

**A Detailed Guide on Coronavirus
(COVID-19) History, All Current/
Pipeline Treatments & Ongoing/
Past Research/Patents
(Updated - April 30th, 2020)**

Our Partner



BACKGROUND

Researchers first isolated a coronavirus in 1937. They found a coronavirus responsible for an infectious bronchitis virus in birds that had the ability to devastate poultry stocks. Scientists first found evidence of human coronaviruses (**HCoV**) in the 1960s in the noses of people with the common cold. Two human coronaviruses are responsible for a large proportion of common colds name OC43 and 229E. [link](#)

Coronavirus is a large family of zoonotic viruses i.e. they are transmitted between humans and animals; mainly of two categories alphacoronavirus and betacoronavirus, there are six known coronavirus species (HCoV-229E, HCoV-NL63, HCoV-OC43, HCoV- HKU1, SARS-CoV and MERS-CoV) known to affect humans and cause common cold like symptoms, while SARS-CoV and MERS-CoV have caused more fatal illnesses in the past. In December 2019, a novel betacoronavirus named **SARS-CoV-2 or nCoV-2019** and the disease associated is named **Covid-19**, was found to be the reason behind several pneumonia patients in Wuhan, China. **The genome sequence of Covid-19 strain of coronavirus shows 85% similarity to a bat SARS-like CoV (bat-SL-CoVZC45, MG772933.1) genome published previously.** [Link](#)

Though the transmission mode is not exactly known but a high chance of human to human transmission was suspected due to a case of the same virus in Vietnam. [Link](#) A list of symptoms seen in the patients was released for the public to be aware of; **the most common symptoms seen were; fever, cough and myalgia or fatigue; while all the patients had pneumonia and most had underlying chronic diseases.** People showing cold symptoms are also advised to get checked for the disease. [Link](#).

SARS coronavirus (SARS-CoV) – virus identified in 2003. SARS-CoV is thought to be an animal virus from an as-yet-uncertain animal reservoir, perhaps bats, that spread to other animals (civet cats) and first infected humans in the Guangdong province of southern China in 2002. An epidemic of SARS affected 26 countries and resulted in more than 8000 cases in 2003. Since then, a small number of cases have occurred as a result of laboratory accidents or, possibly, through animal-to-human transmission (Guangdong, China). [Link](#)

Current Diagnostics & Treatments

1. Test kits for Covid 19

- A South Korean biotech company, **Seegene** has developed a 2019-nCov assay kit, **Allplex** for detection and identification of 3 target genes specific for COVID-19. [Link](#)
- **Roche** announced that US FDA has issued an Emergency Use Authorization [EUA] for the cobas SARS-COV2-test under 24 hours. The test can be run simultaneously with other assays provided by Roche for use on the cobas 6800/8800 Systems. [Link](#)
- **Abbott** has received emergency use authorization (EUA) from the U.S. Food and Drug Administration (FDA) for the fastest available molecular point-of-care test for the detection of novel coronavirus (COVID-19), delivering positive results in as little as **five minutes and negative results in 13 minutes**. The new Abbott ID NOW COVID-19 runs on Abbott's ID NOW™ platform—a lightweight box (6.6 pounds and the size of a small toaster) that can sit in a variety of locations. [Link](#)
- Pune based molecular diagnostic company **Mylab** becomes the **first Indian company** to have received validation for its Covid-19 diagnostic test kits also known as Reverse transcription polymerase chain reaction (RT-PCR) test. [Link](#)
- **Xpert Xpress SARS-Cov-2** by **Cepheid** received an emergency use authorization from the FDA for the test which will be primarily used in hospitals and emergency rooms. The company intended to roll out the kit by March 30, 2020. [Link](#)
- Researchers at the **Indian Institute of Technology** have developed a probe-free method to detect SARS-Cov-2 which can reduce test costs, making it affordable for large sections. Central Government estimates the cost to be approximately Rs. 4000. [Link](#)
- **Everlywell**, is a health and wellness company that is developing **at-home lab testing kits**. [Link](#)
- **Siemens Healthineers** announced on April 2, 2020 the availability of its molecular **Fast Track Diagnostics (FTD) SARS-CoV-2 Assay test kit**. Test kits are already being **shipped within the European Union for research use only (RUO)** to expedite availability while the company continues to pursue Emergency Use Assessment and Listing (EUAL) from the World Health Organization (WHO) for clinical use. [Link](#)
- The **Biopanda COVID19 Rapid Test Kit** is a qualitative lateral flow immunochromatographic assay for the detection of IgM and IgG antibodies to SARS-CoV-2 in human whole blood, serum or plasma samples. [Link](#)

2. Therapies currently in use

There are some pre-existing drugs for other disease treatments that have been either approved by health organizations or are to be approved for cure of Covid-19:

