



THE UNIVERSITY OF TOKYO

Freie Universität



Berlin



# Trilateral Symposium on NanoBio Integration



September 30 - October 3, 2010  
Freie Universität Berlin

CONFERENCE BOOKLET

# Participating Institutions and Centers



*MATERIALS RESEARCH SCIENCE &  
ENGINEERING CENTER*



**Poly 4 Bio**  
Polmeric Materials for  
Biomedical Application



The Berlin-Brandenburg area has many excellent and interdisciplinary working research groups in the areas of biomaterial development, design of stimuli-responsive polymers, development of nanoscale architectures for drug-delivery and regenerative therapies. Scientists from the Charité Universitätsmedizin Berlin, the Freie Universität Berlin, the research institutions GKSS Center for Biomaterial Development, and the Max-Planck Institute of Colloids and Interfaces are closely working together in joint projects. Centers like the Berlin-Brandenburg Center for Regenerative Therapies and focus areas like Nanoscale Functional Materials were established between the partners.

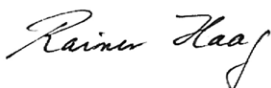
International clusters of excellence in the field of biomaterial development, bio-nano integration, and regenerative therapies exist at the Harvard University, The University of Tokyo and the Freie Universität Berlin with its partner institutions. Internationally visible scientists are working in centers like the WYSS Institute in Harvard and the Center for NanoBio Integration in Tokyo as well as in the Center for Nanoscale Functional Materials in Berlin.

The scope of this Trilateral Symposium is to identify areas of common interests, where the expertise of the different partners are complementary in that way, that complex research goals can be accomplished in a transnational collaboration. Some ideas for joined projects are:

- Exchange of individual scientists funded by the respective centers or national institutions (e.g., DFG, NSF, JSPS)
- International graduate schools to achieve a PhD education with interdisciplinary backgrounds
- Joint Research Labs for long term exchange of scientists and to a better visibility
- Establishment of Transnational Clusters of Excellence as a long term goal

With this brainstorming ideas in mind I am looking forward to an inspiring meeting and fruitful discussions.

I welcome you sincerely to the exciting city of Berlin and to the Freie Universität Berlin.



Rainer Haag  
Freie Universität Berlin

## SEPTEMBER 30, 2010 (THURS.)

Arrival and check in at Seminaris CampusHotel

18.30 Welcome Dinner (Seminaris)

## OCTOBER 1, 2010 (FRI.)

8.30 Registration

8.40 Welcome Address and Objectives of the Symposium  
*Rainer Haag (FU Berlin)*

8.50 Address by the Director of the  
Center for Cluster Development  
*Carsten Dreher (FU Berlin)*

9.00 **Session 1: Center Presentations**  
*Chairperson: Rainer Haag (FU Berlin)*

- Nanobio Integration for Medical Innovation:  
Challenge to Smart Molecular Therapy  
*Kazunori Kataoka (CNBI, Univ. Tokyo)*
- Wyss Institute for Biologically Inspired Engineering:  
A New Paradigm for Technology Innovation  
*Don Ingber (WYSS, Harvard)*
- Nanoscale Functional Materials  
*Stefanie Reich (Nanoscale, FU Berlin)*

Q&A panel and discussion (15 min)

10.15 Coffee break

10.40 **Session 2: Bioinspired Materials**  
*Chairperson: Don Ingber (Harvard, WYSS)*

- Adaptive Bioinspired Materials  
*Joanna Aizenberg (Harvard, WYSS)*
- Unravelling the Materials Basis of Plant Actuation  
*Peter Fratzl (MPI KG)*

- Multivalent Interactions with new Dimensions  
*Rainer Haag (FU Berlin)*
- Evaluation of Network Structure and Physical Properties of Tetra-PEG Gel  
*Takamasa Sakai (Univ. Tokyo)*

Q&A panel and discussion with focus on joint activities and perspectives (30 min)

12.30 Lunch at Seminaris

14.00 **Session 3: Biomaterials and new Formulations in Biomedical Applications**

*Chairperson: Kazunori Kataoka (Univ. Tokyo)*

- Formulation of New Soft Nanomaterials  
*David Weitz (Harvard)*
- Designing (Multi)functional Polymer Networks and Exploring their Application Potential for Regenerative Therapies  
*Andreas Lendlein (GKSS)*
- Nanostructured Phospholipid Polymer Brush as Biointerfaces  
*Kazuhiko Ishihara (Univ. Tokyo)*
- Regenerative Therapies for Musculoskeletal Diseases  
*Georg Duda (Charité)*

