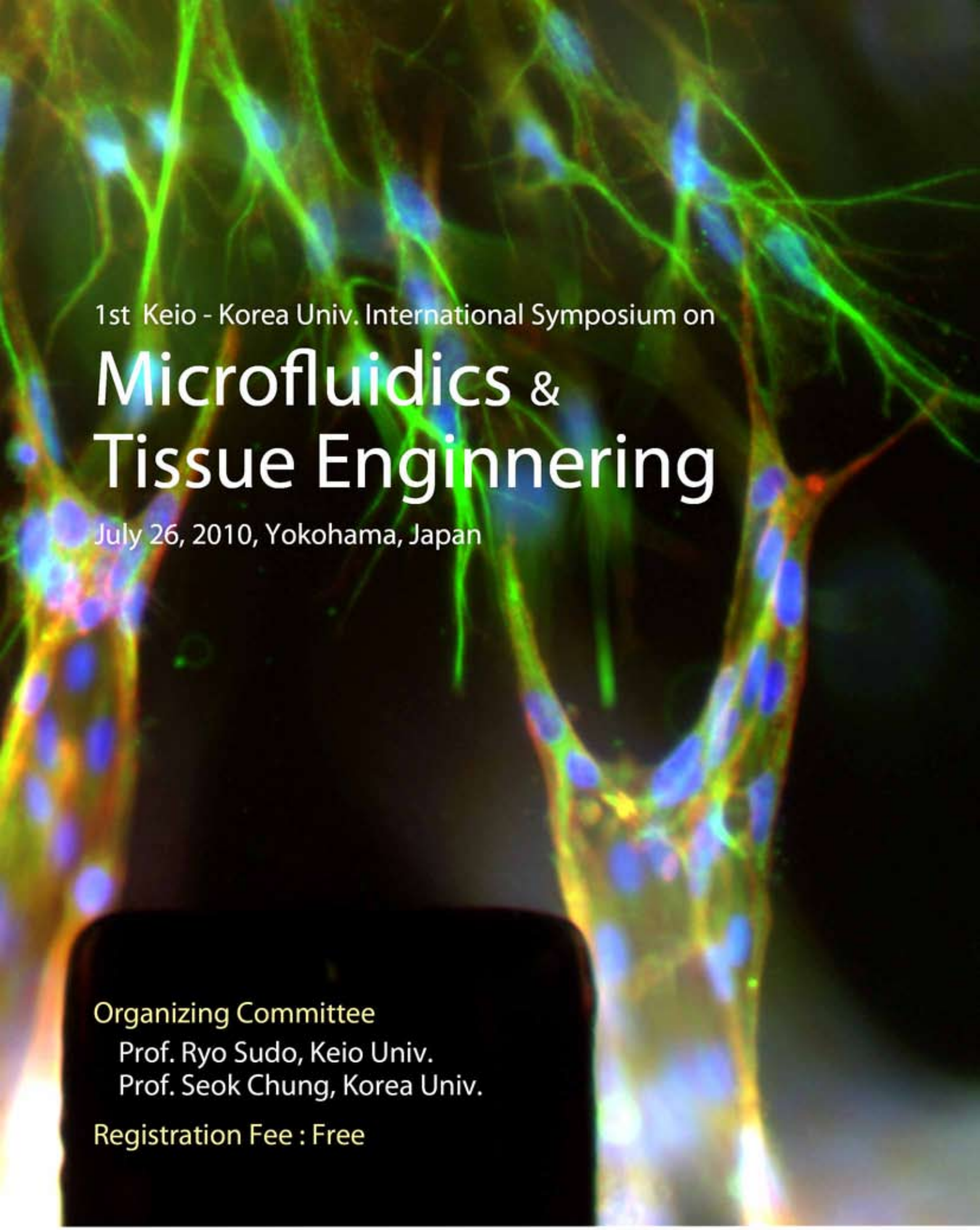


1st Keio - Korea Univ. International Symposium on

Microfluidics & Tissue Enginnering

July 26, 2010, Yokohama, Japan

Organizing Committee

Prof. Ryo Sudo, Keio Univ.
Prof. Seok Chung, Korea Univ.

