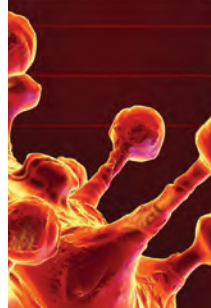
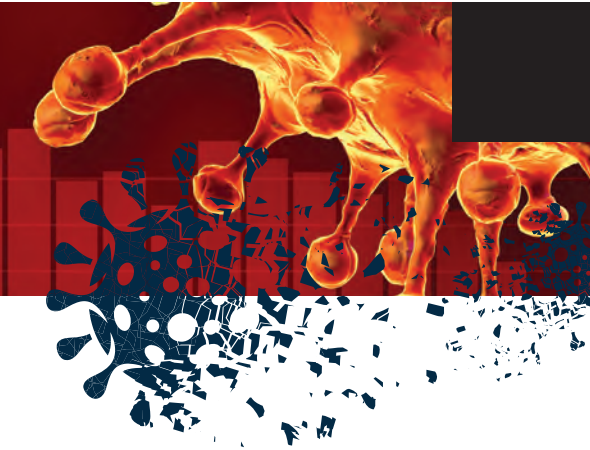


NSTDA

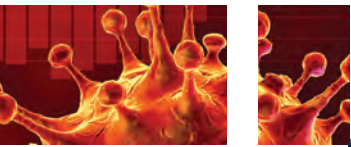
**NAC2022**  
17<sup>th</sup> NSTDA Annual Conference  
การประชุมวิชาการประจำปี สวทช. ครั้งที่ ๑๗



# International Webinar on COVID-19

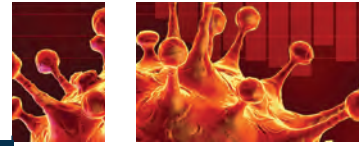


16:30 – 18:20 Hrs. (Thailand time)  
29<sup>th</sup> March 2022  
Thailand Science Park, NSTDA



# Contents

<b>03</b>	<b>Introduction Statement</b>
<b>04</b>	<b>Program Summary</b>
<b>05</b>	<b>Speaker &amp; Chair:</b> Chair: Dr.Prasert Auewarakul Speaker 1: Dr.Pieter Cullis Speaker 2: Dr.George F. Gao Speaker 3: Dr.Ernesto Oviedo-Orta Speaker 4: Dr.Anan Jongkaewwattana
<b>16</b>	<b>Organizer</b>



# Introduction Statement

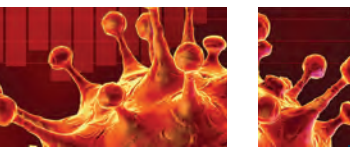
## Rationale

The global pandemic of COVID-19 requires a rapid global response. Since the first infected patient was detected in Wuhan, China, this infectious disease broke out in almost every country in the world, resulting in a devastating number of infections as well as fatalities. Meanwhile, highly contagious variants keep emerging, igniting new waves of COVID and creating serious impacts on societies and economies around the world. It is, therefore, vital that effective diagnostics, treatments, and a vaccine are urgently developed and deployed. Without them, every country will remain vulnerable. Countries and organizations at various levels are joining forces to ensure that life-saving tools are not only developed, but also made universally available and affordable for everyone. No person, country, or region should be left behind.

In response to this concern, the National Science and Technology Development Agency (NSTDA) as a national science and technology research agency in Thailand is hosting an International Webinar on COVID-19 on 29 March 2022 to review the current COVID-19 situation. This webinar is one of many sessions embedded in the NSTDA Annual Conference 2022 (NAC2022) and will be organized via the Cisco WebEx platform. The session will bring together experts and researchers to present, share and discuss improvements and alternative solutions to cope with the global pandemic in order to increase knowledge and positively impact our responses to this pandemic.

## Objective

To serve as a platform for sharing knowledge and disseminating information about the current research on COVID-19.



