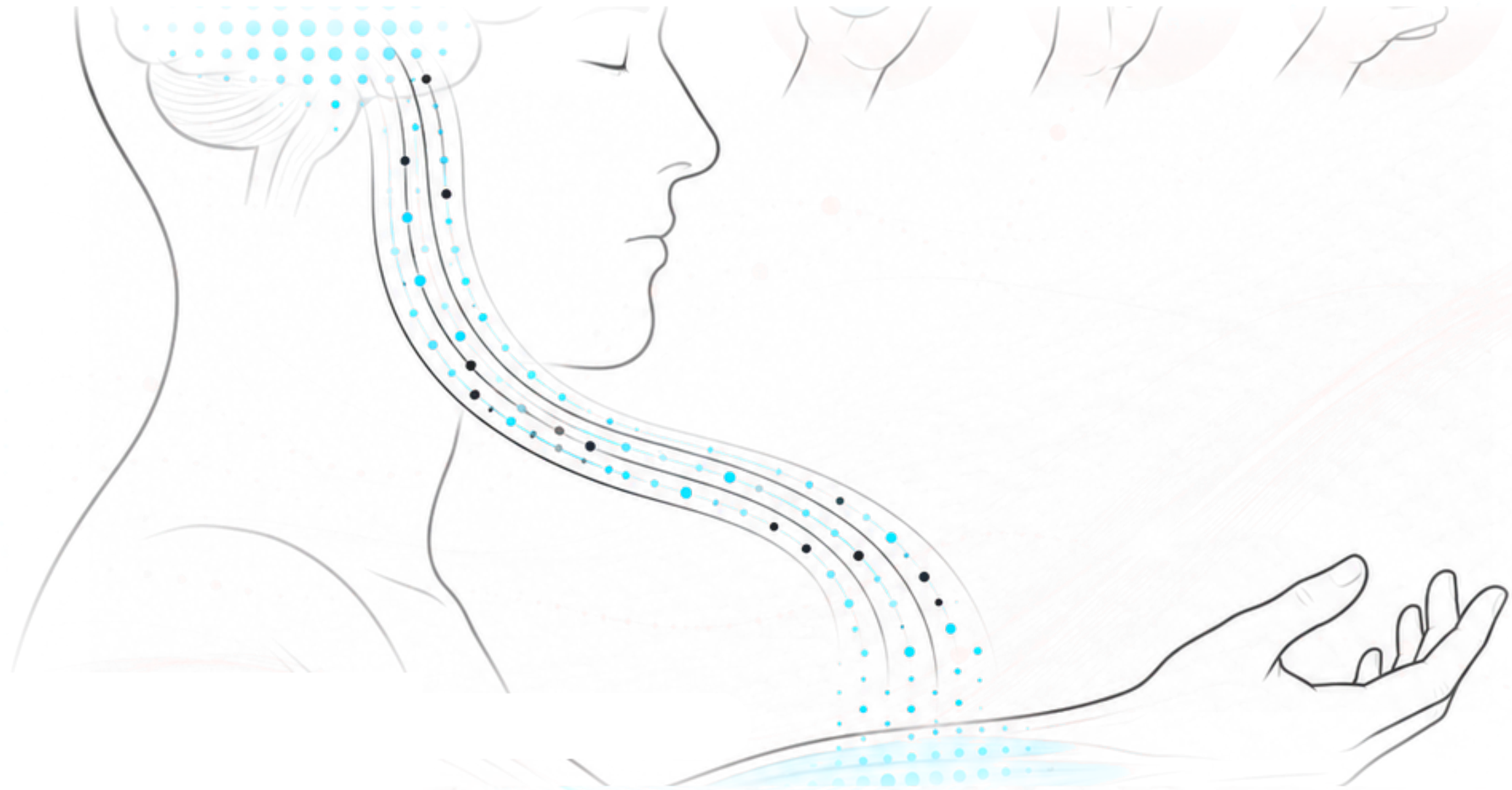
IONBIKE2.0

Funded by the European Union

PUBLICATION · 8 JULY 2026

NEW ARTICLE IN **NATURE COMMUNICATIONS**



CONCEPTUAL ILLUSTRATION

Brain and muscle activity, mapped simultaneously

A wearable multimodal electrophysiology platform maps electrical activity across the cortico-muscular axis.

Body surface potential mapping of the cortico-muscular axis using smart textile electrode arrays

Nature Communications 17, 8441 (2026) doi.org/10.1038/s41467-026-75134-1

A RESULT OF THE **IONBIKE 2.0** PROJECT · HORIZON EUROPE MSCA STAFF EXCHANGES

WHAT IS **ACTUALLY NEW?**

Not EEG itself. The article describes a connected framework for high-density, multi-site mapping.

01

Hybrid e-textile electrode arrays

Conformable, robust electrode layouts for wearable recordings.

02

Conducting-polymer eutectogel coatings

Application-specific skin interfaces that support signal quality.

03

Wireless data acquisition

Reduced wiring complexity across simultaneous recording sites.

04

Interpretable machine learning

Spatial patterns become classifications, maps and predictions.

The advance lies in **bringing these four elements together within a single framework** to map electrical activity across the cortico-muscular axis, simultaneously.

EVIDENCE BOUNDARY

A controlled single-subject proof of concept: it establishes a framework and a route forward, not yet a clinical device or a population-level validation.

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Nature Communications 17, 8441 (2026) doi.org/10.1038/s41467-026-75134-1

THE FULL RESEARCH TEAM

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Nature Communications 17, 8441 (2026). Article affiliations are distinct from the complete IONBIKE 2.0 consortium, presented on the last page.

POLYMAT RESEARCHERS IN THE STUDY

Materials expertise within the integrated platform.

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THE MATERIALS DIMENSION

Conducting-polymer eutectogel electrode coatings are one part of the full system, alongside textile fabrication, electronics, electrophysiology and machine learning.

One contribution within a multidisciplinary, ten-author team. POLYMAT is highlighted here without turning a project-wide result into an institutional-only story.

IONBIKE 2.0
BEYOND ONE PAPER

Short-term research and innovation staff exchanges to push the boundaries of eutectogels.

IONBIKE 2.0 advances eutectogels from fundamental materials science towards applications in **energy, bioelectronics and the environment**. This study belongs to the bioelectronics branch, where materials, wearable devices, electrophysiology and data interpretation meet. **Exchange is the mechanism:** people, expertise and research infrastructure move across academic and industrial organisations.

CHEMISTRY → **EUTECTOGELS** → **DEVICES** → **APPLICATIONS** | **ENERGY · BIOELECTRONICS · ENVIRONMENT**

2024-27	PROJECT DURATION	15	INTERNATIONAL PARTNERS	MSCA	HORIZON EUROPE STAFF EXCHANGES

A 15-PARTNER INTERNATIONAL CONSORTIUM

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- King Abdullah University of Science and Technology
- Deakin University

READ THE ARTICLE

Body surface potential mapping of the cortico-muscular axis using smart textile electrode arrays

https://doi.org/10.1038/s41467-026-75134-1 Nature Communications 17, 8441 (2026) https://ionbike.eu/

Funded by the European Union under the Horizon Europe MSCA Staff Exchanges project IONBIKE 2.0 - Grant Agreement No. 101129945.