



Saving the World with Patents: **Is the TRIPS Waiver helping or hurting innovation?**

June 15, 2021

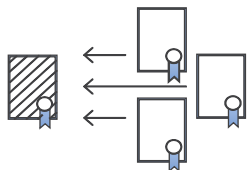


Patent Analytics in LexisNexis® PatentSight®: Quality assessment

Technology Relevance™

Worldwide citations received from later patents, adjusted for age, patent office practices and technology field

Average value: 1



Competitive Impact™

(Individual patent strength)
The relative business value of a patent family

X

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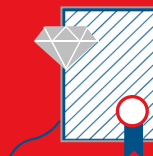
Market Coverage™

Market size protected by active patents and pending patent applications on a certain invention

Value of granted US patent: 1



Individual Patent Family



Patent Asset Index™



Innovative strength of a company or portfolio (ability to achieve competitive advantage)!

Today's speakers



**Brian Arthur
Pomper**
Akin Gump



Melissa Brand
Biotechnology
Innovation Organization
(BIO)



**Dr Sarbani
Chattopadhyay**
LexisNexis
PatentSight



Gene Quinn
IPWatchdog

Vaccine

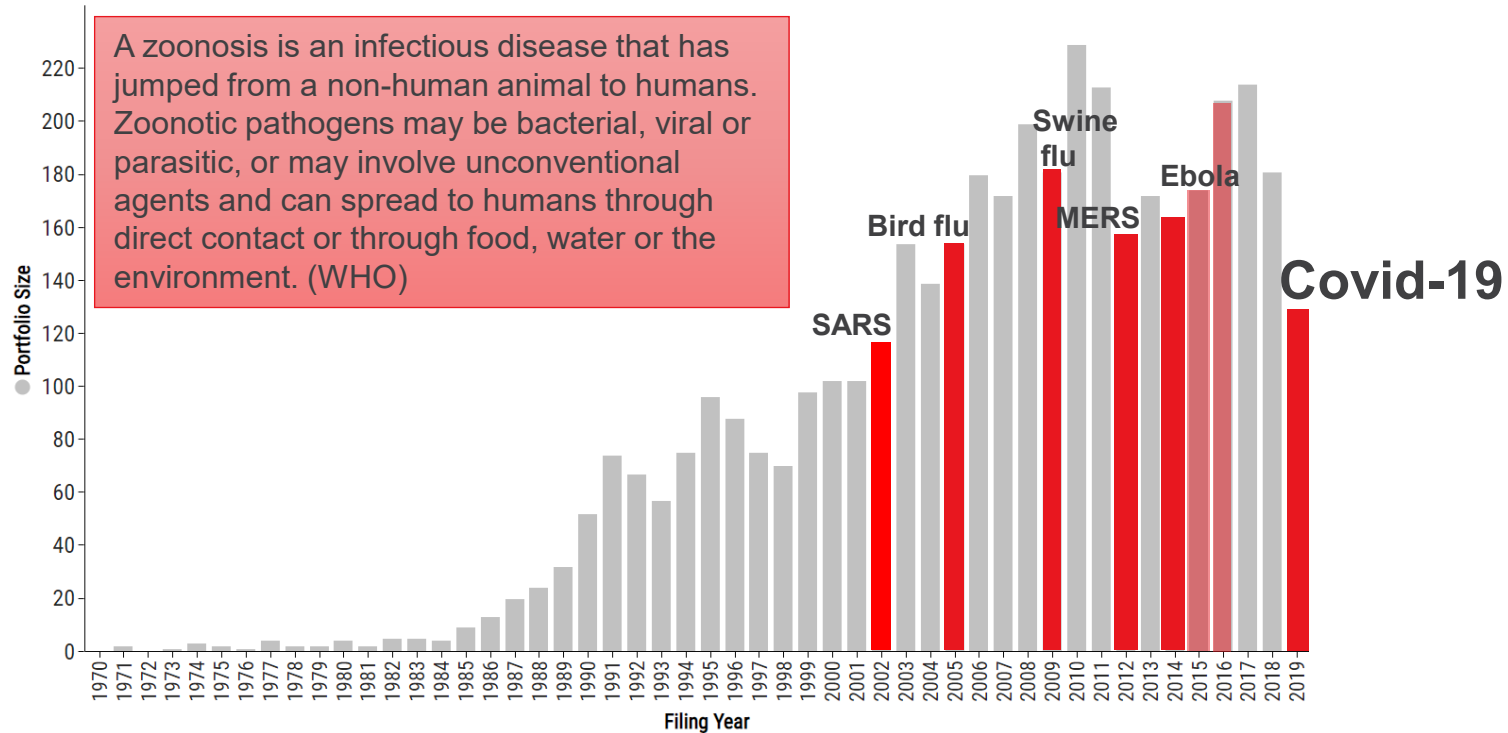
- A substance used to stimulate the production of antibodies and provide immunity against one or several diseases, prepared from the causative agent of a disease, its products, or a synthetic substitute, treated to act as an antigen without inducing the disease
- Prophylactic vaccines are for prevention of disease



