

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

Comprehensive Guide to Autism



SpringerReference

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Comprehensive Guide to Autism

With 495 Figures and 352 Tables

 Springer Reference

Editors

Vinood B. Patel
Department of Biomedical Sciences
Faculty of Science & Technology
University of Westminster
London, UK

Colin R. Martin
Faculty of Society and Health
Buckinghamshire New University
Middlesex, UK
West London Mental Health NHS Trust
London, UK

Victor R. Preedy
Nutritional Sciences Division
and Genomics Centre
King's College London
London, UK

Department of Clinical Biochemistry
King's College Hospital
London, UK

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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.

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Contributors

Morsi Abdallah Department of Child and Adolescent Neuropsychiatry, University of Rostock, Rostock, Germany

Pasquale J. Accardo Department of Developmental Research in Pediatrics, Virginia Commonwealth University, Virginia Commonwealth University Child Developmental Clinic, Richmond, VA, USA

Lauren B. Adamson Department of Psychology, Georgia State University, Atlanta, GA, USA

Hojjat Adeli Neurological Surgery, Columbus, OH, USA

Mehran Ahmadlou Netherlands Institute for Neuroscience, Amsterdam, Netherlands

Hironori Akechi Japan Society for the Promotion of Science, Tokyo, Japan
Division of Information System Design, Tokyo Denki University, Saitama, Japan

Mouna Al Husni Al Keilani Department of Neurology, Université Libre de Bruxelles (ULB), Hôpital Universitaire des Enfants Reine Fabiola, Brussels, Belgium

Yahya M. Al-Farsi College of Medicine and Health Sciences, Sultan Qaboos University, Al Khod, Oman

Carl L. Algood School of Social Work, Howard University, Washington, DC, USA

Itziar Alonso Colmenero Department of Child Neurology, Child Neurophysiology, Sant Joan de Déu Children's Hospital, Esplugues-Barcelona, Spain

Marwan M. Al-Sharbaty Department of Behavioral Medicine, Sultan Qaboos University, College of Medicine and Health Sciences, Al-Khoudh, Sultanate of Oman

Mark D. Alter Department of Psychiatry, University of Pennsylvania, Center for Neurobiology and Behavior, Philadelphia, PA, USA

Therese van Amelsvoort Department of Psychiatry and Psychology, Maastricht University, Maastricht, Netherlands

Simona Amenta Department of Psychology, University of Milano-Bicocca, Milano, Italy

Evdokia Anagnostou Department of Pediatrics, University of Toronto, Bloorview Research Institute, Toronto, ON, Canada

Jeffrey S. Anderson Department of Neuroradiology, University of Utah, Salt Lake City, UT, USA

Lisa M. J. Andersen Northern Stockholm Psychiatry, St Göran Hospital, Stockholm, Sweden

Nicola Antonucci Biomedical Centre for Autism Research and Treatment, Bari, Italy

Kevin M. Antshel Department of Psychiatry and Behavioral Sciences, SUNY Upstate Medical University, Syracuse, NY, USA

Judith Armstrong Morón Molecular Genetics Department, Hospital Sant Joan de Déu, Edifici Docent, Esplugues-Barcelona, Spain

Sheila J. Asghar Department of Pediatrics, College of Medicine, University of Arkansas for Medical Sciences, Little Rock, AR, USA

Muhammad Waqar Azeem Albert J Solnit Children's Center Yale Child Study Center, Yale University School of Medicine, Middletown, CT, USA

Azhari Aziz Department of Microbiology, La Trobe University, Bundoora Campus, Melbourne, VIC, Australia

Efrain C. Azmitia Department of Biology, New York University, New York, NY, USA

Muideen Owolabi Bakare Child and Adolescent Unit, Federal Neuropsychiatric Hospital, Enugu, Enugu State, Nigeria

Trine Lise Bakken Oslo University Hospital, Asker, Norway

Vanessa Hus Bal University of Michigan, Ann Arbor, MI, USA

Michela Balconi Department of Psychology, Catholic University of Milan, Milan, Italy

Victorio Bambini-Junior Departamento de Bioquímica, Universidade Federal do Rio Grande do sul, Instituto de Ciências Básicas da Saúde, Porto Alegre, RS, Brazil

Linda Bandini University of Massachusetts Medical School Eunice Kennedy Shriver Center, Waltham, MA, USA

