

BIOSURF VII

Functional Interfaces for Directing Biological Response

Zurich 2007



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Functional Interfaces for Directing Biological Response

29. - 31. August 2007

Zurich, Switzerland

Swiss Federal Institute of Technology, ETH Zurich



CCMX
Competence Centre for
Materials Science and Technology

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Introduction

Welcome Address

On behalf of the Scientific Committee and the Local Organizing Committee, it is our great pleasure to welcome you to the BIOSURF VII Conference and Workshop, the seventh in a series of international meetings devoted to the science and engineering of biologically oriented materials, surfaces and interfaces. This is also an interface between the traditional disciplines biology, chemistry and engineering, and we very much hope that the conference, as in the past meetings, will foster presentations and discussion of ideas and concepts across those traditional boundaries. Biointerface science has indeed been a very dynamically developing and particularly fertile area of transdisciplinary research in the preceding decade.

BIOSURF VII Conference with the topic "*Functional Interfaces for Directing Biological Response*" will seek to span these disciplines, presenting the state of the art in the biology, chemistry and physics of materials surfaces, biomolecules and cells at surfaces and the application of this art in biotechnology, drug delivery, biodiagnostics and medicine. Keynote speakers will introduce the session topics and provide state-of-the-art overviews, while invited speakers will provide deeper insight into functional interfaces and their relevance for biomaterials and biosensor technology and applications. Additionally, a *Poster Forum* with more than 100 posters will provide an opportunity for younger scientists to present their most recent results and achievements. We would kindly like to encourage you to visit the poster sessions and discuss with the poster presenters.

The **Pre-conference Workshop** will provide tutorial-style introductory lectures by scientists followed by plenary discussion sessions. All lectures will start with a general introduction into the specific field, covering the important scientific and technological aspects, the state of the art and problems/challenges in terms of both the underlying scientific issues as well as applications. The chosen format should enable non-specialists to follow and profit from the lectures. A further aim is the opportunity for the participants to make personal contacts to the lecturers for future interactions. The workshop, designed to be the first in a series, will address a number of topics in the areas of *biomaterials, biosensors, tissue engineering/regenerative medicine and carrier systems for targeted drug delivery*, and thus prepare the participants for the subsequent conference.

For the first time, BIOSURF Conference and Workshop will be held under the auspices of and supported by the *Materials for the Life Sciences (MatLife)* Program of the *Swiss Competence Center for Materials Science and Technology (CCMX)* and the *Materials Research Center (MRC)* of ETH Zurich. The organizers are furthermore very grateful to industrial companies and research organizations for their generous sponsoring of Workshop and Conference, which allowed us to keep the registration fees (particularly for students) at a low level.

On behalf of the
Scientific Committee



Marcus Textor

On behalf of the
Local Organizing Committee



Samuele Tosatti

Conference Program

1st Day - Wednesday August 29th

(Uni Zurich, Aula, KOL G201)

Cellular Response to Designed Surfaces

Chaired by	Viola Vogel, ETH Zurich	
13:00	Welcome address by Marcus Textor	
13:10	Welcome address and Introduction to MRC, CCMX, and ETH Department of Materials by Nicholas D. Spencer, Director, MRC	
13:30	Deborah Leckband	<i>University of Illinois (USA)</i>
	Chemistry of Biological Adhesion	
14:15	Benoit Ladoux	<i>Université Paris 7 (FR)</i>
	Rigidity Sensing in Cell Migration using Microfabricated Substrates	
14:50	Matthias Lütolf	<i>EPF Lausanne (CH)</i>
	Engineering Artificial Stem Cell Niches via Novel Hydrogel Microwell Arrays	
15:10	Coffee Break	
Chaired by	Nicholas D. Spencer, ETH Zurich	
15:40	Dominique Pioletti	<i>EPF Lausanne (CH)</i>
	Biocomposite Scaffolds as Biomimetic Environment for Fetal Cell Growth	
16:15	Daniel A. Hammer	<i>University of Pennsylvania (USA)</i>
	Traction Force Microscopy of Cell Motility and Cell Assembly on Hydrogels	
16:50	Stefan Zauscher	<i>Duke University (USA)</i>
	Mechanisms of Boundary-Lubrication of Articular Cartilage Surfaces: A Molecular View	
17:15-18:45	Poster Session (Uni Zurich Lichthof, KOL D floor) Welcome Aperó offered by JPK Instruments	