Registration Fee : Free

Keio University
KEIO UNIVERSITY

KOREA UNIVERSITY

Schedule Plan

12:30~1:00pm Registration

1:00~1:05pm Opening remark

Ryo Sudo, co-chair

1:05~1:45pm Korean team leader

Seok Chung, Korea Univ.
Recent advances on hydrogel
incorporating 3D microfluidic paltform (40min)

1:45~2:25pm Japanese team leader

Ryo Sudo, Keio Univ.
Microfluidic Platform for Epithelial
Endothelial Interactions (40min)

2:25~3:15pm Invited speaker

Noo Li Jeon, Seoul Nat. Univ.
Microfluidic Platform for Capillary
Mophogenesis and Angiogenesis (50min)

3:15~3:30pm Coffee break

3:30~4:20pm Invited speaker

Roger Kamm, M.I.T
Microfluidic for cell culture: Studies
of cell populations and cell-cell
interactions (50min)

4:20~5:10pm Invited speaker

Shuichi Takayama, Univ. of Michigan
Microfluidic Models of The Body

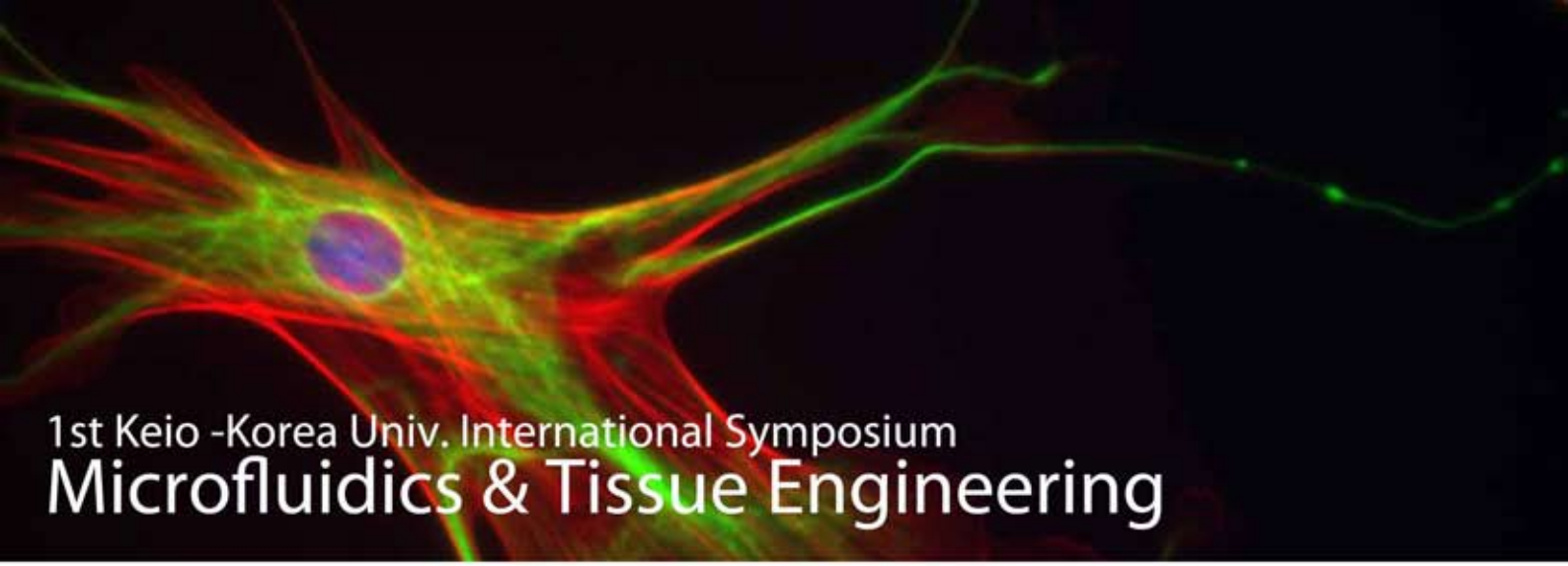
5:10~5:55pm Poster Session

5:55~6:00pm Closing Remark

Seok Chung, co-chair

Symposium Aim

This symposium aims to discuss special topics on
microfluidics and their applications for tissue engineering and cancer studies.
We want to share a common interest in the bioengineering field,
particularly for young graduate students.
This symposium is financially supported by
the Japan Science and Technology Agency (JST) and
the National Research Foundation of Korea (NRF).



