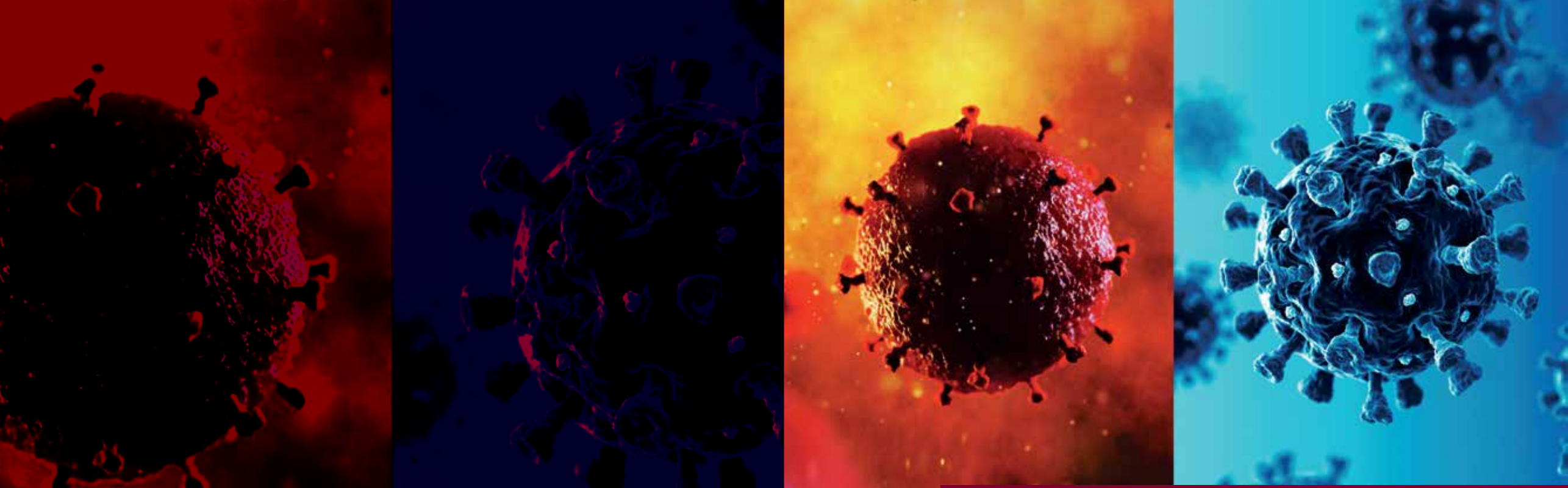

SAPIENZA
UNIVERSITÀ DI ROMA

Conferral of the Doctorate honoris causa in Advances in Infectious Diseases, Microbiology, Legal Medicine and Public Health Sciences on Anthony S. Fauci

Thursday, January 13, 2022 - 3.00 pm
Senate Hall, Rectorate Building

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Programme

Anthony S. Fauci, M.D.,
is director of the National Institute
of Allergy and Infectious Diseases (NIAID)
at the U.S. National Institutes of Health,
where he oversees an extensive research portfolio
devoted to preventing, diagnosing, and treating
infectious and immune-mediated diseases.

He has been a key advisor to seven Presidents
and their administrations on global AIDS issues,
and on initiatives to bolster
medical and public health preparedness
against emerging infectious disease threats
such as pandemic influenza.
As an HIV/AIDS researcher
he has been involved in the scientific effort
since AIDS was recognized in 1981,
conducting pivotal studies that underpin
the current understanding of the disease
and efforts to develop therapies
and tools of prevention.

Anthony S. Fauci was one
of the principal architects
of the President's Emergency Plan
for AIDS Relief (PEPFAR),
which has helped save millions of lives
throughout the developing world.

Opening Address of the Rector

Antonella Polimeni

Your Excellencies,
dear Colleagues,
Ladies and Gentlemen,

Sapienza University of Rome,
in compliance with the resolution
of the Academic Senate of December 13, 2021,
is honoured to confer today
the Doctorate *honoris causa*
in Advances in Infectious Diseases,
Microbiology, Legal Medicine
and Public Health Sciences on Anthony Fauci
"for his fundamental contribution
in the study of infectious diseases,
with special regard to his pioneer studies
on HIV infections and to the establishment
of effective measures of transmission control
and therapies against AIDS,
and more recently, for his strong
and competent contribution
to fight the SARS-CoV2 pandemic."

