Comprehensive Guide to Autism

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Colin R. Martin
Editors

Comprehensive Guide to Autism

With 495 Figures and 352 Tables

Springer Reference

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Foreword

Autism and associated presentations such as Asperger's syndrome represent complex clinical entities that encompass sophisticated psychological, social, and biological issues. The evidence base regarding these complicated presentations continues to develop incrementally with a goal toward both fundamental understanding of these complex conditions and the provision of high-quality and effective intervention. Irrespective of the complexity of the underlying processes, the impact of a diagnosis is not only of significance to the individuals themselves, but also in its effect on the family, friends, and the larger social circle. What should not be lost within the scientific and medical focus on etiological understanding and treatment innovation is the often deleterious impact on the quality of life of the individuals concerned. It should not be forgotten that a diagnosis of an autism spectrum disorder is often accompanied by stigma and erroneous preconceptions of an individual's abilities and expectations in life. Having faced suspicions, if not a formal diagnosis of Asperger's syndrome myself, I am aware of the many difficulties that may be encountered by those with a diagnosis. Yet, I am also aware that those with a diagnosis may achieve much and make a worthwhile and significant contribution to wider society, and there are many examples of this in terms of art, literature, and, indeed my area of academic endeavor, economics.

For the average citizen it is important to understand that there is an incredible range of human minds out there. It is not unusual for some variations to seem strange, not normal, and even dubbed deficiencies, but with those deficiencies often come unusual abilities that may require special nurturing. But these variations help to define what it means to be human.

A fundamental problem for those working in this area is the availability of contemporary, relevant, up-to-date, and applied information. Vinood Patel, Victor Preedy, and Colin Martin have done an excellent job bringing together international experts in the autism and associated disorders field to produce an accessible, evidence-based, and clinically detailed account of the related and contemporary issues. This title is very appropriate and useful to those with either a clinical or a research interest in this area, who will undoubtedly find this volume a valuable and welcome resource. In summary, I would highly recommend this reference work as an informative and authoritative account.

Vernon Lomax Smith

Editors' Note: Vernon Lomax Smith is professor of [economics](#) at [Chapman University's Argyros School of Business and Economics](#) and School of Law in [Orange, California](#), and professor emeritus of [George Mason University](#) Interdisciplinary Center for Economic Science in [Arlington, Virginia](#). Smith shared the 2002 [Nobel Memorial Prize in Economic Sciences](#) with [Daniel Kahneman](#). Various tests carried out on him have suggested symptoms of Asperger's syndrome, discussed more fully in his memoir *Discovery* (Bloomington, Indiana: Authorhouse, 2008). He is a strong advocate for advancing knowledge and understanding of Asperger's syndrome specifically and autism spectrum disorders in general.

Preface

Autism is a complex multi-faceted disorder which affects neurodevelopment during the early years of life and for many remains throughout adulthood. Inherent features include difficulties or deficits in communication, social interaction and cognition, and person-to-person behavioral coordination and recall, to name but a few facets. It impacts the affected individual, family, and in some cases localized communities.

The increased prevalence of childhood autism has resulted in rapid developments in a wide range of disciplines in recent years, though despite intensive research the identification of young children is difficult, the cause(s) remain unresolved, and no single treatment strategy is employed. To address these issues, *Comprehensive Guide to Autism* was conceived as an all-embracing resource that analyzes and discusses the various contemporary issues in the field of autism. The objective of this book is to bring together scientific material from leading experts in the field relating to a wide range of important current topics. These include the early identification of children with autism and subsequent treatment as well as social and behavioral studies. The editors also recognize that recent developments in genetic and immunological studies, the influence of diet, models of autism, and future treatment methods are essential reading for parents, caregivers, psychologists, scientists, and clinicians. Obtaining all this knowledge in a single reference work is a challenge and *Comprehensive Guide to Autism* seeks to overcome this. The title therefore represents a “one-stop shop” of content related to autism.

