清華大學 医学院
TSINGHUA MEDICINE

清華大學 生物医学工程学院
School of Biomedical Engineering, Tsinghua University

Asia Pacific Biomedical Engineering Consortium 2025 Symposium

(APBEC 2025 Symposium)

Conference Manual

Tsinghua University, Beijing, China

10–11 August 2025

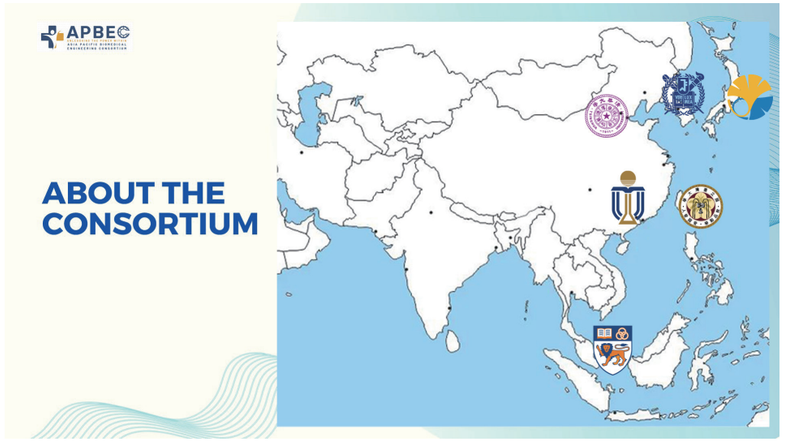
CONTENTS

01 APBEC Introduction

The Asia Pacific Biomedical Engineering Consortium is a collaborative initiative among prestigious universities in the region. The consortium aims to foster interaction and promote collaborative research and education in the field of biomedical engineering.

Drawing together the expertise and resources of Tsinghua University, Seoul National University, University of Tokyo, Taiwan University, National University of Singapore, and The Hong Kong University of Science and Technology, the consortium seeks to drive advancements in biomedical engineering that will benefit the Asia Pacific region and beyond. By fostering a multidisciplinary approach, the consortium aims to tackle complex challenges in healthcare, medical technology, and innovative solutions for improving human health and well-being.

Through joint research projects, knowledge exchange programs, and collaborative educational initiatives, the consortium will facilitate the sharing of expertise, resources, and best practices among member universities. This will enable students, faculty, and researchers to engage in cross-cultural learning experiences, leverage diverse perspectives, and develop groundbreaking solutions to address pressing healthcare needs.



02 Executive Committee

Prof. I-Ming HSING

President

The Hong Kong University of Science and Technology

Prof. Chwee Teck LIM

1st Vice-President

National University of Singapore

Prof. Madoka TAKAI

2nd Vice-President

University of Tokyo

Prof. Jinwook CHOI

Committee Members

Seoul National University

Prof. Yanan DU

Committee Members

Tsinghua University

Prof. Xiaolei SONG

Committee Members

Tsinghua University

Prof. Grace CHAO

Committee Members

Taiwan University

03 Tsinghua BME

Established in January 2024 to advance the “Healthy China” strategy and enhance Tsinghua University's medical disciplines, the School of Biomedical Engineering (BME) operates under the framework of Tsinghua's New Medicine initiative. The discipline traces its origins to 1979 within the Department of Electrical Engineering, where it successively launched its master’s program (1979), undergraduate program (1982), doctoral program (1986), and postdoctoral research station (1998).

Leveraging Tsinghua’s strengths in engineering, the discipline achieved major breakthroughs in biomedical signal processing and ultrasound imaging during the 1980s and 1990s. Significant milestones include becoming a founding department of the School of Medicine (2001), being designated a national first-tier key discipline (2002), expanding to the Shenzhen campus (2004), and integrating Academician Jing Cheng’s systems biology team (2006). The school has also established several cross-disciplinary research platforms, including the Biomedical Imaging Research Center (2010) and the Brain & Intelligence Laboratory (2017).
In 2022, the discipline was ranked as a top BME program in China's national BME evaluation. Today, the school leads pioneering research in medical imaging, neural engineering, micro/nano medicine and tissue engineering, advanced medical devices, and AI-driven medical engineering.

