

Interdisciplinary Thinking: Silos to Synergy

September 24-29, 2025
University of Toyama, Japan



富山大学 医学部
University of Toyama, Faculty of Medicine
医学科・看護学科

富山大学 和漢医薬学総合研究所
Institute of Natural Medicine

富山大学 工学部
Faculty of Engineering, University of Toyama





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2025
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Welcome to The University of Toyama



PROF. SHIGERU SAITO

The President of The University of Toyama

Welcome to the University of Toyama.

It is a great pleasure to host you at the inaugural TOMIDAI GLOBAL SCI FRONTIERS. We are honored to welcome talented graduate students from across Asia and beyond to our university.

This program is part of the initiatives of the newly established Center Initiative for Training International Researchers (CITIR) at the University of Toyama. CITIR aims to foster the next generation of researchers and to build a global network of academic collaboration.

Guided by our university philosophy of integrating knowledge and practice, the University of Toyama serves as a hub of learning and innovation that connects our local community with the global society. We are committed to advancing cutting-edge research and promoting interdisciplinary collaboration across diverse fields such as medicine, materials science, environmental studies, energy, and information technology.

Through this program, we hope you will engage with our advanced research, experience the richness of Toyama's culture and nature, and discover the possibilities of international academic exchange and interdisciplinary research. We believe this experience will broaden your perspectives and inspire your future path as global researchers.

Toyama, surrounded by the majestic Tateyama Mountain Range and the Sea of Japan, offers a unique environment for learning and cultural immersion. We sincerely hope your time here will be both intellectually stimulating and personally enriching.

All of us at the University of Toyama-faculty and staff-look forward to meaningful exchanges with you. We are confident that this five-day program will be both fruitful and unforgettable.

Sincerely,

The President

The University of Toyama

A handwritten signature in black ink, appearing to read 'S. Saito', with a long horizontal flourish extending to the right.

Welcome to Tomidai Global SciFrontiers 2025



DISTINGUISHED PROFESSOR ISHWAR PARHAR

Chief Director, Center Initiative for Training
International Researchers (CITIR)

It is with great pleasure that I welcome you to the Tomidai Global SciFrontiers 2025, Interdisciplinary Symposium on Innovation, Integration, and Impact. This symposium brings together leading scientists, engineers, healthcare professionals, and social scientists from across the region and beyond to explore the power of collaborative thinking in addressing some of the most complex challenges of our time.

In an era where scientific boundaries are rapidly dissolving, solutions to pressing global issues – from climate change and sustainability to reproductive health, mental well-being, food security, and emerging technologies – can no longer be achieved by working in silos. True innovation happens at the intersection of disciplines, where diverse perspectives converge to create new frameworks, tools, and ideas.

At the Center Initiative for Training International Researchers (CITIR), we are committed to nurturing this spirit of synergy beyond silos. Through initiatives such as this symposium, we aim to provide a platform for early-career researchers, established scholars, and innovators to exchange knowledge, forge collaborations, and inspire transformative solutions that extend beyond traditional academic boundaries.

This year's symposium features a carefully curated program of plenary lectures, thematic sessions, and panel discussions designed to showcase how integrating knowledge from diverse fields, including medicine, neuroscience, artificial intelligence, natural medicine, sustainability science, engineering, and social innovation, can accelerate progress and deliver tangible benefits to society.

I would like to extend my most profound appreciation to our distinguished speakers, dedicated organizing committee, institutional partners, and all participants for contributing to this event. Your enthusiasm and expertise are what make gatherings like this truly impactful.

I hope this symposium inspires you to think boldly, collaborate openly, and innovate fearlessly. Together, let us chart new paths for scientific discovery and societal well-being – building bridges across disciplines, institutions, and cultures.

