



CVBE 2023 KYOTO, JAPAN

The 7th CARDIOVASCULAR BIOENGINEERING SYMPOSIUM 2023

May 29 (Mon.) – 31 (Wed.), 2023
Miyako Messe

on behalf of the Organizing Team

Jianyi (Jay) Zhang, MD, PhD

The University of Alabama at Birmingham,
Alabama, U.S.A.

Keiichi Fukuda, MD, PhD

Department of Cardiology,
Keio University School of Medicine, Japan



MONDAY, May 29, 2023

7:30 – 8:20 AM

Registration & Coffee

8:20 – 9:00 AM

Opening Remarks



Keiichi Fukuda, MD, PhD
Chairman and Professor
Department of Cardiology
Keio University, Japan



Jianyi (Jay) Zhang, MD, PhD
Chair, Department of Biomedical Engineering
T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership
Professor of Medicine, of Engineering
School of Medicine, School of Engineering
UAB | The University of Alabama at Birmingham



Denis B. Buxton, PhD
PCBC and PCTC
Director, Basic and Early Translational Research Program
Division of Cardiovascular Sciences
NHLBI



Victor J. Dzau, MD
President, the National Academy of Medicine
James B. Duke Distinguished Professor of Medicine
Professor of Pathology
Duke University

KEYNOTE-LECTURE

Moderator: Jianyi (Jay) Zhang

9:00 – 10:00 AM



RNA therapeutics in cardiac regeneration

Victor J. Dzau, MD

President, the National Academy of Medicine

Professor of Medicine, Duke University

10:00 – 11:40 AM

Session I – New Chapter of Applied Cardiac Medicine

MODERATORS: Victor J.Dzau / Yuji Nakada

10:00 – 10:20 AM



modRNA Therapeutics vs. hiPSC-derived Cell and Cell-products for Myocardial Repair in Large Mammals

Jianyi (Jay) Zhang, MD, PhD

Chair, Department of Biomedical Engineering

T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership

Professor of Medicine, of Engineering, School of Medicine, School of Engineering

UAB | The University of Alabama at Birmingham

10:20– 10:40 AM



Tissue Engineered Heart Repair: from Monkey to Human

Wolfram-Hubertus Zimmermann, MD

Director, Institute of Pharmacology and Toxicology

University Medical Center Göttingen

10:40 – 11:00 AM



ETV2 is a pioneer factor which reprograms fibroblasts to the endothelial lineage

Daniel Garry, MD, PhD

Professor of Medicine, Lillehei Heart Institute

University of Minnesota

11:00 – 11:20 AM



T cell cross reactivity and its role in cardiovascular disease

Patricia Kim Phuong Nguyen, MD

Assistant Professor, Medicine, Stanford University School of Medicine

11:20 – 11:40 AM



The Pig Double-Injury Heart Model Extends Cardiomyocyte Regeneration Capacity Through Redox Regulation

Yuji Nakada, PhD

Assistant Professor, University of Alabama at Birmingham

Department of Biomedical Engineering

School of Medicine, School of Engineering

12:00 – 12:50 PM **Luncheon I:**
Innovative Research on Metabolic System for Regenerative Medicine and Cell Therapy

Moderator: Keiichi Fukuda

Methionine and Zinc: Key Regulators of Pluripotent Stem Cell Fate

Nobuaki Shiraki, PhD

School of Life Science and Technology, Tokyo Institute of Technology

Metabolism-Based Production of Cardiomyocytes from Human PSCs for Regenerative Therapy

Shugo Tohyama, MD, PhD

Department of Cardiology, Keio University School of Medicine

Presented by Ajinomoto Co., Inc.