2nd Day - Thursday August 30th
(Uni Zurich, Aula, KOL G201)

Novel Sensing Platforms & Nanobiotechnology

<i>Chaired by</i>	<i>Erik Reimhult, ETH Zurich</i>	
08:30	Bengt Kasemo	<i>Chalmers University of Technology (SE)</i>
	Supported Lipid Structures - Basic Aspects and Applications	
09:15	Horst Vogel	<i>EPF Lausanne (CH)</i>
	Monitoring Cellular Proteins at Work	
09:50	Milan Mrksich	<i>University of Chicago (USA)</i>
	Label-Free Detection of Protein-Protein Interactions on Biochips	
10:25	Coffee Break	

<i>Chaired by</i>	<i>Janos Vörös, ETH Zurich</i>	
10:55	Marcela Bilek	<i>University of Sydney (Au)</i>
	Plasma Surface Treatment Process for Linker-free, Covalent Attachment of Proteins to Polymeric Surfaces	
11:30	Markus Ehrat	<i>Zeptosens- Division of Bayer AG (CH)</i>
	Protein Microarrays to Elucidate Drug Effects on Cellular Signaling Events	
11:50	Solomzi Makohliso	<i>Ayanda Biosystems S.A. (CH)</i>
	A Novel Biosensor Platform for Clinical Diagnostics Based on a Synthetic Ligand-gated Ion Channel (SLIC)	
12:15-13:30	Poster Session (Uni Zurich, Lichthof, KOL, D Floor) Lunch offered by Roche AG	

<i>Chaired by</i>	<i>Stefan Zauscher, Duke University (USA)</i>	
13:30	David W. Grainger	<i>University of Utah (USA)</i>
	DNA Microarray Assays: What does Fluorescent Signal Mean?	
13:50	Stéphanie Pasche	<i>CSEM (CH)</i>
	Wearable Biosensors for Health Monitoring	
14:10	Coffee Break	

Functional Tissue Engineering & Regenerative Medicine

<i>Chaired by</i>	<i>David W. Grainger, University of Utah (USA)</i>	
14:40	Janos Vörös	<i>ETH Zurich (CH)</i>
	Tailoring the Adsorption of Biomolecules and the Behavior of Cells by Electric Potentials	

15:25	Simon Hoerstrup	<i>University Hospital Zurich (CH)</i>
	Stem Cells for Cardiovascular Regenerative Medicine	
16:00	Ivan Martin	<i>University Hospital Basel (CH)</i>
	Bioreactors for Controlled Cell Culture Within 3D Porous Scaffolds	
16:35	Barbara D. Boyan	<i>Georgia Institute of Technology (USA)</i>
	Basic Mechanisms Mediating Cell Response to Surface Microstructure and Surface Energy	

3rd Day - Friday August 31st
(Uni Zurich, Aula, KOL G201)

Drug Delivery, Carriers & Drug Eluting Materials

<i>Chaired by</i>	<i>Horst Vogel, EPF Lausanne</i>	
08:30	Jeffrey A. Hubbell	<i>EPF Lausanne (CH)</i>
	Functional and Immunofunctional Nanoparticles	
09:15	Kazunari Akiyoshi	<i>Tokyo Medical and Dental University (J)</i>
	Nanogel-based Materials for Drug Delivery System	
09:50	Bruno Gander	<i>ETH Zurich (CH)</i>
	Strategies for Controlling and Enhancing the Immune Response Against Encapsulated Antigens by Surface Modifications of Particulate Delivery Systems	
10:25	Coffee Break offered by LOT Oriel	

