

New and Emerging Proteomic Techniques

Edited by

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Numerous emerging technologies have propelled the growth of proteomics into a wide-ranging discipline with great potential to improve human health through the discovery of new protein biomarkers and therapeutics. In *New and Emerging Proteomic Techniques*, a panel of leading researchers and innovators describe in step-by-step detail the latest techniques that promise to significantly impact the practice of proteomics, as well as its success in developing novel clinical agents. The methods described here span the entire spectrum of top-down and bottom-up approaches, including microarrays, gels, chromatography, and affinity separations, and address every aspect of the human proteome, both quantitatively and qualitatively. The techniques of protein detection utilized are diverse and range from fluorescence and resonance light scattering to surface plasmon resonance and mass spectrometry. Where necessary, two or more distinct techniques are provided for a given problem, and advanced bioinformatics approaches are presented for the analysis of complex proteomic data. The protocols follow the successful *Methods in Molecular Biology*™ series format, each offering step-by-step laboratory instructions, an introduction outlining the principles behind the technique, lists of the necessary equipment and reagents, and tips on troubleshooting and avoiding known pitfalls.

Comprehensive and easy to use, *New and Emerging Proteomic Techniques* offers expert and novice investigators alike today's most promising proteomics techniques for probing the biological processes and understanding the diseases of the human body.

FEATURES

- Diverse collection of the most promising new and emerging proteomics techniques
- Advanced bioinformatics approaches for the analysis of complex proteomic data
- Protein detection with fluorescence, resonance light scattering, and plasmon resonance
- Multiple methods for solving specific problems
- Step-by-step instructions to ensure rapid implementation and successful results
- Tricks of the trade and notes on troubleshooting and avoiding known pitfalls

CONTENTS

On-Chip Protein Synthesis for Making Microarrays. RCA-Enhanced Protein Detection Arrays. Antibody Microarrays Using Resonance Light-Scattering Particles for Detection. Chemical Proteomics Profiling of Proteasome Activity. Two-Dimensional Difference Gel Electrophoresis. Oligomeric States of Proteins Determined by Size-Exclusion Chromatography Coupled With Light Scattering, Absorbance, and Refractive Index Detectors. Surface Plasmon Resonance Imaging Measurements of Protein Interactions With Biopolymer Microarrays. Surface Plasmon

Resonance Mass Spectrometry for Protein Analysis. High-Throughput Affinity Mass Spectrometry. Isotope-Coded Affinity Tags for Protein Quantification. Proteomic Analysis by Multidimensional Protein Identification Technology. Isolation of Glycoproteins and Identification of Their N-Linked Glycosylation Sites. N-Glycosylation Analysis Using the StrOligo Algorithm. MALDI-MS Data Analysis for Disease Biomarker Discovery. Using the Global Proteome Machine for Protein Identification. Index.

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