A worldwide initiative, Project MinE, will dig deep into thousands of DNA profiles in order to discover the genetic causes of Amytrophic Lateral Sclerosis (ALS, also known as Motor Neurone Disease, MND) to ultimately find a cure for this devastating and fatal age-related neurodegeneration. The Irish arm of Project MinE, led by Orla Hardiman, Professor of Neurology in Trinity and Consultant Neurologist at Beaumont Hospital, is a founding member of the Project MinE consortium. The international consortium will analyse the DNA of at least 15,000 ALS patients and 7,500 control subjects. In Ireland, 700 MND patients and 350 healthy participants will contribute to this research effort.

The information obtained in Project MinE will be shared freely with all collaborators in the initiative and made available to scientists researching drug development. Launched in Ireland in 2015, Project MinE is funded with the generous support of the individuals and organisations and matched funding from Science Foundation Ireland (SFI). Project MinE has already resulted in several important discoveries that are reshaping our understanding of MND genomics:

- The identification of NEK1 as a major MND gene that contributes to around 3% of cases;
- The identification of three further key genes (C21orf2, MOBP and SCFD1) that clearly play an important role in modulating risk for MND;
- A clear picture of how much "background" genetic variation contributes to MND risk. Trinity scientists are leading on this aspect of the Project MinE consortium, and have already undertaken a detailed study of the Irish population structure.

They will have new data that help understand their recent discovery of a biological relationship between MND and other neuropsychiatric conditions of how the brain functions as a series of complex networks, and how these networks are disrupted in both MND and schizophrenia. The discovery of the link between MND and schizophrenia by lead scientist Dr Russell McLaughlin, Professor Orla Hardiman, and their international collaborators was published in the prestigious journal *Nature Communications* in early 2017.

- A member of Professor Hardiman’s team Dr Bahman Nasseroleslami, a Senior Research Fellow, and his group studied brainwave patterns. Their research shows that motor neurone disease, along with other neurodegenerative conditions, is associated with important changes in neural communication between different brain networks, rather than changes in a single region of the brain. These new findings considerably advance our understanding of the brain regions that start to get over-connected as the disease progresses and how they relate to the death of the motor neurones. These changes, in comparison to the healthy brain, have revealed some previously unrecognised abnormalities in the brain.

More information on Project MinE, list of supporters and how to donate to this crowd-funded project can be found online at: www.projectmine.com/country/ireland/

We thank all generous supporters, including those who prefer to remain anonymous, of the Irish arm of this international collaborative project aimed at finding solutions to this devastating condition.
The Academic Unit of Neurology is a key partner in the new Science Foundation Ireland Centre FutureNeuro. The FutureNeuro Centre is focused on addressing the biological basis and socioeconomic burden caused by ALS and Epilepsy. Building on world-leading pre-clinical and clinical research into epilepsy and ALS, the FutureNeuro Centre is an exciting scalable platform that will expand quickly to focus on other important neurological diseases such as multiple sclerosis.

**Family History Project**

Data collection continues on the largest family history project undertaken by the group to date under the coordination of PhD candidate Dr Marie Ryan. This work is in collaboration with the University of Edinburgh, and the Neuropsychology theme is led by Dr Niall Pender. This project involves collecting blood samples and detailed family history and neuropsychological measures on ALS patients and as many of their close relatives as possible as well as collecting the same information for healthy controls and their families for comparison. PhD candidate Emmet Costello is also working on this project.

**Clinical Trials of Neurodegeneration Drugs**

The Academic Unit of Neurology is also active in clinical trials of new drugs for neurodegeneration. Dr Julie Kelly, lead in drug development, is working on a new compound that will come to Phase I trial in 18 months. Ms Liz Fogarty, lead in Late Phase Clinical Trials is currently coordinating a number of Phase II and Phase III trials for patients with ALS, progressive MS and Post Polio Syndrome.

