Doctorado honoris causa a Emmanuel Charpentier

Laudatio de Alberto M. Pendás, padrino

Comunicación Universidad de Salamanca / 24/10/2025

Señor Rector Magnífico, Señoras y Señores del Claustro de Doctores, estudiantes y amigos de la Universidad de Salamanca:

Hace ahora casi un año, tuve la ocasión de defender ante este Claustro la candidatura de la Dra Emmanuelle Charpentier a Dr Honoris Causa, convencido de que encarnaba los valores de la investigación fundamental, la curiosidad libre y la excelencia intelectual los cuales han definido por otra parte a esta Universidad durante más de ocho siglos.

Es para mí un honor y una profunda emoción presentar hoy La Laudatio de la Dra. Emmanuelle Charpentier, a quien esta Universidad distingue con el más alto de sus Honores academicos.

Antes de continuar, me van a permitir que dé paso a unas imágenes que ilustra la trayectoria y los méritos científicos de la profesora Charpentier —

Tras ver este breve recorrido por su vida y su obra, tratare de esbozar sus influencias y motivaciones que han dado lugar a su carrera científica.

De niña, Emmanuelle soñaba desde su Juvisy-sur-Orge, en las afueras de París, con ser desde una detective a una intelectual en cualquier ámbito del mundo académico desde ciencias puras a medicina o filosofía. Vocaciones relacionadas con su vida científica que han condicionado su carrera y trayectoria vital y que son una mezcla de curiosidad, disciplina, independencia, inteligencia y determinación.

La curiosidad inagotable por los enigmas de la vida que mostró desde joven inculcadas por sus padres.

La disciplina, la coordinación y la persistencia que fueron abonadas por sus estudios de piano y ballet clásico de niña,

La independencia y la responsabilidad personal, inculcadas por su madre, asi como su interés por el existencialismo como el motor de su propio destino.

La inteligencia, el coraje y la determinación influidos durante su adolescencia por referentes como Marie Curie y Louis Pasteur, pero también por las heroínas televisivas de los 80 Wonder Woman, la Mujer Biónica y Los Ángeles de Charlie, los cuales han asentado las bases para creerse que una mujer podía ser científica, líder y heroína a la vez.

Sus estudios superiores en Microbiología y Genética en la Universidad Pierre et Marie Curie, hoy Sorbona, promovieron, como acabamos de ver su fascinación por los microorganismos y su papel en la salud humana, llevandola al Instituto Pasteur, donde su tesis sobre los mecanismos moleculares de la resistencia bacteriana a antibióticos,

supondría el primer eslabón de una trayectoria que como veremos está marcada por una misma pregunta subyacente.

-Gracias a su formación en Genética microbiana adquirida y ejercida en numerosos centros de prestigio como el Instituto Pasteur y la Universidad Rockefeller, y la Universidad de Viena y Umea, la Prof Charpentier profundizó en los mecanismos de regulación génica del patógeno Streptococcus, un trabajo que sería la base de sus posteriores investigaciones del sistema CRISPR-Cas9.

Con la identificación de un pequeño pero decisivo RNA —el tracrRNA— que reveló cómo se activa el sistema CRISPR en su articulo de Nature 2011 se marcó un punto de inflexión en la historia de la biología moderna: por primera vez, la humanidad disponía de una herramienta eficaz capaz de editar con precisión el genoma de cualquier ser vivo con una precisión sin precedentes.

Posteriormente un segundo descubrimiento publicado en Science 2012, demostro que el tracrRNA guiaba a la Cas9 para generar los DSBs de forma específica, un descubrimiento que no solo abrió una nueva era en la biología molecular; cambió la relación del ser humano con el genoma de todos los seres vivos incluyendo el de él mismo.

La concesión del Premio Nobel de Química en 2020, reconoce internacionalmente el logro y la trascendencia científica de estas aportaciones, consolidando a la Dra. Charpentier como la científica más influyente de nuestro tiempo

De acuerdo con dicha trascendencia, las aplicaciones del sistema CRISPR-Cas9 han transformado de manera profunda todos los campos de la biología moderna, abarcando desde las neurociencias y la biología cardiovascular hasta los procesos del desarrollo, la reproducción y la Oncología.

Además, esta tecnología ha impactado profundamente en otras áreas como la agronomía, la zootecnia y la biotecnología.

Cabe destacar que, gracias a los avances liderados por la EMPRESA cofundada por la Dra. Charpentier CRISPR therapeutics, se ha aprobado el primer tratamiento clínico basado en CRISPR para la anemia de células falciformes, un nuevo hito de la medicina genómica.