- Pre-existing drugs like HIV drugs in combination with some other drugs are being employed in China, Japan and Thailand for treating the patients. **(Japan is looking into using HIV drugs to treat Covid-19. These include antivirals like lopinavir and ritonavir. Doctors in Thailand reported success in treating patients using a combination of HIV drugs alongside oseltamivir, a drug sold under the brand name Tamiflu to treat influenza.**[Link](#)
- **Actemra** by Roche pharmaceuticals. [Link](#)
- **Favilavir** by Zhejiang Hisun Pharmaceutical. [Link](#)
- Altimune's **intranasal coronavirus vaccine**. [Link](#)
- **NX-1800** by Tonix Pharmaceuticals. [Link](#)
- **Innovation Pharmaceuticals** Announces Testing Procedures of **Brilacidin** Against Coronavirus (COVID-19). [Link](#)
- **Chloroquine** a broadly used antimalarial drug, maybe useful in the treatment of patients infected by the novel emerged coronavirus (SARS-CoV-2). [Link](#)
- **NP-120 (Ifenprodil)** by Algernon Pharmaceuticals. [Link](#)
- **APEIRON's APN01** respiratory drug product to start pilot clinical trial to treat coronavirus disease COVID-19 in China.[Link](#)
- **AbbVie** is collaborating with **global health authorities and institutions**, including the Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH), World Health Organization (WHO), among others, to determine antiviral activity as well as efficacy and safety of **Kaletra/Aluvia (lopinavir/ritonavir)** against COVID-19. [Link](#)

Genetic engineering & biotechnology news released a list of top 35 treatments for Covid-19, the top ten of those treatments are:

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- **AIM ImmunoTech:** Treatment: Ampligen® (rintatolimod)
- **Ascleptis Pharma:** Treatments: Ganovo® (danoprevir) plus ritonavir; ASC09 and ritonavir; ASC09 and oseltamivir; ritonavir and oseltamivir;
- **Beijing Staidson Biopharma** and InflaRx: Treatment: IFX-1
- **Biocryst: Treatment:** Galidesivir (BCX4430)
- **BioXyTran:** Treatment: BXT-25
- **Celularity and Sorrento Therapeutics:** Treatment: CYNK-001
- **Chugai Pharmaceutical and Zhejiang Hisun Pharmaceutical:** Treatment: Tocilizumab
- **CureVac:** Treatment: mRNA-based vaccine
- **CytoDyn:** Treatment: Leronlimab (PRO 140)
- **Janssen Pharmaceutical Cos. (Johnson & Johnson):** Treatments: Prezcoibix™ (darunavir and cobicistat); Vaccine to be developed with BARDA

For full list click [here](#)

For treating the pneumonia **outbreak of Covid-19** in China immediate actions taken were using previous antibodies/proteins used for **MERS- and SARS-Cov** such as:

- **MERS-Coronavirus (MERS-CoV) (AA 367-606)**, (Receptor Binding Domain) protein (His tag)
- **MERS-Coronavirus (MERS-CoV) (AA 1-725)** (Active) protein (His tag)
- **anti-SARS-Coronavirus Nucleocapsid Protein (SARS-CoV N)** (cleaved) antibody
- **anti-SARS-Coronavirus Nonstructural Protein 8 (SARS-CoV NSP8)** antibody

For full list click [here](#)

THERAPIES IN THE PIPELINE

Though there is no proper cure for Covid-19 yet, there are some companies claiming that they can provide cure for the disease by modifying already existing drugs and vaccines or work to find new cure or are already have drugs in the pipeline:

- **Gilead pharmaceuticals;** Gilead is working closely with global health authorities to respond to the novel coronavirus (2019-nCoV) outbreak through the appropriate **experimental use of Remdesivir** which is in the phase 3 of clinical trials. [Link](#)
- **Regeneron pharmaceuticals;** is focused on discovery, research, development and manufacturing of a portfolio of **antibodies targeting 2019-nCoV. This effort utilizes Regeneron's proprietary VelociSuite® technologies - including the VelocImmune® platform which uses a unique genetically-engineered mouse with a humanized immune system that can be challenged with all or parts of a virus of interest** - to facilitate swift identification, preclinical validation and development of promising antibody candidates Regeneron has now started testing procedures for Kevzara as a treatment for the coronavirus. [Link](#)
- **Novavax Inc. ;** Novavax Advances Development of Novel COVID-19 Vaccine ; candidate **derived from coronavirus spike (S) protein;** Phase 1 clinical trial planned for late spring. [Link](#)
- **Inovio Pharmaceuticals;** Inovio Accelerates Timeline for COVID-19 **DNA Vaccine INO-4800.** [Link](#)
- **Moderna; mRNA-1273 vaccine** ready for clinical trials for covid-19. [Link](#)
- **Vaxart Inc;** Announces Initiation of Coronavirus Vaccine Program. **Vaxart** plans to **generate vaccine candidates based on the published genome of the 2019 Novel Coronavirus (2019-nCoV)** and evaluate them in preclinical models for their ability to generate both mucosal and systemic immune responses. [Link](#)
- **MIGAL Research institute in Israel;** MIGAL's researchers have developed an effective vaccine against avian coronavirus Infectious Bronchitis Virus (IBV), to be **adapted soon and create a human vaccine against COVID-19.** [Link](#)

