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Below is a collection of articles that were compiled as part of the Autism Society of America's campaign to increase awareness about links between autism spectrum disorders and environmental toxins. Some of these articles appeared in a special issue of the *Autism Advocate* and others are exclusively featured here.

Most of the articles below are in PDF format. You will need Adobe Reader to view them. If you don't already have it installed on your computer, you can download it for free at <http://www.adobe.com/>.

- ? [Autism and the Link Between Brain and Body](#) by Richard Lathe, Ph.D.
- ? [Autism Spectrum Disorders and the Immune System](#) by Paula Goines, B.S., Paul Ashwood, Ph.D., and Judy Van de Water, Ph.D.
- ? [Canadian Study: Is There a Digestive Link to Autism?](#) by Derrick MacFabe, M.D.
- ? [Can Exposure to Environmental Toxicants Influence Autism Susceptibility?](#) by Isaac N. Pessah, Ph.D.
- ? [Environmental Exposures and ASDs: Making the Connection](#) by Claudia S. Miller, M.D., M.S.
- ? [Epidemiologic Approaches to Autism and the Environment](#) by Craig J. Newschaffer, Ph.D.
- ? [Finding the Words: An Interview with Elizabeth Horn](#) - Judith Chinitz Gorman
- ? [Fish and Industry Toxins: A Link to Rising in Hong Kong and China](#) by Kulani Mahikoa
- ? [Helping to Shift the Paradigm: Learning More About Recovery in Autism](#) by Robert Sinaiko, M.D.
- ? [The Children's Corner School: Combining Diet and Education for Optimum Results](#) by Stan Kurtz
- ? [The Crime Against Our Children](#) by Philip and Alice Shabecoff
- ? [The UC Davis M.I.N.D. Institute: Uniquely Designed to Study Gene](#)
- ? [Environmental Interactions in Autism](#) by Robert Hendren, D.O.
- ? [Understanding Mercury, Understanding Autism](#) by Ellen Silbergeld, Ph.D., and Jennifer Nyland, Ph.D.
- ? [We're Loaded With Toxins: Analyzing the Toxic Body Burden of Americans](#) by Judy Chinitz Gorman

**Articles that appear in the Environmental Health and Autism Special Edition of ASA's magazine, *Autism Advocate* include:**

#### Feature Articles

- ? [Time to Get a Grip](#) - Martha R. Herbert, M.D., Ph.D.
- ? An Interview with Dr. Tom Insel, NIMH Director - Bleu Blakslee
- ? Autism's New Paradigm: Seeking Answers to Environmental Threats - Michael Lerner, Ph.D.

#### Biomedical Factors in Autism

- ? Beyond Behavior - Biomedical Diagnoses in Autism Spectrum Disorders - Margaret L. Bauman, M.D.
- ? The Prenatal Environment and Neuroinflammation in Autism - Susan L. Connors, M.D., Carlos A. Pardo, M.D. and Andrew W. Zimmerman, M.D.
- ? Gastrointestinal Illness in Autism: An Interview with Tim Buie, M.D. - Kulani Mahikoa
- ? Evidence for Metabolic Imbalance and Oxidative Stress in Autism - S. Jill James, Ph.D.
- ? Environmental Mercury Release and its Association with Changing Autism Rates - Raymond F. Palmer, Ph.D., and Stephen Blanchard, Ph.D.
- ? Why Time Trends in Autism Matter - Mark F. Blaxill
- ? Transforming the Public Debate on Neurotoxicants: The Learning and Developmental Disabilities Initiative - Elise Miller, M.Ed.
- ? Requirements for Good Scientific Inquiry - G. Jean Harry, Ph.D.
- ? The 'Three Strikes' Concept of Autism - Interviewed by Judy Chinitz Gorman; Edited by Ian Lipkin, M.D., and Mady Hornig, M.D.

#### Treatments for Autism

- ? Biomedical Treatment of Autism - John Green, M.D.
- ? Effective Treatments for Autism - Doreen Granpeesheh, Ph.D., BCBA
- ? The Parents' Role in Biomedical Treatment for Autism Spectrum Disorders - Lisa Ackerman

#### Autism: First Person Perspectives

- ? Autism's McGuffin - Dan Olmsted
  - ? Exploring the Role of Toxicology in the Etiology of Autism: A View from the Spectrum and a Call to Action - Stephen Shore
  - ? Rescuing a Generation - J.B. Handley
  - ? There is Hope: Children with Autism Can Recover - Judy Chinitz Gorman
  - ? Fighting for Our Children: Advocacy in the Age of Environmental Awareness - Bernard Rimland, Ph.D.
- [Become a member of ASA and access the full edition of the \*Autism Advocate\* Special Edition on Environmental Health and Autism.](#)

ASA members have online access to all issues of the *Autism Advocate*, along with a biweekly e-newsletter, advocacy alerts, conference updates and much more.