Q&A panel and discussion with focus on joint activities and perspectives (30 min)

15.50 **Young Investigator Presentations** (7 x 10 min, incl. short Q&A)

17.00 Coffee break and FU Berlin lab visits (chemistry / biochemistry / physics labs)

19:00 Dinner at Alter Krug

## OCTOBER 2, 2010 (SAT.)

### 8.40 **Session 4: Nanomachines and Single Proteins on Surfaces**

*Chairperson: Stefanie Reich (FU Berlin)*

- Programmed Molecular Assembly for Tailored Functional Materials  
*Takuzo Aida (Univ. Tokyo)*
- Single Molecules in Nanostructures  
*Adam Cohen (Harvard)*
- Effect of Membrane Potential on the Photo-Cycle of Sensory Rhodopsin  
*Kenichi Ataka (FU Berlin)*
- Single-Molecule Analyses of Functions and Interactions of Biomolecules by Nano- and Microdevices  
*Takashi Funatsu (Univ. Tokyo)*

Q&A panel and discussion with focus on joint activities and perspectives (30 min)

10.30 Group Picture

10.40 Coffee break

### 11.00 **Session 5: Nanobiomaterials for Delivery**

*Chairperson: Andreas Lendlein (GKSS Teltow / FU Berlin)*

- Biocompatible Polyplex Nanomicelle for Safe and Effective Gene Transfer  
*Keiji Itaka (Univ. Tokyo)*
- Carrier-mediated metal-ion transport and bioavailability  
*Gerd Multhaup (FU Berlin)*
- Engineering Vascular Networks  
*Eduardo A. Silva (Harvard)*

Q&A panel and discussion with focus on joint activities and perspectives (30 min)

12.30 Lunch at Seminaris

- 14.00 **Young Investigator Presentations** (12 x 10 min, incl. short Q&A)
- 16.00 Coffee and Round Table Discussion (room 12.12)
- Return to hotel
- 18.00 Pick up at hotel for sightseeing in the city of Berlin
- 20.00 Dinner at Historische Weinstube

### **OCTOBER 3, 2010 (SUN.)**

- 09.00 Brainstorming brunch (Seminaris)
- 11.00 Visit to Potsdam Palace and Sanssoucis
- 15.00 Opening of the POLYDAYS 2010 Symposium  
(Henry Ford Building, Gary Str. 35, 14195 Berlin,  
FU Campus)

### **LOCATION**

The Trilateral Symposium will be held at the Institut für Chemie und Biochemie, FU Berlin, Takustr. 3, 14195 Berlin, in the main lecture hall and the seminar room 12.12. The Brainstorming Brunch on Sun. Oct. 3, 2010 will be at Seminaris, Takustr. 39, 14195 Berlin. For a map see back cover.

## OCTOBER 1, 2010 (FRI.), 15.50 - 17.00

- The Relationship Between Network Structure and Mechanical Properties in Stiff Biopolymer Networks  
*Louise Jawerth (Harvard / Weitz Group)*
- Glycerol-based Polymers for Biocompatible Surfaces  
*Marie Weinhart (FU Berlin / Haag Group)*
- Evaluation of Topological and Connective Defects in Tetra-PEG Gel  
*Yuki Akagi (Univ. Tokyo / Chung Group)*
- Dynamic Pattern Formation of Hydrogel-actuated Polymer Microstructures in Fluid upon pH Change  
*Lauren Zarzar (Harvard / Aizenberg Group)*
- Degradable Shape-Memory Polymers  
*Marc Behl (GKSS / Lendlein Group)*
- A Human Breathing Lung-on-a-Chip  
*Dan Huh (Harvard / Ingber Group)*
- A New Class of Polyglycerol-Based Amphiphiles for Tailoring the Properties of Carbon Nanotubes  
*Antonio Setaro (FU Berlin / Reich Group)*

