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IDBN

Italian Digital Biomanufacturing Network

UPDATE DAY ON 3D PRINTING IN THE MEDICAL SECTOR PISA 16 DECEMBER 2023

Aula PN4 Polo Universitario Porta Nuova

Prof Paolo Paoletti

Prof Giovanni Vozzi

Prof Vincenzo Ferrari



Hybrid Meeting on-site and online 
(online link inside the program)

Dear colleagues and friends,

The Italian Digital Biomanufacturing Network (IDBN) will organize an update day on 3D printing in the medical field on 16.12.2023 in Pisa.

Themes of the day will be Biofabrication, the use of 3D printing for the planning, guidance and simulation of surgical procedures, the design and creation of prostheses using advanced Additive manufacturing techniques, their implications at ethical and economic level and in the medical fields applications

The objective of this day is to offer an overview on the state of research relating to these new approaches and new technologies in the clinical field, through the presentation of the results both in the research sector and in the application field doctor. We look forward to seeing many of you in Pisa, hoping that this day will be an important moment of discussion, sharing and growth.

The Congress presidents:

Prof Paolo Paoletti

Prof Giovanni Vozzi

Prof Vincenzo Ferranti



[Online meeting link:](https://shorturl.at/bsAX8)

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08:30 Registration

09:00 – 10:20 Session I: BIOPRINTING 1

Chairs: Gabriela Graziani, Serena Danti, Parchi Paolo

09:00 **Multimaterial and Multiscale biofabrication: from research project to commercial application.**
G. Vozzi (Pisa)

09:10 **4D printing as a forefront manufacturing approach for the fabrication of smart devices.**
I. Chiesa, C. De Maria, G. Vozzi (Pisa)

09:20 **Machine learning enabled quality control to accelerate the clinical translation of bioprinted products.** A. F. Bonatti, G. Vozzi, C. De Maria (Pisa)

09:30 **In situ bioprinting: is the future of biofabrication inside the human body?**
G.M. Fortunato, C. De Maria, G. Vozzi (Pisa)

09:40 **Model for tissue engineering the enthesis: a novel biofabrication approach.**
S. Micalizzi, C. De Maria, G. Vozzi (Pisa)

09:50 **Bone Tissue Engineering: A multidisciplinary field for Osteoporosis treatment and research.**
E. Batoni, G. Vozzi (Pisa)  Online

10:00-10:20: Discussion

10:20-10:50 Lecture 1 **Interdisciplinary challenges on the way to clinical translation of biofabrication.**
Prof Jurgen Groll (Würzburg)  Online

10:50-11:10 Coffee Break

11:10 – 12:30 Session I: BIOPRINTING 2

Chairs: Giovanni Vozzi, Carmelo De Maria, Maria Livia Rizzo

11:10 **Nanoscale biomimetic ceramics in additive manufacturing and bioprinting for bone modelling and regeneration.** G. Graziani (Milano)

11:20 **3D printing piezoelectric nanocomposites to promote vascularized bone regeneration.**
S. Danti, C. Ricci, M. Milazzo, M. Labardi, S. Barachini, M. Montali, M. Petrini, P. Parchi (Pisa)

11:30 **Development of a platform for biofabrication of multi-scale and multi-material scaffolds supported by artificial intelligence for tissue engineering applications.**
G. Pegollo, S. Micalizzi, A. De Acutis, C. De Maria, G. Vozzi (Pisa)

11:40 **A 3D eye in vitro model for screening and drug testing.**
A. Esposito, C. De Maria, G. Vozzi (Pisa)

11:50 **A novel micro-dialyser for investigating the human gut microbiota-tissues crosstalk.**
C. Daddi, C. De Maria, G. Vozzi (Pisa)

12:00 **A proof of concept to validate a 3D-bioprinted hydrogel as in vitro 3D model for electrochemotherapy study.** S. Pisani, F. Scocozza, L. Saddemi, M. Conti,
F. Auricchio, G. Bertino, M. Benazzo, B. Conti (Pavia)

12:10-12:30 Discussion

12:30-13:00 Lecture 2 **Procedures and Registry for personalized custom-made implants in Orthopaedics: the experience of Istituto Ortopedico Rizzoli.**

Alberto Leardini, Claudia Capellini, Claudio Belvedere (Bologna)



