autismresearchtrust

art

welcome to art

OUR PROGRESS TO SEPTEMBER 2015

Autism Research Trust

Our progress to September 2015

ART was set up in 2010 and with your generous support we have funded or co-funded an increasing number of research projects at the Autism Research Centre, Cambridge University, in a wide range of programmes.

Since the first publication in 2012, 36 high quality scientific articles have been published – more than one article per month – contributing to the international effort to understand the causes of autism and to evaluate what helps.

To further our understanding of the causes of autism, Cambridge researchers have been investigating promising candidate genes for autism, examining levels of hormone present in the womb during pregnancy, and identifying differences in the brain between people with and without autism, as well as the differences in the biochemical profiles in males and females with autism. Research has also been looking at what happens to the autistic brain across development, particularly during adolescence and whether girls and women with autism are at raised risk for sex steroid hormone-related conditions such as Polycystic Ovary Syndrome.

At the psychological level, they have been testing how people with autism read emotions in other people's eyes, their difficulties in empathy and their ability to systemize, that is, to find patterns in the world and understand how things work. The research team have also been evaluating screening tests for both children and adults on the autism spectrum, and have also explored the sensory hyper-sensitivity in people with autism, and how this might relate to attention and altered perception. We hope that further research in these areas will lead to the availability of diagnostic tools earlier in life.

To provide aids to help in everyday life, ARC researchers have been studying if giving the hormone oxytocin through a nasal spray might help improve social skills such as eye contact. They have also been conducting clinical research, exploring if girls and women with anorexia have higher levels of autistic traits than was previously recognized. Taking data from the Cambridge-based NHS Chitra Sethia Autism Centre clinic for adults with Asperger Syndrome, co-funded by ART and the National Autistic Society, the researchers have found that suicidal thoughts are disturbingly high in adults with Asperger Syndrome. And looking outside of the West, they have found that autism is undiagnosed in countries such as China.

ART hopes that, with further funding in high-quality research, we will be able to better understand the causes of autism so that diagnosis can be made even in infancy. Following early diagnosis, the Cambridge team plan to validate interventions to identify what will help those affected by autism.

ART is proud to have contributed funding to the 36 research projects and scientific journal articles summarized below, which have been made possible with your support.

Funding high-quality research will make a difference to the lives of those with autism.

Journal articles acknowledging ART funding in reverse chronological order:

2015

1. S Baron-Cohen, D Bowen, R Holt, C Allison, B Auyeung, M Lombardo, P Smith, M-C Lai (2015)

   The "Reading the Mind in the Eyes" Test: Complete Absence of Typical Sex Difference in ~ 400 Men and Women with Autism.

   PLoS One, doi:10.1371/journal.pone.0136521.

   This paper reports the largest test of social perception/empathy in autism to date and finds an important clue about autism: the absence of a typical sex difference.

2. V Warrier, V Chee, P Smith, B Chakrabarti, S Baron-Cohen (2015)

   A comprehensive meta-analysis of common genetic variants in autism spectrum conditions.

   Molecular Autism, 6:49.

   This paper reports the first 'meta-analysis' or systematic review of common genetic variations in autism.

3. V Warrier, B Chakrabarti, L Murphy, A Chan, I Craig, U Mallya, S Lakatošová, K Rehnstrom, L Peltonen, S Wheelwright, C Allison, S Fisher, S Baron-Cohen (2015)

   A Pooled Genome-Wide Association Study of Asperger Syndrome.

   PLoS One, doi: 10.1371/journal.pone.0131202.

   This paper reports the first whole genome (genetic) study of Asperger Syndrome since to date most genetic studies have focused on classic autism.

4. F Larson, M-C Lai, A Wagner, MRC AIMS Consortium, S Baron-Cohen, A Holland (2015)

   Testing the 'Extreme Female Brain' Theory of Psychosis in Adults with Autism Spectrum Disorder with or without Co-Morbid Psychosis.

   PLoS One, doi:10.1371/journal.pone.0128102.

   This paper is the first to disprove the hypothesis that psychosis and autism are mirror images of each other.