Welcome to the symposium, and I wish you an engaging and enriching experience.

ishwarparhar

Sincerely,

Prof. Ishwar S. Parhar

Chief Organizer of Tomidai Global SciFrontiers 2025

CITIR, University of Toyama



OUR VISION



Interdisciplinary Thinking: Silos to Synergy

Many of today's global challenges—such as climate change, public health crises, aging populations, and technological disruption—are too complex to understand or address from a single disciplinary perspective. Interdisciplinary research integrates knowledge, methods, and approaches from multiple fields, fostering creativity and innovation to offer more holistic and practical solutions. For instance, merging neuroscience with artificial intelligence can lead to breakthroughs in brain-computer interfaces or mental health diagnostics. Traditional disciplines often operate in silos, limiting perspective. Interdisciplinary research helps bridge those gaps, revealing connections and insights that might be missed within isolated fields—for example, connecting environmental science with economics to understand sustainability better. Governments, funding agencies, and communities increasingly demand research that leads to real-world impact. Interdisciplinary work is essential, as it seamlessly integrates scientific knowledge with social, ethical, and economic considerations. Training researchers and students in interdisciplinary thinking cultivates flexible, critical, and systems-oriented minds. These skills are essential for leadership roles across academia, industry, and public service.

OBJECTIVES

To bring together outstanding early-career researchers from diverse disciplines and countries to foster interdisciplinary dialogue and collaboration.

- Foster regional research leadership among early-career researchers from Japan and the Global South.
- Highlight local grand challenges (aging societies, climate, biodiversity loss, AI).
- Promote Global South integration through an interdisciplinary research network.



DAY 1 (9/24): FOUNDATIONS OF INTERDISCIPLINARY THINKING

14:00 - 16:00 REGISTRATION

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

16:00 - 16:30 OPENING CEREMONY

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

WELCOME TO THE UNIVERSITY OF TOYAMA

PROF. HIDEKI SAKAI



Executive Vice President, University of Toyama
Deputy Director, CITIR

WELCOME & "THE POWER OF INTERDISCIPLINARY THINKING IN A COMPLEX WORLD"

PROGRAM & PURPOSE

DISTINGUISHED RESEARCH PROFESSOR ISHWAR SINGH PARHAR



Chief Director
Center Initiative for Training International Researchers (CITIR)
The University of Toyama

16:30 - 17:15

OPENING KEYNOTE: SHAPING THE FUTURE: TACKLING GLOBAL GRAND CHALLENGES WITH A VALUES- INSPIRED MINDSET

PROF MAHENDHIRAN SANGGARAN NAIR



Pro-Vice Chancellor, SUNWAY University Malaysia

17:15 - 18:00

GROUPING & QUESTIONS TO GROUPS

18:00 - 19:30

WELCOME RECEPTION

Venue: Gofuku Campus University Cafeteria, University of Toyama

PROF. MASAYUKI IKEDA



Vice Director, Organization for Education and Exchange

DAY 2 (9/25) MORNING SESSION: HUMAN SYSTEMS PROGRAM

Venue: Seminar Room 8 , 7th Floor, Pharmacy and Pharmaceutical Sciences Research Building, Sugitani Campus,
University of Toyama

09:00 - 09:10 **OPENING REMARKS & CHAIR**



PROF. TAKASHI NAKAGAWA

Dean, School of Medicine

09:10 - 09:40

**T1: THE MANAGEMENT OF RHEUMATOID ARTHRITIS:
CURRENT STATUS AND FUTURE PERSPECTIVES**



PROF. MASARU KATO

School of Medicine

09:40 - 10:20

**T2: AGING SOCIETY AND ANTI-AGING SOLUTION
PROF. TAKASHI NAKAGAWA**

Dean, School of Medicine

10:20 - 10:40

COFFEE BREAK

10:40 - 11:10

**T3: THE GLOBAL FIGHT: WHY INFECTIOUS DISEASE
RESEARCH MATTERS NOW MORE THAN EVER
PROF. YOSHITOMO MORINAGA**

School of Medicine



11:10 - 11:40

**T4: LUNG BIOENGINEERING USING DECELLULARIZED
SCAFFOLDS**

PROF. TOMOSHI TSUCHIYA

Toyama University Hospital



11:40 - 12:00

**CLOSING REMARKS
PROF. YOSHITOMO MORINAGA**

12:00 - 13:30

LUNCH

DAY 2 (9/25) AFTERNOON SESSION: INSTITUTE OF NATURAL MEDICINE

Venue: Seminar Room 8 , 7th Floor, Pharmacy and Pharmaceutical Sciences Research Building, Sugitani Campus,
University of Toyama

