

'My ambition? Another Nobel prize' says chemistry laureate

December 10 2020, by Sam Kingsley



Charpentier received her Nobel diploma and medal from Per Thoreson, the Swedish ambassador to Germany, in Berlin on Monday

Winning the Nobel prize is often the peak of professional achievement, but chemistry laureate Emmanuelle Charpentier, who received the coveted award this week, has her sights set on repeating her success.

Speaking ahead of Thursday's live-streamed ceremony crowning the Nobel awards week, replacing the usual lavish royal banquet in Stockholm, the 51-year-old French geneticist described winning the [prize](#) as "life-changing" but said she still had many ambitions.

"One ambition would be to win another Nobel prize, of course!" she told AFP.



"But if I want to one day make another discovery, I know I'll need to isolate myself for some years, and I think that's pretty much impossible at the moment," Charpentier said.

Another medal would see Charpentier echo the achievement of scientist Marie Curie, whose 1911 chemistry prize made her the first person in history to be awarded a second Nobel, eight years after her award for physics.

Along with Jennifer Doudna of the US, Charpentier won the Nobel chemistry prize for the gene-editing technique known as the CRISPR-Cas9 DNA "scissors", a tool that allows scientists to snip DNA and edit the genetic code of animals, plants and microorganisms.

The discovery has huge implications for creating new medicines and for scientists' understanding of the role of genes in biology and disease.

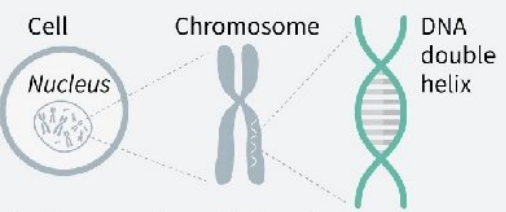
Although she has received dozens of professional distinctions and awards in the years since her research was first published in 2011, Charpentier said the Nobel felt special because it is "held in the highest regard by the public".

NOBEL PRIZE FOR CHEMISTRY 2020

Gene editing with CRISPR/Cas9

DNA: contains the genetic code of a cell



The "genetic scissors" allow the DNA to be modified easily, with precision

FIRST DISCOVERIES

A bacteria, when attacked by a virus, can:

- **Capture** snippets of DNA from the invading virus
- **Integrate** this part of the DNA into its own genome and create an RNA molecule to "remember" the attacking virus. This sequence is known as **CRISPR***

In case the virus attacks again:

- The CRISPR array of the bacteria can now be used to recognise and target invading DNA. It creates a complex of RNA strands and a molecule (Cas9) acting as a "scissor"
- This "genetic scissors" will cut the DNA of the virus and neutralise it

EMMANUELLE CHARPENTIER
France
Aged 51

JENNIFER DOUDNA
America
Aged 56


Development of the gene-editing technique known as the CRISPR-Cas9 DNA snipping "scissors"

RESEARCH SIMPLIFIED

Succeeding research reproduced and simplified the process:

- A single strand of RNA is created and called "guide RNA"
- The "guide RNA", combined with the Cas9 protein, can be controlled so that it cuts a precise DNA location that needed to be removed
- Researchers can then insert a new part of the DNA, or let the cell repair its own DNA

*Clustered Regularly Interspaced Short Palindromic Repeats
Source: nobelprize.org



Graphic on the CRISPR/Cas9 genome editing technique, this year's winner of the Nobel prize for chemistry.

'Everything is science'

However, the public recognition brings with it its own demands and opportunities, which can eat into the time needed for research, she said.

"The challenge in the future for me is to be able to organise myself to contribute to my role, to be present, to be an advocate for science and young scientists," she said.

"I have to make sure I have time to lead my lab and hopefully some time to continue researching, too."

When the award was announced in October—the first time a Nobel science prize has gone to an all-female team—the pair said they hoped it would inspire a new generation of women in science.

Charpentier also said she believed the pandemic had increased the understanding of the importance of science among the public and governments, although she feared that funding would suffer in the [economic downturn](#) sparked by the coronavirus.

Research "is expensive but science benefits everything around us," she said.

"Everything is [science](#) and I hope people understand that."

Because of the pandemic, the traditional Stockholm ceremony honouring the Nobel laureates has been replaced by an online event Thursday, featuring pre-recorded segments of the laureates receiving their prizes in their countries of residence.

Charpentier accepted her Nobel gold medal and diploma on Monday at a ceremony at the Swedish embassy in Berlin, where she is the director of the director of the Max Planck Unit for the Science of Pathogens.

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