The title is divided into the following sections:

Section 1: Setting the Scene: Introductory Chapters

Section 2: Diagnosing Autism Spectrum Disorders

Section 3: Behavioral Issues in Autism Spectrum Disorders

Section 4: Neurophysiology and Neuropathology in Autism Spectrum Disorders

Section 5: Neuroimaging and Structure in Autism Spectrum Disorders

Section 6: Learning Issues in Autism Spectrum Disorders

Section 7: Social and Community Issues in Autism Spectrum Disorders

Section 8: Biochemical Aspects in Autism Spectrum Disorders

Section 9: Principal Factors and Contributing Mechanisms in the Pathophysiology of Autism

Section 10: Immunology and Autism Spectrum Disorders

Section 11: Genetics and Molecular Aspects of Autism Spectrum Disorders

- Section 12: Models for Studying Autism Spectrum Disorders
- Section 13: Asperger's Syndrome
- Section 14: Diet and Nutrition in Autism Spectrum Disorders
- Section 15: Treatments in Autism Spectrum Disorders: Non-pharmacological
- Section 16: Treatments in Autism: Pharmacological and Active Agents
- Section 17: International Aspects and Ethnicity of Autism Spectrum Disorders
- Section 18: Rett Syndrome
- Section 19: Fragile X
- Section 20: Methods, Approaches, Procedures, and Techniques in Autism Spectrum Disorders

The contributors to this title are authors of national and international standing — leaders in the field. The emerging fields of science and important discoveries relating to autism are also incorporated in this title. *Comprehensive Guide to Autism* will be indispensable reading for physicians, behavioral scientists, counselors, social workers, psychologists, health scientists, policy makers, parents, medical departments and colleges, epidemiologists, health practitioners, and other professionals of related disciplines.

Vinood B. Patel
Victor R. Preedy
Colin R. Martin

About the Editors

Vinood B. Patel is currently a Senior Lecturer in Clinical Biochemistry at the University of Westminster and honorary fellow at King's College London. Dr. Patel graduated from the University of Portsmouth with a degree in Pharmacology. Dr. Patel completed his PhD in protein metabolism from King's College School of Medicine & Dentistry, London, in 1997, studying the effect of anti-hypertensive agents on protein metabolism in models of hypertension.

Dr. Patel's postdoctoral work from 1997 was carried out at Wake Forest University Baptist Medical School, North Carolina, USA, studying structural-functional alterations to mitochondrial ribosomes, where he developed novel techniques to characterize their biophysical properties. These studies showed for the first time the susceptibility of mitochondrial ribosomes to dissociate and reduced association following chronic alcohol treatment.

Dr. Patel joined the University of Westminster in 2004 in the Department of Biomedical Sciences, where he currently directs various studies on metabolic pathways involved in liver disease, particularly related to mitochondrial energy regulation and cell death. Research is being undertaken in the following areas: studying the role of macro- and micronutrients, in particular fatty acids in the development of fatty liver disease and understanding the mechanisms for the transition from fatty liver to hepatitis. Work is also being carried out examining how alcohol and its toxic metabolite acetaldehyde damage the liver, and the impact

of oxidative stress and nutritional status. In addition, studies are being carried out investigating iron homeostatic regulation and liver iron overload by understanding the role of the hormone hepcidin and iron related proteins.

Dr. Patel is involved in studies investigating behavioral and neurological disorders. He is also an active lecturer where he is course leader for the MSc Clinical Chemistry and teaches all aspects of clinical biochemistry, disease processes, and laboratory investigation. Dr. Patel has directed several PhD projects as well as supervised many masters and undergraduate research projects. Dr. Patel is a nationally and internationally recognized gastrointestinal researcher and was involved in several NIH-funded biomedical grants related to alcoholic liver disease. He has collaborations in USA, Germany, and Australia, as well as throughout UK, and has presented his work worldwide. Dr. Patel has edited biomedical books in the area of nutrition and health prevention, neurological disorders, and biomarkers, and has published over 150 articles.

Victor R. Preedy is a senior member of King's College London (Professor of Nutritional Biochemistry) and King's College Hospital (Professor of Clinical Biochemistry). He is attached to both the Diabetes and Nutritional Sciences Division and the Department of Nutrition and Dietetics. Professor Preedy is also Director of the Genomics Centre and a member of the School of Medicine.

Professor Preedy graduated in 1974 with an Honours Degree in Biology and Physiology with Pharmacology. He gained his University of London PhD in 1981. In 1992, he received his Membership of the Royal College of Pathologists and in 1993 he gained his second doctoral degree, for his outstanding contribution to protein metabolism in health and disease. Professor Preedy was elected as a Fellow to the Institute of Biology in 1995 and to the Royal College of Pathologists in 2000. Since then he has been elected as a Fellow to the [Royal Society for the Promotion of Health](#) (2004) and [The Royal Institute of Public Health](#) (2004). In 2009, Professor Preedy became a Fellow of the Royal Society for Public Health and in 2012 a Fellow of the Royal Society of Chemistry.

