**YEAR: 2014/15**

**SUPERVISOR: DR ALBERT BASSON**

**STUDENT: MR CHRISTOPHER ODDY**

**INSTITUTION: KING’S COLLEGE, LONDON**

**PROJECT TITLE: THE EXPRESSION OF AUTISM-ASSOCIATED CHROMATIN REMODELLING FACTOR Chd2 DURING BRAIN DEVELOPMENT**

**Brief Resume of your Project’s outcomes for the Society’s Website**: **(no more than 200-250 words)**.

*The title of your project and a brief 200-250 word description of the proposed/completed project. The description should include sufficient detail to be of general interest to a broad readership including scientists and non-specialists. Please also try to include 1-2 graphical images (minimum 75dpi). NB: Authors should NOT include sensitive material or data that they do not want disclosed at this time.*

Mechanisms that control spatiotemporal gene expression are fundamental for normal embryonic and postnatal development and homeostasis. In addition to tissue-specific transcription factors, epigenetic regulators are recruited to regulatory elements where they play a central role in coordinating transcriptional events. Mutations in epigenetic regulators have recently been linked to a number of conditions, including neurodevelopmental disorders. Mutations in the CHD2 gene has been linked to developmental delay, intellectual disability, autism and seizures, CHD8 mutations to autism and intellectual disability, whereas haploinsufficiency of the related gene CHD7 is associated with executive function and intellectual disability. In addition to these neurodevelopmental features, a wide range of other developmental defects are associated, especially with regards to CHD7 haploinsufficiency, which is the primary cause of CHARGE syndrome. Whereas the expression of Chd7 has been reported the expression of Chd2 and Chd8 after mid-gestation has not been investigated. Here we report the expression patterns of Chd2 and Chd8 in the mouse, and compare it directly with that of Chd7. We find high, widespread expression of these genes at early stages of development that gradually becomes restricted during later developmental stages. Chd2 and Chd8 is widely expressed in the developing brain at all stages of development, with expression remaining in the neocortex, hippocampus, olfactory bulb and cerebellum of the adult brain. Chd7 expression by contrast, becomes highly upregulated in the cerebellum, pontine nuclei by birth and remains in the cerebellum and neurogenic niches in the adult brain. In addition to expression in the brain, novel sites of Chd2 and Chd8 expression are reported in the intersomitic regions, cochlea, kidney, lung and tooth buds. These findings suggest additional roles for these genes in epithelial-mesenchymal signaling and branching morphogenesis during development, suggesting that these genes might also be associated with syndromic forms of autism that remain to be fully defined.

*File: UGProjectOutcomes201415BassonOddy*