Biomedical/Education Update:

Additional evidence of underconnectivity seen

Two studies add support to the theory that autism involves faulty brain networking, in which individual brain regions function properly but do not interconnect efficiently with other regions (see ARRI 18/3).

In their initial study, Marcel Just, Nancy Minshew and colleagues reported that during a reading task, autistic subjects showed far less synchronization of different brain areas than did normal controls. In the newer studies, they found that:

—Individuals with autism recall alphabet letters in brain areas that process shapes, rather than in areas that process letters, words, and sentences. While performing this task, the autistic participants also show less activation in parts of the brain that carry out higher-level thinking and reasoning, and more activation in areas involved with perceiving details. Overall, compared to controls, different brain areas in the autistic participants are less likely to work in synchrony when recalling letters.

—Postural control, which involves the integration of many brain systems, is poorer in autistic participants than in controls, particularly when other sensory challenges are present.

The researchers say that evidence of underconnectivity in the autistic brain suggests that teaching strategies that stimulate brain areas to work in synchrony—for instance, creative-thinking and problem-solving exercises—may prove helpful in addressing autistic symptoms.

—

"Brains of people with autism recall letters of the alphabet in brain areas dealing with shapes," news release, National Institute of Child Health and Human Development, Nov. 29, 2004.

—and—

"Underdevelopment of the postural control system in autism," N. J. Minshew, K. Sung, B. L. Jones, and J. M. Furman, *Neurology*, Vol. 63, No 11, December 14, 2004, 2056-61. Address: Nancy Minshew, Dept. of Psychiatry, University of Pittsburgh School of Medicine, 3811 O'Hara Street, Webster Hall, Suite 300, Pittsburgh, PA 15213, minshewnj@upmc.edu.

Data confirm "striking" rise in UK autism rates

Rates of autism and pervasive developmental disorders (PDDs) rose markedly in the United Kingdom in recent years, in parallel with increases in other countries, according to a recent study.

Liam Smeeth and colleagues analyzed the rates of first diagnosis of PDDs among patients registered with doctors reporting to the United Kingdom General Practice Research Database between 1988 and 2001. Their data, the researchers say, revealed a 10-fold increase in the rate of first recorded diagnoses of PDDs from 1988-92 to 2000-01. "The increase was more marked for PDDs other than autism," they say, "but the increase in autism was also striking."

The researchers argue that this increase most likely stems at least in part from improved diagnosis, but conclude that they "cannot exclude a real increase."

Editor's note: They "cannot exclude a real increase" because, unfortunately, the increase is very real.

—

"Rate of first recorded diagnosis of autism and other pervasive developmental disorders in United Kingdom general practice, 1988 to 2001," Liam Smeeth, Claire Cook, Eric Fombonne, Lisa Heavey, Laura Rodrigues, Peter Smith, and Andrew J. Hall, *BMC Medicine*, Nov. 9, 2004 (epub). Address: Liam Smeeth, Dept. of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.

TB antibiotic tested as autism drug

A broad-spectrum antibiotic used to treat tuberculosis may reduce some symptoms of autism, according to a new study.

In a single-blind placebo trial, David Posey and colleagues tested d-cycloserine (Seromycin) on 10 autistic patients ranging in age from 5 to 27. Following a placebo phase, participants received three different doses of d-cycloserine (approximately 0.7, 1.4, and 2.8 mg/kg/day) for two weeks.

The researchers report that treatment resulted in "reduced social withdrawal and increased social responsiveness," with 40 percent of participants rated as "much improved." They note, however, that the lack of a control group, the age range of their subjects, and the single-blind design of their study limit their conclusions.

In this study, one patient developed a motor tic and another exhibited increased echolalia while taking the highest dose of the drug. Other side effects that can occur during treatment with d-cycloserine include vertigo, tremor, confusion, irritability, paranoia, aggression, headache, and drowsiness.

—

"A pilot study of d-cycloserine in subjects with autistic disorder," David J. Posey, Deborah L. Kem, Naomi B. Swiezy, Thayne L. Sweeten, Ryan E. Wiegand, and Christopher J. McDougle, *American Journal of Psychiatry*, Vol. 161, November 2004, 2115-17. Address: David J. Posey, Riley Hospital for Children, Room 4300, 702 Barnhill Drive, Indianapolis, IN 46220.

Ritalin may increase risk of adult depression

Tests on animals suggest that Ritalin (methylphenidate) can alter the brain in ways that increase the risk for adult depression.

William Carlezon and colleagues gave Ritalin to rats during a period equivalent to human development from age 4 to 12, then tested the behavior of the rats when they reached adulthood. The researchers say that in comparison to other rats, the Ritalin-treated animals tended to "give up" quickly on a test measuring their tolerance for stress. The Ritalin-exposed rats also showed less interest in cocaine than normal lab rats, indicating alterations in brain systems involving dopamine (a neurotransmitter involved in causing a pleasurable response to rewards). Overall, Carlezon and colleagues concluded, the Ritalin-exposed rats showed evidence of aberrant brain reward systems and behaviors resembling depression.

The researchers plan to study the effects of other psychotropic drugs, to determine if these drugs also have long-term effects on brain development and behavior.

—

"New study shows early Ritalin may cause long-term effects on the brain," news release, American College of Neuropsychopharmacology. This study was reported at the ACN conference in San Juan, Puerto Rico in December 2004.

—and—

"Understanding the neurobiological consequences of early exposure to psychotropic drugs: linking behavior with molecules," W. A. Carlezon and C. Konradi, *Neuropharmacology*, Vol. 47, Suppl. 1, 2004, 47-60. Address: William Carlezon, McLean Hospital, MRC 217, 115 Mill Street, Belmont, MA 02478, carlezon@mclean.harvard.edu.

—Raise funds for ARI—

If you or your group plan to raise funds for autism research, via a walk, a run, a golf tournament, or other event, consider the Autism Research Institute as the beneficiary.

Since 1967, ARI has conducted and funded "Research That Makes a Difference." Most other organizations spend millions of dollars on "pie in the sky" projects that may help children who will be born 5, 10, or 15 years from now. Our efforts, in contrast, are bringing major improvement, and even recovery (yes, recovery!) to thousands of *today's* autistic children. Please help if you can.