During his career, Professor Preedy has carried out research at the National Heart Hospital (part of Imperial College London) and the MRC Centre at Northwick Park Hospital. He has collaborated with research groups in Finland, Japan, Australia, USA, and Germany. Professor Preedy is a leading expert on the mechanisms of disease and has lectured nationally and internationally. More recently he has become interested in the relationship between diet and behavior.

Professor Preedy is Editor-in-Chief of four major Springer works, namely, *Handbook of Disease Burdens and Quality of Life Measures*, *Handbook of Behavior, Food and Nutrition*, *Handbook of Growth and Growth Monitoring in Health and Disease*, and *Handbook of Anthropometry: Physical Measures of Human Form in Health and Disease*. He has over 570 publications, which include 165 peer-reviewed manuscripts based on original research, 100 reviews, and over 50 books and book volumes.

Colin R. Martin is Professor of Mental Health at Buckinghamshire New University, Middlesex, UK. He holds a joint appointment with West London Mental Health NHS Trust and is also a Visiting Professor at the University of the West of Scotland. He is a Registered Mental Health Nurse, Chartered Health Psychologist, and Chartered Scientist. He also trained in analytical biochemistry, this aspect reflecting the psychobiological focus of much of his research within mental health. A key feature of much of his research work and academic writing concerns the interface between mental health and physical health, particularly in seeking to understand the underlying mechanisms which seamlessly make these two seemingly fundamentally different domains uniquely and dynamically related. Reflecting this interest, he has conducted research on the relationship between mental health and coronary heart disease, depression in chronic kidney disease, anxiety in cancer patients, quality of life in diabetes, and self-esteem in pregnancy. This focus on the interdisciplinary and theoretical cusp has facilitated his development of original ideas in the etiology of conditions which have at their core significant mental health and physical components; for example, he developed a psychobiological model of alcohol dependency which integrated, psychological, social, physical, genetic, and nutritional features and provided a theoretical framework in which the model could be evaluated (Martin and Bonner, 2005). Professor Martin is involved extensively in collaborative international research with many European and non-European countries. He is the lead investigator of a funded Alcohol-Related Brain Damage (ARBD) project, a goal of which is to identify and utilize biomarkers in the planning and monitoring of ARBD patient care.

Professor Martin is a keen book author and editor and his outputs include the seminal five-volume magnum opus, *Handbook of Behavior, Food and Nutrition* (2011) and the recently published prophetic insight into the treatment of neurological disease, *Nanomedicine and the Nervous System* (2012). He also has a longstanding interest in perinatal health and developmental psychology and is editor of the influential *Journal of Reproductive and Infant Psychology*. Three of his books, *Perinatal Mental Health: A Clinical Guide* (2012), *Scientific Basis of*

Healthcare: AIDS and Pregnancy (2012), and the forthcoming *Handbook of Diet and Nutrition in the Menstrual Cycle, Periconception and Fertility*, are a reflection of this area of focus. Professor Martin has an enduring interest in addiction generally and alcohol dependency specifically, and is editor of the book *Identification and Treatment of Alcohol Dependency* (2008). He has published or has in press approximately 200 publications, including research papers, books, and book chapters.

Contents

Volume 1

Section I Setting the Scene: Introductory Chapters	1
Perinatal and Neonatal Complications in Autism Etiology	3
Hannah Gardener and Kristen Lyall	
Genetics of Autism Spectrum Disorder: Experience in Developing Countries	27
Allal Ouhtit, Yahya M. Al-Farsi, Ishita Gupta, Mostafa I. Waly, and Marwan M. Al-Sharbati	
Anatomical and Functional Connectivity in Autism Spectrum Disorders	49
Ralph-Axel Müller	
Endophenotypes in Autism Spectrum Disorders	77
Antonio Maria Persico and Roberto Sacco	
Intensive Behavioral Intervention and Family Psychological Adjustment in Autism	97
Corinna F. Grindle and Bob Remington	
Early and Intensive Behavioral Intervention (EIBI) in Autism	117
Lars Klintwall and Svein Eikeseth	
Health Care Quality for Children: The Position of Autism Spectrum Disorder	139
Christina D. Bethell, Olivia Lindly, Michael Kogan, and Katharine Zuckerman	
Family Burden of Raising a Child with ASD	167
Guillermo Montes and Marie Cianca	
Parenting and Autism Spectrum Disorders	185
Phil Reed and Lisa A. Osborne	

