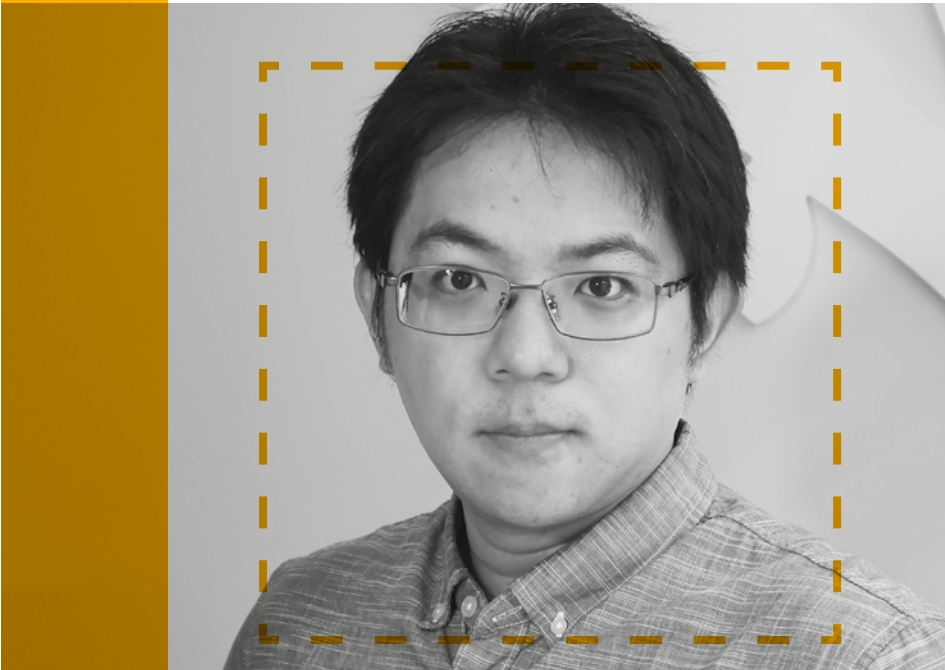


# Meet scientists from the EMBO communities



## Cheng-Ruei Lee Seeds of science

**Associate professor, National Taiwan University, Taipei, and EMBO Global Investigator (2021 – 2025)**

EMBO Global Investigators embark on all kinds of different ways of networking and collaborations. For Cheng-Ruei Lee, one of the most memorable experiences saw him spending time at one of the world’s largest seed vaults at the National Agriculture and Food Research Organization in Tsukuba, Japan, to further his group’s research on the evolution and ecology of crops and their wild relatives.

“My team is interested in looking at the evolutionary genomics of the wild and cultivated varieties of crops such as mung beans,” says Lee, who is an associate professor at the National Taiwan University in Taipei. “We want to understand how, when, and where

these crops were domesticated, the traits that made domestic varieties edible, and what has happened since. The work could help specialists to predict whether certain crops could be suitable for specific environments depending on genetic characteristics.

“My visit to Japan provided an opportunity to access fascinating seed samples, to explore aspects in detail, and discuss new ideas with experts in a wide range of different fields. I have always been interested in history and biology, and this work presents the opportunity to bring these two passions together and work to understand the bigger picture of crop domestication, something that is particularly important in responding to global challenges such as the climate crisis. As this work is international in nature, being an EMBO Global Investigator has been critical in facilitating interactions that can take our work forward: it’s been a tremendous experience so far.”



