



Collaborative Research Centre  
SFB 599  
Biomaterial Engineering

**Sustainable Bioresorbable and  
Permanent Implants of Metallic  
and Ceramic Materials**  
Hannover



October 14-15, 2011

University of Veterinary Medicine Hannover (TiHo)  
Clinic for Small Animals  
Bünteweg 9 – 30559 Hannover  
Lecture Hall „Bayer“

**Colloquium 2011**

# Welcome

Dear Participants,

We would like to invite you to join the colloquium of our Collaborative Research Centre SFB 599 „ Sustainable Bioresorbable and Permanent Implants of Metallic and Ceramic Materials“ in Hannover on October 14-15, 2011.

The aim of the colloquium is to stimulate an exchange of knowledge and experience between researchers of the SFB 599, external scientists and industry. We will present the latest results of our research projects. Further, we have been able to win excellent national and international scientists who will report about their experience in the field of biomedical technology.

Due to the necessary arrangements we kindly ask you to register with Ms. Regina Müller;  
phone +49 (0)511 532-3026,  
e-mail: [mueller.regina@mh-hannover.de](mailto:mueller.regina@mh-hannover.de)

Yours sincerely,



Prof. Prof. h.c. Dr. med. Thomas Lenarz  
Spokesman of SFB 599

## Program: Friday, October 14<sup>th</sup>

### 09:30 Welcome

#### Subject Area EAR

- 10:00 D2 Multimodal functionalization of electrodes  
**Prof. Thomas Lenarz**  
*Hannover Medical School, Germany*
- 10:15 Surface functionalization with self-regenerating properties  
**Dr. Peter Thomsen**  
*BioModics ApS, Lyngby, Denmark*
- 10:45 D1 Mesoporous silica layers on implants: Application in the middle ear  
**Prof. Peter Behrens**  
*Leibniz Universität Hannover, Germany*
- 11:00 Mesoporous silica nanoparticles for targeted cancer therapy  
**Prof. Mika Lindén**  
*University of Ulm, Germany*
- 11:30 T2 Surface functionalization of cochlear implants with ultra-short puls lasers  
**Elena Fadeeva**  
*Laser Zentrum Hannover e.V., Germany*
- 11:45 Time domain based impedance measurement for electrical characterization of cells and tissue  
**PD Dr. Uwe Pliquett**  
*Institute for Bioprocessing and Analytical Measurement Techniques e.V., Heilbad Heiligenstadt, Germany*

### 12:15 LUNCH BREAK

#### Subject Area JOINT

- 13:15 D4 Fully ceramic knee implants – challenges and solutions concerning machining processes  
**Prof. Berend Denkena**  
*Leibniz Universität Hannover, Germany*
- 13:30 Computer-integrated knee surgery system  
**Prof. Mamoru Mitsuishi**  
*The University of Tokyo, Japan*

## Program: Friday, October 14<sup>th</sup>

- 14:00 D6 FE simulation of strain-adaptive bone remodeling in the hip joint after THR  
**M. Sc. Nelly Weigel**  
*Leibniz Universität Hannover, Germany*
- 14:15 Ceramic scaffolds for bone regeneration: in vitro and in vivo studies  
**Prof. Dr. Wiltrud Richter**  
*Heidelberg University Hospital, Germany*
- 14:45 D7 Thin polymer layers – biomedical perspective and analytical challenge  
**Dr. Wibke Dempwolf**  
*Technische Universität Braunschweig, Germany*
- 15:00 The pool of „high tech“ instrumentation in the research building of the Mainz University Medical Center  
**Univ.-Prof. Dr. Heinz Duschner**  
*Mainz University, Germany*

15:30 BREAK

- 16:00 D13 Metal forming adapted design method for patient individual acetabular components  
**Dipl.-Ing. Stefanie Betancur Escobar**  
*Leibniz Universität Hannover, Germany*
- 16:15 Production of standard and patient individual hip implants  
**Dr.-Ing. Marc Kneissler**  
*Biomet Deutschland GmbH, Berlin, Germany*
- 16:45 DR1 Options and therapeutic strategies in infections of joint prostheses  
**Prof. Henning Windhagen**  
*Hannover Medical School, Germany*
- 17:00 Protein Coupling for enhanced fixation in permanent bone implants  
**Prof. Marcus Jäger**  
*Essen University Hospital, Germany*

17:30 BREAK

## Program: Friday / Saturday, October 15<sup>th</sup>

18:00 Bio-inspired intracellular recordings and stimulation of neurons by extracellular multisite noninvasive gold mushroom shaped multi electrode array

