

Nobel Prize in Chemistry awarded to David Baker, Demis Hassabis and John Jumper for decoding protein design and structures

The Nobel Prizes for 2024 in Chemistry was awarded to David Baker “for computational protein design” along with Demis Hassabis and John M. Jumper “for protein structure prediction”

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THE HINDU BUREAU

The banner is a blue rectangular graphic. At the top left is a gold Nobel medal. To its right, the text reads "NOBELPRISET I KEMI 2024" and "THE NOBEL PRIZE IN CHEMISTRY 2024". At the top right is the logo of the Kungl. Vetenskaps Akademi (The Royal Swedish Academy of Sciences). Below this, three portraits of the laureates are shown side-by-side. Under each portrait is the laureate's name, affiliation, and the reason for the award in Swedish and English. The laureates are David Baker (University of Washington, USA), Demis Hassabis (Google DeepMind, United Kingdom), and John M. Jumper (Google DeepMind, United Kingdom). The award for Baker is "för datorbaserad proteindesign" / "for computational protein design". The award for Hassabis and Jumper is "för proteinstrukturprediktion" / "for protein structure prediction". At the bottom left is the hashtag #NobelPrize and at the bottom right is the text "THE NOBEL PRIZE".

Laureate	Affiliation	Reason for Award (Swedish)	Reason for Award (English)
David Baker	University of Washington, USA	"för datorbaserad proteindesign"	"for computational protein design"
Demis Hassabis and John M. Jumper	Google DeepMind, United Kingdom	"för proteinstrukturprediktion"	"for protein structure prediction"

The Royal Swedish Academy of Sciences has decided to award the 2024 Nobel Prize in Chemistry with one half to David Baker “for computational protein design” and the other half jointly to Demis Hassabis and John M. Jumper “for protein structure prediction.”

The 2024 Nobel Prize for chemistry was shared by David Baker “for computational protein design” along with Demis Hassabis and John Jumper “for protein structure prediction,” the

Royal Swedish Academy of Sciences announced on Wednesday (October 9, 2024).

Last year the **Nobel Prize for Chemistry was jointly awarded** to Moungi G. Bawendi, Louis E. Brus and Alexei I. Ekimov for the discovery and synthesis of quantum dots.

The Nobel Prize 2024: An interactive guide

Heiner Linke, chair of the Nobel Committee for Chemistry, said the award honoured research that connected the sequence of amino acids that make up a protein and the protein's structure.

Baker led a team that in 2003 designed a new protein using bespoke software methods. They and others have since refined these methods to be able to point the way to 'designer' proteins intended for specific applications.

Johan Åqvist, a former chair of the chemistry Nobel Committee, called the variety of proteins developed by Baker et al. to be "absolutely mind-blowing" and that "it seems that you can almost construct any type of protein with this technology".

Hassabis and Jumper received the other half of the prize for their hand in developing an artificial intelligence model called AlphaFold 2 that could predict the structures of millions of proteins. Human scientists had done that for only around 1.7 lakh proteins until then, although the structures and patterns therein were used to train AlphaFold.

"Four years ago in 2020, Demis Hassabis and John Jumper managed to crack the code. With skillful use of artificial intelligence, they made it possible to predict the complex structure of essentially any known protein in nature," Linke said.

The Nobel Prize for Hassabis and Jumper comes relatively quickly after the corresponding work, around four to six years. There is usually a gap of a few decades between the work and the prize because the former doesn't immediately prove to be of "greatest benefit to humankind" -- a criterion for winning.

For example, John Goodenough shared the 2019 chemistry prize for his work on lithium-ion batteries in the late 1970s. John Nash, Jr. won part of the Nobel Memorial Prize in Economic Sciences in 1994 for work he had done in the 1950s.

The chemistry prize this year also continues a relatively new tradition in this category of the prize going to non-chemists -- although 1981 chemistry laureate Roald Hoffmann has interpreted this to be a mark of chemistry's "far and influential reach", especially in biochemistry and molecular biology.

Baker works at the University of Washington in Seattle and Hassabis and Jumper work at Google DeepMind in London.

The Prize for Physiology or Medicine, won by [Victor Ambros and Gary Ruvkun](#) for the discovery of microRNA and its role in post-transcriptional gene regulation, kicked off **a week of Nobel Prize announcements**. The Physics Nobel, announced on October 8, was awarded to John Hopfield and Geoffrey Hinton for their work on machine learning with artificial neural networks. The winners of the Literature, Peace and Economic Sciences Prize will be declared on October 10, October 11, and October 14 respectively.

The prizes carry a cash award of 10 million Swedish kronor (nearly \$900,000) and will be awarded on December 10.

The Nobel Prize was created by Swedish inventor Alfred Nobel, who in his will dictated that his estate should be used to fund "prizes to those who, during the preceding year, have conferred the greatest benefit to humankind".

(with inputs from PTI)

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