

REVIEW ARTICLE

Endoplasmic reticulum stress signalling – from basic mechanisms to clinical applications

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The endoplasmic reticulum (ER) is a membranous intracellular organelle and the first compartment of the secretory pathway. As such, the ER contributes to the production and folding of approximately one-third of cellular proteins, and is thus inextricably linked to the maintenance of cellular homeostasis and the fine balance between health and disease. Specific ER stress signalling pathways, collectively known as the unfolded protein response (UPR), are required for maintaining ER homeostasis. The UPR is triggered when ER protein folding capacity is overwhelmed by cellular

Abbreviations

4-PBA, 4-phenylbutyric acid; ALS, amyotrophic lateral sclerosis; ATF4, activating transcription factor 4; ATF6, activating transcription factor 6; ATF6E, cytosolic domain of ATF6; ATF6s, activating transcription factor 6 s; ATF6H, activating transcription factor 6 h; BQF240, cAMP responsive element-binding protein 3 like 2; bP, binding immunoglobulin protein (gene GRP78); bZIP, basic-leucine zipper; CHOP, C/EBP α /enhancer-binding protein (C/EBP α); homologous protein; CRO1, chaperonin cell lysate; CREB1L3, cAMP responsive element-binding protein 3 like 3; CREB, cAMP response element-binding protein; eIF2 α , eukaryotic translation initiation factor 2 α ; eIF2s, eukaryotic translation initiation factor 2 s; ERAD, ER-associated protein degradation; ER, endoplasmic reticulum; ERN1, endoplasmic reticulum to nucleus signalling 1; ERN2, endoplasmic reticulum to nucleus signalling 2; ERO-1, ER oxidoreductin 1; ERs, oestrogen receptor s; GADD34, growth arrest and DNA-damage-inducible 34; GRP78, glucose-regulated protein 78; GSH, glutathione; IBD, inflammatory bowel disease; IRE1s, inositol-requiring enzyme 1 s; IRE1 β , inositol-requiring enzyme 1 β ; LUMIN, cAMP responsive element-binding protein 3 or CREB3; MAAM, mitochondria-associated membrane; MBTPS1, membrane bound transcription factor peptidase, site 1; MBTPS2, membrane bound transcription factor peptidase, site 2; MDM1/USAN13, mitochondrial distribution and morphology 1/uracil nase 13; mTOR, mammalian target of rapamycin; N-ATF6, N-terminal portion of ATF6 or ATF6E; NF- κ B, nuclear transcription factor κ B; NGLY1, N-glycanase; NPL, NAD(P)H-NAD(P)H reductase; OAS1s, cAMP responsive element-binding protein 3 like 1; ORAI1, calcium release-activated calcium channel protein 1; PDI, protein disulfide isomerase; p-eIF2s, phospho-eIF2s; PERK, protein kinase R-like (PKR-like) endoplasmic reticulum kinase; PKR, protein kinase R/activated; PM, plasma membrane; PP1, protein phosphatase type 1; qPCR, quantitative polymerase chain reaction; RER, rough endoplasmic reticulum; RGS, regulated IRE1-dependent decay; ROS, reactive oxygen species; SEC22b, vesicle-trafficking protein SEC22b; SERCA, sarcoplasmic/endoplasmic reticulum ATPase; Ca²⁺-ATPase; SER, smooth endoplasmic reticulum; TAD, transcriptional activation domain; TRAF2, tumour necrosis factor receptor-associated factor 2; TUDCA, tauroursodeoxycholic acid; UDCA, ursodeoxycholic acid; UPR, unfolded protein response; WT, wild-type; XBP1s, spliced isoform of XBP1; XBP1u, unspliced isoform of XBP1; XBP1, X-box binding protein 1.

Stress Basic Mechanisms Clinical Imp

**Malcolm L. Johnson, Vern L.
Bengtson, Peter G. Coleman, Thomas B.
L. Kirkwood**

Stress Basic Mechanisms Clinical Imp:

Management of Obesity, Part I: Overview and Basic Mechanisms, An Issue of Gastroenterology Clinics of North America, E-Book Lee M. Kaplan, 2023-05-18 In this issue of Gastroenterology Clinics guest editor Dr Lee M Kaplan brings his considerable expertise to the topic of Management of Obesity Part I Overview and Basic Mechanisms Most of the world's population live in countries where being overweight and obese is more life threatening than being underweight This preventable disease leaves patients with a cascade of health problems resulting in serious stress and impact on global economies and healthcare systems This issue the first of two addresses basic mechanisms and contributors of obesity along with health care disparities and access Contains 16 practice oriented topics including the many forms of obesity genetic contributions to obesity health complications of obesity the effect of obesity on gastrointestinal disease disparities in access and quality of obesity care and more Provides in depth clinical reviews of management of obesity offering actionable insights for clinical practice Presents the latest information on this timely focused topic under the leadership of experienced editors in the field Authors synthesize and distill the latest research and practice guidelines to create clinically significant topic based reviews

Immune Regulation in Kidney Diseases: Importance, Mechanism and Translation Cheng Yang, Songjie Cai, 2021-03-16

Adaptive Protection of the Heart Felix Z. Meerson, 1990-11-21 This book explores the possibilities of protecting the heart against stress and ischemia through adaptation to intermittent hypoxia or to mild nondamaging stress exposure These possibilities are based on studies that show an increase in the potency and efficiency of stress limiting systems when subjected to repeated stress actions adaptation to high altitude hypoxia or adaptation to increased physical loads Any stress reaction is coupled with an activation of central and local stress limiting systems such as GABAergic opiodergic and serotonergic systems in the brain as well as antioxidants prostaglandins and adenosine in executory organs The book also presents the use of metabolites of stress limiting systems rather than adaptation as a means to prevent cardiac arrhythmias It also discusses genetically determined deficiencies of stress limiting systems and their role in the etiology of stress induced diseases Cardiologists and researchers studying stress and its effect on cardiovascular systems will find this book extremely useful