**Prof. Micha E. Spira**

*The Hebrew University of Jerusalem, Israel*

19:30 Appetizers for Mind and Mouth – Convivial Evening in the Kestnergesellschaft

Goseriede 11, Hannover

Current Exhibition: Daniel Richter: 10001 nights

## Saturday, October 15<sup>th</sup>

### Subject Area BONE

08:30 R6 Reactions of osseous - and lymphoid tissue after implantation of magnesium alloys for orthopaedic applications in comparison to conventional osteosynthesis materials

**Dr. Janin Reifenrath**

*Hannover School of Veterinary Medicine, Germany*

08:45 Histological and immunohistochemical methods for the evaluation of osseous and lymphoid tissue alterations

**Dr. Alexandr Bondarenko**

*Dnipropetrovs'k State Medical Academy, Ukraine*

09:15 D10 New approaches for active improvement of fracture healing

**Dr. Christian Müller**

*Hannover Medical School, Germany*

09:30 TBD

10:00 T3 Design and machining of load bearing resorbable large fragment screws

**Patrick Helmecke**

*Leibniz Universität Hannover, Germany*

10:15 TBD

10:45 BREAK

**Subject Area TOOTH**

- 11:15 D8 Novel surface coatings for prevention of bio-film formation on medical implant surfaces  
**Prof. Meike Stiesch**  
*Hannover Medical School, Germany*
- 11:30 Strategies for antibacterial implants  
**Prof. Dr. Regine Willumeit**  
*Helmholtz-Zentrum Geesthacht, Germany*
- 12:00 D12 Investigation of new fillers in dental composites  
**Prof. Henning Menzel**  
*Technische Universität Braunschweig, Germany*
- 12:15 New components for restorative composites  
**Prof. Norbert Moszner**  
*Ivoclar Vivadent AG, Schaan, Liechtenstein*

12:45 LUNCH BREAK

**Subject Area HEART/VESSELS and  
PARANASAL SINUSES**

- 13:45 R1 Simulation models for calcification and application to stents  
**Prof. Peter Wriggers**  
*Leibniz Universität Hannover, Germany*
- 14:00 Modeling and simulation of stent implantation in arteries: opportunities for the future  
**Prof. Gerhard Holzapfel**  
*Graz University of Technology, Austria*
- 14:30 R7 Stabilizing of tissue engineered aortic prostheses by the use of bioresorbable magnesium alloy structures  
**Dr.-Ing. Thomas Hassel**  
*Leibniz Universität Hannover, Germany*
- 14:45 TBD
- 15:15 R8 Behavior of magnesium under different physical conditions  
**Florian Evertz**  
*Leibniz Universität Hannover, Germany*
- 15:30 TBD

16:00 Goodbye

## Section R: Bioresorbable Implants

- R1 Magnesium degradation  
*Bormann/Bach, Lenarz, Kietzmann*
- R6 Degradable osteosynthesis systems  
*Meyer-Lindenberg, Wriggers, Thorey*
- R7 Structures made of magnesium for the stabilization of cardiovascular tissue scaffolds in the high pressure system  
*Haverich, Hassel*
- R8 Control of the degradation and mode of action of magnesium-based medical implants  
*Glasmacher, Hauser, Kietzmann*

## Section D: Permanent Implants

- D1 Functionalized middle ear prostheses  
*P. Behrens, Müller, Stieve*
- D2 Development of electrode-arrays for optimised electrode-nerve-interaction  
*Lenarz, Chichkov, Menzel*
- D4 Ceramic implants  
*Denkena, Hurschler*
- D6 Numerical simulation on stress-compatible design of total prosthetic joint replacements and implants  
*B.-A. Behrens, Stukenborg-Colsman, Nolte*
- D7 Implant surfaces  
*Windhagen, Dempwolf, Gross*
- D8 Chemical functionalization of dental implant abutments for reduction of oral biofilm formation  
*Stiesch, Menzel, Abraham*

# Subprojects of the Third Funding Period 2011 – 2014

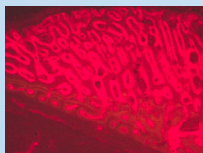
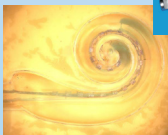
- D9 Biomimetic ceramics  
*Menzel, Ostermeier, Glasmacher*
- D10 Implants with alterable stiffness  
*Gösling, Barcikowski, Hurschler*
- D12 Dental ceramics and composites  
*P. Behrens, Stiesch, Jendras*
- D13 Development, metal-forming and evaluation of patient-individual acetabular components  
*Bouguecha, Wefstaedt, Stukenborg-Colsman*

