
Paul Ashwood, Ph.D.

Paul Ashwood, Ph.D., Assistant Professor, Department of Medical Microbiology and Immunology, School of Medicine

Education

B.Sc., Pharmacology, University College London, 1992
M.Sc., Toxicology and Pathology, Imperial College London, 1994
Ph.D., Immunology, Kings College London, 2001

Biography

Dr. Ashwood's research program is directed at characterizing the role the immune system may play in some subjects with autism. There is a highly complex and interconnected interface between the immune and central nervous systems. The nervous and immune systems share some similarities. They are both highly networked systems that communicate by the release of chemical mediators with many of these mediators exerting effects on both systems. Products of the immune system can have actions that affect mood, sleep, behavior and neurodevelopment. Furthermore, cells of the immune system express receptors that can respond to neuropeptides and products released from the nervous system. In addition, recent studies of genetic linkages in autism have demonstrated that many possible gene abnormalities observed in autism could have important implications for the immune response. Dr. Ashwood is interested in exploring whether the health of one system is integral to the healthy development of the other. His efforts will be to fully characterize the immune response in children with autism, in particular the cellular immune response. Dr. Ashwood's original research in his native England was the first to characterize gastrointestinal pathology observed in some cases of children with autism.

Publications

M Careaga, J Van de Water, P Ashwood. Immune dysfunction in autism spectrum disorders. R Dietert (Ed), "Immunotoxicology in childhood", Taylor & Francis Ltd (in press).

S Bent, K Bertoglio, P Ashwood, E Nemeth, RL Hendren. Preliminary data from a clinical trial of Hyperbaric Oxygen Therapy (HBOT) in Children with Autistic Spectrum Disorder. *Journal of Autism and Developmental Disabilities* (in press)

SH Fatemi, KA Aldinger, P Ashwood, ML Bauman, CD Blaha, GJ Blatt, A Chauhan, V Chauhan, SR Dager, PE Dickson, AM Estes, D Goldowitz, DH Heck, TL Kemper, BH King, LA Martin, KJ Millen, G Mittleman, MW Mosconi, AM Persico, JA Sweeney, SJ Webb, JP Welsh. The role of cerebellum in autism. *The Cerebellum* (in press)

- D Braunschweig, P Duncanson, R Boyce, R Hansen, P Ashwood, IN. Pessah, I Hertz-Picciotto, J Van de Water. Temporal Expression and Cross-Species Conservation of Maternal Antibody Targets in Autism. *Journal of Autism and Developmental Disabilities (in press)*
- C Onore, M Careaga, P Ashwood. The role of immune dysfunction in the pathophysiology of autism. 2012. *Brain Behavior and Immunity* 26(3):383-392
- C Onore, J Van de Water, P Ashwood. Decreased Levels of EGF in Plasma of Children with Autism Spectrum Disorder. 2012. *Autism Research and Treatment* e205362
- JW Critchfield, S van Hemert, M Ash, L Mulder, P Ashwood. 2011. The potential role of probiotics in the management of childhood autism spectrum disorders. *Gastroenterology Research and Practice* e161358
- P Ashwood, BA Corbett, A Kantor, H Schulman, JA Van de Water, DG Amaral. 2011. In search of cellular immunophenotypes in the blood of children with autism. *PLOS One* 6(5): e19299
- P Ashwood, P Krakowiak, I Hertz-Picciotto, R Hansen, I Pessah, J Van de Water. 2011. Altered T cell responses in autism. *Brain Behavior and Immunity* 25(5): 840-849
- S Wills, CC Rossi, J Bennett, V Martinez-Cerdeno, P Ashwood, DG. Amaral, J Van de Water. 2011. Further Characterization Of Autoantibodies To GABAergic Neurons In The Central Nervous System Produced By A Subset Of Children With Autism. *Molecular Autism* 2: 5
- P Ashwood, P Krakowiak, I Hertz-Picciotto, R Hansen, I Pessah, J Van de Water. 2011. Elevated plasma cytokines in autism spectrum disorders provide evidence of immune dysfunction and are associated with impaired behavioral outcome. *Brain Behavior and Immunity* 25(1): 40-45.
- P Ashwood, P Krakowiak, I Hertz-Picciotto, R Hansen, I Pessah, J Van de Water. 2011. Associations of impaired behaviors with elevated plasma chemokines in autism spectrum disorders. *Journal of Neuroimmunology* 232(1-2): 196-199.
- P Goines, L Haapanen, R Boyce, P Duncanson, D Braunschweig, L Delwiche, R Hansen, I Hertz-Picciotto, P Ashwood, J Van de Water. 2011. Autoantibodies to cerebellum in children with autism associate with behavior. *Brain Behavior and Immunity* 25(3): 514-523.
- Y Tian, PG Green, B Stamova, I Hertz-Picciotto, IN Pessah, R Hansen, X Yang, JP Gregg, P Ashwood, G Jickling, J Van de Water, FR Sharp. 2011. Correlations of Gene Expression with Blood Lead Levels in Children with Autism Compared to Typically Developing Controls. *Neurotoxicology Research* 19(1): 1-13.

PE Goines, LA Croen, D Braunschweig, CK Yoshida, JK Grether, RL Hansen, M Kharrazi, P Ashwood, JA Van de Water. 2011. Increased mid-gestational IFN- γ , IL-4, and IL-5 in women giving birth to a child with autism in the Early Markers for Autism study. *Molecular Autism* 2(1): 13.

S Bent, K Bertoglio, P Ashwood, A Bostrom, RL Hendren. 2011. A Pilot Randomized Controlled Trial of Omega-3 Fatty Acids for Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders* 41(5): 545-554.

