

## Antonio Feltrinelli Prize in Medicine

### Speaker:

Prof. Ugur Sahin, M.D., CEO and Co-Founder of BioNTech

Prof. Özlem Türeci, M.D., Chief Medical Officer and Co-Founder at BioNTech

### Speech Title:

“The Dawn of mRNA Medicines: A New Era in Disease Treatment and Prevention”

---

### Speaker: Prof. Özlem Türeci

Your Excellency, President of the Italian Republic, **Sergio Mattarella**,

Dear **Prof. Roberto Antonelli**,

Esteemed representatives of *The Accademia dei Lincei*,

Most esteemed guests,

We'd like to thank the ***The Accademia dei Lincei*** from the bottom of our hearts.

We are deeply honored to receive the ***Feltrinelli Prize for Medicine*** today for our decades of basic and translational science to develop mRNA technology – a technology that pushed open the door to a new era in disease treatment and prevention.

We must share this recognition with the multiple generations of scientists and researchers who have contributed to understanding mRNA, improving it and learning how to apply it. As with any breakthrough innovation, it is the confluence of many efforts that has allowed the practical use of mRNA technology as a powerful tool in the service of humanity -- at a time when it is needed most. This day is about **honoring science and astute thinkers** making a difference for many by collaborating, creating innovations, and continuing to serve science and medicine.

For us, it is a great privilege to be part of today's award ceremony here in Rome. Since we entered the impressive and harmonious building of the *Accademia Nazionale dei Lincei*, we feel the strong presence of the great thinkers that are and have been members of the academy, and we feel immersed in a rich historical heritage.

A heritage that stands for principles, for virtues that are actually timeless.

### Why timeless?

The key ingredients for turning science into survival, into health, are very similar to the principles that the *Accademia Nazionale dei Lincei* stands for and that **Antonio Feltrinelli** wanted to promote with his donation to today's *Accademia Nazionale dei Lincei*: Promoting relentless, distinguished work in science and arts for the service of the country and humanity.

## **What are the key ingredients for science in the service of humanity?**

For us, pursuing this vision meant becoming wanderers between worlds -- three worlds: As **trained physicians**, we grew up in patient care and public health; as **scientists**, we were deeply rooted in academia; as **entrepreneurs**, we started companies and immersed ourselves in the biopharma industry and the private sector.

In the 1990s, as **physicians**, we too often had to tell our cancer patients that there were no more treatment options for them. At the same time, as **scientists**, we were aware of the enormous potential of science to make a difference – through new immunotherapies and technologies such as mRNA that we pioneered.

Our mission was clear: We wanted to bring these new therapeutic modalities from the lab to the patients' bedside.

We had to learn that research alone couldn't get to patients without robust funding and a drug development organization. So, we turned to the **private sector**. Only to find that early research without clinical evidence was unlikely to be funded. Too early, too risky, too difficult --- those were the reactions we experienced. The number of people who believed in mRNA as a potential new drug class in medicine was small. But those who worked with mRNA saw the beauty of this molecule.

We convinced a handful of private investors who believed in our vision and trusted our execution from the very beginning.

In the years that followed, we deepened our understanding of immunology, researched mRNA, built our mastery of the technology, learned how to manufacture mRNA, and treated hundreds of patients with cancer in clinical trials.

In January 2020, when the pandemic broke out, we heard the call to action loud and clear – the moral obligation to use our technology, trust our team's skills and the skills of our partners. As a team we helped respond to a global problem of unprecedented scale.

We feel blessed and honored to have been able to contribute -- based on our decades of research and development – and thanks to our maintained identity as wanderers between worlds.

**And that's the first ingredient: persistence.** It takes a new breed of scientists, deeply rooted in academia and basic research, while never, ever losing sight of why they are doing this: the people. Scientists who firmly believe in something which others may not see today. They will go on, even if they have to go through failures. And they will work rigorously to bring this hidden treasure, the innovation, to fruition. The day of the breakthrough is the day when everyone's eyes are opened.

**The second ingredient is courage,** which is essential for sustainable, solution-oriented scientific progress. Courage – because it makes you fall in love with the unknown.

**Galilei Galileo once said, "I love the stars too much to be afraid of the night."**

Our stars are the complex immune system and technologies such as mRNA but also modalities such as antibodies, small molecules, and cell-based treatments. We see them shine in the darkness and have the courage to explore their universe. We want to understand every single mechanism and function to being able to use them to help patients.

**Another example:** The search for a COVID-19 vaccine was a quest in uncharted territory too, a quest with an unpredictable outcome. To develop something new that better serves humanity, you have to take risks, you have to make bold decisions. Staying on familiar paths in unfamiliar terrain is simply not feasible.

**This leads me to the third ingredient: humility.**

True courage, however, always goes hand in hand with humility. As was once said, "Humility means staying teachable, regardless of how much you already know." And indeed, in the face of this unprecedented global threat of the COVID-19 pandemic, stakeholders - vaccine developers, regulators, public health officials, governments - were open to learn from each other. And we all let science and data be our teachers, even though with a novel virus, data takes time to crystallize, making patience and trust in each other's words even more important. We today have to translate these learnings to bring new treatments to patients with cancer as fast as possible – another pandemic that we are in.

For Ugur and I, learning is a path to courage and humility and is a lifelong endeavor as physicians, scientists, and entrepreneurs. We have had great mentors along the way – and we are still learning from others every day.

