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Nota di contenuto	Control of Primary Metabolism in Plants; Contents; Contributors; Preface; 1 Evaluation of the transcriptome and genome to inform the study of metabolic control in plants; 1.1 Introduction; 1.2 Transcript profiling technologies; 1.3 Transcript profiling workflow; 1.3.1 Data generation; 1.3.2 Data management; 1.3.3 Data processing; 1.3.3.1 Raw data handling; 1.3.3.2 Normalisation; 1.3.4 Data analysis; 1.3.4.1 Differential expression; 1.3.4.2 Data mining; 1.3.4.3 Functional categorisation; 1.3.5 Data visualisation; 1.4 What can we learn from transcript profiles performed in a starchless mutant? 1.5 Conclusion/perspectivesAcknowledgements; References; 2 The use of proteomics in the study of metabolic control; 2.1 Introduction; 2.2 Proteomic methodologies; 2.2.1 Extraction of proteins from plant tissue; 2.2.2 Separation, display and quantification of proteins; 2.2.3 Identification of proteins by mass spectrometry; 2.2.4 Gel-free

proteomic approaches; 2.3 Cataloging protein localization; 2.3.1 Localizing proteins to different tissues; 2.3.2 Establishing subcellular protein localization: methodologies; 2.3.3 Mitochondrial and chloroplast proteomes; 2.3.4 Other subcellular proteomes 2.3.5 A stamp of authenticity for the subcellular protein postcode? 2.4 Quantitative analyses of the proteome; 2.4.1 Examples of quantitative proteomics; 2.4.2 The use of high-throughput measurements of enzyme activity as a proxy for quantitative proteomics; 2.5 The use of proteomics to investigate post-translational modification of proteins; 2.5.1 Systematic identification of phosphorylated proteins; 2.5.2 Systematic identification of protein redox modifications; 2.6 The use of proteomics to investigate protein-protein interactions; 2.7 Future perspectives; References

3 Study of metabolic control in plants by metabolomics 3.1 Introduction; 3.1.1 What is metabolomics?; 3.1.2 Systemic properties in metabolic networks; 3.2 Metabolomic methods; 3.2.1 Historic perspective of plant metabolite analysis; 3.2.2 Modern instrumentation in metabolite analysis; 3.2.3 Sample preparation for metabolomics; 3.2.4 Metabolome coverage; 3.2.4.1 The quest for combining sensitivity and selectivity; 3.2.4.2 Cellular and subcellular metabolomics; 3.2.4.3 Compound identification; 3.2.5 Quality control; 3.3 Metabolomic databases

3.4 Pathways, clusters and networks: applications of plant metabolomics 3.4.1 Bioengineering of metabolism; 3.4.2 Plant biochemistry; 3.4.2.1 Pathway analysis; 3.4.2.2 Flux measurements; 3.4.3 Physiological studies; 3.4.4 Plant metabolomic methods; 3.4.5 Food science; 3.5 Outlook; References; 4 Metabolite transporters in the control of plant primary metabolism; 4.1 Introduction; 4.2 Photoassimilation and assimilate transport in source cells; 4.2.1 Carbon assimilation by the reductive pentose-phosphate pathway (Calvin cycle); 4.2.2 The plastidic triose-phosphate pool - a metabolic crossway

4.2.2.1 Communication between the starch and sucrose biosynthetic pathways via TPT

## Sommario/riassunto

The ability to control the rates of metabolic processes in response to changes in the internal or external environment is an indispensable attribute of living cells that must have arisen with life's origin. This adaptability is necessary for conserving the stability of the intracellular environment which is, in turn, essential for maintaining an efficient functional state. The advent of genomics, proteomics, and metabolomics has revolutionised the study of plant development and is now having a significant impact on the study of plant metabolism and its control. In the last few years, significa