



**A New Journey Against  
Brain Disorders Begins**

**An Introduction  
to Ulysses Neuroscience**

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# Ulysses Neuroscience Limited

## Private Irish R&D Organisation

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Ulysses Neuroscience Limited (UNL) is an Irish SME aimed at advancing knowledge and treatment of brain disorders by providing clinical and preclinical research services to pharmaceutical companies to accelerate their drug discovery programmes in neuropsychiatric, rare neurodevelopmental and neurodegenerative disorders.

We are committed to re-incorporating humanity into all aspects of how we do science. The company is based on three core values which directly drive our research and interaction with pharmaceutical companies:

- **Patient-Centricity**
- **Social Responsibility**
- **Translational Research**

Our core values aim to lead a new journey against brain disorders which will eventually result in the realisation of the revolutionary concept of discovering new treatments “with the patients”.

## Key commercial partnerships for advancing translational medicine

- nQ medical (digital computational biomarkers)
- Michael J Fox Foundation (iPSCs/brain organoids platform)
- Atuka (rodent and non-human primate PD models)
- Biorep (biological material preservation)

## Our Locations

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Trinity College Dublin

Maynooth University



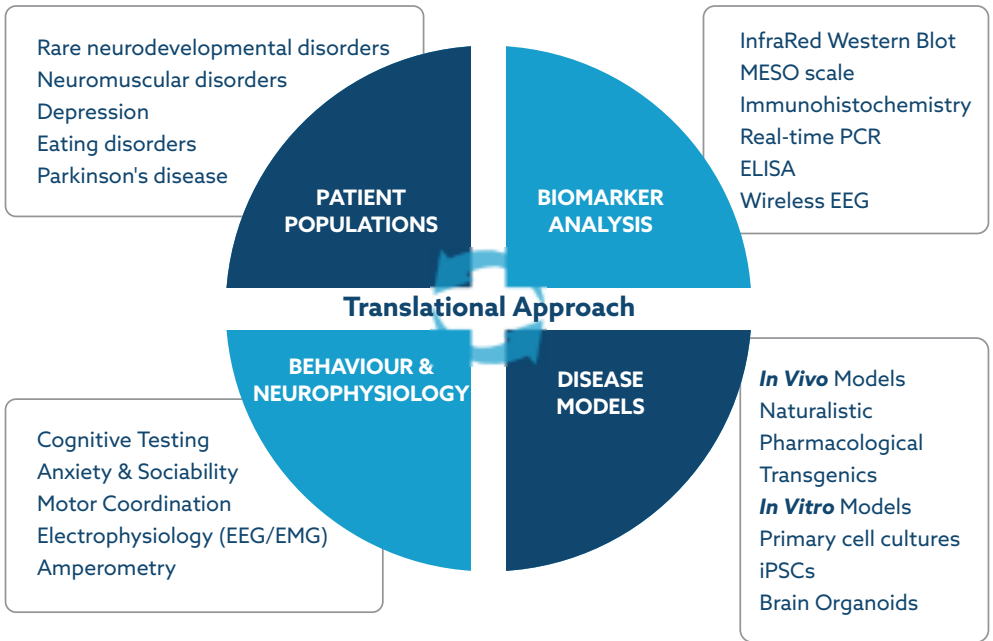
Global leader in patient-centric and translational research

Our Core Research Values

Patient-Centricity

Social Responsibility

Translational Research



Neuropsychiatric & Neurodevelopmental Disorders



Neurodegeneration, Neuroprotection & Neurorepair



Synaptic Plasticity & Microtubule Dynamics

# We Give Voice We Do Science



## ULYSSES NEUROSCIENCE LTD. ADVOCATES WITH FAMILY AND PATIENTS' ASSOCIATIONS

### WHAT WE DO:

- Family and awareness days
- Focus groups
- UlyssesNeuro seminars and webinars
- UlyssesNeuro podcasts

### WHAT YOU GET:

- Patient expert insight
- Rapport with patient communities
- Market and scientific information



## Leaders in patient-centric studies

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At Ulysses Neuroscience Ltd. we are experts in creating a relationship of trust and collaboration with clinicians and patient communities. We organise initiatives such as awareness days and focus groups that provide great insight into the needs and wishes of both the patient and caregiver community and that of their clinicians.