- **Sanofi** - Sanofi's approach involves taking some of the coronavirus's DNA and mixing it with genetic material from a harmless virus, **creating a chimera that can prime the immune system without making patients sick**. Sanofi expects to have a vaccine candidate to test in the lab within six months and could be ready to test a vaccine in people within a year to 18 months. [Link](#)
- **Serum Institute of India** has announced that its **new Covid-19 vaccine candidate**, being developed in collaboration with **US-based Codagenix**, is now in **pre-clinical / animal testing phase**. [Link](#)
- **Eli Lilly** - Eli Lilly has partnered with a Canadian firm called AbCellera to develop antibody treatments for coronavirus infection. Using a blood sample from a coronavirus survivor, AbCellera identified more than 500 antibodies that might protect against the virus. [Link](#)
- **Pfizer** - Outside of its vaccine work with BioNTech, Pfizer has put out a five-point plan to address the outbreak, which includes making its technology, scientists, expertise, and manufacturing available to outside institutions. The company has also promised to create a rapid-response program to make it easier to respond to future pandemics. [Link](#)
- **BioNTech** - Germany's BioNTech is working on an mRNA vaccine for the novel coronavirus with plans to enter clinical testing in April. Pfizer has agreed to co-develop the vaccine in the rest of the world. [Link](#)
- **GlaxoSmithKline** - GSK is providing its proprietary adjuvants — compounds that enhance the effectiveness of vaccines — to Clover Biopharmaceuticals, a privately held company based in Chengdu. Clover's approach involves injecting proteins that spur an immune response, thereby priming the body to resist infection. [Link](#)

- **Ridgeback Biotherapeutics** - EIDD-2801, a ribonucleoside analog that inhibits the replication of multiple RNA viruses including SARS-CoV-2. The FDA has approved an Investigational New Drug application (IND) that will allow to begin human clinical testing. [Link](#)
- **Ennaid** - ENU200, an orally delivered antiviral compound previously approved to treat other infections. In-silico modeling conducted by Ennaid has revealed that ENU200 delivers specific antiviral activity against 2 SARS-CoV-2 proteins, S glycoprotein and Mpro. The Company believes it can quickly bring ENU200 to market by treating patients with COVID-19 in a phase 3 in-home, self-dosing clinical trial of patients with asymptomatic, mild to moderate coronavirus infections. [Link](#)
- **Viriom** – Elsulfavirine is a non-nucleoside reverse transcriptase inhibitor (NNRTI) being investigated by the company in a phase 2 trial across Russia and Eastern Europe in adults with moderate manifestations of COVID-19. [Link](#)
- **Favipiravir**: An antiviral agent approved in Japan for influenza treatment. Fujifilm has announced the initiation of a phase 2 trial in the US. The study will enroll approximately 50 patients with COVID-19, in collaboration with Brigham and Women's Hospital, Massachusetts General Hospital, and the University of Massachusetts Medical School. [Link](#)
- **Mateon Therapeutics** - OT-101, a TGF- β antisense drug candidate that has demonstrated potent antiviral activity against COVID-19. Mateon Therapeutics is expecting to complete the IND submission following submission of a pre-IND application to the FDA to allow the referencing of OT-101's oncology IND. According to the Company, the mechanism of action for OT-101 against COVID-19 includes inhibition of cellular binding, inhibition of viral replication and suppression of viral induced pneumonia. [Link](#)
- **XORTX Therapeutics** – The company is exploring the use of a new formulation of oxypurinol as a novel treatment for acute kidney and lung injury accompanying COVID-19 infection. [Link](#)
- **Relief Therapeutics** – Currently investigating the vasoactive intestinal polypeptide, Aviptadil (RLF-100) for the treatment of acute respiratory distress syndrome in patients with COVI-19 infection. The drug has now entered FDA clinical trials at Thomas Jefferson University Hospital. [Link](#)

1. Some other therapy/methods of treatment:

- **Pharmazz** – Centhaquine, an investigational resuscitative agent that is expected to provide hemodynamic stability, improve tissue oxygenation, reduce pulmonary edema, reduce acute respiratory distress syndrome, reduce multiple organ dysfunction score and decrease mortality in patients with COVID-19. The drug has already been assessed in a phase 3 study for hypovolemic shock.
- **Grifols/ BARDA - Convalescent plasma:** Grifols, in collaboration with the US Biomedical Advanced Research Development Authority (BARDA), the FDA and other federal public health agencies will collect plasma from convalescent COVID-19 patients, process the plasma into a hyperimmune globulin and support the necessary preclinical and clinical studies to determine if anti-SARS-CoV-2 hyperimmune globulin therapy can successfully be used to treat COVID-19 disease.
- **Bellerophon Therapeutics** – Inhalation of nitric oxide: The FDA has granted emergency expanded access for use of the INOpulse® system (Bellerophon Therapeutics) and the Genosyl DS tankless system (VERO Biotech) for treatment of COVID-19. In a clinical study of patients infected with SARS-CoV, nitric oxide demonstrated improvements in arterial oxygenation.
- **Entos Pharmaceuticals** – The company is developing Fusogenix DNA vaccine developed using the Fusogenix drug delivery platform to prevent COVID-19 infections. Fusogenix drug delivery platform is a proteo-lipid vehicle that introduces genetic payload directly into the cells. Entos is working on developing an optimised payload containing multiple protein epitopes derived from SARS-COV-2 proteins, which will stimulate an immune response in the body to prevent COVID-19 infection.

