Leopoldina
Nationale Akademie
der Wissenschaften

Curriculum Vitae Professor Dr Katalin Karikó

Image: Markus Scholz | Leopoldina

Name: **Katalin Karikó**
Date of birth: **17 January 1955**

Research Priorities: mRNA therapy, mRNA vaccines, neurodegenerative diseases

Katalin Karikó is a Hungarian American (US) neuroscientist and biochemist who recognised at an early stage the potential of synthetically produced mRNA for the treatment of immunological and oncological diseases and of vaccine development. Katalin Karikó has made a significant contribution to the basic research on which current mRNA technology is based.

Academic and Professional Career

since 2021	Professor, University of Szeged, Szeged, Hungary
since 2021	Adjunct Professor of Neurosurgery, University of Pennsylvania, Philadelphia, USA
2019 - 2022	Senior Vice President, BioNTech SE, Germany
2013 - 2019	Vice President, BioNTech SE, Germany
2009 - 2021	Adjunct Associate Professor of Neurosurgery, University of Pennsylvania, Philadelphia, USA
1997 - 2009	Senior Head of Research, Department of Neurosurgery, University of Pennsylvania, Philadelphia, USA
1989 - 1997	Scientific Assistant Professor, Department of Medicine, University of Pennsylvania, Philadelphia, USA
1988 - 1989	Postdoctoral Fellow, Department of Pathology, Uniformed Services University of the Health Sciences (USUHS), Bethesda, USA
1985 - 1988	Postdoctoral Fellow, Department of Biochemistry, Temple University, Philadelphia, USA

1982 - 1985	Postdoctoral Fellow, Biological Research Centre, Hungarian Academy of Sciences, Szeged, Hungary
1978 - 1982	PhD in Biochemistry, University of Szeged, Szeged, Hungary
1973 - 1978	Bachelor of Science (BSc) in Biology, University of Szeged, Szeged, Hungary

Honours and Awarded Memberships

2023	Fries Prize for Improving Health, CDC Foundation, Atlanta, USA
2023	Nobel Prize in Physiology or Medicine (together with Drew Weissman), Nobel Assembly at Karolinska Institutet, Stockholm, Sweden
2023	Member, European Molecular Biology Organization
2022	Member, German National Academy of Sciences Leopoldina, Germany
2022	Vilcek Prize for Excellence in Biotechnology, Vilcek Foundation, New York City, USA
2022	Breakthrough Prize in Life Sciences, Breakthrough Prize Foundation, San Francisco, USA
2022	Paul Ehrlich and Ludwig Darmstaedter Prize, Paul Ehrlich Foundation, Frankfurt am Main, Germany
2022	Pearl Meister Greengard Prize, The Rockefeller University, New York City, USA
2022	UNESCO L'Oréal Prize "For Women in Science", United Nations Educational, Scientific and Cultural Organization (UNESCO) and L'Oréal S.A., Paris, France
2022	Member, National Academy of Medicine (NAM), USA
2022	Louis-Jeantet Prize, Louis-Jeantet Foundation, Geneva, Switzerland
2022	Benjamin Franklin Medal in Life Science, Franklin Institute, Philadelphia, USA
2022	Gairdner International Award, Gairdner Foundation, Toronto, Canada
2022	Helmholtz Medal, Berlin-Brandenburg Academy of Sciences and Humanities, Germany
2022	VinFuture Grand Prize, VinFuture Prize Foundation, Hanoi, Vietnam
2022	Jessie Stevenson Kovalenko Medal, National Academy of Sciences, USA
2022	Japan Prize, The Science and Technology Foundation of Japan (JSTF), Japan
2022	Werner von Siemens Ring, Stiftung Werner-von-Siemens-Ring, Berlin, Germany
2022	Novo Nordisk Prize, Novo Nordisk Foundation, Hellerup, Denmark
2022	Member. American Academy of Arts and Sciences, USA