Department of Health Sciences, Boston, MA, USA

Brian D. Barger Department of Educational Psychology, University of Georgia, Athens, GA, USA

Erin T. Barker Department of Psychology, Concordia University, Montreal, QC, Canada

Naama Barnea-Goraly Center for Interdisciplinary Brain Sciences Research, Stanford University, Stanford, CA, USA

Diego Baronio Programa de Pós-Graduação em Saúde da Criança e do Adolescente, Universidade Federal do Rio Grande do Sul, Faculdade de Medicina, Porto Alegre, RS, Brazil

Benjamin Bar-Oz Department of Neonatology, Hadassah Medical Center, Ein-Kerem, Israel

Christian Barth Department of Microbiology, La Trobe University, Bundoora Campus, Melbourne, VIC, Australia

Theresa Bartolotta Office of the Provost, Seton Hall University, South Orange, NJ, USA

Andrea Barton-Hulsey Department of Psychology, Georgia State University, Atlanta, GA, USA

Susanne Bejerot Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden

Aysenil Belger Department of Psychiatry, The University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC, USA

Mashudat A. Bello-Mojeed Child and Adolescent Unit, Federal Neuro-Psychiatric Hospital, Lagos, Nigeria

Robert H. Belmaker Ben Gurion University of the Negev, Beersheba, Israel

Esther Ben-Itzhak Department of Communication Disorders, Ariel University, Ariel, Israel

Andrew D. Benson Department of Psychiatry and Behavioral Sciences, Eastern Virginia Medical School, Norfolk, VA, USA

Leandra N. Berry Baylor College of Medicine, Texas Children's Hospital, Houston, TX, USA

Rashelle C. Berry Pediatric Psychology and Feeding Disorders Program, Marcus Autism Center, Atlanta, GA, USA

Christina D. Bethell Department of Pediatrics, Oregon Health and Science University, School of Medicine, Portland, OR, USA

Binyamin Birkan Cumhuriyet Mah. Abide-i Hurriyet Cad. No.: 39, TOHUM Otizm Vakfi and Istanbul Aydin Universitesi, Sisli/Istanbul, Turkey

Naomi Bishop Department of Microbiology, La Trobe University, Bundoora Campus, Melbourne, VIC, Australia

Jan Blacher Graduate School of Education, University of California, SEARCH Family Autism Resource Center, Riverside, CA, USA

Gene J. Blatt Anatomy and Neurobiology, Boston University School of Medicine, Boston, MA, USA

Russell L. Blaylock Theoretical Neurosciences Research, LLC, Belhaven University, Jackson, MS, USA

Sofia Blazevic Department of Animal Physiology, University of Zagreb, Faculty of Science, Zagreb, Croatia

Susan Maria Bögels Child Development and Education, University of Amsterdam, Amsterdam, Netherlands

Béatrice Bonniau CERMES3-INSERM U988-CNRS UMR 8211-EHESS, Paris Descartes University, Paris, France

Brian Boyd Department of Allied Health Sciences, Division of Occupational Science and Occupational Therapy, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

John Bradshaw School of Psychology and Psychiatry, Monash University, Notting Hill, VIC, Australia

Paolo Brambilla Dipartimento di Patologia e Medicina Clinica e Sperimentale, University of Udine, Udine, Italy

Department of Psychiatry and Behavioral Sciences, University of Texas Medical School at Houston, Houston, USA

Carmela Bravaccio Department of Pediatrics, University Federico II, Naples, Italy

Antonio Bravo Oro Departamento de Neuropediatría, Hospital Central Dr. Ignacio Morones Prieto, San Luís Potosí, S.L.P, Mexico

Denise Brett School of Psychology, National University of Ireland - Galway, Galway, Ireland

Susan E. Bryson Autism Research Centre, IWK Health Centre, Halifax, NS, Canada

Valérie Bultel-Poncé Institut des Biomolécules Max Mousseron (IBMM), UMR 5247 – CNRS – UM I – UM II, Montpellier, France

J. Peter H. Burbach Department of Neuroscience and Pharmacology, Brain Center Rudolf Magnus, University Medical Center Utrecht, Utrecht, Netherlands

Jessica A. Burket Department of Psychiatry and Behavioral Sciences, Eastern Virginia Medical School, Norfolk, VA, USA