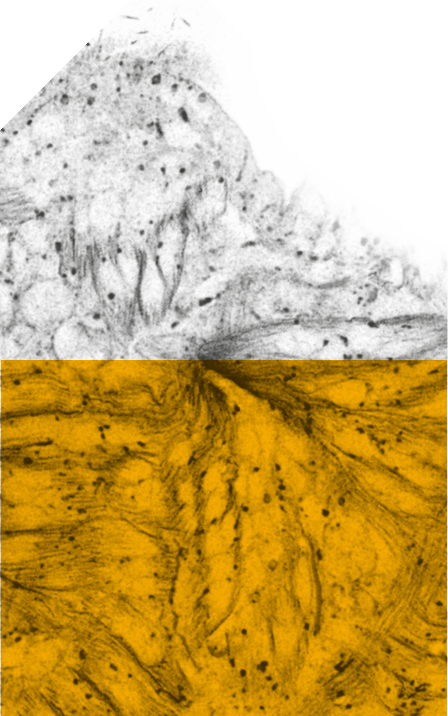
## Matthew Paul Su Perfect timing

**Designated assistant professor, Nagoya University, Japan, and EMBO Scientific Exchange Grantee (2018)**

Flexible funding, superb science, and tremendous timing: elements that Matthew Paul Su says defined his three-month EMBO Scientific Exchange at Taiwan’s National Institute of Infectious Diseases and Vaccinology in Zhunan, where he learned how to develop and apply gene editing techniques to his group’s studies of mosquito biology.

“Mosquito-borne diseases affect hundreds of millions of people around the world each year, and the current tools that we have to control mosquitoes are often insufficient,” says Su, now an assistant professor at Nagoya University, Japan. “For humans, hearing the high-pitched buzz of a female mosquito can spell trouble – however, for male mosquitoes it’s great news because they find females by listening for this sound. There is a lot that we don’t know about the biology underlying this behaviour, and the connections between mosquitoes’ circadian clock, hearing, and mating habits. By learning more about this fundamental biology, I hope one day we will be able to support the development of more effective mosquito population control methods”.

“In 2018, CRISPR/Cas9-based mosquito gene editing methodologies were still relatively new and, thanks to my EMBO Scientific Exchange Grant, I was an early adopter of applying these methodologies in mosquitoes. This has opened every kind of door for me, enabled my group to vastly expand our research, and forged collaborations that are still going strong,” adds Su, who carried out the work in the group of Chunhong Chen. “My time was amazing: researchers have an international outlook and are extremely welcoming, and the country is incredibly beautiful. I would highly recommend it to anyone.”



## Yen-Ping Hsueh Mind the trap

**Associate professor at Academia Sinica, Taipei, and EMBO Young Investigator (2021 – 2025)**

Like many scientists during the COVID-19 pandemic, EMBO Young Investigator Yen-Ping Hsueh missed the networking benefits of face-to-face contact. So, when she was invited to join an EMBO delegation on a multi-city visit to India to deliver seminars on her studies of predator-prey interactions of carnivorous fungi and roundworms, she jumped at the opportunity.

“Roundworms, also known as nematodes, are the most abundant animal on the planet and have adapted to almost every ecosystem: from ocean trenches to Himalayan plateaus,” explains Hsueh, who is an associate professor at Academia Sinica, the National Academy of Taiwan, based in Taipei City. “However, they can fall victim to some improbable predators – carnivorous fungi that lay traps that paralyse them ready for consumption. We want to understand the mechanisms driving these unique interactions from the perspectives of both the fungi and the worms, including how traps are developed, how worms get

caught, how they respond when they encounter a predator, and how these interactions shape co-evolution.

“The EMBO Young Investigator Programme has provided wonderful experiences that have enabled me to develop international connections that have opened up new avenues in my research. I have also benefited from training courses in lab management and scientific writing, and even had the chance to co-organize workshops for students and junior faculty. Thanks to these collaborations, training and networking opportunities available to us on the vibrant Academia Sinica campus, almost any experiment we can dream up, we can make happen.”



## Chih-Yi Gabriela Lin Inspiring connections

**Research scientist at MiNA Therapeutics, London, UK, and former EMBO Postdoctoral Fellow (2019-21)**

In January 2012, Gabriela Lin, then a PhD student, attended a week-long lecture course in Taipei City on the logic of regulatory circuits, organized by Academia Sinica and EMBO. “Specialists from all over the world came and presented an incredible range of studies, some completely new to me,” she recalls. “It showed me the best science is global, collaborative and done without limitations – it was inspirational.”

During the course, Lin learned about opportunities for researchers to work overseas, and when it came to her next career stage, she immediately turned to the EMBO Postdoctoral

Fellowship Programme. “Even at the interview stage, I received invaluable suggestions for my project,” says Lin, who carried out studies on the proteome of telomeres in the group of EMBO Member Joachim Lingner at the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. “Telomeres are crucial for maintaining chromosome structure and genome stability, and their biology is closely associated with ageing and age-related diseases. My project aimed to improve understanding of what happens to telomeres in health and disease.”

