M2 Intership

Silicon Carbide microelectrode array for neural interfacing

Electric brain computer interfaces are based on electrode that collect or stimulate the neural activity. For two decades many types of intracortcial microelectrode arrays have been developed nevertheless long lasting neural implants are still missing to allow a proper of this technology toward clinical application. In this context, the SiCNeural project carried out by a French consortium is considering silicon carbide technology to overcome this barrier. Indeed, SiC offers multiple advantage for neural interface such including biocompatibility and high chemical stability. In this project, 60 microelectrode array for *in vitro* studies are developed to assess the performances of the SiC components for neural recording and stimulation.

The role of the candidate will be to evaluate the electrochemical properties of the electrode array by cyclic voltammetry and impedance spectroscopy. The measurement will be performed both in physiological-like medium and in the presence of redox couple. The candidate will have to implement a dedicated python code to automatize the analysis over the 60 electrode. Depending on the results, the candidate will be able to participate to the recording and stimulation of neural explants.

The candidate will participate to the SiCNeural project meeting to present and discuss her/his results. This project is financially supported by ANR (French National Research Agency).

Requirement: Good level in semi-conductor physics, good basics in impedance spectroscopy, standard basis in python coding. Some basis electrochemistry would be appreciated.

Starting date: March 1st 2024

Duration: 5- 6 months

Location: Grenoble Institute for Neurosciences (GIN) and IMEP-LAHC, Grenoble

Contact:

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Web sites:

https://neurosciences.univ-grenoble-alpes.fr

https://imep-lahc.grenoble-inp.fr/

https://anr.fr/en/funded-projects-and-impact/funded-projects/project/funded/project/b2d9d3668f92a3b9fbbf7866072501ef-3f8b27fa36/?tx_anrprojects_funded%5Bcontroller%5D=Funded&cHash=acf2d0654534921c231ab26c503df423