

## PIVOTAL ASSESSMENT OF THE EFFECTS OF BIOACTIVES ON HEALTH AND WELLBEING. FROM HUMAN GENOMA TO FOOD INDUSTRY.

The **general objective** of PATHWAY-27 addresses the exploitation of bioactive compounds as ingredients of foods that, within the common diet, could significantly benefit human health and wellbeing. PATHWAY-27 uses three model compounds (docosahexaenoic acid - DHA, beta-glucan - BG, and anthocyanins - AC) and three model food matrices (bakery, dairy and egg products) to derive conclusions that will be widely applicable.

The **scientific objective** of PATHWAY-27 is to better understand the potential benefits and mechanism of action of the selected bioactive compounds (DHA, BG and AC), considered as ingredients of the PATHWAY-27 bioactive-enriched foods (BEF), in the prevention of the Metabolic Syndrome (MS).

The **technological objective** of PATHWAY-27 is to develop improved food formulations leading to the production of BEF with a scientifically demonstrated impact on health.

The **mid term results** of the PATHWAY-27 project are as following:

In accordance to the general aim of **Work Package 2** (Feasibility of selected food matrices for the formulation of PATHWAY-27 bioactive-enriched foods) 45 prototypes of BEF (3 food in each matrix, each food enriched with five different bioactive combinations) were developed through a cooperation between academic partners and SMEs. The purified and/ or enriched bioactive containing ingredients for incorporation into BEF, and the BEF prototypes were produced by the SMEs participating in **Work Package 4** (Industrial production of PATHWAY BEF for pilot and intervention studies). To reduce the number of the prototypes to 30 at first a pre-screening based on sensory characteristics and consumers acceptance was carried out. The bioactive content of the 30 selected BEF was assessed in WP2 after manufacture to make sure that the target concentration had been reached. Furthermore, bioaccessibility of the bioactive(s) was determined after *in vitro* digestion, and sensory properties, consumer acceptance, shelf-life and microbiological safety of the BEF were also evaluated. The 15 BEF (one in each matrix, enriched with five different combinations of bioactives) which showed the best overall performances were selected and used in three 4-week human pilot studies, each one considering BEF from one food matrix.

Pilot studies performed in **Work Package 5** (Dietary pilot and intervention studies) provided information on which enrichment process within each food matrix is the most effective in reducing blood triglycerides (TG) and increasing HDL-cholesterol (HDL-C) levels.

In the next phase of the project the most active BEF within each matrix will be used in a larger randomized, placebo-controlled intervention study ran on 800 volunteers in 4 different European countries.

To understand the mechanisms of action of each bioactive compound (DHA, BG and AC) and their possible synergism **Work Package 3** (In vitro studies on the effects and mechanism of action of selected bioactives) is evaluating the impact of these molecules on glucose and lipid metabolism through in vitro studies.



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*In the next period* the results of scientific evidence for the health benefits of DHA alone and in combination with BG or AC will be used by WP3 to select specific biomarkers to be measured in **Work Package 6** (Understanding the effects of the selected bioactives) on volunteers recruited in the intervention study.

Within **Work Package 7** (Guidelines for the substantiation of health claims on bioactive enriched foods) two guidelines are under development:

- **Guidelines on recommended industry practice for developing food products with health claims** (1<sup>st</sup> draft is available for internal discussion)
- **Guidelines for the scientific community** (under development)

These integrated guidelines will represent a key outcome of the project. After finalization through consultations of representatives from academia, governmental organisations and food industry, these guidelines will be made publically available.

A group of young researchers was formed within **Work Package 8**. The main aim of this group is facilitate communication with other young researchers to exchange experiences and provide updates on recent publications, conferences and meetings related to PATHWAY-27.

**Further information:** <http://www.pathway27.eu/>

**Dr. Alessandra Bordoni** (project coordinator)  
Alma Mater Studiorum UNIBO (Italy)  
Tel: +39 51 209 7861  
E-mail: [alessandra.bordoni@unibo.it](mailto:alessandra.bordoni@unibo.it)

**Dr. András Sebők** (WP8 leader)  
Campden BRI Magyarország Nonprofit Kft.(Hungary)  
Tel: +36 1 433 1470  
E-mail: [a.sebok@campdenkht.com](mailto:a.sebok@campdenkht.com)