Research on infectious diseases
and their agents has a long tradition
at Sapienza University, spanning
from clinical infectiology
across tropical medicine and public health
to virology, bacteriology and parasitology.
To mention but a few of the scientists
from Sapienza University who have made
fundamental contributions in the area,
I would like to recall Giuseppe Giunchi,
the founder of the Italian school
of modern infectious diseases at Sapienza,
further developed in recent years
by Vincenzo Vullo and co-workers,
Ferdinando Aiuti, a pioneer of HIV research
who greatly contributed also to remove
the stigma of shame and guilt afforded
to AIDS patients, Giuseppe Sanarelli
who provided relevant contributions
to studies on cholera and, together
with Angelo Celli, to the creation
of the well-known malariology school.
In this perspective, we should not forget
Mario Coluzzi, whose outstanding
contribution to studies on malaria vectors
is recognised worldwide.

Italy's geographical position,
at the Mediterranean border of Europe
and close at the same time to North Africa
and the Middle East, makes our country
naturally sensitive to tropical diseases,
a circumstance witnessed in recent history
when many regions of our country
were heavily affected by transmissible diseases.
At the beginning of the last century,
Italian scientists like Grassi, Celli, Bignami
among others were a reference
for scientists worldwide. At that time,
Italy was a land where infectious diseases
had been endemic for many years.
Only after the Second World War
did large programmes of improvement
of the population's social and hygienic
conditions allow such threats to be defeated.

Nowadays, Italian scientists are still engaged
in studying tropical diseases,

and many Italian research institutions
have been involved in the WHO roadmap
to fight Neglected Tropical Diseases;
this seems especially important
in a situation in which climate change
and globalisation are expanding
the geographic range of endemic diseases
and, in this perspective, Italy is already
facing the introduction of alien species
potentially involved in disease transmission.

In this context, Sapienza University
looks at the eminent figure
of Anthony Fauci as an example
of excellence and dedication in the field
of transmissible diseases. Dr Fauci made
an immense contribution to pioneer studies
for understanding AIDS and developing
new therapies and prevention tools.

Anthony Fauci is widely recognised
for delineating the precise mechanisms
whereby immunosuppressive agents
modulate the human immune response,
providing clues for understanding
the pathogenesis and treatment
of immune-mediated and infectious diseases.

Notably, we should also mention
Dr Fauci's key role as scientific advisor
to seven U.S. Presidents
and their administrations, which had
crucial importance in improving
public health preparedness
against emerging infectious disease threats
such as AIDS and, more recently,
the COVID-19 pandemic. In this regard,
I would like to especially stress
the worldwide impact and contribution
of Anthony Fauci in the past two dramatic
years: his firm and, at the same time,
simple and clear communication
has made him one of the most listened
to scientific voices, not only
by ordinary people around the world
but also by policymakers, helping them
follow the rational way of the scientific method,
even when shortcuts may have been
more accessible and more appealing.

For all the above reasons, today
we are conferring the Doctorate *honoris causa*
in Advances in Infectious Diseases,
Microbiology, Legal Medicine
and Public Health Sciences on Anthony Fauci,
true to our University's tradition
of excellence, inclusion,
internationalisation and cooperation.

Address by the Dean of the Faculty of Pharmacy and Medicine

Carlo Della Rocca

Magnificent Rector,
distinguished Colleagues,
dear Students, Ladies and Gentlemen,

the members of the Faculty
of Pharmacy and Medicine are delighted
to approve the Doctorate *honoris causa*
in Advances in Infectious Diseases,
Microbiology, Legal Medicine
and Public Health Sciences
to Dr. Anthony Fauci, proposed
by the Department of Public Health
and Infectious Diseases.

The Rector has just briefly outlined
the extraordinary scientific achievements
of Anthony Fauci and she underlined
how he served the USA and global community
during the dramatic emergencies of AIDS
and Covid-19 pandemic, providing
an invaluable scientific and moral compass.
Therefore, what I would like
to do here is to recall his career
and scientific achievements.