There are some companies and research institutes **working in partnership** to find a cure for Covid-19 .[Link](#)

- **GeoVax and BravoVax Covid-19 vaccine-** GeoVax, a US-based pharmaceutical company, and BravoVax, a China-based pharmaceutical company, have announced plans to develop a coronavirus cure in the form of vaccine based on the former's MVA-VLP vaccine platform.

- **Takeda pharmaceuticals** have initiated the development of an anti-SARS-CoV-2 polyclonal hyperimmune globulin (H-IG) to treat high-risk individuals with COVID-19 called **TAK-888**. [Link](#)
- **iBio and CC-Pharming**- Bio and CC-Pharming have formed a partnership to develop a plant-derived coronavirus vaccine based on the former's FastPharming System™, which has been previously used for producing antibody candidates for Ebola and Dengue fever virus.
- **Takis and Evvivax**- Rome-based biotech companies, Takis and Evvivax have announced their plans to develop a vaccine against Covid-19. The companies will use genetic vaccination technologies that are capable of generating several antibodies to neutralise viruses and stronger immune response.
- **Vir Biotechnology, Inc.** and **Alnylam Pharmaceuticals, Inc.** announced an expansion of their existing collaboration to include the development and commercialization of RNAi therapeutics targeting SARS-CoV-2, the virus that causes the disease COVID-19. [Link](#)
- **Erasmus MC and Utrecht University** – Together with the Viroscience department upstairs and the Virology department of the Veterinary Medicine Faculty at Utrecht University a group of scientists have developed the first antibody that directly blocks the infection. The group is currently trying to get a pharmaceutical company on board to enable large scale production of the antibody. The antibody still has to be tested on humans (and this will take months) and the article is under peer review before Nature will publish it. [Link](#)
- **Arcturus Therapeutics and Duke University** - Arcturus Therapeutics is pressing forward with a vaccine that relies on engineering RNA. The company plans to take an RNA virus that has been edited to encode for proteins that will protect against infection and load it into a liquid nanoparticle. [Link](#)

Along with traditional wet lab methods computational methods are also being employed to find a cure for Covid -19

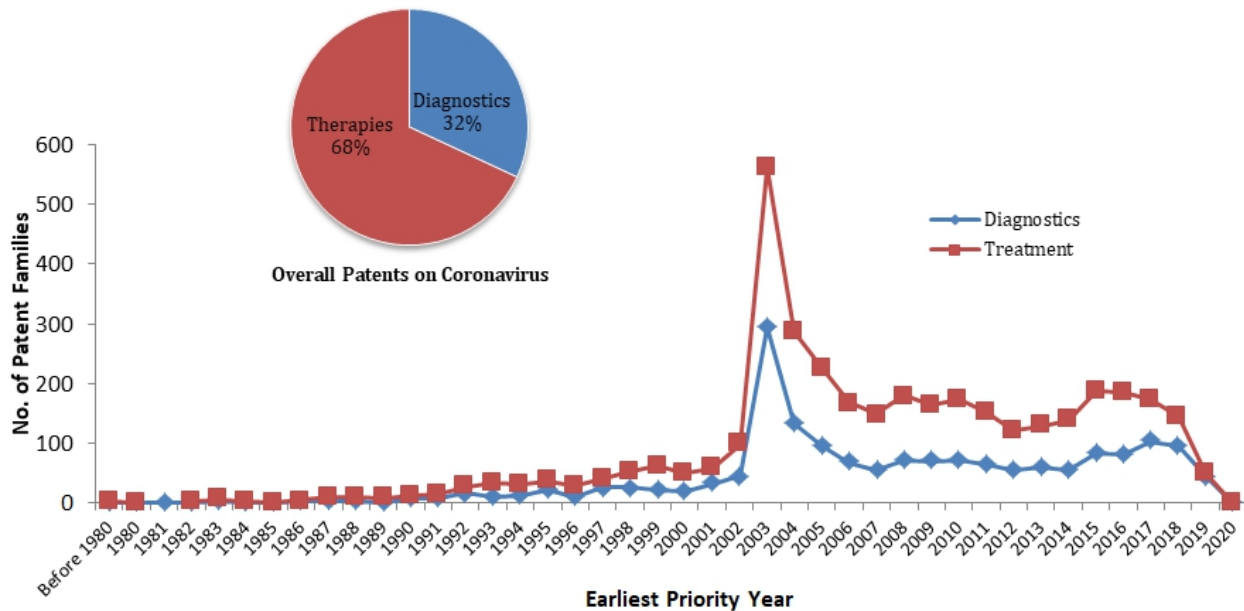
- **COVID-19 Docking Server**, a web server that predicts the binding modes between COVID-19 targets and the ligands including small molecules, peptide and antibody has been introduced by School of Information Science & Engineering, Changzhou University. Structures of proteins involved in the virus life cycle were collected or constructed based on the homologs of coronavirus, and prepared ready for docking. The platform provides a free and interactive tool for the prediction of COVID-19 target-ligand interactions and following drug discovery for COVID-19.