1:00 – 2:40 PM

Session II – Advances in Cardiac therapeutics

MODERATORS: Keiichi Fukuda / Yajing Wang

1:00 – 1:20 PM



iPS-CM: Generation, Selection, and Delivery

Keiichi Fukuda, MD, PhD

Chairman and Professor
Department of Cardiology
Keio University, Japan

1:20 – 1:40 PM



Derivation and Use of Epicardial Lineages from hiPSCs

Sanjay Sinha, MBBCh, PhD

British Heart Foundation Senior Research Fellow,
Wellcome-MRC Cambridge Stem Cell Institute
University of Cambridge

1:40 – 2:00 PM



Finding an Appropriate Dose for Engineered Heart Tissue

Thomas Eschenhagen, MD

Director, Professor in the Institute of Experimental Pharmacology and Toxicology
University Medical Center Hamburg-Eppendorf

2:00 – 2:20 PM



Induced Cardiac Regeneration by Cell Cycle Activation

Mauro Giacca, MD, PhD

Professor, School of Cardiovascular Medicine
King's College London

2:20 – 2:40 PM



Stem Cells & Genomics for Clinical Trial in a Dish

Joseph C. Wu, MD, PhD

Director, Stanford Cardiovascular Institute

Simon H. Stertz, MD, Professor of Medicine & Radiology

Stanford University School of Medicine

2:40 – 3:00 PM

Coffee Break

3:00 – 4:40 PM

Session III – Thinking Out of Box in Cardiac Repair

MODERATORS: Masaki Ieda / Joseph C. Wu

3:00 – 3:20 PM



Molecule driven dynamic transitions of cardiac fibroblasts

Jennifer Davis, PhD

Laboratory Medicine and Pathology, Bioengineering

Associate Director, ISCRM

Associate Professor

University of Washington

3:20 – 3:40 PM



Desmosomes, non-canonical functions in cardiac arrhythmias and disease

Farah Sheikh, PhD, FCVS, FAHA

Professor

Vc-health Sciences-schools

UC San Diego

3:40 – 4:00 PM



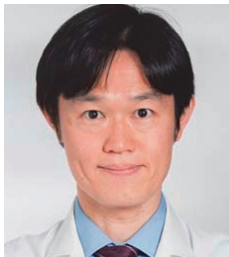
Reprogramming cardiomyocytes to enable heart regeneration

Thomas Braun, MD, PhD

Director, Max-Planck-Institute of Heart and Lung Research, Bad Nauheim,
Department of Cardiac Development and Remodeling

Full Professor, Univ. of Gießen, Medical Faculty, Dept. of Internal Medicine

4:00 – 4:20 PM



Transforming Scar in Heart Muscle

Masaki Ieda, MD, PhD

Chair, Department of Cardiology

Professor of Medicine

University of Tsukuba, Japan

4:20 – 4:40 PM



Endoglin inhibits cardiomyocyte proliferation in the setting of cardiac regeneration

Jop van Berlo, MD, PhD

Associate Professor of Medicine

Director of Graduate Studies,

Integrative Biology and Physiology Graduate Program

Lillehei Heart Institute and Stem Cell Institute

University of Minnesota

7:00 PM Reception / Award Ceremony at Westin Miyako Kyoto Hotel

TUESDAY, May 30, 2023

7:50 – 8:10 **Morning Seminar:**
Innovative Spheroid Manufacturing and Transportation Platform
in Nissan Chemical

Moderator: Keiichi Fukuda

Innovative Spheroid Manufacturing and Transportation Platform in Nissan Chemical

Norio Hashimoto, PhD, MBA

Nissan Chemical America Corporation

Presented by Nissan Chemical Corporation

KEYNOTE-LECTURE

Moderator: Keiichi Fukuda

8:20 – 9:20 AM



Roderic Pettigrew, MD, PhD

Chief Executive Officer of Engineering Health; Executive Dean for Engineering Medicine at Texas A&M University