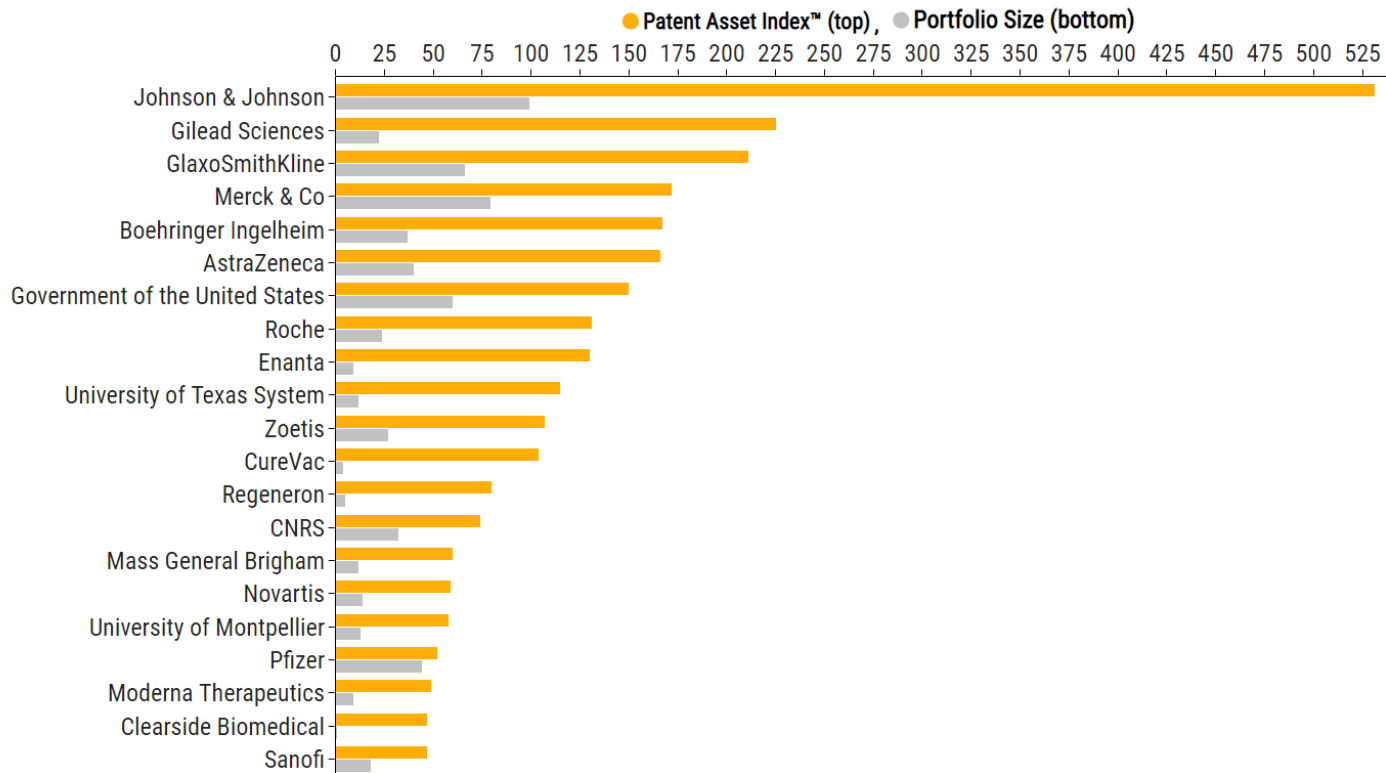
<https://medlineplus.gov/ency/article/002024.htm>

