Manal Adam

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Education

MRC Centre for Neuropsychiatric Genetics and Genomics, Cardiff University 2015- 2019

PhD Neuroscience

- Investigating neural mechanisms that underlie *Ehmt1*-associated neurodevelopmental disorders:

I am using a genomic, cellular and animal model approach to elucidate the role *Ehmt1* haploinsufficiency. Ehmt1 mutations and deletions have been associated neurodevelopmental disorders such as autism, schizophrenia, intellectual disability, and developmental delay. The behavioural phenotype of the mouse model is characterised using assays including learning and memory tasks such as novel object recognition and 5-choice serial task, as well as paradigms developed to discern anxiety phenotypes: elevated plus maze, locomotor activity, and acoustic startle response. Molecular and cellular techniques used to discern the effect of *Ehmt1* haploinsufficiency used include: *in vivo* quantification of proliferation and survival of cells in the dentate gyrus using BrdU and immunohistochemistry; primary cell culture isolation of P7 hippocampal cells to discern survival, proliferation, and phenotype of the cells *in vitro*. Finally, high throughput sequencing (RNA-seq) is being performed to carry out functional enrichment and gene set enrichment analyses for neurodevelopmental disorders.

Institute of Psychiatry, Psychology and Neuroscience, King's College London 2014-2015

M.Sc. Neuroscience in Developmental Neurobiology - *Distinction*

Concepts covered

- Neuroanatomy and Neuropathology
- Functional Genomics and Data Analysis
- Systems Neuroscience
- Neurodevelopmental Disorders
- Neurodegeneration
- Neuropsychology of Mental Health
- Neurogenetics
- Neural Plasticity
- Stem Cells
- Developmental Neurobiology

Degree specialisation in developmental neurobiology, Independent research project on: "Role of Teneurins in the formation of the Hippocampus and Visual System." This project involved using a *Ten-m3* gene-trap line, and Thy-1GFP reporter mouse lines to identify and characterise *Ten-m3* expression patterns in the development of the hippocampus and retina. I identified a strong gradient of density of *Ten-m3* positive cells, providing the first quantification for previous qualitatively described pattern of expression in the retina, corresponding with gradients of *Ten-m3* expression in visual cortex, and superior colliculus. I also show that *Ten-m3* is expressed in a strong gradient confined to the CA1 region of the hippocampus and knock-out of the protein lead misplacement of cell bodies in CA1 region, with homozygous K/O causing a more severe phenotype of misplacement compared to a heterozygous K/O, suggesting a function in the normal topography of hippocampus. Due to the known roles of ten-m3 in axon guidance and synaptic targeting in the development of other neural pathways, I proposed a similar conserved function within the hippocampus.

Bournemouth University 2011-2014

B.Sc. Biological sciences – *First Class Honours*

Final year dissertation: "Investigation of the Biological Mechanisms behind the Coupled Epigenetic Down- regulation Of *RELN* and *GAD-1* in Schizophrenia." This project investigated the epigenetic mechanisms behind *RELN* and *GAD-1*'s down-regulation to gain an understanding behind the mechanisms involved, along with the extent of penetrance the downregulation of these two genes have in schizophrenia.

Skills

Animal Husbandry and Behaviour (rodents)

- Colony management and husbandry
- Behavioural manipulations testing anxiety/exploration, cognition, and social behaviours
- Intraperitoneal and subcutaneous injections of substances in mice
- Transcardial perfusions
- Brain and retinal microdissections

Tissue analysis skills

- Genotyping
- Western blot
- RT-qPCR
- Tissue and cell culture Immunohistochemistry
- Microscopy
- In-situ hybridization

Molecular and cellular biology

- Cell cultures: Cortical and hippocampal primary cell isolation
- Molecular cloning; vector design, primer design

High throughput sequencing

- RNA-seq
- Bioinformatics/ -omics data analysis

I.T. Skills

- Regularly use R/Rstudio and –omic data packages, IBM SPSS Statistics, ImageJ and Sigmaplot in analysis and visualisation of research data.
- Proficient in Python, Unix/Linux shell, and have experience in C++ and Java languages.

