

# Japan and EMBO in numbers

**25**  
EMBO Members and Associate Members<sup>a</sup>

- 3 Kobe
- 2 Kyoto
- 4 Okinawa
- 2 Osaka
- 1 Saitama
- 2 Sendai
- 6 Tokyo
- 4 Yokohama
- 1 Ōtsu

**19**  
EMBO Scientific Exchange Grants<sup>c</sup>

**9**  
EMBO Courses & Workshops<sup>b</sup>

916 participants at EMBO-funded events in Japan  
1,312 Japanese nationals attended EMBO Courses & Workshops around the world

**1**  
EMBO Young Investigator<sup>a</sup>

A former Young Investigator has moved back to Japan.

**2**  
EMBO Postdoctoral Fellows<sup>a</sup>

- Okazaki

## Contact

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Contact point for the memorandum of cooperation between EMBO and the Japan Science and Technology Agency (JST)

# EMBO opportunities in Japan

## EMBO Postdoctoral Fellowships

fund internationally mobile researchers for a period of up to two years, for researchers from Japan wanting to carry out postdoctoral work in an EMBO Member State, and researchers from EMBO Member States wanting to do postdoctoral work in Japan. Applications are open all year round.

## The EMBO Young Investigator Programme

supports group leaders based in Japan and funded by several JST programmes in the early stages of setting up their independent laboratories for a period of four years. Networking is a key aspect. Application deadline: 1 April.

## EMBO Scientific Exchange Grants

fund research exchanges of up to three months for scientists funded by several JST programmes (see the EMBO website for specific information). The grants facilitate collaborations with research groups with expertise, techniques, or infrastructure that is unavailable in the applicant's laboratory. Applications open all year round.

## The agreement between EMBO and The Company of Biologists

... provides funding for organizing EMBO Courses & Workshops in Japan – application deadlines: 1 March and 1 July

... supports keynote lectures given by EMBO Members at conferences held in Japan – applications open all year around

... supports keynote lectures given by EMBO Young Investigators and EMBO Global Investigators at conferences held in Japan – applications open all year around

... offers travel grants, childcare grants, accessibility grants (as of 2026) and fee waivers for scientists in Japan to attend EMBO Courses & Workshops in Europe, Chile, India, Singapore and Taiwan.

## EMBO Press

publishes five journals that serve the global life science community: The EMBO Journal, EMBO Reports, EMBO Molecular Medicine, Molecular Systems Biology, and Life Science Alliance, which is published in partnership with Rockefeller University Press and Cold Spring Harbor Laboratory Press.

Find more EMBO schemes at [embo.org/funding](https://embo.org/funding)

embo.org  
Information as of January 2025  
Contact: [communications@embo.org](mailto:communications@embo.org)  
Cover: Original image courtesy of Jos Wendrich and EMBO Young Investigator Bert De Rybel/VIB/Ghent University

# Focus on Japan



# Facts and figures

The island nation of Japan is an archipelago of more than 14,000 islands including the five main islands of Hokkaido, Honshu, Shikoku, Kyushu and Okinawa. Mountainous regions including hilly terrain accounts for about three-quarters of its total area of 377,974 square kilometres.<sup>1</sup>

A parliamentary constitutional monarchy, Japan has a technology-driven economy and is a major exporter with a large proportion of high value-added products manufactured with advanced technology.<sup>1</sup>

Japan has 810 universities including graduate schools, in addition to numerous technical and specialized training institutions and a network of national research institutes including RIKEN, a National Research and Development Agency, and the Japanese Aerospace Exploration Agency. As of May 2023, there were 2.95 million students enrolled in Japanese universities.<sup>2</sup> The University of Tokyo is the nation's oldest, founded in 1876.<sup>3</sup>

Total expenditure on research and development (R&D) in the fiscal year 2023 was 3.7% of Gross Domestic Product. The total of 22 trillion Yen (approximately Euro 136 billion) was 6.5 per cent higher than the preceding year and the highest ever.<sup>4</sup>

The business sector accounted for 73% of total R&D expenditure, universities and colleges 18%, and the non-profit and public sector 9%.<sup>4</sup> More than 940,000 people in Japan were employed in R&D work in 2022.<sup>5</sup>

Japan ranked 3rd globally in the number of patent applications filed in 2023, with a total of 414,479 applications, including 228,936 domestic applications, which was a rise of 4.6% over the previous year.<sup>6</sup>

Japan's science, technology and innovation policy is set every five years, with the current Sixth Basic Plan commencing in 2021. The Plan identifies the key role of science and technology in tackling global issues including climate and global security concerns, and in delivering benefits to every citizen.<sup>7</sup>

Public funding for research is available through the Japan Society for the Promotion of Science, and the Japan Science and Technology Agency.<sup>8</sup> EMBO and the JSTA signed a memorandum of cooperation in 2023. In May 2020, the European Union and Japan signed a letter of intent to strengthen cooperation in science, technology and innovation.