1st Keio -Korea Univ. International Symposium

Microfluidics & Tissue Engineering

Organizing Committee

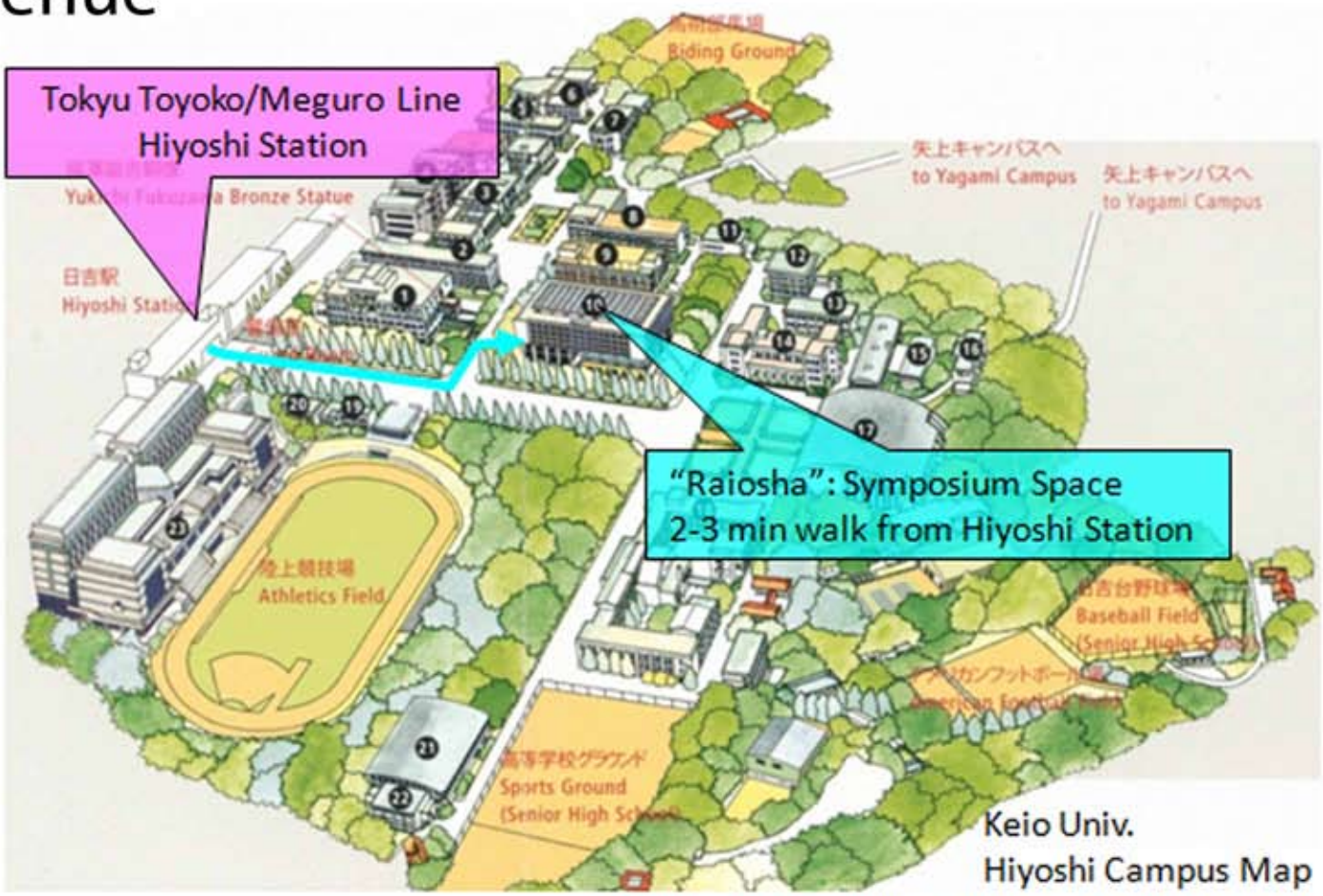
Prof. Ryo Sudo, Keio Univ.
Prof. Seok Chung, Korea Univ.

Registration Information

Please email to 'sudo@sd.keio.ac.jp' with
your name and affiliation by July 25, 2010

Registration Fee is free

Venue



Keio Univ.
Hiyoshi Campus Map

4-1-1 Hiyoshi, Kohoku-ku, Yokohama, 223-8521 JAPAN

Microfluidics for cell culture:
Studies of cell populations and cell-cell interactions

Roger Kamm

Department of Biological Engineering and Mechanical Engineering
Massachusetts Institute of Technology
USA

Abstract:
Microfluidic systems have gained rapidly in popularity for use in cell culture. They now provide the capability to control many of the critical biochemical and biophysical factors, allow for co-culture of multiple cell types, and can be imaged in real time at high resolution. These capabilities have opened the door to studies not previously possible with an in vitro system. For example, one can combine several different cell types and examine their interaction, and their response to time-dependent flows and delivery of growth factors. In this talk, several examples will be presented drawn from the following: angiogenesis, axonal guidance, liver tissue engineering, tumor cell intravasation, and stem cell differentiation.