## OCTOBER 2, 2010 (SAT.), 14.00 - 16.00

- Droplet-Based High-throughput Biology: Sequencing, Screening and the Directed Evolution of Novel Organisms  
*Adam Abate (Harvard / Weitz Group)*
- Design of Artificial Photosynthetic Gels Involving an Electronic Transmission Circuit  
*Kosuke Okeyoshi (Univ. Tokyo / Yoshida Group)*
- Trapping Single Molecules at the One-Nanometer Limit  
*Alex Fields (Harvard / Cohen Group)*
- Spontaneous Formation of Nano-sized Polyion Complex Polymersomes (PICsomes) and Their Properties  
*Yasutaka Anraku (Univ. Tokyo / Kataoka Group)*



- Nanoparticle-Targeting to Ischemic Tissue for Imaging and Therapeutic Angiogenesis  
*Kim Jaeyun (Harvard / Mooney Group)*
- Smart Nanostructured Materials Made of Polymer Nanofibers and Carbon Nanotubes for Neural Implant Applications  
*Izabela Firkowska (FU Berlin / Reich Group)*
- Bionanotubular Machines from Molecular Chaperones: A New Paradigm for ATP-Responsive Protein Delivery  
*Shuvendu Biswas (Univ. Tokyo / Aida Group)*
- Intracellular Protein Delivery with Dendritic Molecular Glue  
*Kou Okuro (Univ. Tokyo / Aida Group)*
- Multifunctional Dendritic Polyglycerol Architectures for Drug and Dye Delivery  
*Marcelo Calderon (FU Berlin / Haag Group)*
- Combination of Chondroitin Sulfate and Polycation-based Gene Carriers for Alleviation of Membrane Damage  
*Satoshi Uchida (Univ. Tokyo / Kataoka Group)*
- High Resolution Detection of Single Nanoparticles in Human Skin and Single Cells by X-ray Microscopy  
*Christina Graf (FU Berlin / Rühl Group)*
- Nanocarrier and Tissue Engineering - New Treatment Options for Severe Skin Diseases  
*Sarah Küchler (FU Berlin / Schäfer-Korting Group)*

### FREIE UNIVERSITÄT BERLIN

**Freie Universität Berlin** was established in 1948 and is located in the residential garden district of Dahlem in southwestern Berlin. Freie Universität Berlin is a leading research institution. It is one of nine German universities that has been successful in obtaining all three funding lines in the federal and state Excellence Initiative, thereby receiving additional funding for its institutional future development strategy. Freie Universität can thus take its place as an “international network university” in the global competition among universities. Its future development strategy is focused around three strategic centers: for cluster development, international cooperation, and graduate studies. Research projects are being developed and assessed within five major focus areas – Area Studies, Humanities, Nanoscale Functional Materials, Plant Sciences, and Urban Earth Studies. Charité University Medicine Berlin, a joint corporation of Freie Universität and Humboldt-Universität, is the largest medical school in Europe.

Currently, Freie Universität has over 130 partnerships with scholarly institutions worldwide. About 600 foreign scholars contribute to the diversity in research and teaching. Of its approximately 32,000 students in over 100 subject areas, 16 percent come from abroad.

The Focus Area **Functional Materials at the Nanoscale** (Nanoscale) focuses on advanced interdisciplinary research on materials properties of nanoscale systems. The systems we are interested in range from nanotubes and nanoparticles over macromolecules to peptides and proteins.

The **Center for Supramolecular Interactions** (CSI) focuses on noncovalent intermolecular interactions and the design of new clinical therapies and molecular devices.

The Freie Universität Berlin is the speaker university of the **Collaborative Research Center (SFB) 765**, with its research of “Multivalency as chemical organisation and action principle: New architectures, functions and applications”. Both, life and materials science benefit greatly from a comprehensive understanding of multivalent interactions.

[www.fu-berlin.de/en/index.html](http://www.fu-berlin.de/en/index.html)

[www.nanoscale.fu-berlin.de](http://www.nanoscale.fu-berlin.de)

[www.fu-berlin.de/sites/en/csi/index.html](http://www.fu-berlin.de/sites/en/csi/index.html)

[www.sfb765.de](http://www.sfb765.de)

### HARVARD UNIVERSITY

**Harvard University** was established in 1636 and consists of 2,100 faculty members and more than 10,000 academic appointments in affiliated teaching hospitals as well as 20,000 students (incl. about 13,600 graduate and professional students). Harvard University is made up of 11 principal academic units, ten faculties, and the Radcliffe Institute for Advanced Study.

The **School of Engineering and Applied Sciences, SEAS**, serves as the connector and integrator of Harvard's teaching and research efforts in engineering, applied sciences, and technology. It is closely linked with a variety of multidisciplinary and innovative research institutes, centers, and initiatives.

