Interfacing with the Brain Using Organic Electronics

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Abstract

One of the most important scientific and technological frontiers of our time is the interfacing ofelectronics with the human brain. This endeavour promises to help understand how the brainworks and deliver new tools for diagnosis and treatment of pathologies including epilepsy andParkinson's disease. Current solutions, however, are limited by the materials that are brought incontact with the tissue and transduce signals across the biotic/abiotic interface. Recent advancesin organic electronics[1,2] have made available materials with a unique combination ofattractive properties, including mechanical flexibility, mixed ionic/electronic conduction,enhanced biocompatibility, and capability for drug delivery (Figure 1). I will present examplesof novel devices for recording and stimulation of neurons and show that organic electronicmaterials offer tremendous opportunities to study the brain and treat its pathologies.

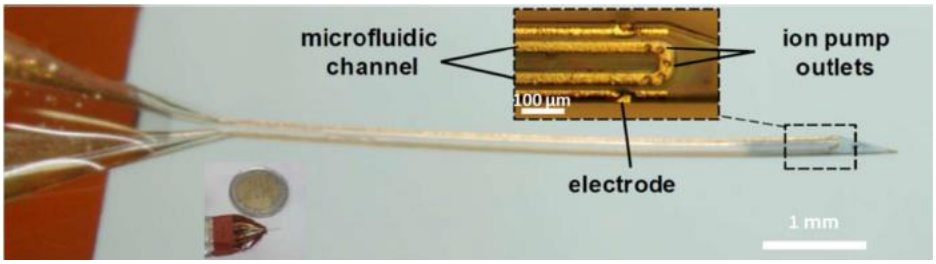

Figure 1: Implantable electrophoretic pump for neural recording and localised drug delivery applications.

References

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