

# Autism and Asperger's Syndrome

## Research Update, January 2011



Monash Alfred Psychiatry Research Centre

*Please note: You have been sent this research update because you have either participated in this research at the Monash Alfred Psychiatry Research Centre (MAPrc, Alfred hospital, Melbourne) and indicated that you would like to know the results, or because you have expressed a wish to be updated on the progress of our research. If you no longer wish to receive these updates, please contact Dr. Peter Enticott ([03] 9076 6594 or peter.enticott@monash.edu).*

### Why is this research being conducted?

There seems to be an increase in the number of people that are being diagnosed with autism and Asperger's syndrome. Despite this, not much is known about the workings of the brain in these conditions, and medical treatment options are limited.

Our research involves the use of modern, non-invasive neuroscience techniques, including transcranial magnetic stimulation (TMS), electroencephalography (EEG), and functional magnetic resonance imaging (fMRI). We are conducting this research to better understand how the brain works in autism spectrum disorders (ASD), which we believe will lead to advances in both diagnosis and treatment. We are also conducting this research to trial new treatment approaches, such as repetitive TMS, which we believe could be effective in treating ASD. This research is funded by the National Health and Medical Research Council (NHMRC) and NARSAD, the world's leading charity dedicated to mental health research.

### What results have emerged since the last research update?

We had a very busy 2010, and results are emerging from several of our studies:

#### Deep TMS in ASD

We now have some preliminary results available from our clinical trial examining "deep repetitive TMS" as a possible treatment for ASD.

Initial results from the first 20 participants suggest that deep rTMS is associated with a small but significant improvement in social relating. This was seen one-month after treatments finished. Importantly, these improvements were not seen in those who were in the placebo condition.

These findings are an encouraging first step, and we are currently applying for funding to conduct an expanded deep rTMS clinical trial in which we will attempt to produce larger and longer lasting effects.

## ASD and “mirror neurons”

Other research that we are currently conducting involves studies of “mirror neurons,” which are a type of brain cells that becomes active when we do something, but also when we watch somebody else do the same thing. Mirror neurons are thought to help us understand what other people are thinking and feeling, and reduced mirror neuron activity may therefore contribute to ASD.

In 2010 we completed world-first studies of the mirror neuron system in ASD using TMS and fMRI. Both studies support the idea that people with ASD have a less active mirror neuron system. In the TMS study, those with the least mirror neuron activity reported more severe social and communicative symptoms. In the fMRI study, we were able to see precisely where in the brain mirror neurons were located. There was a substantial difference in mirror neuron activation between those with and without ASD; for example, those with ASD had less mirror neuron activity in the frontal lobe (which is where we would typically expect to see mirror neurons).

We believe that there may be ways in which we can improve mirror neuron activity among people with ASD. In December 2010 we were awarded a grant from Monash University’s Faculty of Medicine to investigate whether a non-invasive brain stimulation technique, transcranial

direct current stimulation (tDCS), can improve mirror neuron activity among people with ASD (aged 18-65). tDCS is a technique that involves the application of gentle electrical currents through electrodes placed on the scalp. It is hoped that this research will lead to a new treatment for ASD. This project will begin in the second half of 2011.

## **Which research projects are currently being conducted?**

Sensory integration in autism spectrum disorders: In this study, we are investigating how particular sensations, such as hearing, vision, and touch, are processed in individuals with ASD. Participation in this study involves attending the Alfred hospital for two 2-hour sessions. Participants must be aged between 10 and 65 (parent/guardian consent is required for those under 18) and have a formal diagnosis of either high-functioning autism or Asperger’s syndrome.

Deep repetitive TMS in autism spectrum disorders: Despite the findings mentioned above we are still recruiting for our clinical trial. Participation in this study involves attending the Alfred hospital for 15 minutes of TMS each weekday for a two week period. Two hour assessments will be conducted before the first TMS session, after the last TMS session, and one-month after the last TMS session. Participants must be aged between 18 and 65 and have a formal diagnosis of either high-

functioning autism or Asperger's syndrome.

### How can I get involved?

We extend our sincere thanks to all those people who have kindly volunteered to take part in our studies.

We are, however, always looking for more volunteers (both children and adults) to take part in this important research. Individuals can elect to be included on our "Participant Database," which means that you would be invited to take part in any new projects that might be suitable. Participation in any research project is entirely voluntary, and all of our research is approved by the human

research ethics committees of the Alfred hospital and Monash University. Research participants are reimbursed for their expenses (e.g., travel). Alternatively, we can provide taxi vouchers for travel to and from our research venues.

If you or someone you know has been diagnosed with high-functioning autism or Asperger's syndrome, and are interested in participating in one of our research studies, please contact Dr. Peter Enticott by telephone ([03] 9076 6594) or email (peter.enticott@monash.edu). Please also feel free to contact Dr. Enticott if you have any questions about this research.

**About MAPrc:** MAPrc is the Monash Alfred Psychiatry Research Centre. Our mission is to carry out world-class psychiatry research with respect, equality, and understanding.

We are based at the Alfred Hospital, a busy teaching hospital in Melbourne, Victoria, Australia. The hospital setting reflects an important aspect of what we set out to achieve: practical 'real world' advances that make a difference to the lives of people with mental illness and those who care for them. MAPrc is part of Monash University's School of Psychology and Psychiatry and The Alfred Hospital's Department of Psychiatry.

MAPrc coordinates and facilitates all research that is performed within The Alfred's Department of Psychiatry.

### Monash Alfred Psychiatry Research Centre (MAPrc)

We are a research centre of Monash University and the Alfred Hospital  
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