

Preface

Metabolomics is a rapidly-emerging sector of post-genome research. The metabolome (a set of all metabolites of an organism) represents not only the ultimate phenotype of cells by the perturbation of gene expression and the modulation of protein functions caused by the environment or mutations, but the metabolome can also feed back on gene expression and protein function. Therefore, metabolomics plays a key role for understanding cellular systems. Metabolomics is applied to a variety of biological fields from medical science to agriculture. Nevertheless, metabolomics research is particularly important in the plant field because plants collectively produce a huge variety of chemical compounds, far more than animals and even microorganisms. The number of all metabolites in the plant kingdom is estimated at 200,000 or more. In addition, most of the human-beneficial properties of plants, be they foods, medicinal resources, or industrial raw materials, are ascribed to plant metabolites.

This book aims to review the current status of plant metabolomics research. Since metabolomics itself is a new field, no such comprehensive book has yet been published. The chapters are divided into three sections: analytical technology, bioinformatics, and applications. These represent three major elements of metabolomics research. Each chapter provides cutting-edge information contributed by leading researchers from throughout the world.

We hope that this book will be a landmark for plant metabolomics research into the future and will give beneficial guidance to graduate students and researchers in academia, industry, and technology transfer organizations. Since metabolomics is still a growing discipline, further technology development in chemical analysis and bioinformatics will be required. We look forward to breakthrough technology innovations in metabolomics, and yet unforeseen findings and applications in plant science.

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