
Preface

Legumes, with their nitrogen-fixing capacity, are the third largest family of flowering plants and are critical for agricultural and ecological sustainability. They are important for food, feed, human nutrition, bioenergy, and industrial purposes.

Genomics can now be readily applied to legumes with the increasing sequence information and analysis tools available. Model legumes such as *Medicago* and *Lotus*, as well as soybean and pea, have provided much of this information, which is now being applied to the legume family more broadly. This book provides a consideration of a range of methods and protocols, including available resources, used to discover new genes and to understand genes and their interactions.

The book is targeted to plant molecular biologists, molecular breeders, plant physiologists and biochemists, developmental biologists, and those interested in plant–microbe interactions. The chapters are suitable for those already in the field, those plant scientists entering the field, and graduate students. Legume genomics offers a potentially productive field for new investigators.

The first chapter provides an overview of legume genomes followed by chapters on techniques used in genome characterization and analysis. Chapters then follow on transcriptome analysis and miRNA identification and analysis. Also considered are a range of resources available for forward and reverse genetics in *Medicago*, *Lotus*, and pea. These approaches have an increasing role in identifying gene function. Molecular markers developed through genomics are also considered. A number of chapters deal with a range of transformation strategies used to investigate gene function using transformed roots, stable plant transformation, and transient expression, and there is a guide to investigating subcellular localization using fluorescent fusion proteins. There are chapters on proteomics, phosphoproteomics, and metabolomics where, increasingly, mass spectrometry developments provide new approaches for investigating the products of genes—the proteins and the metabolism they regulate and support.

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Legume Genomics

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