PROBIOTICS, 
OTHER NUTRITIONAL FACTORS, 
AND INTESTINAL MICROFLORA
The 42nd Nestlé Nutrition Workshop, Probiotics, Other Nutritional Factors, and Intestinal Microflora, was held in Beijing, China, May 11–15, 1997.
Preface

The 42nd Nestlé Nutrition Workshop, held in Beijing, China, in May 1997, is the basis for this book. In a most interesting milieu, not far from the Forbidden City, a group of international scientists presented research findings and reviews on the intestinal flora, and its consequences for the host, to a large audience, which participated actively in the discussions.

The topic of the meeting was timely. There is a renewed interest in the possibility of defining certain bacterial strains that are members of the normal intestinal flora and have specific definable favorable effects on the host. As a background, the full complexity of the normal intestinal flora was presented, making it clear that our knowledge in this important area is still limited. However, it is known that the normal intestinal flora plays an important role in human ecology. For example, the intestinal flora comprising most of man's total normal bacterial flora amounts to some $10^{14}$ cells per person. In comparison, the human body consists of only $10^{13}$ eukaryotic cells, thus indicating the crucial effect that this flora can have on the health of individuals and populations.

Useful information was presented on the variability and stability of the normal intestinal flora in the individual, and the possible features of bacterial strains with probiotic characteristics. The appearance of microbes in the gut of the neonate and the young was reviewed, showing striking differences in the gut flora which correlate with the age and developmental state of the host. Different intestinal bacteria show variable characteristics—for example, in their capacity to adhere to the intestinal epithelium. It was shown that this is not necessarily a marker of virulence, but possibly a means of remaining in an ecological niche. In addition, analogues of epithelial receptors for various microorganisms are plentiful in the human milk, which, together with other factors in the milk, affect the intestinal flora of the breast-fed infant largely by producing less virulence.

The normal intestinal flora is obviously in close contact and balance with the defense systems of the host. About two thirds of the whole immune system is found in the gut, reflecting the importance of the immunological challenge presented by these numerous bacterial strains. The immune system is there not only to prevent infections, but almost as importantly to suppress immunological/inflammatory reactivity of the host against the normal flora. In fact, we seem normally to be downregulated by specific immunological tolerance to our own normal flora in the 400 square meters of intestinal mucosa.

Several studies were presented relating to alterations in host flora designed to promote health. Possible health effects that might result include improved nutrition, accelerated growth, a diminution in diarrhea incidence, and a decreased incidence of opportunistic infections in immunocompromized individuals. Treatment methods
directed toward these ends include the feeding of specific nonpathogenic organisms such as lactobacilli and bifidobacteria, as well as the ingestion of sugars that promote colonization with these organisms. Preliminary data presented at the meeting indicate that these and other methods have great potential in terms of the specified aims. The successful understanding of the role of the intestinal flora in human health and the development of methods for modulating it might result in new ways of preventing disease and treating a wide range of human disorders.

Lars Å. Hanson, M.D., Ph.D., FRCPCH (Hon)  Robert H. Yolken, M.D.
Göteborg, Sweden  Baltimore, Maryland, USA
Foreword

China has a long-standing tradition of observing the interactions between food intake and health performance. The Chinese believe that the body has to have a balance of yin and yang for it to function harmoniously. Therefore, all foods are classified with yin and yang qualities. Foods are classified as hot, cool, wet, and neutral, and it is considered unwise to ingest either too high or too low a quantity of any except the neutral foods. Food companies that develop concepts of adding value to their products can benefit from the Chinese experience. Therefore, Nestlé was honored that this country was hosting the 42nd Nestlé Nutrition Workshop on probiotics.

More than 50 years of research has resulted in concepts of how pro- and prebiotics could work. Lactobacillus acidophilus and bifidobacteria species, as examples of probiotics, are now common components of yoghurts. They are considered to be live microbial food supplements that beneficially affect the host by improving the intestinal microbial balance.

We know the concepts of the actions of pro- and prebiotics, but surprisingly few clinical data are available documenting the health effects. Those data are necessary if substantial health claims are to be made. Physicians need to know whether the so called win-win situation—probiotic bacteria and a healthy host—really results in better health performance.

The 42nd Nestlé Nutrition Workshop, with highly qualified speakers and a critical, qualified audience, was a more than adequate forum for discussion of these issues. I thank the chairmen Lars Å. Hanson and Robert M. Yolken for putting together the program, as well as Mr. Klauser and his team from Nestlé China for their efforts to make this meeting possible.