Communication

- In addition to research presentations (see below), I have developed strong communication skills through my previous jobs and voluntary work. I was able to hone my communication skills in various formats such public speaking through being head of my debate team and compete in national competitions, as well as presenting in front of peers at university level and in front of the local authorities to receive funding for numerous projects.

Teaching/ Supervision Experience

- Lab demonstrator at Cardiff University 2016- current
    - Organise and run lab practicals for Bioscience undergraduates
- "Student Selected Components" (SSC) module for undergraduate medical students 2017- current
    - Designed and taught SSC module on epigenetics and Kleefstra Syndrome
- Supervision of 4TH year medical student in 4 month lab placement. 2016-2017
    - Supervised student through a 4 month research project
- Undergraduate Tutor at King's College London 2014-2015
- Biological sciences demonstrator at Bournemouth University 2013-2014
- Teaching assistant at St Alban's Preparatory School 2011-2012

Awards and Funding

- Top Student award by Royal Society of Biology 2014
- NMHRI Travel Grant- BNA 2017
- Early Career Researcher – Travel Grant 2017
- Guarantors of Brain- Travel Grant 2017

Publications

- Manal A. Adam, Anthony R. Isles (2017), *Ehmt1* in development and disorder, ***Epigenomes*** 1(3):15 (doi:10.3390/epigenomes1030015)

- Brittany A. Davis, François David, Ciara O'Regan, Manal A. Adam, Adrian J. Harwood, Vincenzo Crunelli, & Anthony R. Isles (2017) *Ehmt1* haploinsufficiency in the forebrain leads to impaired memory, sensory gating and information processing, ***BioRxiv*** (doi:10.1101/257626)

Conferences

- 2017: Society for Neuroscience- Poster: Manal Adam, Neils Haan, Trevor Humby & Anthony Isles (2017) Age- Related Impairment in Sensorimotor Gating in *Ehmt1* Haploinsufficient mouse model.
- 2017: BNA – Poster: Manal Adam, Trevor Humby & Anthony Isles (2017) Molecular and behavioural characterisation of *Ehmt1* haploinsufficiency (BNA 2017 Conference abstract), *Brain and Neurosciences Advances*
- 2017: Speaking of Science – 30 minute Presentation: Manal Adam, Trevor Humby & Anthony Isles (2017) Deciphering Neurodevelopmental Disorders (SoS 2017 conference abstract)
- 2017: MRC CNDD Annual Symposium- Poster: Manal Adam, Neils Haan, Trevor Humby & Anthony Isles (2017) Age dependent impairment in novel *Ehmt1* mouse model, (MRC CNDD symposium abstract)

Professional Societies

- British Neuroscience Association
- Federation of European Neuroscience Societies
- Society for Neuroscience
- Royal Society of Biology

Other Organisations

- British Science Association
- Wise
- Social Mobility Foundation

Other Experiences

- Volunteer Speaker for Science in Health 2016-current
    - school outreach programme

- Organising committee member for Speaking of Science (PhD conference) 2016-2017
    - Publicity subcommittee member disseminating publicity across universities, social media, and email. Designing all logo art.
    - Abstract subcommittee member: reviewing all submitted abstracts and deciding on the chosen abstracts and spread of topics.
    - Finding and obtaining funding and sponsorship for the conference and awards.

- Departmental Postgraduate Representative - King's College London 2014-2015
    - Participated in departmental meetings in developing teaching and research modules
    - Participated in school wide meetings on community affairs

- Youth Action Team Lead- VInspired – community outreach 2011-2015
- University Student Representative – Bournemouth University 2011-2014

Referees

Dr. Anthony R Isles: Primary Supervisor- PhD
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Dr. Robert Hindges: MSc Supervisor
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