

---

# Contents

<i>Preface</i> . . . . .	<i>v</i>
<i>Contributors</i> . . . . .	<i>xi</i>

## OVERVIEW CHAPTERS

1 Two-Dimensional Electrophoresis: An Overview . . . . .	3
<i>Richard Smith</i>	
2 Solubilization of Proteins in 2DE: An Outline . . . . .	19
<i>Thierry Rabilloud</i>	
3 Selection of pH Ranges in 2DE . . . . .	31
<i>Mireille Starita-Geribaldi</i>	
4 Difficult Proteins . . . . .	47
<i>Ben Herbert and Elizabeth Harry</i>	
5 Organelle Proteomics . . . . .	65
<i>Matthias Plösch, Bernhard Granvogl, Veronika Reisinger, Axel Masanek, and Lutz Andreas Eichacker</i>	
6 Applications of Chemical Tagging Approaches in Combination with 2DE and Mass Spectrometry . . . . .	83
<i>Alexander Leitner and Wolfgang Lindner</i>	
7 Immunoblotting 2DE Membranes . . . . .	103
<i>Brian McDonagh</i>	

## PROTOCOLS CHAPTERS

8 Troubleshooting Image Analysis in 2DE . . . . .	113
<i>Bettina Levänen and Åsa M. Wheelock</i>	
9 Analysis of Bacterial Proteins by 2DE . . . . .	131
<i>Philip Cash and Evelyn Argo</i>	
10 Proteomic Analysis of <i>Caenorhabditis elegans</i> . . . . .	145
<i>Pan-Young Jeong, Keun Na, Mi-Jeong Jeong, David Chitwood, Yhong-Hee Shim, and Young-Ki Paik</i>	
11 Protein Extraction for 2DE . . . . .	171
<i>Claus Zabel and Joachim Klose</i>	
12 Analysis of Proteins from Marine Molluscs . . . . .	197
<i>Suze Chora, Maria João Bebianno, and Michèle Roméo</i>	
13 Preparation and Analysis of Plastid Proteomes by 2DE . . . . .	205
<i>Anne von Zychlinski and Wilhelm Gruissem</i>	
14 High-Resolution 2DE . . . . .	221
<i>Katrin Marcus, Cornelia Joppich, Caroline May, Kathy Pfeiffer, Barbara Sitek, Helmut Meyer, and Kai Stuehler</i>	

15	Blue Native-Gel Electrophoresis Proteomics . . . . .	241
	<i>Kelly Andringa, Adrienne King, and Shannon Bailey</i>	
16	2DE for Proteome Analysis of Human Metaphase Chromosomes . . . . .	259
	<i>Kiichi Fukui and Susumu Uchiyama</i>	
17	Microsomal Proteomics . . . . .	273
	<i>Diana M. Wong and Khosrow Adeli</i>	
18	Prefractionation Using Microscale Solution IEF . . . . .	291
	<i>Won-A Joo and David Speicher</i>	
19	Diagonal Electrophoresis for Detection of Protein Disulphide Bridges . . . . .	305
	<i>Brian McDonagh</i>	
20	High-Resolution Large-Gel 2DE . . . . .	311
	<i>Claus Zabel and Joachim Klose</i>	
21	Silver Staining of Proteins in 2DE Gels . . . . .	339
	<i>Cécile Lelong, Mireille Chevallet, Sylvie Luche, and Thierry Rabilloud</i>	
22	Detection of 4-Hydroxy-2-Nonenal- and 3-Nitrotyrosine-Modified Proteins Using a Proteomics Approach . . . . .	351
	<i>Rukhsana Sultana, Tanea Reed, and D. Allan Butterfield</i>	
23	Proteomic Detection of Oxidized and Reduced Thiol Proteins in Cultured Cells . . . . .	363
	<i>Sarah L. Cuddihy, James W. Baty, Kristin K. Brown, Christine C. Winterbourn, and Mark B. Hampton</i>	
24	Detection of Ubiquitination in 2DE . . . . .	377
	<i>Brian McDonagh</i>	
25	Phosphoproteome Analysis by In-Gel Isoelectric Focusing and Tandem Mass Spectrometry . . . . .	383
	<i>Sarka Beranova-Giorgianni, Dominic M. Desiderio, and Francesco Giorgianni</i>	
26	Detection of Protein Glutathionylation . . . . .	397
	<i>Elisabetta Gianazza, Ivano Eberini, and Pietro Ghezzi</i>	
27	Activity-Based Protein Profiling of Protein Tyrosine Phosphatases . . . . .	417
	<i>Chad Walls, Bo Zhou, and Zhong-Yin Zhang</i>	
28	Active Protease Mapping in 2DE Gels . . . . .	431
	<i>Zhenjun Zhao and Pamela J. Russell</i>	
29	Two-Dimensional Difference Gel Electrophoresis . . . . .	439
	<i>Gert Van den Bergh</i>	
30	Protein Expression Profiling . . . . .	455
	<i>Brian P. Bradley, Bose Kalampanayil, and Michael C. O'Neill</i>	
31	C-Terminal Sequence Analysis of 2DE-Separated Proteins . . . . .	469
	<i>Bart Samyn, Kjell Sergeant, and Jozef Van Beeumen</i>	
32	Shotgun Protein Analysis by Liquid Chromatography-Tandem Mass Spectrometry . . . . .	483
	<i>Kazuishi Kubota, Toshiyuki Kosaka, and Kimihisa Ichikawa</i>	

33	<i>De Novo</i> Sequence Analysis of N-Terminal Sulfonated Peptides After in-Gel Guanidination . . . . .	495
	<i>Kjell Sergeant, Jozef Van Beeumen, and Bart Samyn</i>	
34	Tryptic Digestion of In-Gel Proteins for Mass Spectrometry Analysis . . . . .	507
	<i>Mai-Loan Huynh, Pamela Russell, and Bradley Walsh</i>	
35	Database Interrogation Algorithms for Identification of Proteins in Proteomic Separations. . . . .	515
	<i>Patricia M. Palagi, Frédérique Lisacek, and Ron D. Appel</i>	
36	Creating 2DE Databases for the World Wide Web . . . . .	533
	<i>Christine Hoogland, Khaled Mostaguir, and Ron D. Appel</i>	
	<i>Index</i> . . . . .	541

Two-Dimensional Electrophoresis Protocols

Sheehan, D.; Tyther, R. (Eds.)

2009, XIV, 546 p. 100 illus., 1 illus. in color., Hardcover

ISBN: 978-1-58829-937-6

A product of Humana Press