The University is part of an integrated partnership called the National Nanotechnology Infrastructure Network (NNIN), comprised of thirteen user facilities, led by Cornell and Stanford, that provides opportunities for nanoscience and nanotechnology research.

- BASF Advanced Research Initiative at Harvard University
- Center for Microfluidic and Plasmonic Systems
- Center for Research in Computation and Society
- Initiative in Innovation Computing (archive)
- Kavli Institute for Bionano Science and Technology at Harvard University
- Materials Research Science and Engineering Center
- Nanoscale Science and Engineering Center
- The Rowland Institute
- Center for Nanoscale Systems
- Harvard Catalyst
- Harvard University Center for the Environment
- Institute for Quantum Science and Engineering
- The Microbial Sciences Initiative
- Wyss Institute for Biologically Inspired Engineering at Harvard University

[www.harvard.edu/index.php](http://www.harvard.edu/index.php)

[www.seas.harvard.edu](http://www.seas.harvard.edu)

### THE UNIVERSITY OF TOKYO

**The University of Tokyo** was established in 1877 as the first national university in Japan. As a leading research university, the University of Tokyo offers courses in essentially all academic disciplines at both undergraduate and graduate levels and conducts research across the full spectrum of academic activity. The University of Tokyo has a faculty of over 4,000 and a total enrollment of about 29,000, evenly divided between undergraduate and graduate students.

The **Center for NanoBio Integration**, CNBI, researches the structures and functions of the body on a nanoscale and contributes to the development of nanomachines and devices in which bio-inspired structures and functions are incorporated. It establishes the intellectual foundation and the interdisciplinary scientific technological system which explores and reveals the nature of bio-functions on a nanoscale based on nanotechnology and materials technology. It promotes the construction of an innovative “nano-medical” system based on nano-level spatiotemporal bioregulation. Three subthemes related to important nanobio functions are creation of bioinspired nanomachines, an accurate spatiotemporal control-type biosensing system, and nanotechnology and materials technology for nanoscale cell therapy.

[www.u-tokyo.ac.jp/index\\_e.html](http://www.u-tokyo.ac.jp/index_e.html)

<http://park.itc.u-tokyo.ac.jp/CNBI/e/index.html>

### **BERLIN-BRANDENBURG CENTER FOR REGENERATIVE THERAPIES**

Within the Charité Universitätsmedizin Berlin the **Berlin-Brandenburg Center for Regenerative Therapies**, BCRT, is implemented as an independent, interdisciplinary research center pooling national and international expertise for the development of new regenerative therapies for clinical application. It consists of a strategic alliance between Charité Universitätsmedizin Berlin and the Helmholtz Association of German Research Centers, represented by Max-Delbrück-Center, Berlin-Buch and GKSS, Center of Biomaterial Development in Teltow.

The BCRT has a highly interactive research program based on a consortium of internationally acknowledged experts in both basic and clinical science. The program comprises work in three medical research fields linked to overlapping platforms on basic, bioengineering, and translational research. The Center of excellence has a particular emphasis on research and clinical programs related to musculoskeletal and immunological applications as well as regenerative therapies for the cardiovascular system. One Focus is the endogenous regeneration through the application of cells, biological factors, and biomaterials.

<http://bcrt.charite.de>

### **CENTER FOR BIOMATERIAL DEVELOPMENT OF THE HELMHOLTZ SOCIETY**

The research at the **GKSS Center of Biomaterial Development** in Teltow is focused on the development of innovative, polymer-based biomaterials for medical applications. The spectrum of the product developments extends from different types of plastics that can be used in regenerative medicine and in the field of tissue engineering to active implants for minimally invasive surgery, adsorber materials for filter systems, apheresis or other detoxification processes for use on bodily fluids outside the body, and intelligent drug delivery systems for the pharmaceutical industry.

The Research of the Center for Biomaterial Development is split into the following departments: Active Polymers, Interface, Polymer Technology, Biomimetic Materials, Biocompatibility, BCRT / Biointerface Engineering and Polymerphysics.

