

PRESS RELEASE: NBCI launches its collaborative Neonatal Encephalopathy PhD Training Network (HRB NEPTuNE).

HRB COLLABORATIVE DOCTORAL AWARD TRAINS EXPERTS IN UNDERSTANDING OCCURRENCE OF AND LONGTERM OUTCOMES OF NEONATAL ENCEPHALOPATHY

Dublin, 25th September 2018, NBCI, Neonatal Brain Consortium Ireland (www.nbcie.ie), launched their collaborative Neonatal Encephalopathy PhD Training Network - HRB NEPTuNE - in Trinity's Biomedical Science Institute. The training programme will improve understanding of the occurrence of and long-term impacts of encephalopathy in new-borns.

The multidisciplinary research training programme aims to produce a cohort of experts who will advance patient-focused research in neonatal encephalopathy. The five PhD scholars recently recruited to the programme will conduct their research in centres of excellence, advancing their knowledge with integrated support for professional development. The result will be better synthesis between research and health care and will have positive impacts on patient care and health.

HRB NEPTuNE combines the expertise of clinicians, psychologists and neuroscientists from Trinity College Dublin, the INFANT Centre at University College Cork, and the National University of Ireland Galway, along with the patient-focused group, Irish Neonatal Health Alliance (INHA). Clinical Research Development Ireland (CRDI) will provide the framework for the programme's training and instruction.

Neonatal Encephalopathy affects one and a half million babies worldwide. Many cases of NE occur unexpectedly at birth, without any warnings during pregnancy. Instances of NE can have permanent, life changing consequences for the children in question and their families. More than half of medical cases that appear before the High Court are maternity related. High Court awards to families are getting higher as the cost attending to the complex needs of their children rises. The socio-economic cost of NE is profound.

To date, international progress in determining the causes of and further developing treatments for NE has been slow. Ireland is at the forefront of research in neonatal brain injury and has collaborative potential to be an international leader in this area.

Led by Professor Eleanor Molloy (Consultant Neonatologist, Chair and Professor of Paediatrics, TCD and Tallaght Hospital) and Professor Geraldine Boylan (Professor of Neonatal Physiology and Director of the INFANT Research Centre, UCC), the programme's PhD scholars will conduct multidisciplinary research projects in premier research centres in Trinity College Dublin, University College Cork and NUI Galway. Scholars will have a holistic overview involving the entire translational research paradigm from basic science research, translational clinical research, clinical trials to epidemiology and population health, while getting in depth expertise in their chosen areas.

Principal Investigators in this consortium have internationally recognised expertise in neonatology, paediatrics, neurodevelopment, family-centred care, clinical trials and methodology, pharmacology, epidemiology, biostatistics, translational research and neuroimaging in neonatal brain injury. The PhD Scholars, while focussing on their five

individual projects and getting in depth expertise in their chosen areas, will also collaborate to ensure that results will contribute to evidence-based improvement in healthcare.

The most common cause of Neonatal Encephalopathy (NE) is hypoxia-ischaemia (HI) but other disorders such as sepsis, genetic and metabolic disorders may closely mimic the clinical features. It is sometimes difficult to distinguish the cause of encephalopathy in the first few days after birth and to predict longer term outcome. UCC's INFANT Centre will aim to identify the standard EEG features seen in NE using EEGs from a large database of studies available at INFANT. This strand of the NEPTuNE programme will also identify features that are most predictive of poor neurodevelopmental outcome.

Understanding the role of the circadian rhythm in neonatal brain injury and inflammation may lead to simple therapeutic measures such as decreasing the duration of light exposure to increase melatonin production. The CRADLE strand at Trinity College Dublin will investigate the impact of alterations of circadian rhythm in babies and assess whether this alteration can decrease inflammation caused by NE and ultimately improve outcome.

Follow-up research in NE infants neurodevelopmental, cognitive, linguistic and socio-emotional development will be conducted by Trinity College's psychology department. This strand of the programme – PANDA - will consider the impact of parent-infant interactions as predictive of developmental outcomes, including self-regulation, linguistic and cognitive competencies and executive functioning. The influence of neurobiological risk that may arise from NE may disrupt parent-infant interaction and influence the course of development, as has been shown in the context of prematurity. To date, no research has considered the nature of parent-infant interactions in the context of NE.

One of the difficulties often faced by study analysis on a topic is heterogeneity in the outcomes measured in those studies. This means that reviewers are frequently unable to compare the findings of many of the studies and a full analysis of the findings of all included studies is rarely possible. NUIG is to develop and apply agreed standardised sets of outcomes, known as 'core outcome sets' (COS). The COS should represent the minimum to be measured and reported in all trials. This use of the COS across an entire research area would allow for the results of trials to be effectively compared, contrasted and combined.

The fifth strand of the HRB-NEPTuNE project is to investigate the functional brain changes in neonatal encephalopathy (NE) infants and the associated behavioural and cognitive consequences. The Trinity College Institute of Neuroscience will use brain imaging data to quantify the functional integrity of the neural networks and examine potential associations with inflammatory markers and clinical phenotypes.

The programme has received funding from the HRB's Collaborative Doctoral Awards in Patient-focused Research which aims to provide structured PhD training to scholars working in a healthcare setting.

Speaking at the launch, Dr Darrin Morrissey, CEO of the HRB, commended the multidisciplinary approach of the network and acknowledged the importance of such an integrated and inclusive project in advancing patient-focused research.

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