Overview of the Field

Filing Statistics of patents related to vaccines against viruses



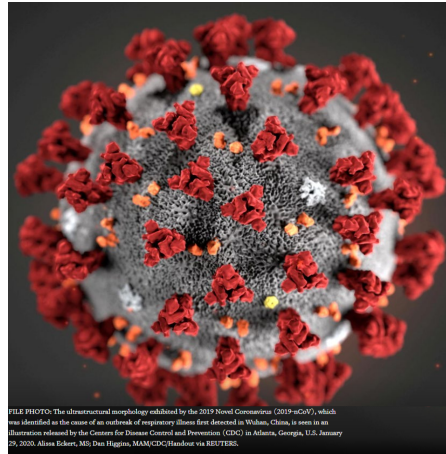
Top 20 companies, as per PatentSight®, in the field of antivirals related to Corona virus family and related virus families (broad overview)



Coronaviridae family

Subunit vaccine
(optional: with adjuvants)

Vector based vaccine



Conjugate vaccine

Nucleic acid vaccine

FILE PHOTO: The ultrastructure morphology exhibited by the 2019 Novel Coronavirus (2019-nCoV), which was identified as the cause of an outbreak of respiratory illness first detected in Wuhan, China, is seen in an illustration released by the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, U.S., January 29, 2020. Alesia Eckert, MS; Dan Higgins, MAM/CDC/Handout via REUTERS

Source: WHO: https://www.who.int/health-topics/coronavirus#tab=tab_1

Inactivated vaccine

Johnson & Johnson

Johnson & Johnson

corona viru: Select Sorted by CI ↓

- A means of producing and utilising a 2003
The present invention relates to the pr...
Johnson & Johnson EP1558723.A1
- Antigenic peptides of sars coronavir 2004
The present invention pertains to antig...
Johnson & Johnson EP1644404.A2
- Binding molecules against sars-coro 2004
The present invention provides binding...
Johnson & Johnson EP1644414.A2
- Compositions against sars-coronavi 2005
The present invention provides compo...
Johnson & Johnson EP1812067.A1
- Multitargeting interfering rnas havin. 2006
Interfering RNA molecules are now de...
Johnson & Johnson EP1951263.A1
- Suppression of viruses involved in re 2008
The present invention concerns metho...
Johnson & Johnson EP2160191.A1
- Recombinant protein production in a 2000
The present invention provides metho...
Johnson & Johnson HK1048138.A1

[Click here to tag patents...](#)

Family of EP1812067.A1 et al.

Compositions against sars-coronavirus and uses thereof

Johnson & Johnson First filing in family 11/10/2005
First publication in family 5/18/2006

The present invention provides compositions of binding molecules specifically binding to a coronavirus such as SARS-CoV and capable of neutralizing an infection caused by the virus. The compositions are suitable for diagnosing, preventing and/or treating a condition resulting from a coronavirus such as SARS-CoV. (Source: EP1812067.A1, equivalent)

No drawing available.

Inventors Adrian De Kruif Cornelis, Brink Edward Norbert Van Den, De Kruif Cornelis Adriaan, G, ...

Johnson & Johnson

Document US2005196384.A1 — family of US2005196384.A...

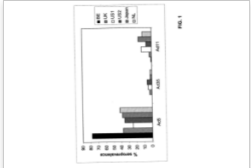
Family of US2005196384.A1 In force E

Settings for recombinant adenoviral-based vaccines

The present invention provides new uses of recombinant adenoviral vectors in vaccination regimens, such as prime/boost set-ups and subsequent vaccinations and applications for gene therapy. Moreover, the invention provides new assays to determine the best regimen for applying the most suitable recombinant viral vector in a vaccination or gene ther...

Source: original

Filing date: 4/14/2005
Publication date: 9/8/2005



Abstract Claims Description Drawings

Source: original

1
. An improvement in a method of delivering a nucleic acid sequence of interest to a subject using an adenoviral delivery vehicle, the method comprising:

- administering to the subject a recombinant adenovirus vector of a first serotype having a nucleic acid sequence of interest, wherein the first serotype is selected from the group consisting of Ad11, Ad26, Ad34, Ad35, Ad46, and Ad49; and
- administering to the subject, subsequent to administering the recombinant adenovirus vector of the first serotype, a recombinant adenovirus vector of a second serotype having a nucleic acid sequence of interest, wherein the second serotype is different from the first serotype.