13:30 - 13:40

WELCOME REMARKS & CHAIR



PROF. CHIHIRO TOHDA

Institute Director, Institute of Natural Medicine

13:40 - 14:05

**T1: METABOLIC REPROGRAMMING USING A SINGLE
TRANSCRIPTION FACTOR**



PROF. TSUBASA SHOJI

Institute of Natural Medicine

14:05 - 14:30

**T2: DISCOVERY OF FIH INHIBITORS AS A POTENTIAL
THERAPEUTIC STRATEGY FOR MAFLD**



ASST. PROF. YU NAKASHIMA

Institute of Natural Medicine

14:30 - 14:55

**T3: UNDERSTANDING THE MOLECULAR MECHANISMS OF
DIETARY RESTRICTION AND NATURAL COMPOUNDS
TOWARDS HEALTHY LONGEVITY USING DROSOPHILA
MELANOGASTER**



ASST. PROF. KAZUTAKA AKAGI

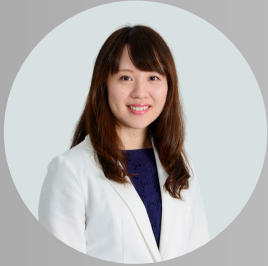
Institute of Natural Medicine

DAY 2 (9/25) AFTERNOON SESSION: INSTITUTE OF NATURAL MEDICINE

Venue: Seminar Room 8 , 7th Floor, Pharmacy and Pharmaceutical Sciences Research Building, Sugitani Campus,
University of Toyama

CHAIR: PROF. CHIRO TOHDA

15:05 - 15:30



T4: ESTABLISHING A FUNDAMENTAL THERAPEUTIC STRATEGY FOR ALZHEIMER'S DISEASE BASED ON DIRECTION-SPECIFIC AXONAL REGENERATION IN THE BRAIN

ASST. PROF. YANG XIMENG

Institute of Natural Medicine

15:30 - 15:55



T5: THE IMPACT OF GOREISAN COMPONENTS ON RAT MESENTERIC COLLECTING LYMPHATIC VESSEL PUMPING

ASST. PROF. MICHIKO JO

Institute of Natural Medicine

15:55 - 16:20



T6: FUNCTIONAL IMPROVEMENT THROUGH WITH CISTANCHE TUBULOSA EXTRACT: BASIC RESEARCH AND CLINICAL RESEARCH AIMED AT SOCIAL IMPLEMENTATION

