



# ACNP

*American College of Neuropsychopharmacology*

**EMBARGOED FOR RELEASE**  
**December 12, 2013 at 12:01 a.m. Eastern**

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### **Worms and Hot Baths: Novel Approaches to Treating Autism**

Hollywood, FL (December 12, 2013) – A new study shows that two unusual treatment approaches may have beneficial effects on the symptoms of autism in children and adults with the disorder. Using a hot bath to raise body temperature and thereby mimic the effects of infection, or using worm eggs to stimulate the production of immunoregulatory factors in the gut to diminish inflammatory signals, both attenuated symptoms of autism. These findings support the idea that disruption of systems in the body that control inflammation may contribute to the disorder. The study was presented today at the American College of Neuropsychopharmacology (ACNP) Annual Meeting.

Approximately 1 in 88 children are afflicted with autism spectrum disorder (ASD). A prevailing hypothesis of ASD is that a hyperactive immune system, resulting in elevated levels of inflammation, may contribute to the disorder. Consistent with this possibility, it is known that approximately one third of those with ASD show a clinical improvement in symptoms in response to a fever.

In a new study led by Eric Hollander MD, a professor at Albert Einstein College of Medicine in New York, the effects of two novel treatment approaches that modify aspects of inflammation were tested on ASD symptoms.

First, as fever may trigger the release of protective anti-inflammatory signals in the body, the effects of raising body temperature to mimic fever on ASD symptoms were assessed. It was found that children with ASD and a history of positive behavioral response to fever had improved social behaviors when bathed each day in a hot tub at 102°F compared with water at 98°F.

Second, using a more unusual approach, adults with ASD were treated for 12 weeks with *Trichuris suis ova* (TSO), which are the eggs of the worm *helminth trichura* (whip worm). This worm is safe in humans as it does not multiply in the host, is not transmittable by contact, and is cleared spontaneously. However, the worms can inhibit immune-mediated responses and diminish inflammation.

The subjects for this study were 10 high functioning ASD patients who were able to give informed consent and who had a history of allergies or a family history of immune-inflammatory illness. Patients were treated for 12 weeks with the worm eggs (2500 eggs every two weeks) but were also subjected to a 12 week placebo phase in a randomized order. It was found that adults with ASD had improvement in repetitive and ritualistic behaviors in response to treatment with the worm eggs.

This is not the first time that worm eggs have been used successfully to treat diseases, particularly immune-related diseases, in humans such as Crohn's Disease. As noted by Dr. Hollander, "TSO has been

*shown to improve various immune inflammatory illness by shifting the ratio of T regulator/T helper cells and their respective cytokines..”*

The findings support the idea that inflammation may contribute to the symptoms of autism, at least in some individuals, and highlight novel treatment approaches. However, as noted by Dr. Hollander, the small sample size and unusual treatment approach means that caution should be exercised when interpreting the studies:

*“Future studies in autism spectrum disorders are needed to replicate and expand these findings, and to study younger subjects with more severe irritability”*

Nevertheless, the findings raise the intriguing possibility that approaches designed to modulate immune responses in ASD patients may be future treatment approaches for the disorder.

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ACNP, founded in 1961, is a professional organization of more than 700 leading scientists, including four Nobel Laureates. The mission of ACNP is to further research and education in neuropsychopharmacology and related fields in the following ways: promoting the interaction of a broad range of scientific disciplines of brain and behavior in order to advance the understanding of prevention and treatment of disease of the nervous system including psychiatric, neurological, behavioral and addictive disorders; encouraging scientists to enter research careers in fields related to these disorders and their treatment; and ensuring the dissemination of relevant scientific advances.