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## **PRESS RELEASE**

### **One therapeutic vaccine platform to treat several forms of cancer: Madiha Derouazi and Elodie Belnoue named as joint finalists for European Inventor Award 2022**

- **Swiss biotechnologist Madiha Derouazi and French immunologist Elodie Belnoue nominated for European Patent Office (EPO) innovation prize for developing a therapeutic vaccine platform to potentially treat cancer – an achievement many thought was impossible**
- **Derouazi and Belnoue’s system allows the different components of a vaccine to be assembled in a way that helps it produce a strong immune response to the disease**
- **The team is currently developing therapeutic vaccines against metastatic colorectal cancer**

**Munich, 17 May 2022** – The European Patent Office (EPO) today announced that Swiss biotechnologist Madiha Derouazi and French immunologist Elodie Belnoue have been jointly nominated for the European Inventor Award 2022 for developing a new way of assembling vaccine compounds that could potentially be used to treat cancer.

Their technology platform, called KISIMA (which means “well” in Swahili), can be used to make therapeutic vaccines aiming to treat different types of cancer. These vaccines work by stimulating the body to produce a strong immune response to the disease. The invention could lead to an additional way of treating cancer, which causes one in six deaths worldwide and 20% of fatalities in Europe.

Other researchers have tried to develop therapeutic cancer vaccines, but have either not been able to provoke a strong immune response or the vaccines have only been effective in a few patients.

*“Derouazi and Belnoue have provided clinicians with a tool that could change how cancer is treated and save many lives,”* says EPO President António Campinos, announcing the European Inventor Award 2022 finalists. *“There are currently no similar solutions on the market, which is a testament to their ingenuity and perseverance.”*

Derouazi and Belnoue have been jointly nominated as finalists in the “SMEs” category, which recognises exceptional inventors in small companies with fewer than 250 employees and an annual turnover of less than EUR 50 million. The winners of the 2022 edition of the EPO’s European Inventor Award will be announced at a [virtual ceremony on 21 June](#).

### **Developing a cancer-fighting vaccine**

A biologist by training, Derouazi first became interested in developing therapeutic cancer vaccines during her post-doc at the French National Center for Scientific Research (CNRS). Unlike prophylactic vaccines, which prevent illness, therapeutic vaccines are used to treat patients who are already affected by helping the immune system fight the disease.

Derouazi was working on delivery systems for antigens (substances that induce an immune response in the body) and considered that cancer antigens could be used to stimulate the immune system to fight cancer – provided they could be effectively delivered into cells. At the same time, a friend was working on a delivery system to transport proteins into cells and Derouazi realised that a similar approach could be used to transport protein-based cancer vaccines. However, the idea of therapeutic vaccines to treat cancer was thought to be impossible by many. *“Nobody believed that you could modulate the immune system to target and fight against cancer,”* says Derouazi. *“Not even oncologists.”*

Derouazi moved to the University of Geneva where she began working on a way of assembling three essential components into a single molecule: a peptide (part of a protein) that can penetrate cells to deliver antigens, a cargo molecule containing antigens tailored to the type of cancer being treated, and another peptide molecule to boost the immune response. In 2012, she applied for a patent and set up a spin-out company, AMAL Therapeutics, to build the vaccine assembly platform and take her work towards market. Elodie Belnoue, whom she had met at the University of Geneva, was her first employee.

The researchers were driven by a desire to create a better way of treating cancer. *“Ten years ago, the treatment of cancer was based on chemotherapies, the prognoses often poor and the treatment opportunity was very low,”* says Derouazi. *“We were searching for alternatives. A therapeutic vaccine for modulating the immune system would certainly not have the same detrimental effect on life quality of the patients as what you have with chemotherapy.”*

In July 2019, AMAL Therapeutics was acquired by pharmaceutical company Boehringer Ingelheim for EUR 425 million, which was the largest biotech company exit in Europe that year. According to Derouazi, securing a patent was central to asserting the company’s value as a biotech start-up. *“Without a patent you have no chance because you have no product, you don’t have an invention that you can hold up and show,”* she says.

The team is currently focusing on using the platform to produce vaccines to treat colorectal cancer. The colorectal cancer vaccine is in early-stage human trials with the vaccine being tested on patients both on its own and in combination with immune-boosting drugs called checkpoint inhibitors.

The cancer vaccines produced with KISIMA are intended to complement existing cancer treatments, such as surgery, chemotherapy and radiotherapy, rather than replace them. Overall, the global cancer immunotherapy market is expected to grow by 12.6% from 2021 to 2026, reaching EUR 253 billion.

## **Notes to the editor**

### **About the inventors**

**Madiha Derouazi** studied biology at the University of Geneva before earning a Master’s of Science in biotechnology engineering from the Berlin Institute of Technology in 2000. In 2005, she completed her PhD in biotechnology at the Swiss Federal Institute of Technology in Lausanne, which was followed by a post-doc at CNRS in France. Here she realised she wanted to focus on cancer. In 2009, Derouazi was hired by the University of Geneva Hospital to lead an independent cancer vaccine project. A colleague remarked that her work was interesting and that she should try to patent it, which led her to found AMAL Therapeutics, where she is still CEO.

**Elodie Belnoue** graduated with a Bachelor of Science in biochemistry from the University of Paris XI in 1996, followed by a Master’s of Science in immunology at the University of Paris

V. She completed her PhD in immunology at the same university in 2002. Following her studies, Belnoue worked in the immunology department at the Cochin Institute in Paris, evaluating immunotherapies for liver tumours, before moving to Geneva in 2003 to work as a post-doctoral fellow in the Center of Neonatal Vaccinology and Immunology. In 2014, Belnoue joined AMAL Therapeutics as a senior scientist where she is responsible for coordinating research and development activities.

The inventors hold European patents [EP3270957B1](#) (granted 2020), [EP3270955B1](#) (granted 2020) and EP2895499B1 (granted 2019).

### **About the European Inventor Award**

The [European Inventor Award](#) is one of Europe's most prestigious innovation prizes. Launched by the EPO in 2006, the award honours individuals and teams' solutions to some of the biggest challenges of our times. The finalists and winners are selected by an independent [jury](#) comprising former Award finalists. Together, they examine the proposals for their contribution towards technical progress, social and sustainable development and economic prosperity. The EPO will confer the Award in four categories (Industry, Research, SMEs and Non-EPO countries), as well as announcing a Lifetime achievement award at a [virtual ceremony](#) on 21 June. In addition, the public selects [Popular Prize](#) winner from the 13 finalists by [voting on the EPO website](#) in the run-up to the ceremony. Voting is open until 21 June 2022. Read more on the [European Inventor Award eligibility and selection criteria](#).

This year, for the first time, the EPO will also award bright young minds with the [Young Inventors prize](#). The new prize offers a monetary reward to the three finalists to further encourage them to find creative solutions to pressing sustainable development challenges.

### **About the EPO**

With 6 400 staff, the European Patent Office (EPO) is one of the largest public service institutions in Europe. Headquartered in Munich with offices in Berlin, Brussels, The Hague and Vienna, the EPO was founded with the aim of strengthening co-operation on patents in Europe. Through the EPO's centralised patent granting procedure, inventors are able to obtain high-quality patent protection in up to 44 countries, covering a market of some 700 million people. The EPO is also the world's leading authority in patent information and patent searching.

### **Media contacts European Patent Office**

#### **Luis Berenguer Giménez**

Principal Director Communication, Spokesperson

#### **EPO Press Desk**

Tel. +49 89 2399 1833

[press@epo.org](mailto:press@epo.org)