## Section DR: Permanent Implants with bioresorbable component

- DR1 Mg-compounds on permanent implants  
*Windhagen, Möhwald, Hauser*

## Section T: Transfer

- T2 Nano-functionalized cochlear implants for optimized electrode-nerve-interaction  
*Paasche, Chichkov, Lenarz*
- T3 Design, safe machining and performance of load bearing resorbable large fragment screws made of magnesium  
*Denkena, Windhagen*





# Participating Institutions

## Hannover Medical School (MHH)

- o Department of Otolaryngology (HNO)
  - Consolidated Institute for Audio- Neurotechnology and Nanobiomaterials (VIANNA)
- o Department of Orthopedics, Annastift
  - Laboratory for Biomechanics and Biomaterials (LBB)
- o Department of Cardiothoracic, Transplantation and Vascular Surgery (HTTG)
  - Leibniz Research Laboratories for Biotechnology and Artificial Organs (LEBAO)
- o Department of Trauma Surgery (UCH)
- o Department of Prosthetic Dentistry and Biomedical Materials Science (ZPR)
- o Institute for Cellular Biology in the Centre for Anatomy

## Leibniz Universität Hannover (LUH)

- o Institute of Inorganic Chemistry (ACI)
- o Institute of Production Engineering and Machine Tools (IFW)
- o Institute of Continuum Mechanics (IKM)
- o Institute of Multiphase Processes (IMP)
- o Institute of Metal Forming and Metal Forming Machine Tools (IFUM)
- o Institute of Materials Science (IW)

## University of Veterinary Medicine Hannover (TiHo)

- o Clinic for Small Animals (KKT)
- o Department of Pharmacology, Toxicology & Pharmacy (PTP)

## Helmholtz Centre for Infection Research, Braunschweig (HZI)

## Laser Zentrum Hannover e.V.

## Technische Universität Braunschweig

- o Institute of Technical Chemistry (ITC)

# Key Contacts

## Spokesman

Prof. Prof. h.c. Dr. med. Thomas Lenarz  
Professor and Chairman  
Department of Otolaryngology  
Hannover Medical School  
Tel.: +49 (0)511 532-6565  
Fax: +49 (0)511 532-5558  
E-Mail: lenarz.thomas@mh-hannover.de

## SFB 599 Office

Regina Müller  
Department of Otolaryngology  
Hannover Medical School  
Carl-Neuberg-Str. 1  
30625 Hannover  
Tel.: +49 (0)511 532-3026  
Fax: +49 (0)511 532-5558  
E-Mail: mueller.regina@mh-hannover.de

## Managing Director

Dr. rer. nat. Johannes Stein  
Department of Otolaryngology  
Hannover Medical School  
Tel.: +49 (0)511 532-9194  
Fax: +49 (0)511 532-5558  
E-Mail: stein.johannes@mh-hannover.de

Homepage: [www.sfb599.de](http://www.sfb599.de)



**The Collaborative Research Centre SFB 599 is funded by the DFG Deutsche Forschungsgemeinschaft.**

## Sign-in

Please type in block letters or send this information by e-mail.

Title: .....

Last name: .....

First name: .....

Institution: .....

Street: .....

Postal code, city:

Phone: .....

Fax: .....

E-Mail: .....

Date and signature

Kindly return this information to Regina Müller by 30 September 2011

# Arrival



## Arrival from main station

Take the underground U1 in direction of Laatzen / Sarstedt, U2 in direction of Rethen or U8 in direction of Messe/Nord until you reach the station Aegidientorplatz. From there, change to U6 (Messe Ost) until you reach the station Bünteweg / Tierärztliche Hochschule. The "TiHo Tower" is situated in front of the station, approximately 3 minute walk to Bünteweg 9.

## Arrival by car

Arrival from the north, west or east:

Follow the motorway A37 (Messeschnellweg) in southward direction and take exit Bult. Then turn left in direction Bemerode. Bünteweg is behind the railroad bridge on the left side.

Arrival from the south:

Follow the motorway A37 (Messeschnellweg) in northward direction (Celle) and take exit Bult. Then turn left in direction Bemerode. Bünteweg is behind the railroad bridge on the left side.

University of Veterinary Medicine Hannover (TiHo)  
Klinik für Kleintiere – Clinic for Small Animals  
Bünteweg 9  
30559 Hannover  
Lecture Hall „Bayer“