

Universität Duisburg-Essen

University Duisburg-Essen

2nd Announcement
Call for Posters and
Preliminary Programme

Biomaterials and Biomechanics: Fundamentals and Clinical Applications

7th Interdisciplinary
Essen-Symposium of the Working Group
on "Biomaterials and Tissue Compatibility"

October 6th - 8th, 2004
Essen, Germany

Organizers:

A. Fischer, H. P. Jennissen, D. Bingmann

Scientific Board:

*D. Bergers, M. Epple, H. Gerding (Münster),
A. Kecskemethy, F. Löer, H. Richter (Düsseldorf)*

Scope of Symposium

More than 100.000 total hip or knee joints are implanted during one year in Germany. Within a time range of ten years about 5 % of those fail by aseptic loosening. The interaction of particles released from the articulating surfaces of cup and ball and the surrounding tissue is one of the major reasons. In cardiology stent related therapies have emerged into clinical application strongly since 1986. Even though many different designs, coatings, and eluted drugs have been incorporated into this treatment about 10 to 20 % of the patients suffer from restenosis. These are just two examples which depict the possibilities and limitations of modern medicine. The challenge of basic and clinical research is to understand the acting mechanisms and bring about measures to counter these problems by a well-aimed selection of suitable therapies. Due to the fact that this must incorporate specialists from all faculties this symposium has been established in order to present a forum for interdisciplinary up-to-date presentations and lively discussions.

The scopes of the 7th Symposium emphasize the properties of surfaces of biomaterials and their interaction with the surrounding soft or hard tissue. This implies the characterization and the functionalization of surfaces. For the first time special sessions on laboratory and computer simulations as well as on rapid prototyping will be provided to show the possibilities and limitations of these new methods during basic research and product development. Due to the fact that clinical experience renders the goals for any development it will be a substantial part of this symposium.

The aim of all former Essen symposia has been to present the newest results as well as to initiate widespread cooperation between interested members of different faculties. Due to the special time schedule of this symposium and its poster session, which allows for stimulating and fruitful discussions, already numerous projects have been initiated. Certainly, the 7th symposium has to be seen in that course as well. Thus, we are proud and thankful that more than 50 scientists from 9 countries will present new results, ideas and concepts at our 7th symposium in Essen.

Alfons Fischer

Programme of the

7th Interdisciplinary Essen-Symposium of the Working Group on „Biomaterials and Tissue Compatibility“, supported by:

- AG Biomaterialien NRW e.V., Düsseldorf
- Kulturstiftung Essen e.V., Essen
- Life Technologies Ruhr e.V., Bochum
- Fahrzeugwerke Lueg AG, Center Essen

University Duisburg-Essen, October, 6th - 8th, 2004

Wednesday, October 6th, 2004

7:30 **Registration**

8:15 **Welcome**

Alfons Fischer (Duisburg-Essen, Germany)

8:30 - 10:00 **Particles and Ions**

8:30 **Effects of wear particles of micro- and nanometer-scale on endothelial cell functions in vitro**

Kirsten Peters (Mainz, Germany)

9:00 **In-vivo micro and nano particles in blood circulation**

Antonietta M. Gatti (Modena, Italy)

9:30 **The interaction of magnetic nanoparticles with peripheral blood cells**

Manuela Schwalbe (Jena, Germany)

10:00 **Coffee Break**

10:30 - 13:00 **Particles and Ions**

10:30 **The clinical relevance of particles and ions in orthopedics**

Markus Wimmer (Rush University Chicago, USA)

11:00 **The morphology of wear particles in metallic biomaterials and their direct relation to the mechanisms of detachment**

Robin Büscher (Duisburg-Essen, Germany)

11:30 **Particle migration within rabbit-models during in vivo testing**

Georg Träger (Essen, Germany)

12:00 **Aseptic loosening of modern joint replacements: the role of the macrophage and a new cellular mechanism of osteoclast differentiation in periprosthetic osteolysis: the RANK/RANKL system**

Thomas Sterner (Essen, Germany)