Chronic Parenting Stress in Mothers of Adolescents and Adults with Autism: Vulnerability and Resilience	207
Erin T. Barker, Marsha R. Mailick, and Leann E. Smith	
Quality of Life in Caregivers of Children with ASD	223
Sabrin Rizk, Kris Pizur-Barnekow, and Amy R. Darragh	
Peers' Knowledge About and Attitudes Towards Students with Autism Spectrum Disorders	247
Jonathan M. Campbell and Brian D. Barger	
Autism and Schizophrenia in Adults: Clinical Considerations on Comorbidity and Differential Diagnosis	263
Lena Nylander	
Section II Diagnosing Autism Spectrum Disorders	283
Diagnosing Autism with Checklist for Autism Spectrum Disorder (CASD)	285
Susan Mayes	
Autism Observation Scale for Infants	299
Susan E. Bryson and Lonnie Zwaigenbaum	
Pediatric Screening of Autism Spectrum Disorders	311
Judith S. Miller, Juhi Pandey, and Leandra N. Berry	
Electroencephalograms in Diagnosis of Autism	327
Mehran Ahmadi and Hojjat Adeli	
Autism Diagnostic Observation Schedule (ADOS) and Its Uses in Research and Practice	345
Sarah Hurwitz and Nurit Yirmiya	
Resolution with Diagnosis Among Parents of Children with ASD	355
Nurit Yirmiya, Ifat Seidman, Nina Koren-Karie, and David Oppenheim	
Assessing Adults with Normal Intelligence for ASD	369
Jonna M. Eriksson, Lisa M. J. Andersen, and Susanne Bejerot	
PDD Behavior Inventories: Clinical and Research Applications to ASD	387
Ira L. Cohen	
Clinical Applications of Robots in Autism Spectrum Disorder Diagnosis and Treatment	411
Joshua J. Diehl, Charles R. Crowell, Michael Villano, Kristin Wier, Karen Tang, and Laurel D. Riek	

Section III Behavioral Issues in Autism Spectrum Disorders	423
Physical Activity and Sedentary Lifestyle in Autism	425
Amir Hossein Memari and Banafsheh Ghaheri	
Rationale for Neurofeedback Training in Children with Autism	439
Jaime A. Pineda, Ashley Juavinett, and Michael Datko	
Behavioral Interventions for Aggressive Behaviors in Autism Spectrum Disorders	461
Olive Healy, Sinead Lydon, Jennifer Holloway, and Martina Dwyer	
Functional Behavior Assessments in Evaluating Individuals with Autism Spectrum Disorders	487
Laura Baylot Casey and J. Brian Smith	
Referential Gaze and Word Mapping in Autism Spectrum Disorders	503
Hironori Akechi and Harumi Kobayashi	
Toe Walking in Autism	519
Pasquale J. Accardo, Eugenio Monasterio, and Donald Oswald	
Pragmatic Language in Autism: An Overview	533
Yan Grace Lam	
Symbolic Play in Children with Autism	551
Yan Grace Lam	
Sexuality and ASD: Current State of Research	569
Laura Gilmour, Veronica Smith, and Melike Schalomom	
Psychosis and Disorganized Behavior in Adults with Autism and Intellectual Disability: Case Identification and Staff-Patient Interaction	585
Trine Lise Bakken	
Anxiety in Individuals with ASD: Prevalence, Phenomenology, Etiology, Assessment, and Interventions	601
Francisca Johanna Arnoldina van Steensel, Susan Maria Bögels, Iliana Magiati, and Sean Perrin	
Syndrome-Specific Impact on Parental Well-Being: Autism Compared	625
Sasha M. Zeedyk, Shana R. Cohen, and Jan Blacher	
Verbal and Visual Metaphor Comprehension in Autism	651
Nira Mashal and Anat Kasirer	

Communality between Obsessive Compulsive Disorder and Autism Spectrum Disorders	671
Susanne Bejerot, Abraham Weizman, and Ruth Gross-Isseroff	

Volume 2

Section IV Neurophysiology and Neuropathology in Autism Spectrum Disorders	693
---	------------

Dynamic Brain Changes in Autism: Review of Telencephalic Structures	695
Efrain C. Azmitia and Allyson Impallomeni	

Hyperserotonemia in Autism: 5HT-Regulating Proteins	717
Dubravka Hranilovic and Sofia Blazevic	

Neurotrophic Factors in Autism Spectrum Disorders	741
Thomas Nickl-Jockschat	

Nicotinic Acetylcholine Receptors in Autism Spectrum Disorders: Therapeutic Implications	755
Stephen I. Deutsch, Barbara L. Schwartz, Maria R. Urbano, Jessica A. Burket, Andrew D. Benson, and Amy L. Herndon	

