Title: Organic Electrochemical Transistors: versatile platforms for Bioelectronics

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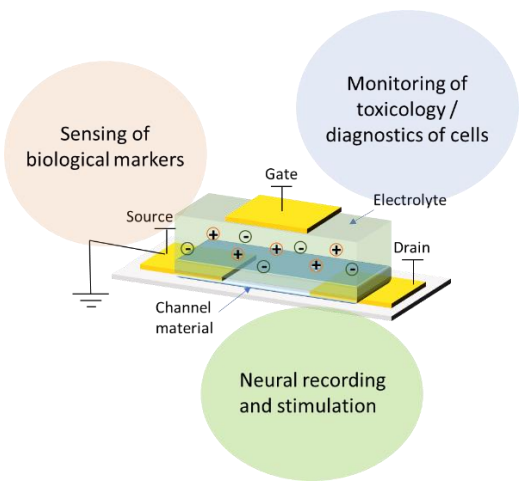
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I. Abstract Body

In recent years, advancements in material research and technology have shed light on the disruptive impact of personalized diagnostic and therapeutic scenarios on the quality of life. Concomitantly, the need to bridge the gap between user-controlled electronics, such as sensors and actuators, and biology is evident. The design of effective interfaces allowing reliable interaction between electronics and biological entities is the ambitious purpose of Bioelectronics (1). Due to (i) the mechanical mismatch between abiotic hardware components and living, water-rich systems and (ii) the fundamental discrepancy in the nature of charge transport, the efficient transduction of the biological signal remains a major challenge. In this panorama, Organic electrochemical transistors (OECTs) (2) are electrochemical devices that are gaining momentum thanks to the unique combination of soft electronic components and the transistor configuration. On one hand, the transducing materials are typically soft conducting polymers capable of mixed conduction, that is, they can detect ionic fluxes and convert the bio-signal into an electronic output (or *vice versa*). On the other hand, the device benefits from intrinsic signal amplification and design versatility, thus realizing a high signal to noise ratio and adapting to a variety of geometries and substrates. In this contribution, the potentiality of OECT-based smart platforms will be presented, with particular focus on the realization of novel electrochemical sensors and biosensors for bio-signals transduction and highly sensitive and selective detection of medically relevant analytes, such as neurotransmitters (3,4).

II. Image:



Bioelectronic applications of the Organic Electrochemical Transistor.

III. References:

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IV. Biography:

Dr Federica Mariani is a post-doctoral research fellow working on bioelectronic devices at the Department of Industrial Chemistry, University of Bologna (Italy). During her studies, she spent some research stays at the Department of Bioelectronics (Ecole Nationale Supérieure des Mines de Saint-Etienne - France) in the group of Prof. R. M. Owens and in the group of Analytical Chemistry - Electroanalysis and Sensors of Prof. Wolfgang Schuhmann (Ruhr-Universität-Bochum - Germany).

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