PROF. CHIHIRO TOHDA

Institute Director, Institute of Natural Medicine

16:20 - 16:40

COFFEE BREAK

16:40 - 18:00



SYSTEMS THINKING INTERDISCIPLINARY WORKSHOP AND VISIT TO NATURAL MEDICINE MUSEUM

PROF. HIROYUKI MORITA

Institute of Natural Medicine

DAY 3 (9/26) MORNING SESSION: BRAIN, SUBCONSCIOUS, AND NEURAL COMPUTATION

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

09:00 - 09:05 WELCOME REMARKS & CHAIR

09:05 - 09:50 T1: INFORMATION PROCESSING IN SUBCONSCIOUS: THE IDLING BRAIN

PROF. KAORU INOKUCHI

Research Center For Idling Brain Science



09:50 - 10:35 T2: NEURAL MECHANISMS UNDERLYING THE REPRESENTATION OF OTHERS

PROF. TERUHIRO OKUYAMA

Institute for Quantitative Biosciences (IQB),
The University of Tokyo



10:35 - 11:20 T3: INFORMATION THEORETICAL APPROACHES TO MODEL SYNAPTIC PLASTICITY

PROF. TARO TOYOIZUMI

RIKEN Center for Brain Science



11:30 - 12:00 T4: HOW TO MAKE GREAT SCIENCE

PROF. KAORU INOKUCHI

Research Center For Idling Brain Science



12:00 - 13:00 LUNCH

DAY 3 (9/26) AFTERNOON SESSION: BIOENGINEERING AND BIOTECHNOLOGY

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

13:00 - 13:05

WELCOME REMARKS & CHAIR



PROF. TOSHIHIDE TABATA

Dean, Graduate School of Pharma-Medical Sciences

13:05 - 13:45

T1: WHAT DNA CAN TELL YOU: APPLICATIONS OF
HUMAN GENOMICS



PROF. NOBUYUKI KUROSAWA

Dean, Graduate School of Innovative Life Science

13:45 - 14:00

Q & A SESSION AND BREAK

14:00 - 14:40

T2: SENSING FORCEPS: A MICROSENSOR DEVICE FOR
THE THINKING SURGICAL ROBOTS



PROF. TOHRU SASAKI

School of Engineering

14:40 - 14:55

T3: INTRODUCTION OF SYNTHETIC CELL BIOLOGY

JUNIOR ASSOC. PROF. SEIICHI KOIKE

School of Engineering



DAY 3 (9/26) AFTERNOON SESSION: BIOENGINEERING AND BIOTECHNOLOGY

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

14:55 - 15:35 T4: PATCH-CLAMP: THE MOST USEFUL BUT LEAST UNDERSTOOD METHOD TO SPY ON BRAIN, HEART, AND MUSCLE FUNCTIONS



PROF. TOSHIHIDE TABATA

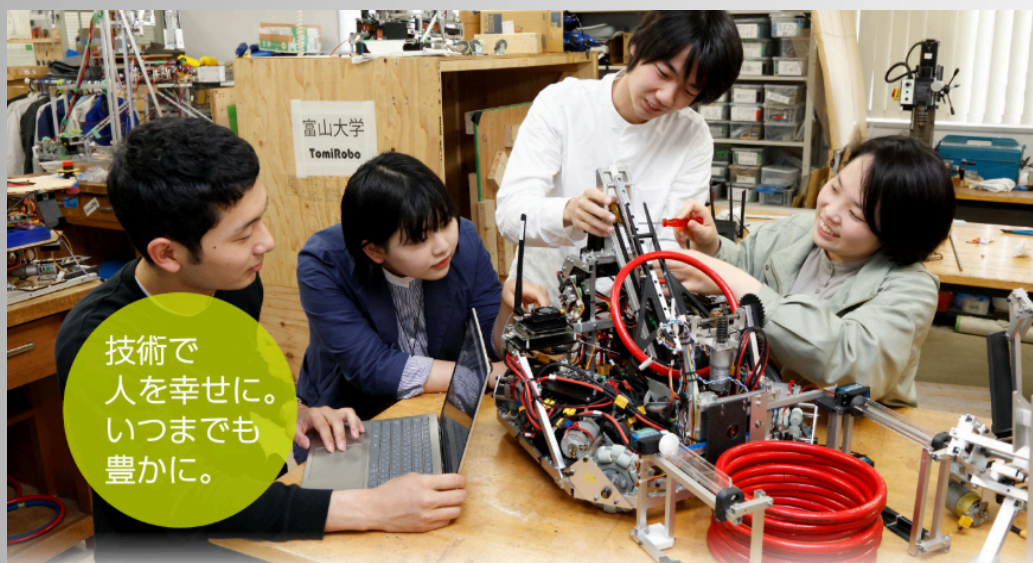
Dean, Graduate School of Pharma-Medical Sciences

