Alexzander A. A. Asea
Ian R. Brown
Editors

Heat Shock Proteins Volume 3

Series Editors: Alexzander A.A. Asea · Stuart K. Calderwood

Heat Shock Proteins and the Brain: Implications for Neurodegenerative Diseases and Neuroprotection

Springer

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HEAT SHOCK PROTEINS

Volume 3

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A. A. A. Asea
Effie and Wofford Cain Centennial Endowed Chair in Clinical Pathology,
Chief, Division of Investigative Pathology, Scott & White Memorial Hospital and Clinic
and The Texas A&M Health Science Center, College of Medicine

S. K. Calderwood
Division of Molecular and Cellular Radiation Oncology,
Beth Israel Deaconess Medical Center and Harvard Medical School

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Alexzander A. A. Asea

Effie and Wofford Cain Centennial Endowed Chair in Clinical Pathology,
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and The Texas A&M Health Science Center, College of Medicine,
Temple, TX, U.S.A.

and

Ian R. Brown

Director, Center for the Neurobiology of Stress, Department of Biological Sciences,
University of Toronto at Scarborough,
Toronto, ON, Canada

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Alexzander A. A. Asea
Scott & White Memorial Hospital and Clinic
and The Texas A&M Health Science Center, College of Medicine
Temple, Texas, U.S.A.

Ian R. Brown
Center for the Neurobiology of Stress
Department of Biological Sciences
University of Toronto at Scarborough
ON, Canada

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This book is dedicated to our children Colleen, Kitty and Heather (I.R.B.), Alexzander Jr., Vanessa and Edwina (A.A.A.)

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PREFACE

With the prevalence of neurodegenerative diseases on the rise as average life expectancy increases, the hunt for effective treatments and preventive measures for these disorders is a pressing challenge. Neurodegenerative disorders such as Alzheimer's disease, Huntington's disease, Parkinson's disease and amyotrophic lateral sclerosis have been termed 'protein misfolding disorders' that are characterized by the neural accumulation of protein aggregates. Manipulation of the cellular stress response involving the induction of heat shock proteins offers a therapeutic strategy to counter conformational changes in neural proteins that trigger pathogenic cascades resulting in neurodegenerative diseases. Heat shock proteins are protein repair agents that provide a line of defense against misfolded, aggregation-prone proteins.

Heat Shock Proteins and the Brain: Implications for Neurodegenerative Diseases and Neuroprotection reviews current progress on neural heat shock proteins (HSP) in relation to neurodegenerative diseases (Part I), neuroprotection (Part II), extracellular HSP (Part III) and aging and control of life span (Part IV). Key basic and clinical research laboratories from major universities and hospitals around the world contribute chapters that review present research activity and importantly project the field into the future. The book is a must read for researchers, postdoctoral fellows and graduate students in the fields of Neuroscience, Neurodegenerative Diseases, Molecular Medicine, Aging, Physiology, Pharmacology and Pathology.

Alexzander A. A. Asea and Ian R. Brown

LIST OF CONTRIBUTORS

Alexzander Asea
Division of Investigative Pathology, Scott and White Memorial Hospital and Clinic and The Texas A&M Health Science Center, College of Medicine, Temple, TX, USA

Ian R. Brown
Center for the Neurobiology of Stress, Department of Biological Sciences, University of Toronto at Scarborough, Toronto, ON, Canada

Stuart K. Calderwood
Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

Serena Carra
Department of Radiation and Stress Cell Biology, University Medical Center Groningen, Groningen, The Netherlands

Michael E. Cheetham
Division of Molecular and Cellular Neuroscience, Institute of Ophthalmology, University College London, London, UK

Ehud Cohen
Molecular and Cell Biology Laboratory, The Salk Institute for Biological Studies, La Jolla, CA, USA

R. William Currie
Department of Anatomy and Neurobiology, Faculty of Medicine, Dalhousie University, Halifax, NS, Canada

Cinzia Dello-Russo
Department of Pharmacology, Catholic University Medical School, Rome, Italy

Andrew Dillin
Molecular and Cell Biology Laboratory, The Salk Institute for Biological Studies, La Jolla, CA, USA