## **Autism and the Link between Brain and Body**

By Richard Lathe, Ph.D.

Why did I write my book *Autism, Brain and Environment*? The conjunction of two factors was pivotal: the autism in the child of a close acquaintance and my research over many years into aspects of brain function. Both combined with a sense of academic irritation at the medical profession's tendency to see brain and body as separate and distinct, and to view peripheral problems (such as gastrointestinal disturbances or impaired immunity) as having "nothing to do with the brain," and thus as issues to be dismissed when treating autism.

In my opinion, the prevailing medical view is somewhat outdated. In fact, scientific literature abounds with cases in which physiological problems result from damage to specific brain regions.

My studies commenced around 1999 with an attempt to chart and compile the different alterations to body biochemistry and physiology often seen in children with autism spectrum disorders. This is an area of intense debate, even among specialists. It seemed useful to try to ascertain, by looking at all the different studies, just how frequent these alterations are. After extensive review a picture started to emerge that gastrointestinal and immune dysfunction is really very common; in some studies affecting the majority of autistic children, although certainly not all.

This means that special attention must be paid to physiological problems, particularly as there is wide literature revealing how body dysfunction can reciprocally be a catalyst of brain damage. These problems should not be ignored — although this is what typically happens — in the hope that they will somehow go away.

At the same time, there was clearly a need to spell out all the biochemical aspects of autism spectrum disorders. Discussion forums abound with queries about changes in esoteric molecular markers, such as blood serotonin or sulfur-containing amino acids, and what they mean. The book tries to give an informed perspective on these issues that will be useful for both family and practitioner.

Having started with biochemistry and physiology, the next step was to think about the causes of autism spectrum disorders. The brain regions involved provide a clue: Abnormalities are most commonly seen in the limbic system, and damage to this system is known to result in abnormal behaviors, including autistic-like behaviors and dysregulated body physiology. The limbic brain is particularly susceptible to environmental stress. In neonates, oxygen deprivation in the limbic system can cause profound damage and autistic symptoms. Other chemical irregularities are known to act similarly. Could something in the environment be responsible for autism?

This obliged me to revisit the debate about rising autism rates. Is there really a rise, or is it just greater awareness? Are children who were once dubbed educational misfits now are labelled autistic? After careful review there was no avoiding the conclusion that the rise in autism prevalence is a real phenomenon, as is increasingly confirmed by more recent studies.

Twin concordance rates and the excess of younger children with autism pointed in the same direction: a real increase in the prevalence of autism. But what finally convinced me was when I looked at a chromosome marker known to predispose to autism. Twenty years ago, 10-20 percent of children with

autism were found to have such an abnormality, but today the chromosome abnormality is very rare, with less than one percent of children newly diagnosed with autism having the marker. The conclusion is unavoidable: Other factors must be contributing to the rise in autism rates.

So, finally, I began addressing the question of what the environmental component might be. This is still not resolved, but some autistic children do show evidence of exposure to heavy metals, and it is clear that some heavy metals and organometals can cause damage to the limbic system.

All the evidence is reviewed in the book, which also considers whether mercury in particular might be the cause of the rise in autism prevalence. But the story is not finished yet. A child exposed to mercury is most likely also differentially exposed to other environmental toxins. Although some children with autism show signs of heavy metal exposure, and many seem to have a genetic frailty in the way they metabolize heavy-metal compounds, it is impossible to be sure that metals are to blame. Only time (and more research) will tell.

The field of autism has unfortunately been rife with accusation and acrimony, sometimes unguided by rational consideration of the facts. A central objective of my book has therefore been to try to assemble all the data into a single work, so as to foster informed discussion and stimulate research. It is my hope that as researchers build on these data, it will be possible to envisage effective therapeutics for a significant percentage of children with autism, and to devise preventative measures.

*Richard Lathe previously held bioscience professorships in France and the UK, and is now director of a biotechnology and neuroscience consultancy based in Edinburgh, Scotland. He is the author of Autism, Brain and Environment (Jessica Kingsley Publishers, London and Philadelphia, summer 2006).*