

Preface *to the special issue of autism*

Autism spectrum disorder (ASD), the fastest-growing complex neurodevelopment disorder, continues to rise in its prevalence, now affecting up to 1 in 50 children in the USA, and averaging 1% globally, according to the latest CDC report. More children will be diagnosed with ASD this year than with AIDS, diabetes & cancer combined in the USA. ASD costs the nation \$137 billion a year and this debt is expected to increase in the next decade. Hence, ASD has become a huge healthcare burden and global threat, categorized by the CDC as a national public health crisis.

ASD is characterized by social-communication impairment, and restricted, repetitive, and stereotyped patterns of behavior, which cause significant disability for those affected. With its etiology still largely unknown, and its pathophysiology poorly understood, ASD currently has no universally accepted therapy. ASD is affecting more and more families; unmet services and limited resources need to be addressed urgently. Researchers, clinicians, healthcare providers, social agencies and government need to coordinate efforts to develop more effective treatments and a satisfactory continuum of care, across the lifespan. Ultimately, a cure needs to be sought for the various subtypes of ASD that exist.

The current issue of North American Journal of Medicine and Science (NAJMS) represents a continuation of our previous two special issues on autism (NAJMS Vol. 5 Issue 3 and Vol. 4 Issue 3) published in July 2012 and July 2011, respectively. In this issue, we are honored to have another panel of expert researchers and clinicians on the frontlines of ASD research and treatment to present their newest research findings and views from different perspectives.

This issue of NAJMS consists of five original research articles, two comprehensive reviews, one case report and two commentary articles, covering topics in genetics, pathogenesis, metabolic disorder biomarkers of ASD, and a clinical study, that bring into focus our newest understanding and treatment strategies.

This issue opens with an exciting presentation of Dr. Hu's original research to study the class prediction methods for identifying potential biomarkers of idiopathic autism based upon gene expression profiling of (LCL), which established via a proof-of-concept investigation that individuals with idiopathic autism can be segregated from non-autistic controls.

The presentation of Dr. Frye's original research helps to clarify mechanisms of BH4 transport across the blood brain barrier (BBB) into the central nervous system. He has hypothesized that BH4 may use some of the same mechanisms as folate, since both folate and BH4 are pterin derivatives. This work has further established that there is a

relationship between serum FRα autoantibody titers and CSF BH4 concentration.

Following this, Dr. Silva's original research article presents evidence that signs of tactile impairment suggestive of sensory neuropathy are nearly universally present in young children with ASD. The tactile impairment appears to be directly related to severe delays of early self-regulation milestones needed for social development, and suggests that a definitive evaluation of the sense of touch in ASD to rule out and address sensory neuropathy might contribute to an improved clinical outcome.

In next study, Dr. Doody has set out to research the types of play most often preferred by children with ASD. The results support the researchers' hypotheses that children with ASD prefer play activities with a strong sensory component and are far less likely to engage in activities involving pretend play.

The data presented in Dr. Mumper's review of the medical literature, suggests that ASD may be impacted by environmental toxicants, duration of breastfeeding, gut flora composition, nutritional status, acetaminophen use, vaccine practices and use of antibiotics and/or frequency of infections. In her current general pediatric practice (Advocates for Children), she has noted a modest trend toward a lower prevalence of ASD than in her previous pediatric practice or recent prevalence estimates from the CDC.

Dr. William S. Stone and his coworker Dr. Iguchi, in their contribution, "Stress and Mental Flexibility in Autism Spectrum Disorders," reviewed representative studies on cognitive flexibility, which is one type of neuropsychological weakness that is often related to repetitive and restricted clinical symptoms in ASD. They have also reviewed effects of stress in both typically developing individuals and in individuals with ASD, to show the importance of this factor in modulating relationships between cognitive inflexibility and clinical symptoms reflecting inflexibility, such as repetitive and restricted behaviors. They present three case vignettes involving higher-functioning individuals with ASD to illustrate some of these relationships, and to suggest the utility of clinical interventions.

In Helen V. Ratajczak's review entitled "Rhythm Definition of Biomarkers for an Objective Measure of Autism," she noted 16 biomarker candidates that could be utilized to develop an objective measure of ASD, and found that 11 of them were quantifiable in saliva collected twice in the evening from 12 neurotypical adults. A diagnosis based on chemical measurements can then be made, resulting in a patient-specific profile that will rank the biomarkers in the order of their difference from normal.

Dr. Wilson evaluated data from his clinical practice in an effort to better understand why the prevalence of ASD has been increasing in all countries with the goal of determining what can be done about it. Because little is known about the cause of ASD, efforts to answer these important questions cause anguish for both medical communities and patients and their families who live with this challenging disorder every day.

Dr. Michelle Hartley-McAndrew's Commentary on "Autism and Moral Development: What Can We Learn from the Sandy Hook School Shooting?" appears next in this issue. She analyzed the horrific school tragedy that resulted in the loss of 28 lives, in addition to widespread mental trauma to countless young students, including many with ASD. This commentary aims to dispel any misunderstanding that ASD equals lack of empathy, which leads to violence. It also alerts the medical community treating those with ASD that the diagnosis of the patient may not end with autism alone.

The final commentary was written by Dr. Herbert, who presents her paper entitled "Everyday Epigenetics from Molecular Intervention to Public Health and Lifestyle Medicine." She asserts that it may well take a grass roots epigenetic/lifestyle medicine revolution to avert the worsening health trends we are facing in the setting of a progressively more toxic and endangered planet. She posits that everyday epigenetics can inform science of what is

possible so that society can respond on an appropriate scale to the magnitude of the crisis we are facing.

We would like to thank all the contributors to this special issue of autism for offering their great expertise in this area, as well as all the peer reviewers for their valuable critiques, comments and precious time. We would like to thank our editorial colleagues for their dedication and collaborative team work with shared vision and spirit. With all our efforts together, we have made this important issue on advances in autism possible.

Finally, we would like to thank our family members for their continuous encouragement and support.

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