9:20 – 10:20 AM

Session IV – Biotechnology and Bioengineering in CV Sciences

Chairs: Tatsuya Shimizu / Joseph Hill

9:20 – 9:40 AM



Dynamic Biomaterials Improve Cardiovascular “Disease-in-a-Dish” Models

Adam J. Engler, PhD

Professor and Chair, Shu Chien-Gene Lay Department of Bioengineering

Sanford Consortium for Regenerative Medicine

University of California San Diego

9:40 – 10:00 AM



Dissecting the sarcomere-metabolism axis in heart regeneration

Ahmed I. Mahmoud, PhD

Professor, Department of Cell and Regenerative Biology
University of Wisconsin-Madison

10:00 – 10:20 AM



Cell Sheet-Based Myocardial Tissue Engineering

Tatsuya Shimizu, MD, PhD

Director & Professor
Institute of Advanced Biomedical Engineering and Science
Tokyo Women's Medical University

10:20 – 10:40 AM

Coffee Break

10:40 – 12:00 PM

Session V – Novel Cardiac Bioengineering Intervention

Chairs: **Youyang Zhao / Li Qian**

10:40 – 11:00 AM



RNA therapeutics

John P. Cooke, MD, PhD

Joseph C. "Rusty" Walter and Carole Walter Looke Presidential Distinguished
Chair in Cardiovascular Disease Research Department of Cardiovascular
Sciences, Professor of Cardiovascular Sciences; Institute for Academic Medicine,
Director, Center for Cardiovascular Regeneration DeBakey Heart & Vascular
Center Houston Methodist Hospital, Weill Cornell Medical College

11:00 – 11:20 AM

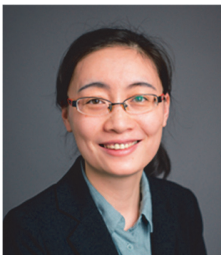


Reactivation of Aging-Impaired Endothelial Regeneration for Vascular Repair and ARDS treatment: Nanoparticle-Directed Precision Gene Therapy

Youyang Zhao, PhD

William G. Swartchild, Jr. Distinguished Research Professor
Head, Section for Injury Repair and Regeneration Research
Lurie Children's Hospital of Chicago; Departments of Pediatrics, Pharmacology, and Medicine, Northwestern University Feinberg School of Medicine

11:20 – 11:40 AM



Transcriptional and Epigenetic Reconfiguration in Direct Cardiac Reprogramming

Yang Zhou, PhD

Assistant Professor, University of Alabama at Birmingham
Department of Biomedical Engineering
School of Medicine, School of Engineering

11:40 – 12:00 PM



Fast skeletal myosin binding protein-C expression exacerbates dysfunction in heart failure

Sakthivel Sadayappan, PhD, MBA

Vice Chair of Basic Research
Director of Heart Branch of the UC Heart, Lung and Vascular Institute
Division of Cardiovascular Health and Disease; University of Cincinnati College of Medicine

**12:10 – 1:00 PM Luncheon II:
Therapeutic delivery of cardiomyocytes**

Moderator: Koichiro Kinugawa

Cardiac repair with hiPSC-cardiomyocytes – application as engineered heart tissue

Thomas Eschenhagen, MD

University Medical Center Hamburg-Eppendorf

Cardiac Cell-based Therapy: Methods of application & Delivery Systems

Joshua Hare, MD, FACC, FAHA

University of Miami

Presented by Novo Nordisk A/S

12:00 – 3:00 PM **Poster Viewing with Lunch**
(Posters will be at display from May 29 to May 31)

3:00 – 3:49 PM **Session VI - Early Career Researcher Presentations –
selected from submitted abstracts**

Moderators: John P. Cooke / Susmita Sahoo

Rapid Fire Presentation (5 min presentation + 2 min discussion)

3:00-3:07 PM **Seitaro Nomura**; Department of Cardiovascular Medicine, The University of Tokyo:
System-level understanding of cardiovascular diseases

3:07-3:14 PM **Jakob Fell**; Stem Cell Unit, Clinic for Cardiology and Pneumology, University Medical
Center, Göttingen:
LZTR1-deficiency drives heart disease by impairing cellular communication