**European funded ALS-CarE**

Through our programme of Health Services Research, and in collaboration with colleagues across Europe, we are developing best practice frameworks for the management of MND/ALS, as well as other neurodegenerative disorders. Building on work already done on the patient journey and funded by a HRB Interdisciplinary Capacity Enhancement Award, current work includes the European funded ALS-CarE: A Programme for ALS Care in Europe which brings together prospective longitudinal data from 8 centres across 6 European countries and addresses issues around disease staging, end of life decisions, quality of life, caregiver burden, as well as examining the cost effectiveness of various models of service delivery. Research Fellow Dr Miriam Galvin is the theme leader on this project. Further research in this area includes defining and addressing the complex needs of ALS caregivers (funded by the American charity ALSA) which commenced data collection in the last six months. This study focuses on the informal caregivers, by identifying and characterizing caregiver burden in detail, including assessment of support, and coping styles, and aligning these factors with the physical, cognitive and behaviour status of people with ALS. The main researcher on this project is PhD candidate Sile Carney under the supervision of Dr Galvin.

**HRB Emerging Investigator Awards to Peter Bede**

Dr Peter Bede, the Iris O’Brien Clinical Lecturer in Neurology and Theme Leader of our Quantitative Neuroimaging Group, is among 11 researchers in Ireland to receive HRB Emerging Investigator Awards, which
are designed to enable researchers at the mid stage of their career to shift gear to become independent investigators.

Peter studies brain imaging (MRI) in neurodegenerative conditions. The aim of Peter’s work is to develop non-invasive imaging modalities into accurate diagnostic, prognostic and monitoring biomarkers. The findings will have implications for diagnostic applications, clinical management, pharmaceutical trials, and characterising anatomical patterns of pathological spread in neurodegeneration. Dr Bede collaborates with our Signal Analysis Theme Group, led by Dr Bahman Nasseroleslami. The Signal Analysis Group uses innovative quantitative EEG to understand the neural networking that’s associated with neurodegeneration. This exciting work will help us to find better and more reliable markers of behavioural change in ALS and related conditions for use in future clinical trials.

**Healthcare Professionals**

**MND Study Day at Beaumont Hospital**

The MND Study Day for healthcare professionals took place again in Beaumont Hospital in November. The event was organised as part of an effort to share the insights gathered through clinical experience in the MND Clinic and elsewhere, as well as the findings of some of our research, with health professionals from around the country who naturally encounter people with MND less frequently in their working lives. The goal of sharing these insights is to provide these healthcare professionals with useful information that might help them feel less isolated in their practice when they are caring for someone with MND. The study day was attended by about 170 people from a diverse range of healthcare professionals. Speakers included Professor Orla Hardiman, MND Nurse Specialist Bernie Corr as well as several researchers looking at the caregiver burden, quality of life and palliative care issues in MND.
WE SINCERELY ACKNOWLEDGE THE SUPPORT OF THE MANY PRIVATE INDIVIDUALS AND ORGANISATIONS WITH THE VISION TO HELP US FIND SOLUTIONS FOR THE ULTIMATE BENEFIT OF PATIENTS WITH NEURODEGENERATIVE DISEASES. OUR SPECIAL THANKS TO THE FOLLOWING 2017 SUPPORTERS:

- The Iris O’Brien Foundation
- The Irish Motor Neurone Disease Association (IMNDA)
- Gerry O’Connor in memory of his brother Tony O’Connor
- Air Corps Charity Golf Outing in Grange Castle Golf Club, organised by Lt. Col. Retd John Hughes
- Maura McHugh and Friends, Donegal
- Matilda Cunnion’s estate
- Dualla Ploughing Association
- Mags and Leonie King through their participation in the VHI Women’s Mini Marathon
- Community in Ballinalee, County Longford
- Joseph and Martha Farrell
- Maureen Fitzpatrick who contributed proceeds of the book by her late husband Michael Fitzpatrick, TD
- Ita Coonan
- The Good Run, organised by Olivia Sexton
- Hähnel Industries in memory of Mr Walter Hähnel
- Rosemary McCarthy
- Maggie Hayes, who is based in Chicago and has been raising funds in the United States in memory of her cousin Nuala

Maggi Hayes’s cousin Nuala Armstrong (pictured right) died in August 2017. In Maggi’s own words: “Nuala and I have been like sisters since we met when at the age of 20. We loved and shared many of the same things, were devoted to our families and each other and laughed easily together. Nuala was always the more practical but blessed with a mischievous sense of humour. I couldn’t have loved her more. I miss her enormously.”

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