Move2Treat

MOVE2TREAT

Technical Newsletter

Issue #2 | June 2026

ABOUT THE PROJECT

EU HORIZON EIC 2024 PATHFINDER OPEN

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https://move2treat.org/

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Funded by
the European Union

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WELCOME TO THE MOVE2TREAT NEWSLETTER

Exploring their role as neural interfaces in research. Movement disorders affect millions worldwide, demanding minimally invasive soft multifunctional neural devices. MOVE2TREAT aims to improve mapping of brain and spinal cord activity through next-generation flexible probes that combine electrical recording, optical stimulation, and targeted drug delivery.

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EDITORIAL SUMMARY

Movement disorders such as Parkinson's disease and essential tremor remain among the most challenging neurological conditions to treat effectively. Current therapeutic approaches often rely on rigid implants that can damage delicate neural tissue over time.

MOVE2TREAT addresses this gap by developing soft, multifunctional neural probes capable of simultaneous electrophysiology, optogenetics, and microfluidic drug delivery. These devices aim to provide unprecedented insight into brain and spinal cord circuit dynamics while maintaining long-term biocompatibility.

DTU

Cyprus University of Technology

UNIVERSITY OF COPENHAGEN

universität freiburg

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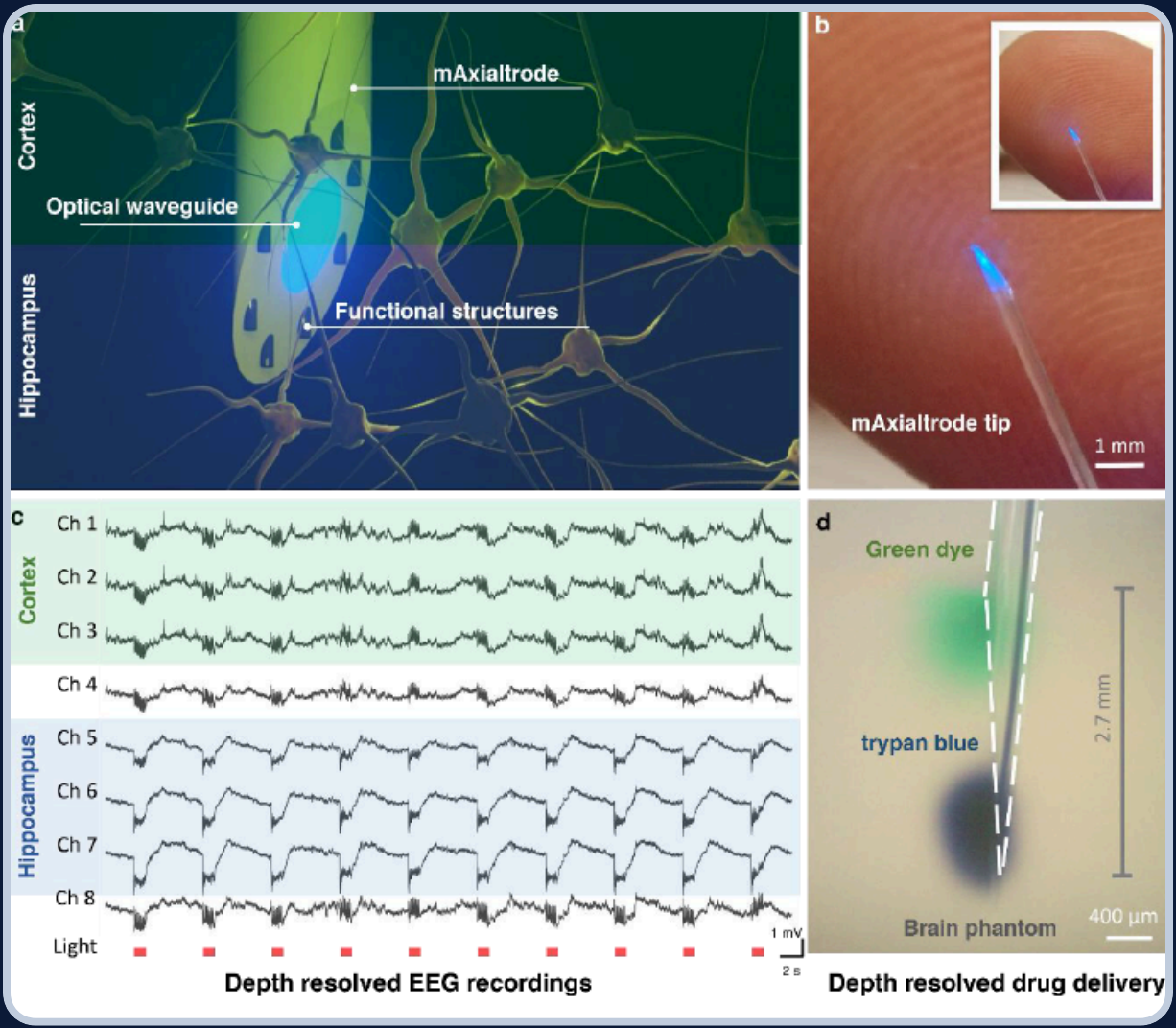
FEATURE

mAxialtrode - DTU

Layer-Crossing Interrogation of Brain Circuits



(a) Schematic of the mAxialtrode with an integrated optical waveguide and functional structures (microfluidic channels or electrodes) for layer-crossing interrogation of brain circuits.