Anthony Fauci attended
Cornell University's Medical College
graduating first in his class
with a Doctor of Medicine degree in 1966.
He then did an internship and residency
in internal medicine at New York Hospital-
Cornell Medical Center
Then Dr. Fauci joined the NIH in 1968
as a clinical associate in the Laboratory
of Clinical Investigation (LCI)
at the National Institute of Allergy
and Infectious Diseases (NIAID). He became
Head of the Clinical Physiology Section, LCI,
and was later appointed Chief
of the Laboratory of Immunoregulation.
Since 1984 he is Director of the NIAID.

Anthony Fauci has carried out
pioneering studies that provided the basis
for understanding the regulation
of the human immune response.
Moreover, he unraveled the mechanisms
whereby immunosuppressive agents
modulate the human immune response.
He applied his deep understanding
of these fundamental mechanisms
for the development of therapies
for formerly fatal inflammatory
and immune-mediated diseases
such as polyarteritis nodosa,
Wegener's granulomatosis,
and lymphomatoid granulomatosis
that in 1985 were declared
as "one of the most important advances
in patient management in rheumatology
over the previous 20 years."

In 1981 Fauci understood the significance
of a new, mysterious disease and decided

to make it the focus of his research,
despite contrary advice from his mentor
and colleagues. His work helped change
the course of the epidemic and in 1984,
at the age of 43, he was named director
of the NIH National Institute of Allergy
and Infectious Diseases (NIAID).
That made him the youngest institute director
ever at NIH. Under Fauci's leadership,
NIAID became the single largest funder
of HIV/AIDS research in the world.
His own lab's research
also has helped clarify fundamental
relationships between the virus
and the immune system.

Anthony Fauci has made seminal contribution
to the understanding of how the HIV virus
disarms the body's immune defenses
by targeting and depleting CD4 cells,
thus leading to its susceptibility
to deadly infections, the AIDS.
He also has delineated the mechanisms
of induction of HIV expression
by endogenous cytokines. Furthermore,
he has been instrumental in developing
highly effective strategies for the therapy
of patients with this deadly disease,
as well as for a vaccine to prevent HIV
infection. He continues to devote much
of his research efforts to identifying the nature
of the immunopathogenic mechanisms
of HIV infection and the scope
of the body's immune responses
to the AIDS retrovirus.

In 2003, an Institute for Scientific Information
study indicated that in the twenty year period
from 1983 to 2002, Anthony Fauci
was the 13th most-cited scientist among
the 2.5 to 3 million authors in all disciplines
throughout the world who published articles
in scientific journals during that time frame.
Dr. Fauci was the world's 10th most-cited
HIV/AIDS researcher in the period 1996-2006.

Research and clinical achievements make
Anthony Fauci a prominent figure in medicine,
across two centuries. But he also served
as head of NIH National Institute of Allergy
and Infectious Diseases and as scientific
advisor to seven US presidents
and their administration, giving a contribution
to shaping national and global policies
with the integrity and principles
of the best practice in science
and medicine.

Anthony Fauci is an outstanding figure
for scientific excellence and for commitment
to medicine and principles of integrity
and dedication to health for all human beings,
on behalf of the entire scientific community,
we are gathered here to express our gratitude
for Anthony Fauci's contributions
and we congratulate him on receiving
the Doctorate *honoris causa* in Advances
in Infectious Diseases, Microbiology,
Legal Medicine and Public Health Sciences
from Sapienza University.

Praise of Anthony S. Fauci
Stefano D'Amelio

Magnificent Rector,
distinguished Colleagues,
dear Students, Ladies and Gentlemen,
dear Dr. Fauci,

it is with great pleasure and pride that,
as coordinator of the PhD course in Advances
in Infectious Diseases, Microbiology
Legal Medicine and Public Health Sciences,
I have been asked to hold a praise
on the occasion of the Doctorate *honoris causa*
awarded to Anthony Fauci.
At its beginning, this initiative was shared
with Professor Beatrice Vallone,
director of the H2CU, the Honors Center
of Italian Universities, an institution
especially devoted to promote the scientific
and academic collaboration
between Italy and USA.

Our PhD course is largely interdisciplinary,
spanning from infectious diseases
to microbiology and parasitology,
to public health, medical statistics
and epidemiology, up to forensic medicine.