Martin L. Duennwald
Boston Biomedical Research Institute, Watertown, MA, USA

Heather D. Durham
Department of Neurology/Neurosurgery and Montreal Neurological Institute, McGill University, Montreal, QC, Canada

Douglas L. Feinstein
Department of Anesthesiology, University of Illinois, and Jesse Brown Veteran's Affairs Research Division, Chicago, IL, USA

Rona G. Giffard
Department of Anesthesia, Stanford University School of Medicine, Stanford, CA, USA

Linda Greensmith
Institute of Neurology, University College London, Queen Square, London, UK

Joanna Howarth
Neuroregenerative Medicine Group, Laboratories for Integrated Neuroscience and Endocrinology, University of Bristol, Bristol, UK

Bernadett Kalmar
Institute of Neurology, University College London, Queen Square, London, UK

Maria Kosmaoglou
Division of Molecular and Cellular Neuroscience, Institute of Ophthalmology, University College London, London, UK

Jacques Landry
Centre de recherche en cancérologie de l'Université Laval, L'Hôtel-Dieu de Québec, Québec, QC, Canada

Do-Young Lee
Neuroregenerative Medicine Group, Laboratories for Integrated Neuroscience and Endocrinology, University of Bristol, Bristol, UK

Jordi Magrané
Department of Neurology and Neuroscience, Weill Medical College of Cornell University, New York, USA

Pamela J. McLean
Mass General Institute for Neurodegenerative Disease (MIND), Massachusetts General Hospital, Charlestown, MA, USA

Carolanne E. Milligan
Department of Neurobiology and Anatomy, Wake Forest University School of Medicine, Winston-Salem, NC, USA

Geneviève Morrow
Lab of Cellular and Developmental Genetics, Department of Medicine, Université Laval, Québec, QC, Canada

Tatiana V. Novoselova
Division of Molecular and Cellular Neuroscience, Institute of Ophthalmology, University College London, London, UK

Yi-Bing Ouyang
Department of Anesthesia, Stanford University School of Medicine, Stanford, CA, USA

Stephen Poon
School of Biological Sciences, University of Wollongong, Wollongong, NSW, Australia

Henry W. Querfurth
Department of Neurology, Caritas St Elizabeth's Medical Center, Tufts University School of Medicine, Boston, MA, USA

Preethi Rao
Division of Investigative Pathology, Scott and White Memorial Hospital and Clinic Temple, TX, USA

Mac B. Robinson
Department of Neurobiology and Anatomy, Wake Forest University School of Medicine, Winston-Salem, NC, USA

Nirmal K. Singh
Department of Medicine, University of Massachusetts Medical School, Worcester, MA, USA

Alessandra Spagnolo
Department of Anesthesiology, University of Illinois, and Jesse Brown Veteran's Affairs Research Division, Chicago, IL, USA

Robert M. Tanguay
Lab of Cellular and Developmental Genetics, Department of Medicine, Université Laval, Québec, QC, Canada

Dellara F. Terry
Geriatrics Section, Department of Medicine, Boston University School of Medicine and Boston Medical Center, Boston, MA, USA

Michael Tytell
Department of Neurobiology and Anatomy, Wake Forest University School of Medicine, Winston-Salem, NC, USA

James B. Uney
Neuroregenerative Medicine Group, Laboratories for Integrated Neuroscience and Endocrinology, University of Bristol, Bristol, UK

Tracy S. Voegeli
Department of Anatomy and Neurobiology, Faculty of Medicine, Dalhousie University, Halifax, NS, Canada

Mark R. Wilson
School of Biological Sciences, University of Wollongong, Wollongong, NSW, Australia

Amanda J. Wintink
Department of Pharmacology, Faculty of Medicine, Dalhousie University, Halifax, NS, Canada

Lijun Xu
Department of Anesthesia, Stanford University School of Medicine, Stanford, CA, USA

Justin J. Yerbury
School of Biological Sciences, University of Wollongong, Wollongong, NSW, Australia

PART I

HEAT SHOCK PROTEINS AND NEURODEGENERATIVE DISEASES