5. X Sun, C Allison, F Matthews, Z Zhang, B Auyeung, S Baron-Cohen, C Brayne (2015).

   Exploring the Underdiagnosis and Prevalence of Autism Spectrum Conditions in Beijing.

   Autism Research, 8: 250-260.

   This paper explores the reasons for why autism is under-diagnosed in China, and how many people have autism in China.

6. Golan, Y Sinai-Gavrilov, S Baron-Cohen (2015)

   The Cambridge Mindreading Face-Voice Battery for Children (CAM-C): complex emotion recognition in children with and without autism spectrum conditions.

   Molecular Autism, 6:22.

   This paper reports the child version of a test developed by the ARC of emotion recognition ability in children with autism.

2015

7. B Khorashad, S Baron-Cohen, G Roshan, M Kazemian, L Khazai, Z Aghili, A Talaei, M Afkhamizadeh (2015)

The ''Reading the Mind in the Eyes'' Test: Investigation of Psychometric Properties and Test–Retest Reliability of the Persian Version.

Journal of Autism and Developmental Disorders, 45: 2651-2666.

This paper reports the first use of a test of emotion recognition/empathy developed at the ARC in a different culture: Iran.

8. D Lisiecka, R Holt, R Tait, M Ford, M-C Lai, L Chura, S Baron-Cohen, M Spencer, J Suckling (2015)

Developmental white matter microstructure in autism phenotype and corresponding endophenotype during adolescence.

Translational Psychiatry, 5, e529; doi:10.1038/tp.2015.23.

This paper studies the 'tracts' in the autistic brain during adolescence, that connect different brain regions with super-fast 'highways', and how this relates to differences in behaviour.

9. A Di Napoli, V Warrier, S Baron-Cohen, B Chakrabarti (2015)

Genetic variant rs17225178 in the ARNT2 gene is associated with Asperger Syndrome.

Molecular Autism, 6:9.

This paper confirms a previous gene from autism studies in a sample of people with Asperger Syndrome.

10. M-C Lai, M Lombardo, B Auyeung, B Chakrabarti, S Baron-Cohen (2015)

Sex/Gender Differences and Autism: Setting the Scene for Future Research.

Journal of the American Academy of Child & Adolescent Psychiatry, 54:11–24.

This paper provides a theoretical framework for researchers on why it is important to look at the relationship between autism and sex/gender, and provides clarity of how to distinguish different scientific questions.

11. B Auyeung, M Lombardo, M Heinrichs, B Chakrabarti, A Sule, J Deakin, R Bethlehem, L Dickens, N Mooney, J Sipple, P Thiemann, S Baron-Cohen (2015)

Oxytocin increases eye contact during a real-time, naturalistic social interaction in males with and without autism.

Translational Psychiatry, 5, e507; doi:10.1038/tp.2014.146.

This paper is the first to show that giving men with autism extra oxytocin via a nasal spray leads to improved eye-contact.

12. C Ashwin, J Hietanen, S Baron-Cohen (2015)

Atypical integration of social cues for orienting to gaze direction in adults with autism.

Molecular Autism, 6:5.

This paper studies how people with autism do not process other people's eyes and gaze in the typical way.

2015

13. E Ruzich, C Allison, P Smith, P Watson, B Auyeung, Howard Ring, S Baron-Cohen (2015)

Measuring autistic traits in the general population: a systematic review of the Autism-Spectrum Quotient (AQ) in a nonclinical population sample of 6,900 typical adult males and females.

Molecular Autism, 6:2.

This is the first systematic review of the findings using an instrument designed by the ARC to measure autistic traits, in the general population.

14. S Baron-Cohen, B Auyeung, B Nørgaard-Pedersen, D Hougaard, M Abdallah, L Melgaard, A Cohen, B Chakrabarti, L Ruta, and M Lombardo (2015)

Elevated fetal steroidogenic activity in autism.

Molecular Psychiatry, 20: 369–376.

This paper is the first study to demonstrate higher levels of prenatal testosterone and related hormones in boys who go on to develop autism.

15. C K Frank, S Baron-Cohen, B L Ganzel (2015)

Sex differences in the neural basis of false-belief and pragmatic language comprehension.

Neuroimage, 105: 300-311.

