



ALMA MATER STUDIORUM
UNIVERSITA' DEGLI STUDI DI BOLOGNA

BOLOGNA, ITALY
MAY 2-6, 2005
SUMMER SCHOOL



BIOMATERIALS IN ORTHOPAEDICS AND DENTISTRY

CHAIRMEN:
ARMANDO GIUNTI AND CARLO PRATI

EDUCATIONAL COORDINATION:
NICOLA BALDINI



BIOMATERIALS IN ORTHOPAEDICS AND DENTISTRY

Biomaterials science has expanded rapidly in the last few years, and this is particularly evident for orthopaedic implants and dental materials. First generation material devices, originally manufactured for different industrial purposes and secondarily adopted for medical applications are being progressively replaced by biomaterials expressly made for specific surgical use, by taking into account criteria determined by bioengineering and biocompatibility testing. More recently, the outstanding advancement of tissue engineering science, with its complex multidisciplinary background of cell biology, molecular biology, physical chemistry, and nanotechnology, has added further inputs to understand and consider when choosing treatment options. The Summer School intends to provide instruments for building and updating a coherent body of knowledge for the use of practitioners in biomaterials in the specific fields of interests of orthopaedic surgery and dentistry. The peculiar features of mineralized tissues (dentin, bone, and cartilage), the methods for the study of tissue-biomaterial interactions, the clinical applications of biomaterials in Orthopaedics and Dentistry, as well as the present and future of tissue engineering, will be addressed in this comprehensive course.



BIOMATERIALS IN ORTHOPAEDICS AND DENTISTRY

Chairmen:

Armando Giunti

Dipartimento di Scienze Anatomiche Umane e Fisiopatologia dell'Apparato Locomotore Sezione Clinica Ortopedica, Università degli Studi di Bologna

Carlo Prati

Dipartimento di Scienze Odontostomatologiche, Università degli Studi di Bologna

Educational coordination:

Nicola Baldini

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Luigi Ambrosio, Istituto per i Materiali Compositi e Biomedici, CNR, Napoli

Sofia Avnet, Istituti Ortopedici Rizzoli, Bologna

Nicola Baldini, Istituti Ortopedici Rizzoli, Bologna

Giorgio Borea, Università degli Studi di Bologna

Stefano Boriani, Azienda USL Città di Bologna, Bologna

Elisabetta Cenni, Istituti Ortopedici Rizzoli, Bologna

Luigi Checchi, Università degli Studi, Bologna

Gabriela Ciapetti, Istituti Ortopedici Rizzoli, Bologna

Alberto Cigada, Politecnico di Milano

Roberto Conte, Azienda Ospedaliera di Bologna

Giuseppe Corinaldesi, Università degli Studi, Bologna

Lucy Di Silvio, King's College, London

Andrea Facchini, Università degli Studi, Bologna

Concezio Fagnano, Università degli Studi, Bologna

Gino Ghigi, Università degli Studi, Bologna

Sandro Giannini, Università degli Studi, Bologna

Roberto Giardino, Università degli Studi, Bologna

Donatella Granchi, Istituti Ortopedici Rizzoli, Bologna

Stefano Guizzardi, Università degli Studi, Parma

Antonio Landi, Policlinico di Modena

Fabrizio Macchi, CeramTek AG, Roma

Nadir Mario Maraldi, Università degli Studi, Bologna

Maurilio Marcacci, Università degli Studi, Bologna

Claudio Marchetti, Università degli Studi, Bologna

Giovanni Marletta, Università degli Studi, Catania

Thimios A. Mitsiadis, King's College London

Lucio Montebugnoli, Università degli Studi, Bologna

Gian Andrea Pelliccioni, Università degli Studi, Bologna

Francesca Perut, Istituti Ortopedici Rizzoli, Bologna

Gabriela Piana, Università degli Studi, Bologna

Paolo Pisi, Università degli Studi, Bologna

Josep A. Planell, Universitat Politecnica de Catalunya, Barcelona

Roberto Rotini, Istituti Ortopedici Rizzoli, Bologna

Vittorio Sambri, Università degli Studi, Bologna

Aldo Toni, Istituti Ortopedici Rizzoli, Bologna

Lucia Savarino, Istituti Ortopedici Rizzoli, Bologna

Gehard Schmidmaier, Charité Campus Virchow-Klinikum, Berlin

Marco Viceconti, Istituti Ortopedici Rizzoli, Bologna

Giovanni Zucchelli, Università degli Studi, Bologna



BIOMATERIALS IN ORTHOPAEDICS AND DENTISTRY

Monday, 2 May 2005

THEORY AND PRACTICE OF STUDYING BIOMATERIAL-HARD TISSUE INTERACTIONS

Cell and molecular biology of mineralized tissues (*N. Baldini*)
Methods of cell and molecular biology (*S. Avnet, F. Perut*)
Embryology, histology, and ultrastructure of bone and tooth (*N.M. Maraldi*)
Methods of light and electron microscopy (*S. Guizzardi*)
Cellular response to materials and surfaces (*L. Di Silvio*)
In vitro cytotoxicity and biocompatibility testing (*G. Ciapetti*)
Bacterial interactions at the bone-implant interface (*V. Sambri*)
In vivo models for biomaterial testing (*R. Giardino*)
ISO specifications in relation to biocompatibility testing (*L. Di Silvio*)