3:14-3:21 PM **Hidenori Tani**; Department of Cardiology, Keio University:
Production of Mature Engineered Heart Tissues with Heart-derived Collagen

3:21-3:28 PM **Inna Rabinovich-Nikitin**; Cardiovascular Sciences, St. Boniface Hospital Albrechtsen
Research Centre, University of Manitoba, Winnipeg, Manitoba:
*Retinoic acid-related orphan receptors regulate autophagy and cell survival in cardiac myocytes during
hypoxic stress*

3:28-3:35 PM **Li Lai**; Department of Cardiovascular Sciences, Houston Methodist Research Institute:
Metabolic and epigenetic coupled regulation of transdifferentiation and vascular regulation

3:35-3:42 PM **Ke Huang**; North Carolina State University:
*A microneedle patch loaded with Il-4 macroparticles facilitates heart repair through cardiomyocyte
phenotype transition*

3:42-3:49 PM **Panel Discussion:** J Cooke, S Sahoo, W Zimmermann, Y Wang, J Chong

4:00 – 4:20 PM **Coffee Break**

4:20 – 5:20 PM

Session VII – Cardiac Protection Advances

Chairs: **Issei Komuro / Yang Zhou**

4:20 – 4:40 PM



The Myocyte GRK2 Interactome: Insights into Cardiac and Mitochondrial Stress Signaling

Walter J. Koch, PhD

William Wikoff Smith Chair in Cardiovascular Medicine
Chair and Professor, Department of Cardiovascular Sciences
Director and Professor, Center for Translational Medicine
Lewis Katz School of Medicine

4:40 – 5:00 PM



Exosomes and Epitranscriptome in Cardiovascular Nnaomedicine

Susmita Sahoo, PhD

Associate Professor
Icahn School of Medicine at Mount Sinai

5:00 – 5:20 PM



Circadian Regulation of Cardio protection

Lorrie Kirshenbaum, PhD

Director, Institute of Cardiovascular Sciences& Research Development
Professor, Department of Physiology & Pathophysiology, and Pharmacology & Therapeutics/ Max Rady College of Medicine
Canada Research Chair, Molecular Cardiology
University of Manitoba

7:00 PM **Faculty Dinner at Funatsuru restaurant**

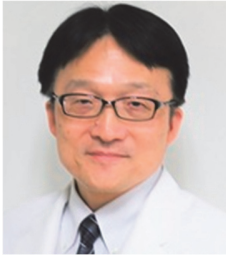
WEDNESDAY, May 31, 2023

8:20 – 10:40 AM

Session VIII - Heart Failure: Deaths and Survival

Chairs: Philippe Menasché / Jennifer Davis

8:20 – 8:40 AM



New molecular mechanisms of heart failure

Issei Komuro, MD, PhD

Professor and Chair, Department of Cardiovascular Medicine, The University of Tokyo Graduate School of Medicine

8:40 – 9:00 AM

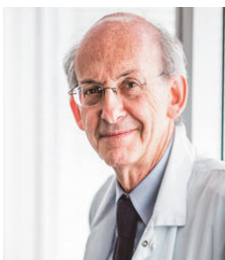


Protein and peptide therapeutics for repair of the infarcted heart

James Chong, PhD, FRACP, MBBS

Associate Professor University of Sydney; Head Cardiac Regeneration Laboratory and Faculty, Westmead Institute for Medical Research; Cardiologist Westmead Hospital; Principal Investigator Westmead Applied Research Centre - Cardiac Regeneration Group

9:00 – 9:20 AM



Extracellular Vesicles for Cardiac Repair: A Translational Experience

Philippe Menasché, MD, PhD

Professor Philippe Menasché
Service as Department of Cardiovascular Surgery
Hôpital Européen Georges Pompidou

9:20 – 9:40 AM



Autophagy

Junichi Sadoshima, MD, PhD

Chair,
Professor of Department of Cell Biology & Molecular Medicine,
Rutgers, New Jersey Medical School