Online

13:00-14:00 Lunch Symposium:

13:00-13:30 Research Project Symposium

CRIO2AR

**CRyotherapy efficacy Improvement in the treatment of
Orthopedic Oncology with Augmented Reality**

Dr Antonio D'Arienzo, Dr Lorenzo Andreani, Dr Branimir Scogliamiglio, Ing Marina Carbone, Prof Paolo Parchi

13:30-14:00 Company Symposium



**The Future of Surgery: 3D Model Development, 3D Printing and
Advanced Visualization in the Operating Room**

Ing Greta Bertola, Ing Francesco Marino, Ing Martina Morelli

14:00 – 15:20 Session 3: SURGICAL PLANNING

Chairs: Scaglione Michelangelo, Vincenzo Ferrari, Ferdinando Auricchio,

14:00 Surgical planning using 3D printing in orthopaedics and traumatology which are the best materials? G. Zarattini (Brescia)

14:10 Virtual surgical planning for the realization of custom bone graft in pediatric orthopedic acute bone correction. Menozzi G.C., Depaoli A, Di Gennaro G.L., Alessandri G, Liverani A, Frizziero L., Vivarelli L, Quinto C, Marmi F., Dallari D, Rocca G, Trisolino G (Bologna)

14:20 Virtual surgical planning and 3D printing in pediatric orthopedic surgery: the preliminary experience of the Rizzoli Orthopedic Institute. Depaoli A, Menozzi G.C, Di Gennaro G.L., Alessandri G, Liverani A, Frizziero L, Vivarelli L., Dallari D., Rocca G, Trisolino G (Bologna)

14:30 Use of preoperative planning and 3D printing in pediatric upper extremity surgery. N. Catena, C. Arrigoni (Genova)

14:40 Varicose vein 3D printing model from duplex scan analysis images. E. Cervi, D. Bissacco, G. Zarattini, P. S. Ginestra (Brescia)

14:50 Creation of 3d printed casts in orthopedic reconstructive surgery for the generation of a custom made spacer: our experience. F. Basilico (Milano)

15:00-15:20 Discussion

15:20-15:50 Lecture 3 New technologies in the treatment of spinal deformities: the role of 3D printing.
Prof. Cesare Faldini (Bologna)

15:50-16:10 Coffe break

16:10 – 17:20 Session 4: SURGICAL SIMULATION

Chairs: Marchetti Stefano, Zarattini Guido, Alberto Leardini

16:10 A Novel Simulator for Training Video-assisted Pulmonary Lobectomy in Pediatric Patients.

M. Servi, M. Mencarelli, L. Puggelli, F. Dalle Mura, M. Carfagni, R. Lo Piccolo (Firenze)  Online

16:20 3D printing-based simulator for the training and planning of left atrial appendage occlusion in a realistic environment. B. M. Fanni, E. Gasparotti, A. Esposito, S. Berti, S. Celi (Massa)

16:30 Proposal of a novel complete training program in total hip arthroplasty for orthopedic residents that involve cadaver lab training and patient's specific simulators

F. Falcinelli, N. Piolanti, E. Bonicoli, L. Andreani, S Condino, M Carbone, V Ferrari, M Scaglione, P.D. Parchi (Pisa)

16:40 Comparison between 3D printed pads and biological material in suture learning.

V.Lodovici, M.C. Donati, M. Carbone, P.D. Parchi (Pisa)

16:50 3D Printing technologies in the management of cardiovascular diseases.

K. Capellini, E. Gasparotti, L. Ait Ali, V. Pak, G. Santoro, M. Cantinotti, M. Murzi, A. Clemente and S. Celi (Massa, Pisa)

17:00 A three-dimensionally printed pathological model for otologic surgery.

N. Emiliani, G. Molinari, L. Cercenelli, B. Bortolani, L. Presutti, E Marcelli (Bologna)

17:10 Multidisciplinary experimental study of gait-related disorders: the contribution of diagnostic imaging. M. Dicorato, G. W. Antonucci, F. Basilico, D. Baldi (Cerignola, Trani, Milano, Napoli)

17:20 -17:40 Discussion

17:40-18:10 Lecture 4 Development of patient-specific surgical simulators using 3D printing: our experience.

M. Carbone (Pisa)

18:10 Closing remarks



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