



JoinTECH
by Kyoto Institute of Technology



Dr. Alfredo Rondinella
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**Biomaterials
Engineering
Laboratory**

JoinTECH-Online

Biomaterials and Biocompatibility: Results of a Multidisciplinary Collaboration

Date/Time: August 26, 2025, JST: 10am-12pm, CEST: 3am-5am

Location: Kyoto Institute of Technology, Bldg.15, 2F, N205

日時: 令和7年8月26日(火) 10:00 - 12:00

場所: 京都工芸繊維大学 15号館 2F N205



[Zoom meeting available](#)
[オンライン視聴も歓迎します](#)

ABSTRACT: Biomaterials life-saving and life-enhancing medical technologies are strictly related to their interaction with living systems. This presentation traces the evolution of key concepts: from early definitions of biomaterials and biocompatibility to contemporary views emphasizing the “most appropriate” host responses in context. It also shows how chemistry, topography, mechanics, and exposure time shape tissue interactions, with particular attention to blood–material interfaces and hemocompatibility. It then outlines the pathway to safety and effectiveness: chemical characterization, ISO 10993-guided biological evaluation, risk-based device classification, and clinical studies, explaining how evidence moves materials from bench to bedside. Finally, it presents highlights from a KIT–UniUD collaboration. Special attention will be given to the role of the “Toppo Wassermann” High School of Advanced Studies at the University of Udine in supporting and promoting this international exchange.

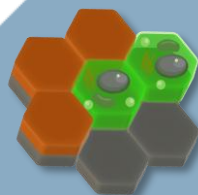
SHORT BIO: Assistant professor in the field of Materials Science and Technology, he deals with the study and development of surface treatments applied to materials for use in the biomedical field. After obtaining a Master's degree in Process and Materials Engineering, he did his PhD in Materials Chemistry at Kyoto Institute of Technology with a thesis entitled "Innovative approaches to biomaterials' technology through systematic spectroscopic analyses". During his study period abroad, he worked on the study of surface chemistry and functionalization of materials used in prosthetics. He exploited the chemistry of oxide and non-oxide ceramics. This research activity, in collaboration with the Kyoto Prefectural University of Medicine, Osaka University, Amedica Co. and Shinsei Co. was divided into two main strands: the first concerned the degradation phenomena of biocompatible oxide ceramic used in orthopedic applications, while the second focused on modulating the surface chemistry of non-oxide ceramics to stimulate osteoinductive activity and at the same time reduce bacterial proliferation on these surfaces. Currently working at the Polytechnic Department of Engineering and Architecture of the University of Udine, he works on evaluating how surface treatments and coatings can influence the biocompatibility, antibacterial properties and corrosion rate of resorbable and non-resorbable metallic materials. Author and co-author of several publications in international journals and referee for some of them, speaker at national and international conferences and scientific meetings.



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JoinTECH-Online

Advanced 3D Printing for Biomaterials

Date/Time: 26 August 2025, JST: 2pm-4pm, CEST: 7am-9am

Location: Kyoto Institute of Technology, Bldg.15, 2F, N205

日時: 令和7年8月26日(火) 14:00 - 16:00

場所: 京都工芸繊維大学 15号館 2F N205



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ABSTRACT: Additive manufacturing techniques are rapidly transforming the development of biomaterials, enabling precise control over scaffold architecture and material composition. This seminar will focus on two cutting-edge fabrication methods: melt electrowriting (MEW) and electrospinning. Participants will gain insight into the principles, setup, and operating parameters of each technique, as well as their advantages and limitations in biomedical applications. Case studies from ongoing KIT-Udine projects will illustrate how these technologies are used to create micro-structured scaffolds designed for tissue regeneration.

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Sustainable Strategies in Biomaterials Engineering

Date/Time: 29 August 2025, JST 10am-12pm, CEST 3am-5am

Location: Kyoto Institute of Technology, Bldg.15, 2F, N205

日時: 令和7年8月29日(金) 10:00 - 12:00

場所: 京都工芸繊維大学 15号館 2F N205



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ABSTRACT: The push for sustainable solutions in materials science has extended into the biomedical field, where researchers are exploring new strategies to minimize environmental impact without compromising performance. This presentation clarifies the operational definitions of sustainable development, biomaterials, and biocompatibility and establishes a practical framework in which choices regarding process, structure, and properties are linked to each other. Seminar will present a selection of innovative approaches to sustainable biomaterials design, including the use of bio-based materials and green chemistry processes.

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