04 Meeting Schedule

APBEC 2025 Program

10-11 August 2025, Tsinghua University, Beijing, China

Aug.10 Sunday		
13:00-13:30	**Registration** **Venue: Vanke School of Public health Room 105**	
Opening Ceremony **Host: Yanan DU** **(Committee member of APBEC, Vice Dean of School of Biomedical Engineering, Tsinghua University)** **Venue: Vanke School of Public health Room 105**		
13:30-13:40	Welcome Remarks	Prof. Tien Yin WONG (Vice Provost, Tsinghua University, Senior Vice-Chancellor, Tsinghua Medicine, Tsinghua University)
13:40-13:45		Prof. Guangzhi Wang (Executive Dean, School of Biomedical Engineering, Tsinghua University)
APBEC Young Scholars Award 2025		
13:45-13:55	Introduction of APBEC	Prof. I-Ming HSING (President of APBEC and Chair of APBEC Selection Committee, The Hong Kong University of Science and Technology)
13:55-14:00	Present awards	Prof. I-Ming HSING (President of APBEC and Chair of APBEC Selection Committee, The Hong Kong University of Science and Technology) Prof. Guangzhi WANG/Prof. Peng LIU (Executive Dean of School of Biomedical Engineering, Tsinghua University /Secretary of the CPC Committee, School of Biomedical Engineering, Tsinghua University)
14:00-14:05	Conference Group Photograph	
Keynote Talks-1 **Chair: Chwee Teck LIM** **(Vice-President of APBEC and Chair of APBEC Selection Committee, National University of Singapore)**		
14:05-14:30	AI in Medicine Speaker: Tien Yin WONG Tsinghua University(Beijing)	
14:30-14:55	Introduction of the department of bioengineering at UTokyo Speaker: Hitoshi TABATA The University of Tokyo	
14:55-15:20	Automated, Adaptive and AI-Driven Biomanufacture of Cell and Gene Therapies Speaker: Qasim RAFIQ University College London	
15:20-15:50	**Coffee Break**	
Keynote Talks-2 **Chair: Madoka TAKAI** **(Vice-President of APBEC and Chair of APBEC Selection Committee, University of Tokyo)**		
15:50-16:15	Quantitative susceptibility mapping (QSM) and its applications in studying iron, myelin, fibrosis and calcifications Speaker: Yi WANG Cornell University	
16:15-16:40	Minimally invasive brain computer interface NEO: from bench to bed Speaker: Bo HONG Tsinghua University(Beijing)	
16:40-17:05	State of the Art in fMRI and Optogenetic Integration Speaker: Seong-Gi KIM Sungkyunkwan University	
17:05-	**Welcome Dinner at Xi Chunyuan Restaurant, Tsinghua University**	

<table>
<tr><td colspan="4">Aug.11 Monday</td></tr>
<tr><td colspan="4">Invited Talks
Venue: Medical Science Building</td></tr>
<tr><td rowspan="5">9:00-9:20
9:20-9:40
9:40-10:00
10:00-10:20</td><td colspan="2">Parallel Session 1
Venue: Medical Science Building Room B416</td><td colspan="2">Parallel Session 2
Venue: Medical Science Building Room B323</td></tr>
<tr><td rowspan="4">Theme I: Biomaterials and Tissue/Neuro Engineering

Session Chair: Grace CHAO (Committee member of APBEC, Taiwan University)</td><td>Development of a Delivery System for HGF DNA Aptamers
Speaker: Taichi ITO
The University of Tokyo</td><td rowspan="4">Theme II: AI for Biomedicine

Session Chair: Qiyuan TIAN (Tsinghua University(Beijing))</td><td>Comprehensive AI for Spine Deformity: Technologies can be Transferred to Other Specialists
Speaker: Teng ZHANG
The University of Hong Kong</td></tr>
<tr><td>Synthetic organoids for precision cancer medicine and regenerative therapy
Speaker: Shaohua MA
Tsinghua University(Beijing)</td><td>Constructing Digital Embryos and Organs Based on Spatiotemporal Omics Technology
Speaker: Peng XIE
Southeast University</td></tr>
<tr><td>Engineering Cell Spheroids and Their Decellularized ECM for Regenerative Therapies
Speaker: Chieh-Cheng HUANG
Tsing Hua University(Hsinchu)</td><td>Harnessing Large AI Models for Transforming Healthcare
Speaker: Hao CHEN
The Hong Kong University of Science and Technology</td></tr>
<tr><td>Behaviorally Reinforced Generative Spike Prediction Model: Towards the Rewiring of Disconnected Brain Areas
Speaker: Yiwen WANG
The Hong Kong University of Science and Technology</td><td>AI for human neuroimaging
Speaker: Qiyuan TIAN
Tsinghua University(Beijing)</td></tr>
<tr><td>10:20-10:50</td><td colspan="3">Poster Session
Coffee Break
Medical Science Building 2nd floor</td></tr>
</table>