Cellular Response to Gradient Surfaces

<i>Chaired by</i>	<i>Géraldine Coullerez, ETH Zurich</i>	
10:55	Nicholas D. Spencer	<i>ETH Zurich (CH)</i>
	Surface-Chemical and -Morphological Gradients for Life-Science Applications	
11:30	Jan Genzer	<i>North Carolina State University (CH)</i>
	Combinatorial Polymer Brushes as a Novel Platform for Studying Partitioning of Biomolecules on Man-Made Surfaces	
12:15-13:00	Lunch (Mensa, University)	
13:00-13:30	Poster session (Uni Zurich, Lichthof, KOL, D floor)	

Anti-Microbial/Anti-Inflammatory Surfaces

<i>Chaired by</i>	<i>John W. Haycock, University of Sheffield (UK)</i>	
13:30	Henk Busscher	<i>University Medical Center Groningen (NL)</i>
	Mechanisms of and Means to Prevent Microbial Adhesion and Biofilm Formation on Surfaces	
14:05	Martin Malmsten	<i>Uppsala University (SE)</i>
	Biophysical Aspects of Proteolytically Derived Antimicrobial Peptides	
14:40	Regine Landmann	<i>University Hospital Basel (CH)</i>
	Susceptibility of Titanium and Stainless Steel Implants to Staphylococcal Infection with Biofilm in a Mouse Tissue Cage Model	

15:00	Dawn Balazs	<i>EMPA St. Gallen (CH)</i>
	Multi-functional Nanocomposite Plasma Coatings for Biomaterials	
15:20	Closing Remarks	
15:30	Farewell Aperero	

General Information & Maps

Location & Contact

Conference Location University of Zurich
 KOL G201
 Rämistrasse 71
 8006 Zurich
 Switzerland

Local Conference Office:

ETH Zurich, Oberflächentechnik
Mrs. Esther Stähli / Ms. Josephine Baer
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Directions

To ETH Zurich, HG D 5.2 (Rämistrasse 101)

By tram:

Line 6 (from "Central") or line 10 (from "Hauptbahnhof") to "ETH / Universitätsspital"

To University of Zurich, KOL G 201 (Rämistrasse 71)

By tram:

Line 6 (from "Central") or line 10 (from "Hauptbahnhof") to "ETH / Universitätsspital", short walk along Rämistrasse

From the airport:

