

# Our Research

## EARLY DIAGNOSIS AND BIOMARKERS

We are focused on developing non-invasive diagnostic tools capable of detecting disease prior to the onset of clinical symptoms, with the aim of reducing diagnostic delays and allowing earlier interventions e.g.:

Threshold tracking transcranial magnetic stimulation (TMS) to assess cortical and axonal excitability which are often the first sign of neurodegeneration.



We are also actively engaged in the identification of blood-based biomarkers, including genetic material, brain-derived proteins and hormones, as well as immune-related cells and proteins that have the potential to serve as accessible, reliable indicators for early disease detection and ongoing monitoring.



## UNDERSTANDING THE MECHANISMS OF NEURODEGENERATION

Through advanced neurophysiological assessments and longitudinal imaging, we investigate the process of neurodegeneration in real time. By monitoring changes in brain connectivity, excitability and structure, we aim to gain deeper insights into disease trajectories and treatment responses.



# Industry Partners

Our group has extensive experience collaborating with major industry partners, supporting the translation of scientific discoveries into real-world applications.



VISIT OUR WEBPAGE

To learn more and view our researcher profiles, scan the QR code.



# The Kiernan Group



# Who We Are

## ► BACKGROUND

Our research into neurodegenerative disorders is led by Professor Matthew Kiernan AM and supported by a team of multi-disciplinary researchers. We are dedicated to advancing the field by focusing on early detection, uncovering novel treatments and deepening our understanding of the fundamental mechanisms that underpin these neurodegenerative conditions.

## 🔍 FIELDS OF INTEREST

Our investigative efforts span a wide spectrum of neurodegenerative disorders, including motor neurone disease, dementia and neuropathy, while also exploring the complexities of healthy ageing. Our multidisciplinary approach places us at the forefront of brain and nervous system research.

## 🎯 GOALS


Our team is driven by a shared mission: to improve and expedite the diagnosis of neurodegenerative diseases and to uncover the pathophysiological processes underlying these conditions.

We also conduct clinical trials to investigate potential therapeutic interventions, with the aim of developing effective treatments and, ultimately, stopping disease progression.

# Initiatives

Our group has been a crucial part of the conception of national initiatives, including the MiNDAUS partnership and ALLSTAR.

The MiNDAUS partnership is a national collaboration uniting clinicians, researchers, advocacy groups, caregivers and funding bodies with a shared commitment to enhance outcomes for people living with motor neurone disease.

Launching in pilot form in 2021, the MiNDAUS registry serves as a centralised, secure database that enables patients to manage their personal health information. With consent, this data can also be shared to support approved research and participation in clinical trials, helping to advance knowledge and accelerate the development of new treatments. See the sites below indicated by 

ALLSTAR is a national initiative with a focus on enhancing access to clinical trials for people living with neurodegenerative conditions. It offers full-service support from protocol development to trial delivery at member research sites across the country (see sites below indicated by stars).



We have played an integral role in establishing the Asia-Pacific MND Imaging Initiative (AMII), a collaborative clinical imaging network and centralised repository supporting MND research across Australia and South-East Asia. With over 500 scans, AMII is helping to drive cross-border research and insights into disease progression.

# Collaborators

## NATIONAL RESEARCH PARTNERS

Our research is supported by a network of leading national partners. These collaborations are instrumental in driving clinical research, fostering innovation, and translating discoveries into real-world outcomes. We are proud to work alongside the following key organisations:



## INTERNATIONAL ALS NETWORKS

We are actively engaged in international consortia advancing the diagnosis and treatment of amyotrophic lateral sclerosis. These global networks foster collaboration, standardisation and innovation across borders, enabling our team to contribute to and benefit from the latest advances in ALS research and clinical trials.

By aligning with shared trial infrastructure and participating in international recruitment efforts, we help improve trial efficiency and expand access for Australian patients. Harmonised clinical, imaging and biomarker protocols further support the generation of high-quality, comparable data across countries.

