

TERMIS-AM 2025 Workshop:

Artificial Intelligence (AI) in Biofabrication, Tissue Engineering, and Regenerative Medicine: From Experimental Design and Advanced Analyses towards Enabling Therapeutic Applications

This workshop will explore the transformative role of Artificial Intelligence (AI) in advancing biofabrication, tissue engineering, and regenerative medicine. We will focus on how AI techniques can enhance the analysis of omics data to uncover biomarkers, gene expression patterns, and biological pathways in both healthy and engineered tissues, providing critical insights into tissue regeneration. Participants will learn how to design experiments to enable sufficient and high quality data collection suitable for AI applications, combining AI with novel imaging methods and computational tools to explore cellular behavior and tissue dynamics at the single-cell level, and unlocking new strategies for improving therapeutic outcomes. Additionally, the session will highlight AI's impact on optimizing scaffold design, material selection, and bioprinting technologies, particularly in musculoskeletal applications, while addressing the role of deep learning models in predicting scaffold biocompatibility and automating tissue engineering processes. This workshop will provide a comprehensive overview of how AI is shaping the future of tissue engineering and regenerative medicine, enabling more effective, targeted therapeutic interventions.

Workshop Organizers: *Bernd Rolauffs, Melanie Hart, Mostafa Rezapour, Tracy Criswell, Metin Gurcan, Patrick McNutt, Will Qiao, Kelvin Yeung, Grace Zhang, Tomas Gonzalez-Fernandez, Ruogang Zhao*

Workshop Preliminary Program

1:00pm – 1:10pm	Welcome & Introduction
1:10pm – 1:40pm	Imaging Meets Artificial Intelligence (AI): Exploring Cellular and Tissue Functions in New Dimensions <i>Bernd Rolauffs, Melanie Hart</i>
1:40pm – 2:10pm	Harnessing AI to Advance In Vitro Cardiac Models <i>Zhen Ma</i>
2:10pm – 2:40pm	Coffee Break
2:40pm – 3:10pm	Artificial Intelligence (AI) Applications in Regenerative Medicine (Part I) <i>Mostafa Rezapour, Patrick Michael McNutt</i>
3:10pm – 3:40pm	Artificial Intelligence (AI) Applications in Regenerative Medicine (Part I) <i>Mostafa Rezapour, Patrick Michael McNutt</i>
3:40pm – 4:00pm	Q&A + Discussion