

# Lithuania and EMBO in numbers<sup>a</sup>

**3**  
EMBO Members

**5**  
EMBO Short-Term Exchange Grants

5 researchers from Lithuanian institutions were awarded a Short-Term Exchange Grant to another institution from 2019 to 2024

**4**  
EMBO Installation Grantees

**EMBO Courses & Workshops**

95 attendees from Lithuanian institutions attended EMBO-funded courses and workshops from 2019 to 2024

**2**  
EMBO Postdoctoral Fellows

## EMBC Delegates

**Milda Jodinskiene**  
Research Council of Lithuania

**Virginijus Sikšnyš**  
Vilnius University

The EMBO Programmes are funded by the European Molecular Biology Conference (EMBC), an inter-governmental organization that comprises 31 member states.

Lithuania has been an EMBC Member State since 2016.

# EMBO opportunities in Lithuania

## EMBO Postdoctoral Fellowships

fund internationally mobile researchers for a period of up to two years. 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.

## 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.

## EMBO Courses & Workshops

stimulate exchanges of the latest scientific knowledge and provide training in experimental techniques. Application deadlines: 1 March and 1 July.

## 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](https://embo.org)  
Information as of March 2025  
Contact: [communications@embo.org](mailto:communications@embo.org)  
Cover: Original image courtesy of Ana Faro and EMBO Member Stephen Wilson

# Focus on Lithuania



# Perspectives from Saulius Klimašauskas

Distinguished research professor at Vilnius University |  
EMBO Member



inside live cells. Now we are working with redesigned mammalian cells are trying to adapt these systems for epigenetic studies *in vivo*.

## What encouraged you along that path?

Because of my specific background, I worked in a niche that I created myself, but it was interesting to others as well. There are only a few groups in the world working along similar lines, so we collaborated. But it is not like most mainstream research areas where you have to be very fast! We are creating methods and tools. We are like engineers creating tools for other research groups. The response is not always immediate. It takes a few years for others to realize, and we have to publish a few papers to show that the tools work.

## How did you start your research career?

I graduated as an organic chemist, then switched to bioorganic chemistry and then started working on bacterial DNA methyltransferases – first the biochemical aspects and later sequencing and structural comparisons. During five years as a postdoc at Cold Spring Harbor Laboratory in the US, we discovered an amazing mechanistic feature of these enzymes called DNA base flipping. This has been the focus of my research for more than a decade when I returned to Lithuania and started my own research group here.

In 2005, in collaboration with German scientist Elmar Weinhold, I came up with the idea that we could re-engineer these enzymes to turn them into tools for labelling their substrates in DNA and RNA. We then developed robust methods for epigenome profiling to label unmethylated CpG sites in the genome. We could then extract them, analyze them and do high resolution mapping.

Lately we have turned to similar engineering of much more complex mammalian DNA methyltransferases

## Do you have an idea where this might lead?

We have licensed some of these tools. A company in the UK will use them for developing early detection methods for cancer from liquid biopsies from blood or saliva using covalent labeling as this is very robust and one can achieve high sensitivity.

For other methods, people use antibodies and these have non-covalent interactions, so are not that robust. With genetic information you can extract a sequence and pick up mutations, but these mutations are not abundant, and you need a much more advanced stage of disease to detect them.

If you track epigenetic modifications, and you map them, then you have these markers which are more sensitive. Every cell in an organism has the same genome, but epigenomes vary in a cell type, or disease state-specific manner, so you can determine from which organ the particular DNA came and have an indication where to look with other tools.

I am still carrying out a combination of fundamental and applied research but need somebody else to bring our tools to real medical applications.

## What drives you?

Curiosity and maybe some creativity. You want to create, like an improvising performer in a way. Being able to modify things the way you want means you probably do understand how they really work. Otherwise, you can say 'this is important' but it is very hard to prove it.

## How important is EMBO for the life sciences in Lithuania?

It is really important. We have Postdoctoral Fellowships and Installation Grants, and the status and the connections these people get is important. They become part of a bigger community and can unlock their potential much better. I have heard this from many people here who were awarded these grants.

## What has the election to the EMBO Membership meant for you?

It meant high recognition and prestige, especially locally. It opened many doors for me, and I believe it led to this special distinguished professorship – there are only eight in the whole university from different fields. EMBO Membership is a “proof of quality” because from Lithuania and smaller countries sometimes people don't know what to expect.

## Would you call yourself a chemist or a biologist or both?

My thinking is still more “chemical thinking”, and my publications are often in chemistry journals. But it is a mix: chemistry is a powerful tool to help address complex biological questions.

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

The most important thing is to have good teachers and advisors to help you work out how to think and how to behave, and you have to be happy with your work!

# Meet scientists from the EMBO communities



## Jorūnė Sakalauskaitė Studying ancient proteins

Researcher at the Vilnius University Life Sciences Center | Former EMBO Postdoctoral Fellow

Jorūnė Sakalauskaitė says her EMBO Fellowship came at a critical time in her career. “When I finished my postdoc in Denmark, I was unsure whether to stay in science,” she says. “The EMBO Fellowship confirmed that what I was doing is actually interesting to other scientists and worth pursuing. It was the important transition to where I am now.”

Her research is in the field of palaeoproteomics, and she is working closely with archaeologists and marine biologists. “I use mass spectrometry techniques to study proteins, and I am looking at an ancient protein in mollusc shells especially during the Neolithic time in Europe, about 6,000 to 8,000 years ago, when shells were used as jewelry objects”, Sakalauskaitė says.

“We find Mediterranean species spread across Central Europe and the north. That helps us to understand how people were connected through trade routes in the past. We work very closely with archaeologists who have a question, and we have the tools that can help provide answers”, she explains.

Sakalauskaitė's research also has a more fundamental driver: why are proteins preserved so well in some mineralized tissues? “A protein in solution does not last long, but we can find proteins in mineralized tissues for millions of years. Why are they there?” she says, adding that proteins can be found in ancient mollusc or egg shells or human teeth enamel. “Proteins have been found in teeth that are several million years old, from Asian hominids!” Sakalauskaitė says.



## Algirdas Toleikis Studying molecular motors

Group leader at the Vilnius University Life Sciences Center | EMBO Installation Grantee

Algirdas Toleikis became fascinated by molecular motors during his postdoctoral research at Warwick University, UK, and, thanks to an EMBO Installation Grant, now he studies helicases in his own laboratory in Vilnius. “I remember when I saw for the first time this purified molecule, which is just a protein, just one molecule, and I put it on a glass slide, and I saw that it actually moved! It knows its job and it does its thing although it is a single molecule with no brain, nothing”, Algirdas Toleikis says.

“I like imagining molecular motors as cars in a busy city: to navigate the city you need to be quite intelligent, you need to know how to drive the car, and you need to know what you are doing on the road. By the same comparison, when I think about molecular motors, that just blows my mind.”

Toleikis' journey from postdoc to group leader included more than a year working as a computer programmer while applying for funding. But his heart remained in research.

“Sometimes people want a less risky and permanent job without the hassles of the academic arena. But, it is boring! I wanted to go back to this risky and adventurous world,” he says. His EMBO Installation Grant made the transition back to academia possible and it has been “absolutely amazing”.

Toleikis says his grant is also helping research administration become more flexible and efficient. “Local administrators might say ‘you cannot do this or that’. Then I come back with my EMBO Installation Grant agreement. So I keep pushing and suddenly it becomes possible,” he says.