6
. The method according to claim 5, wherein the viral antigen is selected from the group consisting of an Ebola virus antigen, a measles virus antigen, and a West Nile virus antigen.

Background document on the Janssen Ad26.COV2.S (COVID-19) vaccine

Background document to the WHO Interim
recommendations for use of Ad26.COV2.S
(COVID-19) vaccine
17 March 2021



Characteristics of Ad26.COV2.S (COVID-19) vaccine

The Janssen COVID-19 Vaccine is a replication-incompetent **adenovirus type 26 (Ad26)-vectored** monovalent vaccine encoding the **SARS-CoV-2 spike (S) protein** from the Wuhan-Hu-1 isolate (GenBank accession number MN908947), stabilized in its prefusion conformation. The vector cannot replicate in human cells because the E1 gene was deleted from the genome. To manufacture vaccines that are based on replication incompetent adenoviral vectors, a specific cell line is used that complements for the missing E1 gene. This cell line is derived from a single human primary cell, obtained in 1985 from fetal retina tissue (at 18 weeks of gestation adhering to the Dutch laws that were in effect). The cell line was established by transformation of the primary cells using the Adenovirus E1 gene which resulted in a cell line that constitutively expresses E1, and that is thus able to complement the adenoviral vector that misses E1, allowing the vector to replicate during the manufacturing process. Another consequence of the E1 transformation is that the cell line can be propagated indefinitely and as a result, there is no need to go back to the primary cells in any part of the scientific discovery or manufacturing process. The Ad26 vector expressing the S protein is grown in PER.C6G TetR cell line, in media containing amino acids and no animal-derived proteins. After propagation, the vaccine is processed through several purification steps, formulated with inactive ingredients and filled into vials.

Novavax

Novavax

corc Cancel select Sorted by... ↓

- Modified rsv f proteins and meth** 2009
The present invention is generally ...
Novavax EP2370099.A1
- Immunogenic middle east respir** 2014
Disclosed herein are nanoparticle...
Novavax EP3046579.A1
- Vaccine compositions having im** 2016
Disclosed herein are nanoparticle...
Novavax EP3344291.A2
- Composition Comprising Iscom** 2004
Iscom particles can be used as an...
Novavax US2008095795.A1
- Avian influenza chimeric VLPS** 2008
This invention discloses a method...
Novavax EP2540312.A1
- Coronavirus vaccine formulation** 2020
Disclosed herein are coronavirus ...
Novavax US10953089.B1
- Antimicrobial oil-in-water emuls** 1994
An antibacterial oil-in-water emuls...
Novavax EP0760650.A1

[Click here to tag patents...](#)

Family of EP3046579.A1 et al. In force

- Immunogenic middle east respiratory syndrome coronavirus (mers-cov) compositions and methods**

Novavax First filing in family 9/19/2014
First publication in family 3/26/2015

Disclosed herein are nanoparticles containing **MERS virus** proteins in polymer structures, and compositions containing the nanoparticles formulated for administration as immunogenic compositions. Also provided herein are vector constructs encoding the proteins, and host cells containing the vector constructs. The disclosure also includes methods of making the nanoparticles and administering them to vertebrates, including methods of inducing immune responses to **MERS** that reduce or prevent infection by the **virus**. (Source: EP3046579.A1, equivalent)

No drawing available.

Inventors Gale Smith, Liu Ye, Massare Michael
Applicant Novavax Inc

Document US10751410.B2 – family of EP3046579.A1 et al.

Family of EP3046579.A1

Immunogenic middle east respiratory syndrome coronavirus (MERS-CoV) compositions and methods

Disclosed herein are nanoparticles containing MERS virus proteins in polymer structures, and compositions containing the nanoparticles formulated for administration as immunogenic compositions. Also provided herein are vector constructs encoding the proteins, and host cells containing the vector constructs. The disclosure also includes methods of making the nanoparticles and administering them to vertebrates, including methods of inducing immune responses to MERS that reduce or prevent infection ...

