Preface

Tis evident that all reasonings concerning matter of fact are founded on the relation of cause and effect, and that we can never infer the existence of one object from another, unless they be connected together, either mediately or immediately. In order therefore to understand these reasonings, we must be perfectly acquainted with the idea of a cause; and in order to that, must look about us to find something that is the cause of another.

David Hume (1711–1776)
from "An Abstract of a Treatise of Human Nature."

Hume pioneered the idea that getting intimately acquainted with one matter (e.g. a plant hormone) will not provide adequate information on this matter. To acquire such information, we should examine causality. In our case: What roles the plant hormones have in patterning and what are the impacts of interactions between plant hormones (phytohormones) on the shaping of plant organs?

I should apologize because the analogy of Hume's matter and plant hormones is far-fetched. Hume was interested in the nature of matter. He provided an example of a baby who has a ball. When he throws an elastic ball to the floor, it bounces. But if he throws a soft-cloth ball to the floor, it rests on the floor without bouncing. By that, the matter of the ball is characterized. In the present book we are less interested in the nature of the matter (phytohormones) and more in the impact of the matter on a phenomenon (plant patterning). We go

further and are interested in the roles of interactions between plant hormones and the shaping of plant organs.

The role of phytohormones in the shaping of plant organs was mentioned in my previous book (Galun, 2007). During recent years, this subject was intensively studied and the understanding of the biosynthesis, signal transduction, and interactions of phytohormones improved considerably. Therefore, a comprehensive treatment of this subject is timely.

This book, like my previous books (Galun and Breiman, 1997; Galun and Galun, 2001; Galun, 2003, 2005, 2007), is aimed at a wide range of readers. A basic knowledge of botany, biochemistry and genetics should be helpful for the readers of the book, although I attempted to explain relevant concepts and processes to the novice. An example of such an explanation concerns *ubiquitination*, a process that takes place in (probably) all eukaryotic organisms and causes the degradation of specific target proteins. Because several phytohormones are involved in the ubiquitin-proteasome system, a section in the "Introduction" is devoted to this process.

Scholars engaged in the study of plant patterning commonly focus on one or very few plant organs. The book covers most of the plant organs and should provide these scholars with a broad view on the role of phytohormones in plant patterning.

I wrote this book in a form that will enable its use also as a companion textbook for students in advanced plant biology courses, especially courses that deal with plant hormones and patterning of plants. This text will thus supplement books that deal mainly with housekeeping biochemistry and molecular biology of plants (e.g. Buchanan *et al.*, 2000).

I am grateful to my wife, Professor Margalith Galun, who read parts of the draft of this book and provided constructive remarks. The moral support of other members of my family is very much appreciated. I also thank the staff members of my Department of Plant Sciences at the Weizmann Institute of Science in Rehovot: Professor Dan Atsmon, Professor Moshe Feldman, Professor Robert Fluhr, who discussed with me several issues of this book during my writing. I am

especially grateful to Professor Yuval Eshed, an expert on the molecular aspects of plant differentiation, who provided me with ample advice. Professor Rudolf Hagemann of the Institute of Genetics of the Martin-Luther University in Halle/Saale is hereby acknowledged for detailing to me the contributions of various German scholars in choosing Arabidopsis (previously named *Stenophragma thalianum*) as a model plant for genetics investigators.

I very much appreciate the efforts of my publisher, World Scientific Publishing Co. and especially of Ms. Sook-Cheng Lim, scientific editor at WSPC, for editing and production of this book. I acknowledge the professional and good work of the Graphic Arts Department of the Weizmann Institute of Science for handling the figures. I further acknowledge the permission to use figures and tables that were granted by the respective publishers and authors. I provided the sources of these figures and tables below each figure and table, and the full citations are listed in the reference list. These citations should mean that I am grateful for the consent of the publishers to use their copyrighted material in this book. A "corpus acknowledgement" to the respective publishers is provided at the end of the book. Thanks are due to Mrs. Suzanne Trauffer Ramakrishna for her professional typing.

As in most of my previous books, Dr. Nillie Weinstein was a source of inspiration, especially for non-scientific aspects of this book, that were particularly relevant for writing the Preface, Introduction, and Epilogue.

Esra Galun
Rehovot, Israel
7th April 2010