Symposium 17: Genetics of language disorders: from gene mapping to biological mechanisms

Supported by The Genetics Society

Theme: Genetics and epigenetics

Tuesday 11th April, 13:20 – 15:00

Current genomic technologies offer an unprecedented resolution to map common and rare variants underlying human diseases. The use of genomic information applied to the field of literacy and language genetics, however, still faces significant challenges. A main difficulty resides in the definition of the phenotype which cannot be measured under universal and homogenous criteria, especially across different countries because of its dependence on the spoken (and written) language. Nevertheless, significant progress has been made both in identifying novel genes for these complex traits and in dissecting their biological function.

This symposium brings together four internationally recognised researchers who have significantly contributed to recent advances in this field. We will discuss the importance of phenotype definition for gene identification through genetic screenings by quantitative GWAS and next generation sequencing. Gene mapping is only the initial step and genetic associations require to be followed up by functional studies to understand their relevance to a phenotype. However, another significant challenge is to identify suitable biological models to study the role of these genes during neurodevelopment.

The presentations will discuss the use of stem cells, zebrafish, mice and bats to study of candidate genes for complex traits contribute to neuronal function and neurodevelopment. An intriguing finding in the area is that of an unexpected role of dyslexia candidate genes in cilia biology which is advancing our understanding of cellular mechanisms, e.g. neuronal migration, implicated in the early phases of brain development. Talks will therefore cover the route which goes from clinical and phenotypic assessment to the study of biological mechanisms.

The findings and methodology presented at this symposium will be relevant to the field of complex cognitive trait genetics and psychiatric disorders, going well beyond the context of language-related conditions.

Chair: Dr Silvia Paracchini (University of St Andrews)

Speaker 1: Dr Silvia Paracchini

'Dyslexia and cilia biology: a new link between cognition and brain asymmetries?'

Speaker 2: Professor Tim Bates (University of Edinburgh)

'Genetic associations with variation in reading and language ability: present results and future directions'

Speaker 3: Dr Dianne Newbury (University of Oxford)

'Using extreme traits to identify genetic contributions to speech and language disorders'

Speaker 4: Dr Sonja Vernes (Max Planck Insititute, The Netherlands)

'Model systems to understand language disorders: FOXP2 and beyond'