In the vast majority of the research
and academic fields covered
by our PhD course, Anthony Fauci
represents an extraordinary example
of scientific excellence and a worldwide
recognized global expert.
His scientific production is terrific,
counting up to 1171 scientific papers
in Scopus, with an H-index of 183.
He has been a pioneer in immunomodulation,
providing fundamental contributions
to the study on the complex mechanisms
that contributes to define
the human immune response.
This allowed relevant advances
in developing treatment strategies
of inflammatory and immune-mediated
diseases such as polyarteritis nodosa,
granulomatosis with polyangiitis
(formerly Wegener's granulomatosis),
and lymphomatoid granulomatosis.

In the late seventies, Anthony Fauci
carried out important studies
on immune regulation in infections caused
by *Mycobacterium tuberculosis*.
He never neglected this disease,
and recently he claimed for the need
of measures for the intensification
of public health efforts, including
improving the current diagnostic,
preventive, and therapeutic tools.

Dr. Fauci has given a fundamental
contribution to the understanding
of how HIV destroys the immune defenses
leading to its susceptibility
to deadly infections. As director of NIAID,
he has a longstanding commitment
to discover new drugs to control HIV
and AIDS-associated complications
and co-infections. His studies have permitted
the development of anti-HIV treatments that
have radically increased life expectancy

and improved the living conditions
of HIV-infected people throughout the world.
As an immunologist, he contributed
with fundamental findings on HIV's
pathogenesis. At the same time,
he was the key architect of the US President's
Emergency Plan for AIDS Relief
that provides anti-HIV treatments to people
from the poorest countries. Dr. Fauci
published over 400 papers on HIV
and the most recent publications focused on
the development of the long-awaited vaccine,
shedding a light of hope for the future.

In the course of Ebola epidemics,
along to relevant papers on the treatment
of the diseases, Anthony Fauci
has treated Ebola patients himself,
and I want to report the following highly
moral statements using his own words:
"I do believe that one gets unique insights
into disease when you actually physically
interact with patients." Moreover,
he also wanted to show his staff
that he wouldn't ask them to do anything
he wouldn't do himself. This is
a strong moral and teaching legacy.

Dr. Fauci has been deeply involved
in programs aimed to reduce
the malaria burden in endemic countries.
In particular, he has claimed the need
for the availability of the genomic sequence
data for each of the three organisms
involved in malaria transmission,
with the aim to clarify the pathophysiologic
relationships among human host,
parasite, and vector.

Another important area of research
that Anthony Fauci has stimulated
at his Institute regards Neglected
Tropical Diseases, by supporting
and stimulating programs on vector biology,
filariasis, schistosomiasis and by funding
eight Tropical Research Medicine Centers
to support studies on NTDs in endemic areas.

In the last two years characterized
by the COVID-19 pandemics, Dr. Fauci
has represented for the United States citizens
and for all of us a firm point of reference
both for his scientific authority
and for his honesty and clarity
in communicating the severity of the disease
to the large public and to policymakers.
He advocated the three-ways approach
for the control of the pandemics, represented
by prevention, vaccination and therapies.
In this context, Dr. Fauci recently reviewed
the efficacy of several therapeutic strategies,
identifying pitfalls in approaches that failed
to demonstrate efficacy following validation
based on randomized controlled clinical trials.
He always underlined the need
of a data-driven approach to evaluate
eventual benefits in treating hospitalized
COVID-19 patients.

His ability and dedication to the research
in all these fields has been always characterized
by a "bench to bed" approach, as he understood
the necessary connection between basic
and applied science, and on how science
represents not only a value for the universal
knowledge but also an essential tool
for the improvement of humanity,
with a strong and passionate eye
to the patient well-being. Nevertheless,
he recently claimed that mRNA-based vaccines
against COVID-19, which marked
a critical milestone in reducing the impact
of the pandemic, are the fruits of years
of basic research.

We all know that the strong links
of Anthony Fauci with our country
have their roots also on his Italian origin,
in part from Sicily and for the other side
from Naples and Irpinia. But the connections
went over in all these years,
as he has mentored a large number
of Italian researchers, now spread
in numerous laboratories in the world.

