
Contents

| | |
|---|-----------|
| <i>Preface</i> | <i>v</i> |
| <i>Contributors</i> | <i>ix</i> |
| PART I EXPRESSION AND PURIFICATION OF MATRIX METALLOPROTEASES | |
| 1 Expression and Purification of Matrix Metalloproteinases in <i>Escherichia coli</i> | 3 |
| <i>Krishna K. Singh, Ruchi Jain, Harini Ramanan, and Deepak K. Saini</i> | |
| 2 Expression and Purification of a Matrix Metalloprotease Transmembrane Domain in <i>Escherichia coli</i> | 17 |
| <i>Charles A. Galea</i> | |
| 3 Heterologous Expression of the Astacin Protease Meprin β in <i>Pichia pastoris</i> | 35 |
| <i>Dagmar Schlenzig and Stephan Schilling</i> | |
| PART II STRUCTURAL CHARACTERIZATION OF MATRIX METALLOPROTEASES | |
| 4 Structural Studies of Matrix Metalloproteinase by X-Ray Diffraction | 49 |
| <i>Elena Decaneto, Wolfgang Lubitz, and Hideaki Ogata</i> | |
| 5 Mapping Lipid Bilayer Recognition Sites of Metalloproteinases and Other Prospective Peripheral Membrane Proteins | 61 |
| <i>Tara C. Marcink, Rama K. Koppiseti, Yan G. Fulcher, and Steven R. Van Doren</i> | |
| 6 Using Small Angle X-Ray Scattering (SAXS) to Characterize the Solution Conformation and Flexibility of Matrix Metalloproteinases (MMPs) | 87 |
| <i>Louise E. Butt, Robert A. Holland, Nikul S. Khunti, Debra L. Quinn, and Andrew R. Pickford</i> | |
| PART III COMPUTATIONAL SIMULATIONS OF MATRIX METALLOPROTEASES | |
| 7 Molecular Dynamics Studies of Matrix Metalloproteases | 111 |
| <i>Natalia Díaz and Dimas Suárez</i> | |
| PART IV DETERMINING MATRIX METALLOPROTEASE SUBSTRATE SPECIFICITY | |
| 8 Determining the Substrate Specificity of Matrix Metalloproteases using Fluorogenic Peptide Substrates | 137 |
| <i>Maciej J. Stawikowski, Anna M. Knapinska, and Gregg B. Fields</i> | |
| 9 Time-Resolved Analysis of Matrix Metalloproteinase Substrates in Complex Samples | 185 |
| <i>Pascal Schlage, Fabian E. Egli, and Ulrich auf dem Keller</i> | |

| | | |
|--|--|-----|
| 10 | Identification of Protease Cleavage Sites by Charge-Based Enrichment of Protein N-Termini | 199 |
| | <i>Zon W. Lai and Oliver Schilling</i> | |
| 11 | Mapping the Substrate Recognition Landscapes of Metalloproteases Using Comprehensive Mutagenesis | 209 |
| | <i>Colin A. Kretz</i> | |
| PART V DETECTION OF MATRIX METALLOPROTEASES | | |
| 12 | Detection of Matrix Metalloproteinases by Zymography | 231 |
| | <i>Rajeev B. Tajhya, Rutvik S. Patel, and Christine Beeton</i> | |
| 13 | Imaging Matrix Metalloproteases in Spontaneous Colon Tumors: Validation by Correlation with Histopathology | 245 |
| | <i>Harvey Hensley, Harry S. Cooper, Wen-Chi L. Chang, and Margie L. Clapper</i> | |
| PART VI MATRIX METALLOPROTEASE INHIBITORS | | |
| 14 | Virtual High-Throughput Screening for Matrix Metalloproteinase Inhibitors | 259 |
| | <i>Jun Yong Choi and Rita Fuerst</i> | |
| 15 | Computational Approaches to Matrix Metalloprotease Drug Design | 273 |
| | <i>Tanya Singh, B. Jayaram, and Olayiwola Adedotun Adekoya</i> | |
| 16 | A Simple Adaptable Blood-Brain Barrier Cell Model for Screening Matrix Metalloproteinase Inhibitor Functionality | 287 |
| | <i>Jennifer S. Myers, Joan Hare, and Qing-Xiang Amy Sang</i> | |
| PART VII MATRIX METALLOPROTEASES AS BIOMARKERS | | |
| 17 | Matrix Metalloproteases as Biomarkers of Disease | 299 |
| | <i>Fernando Luiz Affonso Fonseca, Beatriz da Costa Aguiar Alves, Ligia Ajajime Azzalis, and Thaís Moura Gáscon Belardo</i> | |
| | <i>Index</i> | 313 |

Matrix Metalloproteases

Methods and Protocols

Galea, C.A. (Ed.)

2017, XI, 314 p. 56 illus., 34 illus. in color., Hardcover

ISBN: 978-1-4939-6861-9

A product of Humana Press