

# Slovakia and EMBO in numbers

**2**  
**EMBO Members<sup>a</sup>**

**13**  
**EMBO Postdoctoral Fellows<sup>b</sup>**

**119** researchers from Slovakian institutions attended EMBO-funded events abroad<sup>c</sup>

<sup>a</sup> Slovakian citizens  
<sup>b</sup> Former and current Fellows from or in Slovakia  
<sup>c</sup> 2020–25

## EMBC Delegates

**Marcel Sládok**  
Ministry of Education, Science, Research and Sport

**Professor Ján Turna**  
Science Park of Comenius University

The EMBO Programmes are funded by the European Molecular Biology Conference (EMBC), an inter-governmental organization that comprises 32 members states.

Slovakia has been an EMBC Member since 2007.

# Facts and figures

The Slovak Republic is a landlocked country in central Europe created by the division of the former Czechoslovakia in 1993. A parliamentary democratic republic, Slovakia is a member of the European Union and of the North Atlantic Treaty Organization.<sup>1</sup>

Slovakia has 33 higher education institutions including the country’s oldest university – the Pavol Jozef Šafárik University in Košice founded in 1657.<sup>2</sup> Around 26% of Slovak adults attain a tertiary education.<sup>3</sup>

The World Intellectual Property Organisation’s Global Innovation Index 2024 ranked Slovakia 29th of 39 economies in Europe and 46th globally.<sup>4</sup> In 2023 the country had more than 24,300 full-time person equivalent working in R&D.

Gross expenditure on research and development (GERD) increased by 65% between 2019 and 2023 to reach 1.28 billion Euro or 1.04% of Gross Domestic Product. The main sectors financing GERD in 2022 were the private business sector providing 47%, government with 34% and inward investment contributing 17%.<sup>5</sup>

## Key figures

**Population: 5.42 million<sup>1</sup>**

**R&D spending: 1.04% of GDP<sup>5</sup>**

**People employed in R&D: 24,330<sup>5</sup>**

**Patents: 30<sup>6</sup>**

**Higher education institutions: 33<sup>2</sup>**

**Horizon Europe funding:<sup>8</sup>**

**472 organizations including 109 SMEs involved in Horizon Europe activities**

**1 ERC principal investigators**

**52 Marie Skłodowska-Curie Actions funded researchers**

The European Patent Office granted 30 patents to residents of Slovakia in 2024.<sup>6</sup> Life scientists in Slovakia have access to funding from the Slovak Research & Development Agency, the Science Grant Agency, private sources,<sup>7</sup> and through Horizon Europe and Marie Skłodowska-Curie Actions<sup>8</sup> as well as EMBO.

References  
1. European Union, country profile Slovakia  
2. Slovak Academic Information Agency, Study in Slovakia:  
3. Eurostat, Population by educational attainment level, sex and age  
4. WIPO 2024, Global Innovation Index 2024  
5. OECD Data Explorer, Main Science and Technology Indicators  
6. European Patent Office, Patent Index 2024  
7. Slovak Academic Information Agency, Research in Slovakia  
8. European Commission, Horizon Europe country profile

# EMBO opportunities in Slovakia

## 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.



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

## 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.



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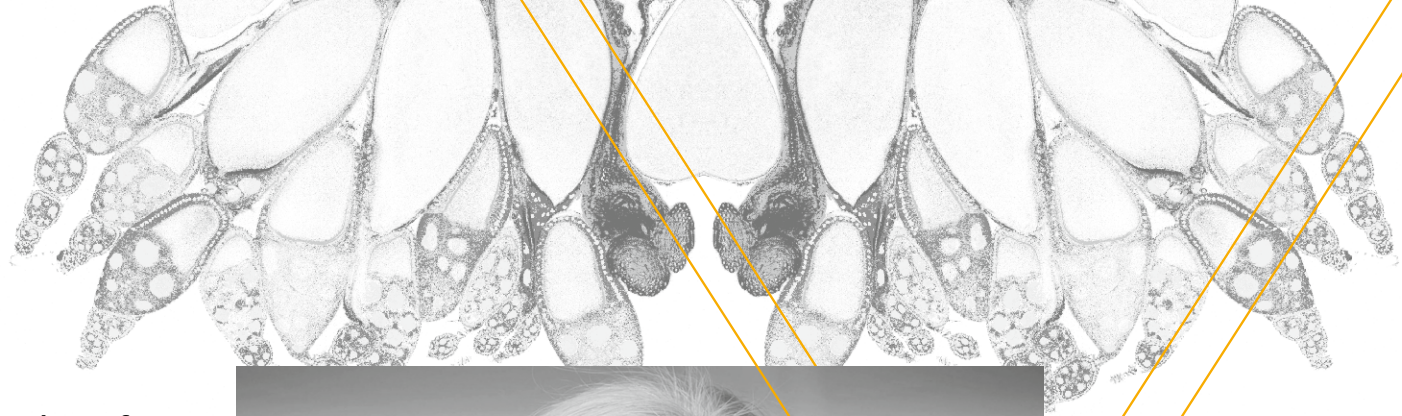
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# Focus on Slovakia







## Silvia Pastoreková Unpredictable pathways

Director General of the Biomedical Research Center of the Slovak Academy of Sciences | EMBO Member

When Silvia Pastoreková was doing her PhD, she initially focused her study on the puzzles of virus genetics and their possible roles in human cancers. However, the project, carried out under the guidance of late EMBO Member Jan Závada, was led in unexpected directions when a monoclonal antibody that she produced as part of the project serendipitously enabled the identification of an enzyme called carbonic anhydrase IX (CA9), which can play a key role in the survival of cancer cells.

