

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

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Volume 3

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## Series Editors:

**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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*Edited by*

Alexzander 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,  
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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*Editors*

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**