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Gastrointestinal Functions

Editors
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Gastrointestinal Functions
The 46th Nestlé Nutrition Workshop, Gastrointestinal Functions, was held in Montréal, Canada.
Gastrointestinal Functions

Editors

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Preface

The subject of gastrointestinal function is topical and extremely complex, as will be appreciated during the next three days.

Physicians caring for children and adolescents are confronted daily by a multitude of chronic or functional gastrointestinal disorders, the nature of which is often poorly understood. Some of these entities are the subject of this workshop.

Over four million infants and children die of diarrhea worldwide each year. In industrialized countries, diarrhea is a major reason for hospital admission (30%) and remains an important cause of infant morbidity and mortality. Diarrhea is by far the most frequent clinical manifestation of a long list of diseases affecting the gastrointestinal tract. The various etiologies range from bacterial, viral, and parasitic agents such as shigellae and enteropathogenic E. coli, adenoviruses, rotaviruses, and amoebae, to endocrinopathies (congenital adrenal hyperplasia, hyperthyroidism) and dietary causes (food intolerance, transport defects, protein malnutrition, or overfeeding). Diarrhea is also an important symptom of celiac disease and inflammatory bowel disease. In the above conditions, immune mechanisms are often present in the background.

As our knowledge of cellular biology widens, we become increasingly aware that, in addition to its central function as a digestive organ, the gut plays a key role in the development and maintenance of the host’s immune homeostasis. Indeed the intestine is confronted, soon after birth, with a vast array of foreign antigens and microorganisms, armed with only a single epithelial cell layer at the interface between the body and the environment. The intestinal mucosa is thus burdened with the responsibility of generating a physical barrier as well as protective immune response against potential pathogens. The essential role of the gut in protecting the body is well demonstrated in conditions in which the immune function is altered, as seen in congenital or acquired immunodeficiency disorders.

Epidemiological studies clearly indicate that the incidence of ulcerative colitis and Crohn’s disease—collectively termed chronic inflammatory bowel disease—has steadily increased to an incidence of 10–20 cases/100,000/year in Canada. Celiac disease, with a prevalence varying from 1/300 to 1/2000 in different countries, is yet another important clinical condition in which the immune system mediates tissue damage. Indeed, excessive production of proinflammatory cytokines (IL-1, IL-6, TNFα) has been documented in young patients with these diseases. These conditions are commonly associated with failure to thrive, resulting from inadequate energy intake because of malabsorption and anorexia.

Although earlier recognition of the diseases results in reduced morbidity, their diagnosis is often delayed or missed owing to the lack of sensitive and specific diagnostic tools. However, recent advances in serology are producing assays that
may be of significant value for the diagnosis of both Crohn's disease and ulcerative colitis. Nevertheless, these conditions remain a diagnostic challenge for the physician as many cases pass unnoticed because of the subtlety of their presentation. All the diseases briefly mentioned above are associated with alterations in gastrointestinal cell proliferation, differentiation, and/or apoptotic processes. A better understanding of the cell biology of the enterocyte will thus improve our ability to diagnose and treat these patients.

In this Workshop, renowned investigators in their respective fields highlight recent advances in various gastrointestinal conditions and discuss in detail the different animal and cell models currently employed to resolve some of the enigmas with which we are confronted. Among the clinical topics addressed are the management of intractable diarrhea, esophageal dysfunction, gut motility disorders, and inflammatory bowel disease. To further our understanding of the pathophysiology of these conditions, recent data and concepts are presented on the mechanisms involved in the assembly of brush border membranes, the role of extracellular matrix proteins in intercellular interactions and the differentiation of enterocytes, the structure-function relation of intestinal disaccharidases, and the early development and the role of the gastric epithelium.

This volume reflects the state-of-the-art in the field of gastroenterology, presented by a panel of internationally renowned clinical and biomedical investigators. It will be a reference work for the upcoming generation of researchers.

Professor Edgard E. Delvin, Montreal, Canada  
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Foreword

As a primary organ in direct contact with the environment, the gastrointestinal tract plays a major role in the nutrition and health of infants and children.

A previous Nestlé Nutrition Workshop covered some aspects of gastrointestinal tract function. However, during the past decade considerable knowledge has been compiled and this volume updates the recent progress made in this field. The program of this workshop, proposed by Professor Edgard Delvin and Professor Michael Lentze, covers the most relevant developmental aspects of the structure and functions of the gastrointestinal tract.

One of the most striking features of the gastrointestinal epithelium is the rapid, continuous cellular differentiation and renewal occurring in this organ. Although structural studies permit a better understanding of cellular activity, molecular biology now opens new perspectives on how the organization and function of the intestinal epithelium may be controlled.

As presented and discussed in this volume, some basic understanding of control mechanisms is now available, at least in the normal intestine. The complexity of the relation between structure and function becomes evident in diseases such as celiac disease and chronic inflammatory bowel disorders. However, despite considerable research, the development of these diseases remains enigmatic.

We thank the chairmen and speakers for their invaluable contribution to the program, as well as all the participants for their discussions. Nestlé Canada hosted the 46th Nestlé Nutrition Workshop and we thank them for the excellent organization and warm hospitality.

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