

Though our scientists are skilled in other areas, studying good bacteria is the heart of their work at Danone Research. The products of the future will come from a thorough understanding of the role of pre- and probiotics\* in human health.

# The hunt for (good) bacteria



**Alice Dautry** currently serves as Managing Director of the Pasteur Institute, where she has worked since 1977 and continues to head a laboratory. A cellular biologist, she is also in charge of a research unit associated with CNRS, France's national research institute. Throughout her career, she has combined research with teaching, research assessment, and scientific consulting, and has authored numerous publications. Her current research focuses on immune-system receptors and intracellular bacteria infections. Since 2004, Danone has renewed its historic partnership with the Pasteur Institute to study probiotic bacteria.

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**Evan Abrahamse**, a Dutch biochemist at Danone Research, has been studying the gastrointestinal system for ten years. He is the driving force behind new technology for **intestinal simulation**, a unique research tool for specialized nutrition products that enables Danone to study the action of probiotics and other bacteria at various points along the gastrointestinal tract of both adults and children.

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**“A detailed understanding of intestinal metabolism is critical to identifying the nutritional ingredients with the greatest health benefits.”**



**Jan Knol**, a native of the Netherlands, has a Ph.D. in microbiology and is the leading expert on the subject at Danone Research, where he serves as scientific officer of the Microbiota and Gut Biology team. His primary research areas include the study of interactions between bacteria and the human body, and the impact of nutrition on these interactions.

**“We’re starting to understand how bacteria influence health. And this is only the beginning!”**

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**Gregor Reid** is a doctor of microbiology and immunology, and head of the Canadian Research and Development Centre for Probiotics. He has worked with Danone Fresh Dairy Products for nearly a decade. Danone Research has now teamed up with him to found a research chair in probiotics in Canada that will significantly reinforce Danone's links to academic circles in North America. A world expert in probiotics, Dr. Reid is convinced that bacteria can make an important contribution to health. His research includes studies on the use of a lactobacillus to prevent female urogenital infections, and he also helped found a community kitchen in Tanzania to produce probiotic yogurts for people infected with HIV.

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**“No medical product on the market can match bacteria for range of effectiveness.”**



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For Danone Research, 2008 opened new horizons as we began to integrate our new Baby Nutrition and Medical Nutrition businesses, both highly reliant on R&D capacities. By the same token, it raised new challenges—linking up with new research teams, overhauling our organization, and redefining our priorities, while at the same time reaffirming an ambition that is unique in the food industry.

**T**he promise of a food business focused exclusively on health naturally hinges on a higher standard for scientific credibility, making quality research essential. With that in mind, in the past few months our scientists have worked to set up organizational structures that match Danone's new scope and favor the development of synergies. Other priorities included reinforcing the scientific standing of our products and enhancing transparency and dialog with scientific institutions, public authorities and consumers.

#### **A UNIQUE RESEARCH MODEL SERVING SCIENCE AND INNOVATION**

An international pacesetter in infant and medical nutrition, Numico was acquired by Danone at the end of 2007. It brought with it widely respected research capacities, with a culture and dedication to professional standards similar to those of our existing teams, but also complementing their expertise with new know-how. A first step in the integration process was naturally to bring our two structures closer together to favor synergies, while

preserving the internal dynamics and expertise of each.

In 2008 Danone Research, the organization heading up all our group's research resources around the world, thus underwent a major overhaul and is now structured around two main centers—the Daniel Carasso Research Center in Palaiseau near Paris, and another in Wageningen in the Netherlands, the hub of the "Food Valley" food

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The research and development model adopted by Danone continues to set us apart from the rest of the agrifood sector. Whereas the general practice is to separate

upstream fundamental research from new product development, Danone Research unites the two, combining the long-term vision essential to breakthrough innovation with the near-term creativity needed to bring a steady flow of new products to market each year.

To ensure that our R&D teams are familiar with product-specific challenges, they are based primarily within our four divisions—

Fresh Dairy Products, Waters, Baby Nutrition and Medical Nutrition. But a number of researchers also play a cross-functional role, supporting multiple divisions or even all four, in key areas that include managing clinical studies; researching prebiotics<sup>1</sup> and probiotics<sup>2</sup> and their interaction with intestinal flora; immunology; defining a comprehensive approach to nutrition; and studying consumer

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## Health governance/ changes in 2008

### Responsibility

**A year after adopting our 100% health focus and integrating new divisions into the group, Danone has to live up to additional responsibilities. Any business dealing with nutrition for the aged and sick, for infants, for pregnant women and for nursing mothers must be very aware of their vulnerability. More than ever before, the quality of Danone products must be absolutely irreproachable.**

### Science

**Danone researchers are now addressing major public health issues such as Alzheimer's disease. Science thus has a much more important place in our group, both as a business driver and a focus for investment.**

### The medical community

**Ties to the medical community—previously a matter of opportunity with more or less relevance in different countries—are now critical. By stages, all of our subsidiaries will be sending representatives to visit hospital personnel and other medical practitioners, including specialists in pediatrics and geriatrics, to introduce them to select Danone products and explain their scientific properties.**

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The Danone business that is most closely linked to health and research—thus helping to inspire the other three—is unquestionably Medical Nutrition, shown here in an Italian hospital.

↳ behavior and preference. Whether within individual divisions or in cross-functional units, our research teams bring together a broad range of nationalities and personal profiles, as well as a wide variety of research areas and complementary specializations.

