Development of integrated micro-electro-apta-sensors into a diabetes organoid-on-a-chip device.

Type 2 diabetes is a serious metabolic disease and a better understanding of the mechanisms involved represents a major public health issue. In both diabetic and obese individuals, adipose tissue cells exhibit insulin resistance and chronic low-grade inflammation, the mechanisms of which are not yet clearly established. In order to better understanding those mechanisms and associated secretions, the scientists are developing organoid-on-a-chip systems that mimic the biological functions of studied organs in a perfectly controlled fashion. These tools are very promising for basic research in biology but also for drug screening. However, there is a need to develop integrated miniaturized sensors to monitor chemical or biological markers secreted by organs. The aim of this thesis is to develop a multiplexed miniaturized system for continuous, real-time and non-invasive monitoring of the secretion of blood markers of the inflammation in an organoid-on-a-chip device. In order to produce this system of electrochemical microsensors based on aptamers, we propose to study an innovative cold atmospheric plasma technology, which should co-deposit conductive polymers and aptamers on the electrodes. The candidate should have an engineer profile or M2 in chemistry with in-depth knowledge in electrochemistry, chemistry of materials and polymers and biochemistry and be highly motivated for cross-disciplinary subjects.

Practical information

RECOMMENDED TRAINING : Ingénieur chimiste ou M2 chimie, électrochimie,chimie des matériaux et des polymères, biochimie

UNIVERSITY / DOCTORAL SCHOOL : Chimie et Sciences du Vivant (EDCSV) Université Grenoble Alpes

DESIRED START DATE OF THE THESIS : 01-10-2022

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Laboratory

Laboratoire Chimie, Capteurs et Biomatériaux

Establishment / Location

Grenoble