GABAergic Neuromarkers and the Autistic Brain	779
Gene J. Blatt	

Electrophysiology of Visual and Auditory Perception in Autism Spectrum Disorders	791
Takao Yamasaki, Toshihiko Maekawa, Hidetoshi Takahashi, Takako Fujita, Yoko Kamio, and Shozo Tobimatsu	

Motor Functioning in Autism Spectrum Disorders	809
Nicole Papadopoulos, Nicole Rinehart, John Bradshaw, Jennifer McGinley, and Peter Enticott	

Neurobeachin Gene in Autism	825
John W. M. Creemers, Kim Nuytens, and Krizia Tuand	

Cerebellum and the Psychopathology of Autism and Asperger's Disorder	845
Beth Johnson, Chloe Stanley-Cary, Joanne Fielding, Nicole Rinehart, and Nicole Papadopoulos	

Neurobiological Correlates of Classical and Quantum Neural Information Processing from the Perspective of Autism	865
Antonio Cassella	

Section V Neuroimaging and Structure in Autism Spectrum Disorders	891
Introduction to Neuroimaging Research in Autism Spectrum Disorders	893
Naama Barnea-Goraly and Matthew J. Marzelli	
Developmental Trajectory of White Matter and Connectivity Maturation in Autism	911
Paola Mengotti and Paolo Brambilla	
Single-Photon Emission Computed Tomography and Electroencephalography Findings in Children with Autism Spectrum Disorders	929
Masayuki Sasaki	
Imaging and the Corpus Callosum in Patients with Autism	947
Manuel F. Casanova, Brynn Dombroski, and Andrew E. Switala	
Imaging the Neural Correlates of Behavioral and Cognitive Shifts in Autism	963
Aysenil Belger, Kimberly L. H. Carpenter, and Sarah E. Schipul	
Section VI Learning Issues in Autism Spectrum Disorders	987
Joint Attention Training in Children with Autism	989
James Meindl	
Attention Deficit Hyperactivity Disorder (ADHD) in Children with Autism Spectrum Disorders	1013
Kevin M. Antshel and Bridget O. Hier	
Reading and Text Comprehension Skills in School-age Children with Autism Spectrum Disorders	1031
Jakob Åsberg Johnels	
Teaching Children with Autism to Recognize Faces	1043
Buyun Xu and James W. Tanaka	
Early Language Acquisition in Autism Spectrum Disorders: A Developmental View	1061
Lauren B. Adamson, Maryann Ronski, and Andrea Barton-Hulsey	
Augmentative and Alternative Communication Solutions and Autism	1081
Margaret Lubas, Jennifer R. Mitchell, and Gianluca De Leo	

Section VII Social and Community Issues in Autism Spectrum Disorders	1097
Social Competence Impairments in Autism Spectrum Disorders	1099
Gregory Chasson and Sara R. Jarosiewicz	
Adaptive Social Abilities in Autism	1119
So Hyun Kim, Vanessa Hus Bal, and Catherine Lord	
Social Skills Deficits in Children with Autism Spectrum Disorders: Evidence Based Interventions	1133
Jennifer Holloway, Olive Healy, Martina Dwyer, and Sinead Lydon	
Service Use Among Young Children with Autism Spectrum Disorders	1159
Dwight Irvin, Elena Patten, and Brian Boyd	
Psychophysiological Arousal to Social Stress in Autism Spectrum Disorders	1177
Todd P. Levine, Elisabeth Conradt, Matthew S. Goodwin, Stephen J. Sheinkopf, and Barry Lester	
Health Care and Services for Individuals with ASDs: Disparities and Transitions	1195
Helen M. Johnson and Todd P. Levine	
Psychological Roots of Social and Linguistic Deficiencies in Autism and the Distinction between Classical and Quantum Neural Computing	1219
Antonio Cassella	

Volume 3

Section VIII Biochemical Aspects in Autism Spectrum Disorders	1243
Receptor/Regulatory Molecules Pattern Changes: Caspases in Autism Spectrum Disorders	1245
Dario Siniscalco, Nicola Antonucci, Sabatino Maione, and Laura de Magistris	
Lipid Signalling in the Pathology of Autism Spectrum Disorders	1259
Christine Wong and Dorota Anna Crawford	

