

**AO Foundation**



*Biotechnology Symposium*

## **From Basic Research to Clinical Applications using Biotechnology and Bioengineering**

Seminar organized by AO Biotechnology Advisory Board  
with the support of AO Research Board and AO Research Fund  
in collaboration with the SMPA

**University Hospital Lausanne, CHUV  
Lausanne, Switzerland  
October 19 to 21, 2006**

Preliminary Program and Call for Posters



Saturday, October 21, 2006

Invited Lectures: Biotechnology and Clinical Needs

- 8:15 **Biotechnology in trauma**  
Norbert Haas, Berlin
- 8:30 **Clinical needs and applications of biotechnology in CMF**  
Adrian Sugar, Swansea
- 8:45 **From basic research to clinical application**  
Pierre-Yves Zambelli, Lausanne

Session 5: Cell Based Therapy I

- 9:00 **The role of periosteal cells and mesenchymal stem cells in the physiological healing process of long- bone defects. Potential regeneration acceleration by autologous cell transplantation.**  
Georg N Duda, Berlin
- 9:10 **Processing of metals by human bone and immune cells**  
Luis Filgueira, Crawley
- 9:20 **Treatment of non-union fracture with fetal cells therapy**  
Dominique P Pioletti, Lausanne
- 9:30 **Bone regeneration with platelet-rich plasma, calcium phosphate ceramics, and stem cells**  
Philip Kasten, Heidelberg
- 9:40 **Estrogen-withdrawal increases the mechanosensitivity of bones to loading**  
Teppo Jarvinen, Tampere
- 9:50 **Panel discussion: Addressing challenges in cell-based therapies**
- 10:10 **Coffee break and poster session**

Session 5: Cell Based Therapy II

- 10:40 **Mechanoregulation of cell phenotype for musculoskeletal tissue engineering**  
Keita Ito, Davos
- 10:50 **HLA-independent transplantation of human mesenchymal stem cells from bone marrow and adipose tissue for regeneration of bone**  
Philipp Niemeyer, Heidelberg
- 11:00 **Bioreactor-based engineering of osteoinductive grafts**  
Ivan Martin, Basel
- 11:10 **PTH and alendronate improve osteotomy healing in an osteoporotic rat model**  
José Toro, New York

## Saturday, October 21, 2006

- 11:20 **An engineered vascularized graft for large bone defects**  
Mauro Alini, Davos
- 11:30 **Panel discussion: Addressing challenges in cell-based therapies**
- 11:45 **Swiss MD-PhD Association (SMPA): a way to bridge the gap between the bench and the patient's bed**  
David Winkler, Basel
- 11:55 **Biotechnology funding in the AO Foundation**  
Adrian Sugar, Margarethe Hofmann-Antenbrink
- 12:10 **Lunch / exhibitors / poster viewing**  
**For SMPA members: General Assembly 2006: 13.00-13.30**

### Session 6: Tissue Engineering & Gene Therapy

- 13:30 **Ethical considerations**  
Catherine El-Bez, Lausanne
- 13:45 **Nonviral DNA vectors in bone regeneration**  
Jeffrey Hubbell, Lausanne
- 13:55 **PDGF gene therapy to promote oral implant osseointegration**  
Zachary Abramson, Ann Arbor
- 14:05 **Environmental factors influence gene transcription by human nucleus pulposus cells**  
Anthony Freemont, Manchester
- 14:15 **Panel discussion: Tissue engineering and gene delivery**
- 14:30 **Coffee break - poster viewing**

### Session 7: Biomedical Engineering

- 15:00 **Molecular modelling of proteins: from simulations to patients**  
Olivier Michielin, Lausanne
- 15:15 **Bone formation enhancement by BMP-2-functionalized implant coatings - a study in miniature pigs**  
Yuelian Liu, Bern
- 15:25 **Characterizing cell adhesion and migration on surfaces biofunctionalized with nanopatterned collagen matrices**  
Clemens Franz, Dresden