En un tiempo en que la ciencia parece supeditada a la rentabilidad, su trayectoria nos recuerda que las grandes revoluciones del conocimiento nacen del deseo de comprender, no del afán de producir.

El reconocimiento de sus múltiples doctorados honoris causa por universidades históricas de prestigio como Bolonia, Oxford y Viena se completa hoy con orgullo el de la Universidad de Salamanca, heredera de más de ocho siglos de historia académica y de compromiso con el saber universal.

Hoy, desde el Instituto Max Planck para la Ciencia de los Patógenos en Berlín -instituto que ella misma fundó y dirige-, continúa explorando los mecanismos moleculares que regulan la virulencia, la adaptación y la interacción de bacterias patógenas con la inmunidad innata del huésped.

Sus contribuciones no se limitan a sus descubrimientos científicos.

La Dra. Charpentier encarna los valores que toda UNIVERSIDAD debe promover:

-el conocimiento,

-la innovación

-y el bienestar social.

En un ámbito históricamente dominado por hombres, ha demostrado que la excelencia no tiene género, y que la pasión, la curiosidad y el rigor son los verdaderos motores del conocimiento.
Su historia, desde la niña que soñaba con resolver enigmas a la científica que ideó una forma de editar el código genético- debe servir de inspiración para que los jóvenes, especialmente mujeres, CREAN en su capacidad de convertirse en protagonistas de la ciencia.

Ella misma lo expresa con sencillez y lucidez:

“Ser científica me permite ser un poco de todo: detective, creadora y pensadora. Lo importante es mantener la curiosidad y devolver a la sociedad lo que la ciencia nos da.”

Esta investidura adquiere además un significado especial al coincidir con el vigésimo quinto 25 th aniversario del Centro de Investigación del Cáncer, institución que ha tenido el honor de proponer a la doctora Emmanuelle Charpentier para este reconocimiento.

Señor Rector, Doctores y Doctoras, Señoras y Señores:

honrar hoy a Emmanuelle Charpentier es celebrar la capacidad transformadora de la mente humana, recordar que el verdadero progreso nace, siempre, de la curiosidad sin fronteras. reafirmar el compromiso de esta UNIVERSIDAD con el pensamiento crítico, con la investigación desinteresada y con la convicción de que el conocimiento, cuando es libre, es la más alta forma de servicio público, un compromiso que hoy resulta más necesario que nunca, en un tiempo CONVULSO en EL que soplan vientos de autoritarismo y de necedad, y en el que defender la razón y la libertad del pensamiento es, una vez más, un deber moral y cívico.

Su larga lista de galardones y premios de máximo prestigio como el Premio Kavli, el Premio Wolf de Medicina, el BBVA Fronteras del Conocimiento o el Premio Princesa de Asturias (2016), además del mencionado Nobel, son el reconocimiento académico a su exceptional contribución.

Name and date of birth

Emmanuelle Charpentier, born December 11, 1968.

2. Childhood dreams as a woman

As a child, I dreamed of being someone special. I saw myself as a nun or a detective, or an intellectual in academia (in various fields ranging from hard sciences to medicine,

psychiatry, philosophy or sociology). I sometimes had ambitious aspirations, like curing the world of all diseases and poverty! I imagined that, as a nun, I would have endless hours of peace and quiet to work and create, and that, as a detective, I would be able to solve puzzles and enigmas, and work on human complexities. Being a scientist allows me to perform some of these roles, although I sometimes wish I had a little more time for creativity and contemplation!

3. Hobbies and preferences in adolescence

I studied classical piano and ballet as a child and into adulthood. Piano and dance taught me discipline, the practice of repetition, coordination, persistence, performance and stamina, which formed a good basis for my later activities in the field of scientific research.

4. Women she admires, men she admires

Historical scientific and intellectual figures have had a very important influence, like Marie Curie of course, but all the more so as they were from another century and didn't have access to the same technologies and knowledge, which makes their discoveries all the more remarkable. I was impressed by the fact that they truly devoted their lives to their work and their passion, the quest for discovery and new knowledge. Louis Pasteur has to be on the list because, from the age of 11, I apparently told my mother that I would one day work at the Pasteur Institute in Paris, which I did.

In the early '80s, in the days of three-channel television, I had a few images of strong women in the media that I could admire: There were the French journalists Christine Okrent and Anne Sinclair, and the grande dames: Wonder Woman, Bionic Woman and Charlie's Angels, whom I admired because they were all both feminine and very powerful. My parents let me make my own decisions, and my mother always insisted that independence (especially as a woman) and responsibility had to be a priority. This idea was reinforced in my teens, when I became interested in existentialism and the idea that you are the motor of your own life, and that you are responsible for yourself and your destiny, its positive and negative consequences.