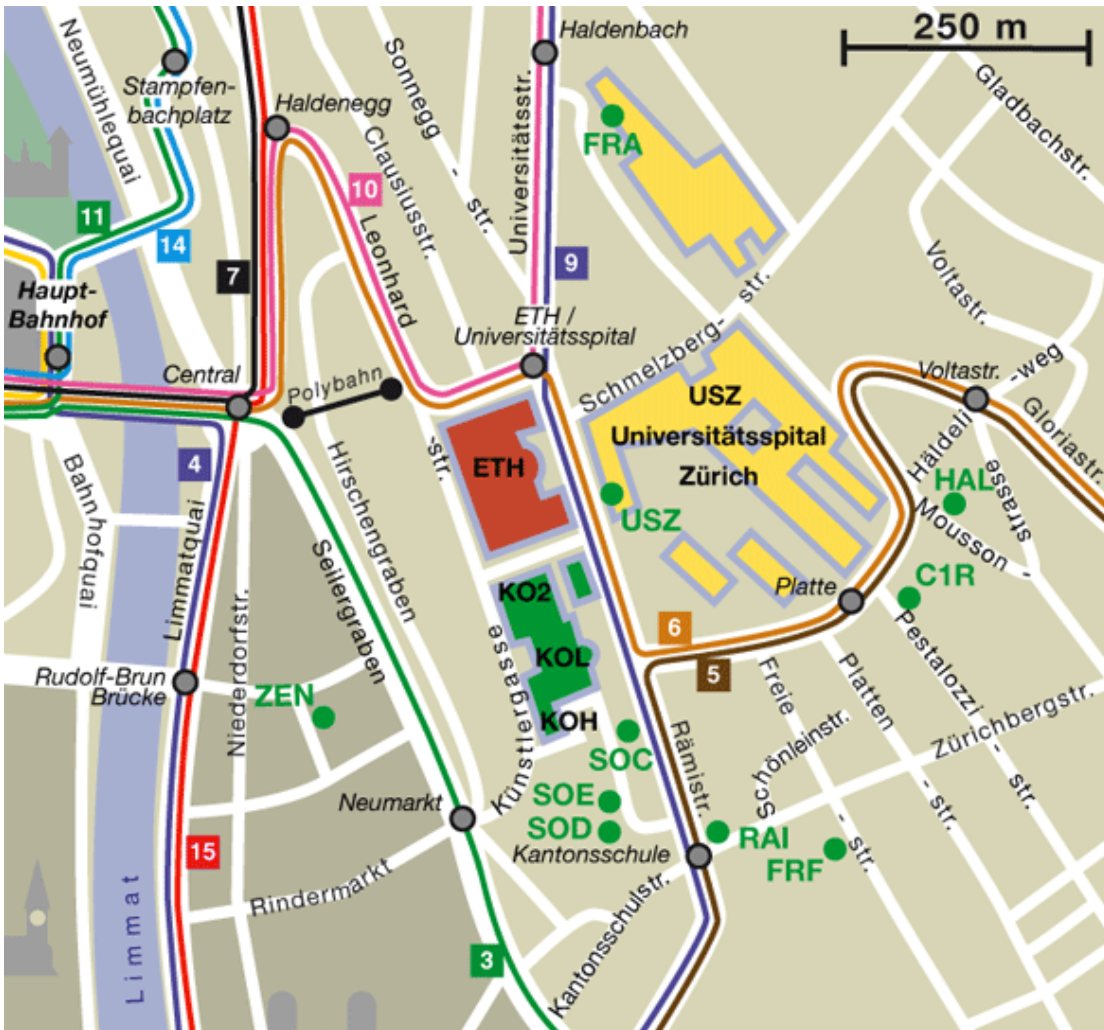
Trains S2/S16/S14/Inter Regio to "Hauptbahnhof", then see tram instructions above

There are direct trains from the airport to Zurich Main Railway Station ("Hauptbahnhof") every 15 minutes.

For more information and timetable, please check:

<http://www.sbb.ch/en/index.htm>

Maps



For more information, please visit:

<http://www.plaene.unizh.ch/index.html>

http://www.ethz.ch/about/location/zentrum/index_EN



KOL / KO2

KO2

Hörsaalbereich

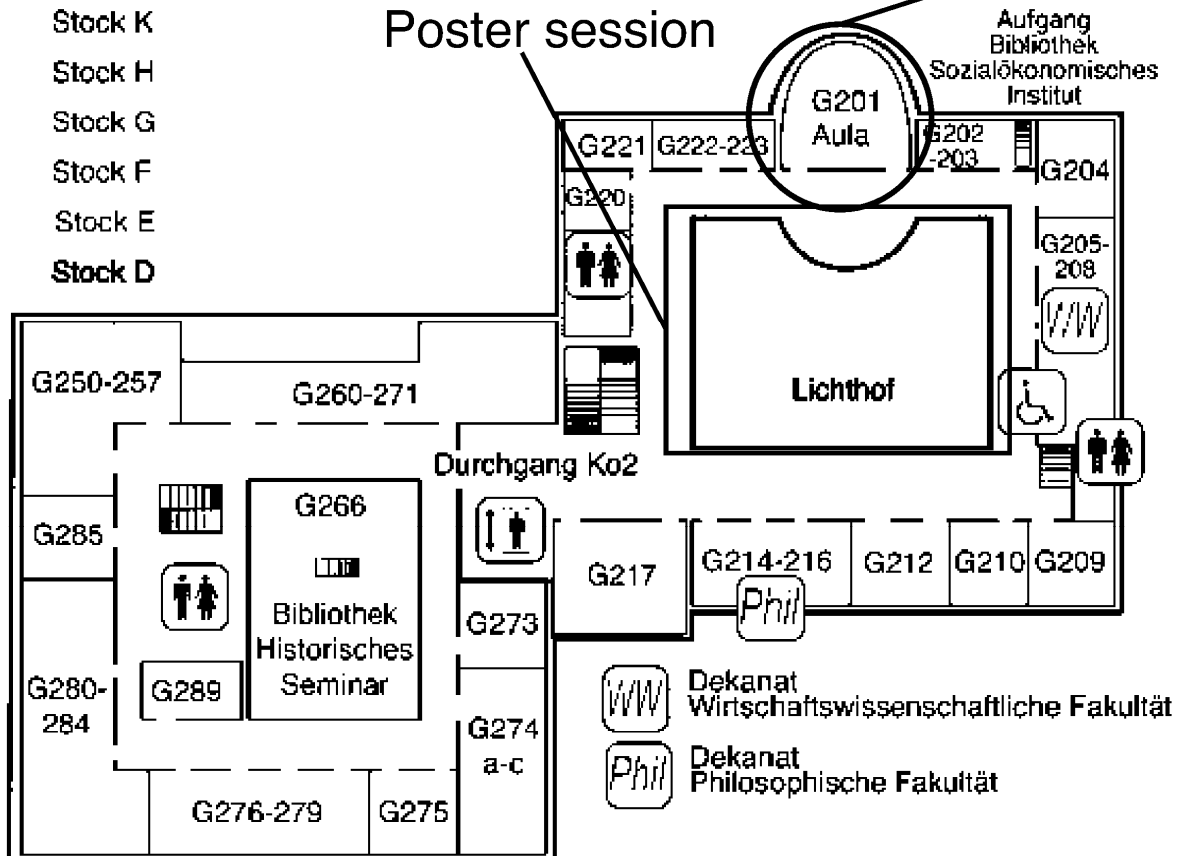
KOL

- Stock N
- Stock M
- Stock L
- Stock K
- Stock H
- Stock G
- Stock F
- Stock E
- Stock D**

Conference

Stockwerk G

Poster session



Meeting at a Glance

Wednesday August 29 th		Thursday August 30 th		Friday August 31 st	
	WORKSHOP	07:30-08:30	Registration	07:30-08:30	Registration
		08:30-09:15	Kasemo	08:30-09:15	Hubbell
		09:15-09:50	Vogel	09:15-09:50	Akiyoshi
		09:50-10:25	Mrksich	09:50-10:25	Gander
		10:25-10:55	Coffee Break	10:25-10:55	Coffee Break
		10:55-11:30	Bilek	10:55-11:30	Spencer
		11:30-11:50	Ehrat	11:30-12:05	Genzer
		11:50-12:10	Makohliso		
11:00-13:00	Registration	12:15-13:00	Lunch	12:15-13:00	Lunch
13:00-13:10	Welcome	13:00-13:30	Poster session	13:00-13:30	Poster session
13:10-13:30	Opening Talk				
13:30-14:15	Leckband	13:30-13:50	Grainger	13:30-14:05	Busscher
14:15-14:50	Ladoux	13:50-14:10	Pasche	14:05-14:40	Malmsten
14:50-15:10	Lütolf	14:10-14:40	Coffee Break	14:40-15:00	Landmann
15:10-15:40	Coffee Break	14:40-15:25	Vörös	15:00-15:20	Balazs
15:40-16:15	Pioletti	15:25-16:00	Hoerstrup	15:20- 15:30	Closing
16:15-16:50	Hammer	16:00-16:35	Martin	15:30-16:00	Farewell Apero
16:50-17:10	Zauscher	16:35-17:10	Boyan		
17:15-18:45	Poster session & Welcome Apero				
	Keynote Lecture	19:00-21:00	Dinner		
	Invited Lecture				
	Young Scientist and Industry				

35 min + 10 min discussion
 25 min + 10 min discussion
 15 min + 5 min discussion