[www.gkss.de/institute/polymer\\_research/structure/teltow/index.html.en](http://www.gkss.de/institute/polymer_research/structure/teltow/index.html.en)

### MAX PLANCK INSTITUTE OF COLLOIDS AND INTERFACES

The **Max Planck Institute of Colloids and Interfaces**, MPI-CI, was established in 1992. Research in Colloid and Interface Science is covered by the following Departments: Biomaterials, Biomolecular Systems, Colloid Chemistry, Interfaces as well as Theory and Bio-Systems. Current research topics are polymeric films, membranes, microcapsules, organic and inorganic nanostructures, biomineralization, nano- and microreactors, molecular motors and filaments as well as chemistry and biology of carbohydrates. Biomimetic research is at the core of the Institute's activity. A common goal is to learn from nature how to build hierarchical materials or active systems with new functionalities with adaptive, self-healing, and self-assembling properties.

The Department of Biomaterials focuses on interdisciplinary research in the field of biological and biomimetic materials. Research groups deal with "understanding" the mechanical properties of biological materials and their adaptation to external stimuli, as well as with more applied topics, relating to the development of new materials, on the one hand, and to medical problems in bone research, on the other. One group is dedicated to the development of a new micro-focus beamline for scanning x-ray scattering applications at the „BESSY synchrotron“ in Berlin.

[www.mpikg.mpg.de/english/cont\\_issues/news/index.html](http://www.mpikg.mpg.de/english/cont_issues/news/index.html)

### WYSS INSTITUTE FOR BIOLOGICALLY INSPIRED ENGINEERING

The **Wyss Institute Harvard**, named after Hansjörg Wyss, focuses its research and development efforts on six Enabling Technology Platforms to create and translate new bioinspired materials and devices into products. These Platforms are teams of Institute faculty, students, fellows and expert research scientists and engineers with extensive industrial experience, who develop new technologies necessary to advance bioinspired material and device development. The Institute's initial Enabling Technology Platforms are: Adaptive Architecture, Anticipatory Medical Devices, Bioinspired Robotics, Biomaterials Evolution, Biomimetic Microsystems and Programmable Nanomaterials.

<http://wyss.harvard.edu/>

### **Prof. Dr. Takuzo Aida**

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<http://macro.chem.t.u-tokyo.ac.jp>



Self-assembly of  $\pi$ -conjugated molecules; photo, bio, and supramolecular chemistry of dendrimers; soft electronic materials including liquid crystalline semiconductors; new environmentally friendly materials mostly composed of water; stimuli-responsive molecular and biomolecular machines

### **Prof. Dr. Joanna Aizenberg**



Amy Smith Berylson Professor of Materials Science; Professor of Chemistry and Chemical Biology; School of Engineering and Applied Sciences; Wyss Institute for Biologically Inspired Engineering; Harvard University

School of Engineering and Applied Sciences, 29 Oxford St, Pierce 229  
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[www.seas.harvard.edu/aizenberg\\_lab](http://www.seas.harvard.edu/aizenberg_lab)  
<http://wyss.harvard.edu/viewpage/118/joanna-aizenberg>

Biomaterials, materials science, biomimetics, self-assembly, nanofabrication, bio-optics, hybrid materials, biomineralization, control of crystallization, surface science and bio-mechanics

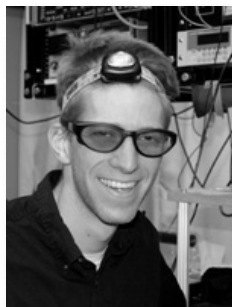
### **Prof. Dr. Ung-il Chung / Yuichi Tei**

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[www.bioeng.t.u-tokyo.ac.jp/index\\_e.html](http://www.bioeng.t.u-tokyo.ac.jp/index_e.html)  
[www.tetrapod.t.u-tokyo.ac.jp/member\\_english.html](http://www.tetrapod.t.u-tokyo.ac.jp/member_english.html)



Development of intelligent implant devices with regeneration-inducing capacity. Regenerative medicine / tissue engineering, focus on signals and scaffolds. Development of monitoring systems for cell differentiation using cell-based sensors. Development of novel manufacturing methods for scaffolds. Fabrication of intelligent biomaterials by integration with DDS.



### **Prof. Dr. Adam E. Cohen**

Assistant Professor of Chemistry and Chemical Biology and Physics  
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Depts. of Chemistry and Chemical Biology and of Physics, Harvard University  
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[www2.lsddiv.harvard.edu/labs/cohen](http://www2.lsddiv.harvard.edu/labs/cohen)

Developing and applying physical tools for studying molecules and cells

Current interests: Trapping single molecules in solution; single molecules in nanostructures; transport through hydrogels; magnetochemistry; optical chirality; optical imaging of membrane potential.