With the conferring of the Doctorate
honoris causa to Anthony Fauci,
we want not only to renew
this connection and to acknowledge
his universal contribution in the field
of infectious disease, but also recognize
an example that will stimulate
our PhD students to pursue
their scientific objectives with dedication,
commitment and creativity, in the belief
that basic or applied research will make
the world a better place to live.

Stefano D'Amelio
Professor in Parasitology
and Parasitic Diseases of Animals

Lectio magistralis

Anthony S. Fauci

COVID-19: Lessons Learned and Remaining Challenges

Summary

Just over two years ago, a novel coronavirus causing severe pneumonia was first recognized in Wuhan, China. Later named SARS-CoV-2, this virus has since spread throughout the world and has caused several hundred million cases of coronavirus disease 2019 (COVID-19) and more than five million deaths. The COVID-19 pandemic has been characterized by the emergence and spread of SARS-CoV-2 variants, including the highly transmissible and severe delta variant and the highly transmissible omicron variant now predominant in many parts of the world. Early data suggest that the disease severity of COVID-19 caused by infection with the omicron variant is lower than with previous variants. However, the increased transmissibility and immune evasion of omicron may override any impact lower disease severity may have on the burden of hospitalizations and death, particularly among unvaccinated individuals at highest risk.

Infection with SARS-CoV-2 is associated with a wide spectrum of a disease, from asymptomatic infections to severe pneumonia and organ failure. Numerous non-pulmonary complications of COVID-19 have been reported, including neurologic disorders, hyperinflammation, cardiac dysfunction, hypercoagulability, acute kidney injury, and multisystem inflammatory syndrome in children (MIS-C). Risk factors for severe COVID-19 illness include being older than 65 years, and having underlying conditions such as obesity, hypertension, diabetes, chronic lung disease, or immunosuppression.

The public health response to COVID-19 has required an unprecedented public-private research effort. Clinical trials launched very early in the pandemic demonstrated the benefit of several repurposed therapeutics – including remdesivir, corticosteroids, and other immunomodulators – in mitigating severe outcomes. The development of monoclonal antibody therapies, delivered as infusions, later proved highly effective at preventing progression to advanced disease if given early in infection. However, some of these products have little or no effectiveness against the omicron variant. Recently, two effective oral drugs (Paxlovid and Molnupirivir) have been authorized for outpatient use in individuals with SARS-CoV-2 at high risk for progression to severe disease. Research programs have been launched

to stimulate the discovery and development of additional antivirals for COVID-19 and future viral pandemics.

The notable extraordinary scientific success story of the pandemic has been vaccines. Sustained research investments prior to the emergence of SARS-CoV-2 and the formation of robust public-private partnerships enabled the rapid pace of COVID-19 vaccine development. The Pfizer-BioNTech and Moderna mRNA vaccines and the Johnson & Johnson adenovirus-vectored vaccine now are authorized or approved for use in the United States and many other countries. Other countries including the UK, Russia, China, India among others have developed effective vaccines with varying degrees of effectiveness. With regard to the vaccines utilized in the USA, real-world effectiveness studies have shown that these vaccines greatly reduce symptomatic infection, severe disease, and death from COVID-19. However, protection (particularly against symptomatic infection) wanes over time, especially with the immune-evasive omicron variant. A booster (third mRNA or second adenovirus) dose has been shown to restore high levels of protection, even against omicron. Looking to the future, the development of broadly protective coronavirus vaccines that are impervious to viral variants is a major research priority.

As we enter the third year of the COVID-19 pandemic, we face significant challenges with the surging omicron variant and perhaps other variants to follow. Fortunately, we have the tools we need to bring the SARS-CoV-2 virus under control. Using these tools, particularly vaccines and therapies, in conjunction with proven public health measures such as masking, ventilation, and social distancing we can help subdue outbreaks. Vaccination, including booster doses, can turn a potentially deadly pneumonia into a mild respiratory illness. Rapid antigen and molecular diagnostic tests can identify infected individuals to break the chain of transmission and enable isolation and early treatment. Therapeutics can prevent progression to severe disease for those at high risk. In 2022 and beyond, we will apply what we have learned during the first two years of the COVID-19 response to prepare for future SARS-CoV-2 variants and other viral pathogens with pandemic potential.

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