The COVID-19 Docking Server and tutorials are freely available [here](#).

- A study on **Virtual Screening Based Prediction of Potential Drugs for COVID-19** by Dr. Talluri Sekhar Professor, Department of Biotechnology, GITAM, and Visakhapatnam, India concluded **Saquinavir and Beclabuvir** as the best candidates for COVID-19 therapy.[Link](#)

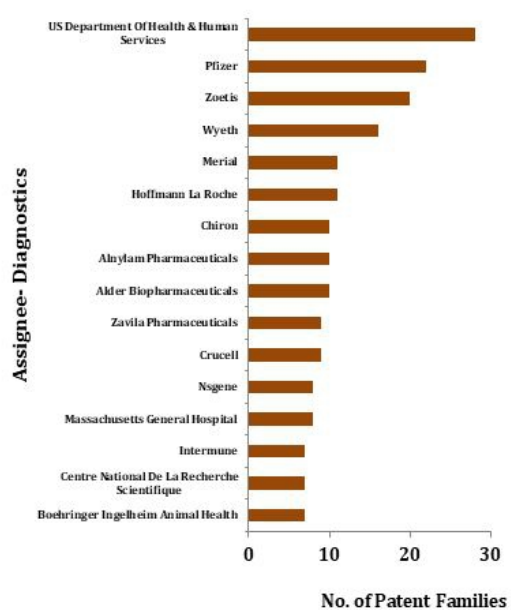
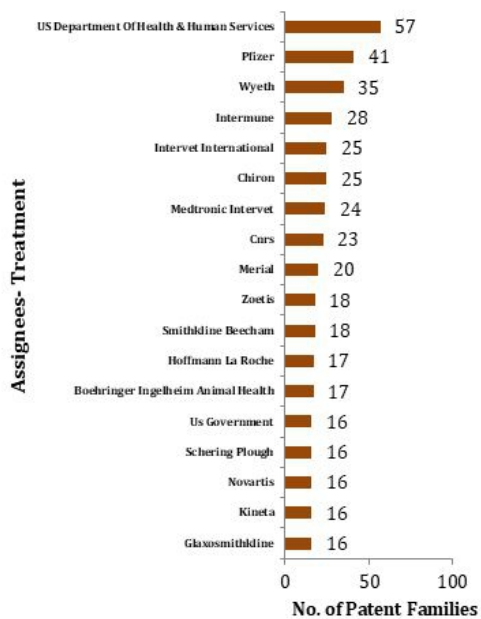
Quick Patent Landscape

An automated patent landscape using coronavirus related keywords yielded approximately 4300 Patent Families.