## Saturday, October 21, 2006

- 15:35    **Quantification of porosity, connectivity, and material density of calcium phosphate ceramic implants using micro-computed tomography**  
Ling Qin, Hong Kong
- 15:45    **Optimization of extracellular matrix production and gene expression by human annulus cells in three-dimensional constructs**  
Helen E Gruber, Charlotte
- 15:55    **Targeted delivery of natural TGF- $\beta$  antagonist suppresses scar formation during wound healing**  
Tero Järvinen, La Jolla
- 16:05    **Panel discussion: Addressing challenges in orthopedic bioengineering**
- 16:20    **Final discussion and summary of the conference**
- 17:20    **Apéro**
  
- 19:00    **Closing dinner**

## List of speakers

- Zachary Abramson**, PhD, Michigan Center for Oral Health Research, University of Michigan, Clinical Research Center, Ann Arbor, MI, USA
- Charles Archer**, PhD, Professor, School of Biosciences, Cardiff Institute of Tissue Engineering and Repair, Cardiff University, Cardiff, UK
- Karen Burg**, PhD, Professor, Department of Bioengineering, Clemson University, Clemson, SC, USA
- Francis C.W. Chan**, MD, The Chinese University of Hong Kong, Prince of Wales Hospital, Department of Orthopedics and Traumatology, Hong Kong (SAR), China
- J Hu Y Cheng**, MD, The Chinese University of Hong Kong, Prince of Wales Hospital, Department for Orthopedics and Traumatology, Hong Kong (SAR), China
- Lim Kwong Cheung**, DMD, Professor, Oral & Maxillofacial Surgery, Faculty of Dentistry, Prince Philip Dental Hospital, The University of Hong Kong, Hong Kong, China
- Georg N Duda**, PhD, Professor, Center for Musculoskeletal Surgery, Charité - Universitätsmedizin Berlin, Berlin, Germany
- Catherine El-Bez**, PhD, Bioethics, University of Lausanne, Switzerland
- Stephen Ferguson**, PhD, ME Müller Research Centre for Orthopaedic Surgery, Institute for Evaluative Research in Orthopaedic Surgery, University of Bern, Bern, Switzerland
- Luis Filgueira**, PhD, Senior Lecturer, The University of Western Australia, School of Anatomy & Human Biology, Crawley, WA, Australia
- Clemens Franz**, PhD, Research Fellow, Biotec, TU Dresden, Dresden, Germany
- Anthony Freemont**, MD, Professor, University of Manchester, School of Medicine, Division of Regenerative Medicine, Manchester, UK
- Allen Goodship**, MD, Professor, Institute of Orthopaedics and Musculoskeletal Science, University College London, London, UK
- Helen E Gruber**, PhD, Carolinas Medical Center, Department of Orthopedic Surgery, Charlotte, NC, USA
- Robert E Guldberg**, MD, Professor, Parker H Petit Institute for Bioengineering and Bioscience, Georgia Institute of Technology, Atlanta, Georgia, USA
- Norbert Haas**, MD, Professor, Charité - University Medicine Berlin, Free and Humboldt-University, Berlin, Germany
- Carl Haasper**, MD, Unfallchirurgische Klinik, Trauma Department, Medizinische Hochschule Hannover (MHH), Hannover, Germany

## List of speakers

**Margarethe Hofmann-Antenbrink**, PhD, MAT SEARCH, Pully, Switzerland  
Chairperson AO Biotechnology Advisory Board

**Jeffrey Hubbell**, PhD, Professor, Laboratory for Regenerative Medicine and Pharmacobiology,  
Integrative Biosciences Institute, Swiss Federal Institute of Technology (EPFL),  
Lausanne, Switzerland

**James C. Iatridis**, PhD, Professor, Dept of Mechanical Engineering and Dept of Orthopaedics &  
Rehabilitation, University of Vermont, Burlington, Vermont, USA

**Keita Ito**, MD, ScD, Professor, AO Research Institute, Davos Platz, Switzerland

**Esmail Jabbari**, PhD, Professor, Biomimetic and Tissue Engineering Laboratories, Department  
of Chemical Engineering, University of South Carolina, Columbia, SC, USA