10:50-11:10	**Theme I: Biomaterials and Tissue/Neuro Engineering** **Session Chair: Grace CHAO (Committee member of APBEC, Taiwan University)**	Tissue-adhesive Neuroprosthetic Devices Speaker: Donghee SON Sungkyunkwan University	**Theme IV: Bioimaging** **Session Chair:Jinwook CHOI (Committee member of APBEC, Seoul National University)**	Deep Learning Methods for Low-Dose Tau PET Enhancement Speaker: Kevin Tze-Hsiang CHEN Taiwan University
11:10-11:30		Polyelectrolyte Carriers: Protecting and Delivering Bioactive Agents for Tissue Repair Speaker: Justin J. CHUNG Seoul National University Hospital		Acoustic-assisted optical sensing in brain tissue Speaker: Keiich NAKAGAWA The University of Tokyo
11:30-11:50		Advances in Cardiovascular Nanomedicines Speaker: Hongliang HE Southeast University		The age for clinical metabolic MRI-from anatomy to cell metabolic language Speaker: Xiaolei SONG Tsinghua University(Beijing)
11:50-14:00	**Lunch at Medical Scinece Building Room B323, Tsinghua University** **Lab Tour of the School of BME, Tsinghua University (Guide: Xiaolei SONG, Xiaochuan DAI）** **Poster Session**			
	Parallel Session 1 **Medical Science Building Room B416**		**APBEC Executive Committee Meeting** **Medical Science Building Room B215**	
14:00-14:20	**Theme III: Micro/nano Medicine** **Session Chair: Xiaochuan DAI (Tsinghua University(Beijing))**	Antigen-specific immune tolerance induced by ultrasmall silica drug delivery system Speaker: Kai MA Tsinghua University(Beijing)	Proposed Agenda Items 1. Succession arrangement of the APBEC President 2. Activities for 2026	
14:20-14:40		Immune organoids as a physiologically authentic model to study human immunity Speaker: Tay Kah Ping Andy National University of Singapore		
14:40-15:00		Merging Bio-integrated Materials and Devices with Ultrasound: Opportunities in Sensing, Modulation and Actuation Speaker: Jiaqi LIU The Hong Kong University of Science and Technology		
15:00-15:20		Developing Next-Generation of Adeno-associated Viral (AAVs) Vectors for Therapeutic Gene Delivery Speaker: Bonnie Danqing ZHU The Hong Kong University of Science and Technology		

15:20-15:40	**Theme III: Micro/nano Medicine** **Session Chair: Xiaochuan DAI (Tsinghua University(Beijing))**	Decoding Physiology Through Skin Vibrations: From Skin-Interfaced to Contactless Wearables Speaker: Changsheng WU National University of Singapore	Proposed Agenda Items 1. Succession arrangement of the APBEC President 2. Activities for 2026
15:40-16:00		Wearable Skin-tone Friendly Electronic Device for Cardiovascular Monitoring Speaker: Ting-Wei WANG Tsing Hua University(Hsinchu)	
16:00-16:10	**Poster Session** **Coffee Break** **Medical Science Building 2nd floor**		
Roundtable Forum **Medical Science Building Room B416**			
16:10-16:40	Session I: AI empowered Research and Education Session Chair: Liu Peng (Tsinghua University(Beijing))/Guangzhi Wang(Tsinghua University(Beijing))		Profs. Chwee Teck LIM,I MING HSING, Grace CHAO, Jinwook CHOI, Madoka TAKAI, Qasim RAFIQ and all the Invited Speakers
16:40-17:10	Session II: How to facilitate international collaboration in this era? Session Chair:Yanan Du (Committee member of APBEC, Tsinghua University(Beijing))		
Chosing Ceremony **Poster Award**			
17:10-17:15	Present awards		Prof. Peng LIU (Secretary of the CPC Committee, School of Biomedical Engineering, Tsinghua University)
17:15-17:20	Concluding Remarks		

05 Keynote Talks

Tien Y. WONG

Professor

Tsinghua University(Beijing)

Title of the Report：**AI in Medicine**

Hitoshi TABATA

Professor

The University of Tokyo

Title of the Report：**Introduction of the department of bioengineering at UTokyo**

Qasim RAFIQ

Professor

University College London

Title of the Report：**Automated, Adaptive and AI-Driven Biomanufacture of Cell and Gene Therapies**

