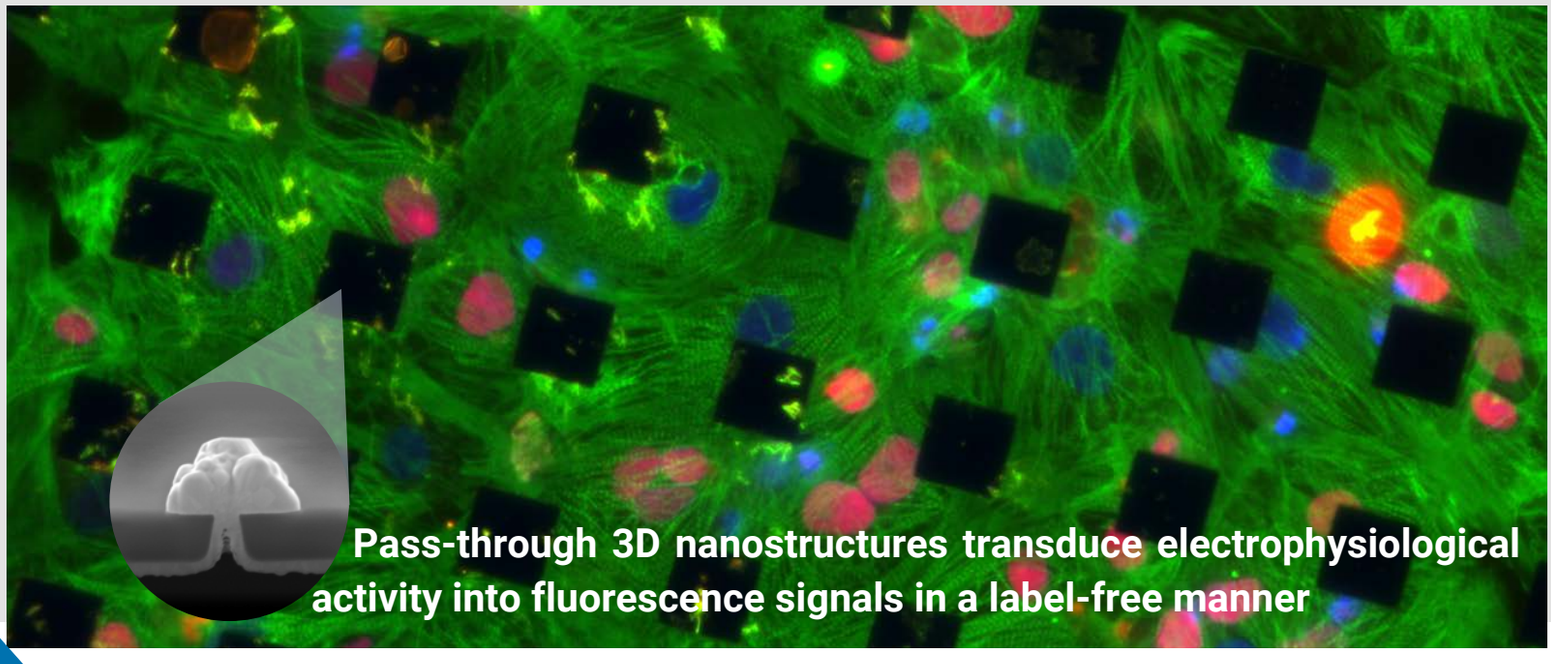
TOX Free

European Union's H2020 Research and Innovation Programme
Grant agreement number 964518

TOXicity assessment on neurons and cardiomyocytes by means of FluoRescence Emitting Electrodes

Drugs, pesticides and chemical pollutants can potentially cause neurotoxicity and cardiotoxicity. However, we lack robust assays for accurate and sensitive assessment of functional toxicity in the cardiac and central nervous systems. The EU-funded TOX-Free project develops a non-invasive nanotechnology-based technique capable of recording in vitro electrical signals from human stem-cell derived neuronal and cardiac cells. The TOX-Free biosensing technology is based on the "VIrtual CEll" (VICE) concept that transduces electrophysiological activity into optical signals in a label-free way*.
The VICE biosensor will allow the assessment and quantification of subtle cellular and functional disturbances by toxicants or drugs beyond existing technologies including microelectrode array (MEA) and live-cell imaging. The biosensor will find direct applications in toxicology and pharmacology as well as in basic biology studies.