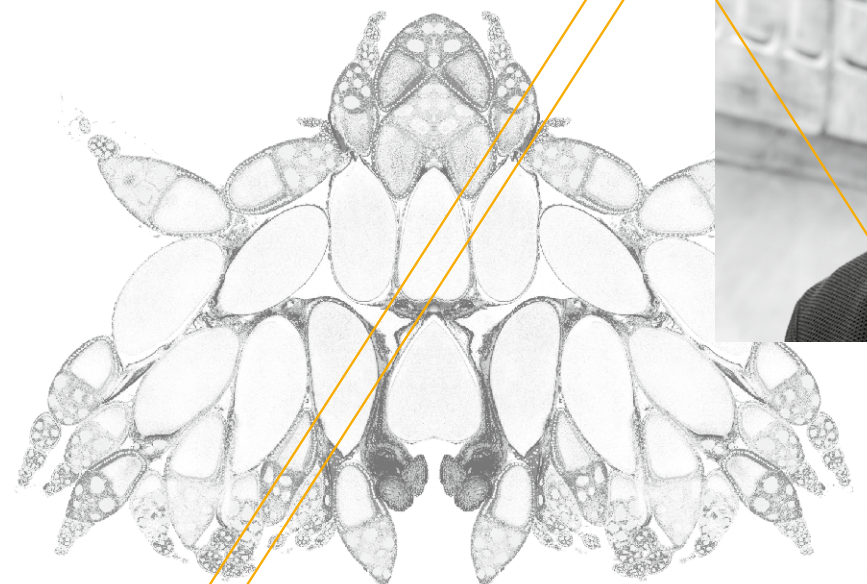
“My team’s research is focussed on understanding the molecular mechanisms of how cancer cells adapt to conditions such as low oxygenation and acidosis in the tumour microenvironment,” says Pastoreková, who is Director General of the Biomedical Research Center of the Slovak Academy of Sciences in Bratislava.

“CA9 belongs to a family of enzymes that are present in all living organisms and help to regulate pH and ensure a balance necessary for healthy physiological processes. However, unlike other CA family members, CA9 can assume this role primarily on the surface of cancer cells, thereby supporting their survival, invasiveness, and ability to spread. Moreover, the expression of CA9 is induced by low oxygen conditions, allowing cancer cells to adapt and acquire aggressive behaviours. The work opens opportunities to identify biomarkers and develop cancer therapeutics that target tumours that express this key enzyme.”

At home, Pastoreková keeps paper and pencil ready by her bedside to capture any ideas that might come in the night, often flowing from discussions with team colleagues, and with her husband and research partner Jaromir, immunologist son Michal, and architect daughter Laura.

“My family has been the strongest pillar of my personal and professional life, together with the international connections and friendships we have created through our work,” says Pastoreková, who has previously represented the Slovak Republic in the EMBC (2007-2019), the EMBO funding body.

“My experiences with EMBO have been very positive, and I am very proud to now become an EMBO Member. It provides me with a superb opportunity to further connections between EMBO and Slovak researchers. I will use the position to promote the EMBO opportunities to our young researchers, spread awareness of Slovak science across Europe, and get inspired by the excellent research that is carried out by members of the EMBO community.”



## Meet scientists from the EMBO communities



## Ondrej Belan Understanding viral interaction with cancers

Postdoctoral researcher at the Brigham and Women’s Hospital and Harvard Medical School | former EMBO Postdoctoral Fellow

Piešťany on the Váh River is Slovakia’s best-known spa resort and although virologist Ondrej Belan grew up there he never visited the spa. He has instead contributed to the Slovak economy by encouraging colleagues from Harvard Medical School to visit his native country.

The EMBO Postdoctoral Fellow is also contributing to Slovak and global science through his research into understanding viral transmission of cancers. “I originally studied medicine but switched to biochemistry. My PhD was on very basic biophysical technology, but I wanted to move into genetic technology that could potentially have more impact,” he says.

Belan says it was towards the end of his PhD during the global COVID pandemic that he decided to move into immunology. “I wanted to do research that was more easily translatable into tangible outcomes like cures for known diseases,” he says.

His EMBO Postdoctoral Fellowship enabled Belan to join Stephen J Elledge’s lab in the United States. “My current lab is perfect because they have developed a lot of new technological approaches although it is still purely focused on tangible outcomes,” he says. “EMBO was my primary sponsor for the postdoc.”

Belan says he was encouraged to apply for the Fellowship by successful friends. “They were very happy with the programme. It was really great, and the application process helped me frame my research project,” he says.

Belan says the group uses synthetic biology techniques to create a ‘synthetic human viral library’ containing every gene from every virus that infects humans.

“The question I am asking is: which of these genes cause cancer?” he says. “Noone has been able to investigate this at scale because there are so many viral genes, so it is too difficult to examine. But now we can take these viral genes, and using mouse cancer models you can inject the tumour *in vivo* so that every cell has a viral protein in it.”

The technique allows the group to sequence the subsequent tumour to identify which viral gene is able to evade the immune system and thus proliferate. “There are so many viruses, and we do not know precisely how they cause cancer. That is what I am working on,” Belan says.

The group has also developed a technique to identify the antibodies for every virus that has infected an individual using a single drop of blood from that patient. “I have tested HIV patients and Hepatitis C patients, and we see the viral antibodies,” he says. “We can use this as a diagnostic tool. People can know if they have been infected with a certain virus and therefore might have a higher probability to develop a certain disease.”