# Program Summary

International Webinar on Covid-19

29<sup>th</sup> March 2022; 16:30-18:20 hrs., Thailand Science Park

Time (Thailand)	Activity
16:30 - 16:40 hrs. (05:30 - 05:40, US) (02:30 - 02:40, Canada) (17:30 - 17:40, China)	<b>Welcome Remarks</b> by <b>Dr.Prasit Palittapongarnpim</b> Executive Vice President, National Science and Technology Development Agency
<b>Global Situation on COVID-19 / 2<sup>nd</sup> Generation of Vaccine &amp; Treatment</b> (25-minute talk with 5-minute discussion for each speaker)	
16:40 – 18:10 hrs. (05:40 - 07:10, US) (02:40 - 04:10, Canada) (17:40 - 19:10, China)	<b>Chair: Dr.Prasert Auewarakul</b> Deputy Dean of Research, Faculty of Medicine Siriraj Hospital Mahidol University, Thailand  <b>Speakers</b> <b>1. “Design of the lipid nanoparticles for the COVID-19 mRNA vaccines”</b> Dr.Pieter Cullis, Biochemistry and Molecular Biology, The University of British Columbia, Canada (Pre-recorded talk) <b>2. "COVID-19: virus, vaccines and control"</b> Dr.George F. Gao, Director-General, Chinese Center for Disease Control and Prevention, Chinese Academy of Sciences, P.R. China <b>3. “Monoclonal Antibody Therapies in the fight against COVID-19”</b> Dr.Ernesto Oviedo-Orta, Infectious Disease Lead. General Medicine Franchise/ Senior Director. Medical Affairs, Regeneron Genetics Center, USA <b>4. “Advancement of viral vector-based COVID-19 vaccines in Thailand”</b> Dr.Anan Jongkaewwattana, Director, Veteri- nary Health Innovation and Management Research Group, BIOTEC, Thailand
18:10 – 18:20 hrs. (07:10 - 07:20, US) (04:10 - 04:20, Canada) (19:10 - 19:20, China)	<b>Wrap up &amp; closing</b>

# Chair

Name:

**Dr. Prasert Auewarakul**

Organization:

Mahidol University

Current Position:

Professor

Contact e-Mail Address:

Prasert.aue@mahidol.ac.th

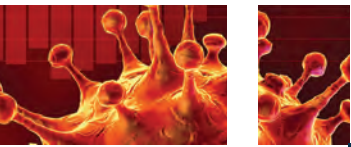
Education:

M.D. Mahidol University

Dr. Med. Heidelberg University

**Work Experience:** Since 1997 he has been working as a faculty member at the Department of Microbiology, Faculty of Medical Siriraj Hospital, Mahidol University in Bangkok. His research interests include biology and pathogenesis of influenza and emerging viruses, and antiviral development. He was the chairman of the Health and Medicine Cluster at the National Science and Technology Development Agency during 2011-2019. He is currently the Deputy Dean for Research at the Faculty of Medicine Siriraj Hospital.





# Speaker 1



**Name:**  
**Dr. PIETER R. CULLIS**

**Organization:**  
Department of Biochemistry and molecular Biology  
The University of British Columbia, Canada

**Current Position:**  
Director, Life Sciences Institute  
Director, Nanomedicines Research Group

**Contact e-Mail Address:**  
pieterc@mail.ubc.ca

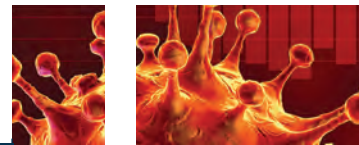
Assistant:  
Cayetana Schluter (cayetana@mail.ubc.ca)

**Education:**

- 1964-1967: BSc, Physics, The University of British Columbia, Canada
- 1964-1972: PhD, Physics, The University of British Columbia, Canada
- 1973-1976: Postdoc, Biochemistry, University of Oxford, UK
- 1977: Postdoc, Biochemistry, University of Utrecht, Holland

