Integrated design and control for sustainable biopharma manufacturing via Reinforcement Learning

Dr Maria Papathanasiou

The Papathanasiou lab is seeking for motivated PhD candidates who are passionate about digital tool development and their application in biopharma. The (bio-)pharmaceutical industry is challenged to ramp up its global capacity, while working to meet net-zero targets, ensuring continuous drug supply. Beyond the geopolitical challenges faced worldwide, (bio-)pharmaceutical processes have been historically very complex to design, optimise and integrate in a global distribution network that is resilient and adaptable to change. In that, digital tools, assisted by Artificial Intelligence, can revolutionise the state-of-the-art in biopharma manufacturing and supply chains, offering a cost-effective solution to improve performance and increase resilience. This research area investigates how a portfolio of digital solutions, can identify and quantify manufacturing uncertainties and estimate their impact on drug supply. Projects are focused both on digital design space identification for improved manufacturing regimes that meet, as well as supply chain optimisation focusing on the integration of economic, social and environmental sustainability.