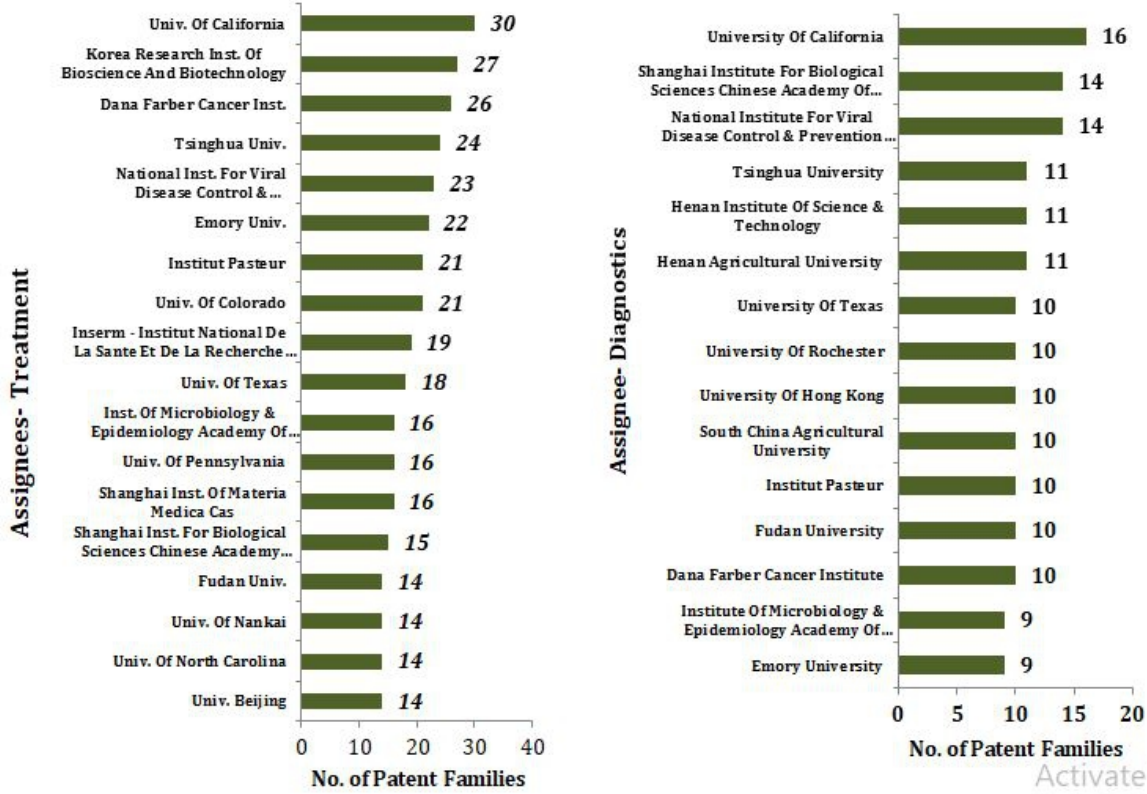


A spike on filing on coronavirus related technologies can be seen in the year 2003. This correlates with the first SARS outbreak in 2002.

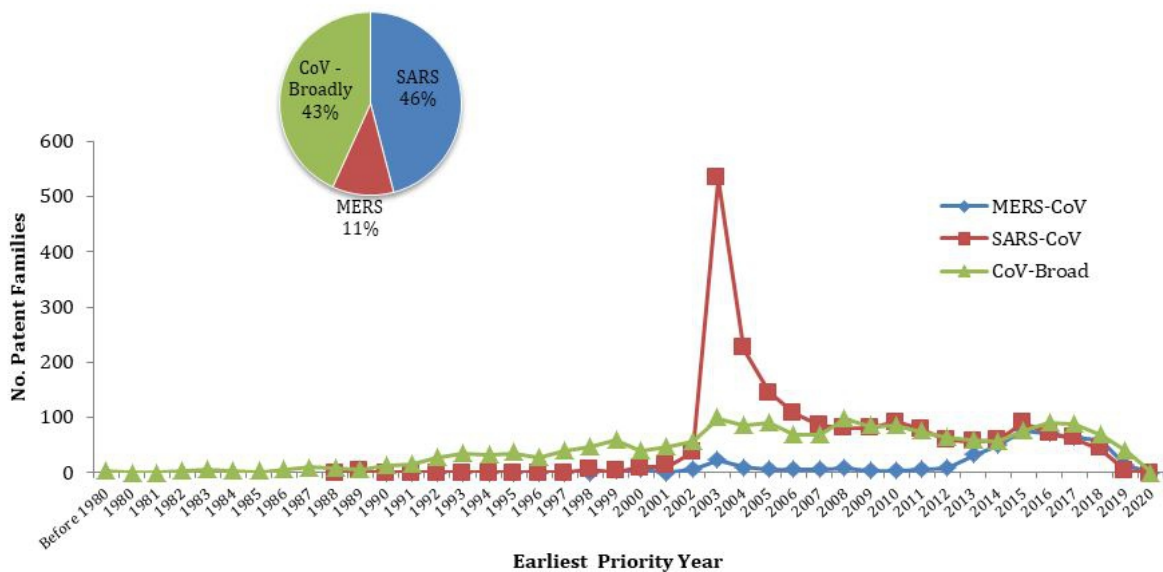
The major players in the domain (both for therapeutics and diagnostics) are United Department of Health & Human Services and Pfizer.



There are multiple universities and research institutes like University of California active in the domain.



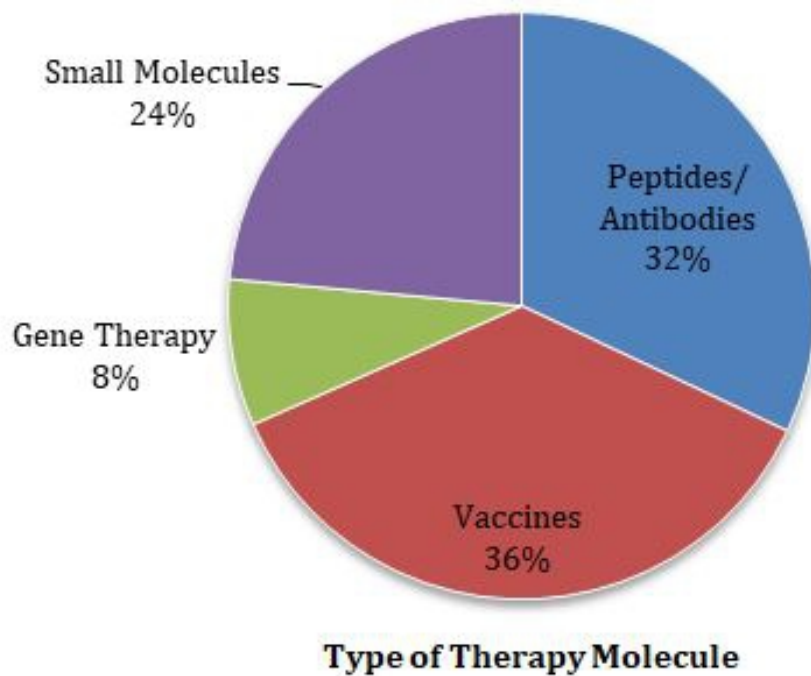
Majority of the patent filings in the domain are targeted against SARS-CoV and MERS-CoV.



