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## Preface

In 1982, two volumes of the *Handbook of Experimental Pharmacology* edited by Professor Giulio Bertaccini, M.D., addressing Mediators and Drugs in Gastrointestinal Motility I and II were published. In 1993, David R. Brown, Ph.D., edited a volume in the *Handbook of Experimental Pharmacology* on Gastrointestinal Regulatory Peptides. Over 20 years later this latest volume of the *Handbook of Experimental Pharmacology* aims to connect current ideas and concepts about gastrointestinal (GI) disorders with the search for novel therapeutics. Towards this goal, the following chapters will provide a timely state-of-the-art overview of the GI tract in health and disease, current treatment approaches and ongoing developments in drug discovery, and their potential for the better treatment of patients with GI disorders. GI disorders rank among the most prevalent disorders, with the most common including esophageal and swallowing disorders, gastric and peptic ulcer disease, gastroparesis or delayed gastric emptying, irritable bowel syndrome (IBS), and inflammatory bowel disease (IBD). Some of these disorders are organic involving pathological damage to the GI tract as seen in IBD when the bowel becomes inflamed and damaged, leading to abdominal pain, diarrhea, and rectal bleeding. Other GI disorders such as IBS are termed “functional” disorders because they lack a structural or biochemically defined cause. Recent estimates suggest that one in four people suffer from a functional bowel disorder and they represent 40% of GI problems seen by physicians. The major symptoms of common GI disorders include recurrent abdominal pain and bloating, heartburn, indigestion/dyspepsia, nausea and vomiting, diarrhea, and constipation. Despite GI disorders placing a growing burden on today’s healthcare system, many GI disorders are difficult to diagnose and the symptoms are not effectively managed. In addition, many patients with GI disorders do not benefit from the currently available therapeutics. Novel effective therapeutics are thus urgently needed. Currently, there are a limited number of medications available or approved to treat GI disorders due, in part, to a lack of knowledge of the exact mechanisms underlying GI motility, absorption, secretion, inflammation, and sensation. Although significant gaps in the understanding of GI disorders still exist, new therapies are likely to emerge from current research and development. The immune system in the gut is currently offering a wide variety of therapeutic targets to treat IBD, whereas concepts that have emerged to treat GI dysmotility, abdominal pain and IBS, include the

brain-gut axis linking the nervous system in the GI tract to the CNS. The gut microbiome is currently an area of active research. Moreover, our understanding of the gut microbiota remains in its infancy; however major advances linking the intestinal microbiome to the brain-gut axis are likely over the upcoming years and will offer new therapeutic targets for the development of novel drugs to treat GI disorders.

I am immensely grateful to James Barrett for inviting me to serve as the Editor of this volume on Gastrointestinal Pharmacology in the *Handbook of Experimental Pharmacology* book series. I would like to thank the editorial staff from Springer for all their support. Most importantly, the success of this volume on Gastrointestinal Pharmacology is due to each of my colleagues who generously contributed their expertise and time to preparing such outstanding chapters for this volume of the *Handbook of Experimental Pharmacology*. I am indebted to this team of highly distinguished leaders in the GI field. We hope that this volume of the handbook will serve as an essential reference to investigators and scholars involved in basic and clinical GI research as well as individuals treating patients with GI disorders.

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