Chapter 1
Introduction: the Science and the Art of Inflammatory Bowel Disease

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This book is about the science and the art and the science of the art of gastroenterology as it pertains to inflammatory bowel disease. Once described as disabling and under-researched diseases, the inflammatory bowel diseases now attract intense interest from clinical and basic investigators, but remain an important cause of suffering and a major burden on healthcare resources.

Why another textbook, in this era of rapid information access? The answer is simple – there is a continuing need for informed opinion and perspective on the deluge of data generated in recent years spanning a diversity of aspects of inflammatory bowel disease. Many wish for a single repository of information from authoritative sources. With this in mind, the authors for this textbook were selected because they are expert and currently active contributors to their respective areas of the field. Each was charged with delivering a crisp, timely and opinionated account of their area with a futuristic perspective.

A recurring theme within modern biology in general and inflammatory bowel disease, in particular, is the need to think across traditional boundaries of intellectual pursuit and to be aware of research at the interface of disparate disciplines. The convergence of different research avenues in inflammatory bowel disease is represented by the host-microbe interface; other pertinent examples have been variably expressed as the brain-gut axis, immunopertussis dialogue and neuroimmunology. Each is embraced in this textbook in various chapters dealing with disease mechanisms.

One of the great lessons of the recent past in gastroenterology was the failure of traditional epidemiologic and biologic approaches to identify a transmissible agent as the cause of peptic ulcer disease. A more important lesson was that the solution to some complex diseases may never be found by research focused exclusively on the host, without due regard for host-environment interactions, particularly host-microbe interactions. In the future, investigators involved in epidemiologic, genetic or other areas of research in inflammatory bowel disease will have to approach their challenge with some form of rapprochement with disease mechanisms. It is noteworthy, for example, that the genetic risk factors for inflammatory bowel disease are responsible for sensing and interpreting the microenvironment (e.g. NOD2/CARD15) or are involved in the regulation of the host immune response to that microenvironment (e.g. autophagy, IL23R). The complexity and clinical implications of these interactions are discussed by several authors in this volume.

Advances in technology have greatly facilitated research in inflammatory bowel disease. These include automated approaches to gene sequencing and genotyping large numbers of study subjects and molecular strategies for studying the intestinal microbiota, most of which is still unculturable and, therefore, neglected or considered until recently to be obscure. The human organism is now viewed as a composite of the human genome and its commensal microbial genome (microbiome), both of which interact with environmental and lifestyle modifying factors. As the human microbiome project and other similar metagenomic collaborations around the world deliver new information on the diversity and individual variations in the intestinal microbiota, it is anticipated that some of the heterogeneity of inflammatory bowel disease may be resolved. Thus, genetic risk factors will have to be reconciled with variations in microbial composition and with patterns of immunologic responsiveness to the microbiota. The challenge for epidemiologists and biologists will be to relate the aspects of a modern lifestyle with changes in the microbiota and thence with immunologic behavior and susceptibility to disease. Thus, the elucidation of the “IBD genome” provides the foundation for micro- and macro-environmental epidemiologic investigation. The contributing authors to this text have provided the background to this futuristic scenario.
Has the relentless march of the biotech and genotech era of research delivered for the patient? Unquestionably patients are better off today than they were only a generation ago. A more coherent understanding of fundamental disease mechanisms is being translated into improved patient management with a progressive shift toward evidence-based approaches and away from therapeutic empiricism. This is reflected throughout those chapters of this book dedicated to patient care.

Although not quite at the stage of personalized health-care, the splitters are in the ascendancy over the lumpers in today’s approach to the patient with inflammatory bowel disease. Refinement of clinical phenotypes by fusing genetic variation and the functional consequences thereof will lead to the reclassification of standard clinical phenotypes into physiologically determined subgroups and ultimately to individualized therapeutic targeting. These critical steps will continue to inform the interpretation of data on the genotype. This represents just one of many opportunities for clinicians and basic scientists to engage in a mutually beneficial manner in translating bench-to-bedside research to improved management of inflammatory bowel disease.

But some things never change. Clinical care of chronic disease will always require attention to detail, compassion and a commitment to long-term follow-up. In the face of the extraordinary advances in therapeutics, which continue apace, there is substantial patient dissatisfaction with modern medicine, either because of increasing expectations or reduced tolerance of illness. Most patients place greatest emphasis on the doctor–patient relationship. In this relationship, the attitude and level of interest of the former will always be a major determinant of the outcome of the latter.

Textbooks like this cannot confer attitude, energy or enthusiasm on the reader, but they can sensitize and equip the reader with the necessary background information, opinion and perspective. Therein lies the essence of what is intended with this book – to provide stimulus and steerage for the interested clinician, scientist and clinician-scientist in what is already an intriguing and rewarding field of endeavor.