L Heuer, D Braunschweig, P Ashwood, J Van de Water, DB Campbell. 2011. Association of a Functional *MET* Genetic Variant with Autism-Associated Maternal Autoantibodies to Fetal Brain Proteins and Cytokine Expression. *Translational Psychiatry* 1: e48.

CE Herr, R Ghosh, M Dostal, V Skokanova, P Ashwood, M Lipsett, JP Joad, KE Pinkerton, PS Yap, JD Frost, R Sram, I Hertz-Picciotto. 2011. Exposure to air pollution in critical prenatal time windows and IgE levels in newborns. *Pediatric Allergy Immunology* 22(Pt 1): 75-84.

B Stamova, PG Green, Y Tian, I Hertz-Picciotto, IN Pessah, R Hansen, X Yang, J Teng, JP Gregg, P Ashwood, J Van de Water, FR Sharp. 2011. Correlations Between Gene Expression and Mercury Levels in Blood of Boys With and Without Autism. *Neurotoxicology research* 19(1): 31-48.

P Ashwood, DV Nguyen, D Hessel, R J Hagerman, F Tassone. 2010. Plasma cytokine profiles in Fragile X subjects: Is there a role for cytokines in the pathogenesis? *Brain Behavior and Immunity* 24(6): 898-902.

A Enstrom, C Onore, J Van de Water, P Ashwood. 2010. Differential monocyte responses to TLR ligands in children with autism spectrum disorders. *Brain Behavior and Immunity* 24(1): 64-71.

M Careaga, J Van de Water, P Ashwood. 2010. Immune Dysfunction in Autism a Pathway to Treatment. *Neurotherapeutics* 7(3): 283-292.

P Goines, A Zimmerman, P Ashwood, J Van de Water. 2010. The immune system, Autoimmunity, Allergy, and Autism Spectrum Disorders. D Amaral, G Dawson, D Gershwind, (Ed), "Autism Spectrum Disorders", New York, NY: Oxford University Press (*in press*).

CE Herr, M Dostal, R Ghosh, P Ashwood, M Lipsett, KE Pinkerton, R Sram, I Hertz-Picciotto I. 2010. Air pollution exposure during critical time periods in gestation and alterations in cord blood lymphocyte distribution: a cohort of livebirths. *Environmental Health* 9(1): 46.

W Chonchaiya, F Tassone, P Ashwood, D Hessel, A Schneider, L Campos, DV Nguyen, RJ Hagerman. 2010. Autoimmune disease in mothers with the FMR1

premutation is associated with seizures in their children with fragile X syndrome. *Human Genetics* 128(5): 539-48.

P Goines, P Ashwood, J Van de Water. 2010, Autism, Peripheral Immunity, and Polybrominated Diphenyl Ethers. C Wang and W Slikker Jr., (Ed), “*Developmental Neurotoxicology Research: Principles, Models, Techniques, strategies, and Mechanisms*”, John Wiley and Sons, Inc., pp521-542.

Presentations

XXIV Update Course, Neurobiology, diagnosis and treatment in autism: an update, “The role of the immune response in autism”, Rapallo, Italy, March, 2012

All Wales Autism Resource (AWARES) online conference, Invited expert, website based conference, “The potential role of probiotics in the management of childhood autism spectrum disorders”, November, 2011

Planet xMAP 2011 Europe ”The role of cytokines in the pathogenesis of autism”, Vienna, Austria. September, 2011.

AWARES online conference, Invited expert, website based conference, “Association of elevated plasma *cytokines and impaired behaviors in autism*”, October to November, 2010

North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN), Invited speaker: “*Gastrointestinal Conditions in Children with Autism Spectrum Disorders*”, National Harbor, MD November 2009

AWARES online conference, Invited expert, website based conference, “*IL-17 production in autism*”, October to November, 2009

Research Funding

Co-Investigator, “*Autism Risk, Prenatal Environmental Exposures, and Pathophysiologic Markers*”, R01ES020392-01 National Institute of Environmental Health Sciences (NIEHS), (PI: Hertz-Picciotto), 2011-2016, Direct costs \$11,772,359

Principal Investigator, “*Defining the Underlying Biology of Gastrointestinal Dysfunction in Autism*”, Autism Speaks Foundation, Trailblazer Awards, 2011-2013. Direct costs \$769, 300

Principal Investigator, “*Mediators of neuroimmune activation and the pathophysiology of schizophrenia: translating human studies with mouse models*”, National Alliance for Research on Schizophrenia and Depression (NARSAD), Young Investigator Award, 2011-2013, Direct Costs \$60,000.

Principal Investigator, “Glutamate signaling in Children with Autism Spectrum Disorders”, Autism Research Institute, 2011-2012, Direct costs \$57,840.

Co-Investigator, “Maternal Prenatal Biologic Markers for Autism”, R01MH72565-01 National Institute of Mental Health (NIMH), 2010-2015, Direct costs \$2,422,502. (PI: Croen)

Community Service

Master Advisor, Graduate Group in Immunology
Executive Committee Member, Graduate Group in Immunology
Member, Planning and Development Committee, Graduate Group in Immunology
Member, International Society for Autism Research
Member, Society for Psychoneuroimmunology
Member, Autism Recovery Consortium

Awards and Honors

Lecture Fellow, Eden Institute Foundation, Princeton
Top Ten Autism Research Achievements of 2011, Autism Speaks
Barbara and Michael Bass Investigator, Brain and Behavior Research Foundation.
Bob and Suzanne Wright Trailblazer Award
NARSAD, Young Investigator Award
Autism Science Achievement of 2010, Autism Speaks
Top Ten Autism Research Achievements of 2008, Autism Speaks