### **Univ.-Prof. Dr.-Ing. Georg N. Duda**

Julius Wolff Institute and Center for Musculoskeletal Surgery Berlin-Brandenburg Center for Regenerative Therapies, Univer Speaker SFB 760 and GSC 203  
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Biomechanical aspects of bone and soft tissue healing and regeneration, development of new methods to document healing progress in experimental and clinical settings. Goal is to achieve a broader understanding of the mechanical boundary conditions and how they drive and influence regeneration and healing of bone and other musculoskeletal tissues. In particular, the effect of physical effects on the endogenous regeneration pathway is evaluated using biomechanical, histological and molecular biological methods.



### **Prof. Dr. Peter Fratzl**

Director Max Planck Institute of Colloids and Interfaces, Potsdam  
Hon. Professor at Humboldt University Berlin and Potsdam University

MPI Colloids and Interfaces, Department of Biomaterials Research Campus Golm, 14424 Potsdam

[Fratzl@mpikg.mpg.de](mailto:Fratzl@mpikg.mpg.de)  
[www.mpihg.mpg.de/bm](http://www.mpihg.mpg.de/bm)

Bio-mimetic materials research, structure function relation in biological materials, mechanical properties and numerical modeling of composite materials, solid-state phase transformations, bone and mineral research with biomedical applications (such as bone material quality in osteoporosis treatment or materials aspects in bone regeneration)

## Prof. Dr. Takashi Funatsu

Professor of Biophysics  
Laboratory of Bioanalytical Chemistry,  
Graduate School of Pharmaceutical Sciences,  
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Single molecule biophysics, Analytical Chemistry  
Current interests: Elucidating the molecular mechanism of bio-molecular machine, such as a molecular chaperonin, single molecule imaging of processing and transport of mRNA in a living cell, development of micro/nano devices to analyze bio-molecular interactions



## Prof. Dr. Rainer Haag

Chair Professor of Organic and Macromolecular Chemistry  
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Antifouling surfaces, functional dendritic architectures, nanocarriers for drug/dye/RNA delivery, multivalent nanoparticles  
Current interests: Supramolecular self-assembly of dendritic amphiphiles and guest encapsulation understanding of multivalent interactions on a macroscopic level, water soluble dendri-perylene functionalized carbon nanotubes as supramolecular NIR light sources

## **Prof. Dr. Joachim Heberle**

Professor of Experimental Molecular Biophysics

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[www.physik.fu-berlin.de/einrichtungen/ag/ag-heberle](http://www.physik.fu-berlin.de/einrichtungen/ag/ag-heberle)



Time-resolved vibrational spectroscopy, photosensory and photosynthetic processes, membrane proteins, protein-protein and protein-lipid interactions, signal transduction, bioelectrochemistry, molecular biophysics, ion and electron transfer, respiration, surface structuring and functionalization, biosensors & bioanalytics.



## **Prof. Dr. Donald Ingber**

Professor of Bioengineering, Harvard School of Engineering and Applied Sciences; Judah Folkman Professor of Vascular Biology, Harvard Medical School and Children's Hospital Boston; Member of the Kavli Institute for Bionano Science and Technology; Founding Director, Wyss Institute for Biologically Inspired Engineering at Harvard University  
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[www.seas.harvard.edu/directory/ingber](http://www.seas.harvard.edu/directory/ingber)  
[wyss.harvard.edu/viewpage/121/donald-e-ingber](http://wyss.harvard.edu/viewpage/121/donald-e-ingber)  
[www.childrenshospital.org/research/ingber/](http://www.childrenshospital.org/research/ingber/)

Cell and tissue engineering, control of tissue morphogenesis, angiogenesis and cancer research, systems biology, and nanobiotechnology

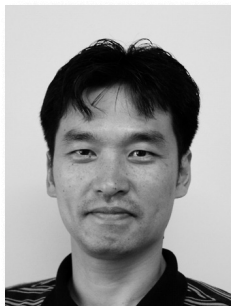
## **Prof. Dr. Kazuhiko Ishihara**

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[www.mpc.t.u-tokyo.ac.jp/eng/index.html](http://www.mpc.t.u-tokyo.ac.jp/eng/index.html)



