipid metabolism was carried out: Apo-AIV, Apo-B, Apo-CIII, Apo-E, cholesterol ester transfer protein (CETP), hepatic

lipase (HL), lipoprotein lipase (LPL), intestinal fatty acid binding protein (I-FABP), microsomal triglyceride transfer protein (MTP), and scavenger-receptor class B type I (SR-BI). Results showed that plasma alpha-tocopherol was significantly ( $p < 0.05$ ) associated with Apo-AIV, Apo-CIII, Apo-E, CETP and SR-BI genotypes. Gamma-tocopherol was associated with Apo-AIV, HL and SR-BI. Alpha-carotene was associated with HL and SR-BI, beta-carotene with Apo-B, HL and SR-BI, lycopene with apo-AIV, apo-B and I-FABP, beta-cryptoxanthin with SR-BI. No association was found between either lutein or zeaxanthin and the studied SNPs. These results show that several genes involved in lipid metabolism are implicated in the plasma status of these micronutrients.