Dysregulation of Neurogenic Calcium Signaling and Autism	1285
J. Jay Gargus and Galina Schmunk	
Treatment of Elevated Male Hormones in Autism	1313
Mark Geier, Janet K. Kern, Paul G. King, Lisa Sykes and David A. Geier	
Urinary Porphyrins in Autism Spectrum Disorders	1333
Janet K. Kern, David A. Geier, Lisa Sykes, and Mark Geier	
Urinary <i>p</i>-Cresol in ASD	1349
Antonio Maria Persico and Valerio Napolioni	
Section IX Principal Factors and Contributing Mechanisms in the Pathophysiology of Autism	1369
Prematurity and Autism Spectrum Disorders	1371
Maya Yaari, Smadar Eventov-Freidman, David Mankuta, Benjamin Bar-Oz, and Nurit Yirmiya	
Redox/Methylation Theory and Autism	1389
Richard Deth, Malav S. Trivedi, Nathaniel W. Hodgson, Christina R. Muratore, and Mostafa I. Waly	
Mercury Induced Autism	1411
Mark Geier, Janet K. Kern, Paul G. King, Lisa Sykes and David A. Geier	
Autism and Dia1 Family: Cellular Secretory Pathway	1433
Azhari Aziz, Tal Karmi, and Naomi Bishop	
Cortical Underconnectivity Hypothesis in Autism: Evidence from Functional Connectivity MRI	1457
Jeffrey S. Anderson	
Developmental Regression in Autism Spectrum Disorders: Implications for Clinical Outcomes	1473
Brian D. Barger and Jonathan M. Campbell	
Assisted Reproductive Technology in Autism Spectrum Disorders	1495
Takafumi Shimada and Tsukasa Sasaki	
Parental Age, Birth Weight, and Autism Spectrum Disorders	1515
Esther Ben-Itzhak and Ditz A. Zachor	
Autism and Increased Paternal Age	1525
Mark D. Alter and Addie May Nesbitt	

Hypo-Phosphorylation of Salivary Peptidome as Indicator of Molecular Pathogenesis of Autism Spectrum Disorders	1543
Massimo Castagnola, Irene Messana, Tiziana Cabras, Federica Iavarone, Chiara Fanali, Anna Maria Pecoraro, Alessandra Morelli, Giovanni Neri, Maria Giulia Torrioli, and Fiorella Gurrieri	
Section X Immunology and Autism Spectrum Disorders	1565
Immunotoxicity in Autism Spectrum Disorders	1567
Jamie DeWitt and Rodney R. Dietert	
Autism Spectrum Disorders and Aluminum Vaccine Adjuvants	1585
Lucija Tomljenovic, Russell L. Blaylock, and Christopher A. Shaw	
Altered Immune Function Associated with Neurophysiological Abnormalities and Executive Function Deficits in Children with Autism	1611
Yvonne Ming Yee Han, Mei-chun Cheung, Sophia L. Sze and Agnes Sui Yin Chan	
Autism Spectrum Disorders and Circulating Chemokines	1627
Morsi Abdallah, Tanja Michel, and Laszlo Kohidai	
Section XI Genetics and Molecular Aspects of Autism Spectrum Disorders	1643
Autism and Schizophrenia: Genetic and Phenotypic Relationships	1645
Jacob A. S. Vorstman and J. Peter H. Burbach	
UPF3B Gene and Nonsense-Mediated mRNA Decay in Autism Spectrum Disorders	1663
Frederic Laumonnier, Lam Son Nguyen, Lachlan Jolly, Martine Raynaud, and Jozef Gecz	
Nuclear and Mitochondrial Genome Defects in Autism: Genomic Instability and Impact of Epigenetic and Environmental Factors	1679
Moyra Smith	
Autism Spectrum Disorders in Tuberous Sclerosis	1699
Kristina Julich and Mustafa Sahin	
Phenotypic Variation in Autism Spectrum Disorder: Insights from Syndromic Forms of Autism	1715
Naomi Bishop, Azhari Aziz, and Christian Barth	

Section XII Models for Studying Autism Spectrum Disorders . . . 1737

Genetic Modeling and Neurobehavioral Disorders:

Focus on Autism	1739
Bianca De Filippis, Emilia Romano, and Giovanni Laviola	

Propionic Acid Animal Model of Autism	1755
Sandy R. Shultz and Derrick F. MacFabe	

Prenatal Exposure to Valproate in Animals and Autism	1779
Victorio Bambini-Junior, Diego Baronio, Janine MacKenzie, Geancarlo Zanatta, Rudimar dos Santos Riesgo, and Carmem Gottfried	

Neural Dynamics of Autistic Behaviors: Learning, Recognition, Attention, Emotion, Timing, and Social Cognition	1795
Stephen Grossberg	

Integrating Pathogenic Models of Autism: Pathway and Network Analysis	1831
Christian Barth, Azhari Aziz, and Naomi Bishop	