## Key figures

Population: 123.8 million<sup>9</sup>

R&D spending: 3.7% of GDP<sup>4</sup>

People employed in R&D in 2022: 940,069<sup>5</sup>

Patents: 414,479<sup>6</sup>

Higher education institutions: 810<sup>2</sup>

Higher education enrolment: 2.95 million<sup>2</sup>

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<sup>a</sup> In Japan as of January 2025  
<sup>b</sup> 2019 to December 2024  
<sup>c</sup> Awarded to scientists based in Japan for training abroad 2019 to December 2024



# Perspectives from Noriko Osumi

Vice President of Tohoku University and EMBO Associate Member



## How did your initial interest evolve into this current focus?

I have always been fascinated by the dynamic process of change over time. How does a single cell develop into a complex organism and as animals age how do diverse organisms evolve? These intricate processes are precisely orchestrated, and they fascinate me! I also have a strong interest in psychology, particularly in understanding how individual differences shape behaviour and cognition. This interest aligns with my commitment as Vice President for my university in promoting diversity, equity and inclusion. I believe that recognizing the differences between people is an essential starting point for creating a more inclusive environment.

## How did you react to the election as an EMBO Associate Member?

It was a great honour for me and underscores EMBO's recognition of the scientific excellence beyond Europe. For Japan, EMBO has a crucial role in fostering global connections, promoting high quality research and supporting young scientists, particularly through the collaboration of EMBO and the Molecular Biology Society of Japan (MBSJ). A notable example of this partnership are the joint workshops at the MBSJ annual meetings. I have attended these workshops several times and had the privilege of giving a talk last year.

Through my EMBO involvement, I strive to strengthen the bridge between Japanese researchers and international society, encouraging greater participation in the enabling programmes and initiatives. Unfortunately, not all younger Japanese generations know about EMBO, and I would like to advertise the opportunities better.

ment can lead to the diverse pattern of the brain formation ultimately shaping the individuality of each person. This variability contributes to the rich capacity of human neurodiversity, and in a modern society the advancing average age of marriage and parenthood has shifted significantly, with many people having children later in life compared to a century ago.

As diversity becomes more evident it challenges us to rethink societal norms and practices. We must foster inclusivity not only in education and employment but also in health care and social policies to accommodate the unique strength and the needs for the individuals across the diversity spectrum. By understanding and embracing these differences, we can build a more supportive and equitable society.

## Can you tell us about your personal research and its aims?

My lab focuses on uncovering the molecular mechanism of brain development and developmental disorders. Our recent research is centred on kinesin 23, which we have demonstrated to be crucial for neurogenesis in the developing neocortex.

In addition, we are pursuing a unique line of research exploring the paternal effect on offspring development and we have developed a mouse model showing that advanced age increases neurodiversity, with epigenetic mechanism playing a very important role.

Parental age is one of the highest risks for neurodevelopmental disorders such as autism spectrum disorder. So where might this lead? Any differences in the mechanism of brain develop-

## Is international mobility a particular issue for younger Japanese?

Unfortunately for the past 20 years there has been a gradual decrease in the number of Japanese young people studying abroad. Part of the reason is that Japan is very safe and clean. They need to take a risk and move outside their comfort zone. We need to encourage them to go abroad and open their eyes.

Japanese academia is more and more internationalized nowadays. The Japanese population is shrinking, so we need to accept more international people especially at higher academic levels as well. Experience outside Japan can be highly valuable for future jobs.

## What advice would you give a student considering a career in life sciences?

First, stay curious and embrace the joy of discovery. Pursue questions that genuinely excite you as passion is essential. Build resilience in this challenging field by engaging with your mentors and peers as asking questions and fostering discussions will greatly enrich your journey.

Second, uphold research integrity! Even small achievements should be conducted with fairness and honesty. In this era of open science, data are increasingly shared and utilized by others, making your contributions equally valuable. Your data are not just your own, they are part of your scientific community and can serve as a foundation for the work of others.

Finally, collaboration with interdisciplinary teams is key. Don't hesitate to step outside your comfort zone. Explore new techniques to broaden your knowledge and skills and present your work at international meetings to connect with diverse people and perspectives.