This paper reports on sex differences in the brain basis of understanding other people's thoughts and on understanding other people's speech.

2014

16. R Holt, L Chura1, M-C Lai, J Suckling, E von dem Hagen, A Calder, E Bullmore, S Baron-Cohen, M Spencer (2014)

'Reading the Mind in the Eyes': an fMRI study of adolescents with autism and their siblings.

Psychological Medicine, 44: 3215-3227.

This paper reported the first study of the brain basis of difficulties in decoding facial expressions in adolescents with autism.

17. S Baron-Cohen, S Cassidy, B Auyeung, C Allison, M Achoukhi, S Robertson, A Pohl, M-C Lai (2014)

Attenuation of Typical Sex Differences in 800 Adults with Autism vs 3,900 Controls.

PLoS One, doi: 10.1371/journal.pone.0102251.

This paper reported the largest study to date of scores in systemizing and empathy in autism, and the reduction in typical sex differences in these areas in autism.

18. S Baron-Cohen, L Murphy, B Chakrabarti, I Craig, U Mallya, S Lakatos, K Rehnstrom, L Peltonen, S Wheelwright, C Allison, S Fisher, V Warrier (2014)

A Genome Wide Association Study of Mathematical Ability Reveals an Association at Chromosome 3q29, a Locus Associated with Autism and Learning Difficulties: A Preliminary Study.

PLoS One, doi: 10.1371/journal.pone.0096374.

This paper reports the first whole genome (genetic) study of mathematical ability, finding a link with the genetics of autism.

2014

19. A Ruigrok, G Salimi-Khorshidi, M-C Lai, S Baron-Cohen, M Lombardo, R Tait, J Suckling (2014)

A meta-analysis of sex differences in human brain structure.

Neuroscience and Biobehavioral Reviews, 39: 34-50.

This paper is the first 'meta-analysis' or systematic review of where sex differences occur in the structure of the human brain.

20. Di Napoli, V Warrier, S Baron-Cohen, B Chakrabarti (2014)

Genetic variation in the oxytocin receptor (OXTR) gene is associated with Asperger Syndrome.

Molecular Autism, 5:48.

This paper confirms that the oxytocin receptor gene that has been associated with autism is also associated with Asperger Syndrome.

21. C Robertson, C Thomas, D Kravitz, G Wallace, S Baron-Cohen, A Martin, C Baker (2014)

Global motion perception deficits in autism are reflected as early as primary visual cortex.

Brain, doi:10.1093/brain/awu189.

This paper investigates the brain basis of the difficulties people with autism have in processing fast moving changes.

22. M-C Lai, M Lombardo, C Ecker, B Chakrabarti, J Suckling, E Bullmore, F Happé, MRC AIMS Consortium, D Murphy, S Baron-Cohen (2014)

Neuroanatomy of Individual Differences in Language in Adult Males with Autism.

Cerebral Cortex, doi:10.1093/cercor/bhu211.

This paper identifies differences in the brain in men with autism who talked late in childhood, vs. men with autism who talked on time.

23. J C Sullivan, T Tavassoli, K Armstrong, S Baron-Cohen A Humphrey (2014)

Reliability of self, parental, and researcher measurements of head circumference.

Molecular Autism, 5:2.

This paper demonstrates how parents are reliable at measuring the circumference of their child's head, which means this data can be collected more easily at home.

24. M Ewbank, G Rhodes, E von dem Hagen, T Powell, N Bright, R Stoyanova, S Baron-Cohen, A Calder (2014)

Repetition Suppression in Ventral Visual Cortex Is Diminished as a Function of Increasing Autistic Traits.

Cerebral Cortex, 10.1093/cercor/bhu149.

This paper finds that if the same image is perceived over and over again, the response in the brain varies according to how many autistic traits the viewer has.

2014

25. H Steeb, J M Ramsey, P C Guest, P Stocki, J D Cooper, H Rahmoune, E Ingudomnukul, B Auyeung, L Ruta, S Baron-Cohen, S Bahn (2014)

Serum proteomic analysis identifies sex-specific differences in lipid metabolism and inflammation profiles in adults diagnosed with Asperger syndrome.

Molecular Autism, 5:4.