We have a strong working relationship with local and international clinical sites and have robust protocols to ensure the highest standard of quality from sample collection through to analysis. From bedside to bench, we integrate this information into the design of bespoke biomarker and target identification studies and phase IV trials.

Specialising in fluid biomarker analysis in conjunction with existing clinical assessments and scales, we advance the understanding of druggable targets and epidemiological characteristics of a disorder alongside the patient and caregiver populations, and help pharmaceutical companies improve their reach and study efficacy.



## Research & Development (I)

### Disease Models

#### Neurodevelopmental

1. *Fmr1*-KO mice (Fragile X Syndrome model)
2. *Cdkl5*-KO (exon 6) mice (*CDKL5* Deficiency Disorder model)
3. *Ube3a*-KO mice (Angelman syndrome model)

#### Neuropsychiatric

Interferon- $\alpha$  neuroinflammatory model of depression

#### Neurodegenerative

- $\alpha$ -Synuclein model of Parkinson's disease  
(in collaboration with Atuka)
1. Human AAV1/2 A53T
  2. Pre-formed fibrils

## Research & Development (II)

### Behavioural Analysis

#### Cognition

- Operant conditioning
- Object recognition task
- T-maze
- Morris water maze

#### Stress and anxiety

- Forced swimming test
- Elevated + maze & zero maze
- Open field test
- Marble burying test
- Ultrasonic vocalisations

#### Sociability

- 3-Chambers task
- Social interaction

#### Motor Systems

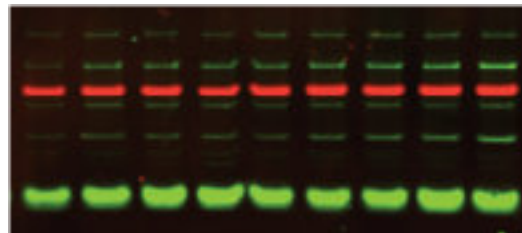
- Prepulse inhibition
- Rotarod
- Cylinder test
- Stepping test
- Gait test
- Grip strength test

## Research & Development (III)

### Cellular / Molecular Methodologies

#### Biomarker capabilities & detection methods

- InfraRed Western Blot - Odyssey CLx Imaging system
- Multiplex MESO Scale Discovery - QuickPlex SQ 120
- Immunohistochemistry
- Real-time PCR
- ELISA
- HPLC
- EEG
- In vivo* amperometry





## Ulysses Maynooth

At our Ulysses Maynooth site, we have developed our electroencephalography (EEG) platform in rats, focusing on home cage and operant chamber-based recordings to use EEG as an endpoint in pharmacological and behavioural studies. We have the capabilities to do both screw-based and depth electrodes, allowing for studies to be tailored to the needs of the research.

### Resting State EEG (rsEEG)

The use of psychedelics for depression has become a major driver of drug discovery in psychiatry, especially the development of novel psychedelic-based compounds which have anti-depressant features but lack the acute hallucinogenic or sensory side effects of compounds like psilocybin. Using rsEEG, we are developing an analytical pipeline to better understand these psychedelic effects in rodents.



### Sleep EEG

Sleep is a key behaviour that is dysregulated across a range of neurological disorders including neurodegenerative disorders like Parkinson's disease and in neurodevelopmental disorders like Angelman syndrome. Sleep EEG is a powerful translational tool for drug discovery which we use to examine changes in sleep architecture during preclinical testing.

### Amperometry and voltammetry

In addition to traditional EEG techniques, we also have the capability to measure real-time changes in neurochemistry in freely-moving animals. We have extensive expertise in amperometric sensors and biosensors used to detect real-time changes in oxygen, glucose, lactate, glutamate, choline and many other analytes. We are also developing our facilities to perform voltammetry for the detection of dopamine and serotonin in awake, behaving rats.

