

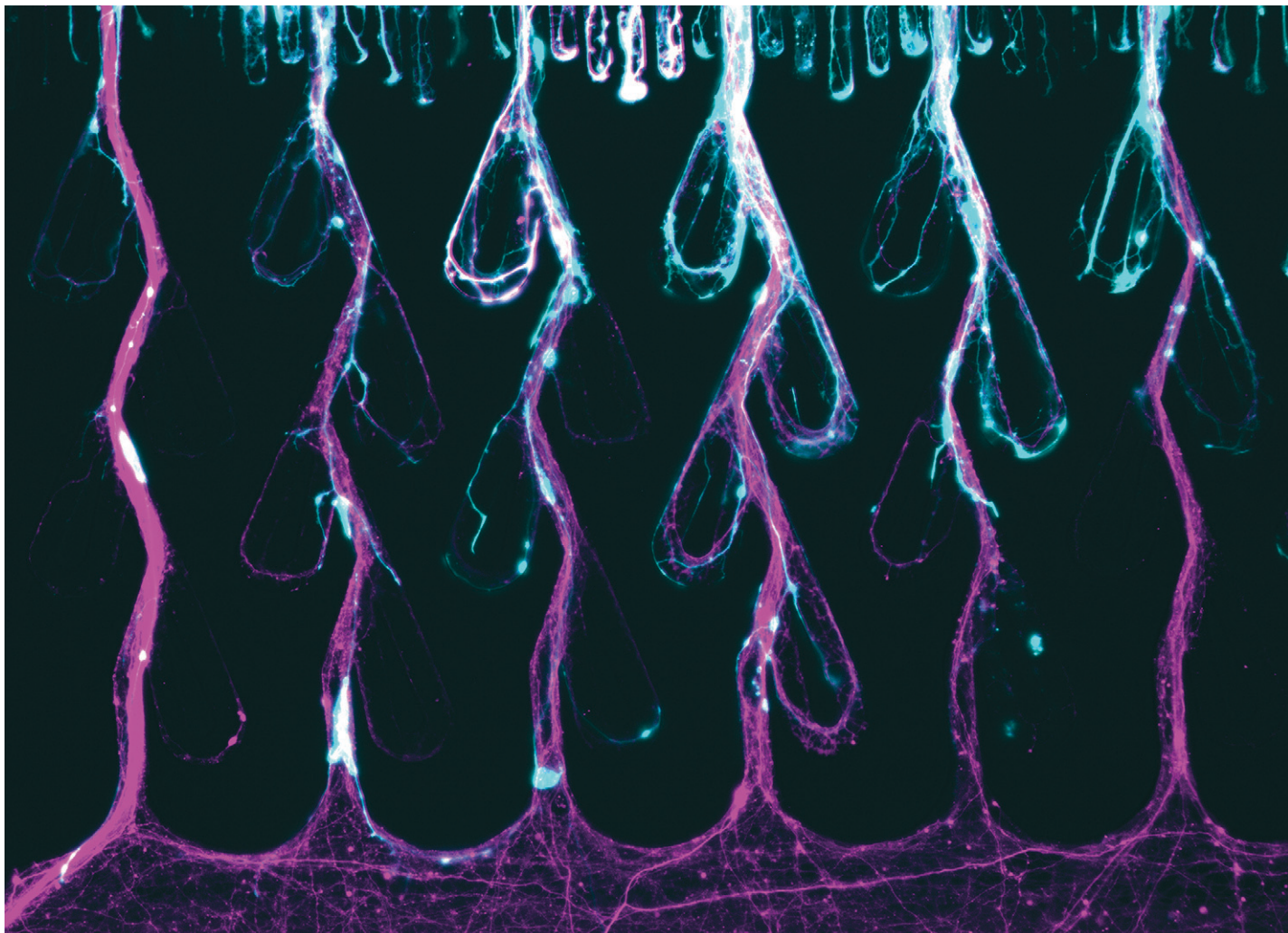
# EES Batteries

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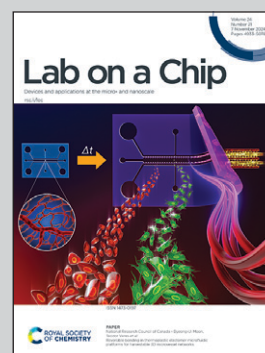


**Showcasing research from Professors Ioanna Sandvig and Axel Sandvig's laboratory at the Department of Neuromedicine and Movement Science (INB), Faculty of Medicine and Health Sciences (MH), Norwegian University of Science and Technology (NTNU), Trondheim, Norway.**

**Engineered cortical microcircuits for investigations of neuroplasticity**

This study addresses the need for improved preclinical models to study neural function and adaptation to neurological disorders. We demonstrate a microfluidic platform with 12 interconnected chambers linked by microtunnels that use geometric constraints to guide unidirectional axonal outgrowth between the neural populations. This design recapitulates the laminar and hierarchical organization of the neocortex. Using embedded nanoporous electrodes, we capture network dynamics and reveal how localized perturbations, such as hypoxia, influence neural adaptation and information rerouting. The platform's versatility makes it ideal for studying neural development, topological organization, plasticity, and disease mechanisms at cellular and network levels. Copyright holder: Nicolai Winter-Hjelm.

**As featured in:**



See Nicolai Winter-Hjelm, Ioanna Sandvig *et al.*, *Lab Chip*, 2024, **24**, 4974.