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#### TITLE

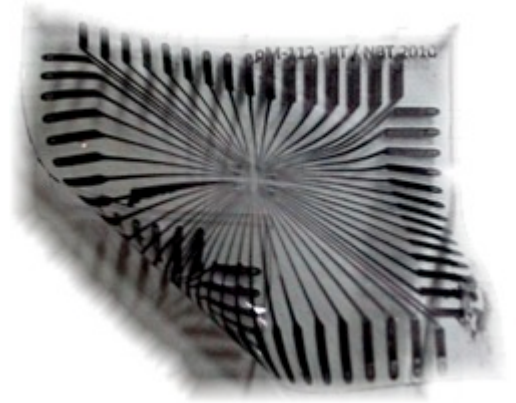
Polymer Microelectrode Array

#### INVENTORS

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#### DESCRIPTION

Microelectrode electrophysiology has become a widespread technique for the extracellular recording of bioelectrical signals. To date, electrodes are made of metals or inorganic semiconductors, or hybrids thereof. We demonstrate that these traditional conductors can be completely substituted by highly flexible electroconductive polymers. The bendable, somewhat stretchable, non-cytotoxic and biostable all-polymer microelectrode arrays (polyMEAs) with a thickness below 500 nm and up to 60 electrodes reliably capture action potentials (APs) and local field potentials (LFPs) from acute preparations of heart muscle cells and retinal whole mounts, in vivo epicortical and epidural recordings as well as during long-term in vitro recordings from cortico-hippocampal co-cultures.



#### APPLICATIONS

This device may help in designing a new generation of less invasive, soft and curvature-adaptive in vivo probes (e.g., in the context of cortical surface field potential recordings, deep brain implants, pacemakers, and cochlear or retinal implants). Moreover, similarly to the recent shift from silicon to organic electronics in consumer devices, conductive polymers may complement if not substitute classical conductor materials in future biomedical and neuroprosthetic transducers.

#### KEYWORDS

polymer microelectrode array, bendable, stretchable, electroconductive polymer

#### BIBLIOGRAPHIC DATA TO2008A000152 No.1386232

Matrice di microelettrodi a base di materiali conduttori polimerici otticamente trasparenti e procedimento per la sua fabbricazione

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