Dear Families,

Firstly, we would like to wish you a Merry Christmas and Happy New Year and our thanks and appreciation for your support of our research efforts! We have had a busy year!! Our clinical team has been out visiting families at home, and children at school and to date over 80 families have had their blood samples collected for DNA analysis, and over 80 children and young adults with ASD have been assessed in school.

The laboratory effort has been moving full steam ahead. Together with the labs in Oxford, Toronto, Los Angeles and Miami over 2000 families from Europe and North America have had their DNA analysed. Each individual had over 1,000,000 genetic markers examined in the lab and now we are at the daunting stage of analyzing all this information. It has been an exciting year for autism genetics. See the update below (Key research findings 2008).

In this newsletter we have included also a piece about the difference between AGP and TASC, as so many of you have asked us about this, and are still asking...! Our apologies if this is confusing, sometimes we even get muddled! We have had some new people join the project since we last wrote and we have included a little profile on everyone in the group (see 'The Research Team').

We have a couple of reminders and some information on new projects that have started or are due to start soon. Look out also for our colouring competition that the children and their brothers and sisters might like to enter!

Wishing you all the best,

The Autism Genetics Research Team, TCD
**Important Research Findings**

The last two years have been an exciting time for autism genetics research. There have been some important papers published, some of which our group has been involved in. A currently interesting finding is an event called ‘copy number variation’. This is where a person can get more (duplication) or less (deletion) genetic material in a particular region than usual. Sometimes duplications or deletions can affect one or more genes. In general, we have two copies of each gene (one from our mother one from our father). One of the most common seen ‘copy number variant’ syndrome in the population is Down’s syndrome – where a child gets an extra copy of a chromosome 21. The implications of these studies (which are ongoing) are that we may identify genes involved in autism. These ‘copy number variations’ sometimes happen in the same region in many different patients. One example in autism research is a region on chromosome 1 (1q21).

Sometimes duplications or deletions can affect one or more genes. In general, we have two copies of each gene (one from our mother one from our father). One of the most common seen ‘copy number variant’ syndrome in the population is Down’s syndrome – where a child gets an extra copy of a chromosome 21. The implications of these studies (which are ongoing) are that we may identify genes involved in autism. These ‘copy number variations’ sometimes happen in the same region in many different patients. One example in autism research is a region on chromosome 1 (1q21).

**What is the difference between AGP and TASC?**

Many of you have asked about the difference between the two research programs, AGP and TASC:

- The International Multi-centre Autism Genome Project (AGP) is the biggest autism research project in the world looking for genes contributing to autism spectrum disorder. Over 100 researchers at 15 different University sites in Europe, including Ireland, the United States and Canada are collaborating on this project.

- The Autism Simplex Collection (TASC) is a collection of medical information and genetic material, or DNA, from individuals with autism, as well as from their parents. The repository holding the genetic material is in Rutgers University, New Jersey in USA. 12 different University sites in Europe, including Ireland, the United States and Canada are collaborating on this project.

The two projects are related and the majority of families are participating in both studies. We will combine the information that is being gathered as part of the TASC program with genetic data to help us to identify genes that are contributing to the risk of developing autism.

**Reminder regarding questionnaires**

Thanks to everyone who has completed the questionnaires so far. We understand that there are a lot to fill in, and that it is hard to fit in when things are busy. Each of the questionnaires is important for examining different aspects of autism behaviour, and for linking in this to the genetic analysis. If you have forgotten about the questionnaires or mislaid them don’t worry, we will probably be contacting you about them in the New Year.

**New Projects:**

We are always trying to find new ways to study autism. We have two projects starting up in 2009.

**Investigating rates of autism in 1st generation Irish children:**

We have noticed through our clinical experience that a large number of the children we see are born to parents who have just moved to Ireland. We are interested to investigate this further to see if there are higher rates of autism in these children compared with children born to native Irish families. If so, we are interested to know if there is any difference in the type of autism, more or less severe or if there are other factors that might have influenced the development of autism. This research project is starting in July 2009 through the Adelaide and Meath Hospital (incorporating the National Children’s Hospital) in Tallaght. The research funds were donated by the National Children’s Foundation, Tallaght.
The TRACT study – (Trinity Research in Autism – Connectivity of Tracts):
With recent advances in brain imaging techniques, we are now able to use Magnetic Resonance Imaging (MRI) for exciting studies in autism. In the TRACT study, we will be using MRI techniques to investigate brain activity and connections between brain regions in children with autism/Asperger syndrome. It is hoped that this study will give us insights into how the brain functions in autism and Asperger syndrome. In the study, we will be asking participants to perform computer-based tasks (like simple computer games) while they are lying in an MRI machine that takes rapid pictures of the brain. We are currently recruiting people who have a diagnosis of Asperger syndrome or autism spectrum condition who are attending (or have attended - if >17 years old) mainstream school. We have to use quite strict criteria to ensure that we can compare the brain scans and so all participants must be male, right-handed, aged between 14 and 21 and have no metal in their body (this includes braces on teeth). If you would like more information about this study, please contact Dr Jane McGrath (contact details below).

As this is an ongoing research projects we are continuously looking for new recruits, so if you know of any other families that might be interested in taking part in this study, please feel free to pass on our details so that they can contact us for more information about this project.

