Trio wins chemistry Nobel for protein design, prediction

AFP – Americans David Baker and John Jumper, together with Briton Demis Hassabis, shared the Nobel Prize in Chemistry on Wednesday for work revealing the secrets of proteins through computing and artificial intelligence.

The three were honoured for cracking the code of the structure of proteins, the building blocks of life, with the jury hailing their work as holding "enormous potential" in a range of fields.

Biochemist Baker, 62, was given half the award "for computational protein design", while Hassabis and Jumper shared the other half "for protein structure prediction," the Nobel committee said.

"David Baker has succeeded with the almost impossible feat of building entirely new kinds of proteins," it said in a statement.

In the early 2000s, Baker created a new protein, dubbed Top7, which was entirely different to all known existing proteins.

The Nobel jury described it as a "bolt from the blue" for researchers working in the field of protein design, as those previously created had only been able to imitate existing structures.

It added that his work has led to the creation of proteins that can "lead to new nanomaterials, targeted pharmaceuticals, more rapid development of vaccines, minimal sensors and a greener chemical industry".

Hassabis and Jumper developed an AI model "to solve a 50-year-old problem: predicting proteins' complex structures," the

jury said of the pair from AI research lab Google DeepMind – which rose to prominence when its AlphaGo model beat the champion of one of the world's oldest board games Go.

– 'Building blocks' –

Hassabis, the 48-year-old Google DeepMind CEO and co-founder, and senior research scientist Jumper, who was born in 1985, were among those speculated to be contenders for this year's Nobel for their work on the AI-model AlphaFold.

They received the prestigious Lasker Award in 2023.

The AI tool is used to predict the three-dimensional structure of proteins based on their amino acid sequence, and the AlphaFold database now contains the predicted structure of over 200 million proteins.

Heiner Linke, chair of the Nobel Committee for Chemistry, told a press conference that "proteins are the molecules that enable life. Proteins are building blocks that form bones, skin, hair and tissue."

"To understand how life works, we first need to understand the shape of proteins," Linke said, adding that being able to predict their structure from their amino acid building blocks had "long been a dream."

Mary Carroll, president of the American Chemical Society, told AFP that "a central tenet of chemistry is that structure determines function".

Baker told reporters Wednesday was turning out to be "quite a unique, special day" for him, after being woken by his phone ringing to learn about the prize.

– 'Mitigate AI risks' –

The researcher said he was really excited about "all the ways in which protein design can now make the world a better

place," while listing areas such as health, medicine as well as technology and sustainability.

"Our new AI methods are much more powerful than our previous traditional scientific model methods," he said.

At a London press conference, Hassabis said he had spent his whole life working on AI and "dreaming for this kind of impact of things like AlphaFold, where we can use it for the benefit of society."

"I've always known and felt that it would be one of the most transformative technologies in human history, probably," Hassabis said.

AI was also featured in Tuesday's physics prize, which honoured key breakthroughs in the development of the technology, going to American John Hopfield and British-Canadian Geoffrey Hinton, known as the Godfather of AI.

But both the physics and chemistry laureates warned of the risks of AI, which promises to revolutionise society but has also raised apocalyptic fears.

"I am worried that the overall consequence of this might be systems more intelligent than us that eventually take control," Hinton, 76, told reporters after the announcement.

Hassibis echoed that thought.

"We have to really think very hard, as these systems and techniques get more powerful, about how to enable and empower all of the amazing benefits and good use cases, whilst mitigating against the bad use cases and the risks," he told reporters.

"All parts of society need to be involved in this discussion because it's going to affect everyone."

The laureates will receive their prize, consisting of a

diploma, a gold medal and a $1 million cheque, from King Carl XVI Gustaf at a formal ceremony in Stockholm on December 10, the anniversary of the 1896 death of scientist Alfred Nobel who created the prizes in his will.

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