Graphene solution-gated field-effect transistor arrays for *in vivo* neural recording

Clement Hebert

Advanced Electronic Materials And Devices Group,
Institut Català de Nanociència i Nanotecnologia, Barcelona, Spain

clement.hebert@icn2.cat

After two decades of investigation and exploitation, the current electrical neural interface technologies are about to reach their limit both for fundamental neural investigation and for clinical applications. Important refinements are still needed to reach low invasiveness, long term efficacy as well as large number of recording/stimulating sites. Thanks to its biocompatibility, low dimensionality, mechanical flexibility and electronic properties, graphene offers new perspectives to address those issues. In this talk, I will present our recent development of graphene solution-gated field-effect transistor arrays for *in vivo* recording. The probes were implanted at the surface and inside the sensory cortex of rats in order to record the activity of the neural network under light and sound stimulation during acute experiments. Similarly, the implants were used for electroretinography. Recently, we also recorded cortical spreading depression, a type of low frequency signal (below 0.1Hz) that cannot be properly analysed using microelectrode technology.