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WPI-Bio2Q NEWSLETTER

Bio2Q Connect

Keio University
Human Biology-Microbiome-Quantum Research Center (Bio2Q)
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THE 5TH WPI-Bio2Q SYMPOSIUM: BRAIN–ORGAN–MICROBIOME



Right: QR code for the Webpage

Keio University WPI-Bio2Q will host "The 5th Keio University WPI-Bio2Q International Symposium" on December 9-10, 2026, at Kitasato Hall on the Shinanomachi Campus in Tokyo.

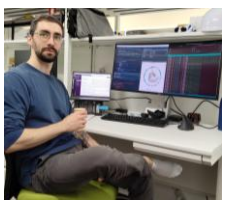
Under the theme "Wiring the Body: Brain-Organ-Microbiome Networks," this two-day symposium focuses on the nervous system to explore complex interactions among the brain, peripheral organs, immune system, and gut microbiome. As disruptions in these networks are increasingly linked to conditions such as neurodegenerative diseases and neuropsychiatric disorders, world-leading domestic and international rese archers will share cutting-edge insights across life science, medicine, AI, and quantum computing.

The program features keynote lectures by distinguished speakers, general poster sessions with awards, an interactive panel discussion, a luncheon seminar, and valuable networking opportunities. We warmly invite researchers, students, and professionals from various disciplines to join us. Please scan the QR code to register and view the complete program.

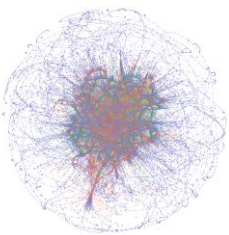
(Miyuki Ogino, Admin)

INTRODUCTION TO Bio2Q RESEARCH

Series #15
Dr. LEONARD DUBOIS
Postdoctoral Fellow, BIO-1 CORE



Dr. Leonard Dubois
Photo used with permission



Pangenome graph of Odoribacter splanchnicus
Provided by Dr. Dubois

The composition of the human gut microbiome encompasses over 1,600 species. Thanks to shotgun metagenomics sequencing, we can retrieve bacterial genomes for all of them, even for the species that were never grown in a lab.

My work in Bio2Q involves collecting genomes from large public databases and digging deeper to characterize intra-species diversity, which is understanding the genetic variation of conspecific bacterial strains. For every single bacterial species, we can precisely measure the differences in the gene set of thousands of strains' genomes. By doing so we can understand the finest difference in metabolic functions between microbiome samples (for example between health and disease).

I am using a pangenome graph approach to also take into account the gene synteny (gene order, e.g. Odoribacter splanchnicus pangenome graph on the left). As it is a computationally demanding task, I rely on resources such as the Bio2Q HPC (High-Performance Computing).

(Leonard Dubois, Postdoc)

WELCOME ON BOARD!

In this series, new members who joined Bio2Q introduce themselves .

JUNGHO SOHN, RESEARCH INTERN
BIO-1 CORE



Jungho Sohn
Photo used with permission

Hello! My name is Jungho Sohn, and I am a final-year Doctor of Pharmacy student at CHA University in Korea. Before focusing on research, I served with the UN peacekeeping mission in Lebanon, where I helped manage medicines for people in need. There I saw how often care arrived too late, and it made me want to work on the science that comes before treatment.

At CHA, I started with lab work on extracellular vesicles and nanoparticle formulations. During a research visit to Kyoto University, I taught myself machine learning, and since then I have been trying to combine the two, using computational methods to study biological signals such as exosomal microRNAs. Through these projects, I have also learned to be careful about whether a result can really be trusted, not just how good it looks.

I am very excited to join Dr. Matsuzaki's lab for four weeks. It is a great opportunity to learn from researchers who work closely with extracellular vesicles and microRNAs, and to see how data and biology come together in real projects. Outside the lab, I look forward to exploring Tokyo, meeting people across Bio2Q, and learning about research culture in Japan. I hope to stay connected with Keio and Bio2Q after the internship as well.

RESEARCH INTERNSHIP PROGRAM 2027: APPLICATIONS NOW OPEN

We are excited to announce that applications are now open for our Research Internship Program 2027!
This program offers students unique opportunities to gain hands-on research experience, work alongside leading experts, and contribute to cutting-edge scientific projects. Interns will develop advanced technical skills, receive dedicated mentorship, and collaborate within a dynamic, international research environment.

Program Details:
Target Candidates: Prospective Master's & PhD students
Period: 8 - 12 weeks (between May 10 - August 10, 2027)
Application Deadline: December 1, 2026 (23:59 JST)

If you are passionate about advancing your research career and expanding your global network, take the next step in your research journey now.



For more information and to submit your application using the required form, please visit our website.