- 12:30 **Pharmacologic options to treat particle-induced osteolysis**
Marius von Knoch (Essen, Germany)
- 13:00 **Lunch**
- 14:00 - 15:30 **Advanced Biomaterials for Active Implants and Tissue Engineering**
- 14:00 **Resorbable antibiotic coatings for bone substitutes and implantable devices**
Matthias Schnabelrauch (Jena, Germany)
- 14:30 **BMPs, receptors and inhibitors. Structure and role in bone formation**
Walter Sebald (Würzburg, Germany)
- 15:00 **Bone substitution materials of nanocrystalline calcium phosphate loaded with antibiotics**
Thea Welzel (Duisburg-Essen, Germany)
- 15:30 **Coffee Break**
- 16:00 - 18:00 **Advanced Biomaterials for Active Implants and Tissue Engineering**
- 16:00 **Modified fibrin hydrogels stimulate angiogenesis in vivo: potential application to increase perfusion of ischemic tissues**
Heike Hall (Zürich, Switzerland)
- 16:30 **Alginate/calcium phosphate scaffolds with oriented, tube-like pores**
Michael Gelinsky (Dresden, Germany)
- 17:00 **Implantable biomaterials made by cell growth on the collagen fibril matrix**
Viorica Trandafir (Bucharest, Romania)
- 17:30 **Silicone breast implants – Products with date of expiry!**
Andrea Janke (Aachen, Germany)
- 14:00 - 15:30 **New Implants and Therapies in Ophthalmology**
- 14:00 **Ophthalmology in Germany: cost cutting by innovative products**
Walter-Gerhard Wrobel (Jena, Germany)
- 14:30 **Femtosecond laser used in ophthalmology surgery**
Mark Tomalla (Duisburg, Germany)
- 15:00 **Internal tamponade of the retina**
Dirk-Henning Menz (Augsburg, Germany)
- 15:30 **Coffee Break**

16:00 - 17:30 **New Implants and Therapies in Ophthalmology**

16:00 **Bioelectrodes for chronic implants**
Thomas Stieglitz (St. Ingbert, Germany)

16:30 **Biomaterial aspects of subretinal implants**
Hugo Hämmerle (Reutlingen, Germany)

17:00 **Intraocular lens materials**
Christiane F. Kreiner (Berlin, Germany)

17:30 **Poster Session and Snacks**

Thursday, October 7th, 2004

8:00 - 10:00 **Hard Tissue Preclinical Evaluation and Computer Simulation**

8:00 **Development of orthopedic implants - safety concept or regulatory hurdle**
Ulrich Fink (Tuttlingen, Germany)

8:30 **Muscoskeletal loading**
Georg Duda (Berlin, Germany)

9:00 **Patients activities - Influence on wear behaviour of total hip endoprostheses**
Michael Morlock (Hamburg, Germany)

9:30 **Rapid identification of muscle activation profiles via optimisation and smooth profile patches**
Andres Kecskemethy (Duisburg-Essen, Germany)

10:00 **Coffee Break**

10:30 - 13:00 **Hard Tissue Preclinical Evaluation and Computer Simulation**

10:30 **Investigation of mechanical compatibility of implants / endoprosthesis and bone tissue. Simulation of intelligent systems on the basis of movable cellular automaton method**
Serguei Psakhie (Tomsk, Russia)

11:00 **Nanocrystalline biomaterial hydroxyapatite and apatite binding in bone: a solid state NMR perspective**
Christian Jäger (Berlin, Germany)

11:30 **Individual biodegradable implants for cranial bone reconstruction**
Carsten Schiller (Duisburg-Essen, Germany)