“Life science research requires such a diverse skill set, including critical thinking, communications, logic, project management, leadership and teamwork. Through my practical work and EMBO Training Courses I have further developed my abilities in these areas. The EMBO support system was critical to the success of my project and has equipped me with everything I need for the next steps in my career.”



# EMBO communities in numbers



# EMBO opportunities

## EMBO Postdoctoral Fellowships

support excellent postdoctoral researchers throughout Europe and the world for a period of up to two years. International mobility is a key requirement. Applications open all year around.

## EMBO Scientific Exchange Grants

fund research exchanges of up to three months. The grants facilitate collaborations with research groups with expertise, techniques, or infrastructure that is unavailable in the applicant's laboratory. Applications open all year around.

## EMBO New Venture Fellowships

help early career scientists to explore topics outside their current area and enter a new research direction. They fund research visits of up to three months. Applications open all year around.

## The EMBO Young Investigator Programme

supports group leaders 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.

## The EMBO Global Investigator Network

supports group leaders setting up their laboratories. Global Investigators receive financial support for four years for training and networking activities, providing them with opportunities to form collaborations with scientists in their region and in Europe. Application deadline: 1 June.

## EMBO Courses & Workshops

stimulate exchanges of the latest scientific knowledge and provide training in experimental techniques. Deadlines for applications for funding: 1 March and 1 August.

## EMBO Global Lecture Courses

enable scientific exchange beyond European borders. They teach participants, primarily PhD students and postdoctoral researchers, about a particular topic in the life sciences. Deadlines for applications for funding: 1 March and 1 August.

## EMBO Member and Young Investigator Keynote Lectures

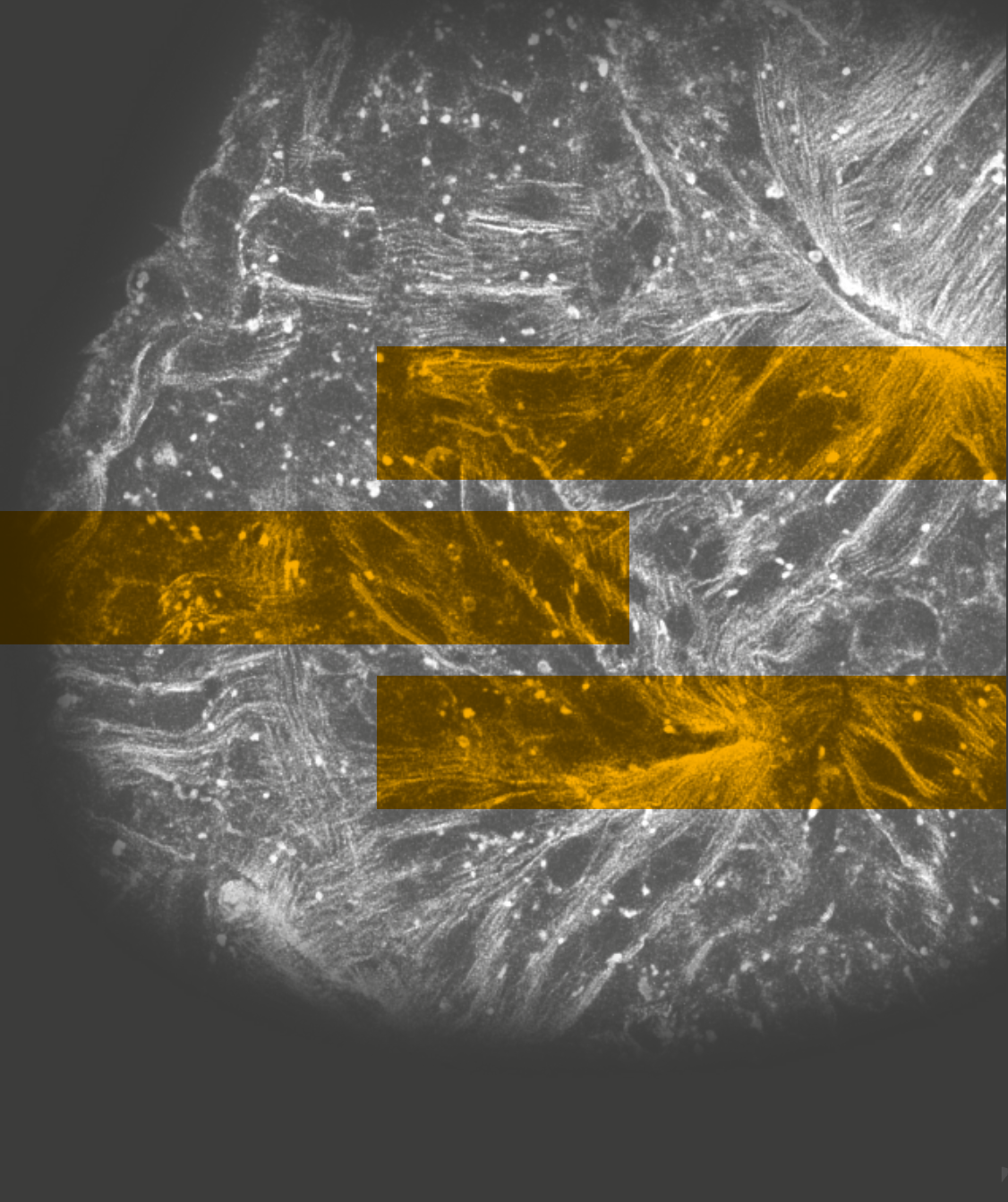
provide funding for EMBO Members, Associate Members and Young Investigators to give keynote lectures at international conferences. Deadlines for applications: 1 February, 1 June and 1 October for EMBO Members. Applications open all year around for Young Investigator Keynote Lectures.

