Title: Smart Electrochemical Device for Personalized Drug Delivery

Abstract:
The healthcare sector is increasingly seeking innovative systems that enhance therapeutic efficacy and support patients in the self-administration process. This project introduces a programmable drug delivery device that enables precise control over dosage and timing through external digital commands.

At its core, the device integrates graphene oxide nanomaterials, which respond to low-voltage electrical signals by altering their conformation, thereby releasing the drug in a non-invasive and finely regulated manner.

This platform represents a major advancement over conventional delivery systems, offering customized release profiles either immediate or scheduled tailored to individual therapeutic needs. The technology is protected by international patent and is currently advancing toward its first functional prototype, combining pharmaceutical formulation with electro-responsive materials and digital control.

By integrating nanotechnology, materials science, and patient-needs design approach, this device lays the foundation for a new generation of smart drug delivery systems, promoting autonomy and improving adherence to treatment.

Short bio:
Audrey Franceschi Biagioni is a Pharmacologist, Neuroscientist, and Biomedical Innovator specializing in drug delivery technologies. With extensive experience in both basic and clinical research, her work focuses on the pharmacological management of psychiatric and neurological disorders, as well as the interactions between carbon-based nanomaterials and biological systems.

Deeply committed to knowledge transfer and innovation-driven entrepreneurship, she aims to translate scientific discoveries into impactful solutions across the pharmaceutical, biotechnology, and medical device sectors. Audrey holds an assistant professor position at SISSA (Scuola Internazionale Superiore di Studi Avanzati) and is co-inventor of a patented graphene-based platform for programmable drug administration, currently being developed as a smart delivery system for personalized therapies.