- 12:00 **Reconstruction of acute rotator cuff injury with new alloplastic tendon axially fixed within a precoated bone screw experimental repair model in sheep**
Martin Sellei (Aachen, Germany)
- 12:30 **Biomaterials - Industrial quest to basic research**
Falko Schlottig (Oberdorf, Switzerland)
- 13:00 **Lunch**
- 14:00 - 18:00 **Laboratory and Computer Simulation in Soft Tissue especially Cardiology**
- 14:00 **Aspects of modelling and computer simulation of soft tissues. Applications to arterial walls**
Jörg Schröder (Duisburg-Essen, Germany)
- 14:30 **Balloon angioplasty and stenting: Mechanical and clinical aspects**
Gerhard A. Holzapfel (Graz, Austria)
- 15:00 **The role of biomechanics in arterial reactions to stents**
James Moore (College Station, USA)
- 15:30 **Coffee Break**
- 16:00 - 17:30 **Laboratory and Computer Simulation in Soft Tissue especially Cardiology**
- 16:00 **Various inorganic coatings for modification of the metal stents surface**
T. Aleksyeyeva (Kiev, Ukraine)
- 16:30 **Thromboresistance fluorocontaining poly(urethaneurea)s: Synthesis, properties and application**
O. V. Shekera (Kiev, Ukraine)
- 17:00 **Laboratory simulation of stent fatigue**
Andreas Meißner (Duisburg-Essen, Germany)
- 17:30 **Poster Session and Refreshments**
- 14:00 - 18:00 **Rapid and Virtual Prototyping in Medical Product Engineering and Therapy Planning**
- 14:00 **Rapid product development of a critical care board for shortening the intensive – medical process chain**
Thomas Krell (Duisburg-Essen, Germany)
- 14:30 **Reverse engineering and rapid prototyping for medical application**
Dieter Fichtner (Dresden, Germany)

- 15:00 **Rapid prototyping and reverse engineering for implants**
Rudolf Meyer (Magdeburg, Germany)
- 15:30 **Coffee Break**
- 16:00 - 18:00 **Rapid and Virtual Prototyping in Medical Product Engineering and Therapy Planning**
- 16:00 **Biocompatibility of ceramic scaffolds for bone replacement made by 3D printing**
Barbara Leukers (Bonn, Germany)
- 16:30 **Surgical navigation in space and time: what clinicians want, what is built, what they get. Is that what they need?**
Wolfgang Freysinger (Innsbruck, Austria)
- 17:00 **Computer-aided 3D-operation planning**
Hans-Florian Zeilhofer (Basel, Switzerland)
- 17:30 **Biomaterials are going 3D with Layer Manufacturing Technologies (LM) – Direct and indirect approaches**
Gideon N. Levy (St.Gallen, Switzerland)
- 18:00 **Poster Session and Refreshments**
- 19:00 **Conference Dinner, City Hall Essen hosted by the mayor of the City of Essen**
3rd Young Scientist Award
Life Tech Ruhr Award

Friday, October 8th, 2004

- 8:00 - 10:00 **Biomaterials, Surfaces and Cell Interaction**
- 8:00 **3D-rapid prototyping of protein molecules relevant for biomaterials**
Markus Laub (Essen, Germany)
- 8:20 **Release kinetics of BMP-2 from metal implant surfaces**
Maria Chatzinikolaidou (Essen, Germany)
- 8:40 **Morphology, micromechanics and failure of bone cement**
Sven Henning (Halle-Wittenberg, Germany)
- 9:10 **The osseous integration of RGD-peptide coated and non-coated metallic implants in the adult sheep**
Erwin Steinhauser (München, Germany)
- 9:30 **Measuring cell-substratum contact dynamics**
Mark R. Holt (London, United Kingdom)

- 10:00 **Coffee Break**
- 10:30 - 13:00 **Biomaterials, Surfaces and Cell Interaction**
- 10:30 **Stress sensing**
David Jones (Marburg, Germany)
- 11:00 **Ionic controls of cell to cell interactions and
membrane forces**
Adam Curtis (Glasgow, United Kingdom)
- 11:30 **Cellular mobility on BMP covered surfaces**
Lars Winkler (Essen, Germany)
- 12:00 **Initial protein interactions on porous
Ti-surfaces**
Jürgen Geis-Gerstorfer (Tübingen, Germany)
- 12:30 **Toxic effects of metals**
Dietrich Büsselberg (Essen, Germany)
- 13:00 **Lunch**
- 14:00 **Farewell**

Poster abstracts are cordially invited to the following topics:

Biomechanics and Implants

- Cardiovascular Implants
- Orthopedic Implants
- Surgical Implants
- Implants Design and Materials
- Laboratory and Computer Simulation
- Rapid and Virtual Prototyping

Biomaterials

- Metals, Ceramics, Polymers
- Composites and Coatings

Surface Tissue Interaction

- Surface Modification
- Surface and Particle Characterization in nm- and μm -scale
- Molecular Layering and Biocoatings
- Surface and Particle Interaction with Cells

Clinical Experience

- Cardiology
- Orthopedics
- Ophthalmology

Contributions to the above or related topics are appreciated. Conference contributions (in English, up to 10 printed pages) will be published in a peer reviewed journal (Materials Science and Engineering Technology, MATWER)

Key Deadlines:

Poster Abstracts: September, 1st, 2004

Latest News Posters (without printed abstracts): October, 1st, 2004

Notification of Acceptance of Posters: September, 15th, 2004

Abstracts:

Abstracts must have a width of 17 cm and must not exceed a length of 26 cm (DIN A4). They might contain figures as well as tables. Font sizes must be at least 10 pt. Names of cited journals should be abbreviated according to the World List of Scientific Periodicals.

Please submit the abstracts via e-mail to (fischer@wt2.uni-duisburg.de) in

Microsoft Word format (all versions), no other format will be accepted. In any case the abstracts should have the following structure: title, author(s), institution(s) with full postal addresses, text, acknowledgement, citation.

Abstracts will be assembled in a symposium booklet available at the beginning of the meeting.

Slide and film projection: Facilities are available for 24 x 26 mm slides, simultaneous projection of two slides, overhead projection, VHS Video, Power-Point presentation.

Exhibition: An industrial exhibition will be run in conjunction with the symposium. Those participants interested in renting exhibition space should tick the box on the registration form for further information.

Sponsorship: Sponsorship is invited in support of this event. Please indicate on the registration form if your organization is interested in sponsoring the symposium.

Registration: A form for registration by fax is enclosed; Additional registration can be done via symposium home page:

<http://www.biomaterials.uni-essen.de>

Symposium Fee: Euro 150,-

University Staff: Euro 75,-

Students: Euro 25,-

Payment: The payment should be done by bank transfer after being invoiced by the symposium secretary's office FET.

Language: English

Venue: University Duisburg-Essen

**Scientific
Symposium
Secretariat:**

Prof. Dr.-Ing. Alfons Fischer
Universität Duisburg-Essen
Institut für Produkt Engineering
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**Location
of Symposium
and Exhibition:**

Hörsaalzentrum
der Universität Duisburg-Essen
Universitätsstr. 3
45141 Essen

**Symposium
and Exhibition
Secretary's
Office:**

FET Zentralstelle für
Forschungs- und Entwicklungstransfer
Universität Duisburg-Essen
Universitätsstr. 2
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fax: ++49 201 183-2134

