

CURE-ND Neurotechnology Workshop | 23-24 February 2021 “Innovative models of neurodegenerative diseases”

One of the major roadblocks to medical progress in the field of neurodegeneration is the absence of animal models that fully recapitulate features of the human diseases. Unprecedented opportunities to tackle this challenge are emerging e.g. from genome engineering and stem cell technologies, and there are intense efforts to develop models with a high translational value. Simultaneously, single-cell, multi-omics and optogenetics technologies now allow longitudinal, molecular and functional analysis of human disease processes in these models at high resolution.

During this workshop, 12 experts will present recent progress in the field and discuss:

- What are the most advanced disease models available to date?
- Which aspects of the human disease do these accurately models, which ones do they fail to replicate?
- How should models be validated? Against which reference, which standards?
- What are currently the best methods to analyse these models?
- What is the field still missing in terms of modelling, and of technologies to analyse disease models?

CURE-ND stands for Catalysing a United Response in Europe to Neurodegenerative Diseases. It is a new alliance between the **German Center for Neurodegenerative Diseases (DZNE)**, the **Paris Brain Institute (ICM)**, **Mission Lucidity (ML)**, a partnership between imec, KU Leuven, UZ Leuven and VIB in Belgium) and the **UK Dementia Research Institute (UK DRI)**. Together, these partners embrace a joint effort to accelerate the pace of scientific discovery and nurture breakthroughs in the field of neurodegenerative diseases. This Neurotechnology Workshop is the first in a series of joint events aiming at exchanging expertise, promoting scientific collaboration and building a strong community of neurodegeneration researchers in Europe and beyond.

REGISTRATION & PRACTICAL INFORMATION

The workshop will take place online in the afternoon (1.30pm – 5.30pm CET) on 23 and 24 February 2021. See the program below for more details.

Participation is free, but registration is required. Please [register here](#) and receive your personal link to attend this online workshop.

We will be using the Zoom platform. If you are not familiar with Zoom, we recommend that you install the Zoom Client Desktop app and join a [test meeting](#) in advance.

PROGRAM

DAY 1 - FEBRUARY 23

SESSION 1 | In vitro models | 1.30-3.30pm CET

(Chair: Julie Williams – UK DRI@Cardiff University)

Sandrine Da Cruz (VIB-KU Leuven, partner institute of ML) From the motor neuron to the neuromuscular junction: unraveling neurodegenerative mechanisms in ALS

Caleb Webber (UK DRI@Cardiff University) Modelling Parkinson's in vitro: from mechanism to treatment

Natalia Rodriguez Muela (DZNE) Human iPSC-derived models to decipher the mystery of selective neuronal vulnerability in motor neuron diseases

Delphine Bohl (ICM) Modelling contributions of myeloid cells to motor neuron degeneration in ALS using human iPSC cells

SESSION 2 | In vivo models | 3.40-5.30pm CET

(Chair: Bassem Hassan – ICM)

Pierre Vanderhaeghen (VIB-KU Leuven, partner institute of ML) Modelling human cortical neuron development, function and disease using xenotransplantation

Bart De Strooper (UK DRI; VIB-KU Leuven, ML) Humanized models to untangle the cellular phase of Alzheimer's disease

Sabine Krabbe (DZNE) Illuminating the neural circuit mechanisms of neurodegenerative disorders with new optical methods

Eric Burguière (ICM) Optogenetic probing of functional neural circuits implicated in compulsive behaviors

DAY 2 - FEBRUARY 24

SESSION 3 | Technologies | 1.30-3.20pm CET

(Chair: Liesbet Lagae – imec & KU Leuven, partner institutes of ML)

Dries Braeken (imec, ML) Printing human microcircuits by microchip technology

Nir Grossman (UK DRI@Imperial College London) Non-invasive brain stimulation to slow/prevent neurodegenerative diseases

Hayder Amin (DZNE) Smart biomarkers for revealing neuronal network complexity in health and disease

Carine Dalle (ICM) Unraveling neuronal network activity and synaptic plasticity with multi-electrode arrays *in vitro*

SESSION 4 | Breakout sessions with panel discussion | Conclusions | 3.35-4.30pm CET