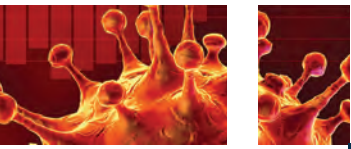
**Work Experience:**

- 1978: Assistant Professor, Biochemistry and Molecular Biology, UBC Vancouver
- 1982: Associate Professor, Biochemistry and Molecular Biology, UBC Vancouver
- 1985-present: Professor, Biochemistry and Molecular Biology, UBC Vancouver
- 1985-2000: Co-Founder and Chairman, Lipex Biomembranes (now Evonik Canada), Vancouver
- 1986-1991: Co-Founder, Director and President, Canadian Liposome Company Vancouver
- 1991: Co-Founder; Director 1991-1996, Northern Lipids (now Evonik Canada, Vancouver
- 1992-2007: Co-Founder and Director (Vice President, Research 1992-2004) Inex Pharmaceuticals Corp (now Genevant), Burnaby
- 2001-2005: Co-founder, Director and Chairman SAB 2005-2010, Protiva Biotherapeutics (now Arbutus), Burnaby



# Speaker 1

- 2004-2010: Co-founder, Scientific Director, Centre for Drug Research and Development (now Admare), BC
- 2009-present: Co-Founder and Chairman, Acuitas Therapeutics, Vancouver
- 2010-2015: Co-Founder and Chairman, Precision NanoSystems, Vancouver
- 2011-present: Co-Founder and Chairman, Personalized Medicine Initiative, Vancouver
- 2013-2017: Director, Life Sciences Institute, UBC Vancouver
- 2014-2016: Co-Founder & Director, GenXys Health Care Systems, Vancouver
- 2014-2019: Co-Founder & Director, Mesentech, Vancouver
- 2014-present: Director, Chairman 2017 on, AllerGen National Centre of Excellence, Hamilton
- 2015-present: Integrated NanoTherapeutics Vancouver Co-Founder
- 2019-2021: Scientific Director & CEO, NanoMedicines Innovation Network NCE Vancouver
- 2020-present: Co-Founder and Chairman, Nanovation Vancouver



## Speaker 2



**Name:**

**Dr. George F. Gao,**

**Organization:**

Chinese Center for Disease Control and Prevention (China CDC)

**Current Position:**

- Director-General, Chinese Center for Disease Control and Prevention (China CDC)
- Vice President, the National Natural Science Foundation of China (NSFC)
- Director and Professor, CAS Key Laboratory of Pathogen Microbiology and Immunology, Institute of Microbiology, Chinese Academy of Sciences
- Dean, Savaid Medical School, University of Chinese Academy of Sciences

**Contact e-Mail Address:**

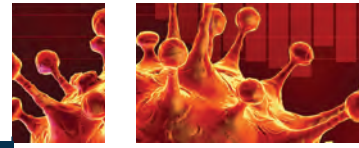
gaof@im.ac.cn

(PA to Prof. George Fu Gao: baiyu@im.ac.cn)

**Education:**

He obtained his PhD (DPhil) degree from Oxford University, UK and did his postdoc work in both Oxford University and Harvard University (with a brief stay in Calgary University). His researches focus on pathogen microbiology and immunology. Gao is a leading scientist in the field of pathogenic microorganisms and immunology in China and worldwide, and he has long been engaged in the transmission of pathogenic microorganisms across hosts, infection mechanisms and hosts cellular immunity, as well as public health policy and global health strategy, including Influenza, MERS, Ebola, Zika, Chikungunya, and especially for COVID-19 pandemic's prevention and control in China. He is a leading figure for the control of infectious diseases in China and a world advocate voice of global public health strategy.

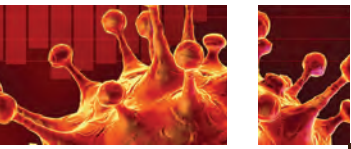




## Speaker 2

**Work Experience:** He worked in Beijing Agricultural University (1986-1991), Oxford University (2001-2006), Institute of Microbiology, CAS (2004-2008, Director General). Gao is a member (academician) of Chinese Academy of Sciences (elected in 2013), a fellow of The Third World Academy of Sciences (TWAS, also known as The World Academy of Sciences) (elected in 2014), an associate (foreign) member of EMBO (European Molecular Biology organization) (elected in 2016), a fellow of AAS (African Academy of Sciences) (elected in 2017), a corresponding member of Brazilian Academy of Sciences (elected in 2019), a member of National Academy of Medicine (USA) (elected in 2019), an international member of National Academy of Sciences (USA) (elected in 2019), a member of the German National Academy of Sciences Leopoldina (elected in 2020), a member of Academia Europaea (elected in 2020) etc..