2022	Ross Prize in Molecular Medicine, Feinstein Institutes for Medical Research and Molecular Medicine, Northwell Health, New York City, USA
2022	Honorary Member, Hungarian Academy of Sciences, Hungary
2022	Warren Alpert Foundation Prize, Warren Alpert Foundation, Providence, USA
2022	Tang Prize for Biopharmaceutical Research, Tang Prize Foundation, Taipei City, Taiwan
2022	BBVA Award, BBVA Foundation, Bilbao, and Spanish National Research Council, Spain
2022	Solvay Prize, Solvay Prize Organization, Brussels, Belgium
2022	Park MahnHoon Award, International Vaccine Institute, Seoul, South Korea
2022	European Inventor Award, “Lifetime Achievement” category, European Patent Organisation
2022	Honorary Doctorate, Yale University, New Haven, USA
2022	Honorary Doctorate, Rockefeller University, New York City, USA
2022	Honorary Doctorate, University of Geneva, Geneva, Switzerland
2022	Honorary Doctorate, Free University of Brussels (ULB), Brussels, Belgium
2022	Honorary Doctorate, Tel Aviv University, Tel Aviv, Israel
2022	Honorary Doctorate, Eötvös-Loránd University, Budapest, Hungary
2021	Foreign Member, Académie des sciences, Paris, France
2021	AAAS Fellow, American Academy of Arts and Sciences, USA
2021	Honorary Doctorate, University of Szeged, Szeged, Hungary
2021	Honorary Doctorate, Humanitas University, Milan, Italy
2021	Honorary Doctorate, Duke University, Durham, USA
2021	Meyenburg Prize, Meyenburg Foundation, Heidelberg, Germany
2021	Reichstein Medal, Swiss Academy of Pharmaceutical Sciences, Switzerland
2021	German Future Prize, Federal President’s Prize for Technology and Innovation, Germany
2021	Lasker-DeBakey Clinical Medical Research Award, Lasker Foundation, New York City, USA
2021	Louisa Gross Horwitz Prize, Columbia University, New York City, USA
2021	Paul Janssen Award, Johnson & Johnson, New Brunswick, USA
2021	Prince Mahidol Award, Prince Mahidol Award Foundation, Bangkok, Thailand

2021	Wilhelm Exner Medal, Austrian Trade Association, Vienna, Austria
2021	Grande Médaille, Académie des sciences, Paris, France
2021	Coley Award in Basic Immunology, Cancer Research Institute, New York City, USA
2021	Albany Medical Center Prize in Medicine and Biomedical Research, University at Albany, Albany, USA
2021	Keio Medical Science Prize, Keio University, Tokyo, Japan
2021	Janos Bolyai Prize, Hungarian Academy of Sciences, Hungary
2021	Semmelweis Award, Hungarian Government, Budapest, Hungary
2021	Princess Asturias Award, Princess Asturias Foundation, Oviedo, Spain
2021	Széchenyi Prize, Hungarian Government, Budapest, Hungary
2020	Elected Member, Academia Europaea
2009	Honorary Citizenship, Kisújszállás, Hungary

Research priorities

Katalin Karikó is a Hungarian American (US) neuroscientist and biochemist who recognised at an early stage the potential of synthetically produced mRNA for the treatment of immunological and oncological diseases and of vaccine development. Katalin Karikó has made a significant contribution to the basic research on which current mRNA technology is based.

The biochemist searched for ways to prevent the inflammatory processes triggered by synthetic mRNA, which have stood in the way of a medical application of mRNA technology for a long time. She observed that the inflammation reaction can be avoided pseudouridine with its different spatial arrangement was incorporated into the mRNA instead of uridine, the nucleoside building block . Embedded in nanolipid particles, an mRNA modified in this way forms the basis for the mRNA vaccines that have been used worldwide since the end of 2020 and have since immunised millions of people against the SARS-CoV-2 virus. With this research Katalin Karikó has laid the foundations of a new technology. Future possible applications are so diverse that they are hard to estimate at present.

The scientist is now focusing on extending mRNA technology to therapeutic proteins for treating tissue injuries and above all for treating tumour diseases. With this aim, Katalin Karikó continues to conduct basic research to obtain a deeper understanding of mRNA technology.

Since her PhD, the biochemist has also been interested in the causes of neurodegenerative diseases, in which a certain section of the genetic code in the DNA is present in multiple repetitions and thus leads to faulty RNA and ultimately to neurotoxic proteins. However, mutated RNA not only produces a defective protein, but can also exert further toxic effects, for example by disrupting the

folding of the protein which is crucial for a protein's action. These genetically determined diseases are also referred to as RNA toxicity diseases. In addition to Huntington's disease, they include Friedreich's ataxia, fragile X ataxia, movement disorders of the central nervous system and forms of amyotrophic lateral sclerosis (ALS). Katalin Karikó's team is researching such faulty RNA protein interactions with their neurotoxic effects at the molecular level in order to identify target molecules for innovative treatment approaches.