(Futaba Kato, Admin)

AT THE YOTSUYA FESTIVAL: SHARING SCIENCE WITH THE PUBLIC

Bio2Q participated in Keio University's "Yotsuya Festival", held at the Shinanomachi Campus on October 3–4. It was a valuable opportunity to introduce Bio2Q's research activities to the public. This year, we also hosted the science art gallery, which showcased fascinating and mysterious images provided by researchers at Bio2Q. A total of 278 people –including families, students, and researchers interested in the gut microbiome and health - visited the Bio2Q community space. I am confident that we were able to provide these visitors with a highly engaging opportunity to learn how gut microbiome work in harmony with various organs, including the nervous system and the brain, to maintain health homeostasis. We will continue to widely communicate information about Bio2Q's activities to the public.

(Junta Komamura, URA)

WPI-Bio2Q SCIENCE ART GALLERY – TOP TWO VOTED IMAGES

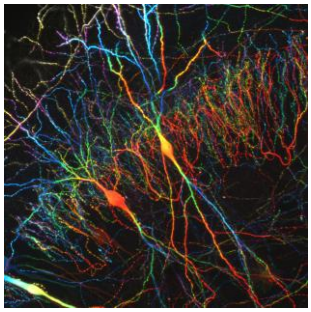


Photo used with permission

Networking

Thomas Chater, Bio2Q Researcher

This image shows a handful of brain cells in the hippocampus, a brain area critical for learning and memory. In the center are two neurons, surrounded by a web of fine neuronal projections. These neurons are filled with a fluorescent protein (GFP) allowing their visualization and have been color-coded by their depth in the sample. This technique allows us to see a fraction of the cells that are packed into brain tissue and gives you some idea of the sheer complexity of the brain. When we learn something new, there are corresponding changes in the fine structure of our brain. Specifically, the number, size, and strength of connections between brain cells changes in response to learning. This is called synaptic plasticity and has been a long-standing area of interest in neuroscience. My research is trying to understand this process, by filling cells with fluorescent proteins, and watching in real-time as synapses change in strength.



Photo used with permission

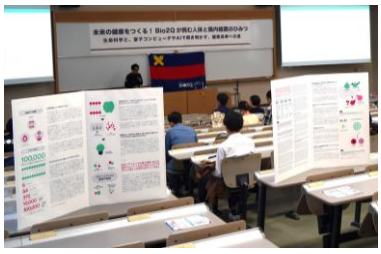
"Snowflakes" in a Flask: The Hidden Geometry of Crystallization

Joaquim Caner, Postdoc

This image captures a striking moment during the purification of a synthesized compound in the laboratory. Inside a round-bottom flask, the substance has organized into delicate needle-like crystal clusters, creating a pattern reminiscent of snowflakes suspended in a glass sphere. The reflections of the laboratory lights on the curved glass add an unexpected geometric dimension to the scene. Crystallization is a fundamental process in chemistry: a transition from a disordered solution into a highly organized solid state driven by molecular interactions. While researchers often focus on practical outcomes such as purity and yield, moments like this reveal the quiet aesthetic beauty hidden within chemical synthesis.
The original photograph was taken during routine laboratory work.

AI-assisted processing was used to reduce visual distractions and enhance the presentation of the crystals while keeping the original scientific subject. This flask became a small window into how matter naturally creates order, transforming an ordinary laboratory observation into a moment of scientific art.

2026 KEIO MITA-KAI HOMECOMING DAY



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Bio2Q researchers gave lectures on "Building Future Health! Secrets of the Human Body and Gut Microbiome Explored by Bio2Q" at the 2026 Keio Mita-Kai Homecoming Day at Hiyoshi Campus on October 18.
Oltea Sampetrean (Administrative Director, PI), Takahiko Koyama (PI), Kunimichi Suzuki (PI), and Yasumichi Arai (PI) explained how Bio2Q combines life science, quantum computing, and AI to explore pathways to healthy longevity.

(Minami Hosoya, Admin)

UPCOMING EVENTS

Nov. 14 (Sat)
The 15th WPI Science Symposium @ Osaka
Poster presenter, Shohei Kojima, Jr. PI
Nov. 27 (Fri)
The 31st Keio Medical Science Prize Symposium 2026 @ Shinanomachi
Dec. 9 (Wed) – 10 (Thu)
The 5th Keio University WPI-Bio2Q International Symposium 2026 @ Shinanomachi
Dec. 11 (Fri)
Symposium on Spatiotemporal Dynamics of Biological Systems @ Mita
Dec. 16 (Wed)
KEIO TECHNO-MALL 2026 @ Yurakucho

The next "Bio2Q Connect" will be issued on December 29, 2026.