15:35 - 15:50 Q & A SESSION AND BREAK

15:50 - 15:55 CLOSING REMARKS

16:00 - 16:30 COFFEE BREAK

16:30 ≈ SYSTEMS THINKING INTERDISCIPLINARY WORKSHOP



DAY 4 (9/27) MORNING SESSION: SUSTAINABILITY SCIENCE AND HEALTH

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

09:00 - 09:15 WELCOME REMARKS & CHAIR



PROF. NAOYA WADA

Director, Global Research Centre for Advanced
Sustainability Science

09:15 - 10:00

**T1: KEYNOTE LECTURE-SUSTAINABILITY STUDIES AND
GLOBAL RISK**



PROF. NORIO HORIE

Dean, Graduate School of Sustainability Studies

10:00 - 10:10

COFFEE BREAK

10:10 - 10:40

**T2: PRENATAL EXPOSURE TO AIR POLLUTION AND
CHILD HEALTH**



SENIOR ASST. PROF. JIE YANG

Shinshu University

10:50 - 11:20

**T3: A GEOGRAPHICAL ANALYSIS OF THE CAUSAL
CONNECTION BETWEEN SOCIAL AND CLIMATIC
FACTORS AND DENGUE OUTBREAKS FROM DHAKA,
BANGLADESH**



ASST. PROF. SHISHIR SHARMIN

Graduate School of Sustainability Studies

11:20 - 11:30

COFFEE BREAK

DAY 4 (9/27) MORNING SESSION: SUSTAINABILITY SCIENCE AND HEALTH

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

11:30 - 12:00 T4: ECOSYSTEM SERVICES AND HUMAN HEALTH
NEXUS: HEALTH AS A VEHICLE FOR SUSTAINABILITY?



ASSOC. PROF. SHAMIK CHAKRABORTY

Graduate School of Sustainability Studies

12:00 - 13:00 LUNCH

DAY 4(9/27) AFTERNOON SESSION: SUSTAINABILITY SCIENCE AND HEALTH

13:00 - 18:30 PRACTICAL TRAINING: "WATER CIRCULATION AND CITY
PLANNING"



PROF. NORIO HORIE

Dean, Graduate School of Sustainability Studies



DAY 5 (9/28) : BREAK

DAY 6 (9/29) : SCIENTIFIC COMMUNICATIONS

Venue: Multipurpose Hall at School of Science, Gofuku campus of University of Toyama

09:00 - 09:05 CHAIR: PROF. MASAYUKI IKEDA

09:05 - 09:30 T1: UNDERSTANDING THE WATER AND NUTRIENT
TRANSPORT BETWEEN LAND AND OCEAN: TOWARD
THE HEALTHY, PRODUCTIVE, AND SUSTAINABLE
ASIAN MARGINAL SEA



PROF. JING ZHANG

Vice President

09:35 - 10:00 T2: FROM TOYAMA TO SILICON VALLEY: A SCIENTIST'S
JOURNEY OF INNOVATION AND LEADERSHIP



DR. MOHAMMAD SHAHID

Astellas Cell & Gene Therapy, South San Francisco, CA

10:00 - 12:00 GROUP PROJECT PREPARATION

12:00 - 13:00 LUNCH + NETWORKING REFLECTIONS

13:00 - 16:00 STUDENT PRESENTATIONS Judges: Prof. Ikeda, Prof. Yoshikawa,

16:00 - 16:15 COFFEE BREAK Prof. Shimizu, Prof. Park, Prof. Ishwar

16:15 - 16:45 PROF. SHIGERU SAITO

The President of The University of Toyama



- AWARDS CEREMONY
- ONLINE ALUMNI PLATFORM LAUNCH
- MESSAGE FROM THE PRESIDENT

16:45 - 17:15 PROF. ISHWAR PARHAR, PROGRAM CHAIR

Chief Director

Center initiative for training international researchers (CITIR)

The University of Toyama



- CERTIFICATE PRESENTATION
- CLOSING REMARKS

GROUP PHOTO

DAY 6 (9/29) : FAREWELL RECEPTION

Venue: Gofuku Campus, University Cafeteria, University of Toyama

18:00 - 19:30 FAREWELL RECEPTION
MR. SHIGENORI ASAHI
PRESIDENT AND CEO, ASAHI COMPANY

CLOSING

PROF. MASAYUKI IKEDA

Vice Director, Organization for International Education and Exchange