Bio:
Roger Kamm is the Germeshausen Professor of Mechanical and Biological Engineering and former Associate Head of the Department of Mechanical Engineering at MIT. A primary objective of Kamm's research group has been the application of fundamental concepts in fluid and solid mechanics to better understand essential biological and physiological phenomena. Spanning a wide range, research in the Kamm lab has addressed issues in the respiratory, ocular and cardiovascular systems. More recently, his attention has focused on two new areas, the molecular mechanisms of cellular force sensation, and the development of new scaffold materials and microfluidic technologies for vascularized engineered tissues. Kamm has a long-standing interest in biomechanics education, and has played key roles in developing both graduate and undergraduate bioengineering programs at MIT. He is the 2010 recipient of the Lissner Award from the American Society of Mechanical Engineers, and a Fellow of the American Institute for Biomedical Engineering, the Biomedical Engineering Society, American Society of Mechanical Engineers, and the American Association for the Advancement of Science. He is the former chair of the US National Committee on Biomechanics, current chair of the World Council on Biomechanics, and Director of the Global Enterprise for Micro Mechanics and Molecular Medicine (GEM^4).

Microfluidic Models of The Body

Shuichi Takayama

Department of Biomedical Engineering and the Macromolecular Science and Engineering
University of Michigan
USA

Abstract:

The gap between the cellular microenvironment in vivo and in vitro poses challenges for obtaining physiologically relevant responses from cells used in basic biological studies or for drawing out the maximum functional potential from cells used therapeutically. One of the reasons for this gap is because the fluidic environment of mammalian cells in vivo is microscale and dynamic whereas typical in vitro cultures are macroscopic and static. This presentation will give an overview of efforts in our laboratory to develop microfluidic systems that enable spatio-temporal control of both the chemical and fluid mechanical environment of cells. The technologies and methods close the physiology gap to provide biological information otherwise difficult to obtain. Specific technological topics that will be discussed include development of computerized microfluidics, self-controlled microfluidic systems, compartmentalized microfluidic devices, and micropatterning using aqueous two-phase systems. Biological topics to be presented include application of the technologies to treat infertility, study lung disease, engineering of stem cell niches, and analysis of cell signaling.

Bio:

Shuichi Takayama is Associate Professor in the Department of Biomedical Engineering and the Macromolecular Science and Engineering Program at the University of Michigan. He is also a WCU Professor at Ulsan National Institute of Science and Technology (UNIST). He received his B.S. and M.S. from the University of Tokyo in 1994, his Ph.D. degree in chemistry and chemical biology from the Scripps Research Institute in 1998, and did postdoctoral studies at Harvard University. His research interest is in study of cells using Micro/Nanofluidics and Biomaterials & Surface Engineering. Honors include Leukemia and Lymphoma Society Fellow, The Ralph E. Powe Junior Faculty Award, The NSF Career Award, The Collegiate Inventors Competition Award, and the College of Engineering Award for Research Excellence.

Microfluidic Platform for Capillary Morphogenesis and Angiogenesis

Noo Li Jeon

School of Mechanical and Aerospace Engineering
Seoul National University
Korea

Abstract:
Capillary morphogenesis and angiogenesis are complex cellular processes that occur in response to external stimuli. Understanding their mechanism and regulating the growth process are critically important in many physiological and pathological processes such as cancer, wound healing, stem cells, and tissue engineering. However, control of 3D cellular microenvironment in terms of mechanical and biochemical factors are difficult to achieve in macroscale models. We have developed a microfluidic platform that can generate capillary morphogenesis and angiogenesis in 3D gels and allow precise spatial and temporal control over numerous instructive cues. This presentation will describe the design and some recent preliminary results obtained with the device.

Bio:

2009- Present	Seoul National University, School of Mechanical and Aerospace Engineering, Associate Professor
2007- 2009	UC Irvine, Department of Biomedical Engineering, Associate Professor
2001-2007	UC Irvine, Department of Biomedical Engineering, Assistant Professor
2000-2001	Harvard Medical School, MGH Hospital and Shriner's Hospital, Research Fellow
1997-2000	Harvard University, Chemistry Department, PostDoc
1991-1997	University of Illinois at Urbana-Champagne, Materials Science and Engineering, Ph.D.
1987-1991	Northwestern University, Materials Science and Engineering, B.S.