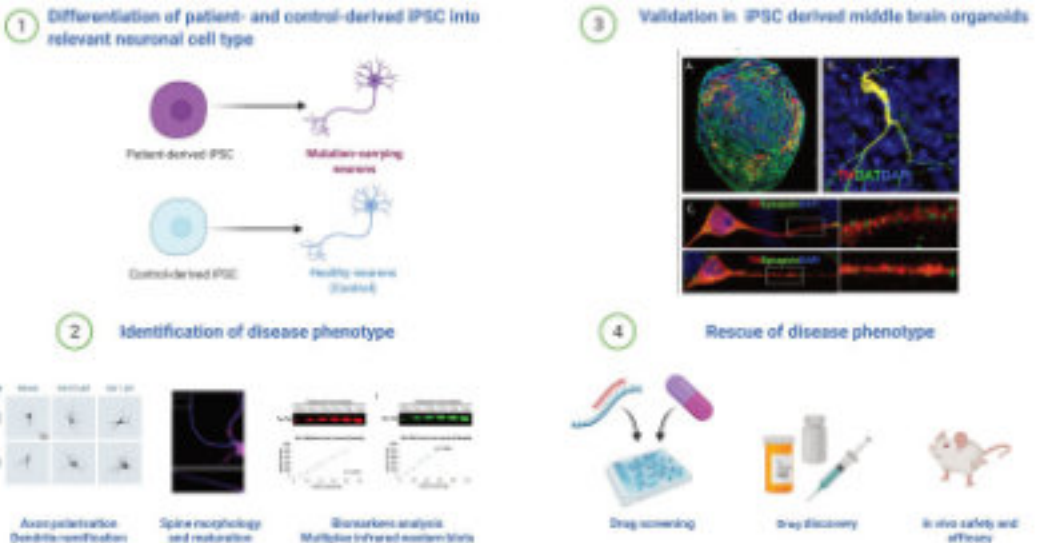
## Primary culture system

- Primary cultures of neurons and glia from wild-type and transgenic mouse models
- Morphometric and functional assays
- Neuroprotective assessment: cell viability, apoptosis and inflammatory gene expression

## iPSCs/organoids platform

- iPSC biobanking, characterisation and neuronal differentiation
- Middle brain organoids from Parkinson's disease patients and control iPSCs (in collaboration with Michael J Fox Foundation (MJFF))
- Quantification and identification of biomarkers and novel disease targets:
  - Infrared Western Blot
  - Immunohistochemistry analysis
  - Synaptogenesis quantification
- Drug screening and target validation

### Use of patient-derived induced pluripotent stem cells (iPSCs) for drug screening







**ULYSSES**  
NEUROSCIENCE

## #ThinkRare

### Rare neurological disorders

We provide patient-centric research services and consultancy that bridge clinical & preclinical domains

#### ASSOCIATED WITH:

- CDKL5 Deficiency Disorder (CDD)
- Fragile X Syndrome (FXS)
- Angelman syndrome (AS)
- Charcot-Marie-Tooth disease (CMT)



"Our goal is to discover that we have always been where we ought to be."

*Aldous Huxley*

## #psychedelics2pt0



Our research facilities in Trinity College Dublin and Maynooth University are fully licensed for the use of Schedule I drugs (glutamatergic and serotonergic psychedelics) for research.



We can provide you with the needed reference synthetic psychedelic for your research with the highest quality control requested.



Our research capabilities on psychedelics can offer novel preclinical approaches to investigate mechanisms of action and efficacy of psychedelics and new derivatives.

## The Founder

**Massimiliano (Massi) Bianchi, Ph.D - President & CEO**

*Adjunct Assistant Professor, School of Psychology, Trinity College Dublin*

*Adjunct Associate Professor, Chemistry Department, Maynooth University*



Professor Max Bianchi launched Ulysses Neuroscience in 2019 following 20 years of international neuropharmacology R&D and executive management experience in industry and CRO including GlaxoSmithKline (UK), MAPREG (France), and Transpharmation Ireland Ltd (Ireland). A native of Italy, Massi originally studied veterinary medicine in Sassari and Milan before obtaining his PhD in psychopharmacology at the University of Nottingham (UK) and embarking on a career in scientific research and the pharmaceutical industry. He is now an industry leader in the field of neuronal plasticity and cytoskeletal dynamics in psychiatric and neurodegenerative disorders, has several patents and is an author on over 50 publications. Massi also holds the positions of Adjunct Assistant Professor in the School of Psychology at Trinity College Dublin and an Adjunct Associate Professor in the Department of Chemistry in Maynooth University.