He has published lots of refereed papers including papers in Cell, Nature, Science, Lancet, New England Journal of Medicine, PNAS. Gao is a recipient of several international and national awards, including TWAS Medical Prize (2012), Nikkei Asian Prize (Japan 2014), Shulan Medical Sciences Award (2016), the Gamaleya Medal (Russia 2018), HKU Centennial Distinguished Chinese Scholar (2019) and the Qiu Shi Outstanding Scientist and Outstanding Scientific Research Team Awards (2019). His research has recently expanded on public health policy and global health strategy. As a leading advocate of global public health strategy, he is instrumental in establishing an Africa-based Centre for pathogens and tropical diseases and has made significant contributions to strengthening public health capacity in developing countries in Africa and to global public health at large.



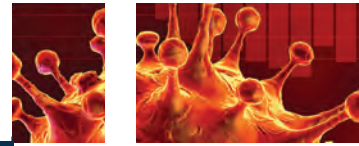
# Abstract

COVID-19: virus, vaccines and control

**George F. Gao**

Email:gaof@im.ac.cn

During recent COVID-19 pandemic, our team sequenced and isolated the novel coronavirus within a week and alerted the world very quickly (The Lancet 2020a; New England Journal of Medicine 2020a/b). I called in the media in China and in the world to the public for the personal protection and national/international control strategy (Science, 2020a). Our group as the first to have discovered the COVID-19 virus receptor as ACE2, the same as the receptor for SARS-CoV, and further elucidated the structural basis of the receptor binding (Cell, 2020a). COVID-19 pandemic continues worldwide with many variants arising, some of which are variants of concern (VOCs). We elucidated the structural basis of all the VOCs to hACE2 (Nat Commun, 2021; Cell, 2022). In addition, we evaluated the cross-species recognition of SARS-CoV, SARS-CoV-2, RaTG13, GX/P2V/2017 and GD/1/2019 to more than 20 ACE2 orthologs (Cell Discov, 2020; PNAS, 2021; Cell, 2021; EMBO J, 2021). We also have been deeply involved in the development of therapeutics and prophylactic vaccines. A novel recombinant protein vaccine (Cell, 2020a), an inactivated vaccine candidate (Cell, 2020b) and several human-origin monoclonal antibodies have been being developed by our group (Nature, 2020; Science, 2020b). What is worth mentioned is that the inactivated vaccine of COVID-19 has been used in China, and many other countries with WHO EUL etc. The recombinant protein COVID-19 vaccine has been approved for the EUA in Uzbekistan, Indonesia and China (recently approved for conditional commercial use in China), and human-origin monoclonal neutralizing antibodies Etesevimab (JS016) with Lilly's Bamlanivimab (LY-CoV555) therapy for emergency use in COVID-19 patients has been approved EUA, the therapy has obtained EUA in more than 17 countries and regions worldwide. We evaluated the neutralization of vaccine-elicited antisera to SARS-CoV-2 VOCs, and provided a better strategy by prolonging the booster interval to protect against highly mutated variants such as omicron (Lancet Microbe, 2021; NEJM, 2022), esp. with his protein submit vaccine ZF2001.



## Speaker 3

Name:

**Dr. Pernesto Oviedo-Orta MD PhD MBA**

Organization:

Regeneron Pharmaceuticals

Current Position:

Director, Life Sciences Institute

Director, Nanomedicines Research Group

Contact e-Mail Address:

1 Rockwood Rd. Sleepy Hollow, NY 10591. United States of America

Education:

MD (1992) Havana Medical School, Havana, Cuba.  
Clinical Immunology

(1996) Havana Medical School, Havana, Cuba. PhD Medical Biochemistry & Immunology

(2000) University of Wales College of Medicine, Cardiff. UK.

MBA (2006) King Juan Carlos University, Madrid. Spain.

Work Experience:

(1992-6) Resident Clinical Immunology  
Havana Medical School, Havana, Cuba.

(1996-2000) International Research Fellow (Royal Society)  
University of Wales College of Medicine, Cardiff, UK.

(2000-4) BHF Fellow  
Bristol Heart Institute, University of Bristol, Bristol. UK.