Source: original

Filing date:
Publication date:


Abstract Claims Description Drawings

1
An immunogenic composition comprising

- (i) a MERS-CoV nanoparticle, wherein the nanoparticle comprises a MERS CoV antigen, wherein the antigen consists of baculovirus Spike polypeptide in trimer form; and wherein the Spike polypeptide is the only polypeptide in the nanoparticle, and
- (ii) an adjuvant, wherein the adjuvant consists of two ISCOM matrix particle types wherein the first particle type comprises a lipid from Quillaja Saponaria Molina, and the second particle type comprises a lipid and saponin Fraction C from Quillaja Saponaria Molina;

wherein the composition is capable of inducing neutralizing antibodies against MERS-CoV.

Matrix-M™ adjuvant



Matrix-M is composed of 40 nanometer particles based on saponin extracted from the Quillaja saponaria Molina bark together with cholesterol and phospholipid.

Induces the influx of antigen-presenting cells (APC), which enhance activated T cell, B cell, and APC populations.

<https://www.novavax.com/our-unique-technology>

News

Novavax to Present at
International Society for
Vaccines Virtual Congress
COVID-19 Vaccine Update

Novavax COVID-19 Vaccine Demonstrates 89.3% Efficacy in UK Phase 3 Trial

Jan 28, 2021 at 4:05 PM EST

First to Demonstrate Clinical Efficacy Against COVID-19 and Both UK and South Africa Variants

coronavirus spike (S) protein and is adjuvanted with Novavax' patented saponin-based Matrix-M™ to enhance the immune response and stimulate high levels of neutralizing antibodies. NVX-CoV2373 contains purified protein antigen and can neither replicate, nor can it cause COVID-19. In preclinical studies, NVX-CoV2373 induced antibodies that blocked the binding of spike protein to cellular receptors and provided protection from infection and disease. It was generally well-tolerated and elicited robust antibody response in Phase 1/2 clinical testing.

Sanofi

Sanofi

baculovirus Select Sorted by CI ↓

Amino acid sequences directed agai.	2009
The present invention relates in part to...	
Sanofi	EP2285408.A2
Novel immunogenic formulations co.	2017
The present invention provides for nov...	
Boehringer Ingelheim, San...	EP3471760.A1
Monovalent, bivalent and trivalent an	2010
Amino acid sequences are provided th...	
Sanofi	EP2438087.A2
Inhalation device for use in aerosol t.	2015
Methods are provided for the treatmen...	
Sanofi	EP3204095.A1
Multimerization of recombinant prot.	2015
The present invention relates to polym...	
Sanofi	EP3233924.A1
amino acid sequences directed agai.	2010
Amino acid sequences are provided th...	
Sanofi	US2012301469.A1
Vectors expressing SARS immunoge.	2004
SARS (severe acute respiratory syndro...	
Sanofi	US2013216566.A1

Family of US2013216566.A1 et al. In force

Vectors expressing SARS immunogens, compositions containing such vectors or expression products thereof, methods and assay...

Sanofi

First filing in family 6/21/2004
First publication in family 3/10/2005

SARS (severe acute respiratory syndrome virus, a coronavirus) immunogens, antigens, or epitopes, nucleic acid molecules encoding such immunogens, antigens, or epitopes; vectors containing such nucleic acid molecules, e.g., viral vectors such as baculovirus vectors, DNA vectors, such as DNA plasmid vectors, e.g., DNA plasmids that express a nucleic acid molecule in a mammalian cell, uses for such immunogens, antigens or epitopes and vectors, e.g., as an active component immunogenic, immunological or vaccine compositions, or to generate antibodies, such as monoclonal antibodies, and methods for making, and using such immunogens, antigens or epitopes, vectors, antibodies, including in methods for eliciting an immunological or immunogenic or vaccine response, as well as i...

FIGURE 1A

GlaxoSmithKline

GlaxoSmithKline

High Select Sorted by First filing ↑

<input type="radio"/> Vaccine including oil/water emulsi The present invention provides vacci... GlaxoSmithKline	1994 NL300362.I1
<input type="radio"/> Oil in water vaccine compositions The present invention relates to impr... GlaxoSmithKline	1998 EP0999852.A1
<input type="radio"/> Vaccines The present inventions relates to an ... GlaxoSmithKline	1998 EP1009430.A1
<input type="radio"/> Novel treatment. This invention provides a pharmaceut... GlaxoSmithKline	1999 ZA200105690.B
<input type="radio"/> Microparticles for delivery of the he Microparticles with adsorbent surfac... GlaxoSmithKline	2001 MXPA03002640.A
<input checked="" type="radio"/> Use of an influenza virus and an oil- The present invention relates to influ... GlaxoSmithKline	2006 EP1861120.A1
<input type="radio"/> Vaccine comprising an oil in water . The present invention provides an im... GlaxoSmithKline	2007 EP2086582.A1

