

Series Editor: *John M. Walker*

PLANT CELL ELECTROPORATION AND ELECTROFUSION PROTOCOLS

Edited by *Jac A. Nickoloff*, *Harvard University, Boston, MA*

In *Plant Cell Electroporation and Electrofusion Protocols*, leading experts and innovators describe in detail plant cell electroporation and electrofusion techniques for many types of plants. Their protocols cover a diverse set of plant cell types, including different cell types from a single organism (i.e., leaf cells and pollen) and the most important model plants, including maize and tobacco. Each protocol also contains detailed instructions for growth and growth optimization, protoplast generation, and protoplast regeneration for specific plant cell types, along with extensive troubleshooting advice and descriptions of expected results to simplify study design.

Plant Cell Electroporation and Electrofusion Protocols offers a unique reference guide to the electroporation and electrofusion methods now used widely in many areas of plant research, including molecular genetics, transgenic plant studies, plant cell fusion studies, and crop development. It is the only electroporation book devoted entirely to plants. Two companion volumes are also available: *Animal Cell Electroporation and Electrofusion Protocols* and *Electroporation Protocols for Microorganisms*.

FEATURES

- Covers a wide variety of plant species and cell types
- Extensive references to primary literature
- Facilitates development of new protocols or modification of existing ones
- Full discussion of theory, practice, and instrumentation

CONTENTS

PART I. THEORY AND INSTRUMENTATION. ELECTROPORATION THEORY: CONCEPTS AND MECHANISMS. Effects of Pulse Length and Strength on Electroporation Efficiency. Instrumentation. PART II. ELECTROPORATION PROTOCOLS. Electroporation of *Agrobacterium tumefaciens*. Electroporation of DNA into the Unicellular Green Alga *Chlamydomonas reinhardtii*. Pollen Electrotransformation in Tobacco. Electroporation of Tobacco Leaf Protoplasts Using Plasmid DNA or Total Genomic DNA. Electroporation of *Brassica*. Transformation of Maize

by Electroporation of Embryos. Transient Gene Expression Analysis in Electroporated Maize Protoplasts. Reporter Genes and Transient Assays for Plants. PART III. ELECTROFUSION PROTOCOLS. Electrofusion of Plant Protoplasts: Selection and Screening for Somatic Hybrids of *Nicotiana*. Protoplast Electrofusion and Regeneration in Potato. Polymer-Supported Electrofusion of Protoplasts: A Novel Method and a Synergistic Effect. Index.