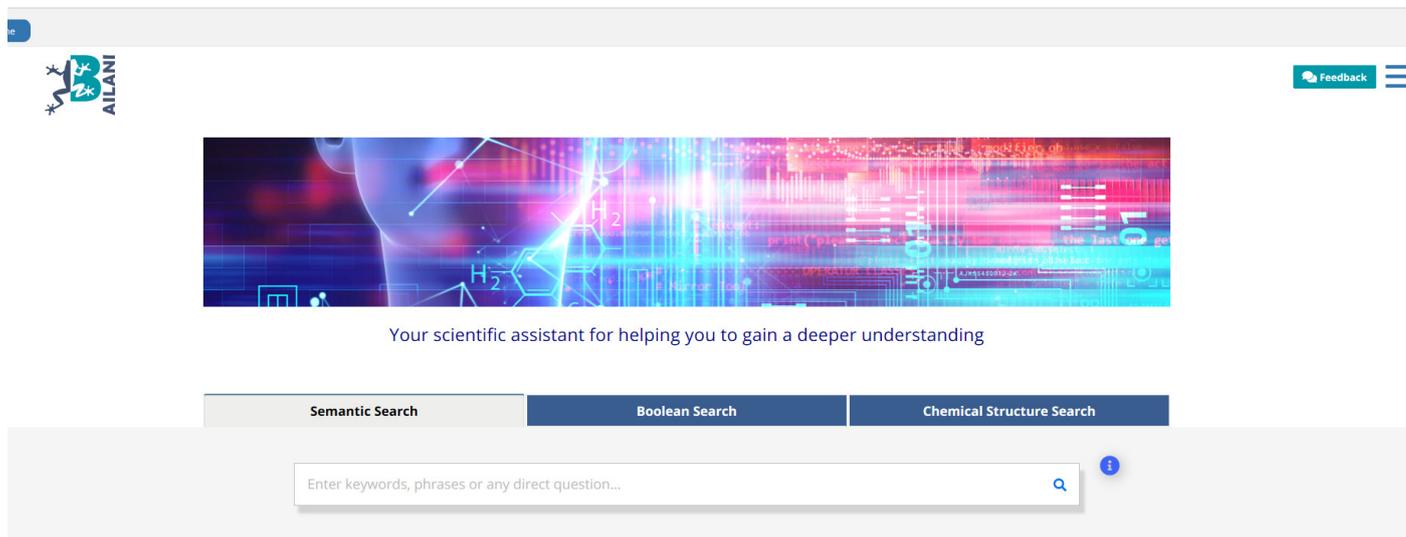


AILANI - Your scientific assistant for COVID-19



Deeper Knowledge for Research Scientists and Public Authorities

Get a deeper insight in your knowledge

AILANI is a novel and unique semantic search enterprise solution for fast, easy and comprehensive knowledge discovery. It helps your scientists to get faster insight in existing public and proprietary knowledge and offers highly efficient possibilities to evaluate this knowledge in the short-term for better research decisions and results.

AILANI stands for Artificial Intelligence LANguage Interface. The platform combines semantic modeling, ontologies, linguistics and artificial intelligence (AI) algorithms in a self-refining system that delivers results based on interrelated meaning of facts.

AILANI delivers the most relevant results and puts them in a wider context for deeper analysis. Queries can be expressed in natural language and AILANI will provide you with relevant answers regardless of the quality of your search term.

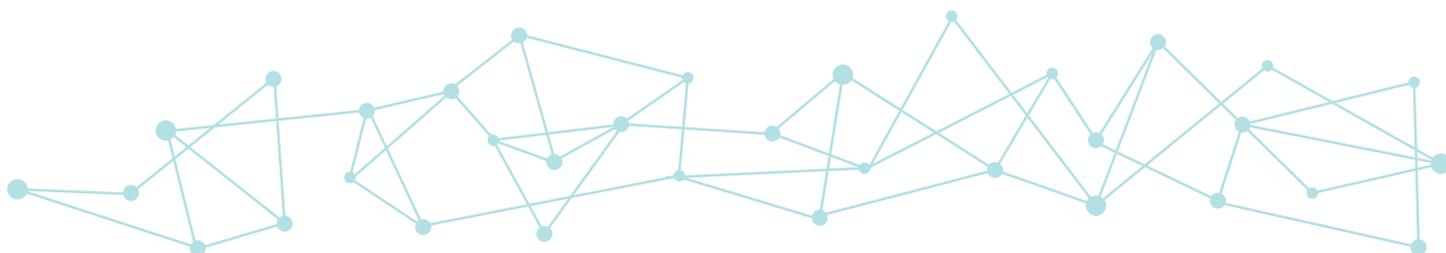
AILANI as Scientific Assistant for COVID-19

Showing the most relevant keyword results first, the user has the possibility to drill down on visual summaries of the results and associated categories such as disease, source or biological process.