A patent [FR2263769A1](#) filed by DU PONT DE NEMOURS on July 12th, 1973 is the earliest patent filled in this domain; which disclosed 2-substituted-tetrahydrocycloalkane (e.g.) isoindolins a drug useful against rhino-and coronavirus infections.

The graph demonstrates the increase in filings for SARS and MERS in the years 2003 and 2014 respectively. This is in direct co-relation with the SARS and MERS outbreaks.

If the patent dataset is segregated in types of therapy molecules, we observe that 76% of the patents related to biologics of some kind, among which 36% are directly related to vaccines.



1. Exemplary Patents in the domain

Some exemplary patents of each therapy molecule type have been analysed.

Gene Therapy:

Patent Number : US20190030187A1					
Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
siRNA/Nanoparticle Formulations for Treatment of Middle -East Respiratory Syndrome Coronavirus Infection	January 31, 2019	September 7, 2016	September 8, 2015	Cai Yibin et al.	Sirnaomics Inc
Abstract					
The present invention relates to compositions and methods for siRNA therapeutics for prevention and treatment of Middle East Respiratory Syndrome Corona Virus (MERS -CoV) infections. The compositions include a pharmaceutical composition comprising siRNA cocktails that target viral genes and pharmaceutically acceptable polymeric nanoparticle carriers and liposomal nanoparticle carriers.					
Sagacious Comments					
This prior art reference discloses a pharmaceutical composition cocktail that consists of different siRNA that target one or more conserved regions of Middle -East Respiratory Syndrome Corona Virus (MERS -CoV). The reference also discloses the carrier which is a polymeric nanoparticle or a liposomal nanoparticle.					

Vaccines:

Patent Number: US20180333482A1					
Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
Coronaviruses, vaccines comprising the same, and methods for preventing disease	November 22, 2018	March 2, 2018	March 3, 2017	Baker Susan et al.	Loyola Univ Chicago
Abstract					
Coronaviruses, vaccines comprising the same, and methods for preventing disease. One embodiment of such includes a live, attenuated coronavirus comprising a variant replicase gene encoding polyproteins comprising a non-structural protein (nsp) -15, the replicase gene encoding the nsp15 and causes any change, including mutations and/or deletions, that affects the stability or activity of the nsp15.					
Sagacious Comments					
This reference discloses mutant coronaviruses, vaccines comprising mutant coronaviruses, methods of producing vaccines, and methods of preventing disease in subjects. The reference discloses a live attenuated coronavirus comprising a variant replicase gene encoding polyproteins comprising a non -structural protein (nsp) 15. The reference also discloses a method of preventing disease in a subject and a method of producing a vaccine by modifying a wild -type coronavirus.					

Patent Number: US20200030432A1					
Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
Zoonotic disease rna vaccines	January 30, 2020	March 16, 2018	March 17, 2017	Benenato Kerry et al.	Moderna Inc
Abstract					
The disclosure relates to Lassa virus, Nipah virus, and betacoronavirus ribonucleic acid vaccines as well as methods of using the vaccines and compositions comprising the vaccines.					
Sagacious Comments					
This reference discloses a zoonotic disease vaccine, comprising a ribonucleic acid (RNA) comprising an open reading frame (ORF) encoding an antigen selected from Lassa virus antigens, Nipah virus antigens, and betacoronavirus antigens, wherein intramuscular (IM) administration of a therapeutically effective amount of the vaccine to a subject induces an immune response in the subject.					

Patent Number: US9889194B2					
Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
Immunogenic composition for MERS coronavirus infection	February 13, 2018	February 28, 2014	March 1, 2013	Du Lanying et al.	New York Blood Center Inc ; Zhao Guangyu
Abstract					
Described herein are immunogenic compositions for preventing infection with Middle East respiratory syndrome coronavirus (MERS-CoV) wherein the immunogenic compositions comprise at least a portion of the MERS-CoV S protein and an immunopotentiator.					
Sagacious Comments					
This reference discloses immunogenic compositions for the prevention or treatment of infection with a new coronavirus MERS-CoV (also known as hCoV-EMC or NCoV). The disclosed immunogenic compositions are proteins comprising: 1) at least a portion of the MERS-CoV genome, and 2) an immunopotentiator sequence. The sequences are contiguous and expressed as a single protein in a mammalian expression system, or the MERS-CoV portion and the immunopotentiator are chemically linked and stabilized. Optionally, a stabilization sequence and/or a linker sequence are disposed between the MERS-CoV sequence and the immunopotentiator.					