9:40 – 10:00 AM



Role of Hexokinases and protein O-GlcNAcylation in heart failure with preserved ejection fraction

Hossain Ardehali, MD, PhD

Professor, Feinberg Cardiovascular Research Institute
Department of Medicine
Feinberg School of Medicine
Northwestern University

10:00 – 10:20 AM

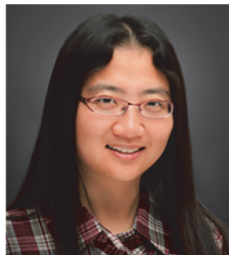


Secretion of Mitochondria in Extracellular Vesicles as an Alternative Quality Control Pathway in the Heart

Asa Gustafsson, PhD

Professor, School of Pharmacy and Pharmaceutical Science,
UC San Diego

10:20– 10:40 AM



Reprogramming Approach for Heart Repair

Li Qian, PhD

Professor, Associate Director of the McAllister Heart Institute
University of North Carolina at Chapel Hill

10:40 – 11:00 AM

Coffee Break

11:00 – 12:40 PM

Session IX – Breaking through in Heart Reparations

Chairs: E. Dale Abel / Nicole Purcell

11:00 – 11:20 AM



Inflammatory Tales in Cardiovascular Medicine

Joseph Hill, MD, PhD

Professor of Medicine and Molecular Biology
James T. Willerson M.D. Distinguished Chair in Cardiovascular Diseases
Frank M. Ryburn, Jr. Chair in Heart Research; Director, Harry S. Moss Heart Center,
UT Southwestern Medical Center

11:20 – 11:40 AM



Genetic variants impacting cardiomyocyte cell cycle activity

Loren (J) Field, PhD

Professor, Krannert Cardiovascular Research Center, Department of Medicine,
Indiana University School of Medicine

11:40 – 12:00 PM



N-Cadherin: A Novel Target Enhancing Cell Therapy Efficacy against Ischemic Heart Failure

Xinliang (Xin) Ma, MD

Professor of Emergency Medicine

Professor of Medicine, Thomas Jefferson University, Philadelphia

12:00 – 12:20 PM



Myeloid-specific Regulation of RhoA in Cardiac Fibrosis

Maria Kontaridis, PhD

Executive Director / Gordon K. Moe Professor and Chair Biomedical Research and
Translational Medicine / Director of Research

Associate Professor of Medicine, Part-time Beth Israel Deaconess Medical Center
Harvard Medical School Boston, Massachusetts

12:20 – 12:40 PM



The Effect of Systemic Nicotine on Inflammation, Cognition, and Aging in Adolescent Mice

Nicole Purcell, PhD

Associate Professor at HMRI- Huntington Medical Research Institutes
Pasadena, California, United States

12:45 – 1:35 PM Luncheon III:
Industrialization of Regenerative Medicine in East Asia

Moderator: Tsugio Sasaki

Taiwan's Regenerative Medicine Development and Its Role in the Global Industrial Chain
Shih-Chia LIN
Locus Cell Co., LTD. ; Foundation of Medical Professionals Alliance in Taiwan

Presented by SHIBUYA CORPORATION

1:40 – 3:20 PM Session X – View Beyond Cardiology

Chairs: Maria Kontaridis / Sakthivel Sadayappan

1:40 – 2:00 PM



Cardiac Regeneration with iPSC-Derived Cardiac Spheroids in Non-Human Primates

Yuji Shiba, MD, PhD

Head of the Department of Biotechnology and Biomedical Engineering
Academic Assembly Associate Professor, Institute of Medicine
Institute for Biomedical Sciences
Shinshu University, Japan

2:00 – 2:20 PM



Metabolism in heart failure

E. Dale Abel, M.D., Ph.D.

William S. Adams Distinguished Professor of Medicine
Chair and Executive Medical Director
Department of Medicine
David Geffen School of Medicine and UCLA Health