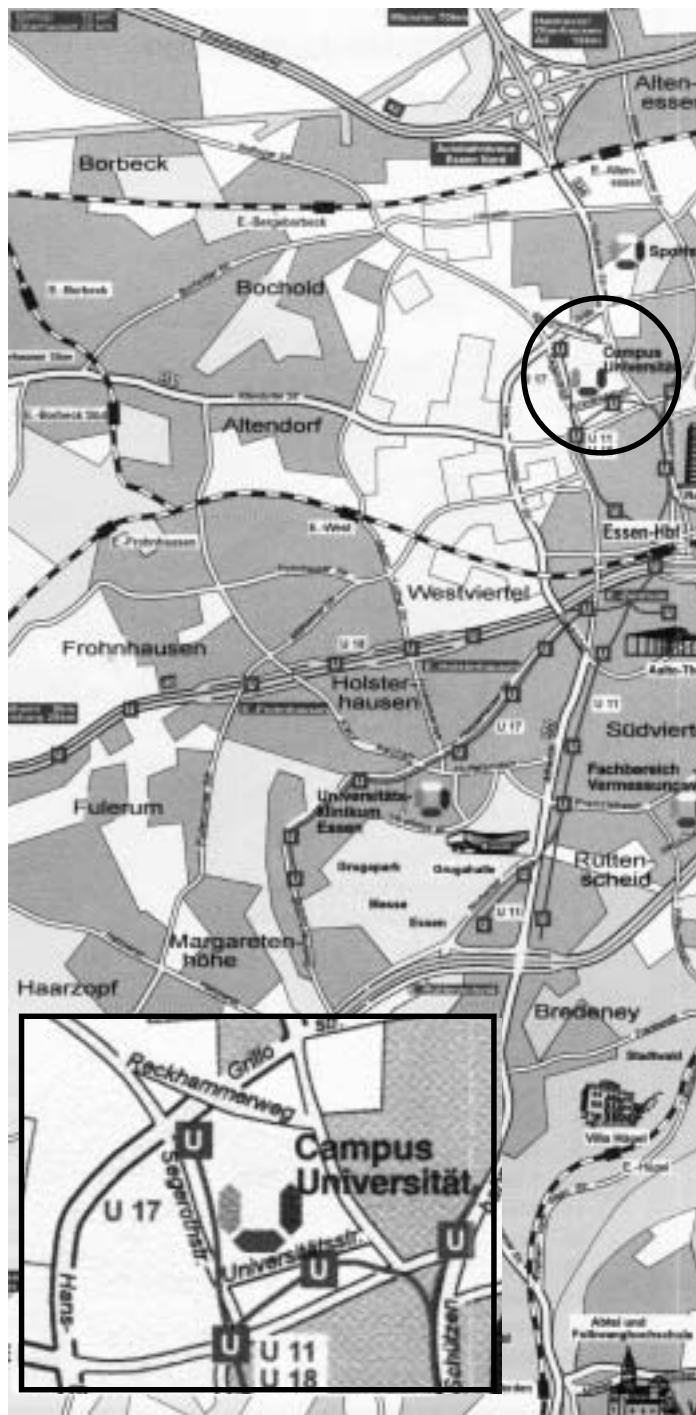
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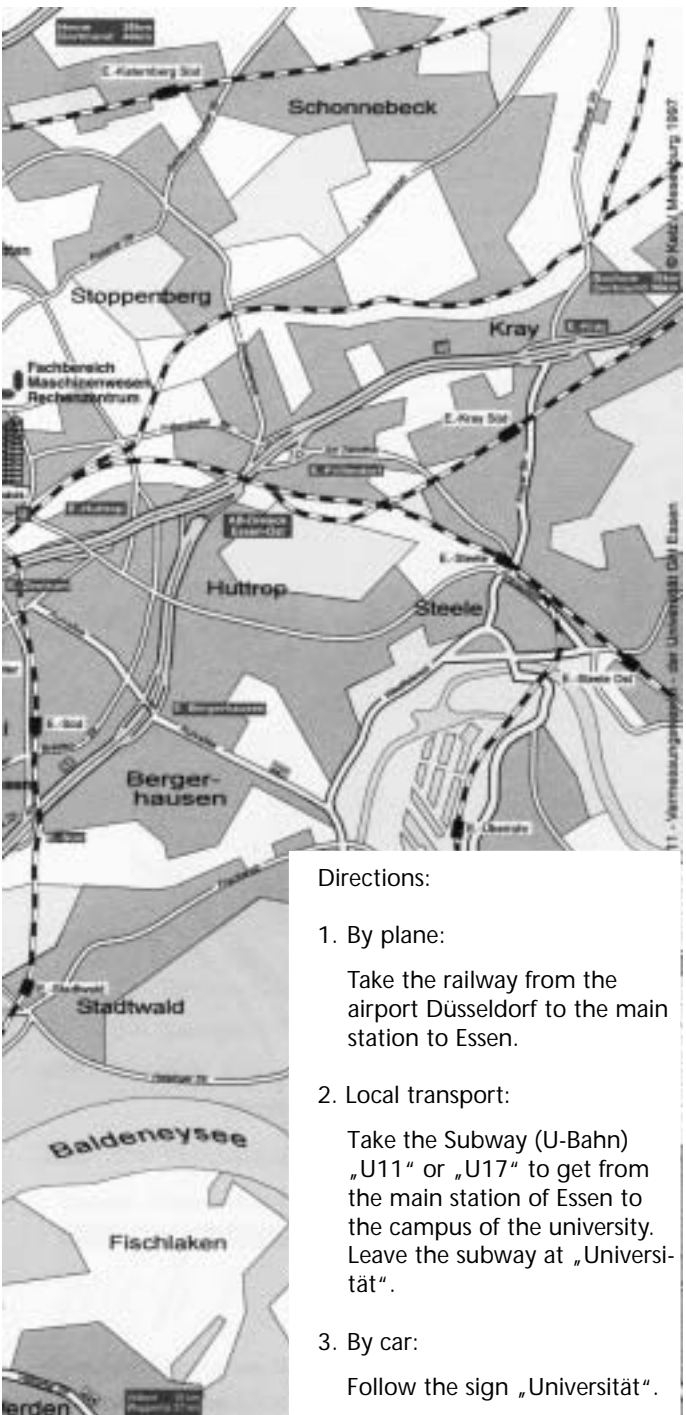
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**Room
Reservation:**

