NIHR GOSH BRC Vacation Studentship

PROGRESS FORM – VACATION STUDENT 2018

Student's name:	**Olivia Lucas**
Primary supervisor:	**Dr Matt Hall**
Subsidiary supervisor (where applicable):	**Dr Amy McDowell**
Project title(s):	**Histology & time-dependence in diffusion MRI for Duchenne Muscular Dystrophy**

Summary

What are you trying to do in this studentship?

My aim is to gain first-hand research experience through a project at ICH, focused on translating advanced MRI techniques into clinical practice. At the Developmental Imaging and Biophysics Section, I will be studying time-dependence in diffusion magnetic resonance imaging (MRI) and analysing MR images obtained from the forelimb of control mice and mice with Duchenne Muscular Dystrophy (DMD). Regions of abnormality will be identified and corresponding regions in the histology samples of muscle tissue analysed. We hope to determine if the abnormal regions on the Mdx (the mouse model of DMD) images are statistically significant, and how the fibres in these regions are affected.

Why is this research important?

DMD is a chronic genetic muscle-wasting condition that affects 1 in 3,600 males. It is caused by a mis-expressed dystrophin gene, resulting in absence of the dystrophin protein; this holds a major structural role in muscle. At present, clinical diagnosis is relatively straightforward, but monitoring disease progression remains more difficult. The current gold standard is muscle biopsy; however, this is an invasive and localised procedure susceptible to human error. There is an immediate need for non-invasive procedures capable of monitoring disease progression and therapeutic response. Diffusion MRI is a novel, non-invasive imaging modality that can screen the entire muscle. Research into this field is vital to support clinicians in DMD treatment and aid the development of new therapies.

Value of Your Experience

Please comment on the value of your experience undertaking this NIHR GOSH BRC vacation studentship.

My time at UCL Great Ormond Street Institute of Child Health this summer has been invaluable. It has provided me with a fantastic insight into a world-leading research environment and I have had the opportunity to work with and learn from academics who are leading in their field. As a biomedical science student, I previously had limited knowledge on imaging and biophysics and its application to disease. Not only do I now have a much deeper understanding of different imaging modalities and how they link to therapeutic interventions, I have also developed new skills in numerous statistical and medical image processing programs. These skills will be extremely beneficial as I enter the final year of my undergraduate degree and apply for further study. Additionally, working with PhD and Postdoctoral researchers and attending a few seminars at ICH have helped me to understand the fundamentals of applying for and studying a PhD; this is an understanding I do not believe I could have gained elsewhere.