Tiziana Cabras Dipartimento di Scienze della Vita e dell' Ambiente, Cittadella Universitaria di Monserrato, Università degli Studi di Cagliari, Monserrato (CA), Italy

Jonathan M. Campbell Department of Educational, School, and Counseling Psychology, University of Kentucky, Lexington, KY, USA

Rita Cariello Department Magrassi-Lanzara and Centro Interuniversitario per ricerche su alimenti, nutrizione e apparato digerente (CIRANAD), Second University of Naples, Naples, Italy

Dennis P. Carmody School of Nursing, Rutgers University, Newark, NJ, USA

Kimberly L. H. Carpenter Duke University, Durham, NC, USA

Manuel F. Casanova Department of Psychiatry and Behavioral Sciences, University of Louisville, Louisville, KY, USA

Laura Baylot Casey The University of Memphis, Memphis, TN, USA

Antonio Cassella Mérida State Institute of Research of Social Intelligence and Autism (IMERISYA), Zea Mérida, Venezuela

Massimo Castagnola Facoltà di Medicina, Università Cattolica, Istituto di Biochimica e Biochimica Clinica, Roma, Italy

Sharon A. Cermak Division of Occupational Science and Occupational Therapy at the Ostrow School of Dentistry, University of Southern California, Professor of Pediatrics at the USC Keck School of Medicine Children's Hospital Los Angeles, Los Angeles, CA, USA

Brigitte Chamak CERMES3-INSERM U988-CNRS UMR 8211-EHESS, Paris Descartes University, Paris, France

Agnes Sui Yin Chan Department of Psychology, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong

Chanwuyi Research Center for Neuropsychological Well-Being, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong

Henan Songshan Research Institute for Chanwuyi, Henan, China

Chris Chappleau Department of Pharmacy, The University of Alabama Birmingham, Birmingham, AL, USA

Gregory Chasson Department of Psychology, Towson University, Towson, MD, USA

Daniel K. L. Cheuk Department of Paediatrics and Adolescent Medicine, The University of Hong Kong, Queen Mary Hospital, Hong Kong SAR, China

Mei-chun Cheung Institute of Textiles and Clothing, The Hong Kong Polytechnic University, Kowloon, Hong Kong

Jiae Choi Medical Research Division, Korea Institute of Oriental Medicine, Daejeon, South Korea

Vanessa L. Y. Chu Department of Paediatrics and Adolescent Medicine, The University of Hong Kong, Queen Mary Hospital, Hong Kong SAR, China

Marie Cianca Ralph C. Wilson Jr. School of Education, St. John Fisher College, Rochester, NY, USA

Lucia Ciccoli Department of Molecular and Developmental Medicine, University of Siena, Siena, Italy

Ira L. Cohen Department of Psychology, NYS Institute for Basic Research in Developmental Disabilities, Staten Island, NY, USA

Shana R. Cohen Graduate School of Education, University of California, SEARCH Family Autism Resource Center, Riverside, CA, USA

Elisabeth Conradt Departments of Psychiatry and Human Behavior and Pediatrics, Alpert Medical School of Brown University, Brown Center for the Study of Children at Risk, Providence, RI, USA

Dorota Anna Crawford Department of Biology, York University, Faculty of Health, Toronto, ON, Canada

John W. M. Creemers Department of Human Genetics, and Leuven autism Research Consortium (LAuRes), KU Leuven, Laboratory for Biochemical Neuroendocrinology, Leuven, Belgium

Charles R. Crowell Department of Psychology, University of Notre Dame, Notre Dame, IN, USA

Carol Curtin Family Medicine & Community Health, University of Massachusetts Medical School Eunice Kennedy Shriver Center, Waltham, MA, USA

Amy R. Darragh School of Health and Rehabilitation Sciences, The Ohio State University, Columbus, OH, USA

Michael Datko Department of Cognitive Science, University of California, San Diego, CA, USA

Claudio De Felice Neonatal Intensive Care Unit, University Hospital, Azienda Ospedaliera Universitaria Senese, Siena, Italy

Bianca De Filippis Sect. Behavioural Neuroscience, Dept. Cell Biology & Neuroscience, Istituto Superiore di Sanità, Roma, Italy