[Click here to tag patents...](#)

Family of EP1861120.A1 et al. In force

- Use of an influenza virus and an oil-in-water emulsion adjuvant to induce cd4 t-cell and/or improved b-memory cell response

GlaxoSmithKline First filing in family 3/21/2006
First publication in family 9/28/2006

The present invention relates to influenza vaccine formulations and vaccination regimes for immunising against influenza disease, their use in medicine, in particular their use in augmenting immune responses to various antigens, and to methods of preparation. In particular, the invention relates to multivalent influenza immunogenic compositions comprising an influenza antigen or antigenic preparation thereof from at least two influenza virus strains, at least one strain being associated with a pandemic outbreak or having the potential to be associated with a pandemic outbreak, in combination with an oil-in-water emulsion adjuvant. (Source: EP1861120.A1, equivalent)

No drawing available.

Inventors Emmanuel Jules Hanon, Jean Stephenne

GlaxoSmithKline

Document EP1861120.A1 – family of EP1861120.A1 et al.

metaadjuvant metabolisable oil, alpha-tocopherol Family of EP1861120.A1 et al.

USE OF AN INFLUENZA VIRUS AND AN OIL-IN-WATER EMULSION ADJUVANT TO INDUCE CD...

The present invention relates to influenza vaccine formulations and vaccination regimes for immunising against influenza disease, their use in medicine, in particular their use in augmenting immune responses to various antigens, and to methods of preparation. In particular, the invention relates to multivalent influenza immunogenic compositions co...

Source: equivalent

Abstract Claims Description Drawings

1

The use of an influenza virus or antigenic preparation thereof and an oil-in-water emulsion adjuvant in the preparation of an immunogenic composition for vaccination of human elderly aged 65 years old and over against influenza, wherein said oil-in-water emulsion comprises a metabolisable oil, alpha-tocopherol and an emulsifying agent.

9

The use according to any of claims 1 to 8 wherein said metabolisable oil is squalene.

AS03

AS03 (for "Adjuvant System 03") is the trade name for a squalene-based immunologic adjuvant used in various vaccine products by GlaxoSmithKline (GSK). It is used, for example, in GSK's A/H1N1 pandemic flu vaccine Pandemrix. It is also in Arepannix and the Q-pan for H5N1 influenza.^[1]

A dose of AS03 adjuvant contains^[2]

- 10.69 mg squalene
- 11.86 mg DL- α -tocopherol
- 4.86 mg polysorbate 80

In the 2009 influenza pandemic, vaccines containing AS03 delivered a stronger immunogenic response against pandemic H1N1 influenza than non-adjuvanted vaccines, despite their containing lower levels of viral antigen.^[3]

Source: equivalent

Safety and immunogenicity of SARS-CoV-2 recombinant protein vaccine formulations in healthy adults: interim results of a randomised, placebo-controlled, phase 1–2, dose-ranging study

Prof Paul A Goepfert, MD · Bo Fu, PhD · Anne-Laure Chabanon, PhD · Matthew I Bonaparte, PhD ·
Matthew G Davis, MD · Brandon J Essink, MD · et al. [Show all authors](#)