Tuesday, 3 May 2005

BIOMATERIALS FOR ORTHOPAEDIC AND DENTAL IMPLANTS

Introduction (*N. Baldini, C. Prati*)
Metals devices (*A. Cigada*)
Corrosion, ion release, and metal toxicity (*L. Savarino*)
Osteoconductive and biomimetic coatings (*L. Di Silvio*)
Acrylic cements (*J.A. Planell*)
Dental materials (*T.A. Mitsiadis*)
Ceramics (*F. Macchi*)
Biomechanical testing of biomaterials (*M. Viceconti*)
Spectroscopic analyses of biomaterials (*C. Fagnano*)
Allergic reactions to implant devices (*D. Granchi*)

Wednesday, 4 May 2005

BONE AND TOOTH ENGINEERING

Introduction (*N. Baldini, C. Prati*)
Biodegradable ceramic/cements (*J.A. Planell*)
Biodegradable polymers (*L. Ambrosio*)
Surface modifications and nanostructured materials (*G. Marletta*)
Stem cells and cell differentiation (*L. Di Silvio*)
Allogenic cell transplantation (*R. Conte*)
Growth factors and angiogenesis (*E. Cenni*)
Bone engineering (*G. Ciapetti, I. Amato*)
Tooth engineering (*T.A. Mitsiadis*)
Cartilage engineering (*A. Facchini*)
Intervertebral disc engineering (*L. Di Silvio*)

Thursday, 5 May 2005

APPLICATIONS OF BIOMATERIALS FOR ORTHOPAEDICS

Introduction (*A. Giunti*)
Shoulder prostheses (*R. Rotini*)
Biomaterials for hip prostheses (*A. Toni*)
Biomaterials for knee prostheses (*M. Marcacci*)
Biomaterials for heel and foot surgery (*S. Giannini*)
Pathophysiology of bone-implant interface (*N. Baldini*)
Biomaterials for spine surgery (*S. Boriani*)
Biomaterials for osteosynthesis (*R. Schmidmaier*)
Biomaterials for hand surgery (*A. Landi*)

Friday, 6 May 2005

APPLICATIONS OF BIOMATERIALS FOR DENTISTRY

Orthodontic problems in adults and children (*G. Borea*)
Imaging for dentistry (*G. Ghigi, P. Pisi*)
Maxillo-facial surgery and bone replacement biomaterials (*C. Marchetti*)
Oral implantology (*G. Corinaldesi*)
Periodontal diseases and surgical techniques (*L. Checchi, G. Zucchelli*)
Biomaterials for periapical bone dentistry (*C. Prati, G.A. Pelliccioni*)
Biomaterials for reconstructive dentistry in congenital diseases of the palate (*G. Piana*)
Biomaterials for reconstruction after oral cancer (*L. Montebugnoli*)



BIOMATERIALS IN ORTHOPAEDICS AND DENTISTRY

- General information** The Summer School is set up at the Department of Dentistry, Via San Vitale 57, Bologna. The Department is located in Bologna city centre o at walking distance from the university college and most hotels. The working language is **English**. In order to assure active participation of all students, a good knowledge of English is required.
- Requirements** The Summer School is primarily dedicated to practicing orthopaedic surgeons and dentists that are interested in updating their knowledge of biomaterials for clinical applications. Undergraduate students in Medicine, Dentistry, Veterinary Medicine, Biology, Biotechnologies, Chemistry, and Engineering, as well as graduate students in Biomaterial Science, Biotechnologies, Medical Technologies, and similar disciplines may also apply.
- Application procedure** Please complete the Summer School application form and send it **before 28 February 2005** to the organizing secretariat. This is intended as a pre-registration procedure. Applicants will be informed by **15 March 2005** about admission. (**Maximum of 35 attendees**).
- Fees** Students must finance their travel and contribute to the organization of the program in the amount of **450 €**. The Summer School offers coffee breaks, lunches, and course materials. Accommodation is not included.
- Scholarships** 3 scholarships, covering the cost of the registration fee, will be awarded. Candidates must be students (certification required) from academic or research centres of new EU candidate countries or third world countries. A CV is required.
- Credits** For Italian physicians and dentists: attending the Summer School will fulfil the total amount of required **ECM** credits for 2005.
For undergraduate students: a total of **5 ECTS** credits is attributed to the Summer School.
- Accommodation** A limited number of rooms will be available at the *Collegio Erasmus*, at a walking distance from the site of the Summer School. The secretariat of the Summer School will provide, upon request, information and advice on hotel accommodation in the city centre.
- Organisation** For further information please contact:
Dr. Nicola Baldini
Educational Coordinator of the Summer School
7[^] Divisione di Ortopedia e Traumatologia and Laboratorio di Fisiopatologia degli Impianti Ortopedici
Istituti Ortopedici Rizzoli
Via di Barbiano, 1/10, 40136 Bologna, Italy.
Tel/fax 051 6366748, e-mail: fisiopatologia@ior.it

Summer School
“Biomaterials in Orthopaedics and Dentistry”
2-6 may 2005

Surname	
Name	
Place & date of birth	
Mailing address	
Post code	
City & Country	
Students: course	
Practitioners: discipline	
<i>Codice fiscale</i>	
Institution	
Business address	
Post code	
City & Country	
Phone	
Fax	
E-mail	

Submit the pre-registration form to the following address:

Laboratorio di Fisiopatologia degli Impianti Ortopedici
Istituti Ortopedici Rizzoli
Via di Barbiano 1/10
40136 Bologna, Italy
phone/fax: +39.051.6366748
e-mail: fisiopatologia@ior.it

Please note that a maximum number of 35 attendees will be considered.
 Admission to the Summer School will be confirmed to the applicants by March 15.
 Payment modalities will be detailed.

- I wish to apply for a scholarship covering the admission fee
(applicants should attach their CV)