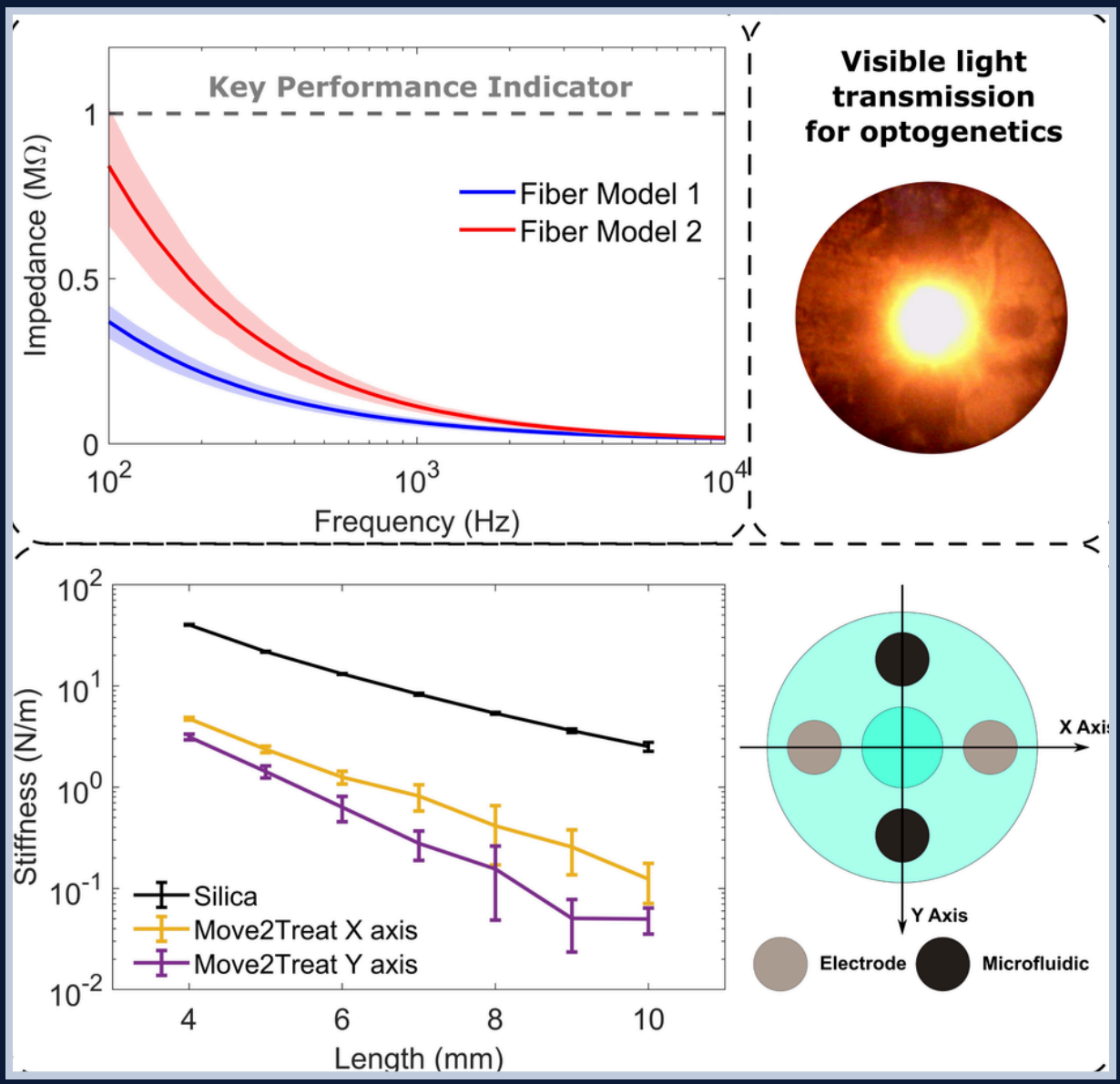
(b) Photograph of the mAxialtrode tip on a fingertip, illustrating its small size.

(c) EEG recordings from multiple channels spanning the cortex and hippocampus during light stimulation.

(d) Drug delivery at different depths in a brain phantom, showing green dye from upper channels and trypan blue from lower channels, with a delivery span of up to 2.7 mm.