**Teppo Jarvinen**, MD, PhD, University of Tampere, Department of Surgery, Tampere, Finland

**Tero Järvinen**, MD, PhD, Burnham Institute for Medical Research, La Jolla, CA, USA

**Philip Kasten**, MD, Orthopädische Universitätsklinik Heidelberg, Heidelberg, Germany

**James F Kellam**, MD, Past President, AO Foundation, Department of Orthopedic Surgery,  
Carolinas Medical Center, Charlotte, NC, USA

**Dimitris Kletsas**, MD, NCSR "Demokritos", Institute of Biology, P Grigoriou & Neapoleos,  
Athens, Greece

**Paul H Krebsbach**, PhD, Professor, Department of Oral Medicine, Pathology and Oncology,  
University of Michigan, School of Dentistry, Ann Arbor, Michigan, USA

**Jens Kuschnierz**, MD, University of Freiburg, Department of Oral and Maxillofacial Surgery,  
Freiburg, Germany

**Y Liu**, PhD, ITI Research Institute for Dental and Skeletal Biology, University of Bern,  
Switzerland

**Henning Madry**, MD, Laboratory for Experimental Orthopaedics, Klinik für Orthopädie und  
Orthopädische Chirurgie, Universitätsklinikum des Saarlandes, Homburg, Germany

**Ivan Martin**, PD, PhD, Tissue Engineering, Department of Surgery, University Hospital, Basel,  
Switzerland

**O Michielin**, MD, PhD, Professor, Medical Faculty, University of Lausanne, Swiss Institute for  
Bioinformatics, Lausanne, Ludwig Institute for Cancer Research, Lausanne Branch,  
Multidisciplinary Oncology Center of Lausanne, Lausanne, Switzerland

**F Mwale**, MD, Professor, SMBD, Jewish General Hospital, McGill University, Montreal, Canada

**Philipp Niemeyer**, MD, Department Orthopedic Surgery and Traumatology, Freiburg  
University Hospital, Freiburg, Germany

## List of speakers

- Tom Oxland**, MD, Professor, University of British Columbia, Department of Orthopedics, Division of Orthopedic Engineering, Vancouver, Canada
- Dominique P Pioletti**, PhD, Professor, Bone Bioengineering Group, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland
- Ling Qin**, MD, Professor, Musculoskeletal Research Laboratory, Department of Orthopedics & Traumatology, The Chinese University of Hong Kong, Hong Kong (SAR), China
- Mark A Randolph**, MAS The Department of Orthopaedic Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA
- Brigitte von Rechenberg**, PD, MD vet, MSRU, Equine Hospital, University of Zürich, Zürich, Switzerland
- Henning Schliephake**, MD, PhD, Professor, Department of Oral and Maxillofacial Surgery, George-August University, Göttingen, Germany
- Norbert Suedkamp**, MD, Professor, Chairman AO Research Board, Department of Orthopedic Surgery and Traumatology, Freiburg University Hospital, Germany
- Adrian Sugar**, MD, Chairman AO Research Fund, Maxillofacial Unit, The Welsh Centre for Burns Plastic Surgery and Maxillofacial Surgery, Swansea NHS Trust, Morriston Hospital, Morriston, Swansea, UK
- José Toro**, MD, Professor, The Hospital for Special Surgery, New York, New York, USA
- Franz E Weber**, PhD, Institute for Oral Biology Section Bioengineering and University Hospital, Dept of Cranio-Maxillofacial Surgery, Zürich, Switzerland
- Chris van der Werken**, MD, PhD, Professor, President, AO Foundation, Department of Surgery, University Medical Centre, Utrecht, The Netherlands
- Markus A. Wimmer**, PhD, Professor, Section of Tribology, Department of Orthopedics, Rush University Medical Center, Chicago, Illinois, USA
- David Winkler**, MD, PhD, President of the SMPA, Kantonsspital Basel, Neurobiology, Basel, Switzerland
- Pierre-Yves Zambelli**, PD MER, MD, Hôpital Orthopédique de la Suisse romande, Lausanne, Switzerland