Gianluca De Leo College of Health Sciences, Old Dominion University, Norfolk, VA, USA

Nicolas Deconinck Department of Neurology, Université Libre de Bruxelles (ULB), Hôpital Universitaire des Enfants Reine Fabiola, Brussels, Belgium

Richard Deth Department of Pharmaceutical Sciences, Northeastern University, Boston, MA, USA

Stephen I. Deutsch Department of Psychiatry and Behavioral Sciences, Eastern Virginia Medical School, Norfolk, VA, USA

Jamie DeWitt Department of Pharmacology and Toxicology, East Carolina University, Greenville, NC, USA

Andrea Diaz-Stransky Psychiatry and Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD, USA

Joshua J. Diehl Department of Psychology, University of Notre Dame, Notre Dame, IN, USA

Rodney R. Dietert Department of Microbiology and Immunology, College of Veterinary Medicine, Ithaca, NY, USA

Mark Dixon Rehabilitation Institute, Southern Illinois University, Carbondale, IL, USA

Brynn Dombroski University of Louisville, Louisville, KY, USA

Esther D. A. van Duin Department of Psychiatry, Academic Medical Centre, Amsterdam, Netherlands

Thierry Durand Institut des Biomolécules Max Mousseron (IBMM), UMR 5247 – CNRS – UM I – UM II, Montpellier, France

Martina Dwyer School of Psychology, National University of Ireland - Galway, Galway, Ireland

Svein Eikeseth Department of Behavioral Sciences, Oslo and Akershus University College, Oslo, Norway

Rebecca Embacher Center for Autism, The Cleveland Clinic, Cleveland, OH, USA

Peter Enticott Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne, VIC, Australia

Craig A. Erickson Division of Child and Adolescent Psychiatry, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, USA

Jonna M. Eriksson Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden

Edzard Ernst Complementary Medicine, Peninsula Medical School, Universities of Exeter and Plymouth, Exeter, UK

Carmen Esmer Department of Neurogenetics, Hospital Central Dr. Ignacio Morones Prieto, San Luís Potosí, S.L.P., Mexico

Smadar Eventov-Freidman Hadassah University Hospital, Ein-Kerem, Israel

Chiara Fanali Centro Integrato di Ricerca, Università Campus Bio-Medico, Facoltà di Medicina e Chirurgia, Roma, Italy

Faraz Farzin Department of Psychology, Stanford University, Stanford, CA, USA

Claudio De Felice Neonatal Intensive Care Unit, University Hospital, Azienda Ospedaliera Universitaria Senese, Siena, Italy

Chiara Ferrari Laboratory of Cognitive Psychology, Catholic University of Milan, Milan, Italy

Department of Brain and Behavioural Sciences, University of Pavia, Pavia, Italy

Joanne Fielding School of Psychology and Psychiatry, Ocular Motor Research Unit, Monash University, Clayton, VIC, Australia

Allison Frazier Center for Autism, Cleveland Clinic Center for Autism Outreach Department, Cleveland, OH, USA

Thomas W. Frazier Center for Autism, The Cleveland Clinic, Cleveland, OH, USA

Takako Fujita Department of Pediatrics, Fukuoka University School of Medicine, Fukuoka, Japan

Jean-Marie Galano Institut des Biomolécules Max Mousseron (IBMM), UMR 5247 – CNRS – UM I – UM II, Montpellier, France

Hannah Gardener Department of Neurology, University of Miami Miller School of Medicine, Miami, FL, USA

J. Jay Gargus Department of Physiology and Biophysics and Section of Human Genetics, Pediatrics, University of California, School of Medicine, Irvine, CA, USA

Jozef Gez School of Paediatrics and Reproductive Health, The University of Adelaide, Adelaide, Australia

Mark Geier The Institute of Chronic Illnesses, Inc, Silver Spring, MD, USA

David A. Geier The Institute of Chronic Illnesses, Inc, Silver Spring, MD, USA

Banafsheh Ghaheri Faculty of Physical Education & Sport Sciences, University of Tehran, Tehran, Iran

Laura Gilmour Special Education, Department of Educational Psychology, University of Alberta, Edmonton, AB, Canada

Darren Goffin School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

Matthew S. Goodwin Department of Health Sciences, Northeastern University, Bouvé; College of Health Science & College of Computer and Information Science, Boston, MA, USA