Another element of my upbringing was Catholic associations, which also played an important role in my education. From the age of 7 to 15, I was part of a Catholic children's association, an organization that worked on many humanitarian and community projects, with people of remarkable generosity. This, along with an aunt who worked as a missionary, drove me to always want to help others and instilled in me an attitude of generosity that I believe is also necessary as a scientist.

5. Background, life difficulties or strengths that helped her progress

At Pasteur, I was confronted with researchers who were the best in their field. I appreciated and learned about the freedom of research, the community and team spirit (also the conflicting relationships between people with strong personalities and at the time also a certain culture of academic hierarchy with its weak points!), and the fact of being surrounded by other people from all countries and backgrounds, as committed to their work as I was. Here, I realized that as a group, we could really learn from and teach each other. I felt at home in the laboratory, especially in the evenings and at weekends, looking out of the window at the building where Louis Pasteur's tomb rested

and where I could find spiritual guidance, and this stay really cemented my later passion for laboratory research.

I finished my studies quickly, rushing towards a PhD, 3 post-docs and a portfolio of publications, as at the time there was an age limit to enter the French university research system. I put a lot of pressure on myself with challenges and deadlines and regret, in retrospect, not taking the time to appreciate my own successes, focusing on the often unconstructive peer reviews rather than praise. However, I continue to distance myself from the idea of “living in the moment”, as I am constantly trying to anticipate everything and project myself into the future.

6. “Skipped"

7. First goal achieved in life

I suppose my first achieved goal was to study and work at the Pasteur Institute, as I had predicted when I was 11.

8. Main goal achieved in life

I can not say that winning the Nobel Prize in Chemistry was necessarily one of my goals, but some people have said to me along the way, “Don't worry, you will get your Nobel!”. That was at the Rockefeller University in New York, before Elaine Tuomamen's lab moved to St Jude Children's Research Hospital in Memphis, TN. I was working around the clock, practically tethered to the bench and determined to get the final results of my experiments. I am fortunate to have received many prestigious awards and honors, including this honorary doctorate. The research that led me to the discovery of CRISPR-Cas and the Nobel Prize can certainly be classified as a “main objective achieved”!

9. Dreams that are still ahead

A second Nobel Prize? Perhaps! I'd have to go back to being “my best researcher and leader”, as I was for the discovery of CRISPR-Cas, with the opportunity to devote all my time to another “project of my life” with the freedom to concentrate fully on the challenge. However, the most important thing for me in the near future is to keep finding ways to give back. My goals for the future are to continue to promote science and education through outreach. Qualified researchers and teachers are essential to the progress of science and, without them, the chances of making new discoveries are reduced. In today's technology-driven world, science is not sufficiently promoted, and young people don't always know which path to take to work in this field. I hope that young people will be inspired by the story of my career and that of others, and not just by science, to make their own discoveries that will have an impact, because science is also a human story.

10. How she felt when obtained the honoris causa by University of Salamanca ?

It is a great honor to receive an honorary doctorate from the University of Salamanca, with its impressive history as one of the very first universities in the world, and in this beautiful historic city of Salamanca. I also find it remarkable that the first woman professor, Luisa de Medrano, taught here and paved the way for women in academia as far back as the Renaissance. I am also honored that my invitation comes from a researcher at the CIC, where important work is being carried out that is essential to finding innovative solutions in medicine and in future cancer treatments.

11. Other awards and recognitions

(Attached is a PDF list of Awards and Honours)

12. Which is your view of the future of research and university in the near future?

I am actually quite concerned that public, youth and political interest in research and academic life in the scientific field seems to be waning. Biotechnology in the private sector is evolving rapidly and may appear to be a much more attractive path for many young people. I would like to rekindle passion for basic science by my example and inspire young people to continue the important work of broadening human understanding of the natural world and asking the important questions that may or may not lead to fruitful applications, rather than simply working on developing the latest product.

13. Can you give us some recommendations for students/girls/women in the XXI century?

I would encourage girls and women the same way I would encourage any student: to follow their passion. Although it is hard work, experiments regularly fail and it often takes years for results to finally become visible. I would like to motivate the new generation of researchers to show perseverance, curiosity and enthusiasm for basic science. It is vital for the survival of our planet and humanity that science receives more attention and value, and that students see the value of finding sound scientific solutions. I would like to encourage them to take risks and cross as many boundaries as possible, because what lies behind those boundaries broadens your mind and is a very rewarding experience. Girls and women may face additional obstacles or setbacks, but I believe that as long as they are clear in their motivation and purpose, they can achieve their goals, and more!

Best wishes,