Autism: From Static Genetic Brain Defect to Dynamic Gene-Environment Modulated Pathophysiology

Martha R. Herbert, PhD, MD


CHAPTER’S SECTION HEADERS:
Autism Status Quo: Genes, Brain, Behavior and Hopelessness
Anomalies Undermining the Genes-Brain-Behavior Model
   Not a Static Prevalence
   Not Just Genes: Environmental Contributors.
   Not Just Inherited Genes: De Novo Mutations.
   Not Even Mainly Genes: Substantial Environmental Contribution.
   Not Just Brain Genes
   Not Just Local, Modular Brain Disturbances: Whole Brain Involvement.
   Not Just Prenatal
   Not Necessarily Present at Birth
   Not Just Behavior
   Not Just the Brain
   Not Just Deficit: Giftedness and High Intelligence.
   Not a Life Sentence: Evidence of Remission and Recovery.
Dynamical Physiological Processes Implicated In Autism
   Immune Dysregulation
   Mitochondrial Dysfunction
   Oxidative Stress
   Methylation Disturbance
   Disturbed Gut Microbial Ecology
   Hormonal Dysregulation
Active Pathophysiology, Genes and Environment
   Active Pathophysiology and the Brain
   Impact on Synaptic functioning
Could Active Pathophysiology Be Impairing Connectivity?
Does Active Pathophysiology Modulate Genetic Substrate Or Could It Be a Primary Cause of Brain Dysfunction?
From Genes and Neurons to Environment and Glial Cells
   Cause?
   Modulating Severity by Treating Intermediary Metabolism
   Obstructed Rather Than Defective
Environment: The Gift That Keeps On Giving
   Hardware or Software?
   From Developmental To Early Onset Chronic Pathophysiology
From a Fixed Unitary Phenomenon to Modifiable Manifestations of Complex Interacting Systems Problems
   Autism as an Epiphemenon or Emergent Property of a Challenged System
   Specific Genetic Determinants or Final Common Pathways of Pathophysiology?
Time to Get a Grip
Addressing an Apparent Epidemic Through a Praxis of Environmental Pathophysiology
Beyond Autism