Yi WANG

Professor

Cornell University

Title of the Report：**Quantitative susceptibility mapping (QSM) and its applications in studying iron, myelin, fibrosis and calcifications**

Bo HONG

Professor

Tsinghua University(Beijing)

Title of the Report：**Minimally invasive brain computer interface NEO: from bench to bed**

Seong-Gi KIM

Professor

Sungkyunkwan University

Title of the Report：**State of the Art in fMRI and Optogenetic Integration**

Invited Talks

Theme I: Biomaterials and Tissue/Neuro Engineering

Taichi ITO

Professor

The University of Tokyo

Title of the Report：**Development of a Delivery System for HGF DNA Aptamers**

Shaohua MA

Associate Professor

Tsinghua University(Beijing)

Title of the Report：**Synthetic organoids for precision cancer medicine and regenerative therapy**

Chieh-Cheng HUANG

Associate Professor

Tsing Hua University(Hsinchu)

Title of the Report：**Engineering Cell Spheroids and Their Decellularized ECM for Regenerative Therapies**

Yiwen WANG

Associate Professor

The Hong Kong University of Science and Technology

Title of the Report：**Behaviorally Reinforced Generative Spike Prediction Model: Towards the Rewiring of Disconnected Brain Areas**

Donghee SON

Associate Professor

Sungkyunkwan University

Title of the Report：**Tissue-adhesive Neuroprosthetic Devices**

Justin J. CHUNG

Assistant Professor

Seoul National University Hospital

Title of the Report：**Polyelectrolyte Carriers: Protecting and Delivering Bioactive Agents for Tissue Repair**

Invited Talks

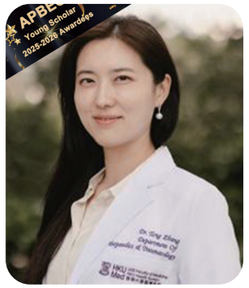
Hongliang HE

Young Chief Professor

Southeast University

Title of the Report：**Advances in Cardiovascular Nanomedicines**

Theme II: AI for Biomedicine

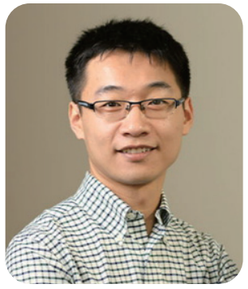


Teng ZHANG

Assistant Professor

The University of Hong Kong

Title of the Report：**Comprehensive AI for Spine Deformity: Technologies can be Transferred to Other Specialists**



Peng XIE

Principal Investigator

Southeast University

Title of the Report：**Constructing Digital Embryos and Organs Based on Spatiotemporal Omics Technology**

Hao CHEN

Assistant Professor

The Hong Kong University of Science and Technology

Title of the Report：**Harnessing Large AI Models for Transforming Healthcare**

Qiyuan TIAN

Associate Professor

Tsinghua University(Beijing)

Title of the Report：**AI for human neuroimaging**

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Theme III: Micro/Nano Medicine

Kai MA

Assistant Professor

Tsinghua University(Beijing)

Title of the Report：**Antigen-specific immune tolerance induced by ultrasmall silica drug delivery system**

Tay Kah Ping Andy

Assistant Professor

National University of Singapore

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Jiaqi LIU

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Bonnie Danqing ZHU

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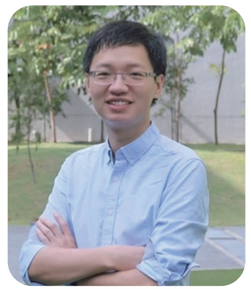

Changsheng WU

Assistant Professor

National University of Singapore

Title of the Report：**Decoding Physiology Through Skin Vibrations: From Skin-Interfaced to Contactless Wearables**

Ting-Wei WANG

Assistant Professor

Tsing Hua University(Hsinchu)

Title of the Report：**Wearable Skin-tone Friendly Electronic Device for Cardiovascular Monitoring**

Invited Talks

Theme IV: Bioimaging

Kevin Tze-Hsiang CHEN

Assistant Professor

Taiwan University

Title of the Report: **Deep Learning Methods for Low-Dose Tau PET Enhancement**

Keiich NAKAGAWA

Assistant Professor

The University of Tokyo

Title of the Report: **Acoustic-assisted optical sensing in brain tissue**

Xiaolei SONG

Associate Professor

Tsinghua University(Beijing)

Title of the Report: **The age for clinical metabolic MRI-from anatomy to cell metabolic language**

▲ **Medical Science Building**

▲ **Vanke School of Public Health**

06 Campus Map