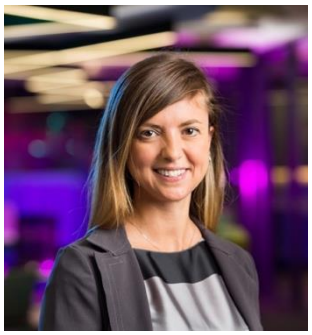
Martedì 09 Giugno 2025
10.00-11.00

Sala degli Affreschi
Facoltà di Ingegneria Civile e Industriale
Viale Eudossiana 18, Roma

"REMOD-Regenerative Engineering and Modeling of Osteochondral Diseases Group: Advancing Cartilage Repair and Osteosarcoma treatment through Biofabrication"



Seminar lecture from

Prof Serena Duchi

A/Prof Serena Duchi, Dept. of Surgery,
University of Melbourne-Biofab3D-ACMD-St. Vincent's Hospital Melbourne, Victoria, Australia

The Regenerative Engineering and Modeling of Osteochondral Diseases-REMOD group is dedicated to advancing innovative strategies in tissue engineering to both repair cartilage and model bone-related diseases. The work primarily focuses on developing regenerative solutions for osteochondral defects to prevent the progression of osteoarthritis (OA), a leading cause of disability worldwide. By integrating biomaterials, stem cells, and biophysical cues, we create engineered cartilage constructs that mimic the native architecture and function of articular cartilage. These constructs aim not only to restore joint function but also to halt or reverse OA development in its early stages. In parallel, we apply similar regenerative engineering principles to model bone tumors, particularly osteosarcoma, a highly aggressive pediatric bone cancer. Using 3D-printed and scaffold-based platforms, we replicate the tumor microenvironment to study tumor-stroma interactions, drug resistance, and metastatic behavior. This dual application of our tissue engineering technologies — for both regenerative repair and disease modeling — allows us to bridge the gap between fundamental research and translational therapies.
Our interdisciplinary approach harnesses the convergence of materials science, cellular biology, and bioengineering to address unmet clinical needs. By tailoring scaffold properties, biochemical signaling, and mechanical stimuli, we are creating functional tissue models that serve as both therapeutic tools and preclinical testing platforms. Ultimately, our goal is to engineer better treatments for musculoskeletal disorders and cancers through the lens of regenerative science.

Biography

Cellular biologist specialized in musculoskeletal diseases and regenerative medicine, with strong focus on translation and international collaborations. A/Prof Duchi earned her PhD in Cell Biology & Physiology in 2009 through a joint program Bologna University-Italy and Medical University of South Carolina-USA. She undertook a postdoc fellowship at IFOM (2009–2011), leading European institute for oncology research, and a researcher position at Rizzoli Orthopaedic Institute-Italy (2011–2015), world-renowned center in orthopaedics and regenerative medicine. In 2016, she joined the University of Melbourne and the Aikenhead Centre for Medical Discovery (ACMD), and since 2021, she is the group leader of the REMOD group, focusing on cartilage regeneration and bone disease modeling. A/Prof Duchi has secured over $9.1 million in competitive funding, including leadership of the Stem Cell stream in the MRFF-ARISTOCRAT initiative—part of the Stem Cell Therapies Mission led by Prof Peter Choong—securing $1 million for her team. This project is expected to culminate in a first-in-human trial in 2026.Her achievements include the Veski Innovator of the Year award, recognition as a finalist in the Australian Museum Eureka Prize, collaborations with industry partners, three patents, and over 60 publications, with more than 2,800 citations.

DIPARTIMENTO DI INGEGNERIA MECCANICA E AEROSPAZIALE

SAPIENZA UNIVERSITÀ DI ROMA

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