

# The PROEUHEALTH Cluster

## Developing new probiotic foods for improved human health

### Why study gut health and probiotics?

All of us carry in our intestinal tracts a complex population of microbes. In fact, we have about twenty times more bacterial cells than human cells in our body. These bacteria are very important to our health. They provide us with protection against intestinal infections, contribute to our nutrition, and influence our immune systems.

The beneficial bacteria are called **probiotics** and food ingredients that promote their growth in the gut are called **prebiotics**. Foods that contain both probiotics and prebiotics are called **synbiotics**.

Probiotic bacteria, such as certain types of lactobacilli or bifidobacteria, are being increasingly included in yoghurts and other foods.

### What is the aim?

The EU-funded research in the **PROEUHEALTH cluster will apply a scientific approach to examine the role of probiotic bacteria in our well-being**. The research carried out within the cluster will

- 1) increase our understanding of the role of intestinal bacteria in human health and disease
- 2) develop new functional foods and therapies.

### What makes the cluster?

The cluster has 64 research partners from 16 European countries. **Short descriptions of the eight cluster projects are given overleaf**. If you want to learn more about probiotics and the PROEUHEALTH Cluster, visit our website at **<http://proeuhealth.vtt.fi>**, or contact our consumer platform.

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## The Cluster Projects

Eight European projects are included in the cluster. These projects are independently funded by the European Commission's 5th Framework Programme. They cover all aspects in the development of new probiotic foods: from basic research tools to processing technologies and human clinical trials.

### Project 1. MICROBE DIAGNOSTICS

#### Which bacterium is which?

In our intestines live more than 400 different species of bacteria. Most of them have numerous strains that vary in their properties. In this project, new techniques are developed for rapid and reliable identification of these bacteria based on their DNA (i.e. their genes). With the new tools the bacteria usually present in the intestines of healthy people can be identified. Similarly, changes linked to age, diet, lifestyle and disease can be recognised. This knowledge can be used in the development of new functional foods and therapeutic treatments.

**Project number: QLK1-2000-00108**

**Coordinator: Prof. Michael Blaut, D**

### Project 2. DEPROHEALTH

#### Second generation probiotics

This project aims to develop new probiotic strains with enhanced health properties. This will be achieved by engineering specific strains to produce a compound that is beneficial to the human health. This project targets the diseases linked to the harmful bacterium *Helicobacter pylori* which can lead to stomach ulcers, and to rotavirus which causes severe diarrhoea, especially in infants. The project will also study the interaction between the probiotics and the human immune system, trying to identify the mechanisms underlying this relationship.

**Project number: QLK1-2000-00146**

**Coordinator: Prof. Annick Mercenier, F**

### Project 3. PROGID

#### New therapeutics with potential against IBD

Inflammatory bowel diseases (IBD), Crohn's disease and ulcerative colitis are important, lifelong, and disabling diseases with recurrences of intestinal symptoms. This project will assess the ability of two new, specially selected probiotics to ease the effects of IBD. Two long-term human clinical trials will be conducted. Further studies will explore the role of the human intestinal bacteria in these diseases, potentially opening new therapeutic approaches for preventing these diseases.

**Project number: QLK1-2000-00563**

**Coordinator: Prof. Fergus Shanahan, IE**

### Project 4. CROWNALIFE

#### A healthier retirement

As we grow older, the composition of the bacterial ecosystem in our gut is believed to slowly change. This may leave us more vulnerable to intestinal infections and diseases of the gut. In this project, the effect of ageing on the composition and activity of the intestinal microbes will be studied in order to develop new functional food ingredients specifically targeted at elderly people.

**Project number: QLK1-2000-00067**

**Coordinator: Dr. Joël Doré, F**

### Project 5. PROTECH

#### Keeping probiotics alive and healthy so that they can keep you healthy

Functional probiotic bacteria should be alive and healthy when they reach our intestines. This means that they must survive processing and storage conditions. In this project, new processing techniques will be developed to ensure that the probiotic foods we eat really are effective. New techniques for manufacturing a wider range of probiotic foods will be developed. In addition, prebiotics will be optimised and the interaction between probiotics and prebiotics will be evaluated for synergistic effects.

**Project number: QLK1-2000-00042**

**Coordinator: Prof. Dietrich Knorr, D**

### Project 6. PROPATH

#### Probiotics can defend against bad bacteria

The ability of probiotic lactic acid bacteria to prevent gastrointestinal disorders will be studied. The project investigates how widely selected potential probiotic lactic acid bacteria can inhibit harmful bacteria that cause diarrhea or gastric disorders, and what this effect is based on. The most promising lactic acid bacteria candidates will be tested in clinical trials on their ability to prevent such disorders like malfunction of the stomach caused by *H. pylori* bacteria, irritable bowel syndrome or acute diarrhea in infants. These disorders are common problems for a considerable number of European consumers.

**Project number: QLK-2001-01179**

**Coordinator: Prof. Luc de Vuyst, B**

### Project 7. PROSAFE

#### Ensuring the safety of probiotic bacteria

The objective of this project is to propose criteria and guidelines for testing safety of different lactic acid bacteria (LAB) strains including those with that have probiotic activity. The project will develop procedures and standardised ways to assess safety before any bacteria has been applied in food production and also ways to survey the safety issues when products are marketed. The project will result in recommendations for biosafety evaluation of probiotic LAB.

**Project number: QLK-2001-01273**

**Coordinator: Dr. Herman Goossens, B**

### Project 8. EU and MICROFUNCTION

#### Why are probiotics effective?

The objective of this project is to determine the efficacy and safety of probiotics, prebiotics and synbiotics (synbiotics = a combination of probiotics and prebiotics that support the growth of probiotics), which may depend on the dose of these components, their proportions in the food product and their interaction with the host. The research will try to find possible markers of probiotics that show the efficacy of them and also help us to understand how probiotics work in our bodies. These results will improve consumers' possibilities to improve their gut health safely in the future.

**Project number: QLK1-2001-00135**

**Coordinator: Prof. Glenn Gibson, UK**