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# Preface

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In Shakespeare's *The Twelfth Night*, the story is told of a young woman who became severely depressed because she was in love with somebody and could not tell anyone about it, not even the beloved himself. She is described as suffering from a "green and yellow melancholy," a green sickness resulting from the teenager having fallen in love. It is a fact that iron deficiency commonly occurs after a few menstrual periods and imparts a green color to the complexion, while the yellow is no doubt due to jaundice and liver disease that will often cause a person to become depressed.

Iron deficiency is ever-present among all populations throughout the world, irrespective of race, culture, or ethnic background. Even with the latest advances in medicine, improved nutrition, and the ready availability of cheap oral iron, there is still no satisfactory explanation for the widespread occurrence of iron deficiency or for the absence of effective treatment. Several thousand years ago, human societies changed with the advent of the agrarian revolution, when humans turned to agriculture and to eat more fruits and vegetables than meat. The diet became iron-deficient and new epidemic infections emerged due to the stressors of crowding and lifestyle changes. This change of diet increased the frequency of iron deficiency. Some historians go so far as to claim that nutritional deficiency and iron deficiency, in particular, were the major factors responsible for the disappearance of the Maya culture.

The old notion that iron deficiency effects are mediated by the hemoglobin system and its corresponding decrease in oxygen supply to the tissues has been replaced by the findings that, in addition to the impact on the oxygen system, iron plays a major role in brain neurochemistry (e.g., neurotransmitters) and brain structure (e.g., myelin). Recent studies indicate that overload of iron might be linked to severe CNS age-related disorders, not least because iron is a substrate for free radicals. The story is unfolding, and clearly multidisciplinary approaches are needed to study the integrated effects of iron and brain and behavior and health disorders.

*Iron Deficiency and Overload: From Biology to Clinical Medicine* represents our attempt to present a sampling of the major issues in iron research, from the most basic research level to human applications. We have assembled chapters whose topics reflect the excitement in current theoretical development and laboratory activity in this area. The distinguished authors who contributed to this volume address their presentations to professionals and graduate students from diverse areas, disciplines, who need to be better informed about the concepts, methodologies, and current status of the field. Such information is all too often to be found only in the specialized scientific literature of some neighboring discipline and not likely to be routinely consulted by all. We leave the reader to forge the individual integration of the information provided in this volume.

We are most appreciative of the support provided by Humana Press in bringing this book to publication. We are especially grateful to Paul Dolgert, Editorial Director, and to Dr. Adrienne Bendich, Series Editor, for their constant guidance and help. We hope that this book will encourage more scientists and researchers to focus on issues in the topic of iron deficiency and iron overload, in order to gain a better understanding of the problems and to devise better methods to overcome those problems.

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<http://www.springer.com/978-1-934115-22-0>

Iron Deficiency and Overload

From Basic Biology to Clinical Medicine

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2010, XVI, 376 p. 54 illus., 7 illus. in color., Hardcover

ISBN: 978-1-934115-22-0

A product of Humana Press