## 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 October 2023  
Contact: [communications@embo.org](mailto:communications@embo.org)  
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# Focus on Taiwan

# Facts and figures

Taiwan boasts a favourable location, competitive economy, and talented scientific workforce<sup>1,2</sup>. It has more than 1.2 million students enrolled across nearly 150 higher education institutions<sup>3</sup>.

Recognized as a global leader in the IT, semiconductor, and electronics industries, Taiwan also excels in life science fields<sup>4</sup>. It is home to several renowned clusters of excellence with academic and business organizations specializing in areas such as plant and animal science, precision medicine, medical technology, and clinical trials<sup>5</sup>.

In 2021 gross expenditure on research and development (GERD) was 3.78% of GDP<sup>6</sup>, one of the highest rates in the world<sup>7</sup>. Business enterprise financed 84.2% of GERD expenditure<sup>8</sup>.

Major funding agencies include the National Science and Technology Council (NSTC)<sup>9</sup> and the Ministry of Economic Affairs (MOEA)<sup>10</sup>, which support academic researchers and SMEs respectively. Taiwan participates in over 100 international research cooperation programmes with more than 40 countries and several international organizations<sup>11</sup>. These include joint research projects, joint conferences, facilities sharing, reciprocal visits, and information exchange. Research institutions have been active participants in the EU's research framework programmes<sup>12</sup>.

There are diverse programmes to foster creativity and interactions between academia and industry<sup>13</sup>. Taiwan implements strong intellectual property protections and patent safeguards<sup>14</sup>. In 2021, 59,476 patents were granted<sup>15</sup>.

## Key figures

Population: 23.4 million<sup>15</sup>

R&D spending: 3.78% of GDP<sup>16</sup>

Total researchers: 208,660<sup>16</sup>

Researchers per 1,000 employed: 14.7<sup>16</sup>

Researchers in higher education: ~49,800<sup>17</sup>

Researchers in business enterprise: ~136,300<sup>17</sup>

Researchers in government sector: ~21,900<sup>17</sup>

Higher education institutions: 149 with 1.2 million students<sup>18</sup>

International students: ~130,000<sup>19</sup>

PhD students: 28,907<sup>18</sup>

Publications: 37,596 (Science Citation Index Expanded)<sup>17</sup>

Patents granted: 59,476<sup>17</sup>

Number of SMEs: 1.59 million<sup>20</sup>

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