Research Team Contact Information

TASC
Dr. Gillian Hughes,
Ms. Sharon Elias
Mr. Sean Brennan

The TRACT study
Dr. Jane McGrath

Contact Address:
Room 0.07
Old Stone Building
Trinity Centre for Health Sciences
St. James' Hospital
Dublin 8
Tel.: (01) 896 2315
Fax: (01) 896 3405

E-mail: autismresearch@tcd.ie
Web:
http://www.medicine.tcd.ie/psychiatry/research/neuropsychiatry/autism

For further information contact:
Dr. Louise Gallagher (01) 896 2144 or lgallagh@tcd.ie
Dr. Nadia Bolshakova (01) 896 2144 or bolshakn@tcd.ie

The Research Team

Dr. Ric Anney is a molecular biologist and genetic epidemiologist, a long way of saying that he spends his days in the lab working with DNA and is good at maths! Ric spent several years in Australia and previously in Cardiff developing his skills. Since moving from sunny Australia to rainy Dublin Ric has focused on the genetics of childhood mental health disorders, e.g. attention deficit/hyperactivity disorder and autism. He is a busy chap and has published over 18 papers in the last 12 months.

Dr. Nadia Bolshakova is a Research Project Manager of the Autism Simplex Collection (TASC) and the Irish part of AGP. She is dealing with different aspects of the research projects such as tracking performance of the research sites, working with the database, preparing progress reports, arranging conference calls and meetings and monitoring our budgets.

Sean Brennan is a research assistant on the AGP and TASC projects. His work involves conversing with participants and conducting psychological assessments, including IQ and language tests. Each assessment is important as the information obtained links in with the genetic analysis and will help to show which behaviours and traits may have a partly genetic basis.

Lynne Cochrane is a post-doctoral researcher working in the lab. Lynne recently finished her PhD
studies in autism where she has been investigating dopamine (a brain chemical) genes. Her PhD thesis also looked at rare genetic mutations in genes called Neuroligins – which are involved in brain cell communication. She is earning her stripes now by following up the neuroligin work further!

**Sharon Elias**, Research Assistant, TASC project. Sharon previously worked in the Solas centre assessing children with autism. She is now psychological assessments, including IQ and language tests with children at their homes and schools as well as completing parental interviews as part of TASC.

**Dr. Eleisa Heron** joined the group in July 2008 as a Lecturer in Biostatistical Genetics (a mathsy type of person!). She previously worked in Warwick University, UK and studied in TCD prior to this where she completed her PhD in Statistics. Eleisa is working on new mathematical methods to analyse the genetic and clinical data that we have collected.

**Dr. Gillian Hughes** joined the TASC project in July 2008. Gillian is a psychiatrist and studied medicine in Trinity College. Gillian has taken over from Jane Sanders, some of you may have met her already! She will be collecting blood and some other clinical information.

**Dr. Jane McGrath (previously Sanders)**, Research Fellow. Jane previously worked on the TASC project and many of you may have met her when she came to collect blood samples. Jane is now running a brain imaging project in high functioning autism and Asperger syndrome. (See our box above about the project and contact details if you would like to take part)

**Alison Merikangas** joined the group as a PhD student in October 2008. She will be studying copy number variants (see above) in autism and schizophrenia. Alison has a BS in psychology, an a MPH in Epidemiology and worked at the National Institute of Mental Health in the US.

**Dr. Norbert Skokauskas** is a child-psychiatrist who is interested in mental health problems in children with autism. He hopes that it will help us to understand and detect mental health difficulties with autism as these are frequently overlooked. Norbert has been recently in touch with you regarding some of the questionnaires and is very thankful for the response!

**Katherine Tansey** is a third year Ph.D. student working in the lab. She is interested in understanding more about the different aspects of autism and if there are genes that are responsible for certain aspects of the disorder, e.g. communication, social interaction or repetitive behaviours. Katie studied in Rutger’s University New Jersey before joining the group.

**Dr. Ricardo Segurado** is a statistical geneticist (another maths person!) is also interested in the statistical analysis of our genetic data. As of December 2007, he holds a Post-Doctoral Research Fellowship from the HRB on "Multi-locus approaches to susceptibility genes for autism: Epistasis and heterogeneity", and is investigating statistical techniques to detect interactions between genes in Autism.

**Dr. Louise Gallagher** is the principal investigator of the TASC programs and, together with Prof Michael Gill at TCD and Prof Andrew Green and Dr. Sean Ennis at UCD, has responsibility for the AGP program. Louise first became interested in genetics research 10 years ago when she started to recruit families for autism genetics studies in Ireland. Many of you may have met her at the time. She has a keen interest in understanding the causes of autism to provide better treatments and interventions for children with autism in the future. Louise is also a Consultant Child and Adolescent Psychiatrist based in the HSE and the National Children’s Hospital in Tallaght where she has established a specialist clinic for the assessment of pre-school children with suspected autism.

**The UCD team:**
Our research efforts are supported through our collaboration with our colleagues in University College Dublin. Over at UCD the group is led by Dr. Sean Ennis and Prof. Andrew Green. Regina Regan and Judith Conroy are the post-doc researchers and Naisha Shah and Gillian Casey are PhD students.

**Colouring Competition!!**
Colour in Santa and return to: Room 0.07, The Stone Building, Trinity Centre for Health Sciences, St.James' Hospital, Dublin 8.
All entries will receive a prize from Santa himself!