Effects of nanoparticle on the electrophysiological activity of in-vitro neuronal networks

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Motivation and application domain
There is a lot of interest in understanding the possible neurotoxic effect of nanoparticle at the level of the nervous system. The use of in-vitro models is a preliminary step for understand these effects at cellular network level.

General objectives and main activities
There are very few systematic studies dealing with in-vitro neurons and electrophysiological induced changes by nanoparticles. The main objective is to establish a protocol and perform experiments for investigating acute (and chronic) effects in a dose dependent manner. Starting from preliminary experiments performed in our Lab and from literature the student will develop an appropriate protocol and will analyse the obtained data.

Training Objectives (technical/analytical tools, experimental methodologies)
Use of MEAs, use of electrophysiological experimental set-up and experiment execution.
Development of experimental protocols.
Analysis of data and development of new algorithms

Place(s) where the thesis work will be carried out: Neuroengineering Lab

Curriculum: Neuroengineering and Bio-ICT

Maximum number of students: 2