Science is a marathon, not a sprint. Celebrate small victories along the way and remain open to new opportunities and directions. The journey is itself is as rewarding as the destination.

# Meet scientists from the EMBO communities



## Yukiko Goda Connecting minds

Professor at the Okinawa Institute of Science and Technology | EMBO Associate Member

EMBO Associate Member Yukiko Goda leads pioneering work into how synapses in the brain communicate. Yet it was perhaps down to her own language hurdles when her parents moved their family to Canada from Japan, that she found herself drawn to science.

"I call myself an accidental scientist because I was always more interested in literature," says Goda, who is a group leader at the Okinawa Institute of Science and Technology (OIST), Japan. "At university, I had tremendous experiences as an intern in organic chemistry and gene regulation labs, and this got me really interested in pursuing a career in research."

It was an unexpected connection that landed Goda a role as a postdoctoral researcher at the Salk Institute in the US. "I happened to be visiting an institute at the same time as my future group leader, Chuck Stevens," she says. "I wanted to connect my research with electrophysiology, which is used to study how neurons transmit information in the nervous system. We were introduced and struck up a really nice conversation – he invited me to join his group on the spot."

Goda has since gone on to head her own teams in the US, Europe, and now Japan, leading research into how synaptic connections form, function, and adapt – and more recently into the role of abundant glial cells called astrocytes. "Until relatively recently, it had been widely thought that astrocytes just played a passive supportive role in the nervous system," she explains. "But it turns out this highly abundant type of glial cell play central roles in maintaining the health and function of the brain."



## Ryosuke Tanaka Understanding cognition through psychology and neuroscience

Postdoctoral researcher, Institute for Neuroscience, Technical University of Munich | EMBO Postdoctoral Fellow

Beginning his academic career in cognitive sciences, Ryosuke Tanaka chose to move from human psychology to animal studies through neuroscience. "I found human behaviour research limiting, as reaching definite, mechanistic explanations is extremely difficult there", he says. "Meanwhile, small model organisms offer real explanatory power."

After completing a PhD at Yale University as part of the Interdepartmental Neuroscience Program, Tanaka was granted an EMBO Postdoctoral Fellowship and chose to move to Germany for his postdoctoral research. His work now focuses on zebrafish, where he investigates cognitive functions like memory, attention and decision-making by reverse-engineering neural circuits. The zebrafish's small, transparent brain allows for detailed imaging and precise neural manipulation, making it an ideal system for studying cognition.

"Being in different countries has given me a higher-resolution view of how science is structured," Tanaka notes. "I would recommend to any researcher to experience multiple environments – it is not just about the science, but also about seeing different ways of thinking and making connections."

Ryosuke Tanaka also acknowledges that the EMBO Postdoctoral Fellowship has provided him with a level of independence that is rare for postdoctoral researchers allowing him to pursue his own research direction. The fellowship also strengthened his professional network, connecting him with other researchers across Europe. Tanaka is now looking at combining diverse methodologies to uncover how small neural circuits give rise to complex cognitive functions.



## Koichi Sasaki A Learning journey from Kyushu to London

Research associate at Imperial College London | EMBO Postdoctoral Fellow

EMBO Fellow Koichi Sasaki knew early on that he was interested in pursuing research opportunities outside Japan. He initially worked as a JSPS (Japan Society for the Promotion of Science) Overseas Research Fellow at Imperial College London after graduating with a PhD from Kyushu University and was awarded an EMBO Postdoctoral Fellowship in 2023. "I always wanted to do research in an international setting", he notes. "This goes from a very practical level with a desire to improve my English proficiency to immerse myself in a new academic culture and to learn to solve problems in a different way."

Becoming an EMBO Postdoctoral Fellow was a pivotal step in Sasaki's journey. While Sasaki was already aware of the immediate advantage of conducting research with greater autonomy, the networking opportunities at the Annual EMBO Fellows Meeting provided an additional layer of benefits that he had not anticipated.

"I was able to connect with a very dynamic scientific network", he says. "I met amazing scientists who share passion for science and inspire each other in scientific and philosophical perspective. I think that the wonderful atmosphere of this community is made possible by people from all over the world coming together. The EMBO Postdoctoral Fellowship is a stepping stone in my career and a foundational step for me."

Looking ahead, Sasaki hopes to continue working globally to further refine his soft skills and to contribute to innovative research. "My ambition is to engineer molecular systems for therapeutic applications in diseases that are currently untreatable", he concludes. "I am fascinated by the beauty of molecular systems and the possibility to engineer completely new cellular functions in order to develop new therapies in the future."