**Sometimes – as in our visit to this wonderful city – we learn by looking back at the wisdom of those who lived many centuries ago.**

This is the most original part of science and what distinguishes places such as the Accademia Nazionale dei Lincei:

**The illustration of all this --- the symbol of all these principles --- is here on the coat of arms that you passed when you entered this building: The lynx.**

The lynx stands for astuteness. With its keen senses and intellect, it is able to see early on what seems to be hidden to others -- a supposedly incidental element, something that is not visible at first glance – but the lynx sees it, immediately grasps the essentials, and it will persistently pursue.

In this sense: Let us all nourish the spirit of the lynx within us.

***Ugur - the stage is yours.***

**Speaker: Prof. Ugur Sahin**

*Thank you Özlem. I couldn't agree more.*

Today, we are at the dawn of mRNA medicines. With the development and approval of the first mRNA drug, we opened the door to a new era in medicine based on decades of research. Now, we are working to ensure that we can step **through** this door together.

Özlem and I, as scientist-physicians, became wanderers between worlds more than 30 years ago to being able to bring new treatment options, that we believed in, to people with cancer. Based on our research and technological know-how we gained over time --- this is why we could be able to respond quickly at the beginning of the COVID-19 pandemic.

Early in our career, we've decided to focus on mRNA as the cornerstone of our pursuit of individualized cancer treatments. We made this decision despite the broader scientific community's scepticism seeing mRNA as unattractive, something akin to an "ugly duckling". But just like in arts, beauty can be found in unexpected places and in countless forms, a sentiment I'm sure our artist attendees can resonate with today.

**The beauty we see in mRNA is deeply tied to its fundamental role:** mRNA serves as an ancient and universal messaging system within our body. It acts as the body's natural courier, transmitting crucial information among diverse body functions. One primary destination of these messages is the immune system.

In our quest to unveil the hidden potential of mRNA, we have invested countless years in rigorous research. This extensive exploration and the numerous discoveries we made were necessary to harness the true potential of mRNA --- and paved the way to being able to use it in medicine.

At its core, mRNA therapy involves utilizing this molecular courier to engage in a conversation with our body. Through this dialogue, we have shown that we can guide our immune system, helping it to identify enemies such as cancer cells or viral pathogens, and instruct it to take action. Conversely, we can also use mRNA to calm down our immune system when it becomes overly aggressive, as seen in autoimmune diseases.

The potential areas of application of this approach are vast, extending beyond just immunology. Current research is exploring its use in areas such as cardiovascular health and regenerative medicine. Our ambition is to further broaden the use of mRNA, either as a standalone treatment or in combination with other therapies.

The transformative power as well as the potential of mRNA is now clearly visible to all. The mRNA technology, once seen as an "ugly duckling", is undergoing a dramatic metamorphosis. It's evolving into a glorious swan, which we believe is able to redefine the future of medicine in various fields.

Today, we want to achieve much more with mRNA:

- **With mRNA**, our goal is to tackle cancer early, by preventing its devastating spread in the body and personalizing the treatment for enhanced precision and tolerability. mRNA is well suited for this task due to its versatility. We utilize it to create truly tailored therapies for each individual and to address the uniqueness of each tumor. This is which is one of the key challenges in cancer treatment.

- **With mRNA**, we want to respond to neglected global health challenges. We are devoted to addressing unmet needs in infectious diseases, by developing and evaluating investigational vaccines against diseases including malaria, tuberculosis, and HIV.
- **With mRNA**, we want to break through walls where other avenues have led to dead ends. The advancement of mRNA as a platform technology allows to manufacture mRNA-based products in a comparably small space. We are committed to building flexible, scalable solutions for sustainable and accessible local mRNA production, modular factories designed to be established where they are needed most.

**But: It would be an illusion to think that mRNA is a silver bullet.** As scientists, we know better that mRNA is one of many tools that have the potential to transform medicine. And we can only exploit this potential if these tools are combined with insights from fundamental research about mechanisms, targets and deep understanding of biology and diseases.

The enduring trajectory of scientific exploration into mRNA vaccines, pursued by devoted scientists with unwavering belief in the technology, and culminating in its emergence as a lifesaving technology during a pandemic, has taught us two lessons:

**First, it affirms that each of us can make a meaningful difference when we act with both courage and accountability.**

**Second, it has opened the world's eyes to the incredible value of science for society.**

Science can solve the problems of our global community, including problems that people may not even think about yet. And that's the beauty of being a scientist, of being an innovator.

Let's not wait for the next global problem, the next big crisis, to create a sense of urgency, to turn to the high-potential technologies, the scientific concepts that can already today contribute to the well-being of humanity, the preservation of this planet, and other global challenges of our time.

Today is truly remarkable, as we are presented with an abundance of technologies and knowledge that allow us to improve and accelerate our progress, more than ever before. Exceptional progress is being made through collaboration and the convergence of innovations.

**We are at the dawn of mRNA medicines – a new era of medicine – walking through the door that has just opened to pioneer new territories and applications with one common goal: Improving the health of people.**

Let's work with the unknown. Let's be bold and engage in ideas which may seem like something out of a science fiction movie today.

**Let's see the opportunities through the eyes of the lynx and have the humble courage to create a better future.**

Thank you.