Carmem Gottfried Departamento de Bioquímica, Universidade Federal do Rio Grande do Sul, Instituto de Ciências Básicas da Saúde, Porto Alegre, RS, Brazil

Ruby M. Gourdine School of Social Work, Howard University, Washington, DC, USA

Corinna F. Grindle School of Psychology, Bangor University, Adeilad Brigantia, Gwynedd, UK

Stephen Grossberg Department of Cognitive and Neural Systems, Boston University, Center for Adaptive Systems, Boston, MA, USA

Ruth Gross-Isseroff Geha Mental Health Center, PetachTikva, Israel

Olivier Guillin Department of Psychiatry 3, Centre Hospitalier du Rouvray, Rouvray, France

Ishita Gupta Department of Genetics, Sultan Qaboos University, College of Medicine and Health Sciences, Al-Khoudh, Sultanate of Oman

Fiorella Gurrieri Istituto di Genetica Medica, Università Cattolica, Facoltà di Medicina, Roma, Italy

Alexandre Guy Institut des Biomolécules Max Mousseron (IBMM), UMR 5247 – CNRS – UM I – UM II, Montpellier, France

Yvonne Ming Yee Han Department of Special Education & Counselling, The Hong Kong Institute of Education, Tai Po, New Territories, Hong Kong

Joussef Hayek Child Neuropsychiatry Unit, University Hospital, Azienda Ospedaliera Universitaria Senese, Siena, Italy

Olive Healy School of Psychology, National University of Ireland - Galway, Galway, Ireland

Amy L. Herndon Department of Psychiatry and Behavioral Sciences, Eastern Virginia Medical School, Norfolk, VA, USA

Bridget O. Hier Department of Psychology, Syracuse University, Syracuse, NY, USA

Jason M. Hirst 4001 Dole Human Development Center, University of Kansas, Lawrence, KS, USA

Nathaniel W. Hodgson Northeastern University, Boston, MA, USA

Jennifer Holloway School of Psychology, National University of Ireland - Galway, Galway, Ireland

Dubravka Hranilovic Department of Animal Physiology, University of Zagreb, Faculty of Science, Zagreb, Croatia

Sarah Hurwitz Department of Psychology, The Hebrew University of Jerusalem, Jerusalem, Israel

Hanan Hussein Institute of Psychiatry (WHO Collaborating Center for Training and Research), Department of Neuropsychiatry, Ain Shams University, Cairo, Egypt

Federica Iavarone Facoltà di Medicina, Università Cattolica, Istituto di Biochimica e Biochimica Clinica, Roma, Italy

Allyson Impallomeni Department of Biology, New York University, New York, NY, USA

Nazish Imran Department of Child & Family Psychiatry, King Edward Medical University/Mayo Hospital, Lahore, Pakistan

Naoko Inada Department of Child and Adolescent Mental Health, National Center of Neurology and Psychiatry, National Institute of Mental Health, Tokyo, Japan

Dwight Irvin Juniper Gardens Children's Project, University of Kansas, Kansas City, KS, USA

David L. Jaquess Pediatric Psychology and Feeding Disorders Program, Marcus Autism Center, Atlanta, GA, USA

Sara R. Jarosiewicz Department of Psychology, Towson University, Towson, MD, USA

Sarah R. Jenkins 4001 Dole Human Development Center, University of Kansas, Lawrence, KS, USA

Jakob Åsberg Johnels Gillberg Neuropsychiatry Centre, University of Gothenburg, Gothenburg, Sweden

Beth Johnson School of Psychology and Psychiatry, Ocular Motor Research Unit, Monash University, Clayton, VIC, Australia

Helen M. Johnson Warren Alpert Medical School of Brown University, Providence, RI, USA

Lachlan Jolly School of Paediatrics and Reproductive Health, The University of Adelaide, Adelaide, Australia

Ashley Juavinett Group in Neurosciences, University of California, San Diego, CA, USA

Kristina Julich Department of Neurology, Children's Hospital Boston, Harvard Medical School, Boston, MA, USA

Harumi Jyonouchi Department of Pediatrics, University of Medicine and Dentistry - New Jersey Medical School, F570A, MSB, Newark, NJ, USA

Louise A. Kaczmarek Department of Instruction and Learning, University of Pittsburgh, School of Education, Pittsburgh, PA, USA