KPI Results- DTU

Impedance, Light Transmission & Stiffness



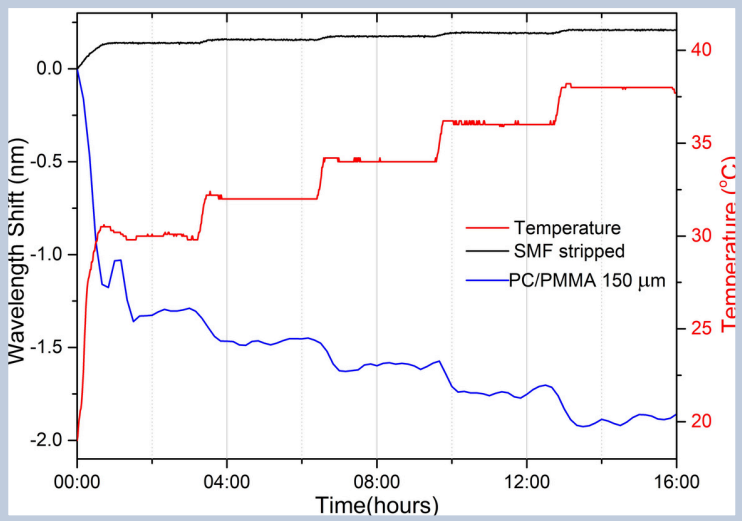
Top left: Impedance results demonstrating performance exceeding our KPI targets.

Top right: Optical fiber light transmission for optogenetics, confirming effective waveguide coupling.

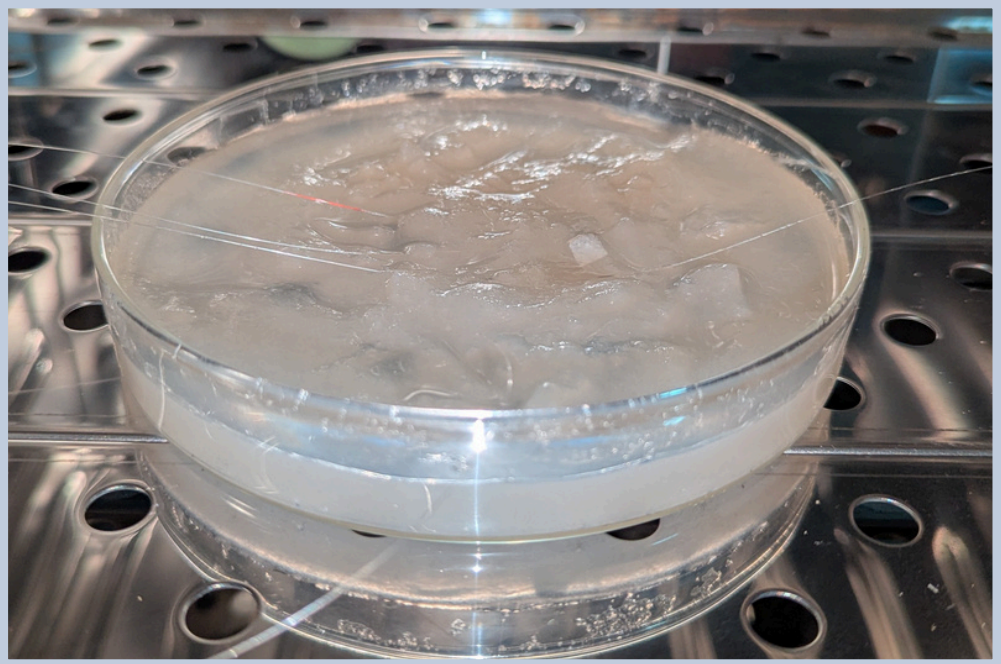
Bottom: Stiffness comparison showing our device is an order of magnitude lower than silica, enabling safer, more compliant neural interfaces.