*A. Barbaglia et al., Advanced Materials, 2021



Pass-through 3D nanostructures transduce electrophysiological activity into fluorescence signals in a label-free manner

ISTITUTO ITALIANO DI TECNOLOGIA

CHAN:PHARM Drug Discovery

multichannel systems Innovations in Electrophysiology

NMI Natural and Medical Sciences Institute

Universität Konstanz

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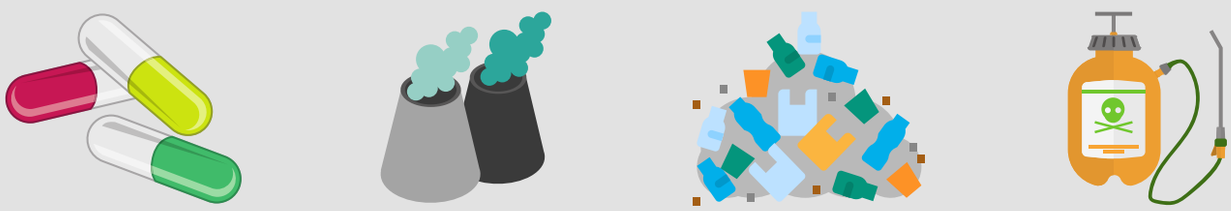
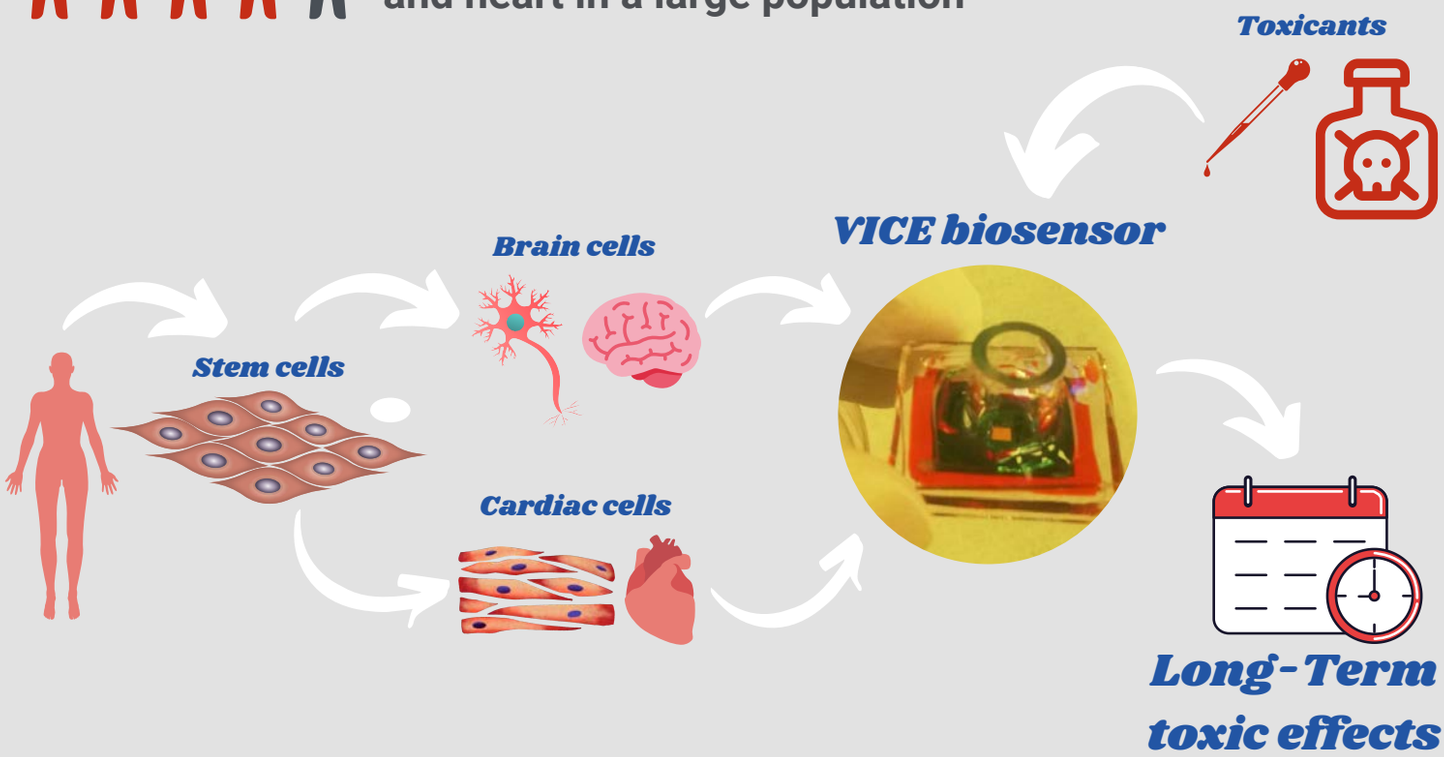
Drugs **Air pollutants** **Nanoplastics** **Pesticides**



Potential long-term toxic effects on brain and heart in a large population



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