(2004-11) Assistant Prof. Immunology  
University of Surrey, Guildford, UK.

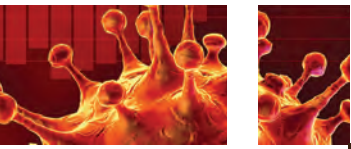
(2011-15) Clinical Sciences Expert  
Novartis Vaccines, Siena, Italy.

(2015-18) Clinical Development Director  
Sanofi Pasteur, Lyon, France.

(2018-20) Senior Director, Clinical Development  
Celgene Co. & BMS, Summit, NJ, USA.

(2020 - ) Senior Director, Medical Affairs  
Regeneron Pharmaceuticals, Sleepy Hollow, NY, USA.





**Author(s) (attach \* to presenter):**

**Dr.Ernesto Oviedo-Orta\***

**Presentation Title:**

Monoclonal Antibody Therapies in the fight against COVID

**Abstract :**

Covid-19 have claimed the life of over 5 million people worldwide in the last two years. The need for effective immediate preventive and treatment options against the disease has triggered unprecedented efforts from the scientific and medical community. Vaccines have played a key role in containing the spread of the infection but for those individuals already infected few treatment alternatives still exist. Monoclonal antibodies against SARS-COV-2 became available to treat patients under Emergency Use Authorization almost a year after the pandemic started and remain one of the most efficacious tools especially for patients unable to mount effective immune responses to vaccines. This presentation provides a historic background of the evolution of monoclonal antibody treatments during the pandemic and also the current status of their development.

# Speaker 4

Name:

**Dr. Anan Jongkaewwattana**

Organization:

National Science and Technology Development Agency (NSTDA)

Current Position:

Director, (Veterinary Health Innovation and Management Research Group)

Contact e-Mail Address:

anan.jon@biotec.or.th

Education:

B.Sc (Hon.) : University of Michigan, Ann Arbor, USA

Ph.D (Microbiology) : University of Alabama School of Medicine, Birmingham, USA

Post doctoral training (Virology) : St. Jude Children's Research Hospital, Memphis, USA

Carlos University, Madrid. Spain.

Work Experience:

1. Development of avian influenza virus (H5N1) vaccines
2. Development of pandemic human influenza (H1N1) vaccines
3. Development of reverse genetics system of human and porcine coronaviruses
4. Development of SARS-CoV-2 vaccines using viral vector-based platform
5. Development of pseudovirus-based systems for coronavirus studies and immunity assessment
6. Development of engineered cell lines for virus research





# Abstract

Author(s) (attach \* to presenter):

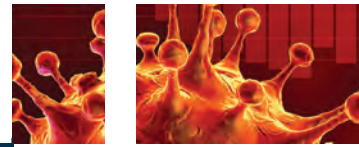
Samaporn Teeravechyan, Challika Kaewborisuth,  
Phanramphoei N Frantz, Surapong Koonpaew, and  
Anan Jongkaewwattana\*

Presentation Title:

Advancement of viral vector-based COVID-19 vaccines in Thailand

**Abstract :**

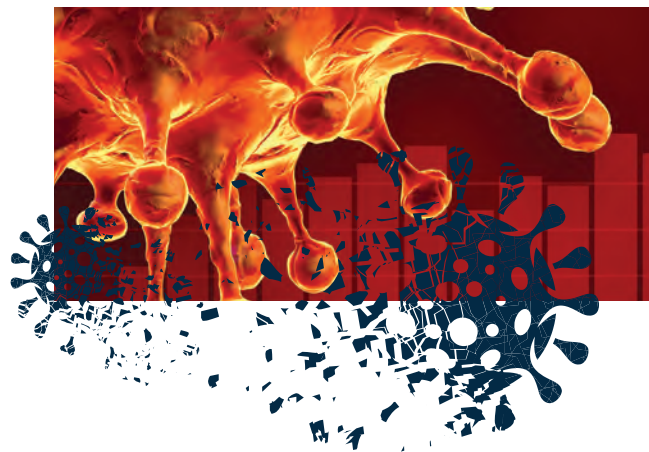
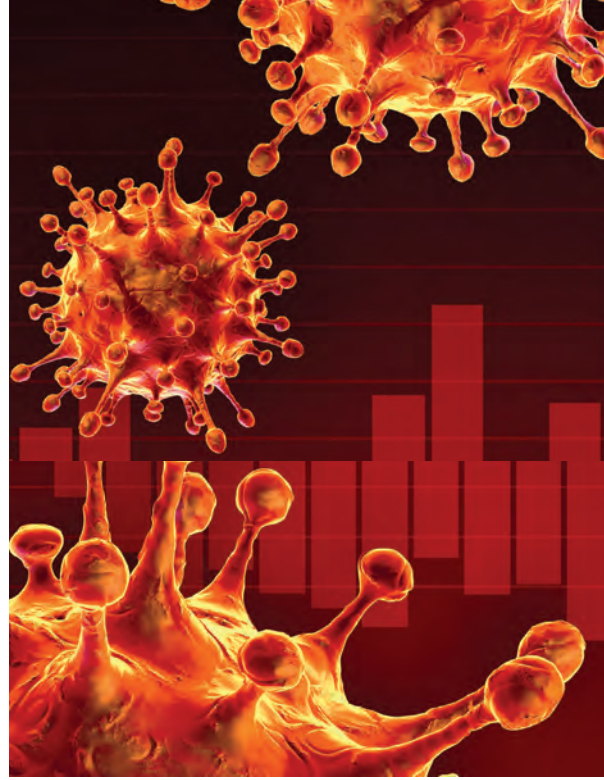
Among many vaccine technologies currently utilized to develop COVID-19, viral vector-based vaccines represent a highly versatile platform that offers several advantages over traditional vaccines. In particular, viral genetic materials can be engineered to express modified SARS-CoV-2 spike, which is believed to trigger signals in target cells that resemble natural infection, which induce potent immune responses. In addition, the production processes of viral vector-based vaccines with means of upscaling have been established, supporting the use of these technologies for pandemic settings. Since the beginning of the COVID-19 pandemic, the Virology and Cell Technology Research Team at BIOTEC, NSTDA, have developed COVID-19 vaccines based on various viral vector platforms, including Adenovirus, Influenza A virus, and Measles virus (in collaboration with Prof. Dr. Frédéric Tangy at Institut Pasteur, Université de Paris). The mice immunized with each vaccine candidate displayed robust immune responses, which agree with the data that all immunized mice were completely protected from challenge with wild-type SARS-CoV-2, preventing replication in lungs and nasal turbinates, bodyweight loss, cytokine storm, and lung pathology. These ongoing research activities have demonstrated the scientific capability of Thai researchers to develop safe and highly efficacious viral vector-based vaccine candidates that can provide complete protection against severe SARS-CoV-2 infection at least in animal models, supporting its further development as human vaccines in future clinical trials.



# Organizer



The National Science and Technology Development Agency (NSTDA) is an autonomous government agency affiliated to the Ministry of Higher Education, Science, Research and Innovation (MHESI). NSTDA is tasked to be a driving force to enhance scientific and technological capabilities of Thailand and to enhance the country's competitiveness and the well-being of Thai citizen through science and technology. The agency is committed to achieve four strategic missions comprising; 1) research & development 2) technology transfer 3) human resource development and 4) S&T infrastructure development, through its five main national research centers; the National Center for Genetic Engineering and Biotechnology (BIOTEC), the National Metal and Materials Technology Center (MTEC), the National Electronics and Computer Technology Center (NECTEC), the National Nanotechnology Center (NANOTEC) and the National Energy Technology (ENTEC). In addition, NSTDA reaches out to other research organizations and universities through joint collaboration and other supporting mechanisms to ensure the best resources are being captured to meet the country's innovation needs. To tie all these functions together, the Technology Management Center (TMC) and the Agricultural Technology and Innovation Management Institute (AGRITEC) of NSTDA serve as a linkage between scientists and end users through various mechanisms.



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**Contact:**

Ms. Mullika Kulsiripruck,  
International Collaboration  
Division (INCO), NSTDA

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[mullika.kul@nstda.or.th](mailto:mullika.kul@nstda.or.th)