Biomaterials and biointerfaces, bioinspired polymers and their biomedical functions, phospholipid polymers and their application for biomaterials; interaction between cell and polymer materials; polymeric membranes with permeability for proteins; stimuli-responsive polymer materials; bio-inspired polymer gels; stabilization of bioactive substances in aqueous solution with phospholipid polymer



## **Dr. Keiji Itaka**

Associate Professor of Division of Clinical  
Biotechnology,  
Center for Disease Biology and Integrative  
Medicine, Graduate School of Medicine,  
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[www.bmw.t.u-tokyo.ac.jp/english/index.html](http://www.bmw.t.u-tokyo.ac.jp/english/index.html)

DDS, Gene delivery, biomaterials, regenerative medicine, orthopedic surgery

Current interests: Biocompatible nanomicelle-type gene carrier for safe and sustained gene expression, and its applications for tissue regeneration and chronic diseases

## **Prof. Dr. Kazunori Kataoka**

Director, Center for NanoBio Integration  
Professor, Department of Materials Engineering, Grad. School of Engineering  
Professor, Center for Disease Biology and Integrative Medicine, Graduate School of Medicine,  
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Nanocarriers for drug and gene delivery, polymeric micelles and vesicles, smart polymeric materials, materials for regenerative medicine

Current interests: Development of new polymeric nanocarrier systems, especially block copolymer micelles and vesicles, for drug, gene, and oligonucleotide delivery. Plasmid DNA packaging for proper gene transfection.



## **Prof. Dr. Andreas Lendlein**

Director, Institute of Polymer Research, GKSS Research Centre Geesthacht GmbH, Teltow (Helmholtz-Society)

Member of the Board of Directors of the Berlin-Brandenburg Centre of Regenerative Therapies (BCRT), Campus Virchow Charité and member of the medical faculty of Charité, Universitätsmedizin Berlin, Full Professor, Materials in Life Sciences, Institute of Chemistry and Institute of Biochemistry and Biology, University of Potsdam, and Professor, Institute of Chemistry, Freie Universität Berlin

Institute of Polymer Research, GKSS Research Centre  
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Macromolecular chemistry, materials science, biomaterial research.  
Other fields: stimuli-sensitive polymers, shape-memory polymers, multifunctional materials, regenerative medicine

### **Prof. Dr. David J. Mooney**

Robert P. Pinkas Family Professor of Bioengineering, Harvard University  
Pierce Hall 319  
The Mooney Lab: Laboratory for Cell and Tissue Engineering

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[wyss.harvard.edu/](http://wyss.harvard.edu/)



Design of new biomaterials that regulate the gene expression of interacting cells for tissue engineering and drug delivery. Current projects focus on therapeutic angiogenesis, regeneration of musculoskeletal tissues, and cancer therapies.



### **Prof. Dr. Gerhard Multhaup**

Professor of Biochemistry  
Head of the Department of Biochemistry  
at the Free University of Berlin  
Head of the group "Biochemistry of Neurodegenerative Diseases"  
Freie Universität Berlin, Institut für Chemie und Biochemie, Thielallee 63, 14195 Berlin

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[chemie.fu-berlin.de/biochemie/agmulthaup/Prof-Multhaup.html](http://chemie.fu-berlin.de/biochemie/agmulthaup/Prof-Multhaup.html)

Biochemistry of neurodegenerative disorders

Current interests: Structural biology and functional aspects of key proteins involved in Alzheimer disease, organization and dynamics of protein-cofactor complexes and preventive, diagnostic approaches.

## **Prof. Dr. Stephanie Reich**

Department of Physics  
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Physics of nanostructures. Properties of systems with dimensions that are in the nanometer range in comparison to those of solid-state bodies, on the one hand, and molecules, on the other. Optical spectroscopy and numerical simulation with ab initio and empirical models. Assigning the atomic structure of carbon nanotubes using Raman scattering; examining physical processes such as the interactions between charge carriers or between electrons and vibrations in one-dimensional systems.