2:20 – 2:40 PM



iPS-based platforms for disease modeling with sympathetic innervation in the heart

Jong-Kook Lee, MD, PhD

Professor

Department of Cardiovascular Regenerative Medicine

Osaka University Graduate School of Medicine

2:40 – 3:00 PM



Novel Mechanism in Diabetic Cardiac Injury

Yajing Wang, PhD

Professor

Director of Basic and Translational Research

Department of Biomedical Engineering

University of Alabama at Birmingham

3:00 – 3:20 PM



Reversing Heart Failure through CTCF-Mediated Structural Repair of the Genome

Manuel Rosa-Garrido, PhD

Assistant Professor,

Department of Biomedical Engineering

University of Alabama at Birmingham

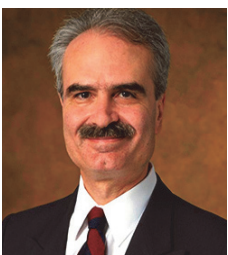
3:20 – 3:40 PM Coffee Break

3:40 – 5:20 PM

Session XI – Cardiac therapy: From Bench to Clinic

Chairs: Joshua M. Hare / Manuel Rosa-Garrido

3:40 – 4:00 PM



Cell therapy for chronic heart failure

Roberto Bolli, MD, D.Sc. (Hon)

Professor of Medicine, Physiology and Biophysics

Distinguished University Scholar

Jewish Hospital Distinguished Chair in Cardiology

Director, Institute of Molecular Cardiology

University of Louisville

4:00 – 4:20 PM



Assessment of the new device for final harvest of novel cell therapies

Joshua M. Hare, MD, FACC, FAHA

Director, Donald Soffer Endowed Program in Regenerative Medicine; Chief Science Officer
Senior Associate Dean for Experimental & Cellular Therapeutics; Louis Lemberg Professor
of Medicine (Cardiology); Professor of Molecular and Cellular Pharmacology; Professor of
Biomedical Engineering; Director, Interdisciplinary Stem Cell Institute (ISCI); Secondary
Appointment of Biochemistry and Molecular Biology, University of Miami

4:20 – 4:40 PM



Generation of cardiac cells and tissues from iPS cells for biomedical applications

Yoshinori Yoshida, MD, PhD

Associate Professor

Department of Cell Growth and Differentiation, Center for iPS Cell Research and
Application

Kyoto University

4:40 – 5:00 PM



Cardiomyopathy Disease Models with Matured iPSC-derived Cardiomyocytes

Hideki Uosaki, MD, PhD

Associate Professor

Division of Regenerative Medicine

Center for Molecular Medicine

Jichi Medical University

5:00 – 5:20 PM



A New Drug Delivery System for Intravenous Coronary Thrombolysis

Yoshihiko Saito, MD, PhD

Professor, Department of Internal Medicine, Nara Medical University

5:20 – 5:40 PM

Session XII - Meet Your Editor

Chairs: Wolfram-Hubertus Zimmermann

5:20 – 5:40 PM



Behind the scenes at Nature Reviews Cardiology

Karina Huynh, PhD

Senior Editor

Nature Reviews Cardiology

5:40 – 5:50 PM

Concluding Remarks



Jianyi (Jay) Zhang, MD, PhD

Chair, Department of Biomedical Engineering

T. Michael and Gillian Goodrich Endowed Chair of Engineering Leadership

Professor of Medicine, of Engineering

School of Medicine, School of Engineering

UAB | The University of Alabama at Birmingham

5:50 – 6:00 PM

CVBE 2024

Welcome to Huston, TX, USA



John P. Cooke, MD, PhD

Joseph C. “Rusty” Walter and Carole Walter Looke Presidential Distinguished Chair
in Cardiovascular Disease Research

Department of Cardiovascular Sciences, Professor of Cardiovascular Sciences

Institute for Academic Medicine,

Director, Center for Cardiovascular Regeneration;

DeBakey Heart & Vascular Center Houston Methodist Hospital, Weill Cornell

Medical College

CVBE 2023

REGISTRATION



<https://www.congre.co.jp/cvbe2023/>

May 29th - May 31st, 2023

While there is no fee to participate in the Symposium, registration is necessary.