Summary

Background

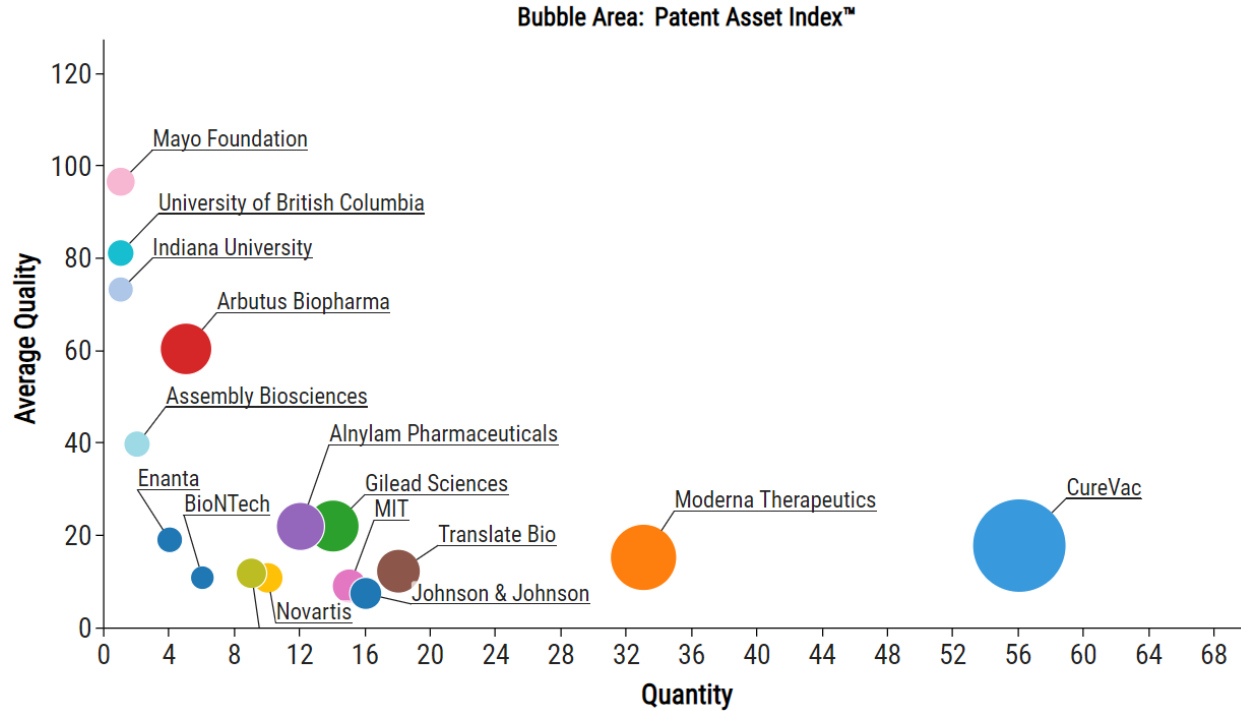
CoV2 preS dTM is a stabilised **pre-fusion spike protein** vaccine produced in a **baculovirus expression** system being developed against SARS-CoV-2. We present interim safety and immunogenicity results of the first-in-human study of the CoV2 preS dTM vaccine with two different adjuvant formulations.

Methods

This phase 1–2, randomised, double-blind study is being done in healthy, SARS-CoV-2-seronegative adults in ten clinical research centres in the USA. Participants were stratified by age (18–49 years and ≥50 years) and randomly assigned using an interactive response technology system with block randomisation (blocks of varying size) to receive one dose (on day 1) or two doses (on days 1 and 22) of placebo or candidate vaccine, containing low-dose (effective dose 1.3 µg) or high-dose (2.6 µg) antigen with adjuvant **AF03 (Sanofi Pasteur)** or **AS03 (GlaxoSmithKline)** or unadjuvanted high-dose antigen (18–49 years only). Primary endpoints were safety, assessed up to day 43, and immunogenicity, measured as SARS-CoV-2 neutralising antibodies (geometric mean titres), assessed on days 1, 22, and 36 serum samples. Safety was assessed according to treatment received in the safety analysis set, which included all randomly assigned participants who received at least one dose. Neutralising antibody titres were assessed in the per-protocol analysis set for immunogenicity, which included participants who received at least one dose, met all inclusion and exclusion criteria, had no protocol deviation, had negative results in the neutralisation test at baseline, and had at least one valid post-dose serology sample. This planned interim analysis reports data up to 43 days after the first vaccination; participants in the trial will be followed up for 12 months after the last study injection. This trial is registered with [ClinicalTrials.gov](#), [NCT04537208](#), and is ongoing.

mRNA Based Vaccines

mRNA Based Vaccines



Thank you.