Yoko Kamio Department of Child and Adolescent Mental Health, National Center of Neurology and Psychiatry, National Institute of Mental Health, Tokyo, Japan

C. Kanai Department of Education and Child Studies, Faculty of Arts & Sciences, Sagami Women's University, Sagamihara, Kanagawa, Japan

Department of Psychiatry, Showa University Karasuyama Hospital, Setagayaku, Tokyo, Japan

Japan Science and Technology Agency, CREST, Tokyo, Japan

Tal Karmi Department of Microbiology, La Trobe University, Bundoora Campus, Melbourne, VIC, Australia

Anat Kasirer School of Education, Bar-Ilan University, Ramat-Gan, Israel

N. Kato Department of Psychiatry, Showa University Karasuyama Hospital, Setagayaku, Tokyo, Japan

Japan Science and Technology Agency, CREST, Tokyo, Japan

Showa University Graduate School of Nursing and Rehabilitation, Karasuyama Hospital, Setagayaku, Tokyo, Japan

Janet K. Kern The Institute of Chronic Illnesses, Inc, Silver Spring, MD, USA

So Hyun Kim Yale Child Study Center, Yale School of Medicine, New Haven, CT, USA

Tae-Hun Kim Medical Research Division, Korea Institute of Oriental Medicine, Daejeon, South Korea

Paul G. King The Coalition for Mercury-free Drugs (CoMeD, Inc.), Lake Hiawatha, NJ, USA

Lars Klintwall Department of Behavioral Sciences, Oslo and Akershus University College, Oslo, Norway

Harumi Kobayashi Division of Information System Design, Tokyo Denki University, Saitama, Japan

Michael Kogan Maternal and Child Health Bureau, Health Resources and Services Administration, Rockville, MD, USA

Laszlo Kohidai Department of Genetics, Cell- and Immunobiology, Semmelweis University, Budapest, Hungary

Anastasia Kokina Department of Instruction and Learning, University of Pittsburgh, School of Education, Pittsburgh, PA, USA

Kami Koldewyn Department of Brain Sciences, Massachusetts Institute of Technology, McGovern Institute for Brain Research, Cambridge, MA, USA

Nina Koren-Karie Center for the Study of Child Development and School of Social Works, University of Haifa, Haifa, Israel

Yan Grace Lam Department of Psychological Studies, Hong Kong Institute of Education, Taipo, New Territories, Hong Kong

Jane B. Lane Department of Pediatrics/Neurology Civitan International Research Center, UAB Rett Syndrome Clinic, The University of Alabama at Birmingham, Birmingham, AL, USA

Frederic Laumonier INSERM U930, Genetics of Autism and Mental Retardation, Universite Francois-Rabelais, Tours cedex, France

Giovanni Laviola Sect. Behavioural Neuroscience, Dept. Cell Biology & Neuroscience, Istituto Superiore di Sanità, Roma, Italy

Ju Ah Lee Medical Research Division, Korea Institute of Oriental Medicine, Daejeon, South Korea

Myeong Soo Lee Medical Research Division, Korea Institute of Oriental Medicine, Daejeon, South Korea

Silvia Leoncini Department of Molecular and Developmental Medicine, University of Siena, Siena, Italy

Child Neuropsychiatry Unit, University Hospital, Azienda Ospedaliera Universitaria Senese, Siena, Italy

Barry Lester Departments of Psychiatry and Human Behavior and Pediatrics, Alpert Medical School of Brown University, Brown Center for the Study of Children at Risk, Providence, RI, USA

Todd P. Levine Brown Center for the Study of Children at Risk, Women and Infants' Hospital of Rhode Island, Providence, RI, USA

Olivia Lindly Department of Pediatrics, Oregon Health and Science University, School of Medicine, Portland, OR, USA

Catherine Lord Center for Autism and the Developing Brain, New York-Presbyterian Hospital/Westchester Division, White Plains, NY, USA

Margaret Lubas College of Health Sciences, Old Dominion University, Norfolk, VA, USA

Kristen Lyall University of California Davis, Davis, CA, USA

Sinead Lydon School of Psychology, National University of Ireland - Galway, Galway, Ireland

Derrick F. MacFabe Departments of Psychology and Psychiatry and Division of Developmental Disabilities, University of Western Ontario, The Kilee Patchell-Evans Autism Research Group, London, ON, Canada