HEALTH & SCIENCE 2025-I Hüseyin KAFADAR, 2025-03-28 CONTENTS CHAPTERS THE APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN HEALTHCARE SYSTEMS F rat KARA Emel MATARACI KARA QUANTUM TECHNOLOGIES THE REVOLUTION SHAPING THE FUTURE OF HEALTH AND SCIENCE Sevdanur GEN AI INTEGRATED MANAGEMENT OF PNEUMOTHORAX A NEW ERA IN DIAGNOSIS AND TREATMENT Alper TABUR ARTIFICIAL INTELLIGENCE APPLICATIONS IN AESTHETIC MESOTHERAPY TREATMENTS Meri YILDIZ YILMAZ FACIAL ANATOMY IN NON SURGICAL AESTHETIC APPLICATIONS Seda ET N LESION STERILIZATION AND TISSUE REPAIR LSTR Alaaddin ZKAN Tu e Nur AH N Asu AKIR THE ROLE OF IODINE IN THE IMMUNE SYSTEM AND FIGHT AGAINST INFECTIONS Ebru BARDA ZKAN G zde AT LA USLU HUMAN PAPILLOMAVIRUS HPV IN BREAST CANCER zcan ERDO AN

THE ROLE OF LIQUID BIOPSY IN THE DIAGNOSIS AND MANAGEMENT OF PULMONARY CARCINOMA Fazl YANIK WHAT IS STROKE RISK FACTORS CLASSIFICATION PATHOPHYSIOLOGY AND NUTRITIONAL INTERVENTIONS IN STROKE pek AKY Z U ur G N EN THERAPEUTIC POTENTIAL OF ASTROCYTES IN NEUROLOGICAL DISEASES Sadettin ERSOY NEUROBEHAVIORAL AND HORMONAL PERSPECTIVE ON FIBROMYALGIA SYNDROME znur zge ZCAN Burcu EVREL IODINE AND NEUROLOGICAL HEALTH EFFECTS ON THE BRAIN FUNCTIONING Ebru BARDA ZKAN Hamit USLU STRESS METABOLISM Merve KIYAR U ur G N EN RESPONSIVE CARE IN CHILD DEVELOPMENT K bra BUDAL AYTA G len BARAN COMPLEMENTARY AND SUPPORTIVE MEDICAL PRACTICES AND NURSING Cansu YILMAZ INFANCY SLEEP PATTERNS AND FEEDING BEHAVIOR Ay l Seda TOGUR Aysel K KSAL AKYOL COMPLIANCE AND MOTIVATION IN ORAL HYGIENE EDUCATION FOR ADULTS Ay e BOZKURT **Navy Medicine** ,1992 Medical Sociology: Social structures and health Graham Scambler,2005 **Foundations of Osteopathic Medicine** Anthony G. Chila,2010 Thoroughly revised for its Third Edition Foundations of Osteopathic Medicine is the most comprehensive current osteopathic text This edition features expanded coverage of international practice and includes a new chapter on the structure of the profession

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Johnson,Vern L. Bengtson,Peter G. Coleman,Thomas B. L. Kirkwood,2005-12-01 The Cambridge Handbook of Age and Ageing first published in 2005 is a guide to the body of knowledge theory policy and practice relevant to age researchers and gerontologists around the world It contains almost 80 original chapters commissioned and written by the world s leading gerontologists from 16 countries and 5 continents The broad focus of the book is on the behavioural and social sciences but it also includes important contributions from the biological and medical sciences It provides comprehensive accessible and authoritative accounts of all the key topics in the field ranging from theories of ageing to demography physical aspects of ageing mental processes and ageing nursing and health care for older people the social context of ageing cross cultural perspectives relationships quality of life gender and financial and policy provision This handbook will be a must have resource for all researchers students and professionals with an interest in age and ageing **Research Awards Index**

,1988 **Epilepsy: A Comprehensive Textbook** Jerome Engel Jr,Solomon L. Moshé,2023-10-23 Authoritative and updated Epilepsy A Comprehensive Textbook 3rd Edition contains 365 chapters that cover the full spectrum of relevant topics in biology physiology and clinical information from molecular biology to public health concerns in developing countries Written by world renowned authorities and expertly edited by epileptologists Drs Jerome Engel Jr Solomon L Mosh Aristeia S Galanopoulou John M Stern Alexis Arzimanoglou Jacqueline A French Renzo Guerrini Andres M Kanner and Istvan Mody this three volume work includes detailed discussions of seizure types and epilepsy syndromes relationships between physiology and clinical events psychiatric and medical comorbidities conditions that could be mistaken for epilepsy and an increasing range of pharmacologic surgical and alternative therapies Geriatric Diabetes Medha N. Munshi,Lewis A.

Lipsitz,2007-05-21 The number of elderly patients with diabetes is increasing at a significant rate Responding to this growth this source serves as a solid arsenal of information on the varying presentations and challenges associated with diabetes in the geriatric patient and supplies clearly written sections on the screening diagnosis and treatment of diabetes

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Molecular Mechanisms of Hormone Actions on Behavior Anne M. Etgen,Donald W. Pfaff,2010-03-16 A single volume of

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