www.patentsight.com

Shelli Sombrio

Senior Business Development Manager

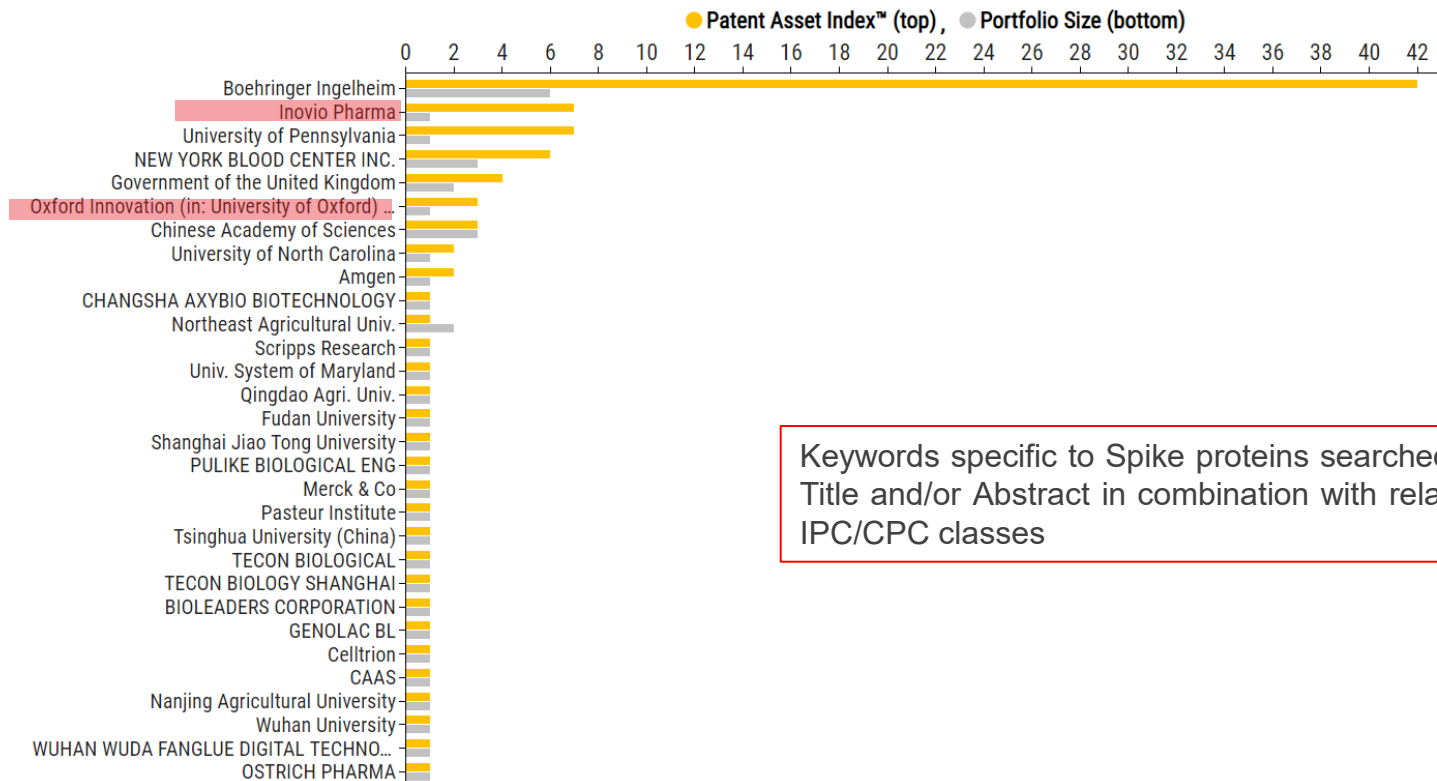
MSombrio@lexisnexisip.com

+1 760-619-9689

Appendix

Other Entities with Know How

Focused Search for Patents Regarding *Coronaviridae* Spike Protein



Keywords specific to Spike proteins searched in Title and/or Abstract in combination with related IPC/CPC classes

Zoetis

Orangutans and bonobos at US zoo get experimental COVID-19 vaccine

March 04, 2021

Nine great apes at the San Diego Zoo are the first non-human primates to receive an experimental COVID-19 vaccine.

In February, four [orangutans](#) and five bonobos at the zoo each received two doses of the vaccine, which was developed by the veterinary pharmaceutical company Zoetis, [according to National Geographic](#).

The zoo reached out to Zoetis after several of the [gorillas at their safari park tested positive for COVID-19](#) in January, and the company responded by providing a small supply of their vaccine, [according to a statement from Zoetis](#).



The vaccine is still experimental and hasn't yet been approved for use in animals in the US.