Biomedical/Education Update:

Vaccine additives linked to lupus

New studies strongly link two substances used as vaccine additives—mercury and mineral oils—to autoimmune disease

The first study, by Charles Via and colleagues, found that "exposure to mercury prior to the induction of an autoimmune disease in mice significantly worsens the severity of that disease after it develops." The researchers injected healthy mice with low doses of inorganic mercury every other day for two weeks. After five days, they artificially induced lupus in the mice, and found that the mice exposed to mercury developed lupus symptoms more quickly, had dramatically elevated levels of autoimmune antibodies associated with lupus, and died more quickly of the disease.

Says Via, "Our findings suggest that low-level mercury exposure does not cause lupus.... You have to have a susceptible individual who has the appropriate environmental exposure. But our study clearly shows that mercury can act as a disease modifier for lupus. Exposure to mercury might either lower the threshold of susceptibility, or increase the severity of the disease."

A second study reports similar alarming findings about mineral oils. A number of vaccines contain these oils, used to enhance the antibody response to vaccination by keeping antigens longer at the injection site and also by transporting emulsified antigens to other locations in the body where they can stimulate antibody production.

Minoru Satoh and colleague injected mice with several vaccine additives including incomplete Freund's adjuvant (a water-in-oil emulsion) and three different medicinal mineral oils. (They also tested the effects of squalene, a controversial additive that has been used in some experimental vaccines. A large percentage of veterans with Gulf War syndrome test positive for anti-squalene antibodies, although the military denies that squalene was used in military vaccines.)

Satoh et al. report that up to 25 percent of the mice injected with mineral oils or squalene produced the abnormal autoantibodies (antibodies against the body's own tissue) seen in lupus. In addition, the mice exhibited an inflammatory immune response.

"I think this is a very significant finding because there is a possibility that vaccination in animals or humans can induce lupus autoantibodies in susceptible individuals," Satoh commented. Previous research has also strongly linked several of the oils tested in this study to the development of autoimmune arthritis.

Editor's Note: This research is of particular interest in light of the heightened incidence of lupus and other autoimmune disorders in families of autistic children.

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"Low-dose exposure to inorganic mercury accelerates disease and mortality in acquired murine lupus," Charles S. Via, Phuong Nguyen, Florin Niculescu, John Papadimitriou, Dennis Hoover, and Ellen K. Silbergeld, *Environmental Health Perspectives*, Vol. 111, No. 10, August 2003, 1273-7. Address: Charles Via, Division of Rheumatology, MSTF 8-34, 10 S. Pine Street, Baltimore, MD 21201, cvia@umaryland.edu.

—and—

"Study suggests low-dose mercury accelerates autoimmune disease," AScribe wire service, September 2, 2003.

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"Induction of lupus autoantibodies by adjuvants," Minoru Satoh, Yoshiki Kuroda, Hideo Yoshida, Krista M. Behney, Akiei Mizutani, Jun Akaogi, Dina C. Nacionales, Thomas D. Lorenson, Robert J. Rosenbauer, and Westley H. Reeves, *Journal of Autoimmunity*, Vol. 21, No. 1, August 2003, 1-9. Address: Minoru Satoh, Division of Rheumatology and Clinical Immunology, Department of Medicine, University of Florida, P.O. Box 100221, 1600 S.W. Archer Road, Gainesville, FL 32610-0221.

—and—

"Vaccine ingredients could trigger autoimmune disease," Helen Dell, *BioMedNet*, August 7, 2003.

Cerebrolysin tested as treatment for autism

Cerebrolysin, a compound of biologically active peptides that appear to mimic the action of nerve growth factor, may improve the cognitive and communication skills of children with autism spectrum disorders, according to a recent study.

Russian scientists have been researching the effects of cerebrolysin on children with a variety of neurologic disorders. Recently, they tested the substance on 19 children with autism and eight with Asperger's syndrome. The children, who were between two and eight years of age, received 10 microinjections of 0.1 ml of cerebrolysin daily for five days.

The researchers report, "Cerebrolysin therapy resulted in improvement of cognitive functions [including] expressive and receptive speech, fine motor, [and] playing." All of the children with Asperger's syndrome showed improvement, as did 17 of the children with autism. No adverse effects were seen. Overall, treatment effects were more pronounced in children with Asperger's syndrome than in those with autism.

Cerebrolysin, currently under investigation in the United States as a treatment for stroke and Alzheimer's disease and showing promising results, appears to protect cells against toxins and injury, promote normal cell development and branching, and inhibit programmed cell death. In a 1999 study, Russian researchers reported that treatment with either cerebrolysin or vitamin B6 and magnesium caused moderate to marked improvement in patients suffering from a wide range of side effects caused by neuroleptic drugs.

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Report on cerebrolysin (no title or authors given), *Zhurnal Nevrologii i Psikhiatrii Imeni S.S. Korsakova*, Vol. 103, No. 6, 2003, 15-8.

—and—

"Cerebrolysin and magnesium-B6 in the treatment of side effects of psychotropic drugs," G. P. Panteleeva, V. V. Bondar, N. I. Krasnikova, and V. A. Raiushkin, *Zhurnal Nevrologii i Psikhiatrii Imeni S.S. Korsakova*, Vol. 99, No. 1, 1999, 37-41.

New social aid tested

A graduate student in Wales is experimenting with a system, dubbed PARLE (for Portable Affect Recognition Learning Environment), that could help people with Asperger's syndrome or high-functioning autism feel more comfortable in social situations.

Jonathan Bishop recently tested the first-generation version of his system, which uses an Internet-compatible mobile telephone. Using the phone, individuals with autism spectrum disorders—who often have difficulty interpreting common conversational phrases, because they tend to interpret them literally—can access a database of phrases and quickly obtain a "translation." (For instance, the phrase "cat got your tongue?" would be translated into a phrase such as, "you are quiet, why is that?") Eventually, Bishop says, the system could incorporate both facial and voice recognition, to provide users with clues about another person's emotions and nonverbal communication. In addition, he says, it could incorporate an earpiece to allow for real-time auditory feedback.

In a preliminary study, Bishop asked 10 individuals with autistic spectrum disorders to read social stories and enter phrases and sentences they found confusing. Participants said the system enhanced their understanding of the stories, and expressed a desire to use the device both at home and in public.

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"An investigation into the potential of the Internet for educating individuals with social impairments," Jonathan Bishop and Mike Reddy, *Journal of Computer Assisted Learning*, in press. Address: Jonathan Bishop, 8 Heol-y-Parc, Efail Isaf, Pontypridd, Rhondda Cynon Taff, Wales, CF38 1AN, UK, jonathan@jonathanbishop.com.