

## **Graphene Based Materials for Ultimate Neuroelectronics**

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### **Abstract**

Neuroelectronic devices are powerful tools to study neural networks activity and to develop neural prostheses. After two decades of investigation and exploitation, the current technologies are about to reach their limit both for fundamental neural investigation and for clinical applications. Thus, important refinements are now needed to fulfill the demanding requirements associated to these applications, such as low invasiveness, long term efficacy as well as large number of recording/stimulating sites. Graphene-based materials belong to the few new material platforms that can be used to reach these ambitious targets. Indeed, graphene and graphene-based materials combine biocompatibility, easy integration in microdevices and CMOS technology, flexibility, and high electronic performance. Further, if integrated together with complementary 2D semiconductor electronic technology, graphene sensors could eventually enable the production of ultimately flat neuroelectronic devices. In this presentation, I will discuss our latest technology developments to record electrical activity in cell cultures as well as in vivo brain activity on rat cortex.