Janine MacKenzie Department of Psychology, University of Manitoba, BC, Canada

Irene Madrigal Biochemistry and Molecular Genetics Department, Hospital Clínic, Barcelona, Spain

Toshihiko Maekawa Department of Clinical Neurophysiology, Kyushu University, Neurological Institute, Graduate School of Medical Sciences, Fukuoka, Japan

Iliana Magiati Department of Psychology, National University of Singapore, Singapore

Laura de Magistris Department Magrassi-Lanzara and Centro Interuniversitario per ricerche su alimenti, nutrizione e apparato digerente (CIRANAD), Second University of Naples, Naples, Italy

Caroline I. Magyar School of Medicine and Dentistry, University of Rochester Medical Center, Rochester, NY, USA

Marsha R. Mailick Waisman Center, University of Wisconsin-Madison, Madison, WI, USA

Sabatino Maione Department of Experimental Medicine, Second University of Naples, Naples, Italy

Beth A. Malow Vanderbilt Kennedy Center, Vanderbilt University, Nashville, TN, USA

David Mankuta Hadassah University Hospital, Ein-Kerem, Israel

Matthew J. Marzelli Department of Psychiatry, Stanford University School of Medicine, Center for Interdisciplinary Brain Sciences Research, Stanford, CA, USA

Nira Mashal School of Education, Bar-Ilan University, Ramat-Gan, Israel

Susan Mayes Penn State College of Medicine, Hershey, PA, USA

Grainne McAlonan National Institute for Health Research (NIHR) Biomedical Research Centre for Mental Health at South London and Maudsley NHS Foundation Trust and Institute of Psychiatry King's College London, Institute of Psychiatry, London, UK

Barbara O. McElhanon Pediatric Gastroenterology, Hepatology and Nutrition, Emory University School of Medicine, Atlanta, GA, USA

Jennifer McGinley Physiotherapy, Centre for Movement Disorders and Gait Research, Southern Health, The University of Melbourne, Parkville, VIC, Australia

James Meindl Instruction and Curriculum Leadership, The University of Memphis, Memphis, TN, USA

Gal Meiri Department of Psychiatry, Ben Gurion University of the Negev, Soroka University Medical Center, Israel

Amir Hossein Memari Sports Medicine Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

Paola Mengotti Neuroscience Area, SISSA, Trieste, Italy

Irene Messana Dipartimento di Scienze della Vita e dell' Ambiente, Cittadella Universitaria di Monserrato, Università degli Studi di Cagliari, Monserrato (CA), Italy

Tanja Michel Department of Psychiatry and Psychotherapy, Rostock University Hospital, University of Rostock, Rostock, Germany

Montserrat Mila Biochemistry and Molecular Genetics Department, Hospital Clínic, Barcelona, Spain

Judith S. Miller Center for Autism Research, Children's Hospital of Philadelphia, Philadelphia, PA, USA

Jennifer R. Mitchell Technical and Training Assistance Centre, Old Dominion University, Norfolk, VA, USA

Ralph-Axel Müller SDSU Department of Psychology, San Diego State University, San Diego, CA, USA

Eugenio Monasterio Department of Physical Medicine and Rehabilitation, Virginia Commonwealth University, Richmond, VA, USA

Guillermo Montes Ralph C. Wilson Jr. School of Education, St. John Fisher College, Rochester, NY, USA

Alessandra Morelli Dipartimento di Scienze Pediatriche Medico Chirurgiche e Neuroscienze dello Sviluppo, Università Cattolica, Cattedra di Neuropsichiatria Infantile, Istituto di Neurologia, Facoltà di Medicina e Chirurgia, Roma, Italy

Kerim Munir The Children's Hospital, Boston, Harvard Medical School, Boston, MA, USA

Christina R. Muratore Center for Neurological Diseases, Harvard Medical School, Boston, MA, USA

Valerio Napolioni Unit of Child and Adolescent Psychiatry, University “Campus Bio-Medico”, Rome, Italy

María Elena Navarro-Calvillo Department of Postgrado, Universidad Autónoma de San Luís Potosí, San Luís Potosí, S.L.P., Mexico

Giovanni Neri Istituto di Genetica Medica, Università Cattolica, Facoltà di Medicina, Roma, Italy