This paper reports a different biochemical profile in men and women with Asperger Syndrome.

26. J Durdiaková, V Warrier, S Banerjee-Basu, S Baron-Cohen, B Chakrabarti (2014)

STX1A and Asperger syndrome: a replication study.

Molecular Autism, 5:14.

This paper confirms a gene in Asperger Syndrome that has been found in autism.

27. S Cassidy, P Bradley, J Robinson, C Allison, M McHugh, S Baron-Cohen (2014)

Suicidal ideation and suicide plans or attempts in adults with Asperger's syndrome attending a specialist diagnostic clinic: a clinical cohort study.

Lancet Psychiatry, 1:142–147.

This paper finds a disturbingly high rate of suicidal thoughts and plans and attempts in adults with Asperger Syndrome.

28. T Tavassoli, R Hoekstra, S Baron-Cohen (2014)

The Sensory Perception Quotient (SPQ): development and validation of a new sensory questionnaire for adults with and without autism.

Molecular Autism, 5:29.

This paper reports the first data from a new instrument, the SPQ or Sensory Perception Quotient, on which adults with autism show unusually high scores indicating sensory hyper-sensitivity.

29. A Pohl, S Cassidy, B Auyeung, S Baron-Cohen (2014)

Uncovering steroidopathy in women with autism: a latent class analysis

Molecular Autism, 5:27.

This paper confirms that women with autism have a raised risk of testosterone-related symptoms such as those seen in Polycystic Ovary Syndrome, including menstrual cycle irregularities.

2013

30. R. A.I. Bethlehem, J. van Honka, B. Auyeung, S. Baron-Cohen (2013)

Oxytocin, brain physiology, and functional connectivity: A review of intranasal oxytocin fMRI studies.

Psychoneuroendocrinology, 38: 962-74.

This paper reviews different theories of how oxytocin acts in the brain.

2013

31. M-C Lai, M Lombardo, J Suckling, A Ruigrok, B Chakrabarti, C Ecker, S Deoni, M Craig, D Murphy, E Bullmore, MRC AIMS Consortium, S Baron-Cohen (2013)

Biological sex affects the neurobiology of autism.

Brain, 136: 2799–2815.

This paper shows how the parts of the brain that differ between typical males and females overlap considerably with the parts of the brain that differ in autism vs. typical individuals, suggesting sex-linked biology is involved in the brain changes in autism.

32. E von dem Hagen, R Stoyanova, J Rowe, S Baron-Cohen, A Calder (2013)

Direct Gaze Elicits Atypical Activation of the Theory-of-Mind Network in Autism Spectrum Conditions.

Cerebral Cortex, 24:1485-92.

This paper reveals where in the brain differences are seen in autism when the individual is looking at another person's eyes looking at them.

33. L Fonville, N Lao-Kaim, V Giampietro, F Van den Eynde, H Davies, N Lounes, C Andrew, J Dalton, A Simmons, S Williams, S Baron-Cohen, K Tchanturia (2013)

Evaluation of Enhanced Attention to Local Detail in Anorexia Nervosa Using the Embedded Figures Test; an fMRI Study.

PLoS One, doi: 10.1371/journal.pone.0063964.

This paper reports where in the brain people with anorexia show a different pattern of activity when they are searching for a target in a complex visual design.

34. K Tchanturia, E Smith, F Weineck, E Fidanboylu, N Kern, J Treasure, S Baron Cohen (2013)

Exploring autistic traits in anorexia: a clinical study.

Molecular Autism, 4:44.

This paper finds that females with anorexia have an above average number of autistic traits.

35. V Warrier, S Baron-Cohen, B Chakrabarti (2013)

Genetic variation in GABRB3 is associated with Asperger syndrome and multiple endophenotypes relevant to autism.

Molecular Autism, 4:48.

This paper confirms an important gene is involved in Asperger Syndrome, as well as empathy, a gene that regulates the neurotransmitter GABA.

36. M C Lai, M Lombardo, S Baron-Cohen (2013)

Autism.

Lancet, 383(9920), 896-910.

This paper summarizes what we know about autism at every level, from behaviour to the molecular, and from causes to treatment.

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Or contact us at **info@autismresearchtrust.org**.