

## Preface

This manual resulted from the need for plant tissue culture laboratory exercises that demonstrate major concepts and that use plant material that is available year round. The strategy in developing this manual was to devise exercises that do not require maintenance of an extensive collection of plant materials, yet give the student the opportunity to work on a wide array of plant materials.

The students who have used these exercises range from high school (science fair and 4-H projects) to undergraduate, graduate and post-doctoral levels. The manual is predominantly directed at students who are in upper-level college or university classes and who have taken courses in chemistry, plant anatomy, and plant physiology.

Before starting the exercises, students should examine Chapters 2 through 5, which deal with the setup of a tissue culture laboratory, media preparation, explants, aseptic technique, and contamination. The information in these chapters will be needed in the exercises that follow.

The brief introduction to each chapter is not intended to be a review of the chapter's topic but rather to complement lecture discussions of the topic. In this revised edition, Dr. Trevor Thorpe has contributed a chapter on the history of plant cell culture. Dr. Brent McCown contributed a chapter on woody trees and shrubs. Dr. Sunghun Park, Jungeun Kim Park, and James E. Craven have contributed a chapter on protoplast isolation and fusion. Jungeun Kim Park, Dr. Sunghun Park, and Qingyu Wu contributed a chapter on *Agrobacterium*-mediated transformation of plants.

In many instances, plant material initiated in one exercise is used in subsequent exercises. Refer to Scheduling and Interrelationships of Exercises to obtain information on the time required to complete the exercises and how they relate to one another.

All of the exercises have been successfully accomplished for at least 15 semesters. Tissue culture, however, is still sometimes more art than science, and variation in individual exercises can be expected.

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