PROFESSOR FERDINAND HASCHKE, M.D.
Vice President,
Nestec Ltd., Vevey, Switzerland
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Contributing Authors

Speakers

Ingegerd Adlerberth  
Department of Clinical Immunology  
University of Göteborg  
Guldhedsqatan 10  
41346 Göteborg  
Sweden

Per Falk  
Gastroenterology Section  
Department of Medicine, KS  
Karolinska Institute  
17176 Stockholm  
Sweden

Rolf Freter  
Department of Microbiology and Immunology  
University of Michigan  
6605 A Medical Sciences Building 2  
Box 0620  
Ann Arbor, Michigan 48109-0620  
USA

Roy Fuller  
Intestinal Microbiology Consultant  
59 Ryeish Green  
Three Mile Cross  
Reading, RG7 1ES  
United Kingdom

Glenn R. Gibson  
Microbiology Department  
Institute of Food Research  
Earley Gate  
Reading, RG6 GB2  
United Kingdom

Lars Å. Hanson  
Department of Clinical Immunology  
University of Göteborg  
Guldhedsqatan 10  
41346 Göteborg  
Sweden

Willi E. Heine  
Department of Pediatrics  
University of Rostock  
16/17 Rembrandt Street  
18057 Rostock  
Germany

Erika Isolauri  
Department of Paediatrics  
University of Turku  
20520 Turku  
Finland

Clemens Kunz  
Research Institute of Child Nutrition  
Heinstück 11  
44225 Dortmund  
Germany

Bo Löönerdal  
Department of Nutrition  
University of California  
Davis, California 95616  
USA

Philippe Marteau  
Department of Gastroenterology  
Hôpital Laennec  
42 Rue de Sèvres  
75010 Paris  
France

Tore Midtvedt  
Institute for Cellular and Molecular Biology  
Department of Microbial Ecology  
Karolinska Institute  
17177 Stockholm  
Sweden

Andrea Pfeifer  
Nestlé Research Center Lausanne  
P.O. Box 44  
CH-1000 Lausanne 26  
Switzerland
CONTRIBUTING AUTHORS

Marcel Roberfroid
Department of Pharmaceutical Sciences
Université Catholique de Louvain
(UCL 7369)
73 Avenue Mounier
1200 Brussels
Belgium

José M. Saavedra
Department of Gastroenterology and Nutrition
Johns Hopkins Children’s Center
600 North Wolfe Street/Brady 320
Baltimore, Maryland 21287-2631
USA

Magda M.S. Carneiro-Sampaio
Department of Immunology
Instituto de Ciencias Biomédicas
Universidade de São Paulo
Avenida Lineu Prestes, 2415
05508-900 São Paulo
Brazil

Gerald W. Tannock
Department of Microbiology
University of Otago
P.O. Box 56
Dunedin
New Zealand

Dirk van der Waaij
Hoge Hereweg 50
9756 TJ
Glimmen
The Netherlands

Agnes E. Wold
Department of Clinical Immunology
University of Göteborg
Guldhedsrgatan 10
41346 Göteborg
Sweden

Robert H. Yolken
Department of Pediatrics
Stanley Division of Neurovirology
Johns Hopkins University/Blalock 1111
600 North Wolfe St.
Baltimore, Maryland 21287-4933
USA

Session Chairmen
Wei-Ping Wang / Shanghai, China
Bai Kang / Liaoning, China
Chun-Ming Chen / Beijing, China
Yong-Sui Dong / Hubei, China
Zai-Fang Jiang / Beijing, China

Invited Attendees
Muhammed Khalid Adhia, Pakistan
Al Adin Al Amri, Saudi Arabia
Michal Andel, Czech Republic
Joanna Panayotou Angelakopoulou, Greece
Kurt Baetlocher, Switzerland
Elisabeth Becher, Switzerland
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Fubao Yao, China
Felizardo Gatcheco, Philippines
Anli C. Grobler, South Africa
Alfredo Larrosa Haro, Mexico
Thuy Tien Hoang, Vietnam
Po-Chao Huang, Chinese Taipei
Yongkun Huang, China
Nguyen Thi Kim Hung, Vietnam
Hussain Imam bin Md. Ismail, Malaysia
Pawel Januszewicz, Poland
CONTRIBUTING AUTHORS

Ronald Kleinman, USA
William Klish, USA
Benjamin Israel Kopelman, Brazil
Tahar Lahrech, Morocco
Alan Lake, USA
Michael Lentze, Germany
Haiqi Li, China
Méi Li, China
Weiming Li, China
Ying-Fong Lin, Chinese Taipei
Louis Low, Hong Kong
Hongshen Ma, China
Meng Mao, China
Federico Arguelles Martin, Spain
Cynthia Moffatt, USA
Ran Namgung, Korea
Thanh Pham Ngoc, Vietnam
Boo Chye Ooi, Singapore
Valentina Ott, Ukraine
Pornpimon Phuapradit, Thailand
Amornrath Podhipak, Thailand
Michael Radke, Germany
Solange Heller Rouassant, Mexico
Michel Roulet, Switzerland
Ian Raymond Rowland, UK
Chaiyong Sakulbordinr, Thailand
Santiago Dalmau Serra, Spain
Salemin Shakir, Bangladesh
Aummaruta Sirichai, Thailand
Umaporn Suthivoravut, Thailand
Hanna Szajewska, Poland
Abdelaziz Benabbes Taarji, Morocco
Baozhen Tang, China
Kraisid Tontisirin, Thailand
Wandee Varavithya, Thailand
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Chongli Yang, China
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