Peptides/Antibodies for Treatment:

Patent Number: WO2019135003A1					
Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
Peptides having protease activity for use in the treatment or prevention of coronavirus infection	July 11, 2019	January 7, 2019	January 8, 2018	Guðmunds dóttir Ágústa et al.	Enzymatica Ab
Abstract					
The present invention provides a polypeptide having protease activity for use in the treatment or prevention of coronavirus infection in a mammal. In particular, the invention relates to treatment or prevention of a coronavirus infection in a human, using trypsins.					
Sagacious Comments					
The prior art reference discloses polypeptide having protease activities for the use in treatment or prevention of coronavirus infection in a mammal. The protease activity is selected from the group consisting of serine proteases, threonine proteases, cysteine proteases, aspartate proteases, glutamic acid proteases and metalloproteases.					

Patent Number: US10406222B2					
Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
Human antibodies to Middle East Respiratory Syndrome –coronavirus spike protein	September 10, 2019	June 26, 2017	May 23, 2014	Kyratsous Christos et al.	Regeneron Pharma
Abstract					
The present invention provides monoclonal antibodies that bind to the Middle East Respiratory Syndrome - Coronavirus (MERS -CoV) spike protein, and methods of use. In various embodiments of the invention, the antibodies are fully human antibodies that bind to MERS -CoV spike protein. In some embodiments, the antibodies of the invention are useful for inhibiting or neutralizing MERS -CoV activity, thus providing a means of treating or preventing MERS infection in humans. In some embodiments, the invention provides for a combination of one or more antibodies that bind to the MERS-CoV spike protein for use in treating MERS infection. In certain embodiments, the one or more antibodies bind to distinct non-competing epitopes comprised in the receptor binding domain of the MERS -CoV spike protein.					
Sagacious Comments					
This prior art reference discloses antibodies and antigen-binding fragments thereof that bind MERS -CoV spike protein. The antibodies of the present invention are useful, inter alia, for inhibiting or neutralizing the activity of MERS-CoV spike protein. The reference also discloses antibodies that are useful for blocking binding of the virus to its host cell receptor dipeptidyl peptidase 4 (DPP4) and for preventing the entry of MERS -Corona virus into host cells. The antibodies function by inhibiting the cell-to-cell transmission of the virus. Additionally, antibodies useful in preventing, treating or ameliorating at least one symptom of MERS -CoV infection in a subject and antibodies that may be administered prophylactically or therapeutically to a subject having or at risk of having MERS -CoV infection has also been disclosed.					

Small Molecules:

Patent Number: [CN106892920B](#)

Title	Publication Date	Filing Date	Priority Date	Inventor	Assignee
Aloperine derivative, preparation method and application thereof	December 13, 2019	December 18, 2015	December 18, 2015	Tang Sheng et al.	Institute of Medical Biotechnology, Chinese Academy of Medical Sciences

Abstract

The present invention provides a picrine derivative, its preparation method and use, in particular, the present invention provides a compound of formula I, its optical isomer, solvate or pharmaceutically acceptable salt, said The compound has excellent antiviral activity, especially against hepatitis B virus (HBV), hepatitis C virus (HCV), Ebola virus (EBOV), Middle East respiratory syndrome virus (MERS virus) and influenza virus (such as H7N9 type Avian influenza viruses) all exhibit high inhibitory activity and have good drug -forming properties, which provides more options for the development of novel antiviral drugs.

Sagacious Comments

The prior art reference discloses the method of preparation and use of a picrine derivative. The invention has modified structure of aloperine that is a novel structure possesses excellent antiviral properties.

About Sagacious IP and Coronavirus Research Assistance Program

We believe that a sure shot way out for now would be to find quick diagnosis and a confirmed cure/ prevention. Keeping this in mind and keeping in mind the expertise of Sagacious IP, we at Sagacious (one of the largest literature information providers globally), are donating 1000 hours of professional support. Sagacious has one of the widest access to global patent/non-patent literature in multiple languages and has diverse multi-lingual team to analyse and translate all such literature.

We have in the past have successfully supported development of cure for may rare diseases by working closely with researchers working on them. We are accordingly - committed to help researchers, get timely & exhaustive information about previous research on Corona/similar viruses so they can accelerate their efforts to find a cure/prevention.

The support may involve analysing all literature till date and putting the findings at where all researchers can access the detailed analysis and pick and choose what information they need. Alternatively, we can offer custom information support to specific research groups as they reach out to us.

More details about our Coronavirus Research Assistance Program and an initial report about current treatment, etc is available here: <https://www.sagaciousresearch.com/coronavirus-research-assistance/>.

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