## John Kealy, Ph.D.

**Chief Scientific Officer & Head of Ulysses Maynooth**



John graduated with a B.A. Mod in Neuroscience from Trinity College Dublin and completed a PhD on the neurophysiology of learning and memory at the Department of Psychology, National University of Ireland, Maynooth. Since then, his postdoctoral experience has largely been built around the intersection between behaviour, metabolism, and the cerebral vasculature in order to create meaningful, translational neuroscience research. John's scientific interests revolve around the effects of genetic, pharmacological, and metabolic interventions both on normal brain function and in animal models of complex neuropsychiatric and neurological disorders – with a focus on disorders such as schizophrenia, epilepsy, Alzheimer's disease and delirium.

## Jennifer Rouine, Ph.D.

**Operations Manager**



Jen joins Ulysses Neuroscience with more than 10 year's preclinical research expertise in both academia and the pharmaceutical industry. Jen has previously held a CRO management position (Transpharmation Ireland Ltd.) and was awarded a Science Foundation Ireland Fellowship which provided an excellent opportunity to explore academia- industry engagements. Jen graduated from Trinity College Dublin with a B.A. Mod in Physiology and an M.Sc. In Neuroscience. Following completion of her Ph.D. on the neuropsychopharmacology of methylenedioxymethamphetamine at Trinity College Institute of Neuroscience, Jen gained significant postdoctoral experience on the neuropsychopharmacology of affective disorders.

## **Aimée Freeburn**

### Head of Biomarker Team



Aimée graduated from National University of Ireland, Galway with a B.A. in Psychology and M.Sc. in Neuropharmacology. Since joining Ulysses Neuroscience as a Research Assistant in 2020, she has taken over as head of the biomarker team and has overseen a range of clinical and preclinical studies across several of our research areas. Driven by the desire for a data and evidence-based approach to patient care and the development of novel therapies, Aimee is working towards growing in her managerial role while exploring her own interest in the area of eating disorder research and therapeutics.

## **Johana Tello, Ph.D**

### In-Vitro Lead



Johana Tello Velasquez is a neurobiologist with expertise in the culture and profiling of primary neuronal and glial cells. She completed his PhD in neuroscience at Griffith University where she developed a screening process to identify natural compounds that enhance olfactory glia as a therapeutic for Spinal Cord Injuries. Before making the transition to neuroscience she studied Marine Biology as an undergraduate in Colombia, a part of science that she is still passionate about. Looking to expand her knowledge in neuroimmunology, she moved to Ireland in 2019. In the last couple of years, she had worked on several projects including the screening of potential cannabinoids as based therapy for neuro-inflammation conditions using patient immune cells (Trinity College) and the study of biological changes in blood vessels observed in COVID-19 patients (RCSI). The overarching goal of her research is to apply the knowledge generated from querying neural biology toward producing better therapies to repair the nervous system. Her current research involves working at the interface of discovery and translational research to develop a robust in vitro platform for the study of neurological conditions.

## **Carolina De Pasquale**

### Patient Insight Manager & Clinical Lead



Carol has worked on speech acoustic coordination in human-human interactions in clinical settings to measure interpersonal rapport in psychotherapy. She joined Bianchi's Lab in molecular neuroscience for two years prior to moving to Ulysses Neuroscience. Having developed a strong interest in neuroscience and psychology during her career so far and in her personal life, she has come to Ulysses Neuroscience as Patient Insight Manager and Clinical Lead. As Patient Insight Manager she is responsible for working on patient relations and creating opportunities for patients to express their priorities and needs, and for helping their communities to come together, working on advocacy and awareness alongside them.



*I am tomorrow, or some future day,  
what I establish today,  
I am today what I established  
yesterday or some previous day.*

*- James Joyce*

## CONTACT US

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## VISIT US

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