## **Prof. David Weitz**

Mallinckrodt Professor of Physics & Applied Physics  
Director, Harvard Materials Research Science & Engineering Center  
Co-director, BASF Advanced Research Initiative at Harvard  
Co-director, Harvard Kavli Institute for Bionano Science & Technology  
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Soft condensed matter physics

Current interests: Materials properties of soft matter, biophysics of biopolymer networks and cells, formulation of new structures using microfluidic techniques, biotechnology

### Dr. Kenichi Ataka

Experimental Molecular Biophysics,  
Department of Physics, Freie Universität  
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[www.physik.fu-berlin.de/einrichtungen/ag/heberle/index.html](http://www.physik.fu-berlin.de/einrichtungen/ag/heberle/index.html)

Functional study of enzymes by using surface analytical technique, Vibrational spectroscopy of solid/liquid interfaces, Electrochemistry. Current interest: time-resolved vibrational spectroscopy of membrane protein monolayer



### Dr. Takamasa Sakai

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[www.tetrapod.t.u-tokyo.ac.jp/](http://www.tetrapod.t.u-tokyo.ac.jp/)



Polymer chemistry, polymer physics  
Current interest: polymer networks formed from star polymers

### Dr. Eduardo A. Silva

Mooney Group, Harvard

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[www.seas.harvard.edu/mooneylab/members.php?name=silva](http://www.seas.harvard.edu/mooneylab/members.php?name=silva)

Multivalent material systems for treating ischemia and tissue regeneration (e.g. coronary infarct, peripheral arterial disease, wound healing and diabetes), nanoscale injectable polymeric systems, capable of recruiting progenitor and mature cells for angiogenesis





## TRAVEL INFORMATION

### Arrival by airplane

From airport Tegel (travel time is ca. 60 minutes)

- Take bus X9 or 109 (outside the main entrance of the airport building) direction Zoologischer Garten
- Get off at Jakob-Kaiser-Platz (subway station) and change to subway
- Take subway line (U-Bahn)) U7 direction Rudow. Get off at subway station Fehrbelliner Platz and change subway lines.
- Take southbound subway line U3 direction Krumme Lanke.
- Get off at Dahlem Dorf.

*By TAXI: It takes about 20 minutes and cost ca. 20 €.*

From airport Schönefeld (travel time is ca. 80 minutes)

- Take bus 171 or walk to S-Bahn (train) station Schönefeld (10 minutes walk from the arrival hall).
- Take line S9 direction Spandau.
- Get off at Treptower Park.
- Change to the circle line S41 traveling west and get off at Heidelberger Platz.
- Change to subway line U3 direction Krumme Lanke.
- Get off at station Dahlem Dorf.

*By TAXI: It takes about 30 minutes and cost ca. 40 €.*

Exit the underground station and follow the detailed plan on the back of this booklet.

### Public transportation

Berlin and the surrounding areas are divided into three fare zones (A,B and C). Tickets are available for two fare zones (AB or AC) or the entire zone (ABC) and can be used for all subway lines, S-Bahn/regional trains and buses.

An AB-ticket is valid within the Berlin city limits and Tegel Airport. A BC-ticket is valid in the areas outside of the S-Bahn circle and in the surrounding areas (Schönefeld Airport is located in zone C). One ticket cost 2,10 - 2,50 € and is valid for two hours (can be used in one general direction, change of lines permitted). There are also 4 single tickets for 8 €, group tickets or day ticket available. For further information, see: [www.bvg.de/index.php/en/index.html](http://www.bvg.de/index.php/en/index.html)

## VENUE

The symposium will take place at the

FREIE UNIVERSITÄT BERLIN  
Institut für Chemie und Biochemie  
Takustr. 3  
14195 Berlin  
[www.chemie.fu-berlin.de/fb/general\\_en.html](http://www.chemie.fu-berlin.de/fb/general_en.html)  
subway stop: Dahlem Dorf

Main lecture hall and seminar room 12.12  
are both on the ground floor.

## ACCOMMODATION

Seminaris CampusHotel  
Science & Conference Center  
Takustrasse 39, 14195 Berlin  
Tel. +49(0)30 - 557797-0  
[berlin@seminaris.de](mailto:berlin@seminaris.de)  
[www.seminaris.de/berlin](http://www.seminaris.de/berlin)  
subway stop: Dahlem Dorf

## EVENING DINNERS

Seminaris Campus Hotel  
Takustr. 39  
14195 Berlin  
subway stop: Dahlem Dorf

Alter Krug  
Königin-Luise-Straße 52  
14195 Berlin  
030-84319540  
subway stop: Dahlem Dorf

Historische Weinstuben  
Poststraße 23  
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030-2424107  
subway stop: Klosterstraße

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