In Fresh Dairy Products, Water and Baby Nutrition, divisional research teams are structured by type of health benefit. Each benefit is associated with one or more of the group's leading brands—Activia for digestive health and Danacol for cardiovascular health, for example, with others targeting the immune system, weight control, hydration and other aspects of health. And each of these teams combines the range of expertise required for its particular field.

At local level, R&D teams within individual subsidiaries have a dual mission, adapting group products to local consumer preferences for product characteristics such as flavors, textures, volumes, and packaging, while at the same time developing products that target their own specific markets.

The Medical Nutrition R&D division is the only exception to this general structure, reflecting specific requirements relating to clinical studies and the regulatory environment. This unit also takes a different approach to sales channels, since most medical nutrition products are prescribed by doctors and are covered or reimbursed by national health insurance systems.

### MAKING A SOLID CASE

Danone's mission, defined as bringing health through food to as many people as possible, means that we must be able to measure our products' contributions to good health. Reflecting this, in 2008 we became even more committed to performing the clinical studies required to back the health benefits of our products. Our goal is to produce scientific evidence for claims that apply to all consumers—the improved regularity associated with Activia, for example—as well as for those concerning particular groups such as children, adults with high cholesterol, or the aged.

Another priority task for Danone Research throughout the year was



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## The right formula

**In 15 different countries, we have adapted the formula for our Danonino range to fight dietary deficiencies identified by local medical practitioners. A new version launched last September in Brazil is a prime example. Gluten-free and fortified with vitamins A, B9 and D, along with calcium, iron, zinc and other nutrients, *Banana de la Selva* (jungle banana) Danoninho is perfectly tailored to the needs of children aged six months to six years.**

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the preparation of documentation required under the European Union's "Regulation on the use of nutrition and health claims for foods", which was adopted in December 2006 and will be applied to all our products by the end of the current year. Designed to ensure that any food-related claims are clear, reliable and scientifically substantiated, this regulation requires authorization for every claim before it can be used in labeling or advertising. To comply, in 2008 Danone Research submitted to the European Food Safety Agency several sets of scientific documentation setting out the evidence concerning the health benefits of our leading brands.

already been launched in Mexico, Spain and France to find out more about the advantages of mineral water in eliminating toxins and the connection between hydration and physical performance. The Waters division has also launched campaigns to raise public awareness and understanding of the scientific basis for the significant differences between mineral water, spring water, filtered water and tap water. While all have their uses, we at Danone are convinced that natural mineral water offers unique benefits, and we thus do everything we can to preserve the purity of the springs that supply it.

## Numico's advanced knowledge of the components of breast milk is an important contribution to Danone Research.

This process naturally concerns Fresh Dairy Products most, but more recently the Waters division has also been involved, setting up two research units—one dedicated to hydration and the other to digestion and the elimination of toxins and waste. Two clinical studies have

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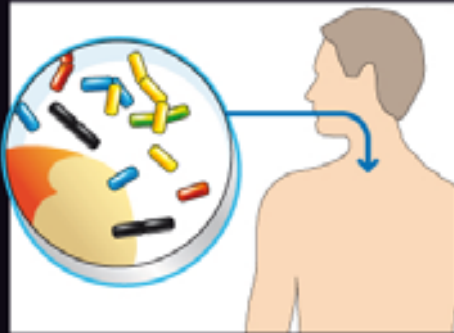
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## Good bacteria: How probiotics work

Bacteria—good and bad—are the oldest form of life on Earth, and no other life forms could exist without them. In the human body, they form an indispensable ecosystem of their own: the intestinal flora. Some of these bacteria are beneficial for human health, and they are called probiotic bacteria.

### The human body

The intestine contains 70% of the body's immune cells. These cells are responsible for fighting off attackers, such as bad bacteria, viruses, and harmful fungi.



Though some microorganisms are harmful to humans, the majority are not.



Everything we eat passes through the digestive tract, which breaks down food and absorbs nutrients.



An immune cell prepares to defend the body by neutralizing an attacker.

### Intestinal flora

Though everyone's flora are unique, they play the same role for all of us. Residing in the digestive tract, intestinal flora help the body fight off hostile microorganisms and digest foods that cannot be broken down by the stomach or the small intestine.



An entire population of tiny living creatures—more than a thousand different species of bacteria—live inside the intestine.



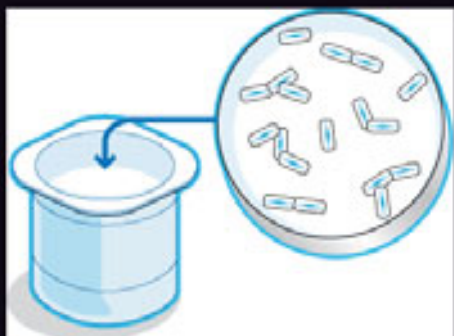
The bacteria in our intestinal flora help the body digest fiber that cannot be processed in the upper portion of the digestive tract.



The bacteria in our intestinal flora help protect the body from attackers.

### Probiotics

Probiotics are living microorganisms that benefit human health when consumed in sufficient quantities. These active ingredients spring into action when they reach the intestine.



Probiotics were first discovered in yogurt.



Probiotics travel through the entire digestive system, reaching the intestine alive. It is here that they begin to have an effect.



Probiotics fight disease-causing microorganisms and help educate the immune system.