Please complete the form before April 1, 2023. Thank you.

Location and direction

Hotel (for Faculty):

The Westin MiyakoKyoto; 1 Awataguchi Kachocho, Higashiyama-ku, Kyoto, 605-0052, Japan

URL: <https://global.miyakohotels.ne.jp/westinkyoto/>

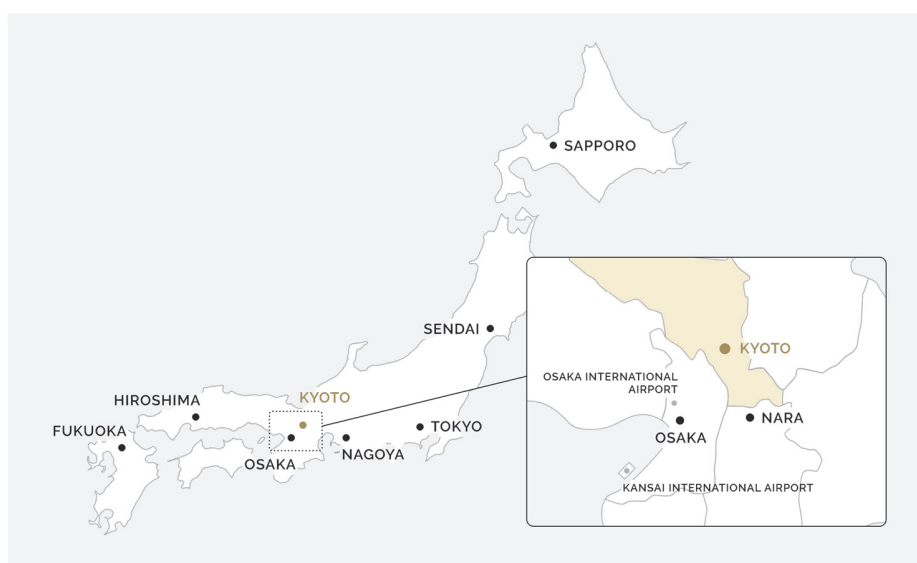
The hotel is a 2 minutes-walk from Keage Station (subway Tozai Line).

To get to the congress venue;

-Walk 15 minutes from the hotel to the venue

-Take a subway, get off at Higashiyama Station (one stop from Keage Station), and walk.

-It also takes about 15 minutes.



Childcare:

Due to the COVID-19 situation, nursery rooms are closed at the facilities, including hotels; however, attendees who stay at The Westin Miyako Kyoto may apply for a baby-sitting service (in the attendee's hotel room) when they request to the hotel concierge in advance. The price is listed below.

Price (one child by one babysitter):

[On Weekdays]

9:00am -7:50pm 2 hours JPY 6,600

3 hours JPY 9,900

Over 8:00pm JPY 1,650/hour (as additional fee)

[On Weekends / National Holidays]

9:00am -7:50pm 2 hours JPY 8,800

3 hours JPY 13,200

Over 8:00pm JPY 1,650/hour (as additional fee)

Notes:

-This service is only available for attendees who stay at The Westin Miyako Kyoto.

(<https://global.miyakohotels.ne.jp/westinkyoto/>)

-Attendees who wish to have a service should contact the hotel concierge directly and make a payment by themselves.

-We recommend that they make a reservation in advance. (It may not be available if they wish to make a reservation on the day.)

-The price above is a pre-booked price for one child by one baby-sitter. It changes depending on the children's age and the number of children.

-Transportation fee: JPY 1,100 will be charged to the price listed above.

-When a service ends over 10:00pm, a transportation fee will be changed from JPY 1,100 to JPY 3,300.