# Metabolization of flavan-3-ol oligomers by human gut bacteria

Halifa Ruben, Agnes Cornu, Pierre Peyret, Claire Dufour, Carine Le Bourvellec, Pascale Mosoni

**Metabolization of flavan-3-ol oligomers by human gut bacteria**

HALIFA Ruben, CORNU Agnes, PEYRET Pierre, DUFOUR Claire, LE BOURVELLEC Carine, MOSONI Pascale

UMR454 MEDIS, Université Clermont Auvergne, INRAE, Clermont-Ferrand, France
UMR1213 Herbivores, VetAgro Sup-Université Clermont Auvergne, INRAE, Clermont-Ferrand, France
UMR408 SQPOV, INRAE, Avignon Université, Avignon, France

Flavan-3-ols are a largely consumed subclass of flavonoids and are involved in the prevention of cardiovascular diseases [1]. The contribution of phenolic metabolites produced by the gut microbiota in the health effects of polyphenols (including flavan-3-ols) is currently an open field of investigation. Although a few bacterial species metabolize flavan-3-ol monomers [2] no bacterial isolates active on oligomers (called procyanidins) have been described. Knowing that the gut microbiota hydrolyzes procyanidins [3], our aim was to identify bacteria degrading flavan-3-ol oligomers and the degradation products. From human stools of three healthy individuals, culturomic approaches combined with screening for the metabolic activity of bacterial isolates by HPLC-DAD allowed us to obtain four strains of Eggerthella *lenta* and one strain of *Flavonifractor plautii* degrading (+)-catechin and (-)-epicatechin. The activity of these strains was then tested on B-type (DP2 to 4) and A-type (DP2) procyanidins and the metabolites generated were characterized by LC-ESI-MS / MS. These two species co-metabolized (+)-catechin and (-)-epicatechin into hydroxyphenylvaleric acid derivatives. Only *E. lenta* converted procyanidins while *F. plautii* alone or in co-culture with *E. lenta* did not show any activity towards procyanidins. The reaction catalyzed by *E. lenta* on dimers (B-type and A-type) corresponded to the opening of the C-ring of the terminal unit. This work is the first report of flavan-3-ol oligomers metabolization by the human gut bacterium *E. lenta.*

1. Fraga et al (2019). Food Funct. 10, 514-528.
2. Braune & Blaut (2016), Gut Microbes, 7, 216-234
3. Le Bourvellec et al (2019) Nutrients, 11, 664.