

Elastin-like proteins combined with PEDOT:PSS as a 3D electroactive substrate for tissue monitoring

How can new technologies improve research in biology? Could we create electronic tools to facilitate *in vitro* toxicology assays?

My project is focused on the development of a Blood Brain Barrier (BBB) cell model with an integrated characterization system for *in vitro* toxicology studies.

The BBB is composed of endothelial cells that form brain microcapillaries. It provides neurons with a stable environment by providing nutrients and protecting them from toxic compounds circulating in the blood. Dysfunction of the BBB is often implicated in the progression of neurodegenerative diseases like Alzheimer's. Toxicology assays are essential to ensure passage of selected drugs across this barrier, but also to ensure minimal toxic effects on the barrier.

In this project we propose to build a BBB cell model built around a conducting polymer merged with an engineered cell matrix based on elastin-like proteins, to detect and electrically quantify changes in BBB barrier integrity over time.

In the short-term, this platform will improve preliminary selection of therapeutic candidates decreasing the need for animal experimentation. In the long-term, it will facilitate study of diseases affecting the CNS and development of new therapeutic strategies.