

THE  KAVLI PRIZE  
BIOGRAPHIES  
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*Emmanuelle Charpentier, Jennifer A. Doudna, Virginijus Šikšnys*



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## Emmanuelle Charpentier

Emmanuelle Charpentier is a French biochemist, microbiologist and geneticist. She studied at the Pierre and Marie Curie University in Paris, receiving a degree in biochemistry in 1991, and obtained her PhD in microbiology at the Pasteur Institute there in 1995.

Between 1996 and 2002 she continued her research in the United States, first in New York and then in Memphis. Returning to Europe she established her own group at the University of Vienna, where, in 2006, she became Lab Head at the Max F. Perutz Laboratories.

In 2009 she moved to the University of Umeå in Sweden, where she established a project on the CRISPR sequences. Charpentier discovered the essential role of the so-called trans-activating CRISPR RNA (tracrRNA) molecule in the

immune systems in bacteria. These results led to a collaboration with Jennifer Doudna and to the demonstration, in 2012, of the potential of the CRISPR-Cas9 system for gene editing.

After Umeå, Charpentier moved to Germany and since 2015 has been Director of the Max Plank Institute for Infection Biology in Berlin. For her work she has received a large number of prizes, including the Breakthrough Prize in Life Sciences, the Warren Alpert Foundation Prize and the Novozymes Prize.



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## Jennifer A. Doudna

Jennifer Doudna is an American biochemist. She obtained her Bachelor of Arts in biochemistry at Pomona College, California, in 1985, before moving to Harvard University where she obtained her PhD in 1989.

After several postdoctoral positions she moved to Yale in 1994, where she would remain until 2000, leading a team that focused on solving the three-dimensional structure of RNA ribozymes.

After two more years at Harvard she moved to Berkeley as Professor of Biochemistry and Molecular Biology, where her research focused on understanding RNA functions via structural and biological methods. While at Berkeley she began a collaboration with Emmanuelle Charpentier. Their work led to a milestone publication in 2012

**The Norwegian Academy of  
Science and Letters**

Drammensveien 78, 0271 Oslo, Norway  
Phone +47 22 84 15 00

[www.dnva.no](http://www.dnva.no)

*See also:*

*The Kavli Prize*

[www.kavliprize.org](http://www.kavliprize.org)

*The Kavli Foundation*

[www.kavlifoundation.org](http://www.kavlifoundation.org)

that marked the development of the CRISPR-Cas9 system as a simple gene-editing tool.

Doudna is still based at the University of California, Berkeley where she is a professor of chemistry and of molecular and cell biology, and an investigator at the Howard Hughes Medical Institute. She has been awarded numerous prizes for her work, including the Breakthrough Prize in Life Sciences, the Gruber Genetics Prize and the Warren Alpert Foundation Prize.



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## Virginijus Šikšnys

Virginijus Šikšnys is a Lithuanian biochemist. He studied organic chemistry at Vilnius University and obtained his Masters degree in 1978. He then moved to the Lomonosov Moscow State University to study enzyme kinetics, where, in 1983, he obtained a Candidate of Sciences degree, equivalent to a PhD.

After Moscow, Šikšnys went back to Vilnius to work at the Institute of Applied Enzymology. Aside from a brief period in 1993 when he was a visiting scientist at the Max Planck Institute for Biochemistry, in Martinsried, Germany, he has spent his entire career in the Lithuanian capital.

Šikšnys's main research interests focused for many years on the role of restriction enzymes in combating viruses. Inspired by a 2007 paper that reported the adaptive immune system

provided by the CRISPR DNA sequence in bacteria, he began working on understanding the role of the enzyme Cas9 in CRISPR. His work led to the publication of a paper in 2012 that demonstrated how the CRISPR-Cas9 system can be used in gene editing.

Šikšnys is now Head of the Department of Protein-DNA Interactions at the Vilnius University Institute of Biotechnology. For his work he has received numerous awards, including the Warren Alpert Foundation Prize and the Novozymes Prize.