



Session	Emerging Innovative Technologies: Novel Fermentation and Downstream Processing Innovations
Title	Next-gen heparin: scaling a safer, more sustainable heparin
Company	ExCulture
Speaker	Ilaria Poledri
Keywords feedstock (max 2)	Acetate
Keywords technology (max 2)	Microbial consortium
Keywords End-Product (max 2)	Non-animal heparin
Abstract:	
Heparin, an essential anticoagulant, is currently sourced from the mucosal lining of approximately one billion pigs annually. This reliance on animal agriculture creates an unsustainable and vulnerable supply chain, exposed to risks from animal epidemics and geopolitical instability, given a 60-80% reliance on China for the global supply. This fragility directly impacts global patient health, causing critical shortages recognised on numerous occasions by the FDA. ExCulture's solution to the heparin's supply chain instability and safety risks is a next-gen animal-free heparin alternative produced through a patent-pending microbial fermentation technology. This process leverages over three decades of research from the Environmental Biotechnology department at Technical University Delft for recovering of high-value polymers from environmental microbial processes. By feeding readily available carbon sources and controlling bioreactor conditions, we can achieve the self-assembly of microorganisms that release sulfated glycosaminoglycans, such as heparin. Our preliminary proof-of-concept, which includes positive anticoagulant data, shows comparability to porcine-derived heparin. The focus now is on optimising our upstream and downstream processes to enhance product yield and purity. Our goal is to create a stable, ethical, and secure supply chain for this crucial medicine.	