Volume 4

Section XIII Asperger's Syndrome 1859

Clinical Characterization of Adults with Asperger's Syndrome	1861
C. Kanai, M. Tani, and N. Kato	

Facial Expression Decoding in Autistic and Asperger Children	1885
Simona Amenta, Chiara Ferrari, and Michela Balconi	

White Matter Brain Structure in Asperger's Syndrome	1905
Esther D. A. van Duin, Janneke Zinkstok, Grainne McAlonan, and Therese van Amelsvoort	

Autism and Asperger Syndrome: Language Use	1929
Jessica de Villiers, Peter Szatmari, and Susan Yang	

Section XIV Diet and Nutrition in Autism Spectrum Disorders 1953

Overweight and Obesity Epidemic: Weight Status in Individuals with Autism	1955
Amir Hossein Memari and Vahid Ziaee	

Assessment and Treatment of Feeding Problems among Children with Autism Spectrum Disorders	1973
Keith E. Williams and Laura Seiverling	
ASD and Food Allergy	1995
Harumi Jyonouchi	
ASD, Eating Problems, and Overlap with Anorexia and Bulimia Nervosa	2015
Maria Rastam and Elisabet Wentz	
Gastrointestinal Disorders and Autism	2035
Antonia Parmeggiani	
Intestinal Barrier in Autism	2047
Laura de Magistris, Annarita Picardi, Anna Sapone, Rita Cariello, Dario Siniscalco, Carmela Bravaccio, and Antonio Pascotto	
Sensory Sensitivity and Food Selectivity in Children with Autism Spectrum Disorders	2061
Sharon A. Cermak, Carol Curtin, and Linda Bandini	
Dietary Diversity in Children with Autism	2077
William G. Sharp, Rashelle C. Berry, Barbara O. McElhanon, and David L. Jaquess	
Section XV Treatments in Autism Spectrum Disorders: Non Pharmacological	2099
Educational Interventions for Young Children with Autism Spectrum Disorders	2101
Svein Eikeseth and Lars Klintwall	
Virtual Reality as Treatment Tool for Children with Autism	2125
Michelle Wang and Evdokia Anagnostou	
Strategies for Treatment of Autistic Dental Patients	2143
Robert E. Rada	
Treatment of Working Memory in Autism	2159
Jonathan Tarbox and Angela Persicke	
Computer Interventions for ASD	2173
Veronica Smith and Andrew Sung	
Complementary and Alternative Medicine for Autism	2191
Tae-Hun Kim, Myeong Soo Lee, Jiae Choi, and Edzard Ernst	
Acupuncture in Autism Spectrum Disorders	2203
Virginia C. N. Wong, Vanessa L. Y. Chu, and Daniel K. L. Cheuk	

Autism Spectrum Disorders and Massage Therapy	2233
Myeong Soo Lee, Ju Ah Lee, Tae-Yong Park, and Byung-Cheul Shin	
Behavioral Treatment of Stereotypic Behavior in Children with Autism	2247
Florence D. DiGennaro Reed, Jason M. Hirst, and Sarah R. Jenkins	
Social Story™ Interventions for Children with Autism Spectrum Disorders	2263
Anastasia Kokina and Louise A. Kaczmarek	
Autism, Parents, and Treatments for Their Children	2283
Kimberly A. Schreck	
Occupational Therapy for Children with Autism	2297
Sylvia Rodger and Helene J. Polatajko	
Section XVI Treatments in Autism: Pharmacological and Active Agents	2315
Reducing Aggression in ASD with Combined Medication and Behavioral Therapy	2317
Thomas W. Frazier, Rebecca Embacher, and Allison Frazier	
Chinese <i>Chan</i>-Based Prospective Neuropsychological Intervention for Autistic Children	2333
Agnes Sui Yin Chan, Yvonne Ming Yee Han, and Mei-chun Cheung	
Aripiprazole Use in ASD	2357
Adelaide S. Robb and Sinan O. Turnacioglu	
Clozapine Use in Autism Spectrum Disorders	2373
Olivier Guillin	
Melatonin Use in Autism Spectrum Disorders	2387
Sheila J. Asghar and Beth A. Malow	
Cholesterol Use in Autism Treatment	2403
Andrea Diaz-Stransky and Elaine Tierney	
Omega-3 Fatty Acids in the Treatment of Autism Spectrum Disorder	2427
Robert H. Belmaker and Gal Meiri	

Volume 5

Section XVII International Aspects and Ethnicity of Autism

Spectrum Disorders 2435

Identification of Autism Spectrum Disorders (ASD) in Africa:

Need for Shifting Research and Public Health Focus 2437

Mashudat A. Bello-Mojeed, Muideen Owolabi Bakare
and Kerim Munir

Autism in the African American Population 2455

Ruby M. Gourdine and Carl L. Algood

Autism Spectrum Disorders in Mexico 2469

Antonio Bravo Oro, Carmen Esmer, and María Elena
Navarro-Calvillo

Autism Spectrum Disorders: Perspective from Pakistan 2483

Nazish Imran and Muhammad Waqar Azeem

Autism: Challenge in Nepal 2497

Merina Shrestha and Susan L. Santangelo

Autism Spectrum Disorders in Developing Countries: Lessons from the Arab World 2509

Ghada R. A. Taha and Hanan Hussein

Autism as Viewed by French Parents 2533

Brigitte Chamak and Béatrice Bonniau

Behavior Analysis and Intervention for Children with

ASD at TOHUM: Turkish Perspectives 2545

Binyamin Birkan

Early Diagnosis of ASD in Toddlers and School Children:

Community Studies and National Surveys in Japan 2561

Yoko Kamio and Naoko Inada

Section XVIII Rett Syndrome 2579

Defining and Diagnosing Rett Syndrome: Correlating

Symptoms and Pathogenesis with Autism 2581

Alan K. Percy, Chris Chapleau, Jane B. Lane, and
Lucas Pozzo-Miller

Epilepsy in Rett Syndrome 2603

Ana Roche-Martinez, Judith Armstrong Morón,
Francesc X. Sanmartí Vilaplana, Itziar Alonso Colmenero,
Oscar Sans Capdevila, and Mercé Pineda Marfá

Biomarkers of Lipid Oxidative Damage in Rett Syndrome	2617
Claudio De Felice, Cinzia Signorini, Silvia Leoncini, Alessandra Pecorelli, Thierry Durand, Jean-Marie Galano, Camille Oger, Valérie Bultel-Poncé, Giuseppe Valacchi, Lucia Ciccoli, and Joussef Hayek	
Neuroprostanes and Neurological Severity in Rett Syndrome	2633
Claudio De Felice, Silvia Leoncini, Cinzia Signorini, Alessandra Pecorelli, Thierry Durand, Jean-Marie Galano, Alexandre Guy, Giuseppe Valacchi, Lucia Ciccoli, and Joussef Hayek	
Rett Syndrome and Sleep	2647
Nicolas Deconinck and Mouna Al Husni Al Keilani	
4HNE Protein Adducts in Autistic Spectrum Disorders: Rett Syndrome and Autism	2667
Giuseppe Valacchi, Alessandra Pecorelli, Cinzia Signorini, Silvia Leoncini, Lucia Ciccoli, Claudio De Felice, and Joussef Hayek	
Communication Skills in Girls with Rett Syndrome	2689
Theresa Bartolotta	
Auditory Brainstem Response in Rett Syndrome	2711
Joseph P. Pillion	
Modeling Rett Syndrome with MeCP2 T158A Knockin Mice	2723
Zhaolan Zhou and Darren Goffin	
Section XIX Fragile X	2741
Fragile X Syndrome and Autism	2743
Faraz Farzin and Kami Koldewyn	
Prevalence Studies on Fragile X Alleles in Autism	2755
Laia Rodriguez-Revenga, Irene Madrigal, and Montserrat Mila	
Medication Management of Fragile X Syndrome	2773
Craig A. Erickson, Logan K. Wink, Tori L. Schaefer, and Rebecca C. Shaffer	
Section XX Methods, Approaches, Procedures and Techniques in Autism Spectrum Disorders	2785
Autistic Behavior Checklist (ABC) and Its Applications	2787
Antonio Bravo Oro, María Elena Navarro-Calvillo, and Carmen Esmer	

Assessment of Co-occurring Emotional and Behavioral Disorders in Youth with ASD Using the Child Behavior Checklist 6–18	2799
Vincent Pandolfi and Caroline I. Magyar	
Modified Checklist for Autism in Toddlers (M-CHAT): Validation and Correlates in Infancy	2813
Kristyn Wright and Diane Poulin-Dubois	
Portable Data Assistants for Data Collection in Autism Treatment	2835
Seth Whiting and Mark Dixon	
Autism: Comparative Genomics and Interactomics	2853
Christian Barth and Naomi Bishop	
Functional Behavior Assessments for Challenging Behavior in Autism	2881
Olive Healy and Denise Brett	
Altered Brain Development: Delay in Emergence of Self-Representation in Children with ASD	2903
Dennis P. Carmody	

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