Addie May Nesbitt Department of Psychiatry, University of Pennsylvania, Perelman School of Medicine, Philadelphia, PA, USA

Lam Son Nguyen School of Paediatrics and Reproductive Health, The University of Adelaide, Adelaide, Australia

Thomas Nickl-Jockschat Department of Psychiatry, Psychotherapy and Psychosomatics, RWTH Aachen University, Aachen, Germany

Kim Nuytens Department of Human Genetics, KU Leuven, Laboratory of Biochemical Neuroendocrinology, Leuven, Belgium

Lena Nylander Department of Psychiatry, Clinical Sciences, Lund University, Lund, Sweden

Camille Oger Institut des Biomolécules Max Mousseron (IBMM), UMR 5247 – CNRS – UM I – UM II, Montpellier, France

David Oppenheim Center for the Study of Child Development and School of Social Works, University of Haifa, Haifa, Israel

Lisa A. Osborne Long-term and Chronic Conditions Centre, Swansea University, College of Medicine, Swansea, UK

Donald Oswald Commonwealth Autism Service, Richmond, VA, USA

Allal Ouhitit Department of Genetics, Sultan Qaboos University, College of Medicine and Health Sciences, Al-Khoudh, Sultanate of Oman

Juhi Pandey Department of Psychology, University of Connecticut, Storrs, CT, USA

Vincent Pandolfi Department of Psychology, Rochester Institute of Technology, Rochester, NY, USA

Nicole Papadopoulos Centre for Developmental Psychiatry and Psychology, Monash University, School of Psychology, Psychiatry, and Psychological Medicine, Notting Hill, VIC, Australia

Tae-Yong Park Division of Clinical Medicine, Wonkwang University, Oriental Medicine, Gunpo, South Korea

Antonia Parmeggiani IRCCS Institute of Neurological Sciences and Department of Medical and Surgical Sciences, University of Bologna, Bologna, Italy

Antonio Pascotto Department of Neuropsychiatry, Psychiatry and Dermatovenereology, Second University of Naples, Naples, Italy

Elena Patten Department of Communication Sciences and Disorders, University of North Carolina Greensboro, Greensboro, NC, USA

Anna Maria Pecoraro Dipartimento di Scienze Pediatriche Medico Chirurgiche e Neuroscienze dello Sviluppo, Università Cattolica, Cattedra di Neuropsichiatria Infantile, Istituto di Neurologia, Facoltà di Medicina e Chirurgia, Roma, Italy

Alessandra Pecorelli Department of Molecular and Developmental Medicine, University of Siena, Siena, Italy

Child Neuropsychiatry Unit, University Hospital, Azienda Ospedaliera Universitaria Senese, Siena, Italy

Alan K. Percy Department of Pediatrics/Neurology Civitan International Research Center, UAB Rett Syndrome Clinic, The University of Alabama at Birmingham, Birmingham, AL, USA

Sean Perrin Department of Psychology, Lund University, Lund, Sweden

Angela Persicke Center for Autism and Related Disorders, Tarzana, CA, USA

Antonio Maria Persico Unit of Child and Adolescent Psychiatry, University “Campus Bio-Medico”, Rome, Italy

Annarita Picardi Department of Experimental Medicine, Dottorato di Ricerca “Alimenti e Salute”, Second University of Naples, Naples, Italy

Joseph P. Pillion Department of Audiology, Kennedy Krieger Institute, Baltimore, MD, USA

Jaime A. Pineda Department of Cognitive Science, University of California, San Diego, CA, USA

Mercé Pineda Marfá Department of Child Neurology, Sant Joan de Déu Children’s Hospital, Esplugues-Barcelona, Spain

Kris Pizur-Barnekow Department of Occupational Science and Technology, University of Wisconsin-Milwaukee, College of Health Sciences, Milwaukee, WI, USA

Helene J. Polatajko Department of Occupational Therapy, Faculty of Medicine, University of Toronto, Toronto, ON, Canada

Diane Poulin-Dubois Department of Psychology, Concordia University, Montreal, QC, Canada

Lucas Pozzo-Miller Department of Neurobiology, The University of Alabama at Birmingham, Birmingham, AL, USA

Robert E. Rada College of Dentistry, University of Illinois, LaGrange, IL, USA