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3 Strategies for the investigation of protein-protein interactions in plants; 3.1 Summary; 3.2 Introduction; 3.3 Biochemical procedures to characterize protein-protein interactions; 3.3.1 Chromatographic purifications; 3.3.2 Sucrose gradient ultrafiltration; 3.3.3 Native gel electrophoresis; 3.3.4 Immunoprecipitations; 3.4 Genetic procedures to characterize protein-protein interactions; 3.4.1 Yeast two-hybrid system; 3.4.2 Yeast three-hybrid system; 3.4.3 Yeast one-hybrid system  
3.4.4 Limitations of yeast two-hybrid systems  
3.4.5 Split-ubiquitin system; 3.4.6 Bimolecular fluorescence complementation (BiFC); 3.4.7 Forster resonance energy transfer (FRET); 3.4.8 Tagging technologies for the purification of protein complexes; 3.5 Cytological procedures to characterize protein-protein interactions; 3.6 Outlook; 4 Proteomics of disulphide and cysteine oxidoreduction; 4.1 Introduction; 4.2 Control of cellular redox status; 4.2.1 Sequence and structural features of proteins catalysing cysteine redox modifications; 4.2.2 Catalytic mechanisms of Trxs and Grxs  
4.3 Proteomics techniques for analysis of cysteine modifications  
4.3.1 Reagents for cysteine labelling; 4.3.2 Disulphide mapping; 4.3.3 S-glutathionylation; 4.3.4 Cysteine SOH, SO<sub>2</sub>H and SO<sub>3</sub>H; 4.3.5 Trxs and disulphide reduction; 4.3.6 S-nitrosylation; 4.4 Conclusions and perspectives; 5 Structural proteomics; 5.1 Introduction; 5.2 Project data handling: Sesame; 5.3 ORF cloning; 5.4 E. coli cell-based protein production pipeline; 5.4.1 Large-scale protein production and labeling; 5.4.2 Protein purification; 5.5 Wheat germ cell-free protein production  
5.6 Mass spectrometry of purified proteins for quality assurance and analysis

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#### Sommario/riassunto

The proteome comprises all protein species resulting from gene expression in a cell, organelle, tissue or organism. By definition, proteomics aims to identify and characterise the expression pattern, cellular location, activity, regulation, post-translational modifications, molecular interactions, three dimensional structures and functions of each protein in a biological system. In plant science, the number of proteome studies is rapidly expanding after the completion of the *Arabidopsis thaliana* genome sequence, and proteome analyses of other important or emerging model systems and crop

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