Please contact:
Touristikzentrale Essen
Postfach 10 10 17
D-45010 Essen

phone: ++49 201 88 72 046
fax: ++49 201 88 72 044





Directions:

1. By plane:

Take the railway from the airport Düsseldorf to the main station to Essen.

2. Local transport:

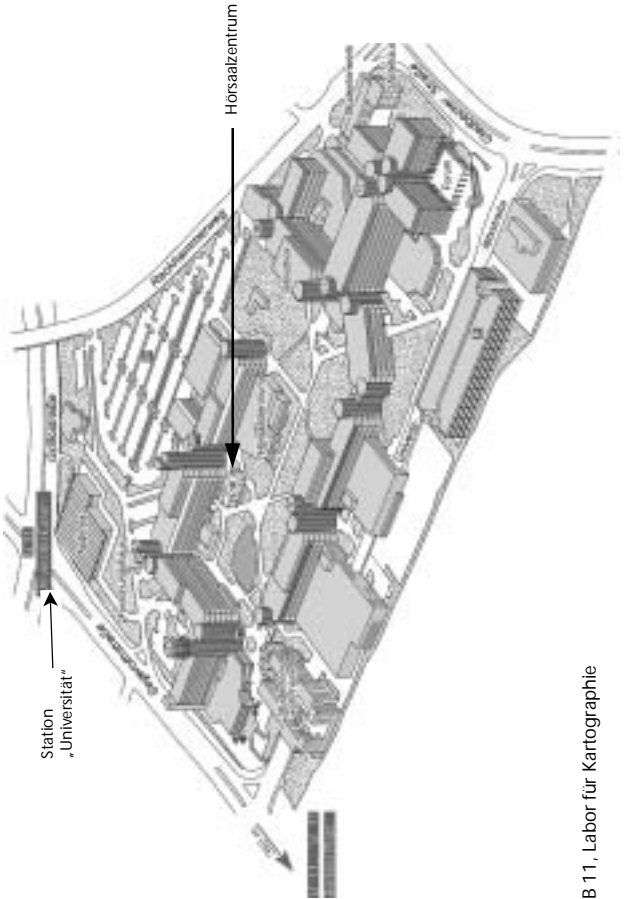
Take the Subway (U-Bahn) „U11“ or „U17“ to get from the main station of Essen to the campus of the university. Leave the subway at „Universität“.

3. By car:

Follow the sign „Universität“.

Follow the instructions on the map to get from station „Universität“ to the

„Hörsaalzentrum“



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Registration form (<http://www.biomaterials.uni-essen.de>)

Biomaterials and Biomechanics: Fundamentals and Clinical Applications

Family Name/First Name/Title:

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Paper

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Our organization/company is interested in
sponsoring the symposium

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Fundamentals and Clinical Applications

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