Polymer Fibre Sensors in Agar-Agar Brain Phantom - CUT

Move2Treat Experimental Results



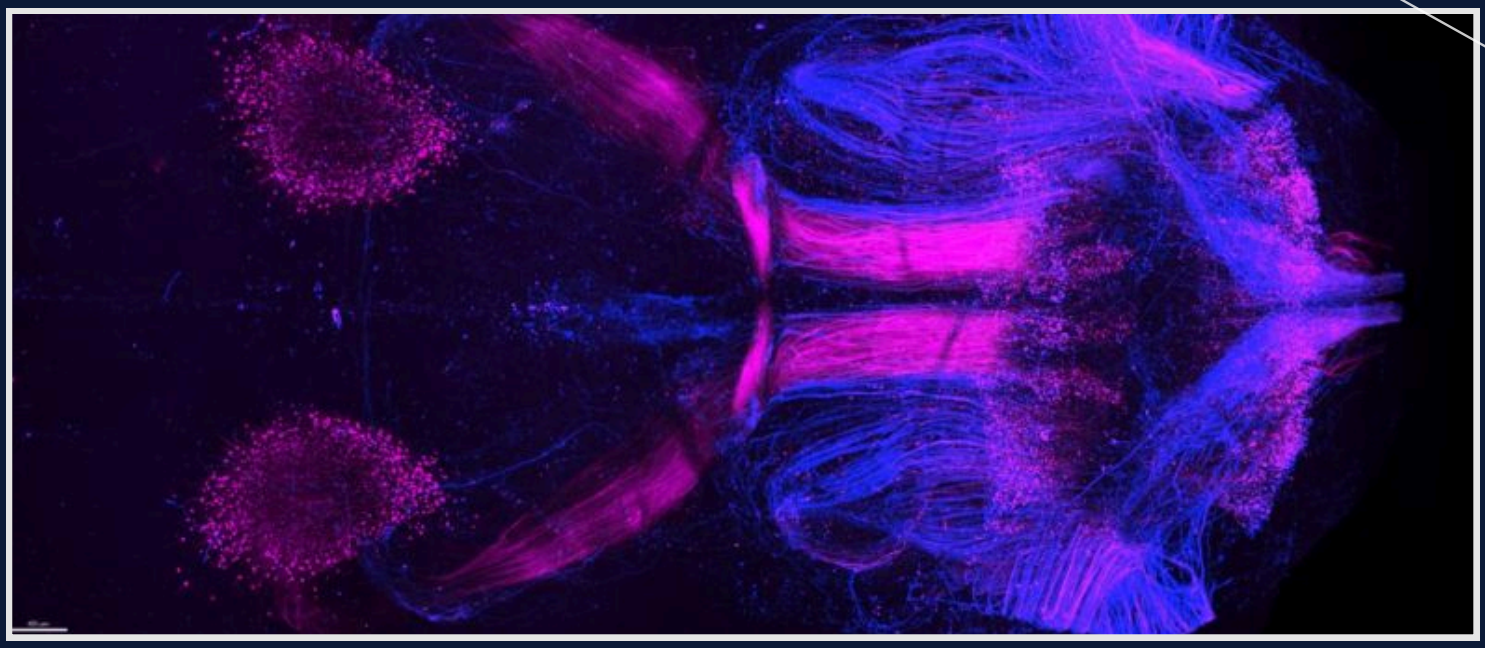
The fibre sensors were subjected to physiologically relevant temperature variations between 30 °C and 38 °C, demonstrating stable and repeatable sensing performance. The graph shows wavelength shift as a function of temperature, confirming linear and reproducible thermal response across multiple heating and cooling cycles.



For the latest Move2Treat experiments, multifunctional polymer fibre sensors were evaluated in an agar-agar brain phantom designed to mimic the mechanical and thermal properties of neural tissue. The fibre implants were embedded within the phantom under realistic soft-tissue conditions, highlighting their potential for reliable in vivo temperature monitoring and future neurophotonic applications.

Brain-Spinal Cord Communication - UCPH

A closer look at how the brain communicates with the spinal cord



This image shows a mouse brain following viral tracing from the lumbar spinal cord, capturing bidirectional communication across several major pathways linking brain and spinal cord.

Anterograde tracing is shown in blue and retrograde tracing in magenta, together revealing long-range neuronal projections and the complex architecture of descending and ascending connections.

This sample was featured as Vibrant's **"Map of the Month."** The dataset was generated by Grace Houser and Martin Carbo-Tano in the Rune Berg Lab, Department of Neuroscience, University of Copenhagen.

The tissue was cleared and imaged using the UltraMicroscope Blaze by Miltenyi Biotec and shared by the team at Vibrant ApS, Virtual Brain Technologies.

This work connects to ongoing efforts within Move2Treat, where advanced imaging and data-driven approaches are helping us better understand neural circuitry and disease-relevant mechanisms.

Accelerated Aging - UFR

Long-Term Stability & Failure Mechanism Analysis

UFR conducted experiments on fibers aged in phosphate-buffered saline at two temperatures: 37 degrees C (body temperature) and 60 degrees C (accelerated aging). The purpose is to evaluate long-term stability and identify potential failure mechanisms early in the development process to improve device reliability.

Neurotechnology: Medical Innovation Instead of Science Fiction

The intersection of humans and machines has long fascinated us, from Black Mirror to The Matrix and Blade Runner. It contrasts the allure of human enhancement with the fear of losing control. Thomas Stieglitz explores this in his podcast episode "Neurotechnologie: Medizinische Innovation statt Science-Fiction," part of the German podcast series Technik aufs Ohr.

https://www.vdi.de/news/detail/neurotechnologie-medizinische-innovation-statt-science-fiction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