Suggestions based on Artificial Intelligence Algorithms complete the list of results and deliver concrete answers, even if the original search term is vague or not directly relevant.

Smart Breadcrumbs allow you follow your search journey. Search can be saved at any time and recalled later.

Users of AILANI can easily set favourites and alerts, thus adapting the system to their individual search behaviours.



Examples for COVID-19 (SARS-CoV-2)

Where does 2019-nCoV originate?

Home Search Where does 2019-nCoV originate? Feedback

Results found by keywords (9) AI suggestions (27)

Question Answering Combined

Selected items: 0 Export

- China**
At present, the mortality of 2019-nCoV in **China** is 2.3%, compared with 9.6% of SARS and 34.4% of MERS reported by WHO. She, J., et al. 2019 novel coronavirus of pneumonia in Wuhan, China: emerging attack and management strategies. *Clin Transl Med* 9, (2020).
2019 novel coronavirus of pneumonia in Wuhan, China: emerging attack and management strategies.
- Wuhan**
To investigate the genetic diversity, time origin, and evolutionary history of the 2019-nCoV outbreak in China and Thailand, a total of 12 genome sequences of the virus with known sampling date (24 December 2019 and 13 January 2020) and geographic location (primarily **Wuhan** city, Hubei Province, China, but also Bangkok, Thailand) were analyzed. We estimated that 2019-nCoV likely originated in **Wuhan** on 9 November 2019 (95% credible interval: 23 September 2019 and 19 December 2019), and that Wuhan is the major hub for the spread of the 2019-nCoV outbreak in China and elsewhere. Li, X., Zhai, J., Wang, X., & Li, Y. Potential of large "first generation" human-to-human transmission of 2019-nCoV. *J Med Virol* 92, 448-454 (2020).
Potential of large "first generation" human-to-human transmission of 2019-nCoV.
- China**
Clinical Characteristics and Long-term Prognosis of 2019-nCoV Infection in Children The study is designed to clarify the clinical characteristics, risk factors and long term prognosis of children with 2019-nCoV infection in **China**. As of February 10th, 2020, more than 45000 human have been confirmed infected with a novel coronavirus (2019-nCoV) in **China**, with at least 800 reported deaths.
Clinical Characteristics and Long-term Prognosis of 2019-nCoV Infection in Children
- China**
The progress of 2019 Novel Coronavirus (2019-nCoV) event in **China**. Wang, G. & Jin, X. The progress of 2019 novel coronavirus event in China. *J Med Virol* (2020).
The progress of 2019 novel coronavirus event in China.
- Wuhan, China**
In December, 2019, a pneumonia associated with the 2019 novel coronavirus (2019-nCoV) emerged in **Wuhan, China**. Chen, N., et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 395, 507-513 (2020).
Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study.

China

is associated with ...
View Association Map

More about this Answer...

Geopolitical Information (the People's Republic of China)

Country	the People's Republic of China
Total Population	1372148.0
Unit (Population)	1000
borders to	the Lao People's Democratic Republic, Mongolia, the Kingdom of Bhutan, the Republic of Tajikistan, the Federal Democratic Republic of Nepal, the Democratic People's Republic of Korea, the Islamic Republic of Afghanistan, the Republic of India, the Republic of the Union of Myanmar, the Kyrgyz Republic, the Islamic Republic of Pakistan, the Republic of Kazakhstan, the Russian Federation, the Socialist Republic of Viet Nam
Total GDP in Current Prices	4985461.0

AILANI: The Artificial Intelligence Algorithm delivers China and Wuhan province as answers.

How does SARS-CoV spread in the population?

Home Search How does SARS-CoV spread in the population? Biomedical Concepts respiratory airway Feedback

Document Source Document Subjects Year Keywords Diseases Molecular Biology Food & Nutrition Chemistry Biomedical Concepts

Selected items: 0 Export Add to Favorites

- Human coronavirus EMC is not the same as severe acute respiratory syndrome coronavirus.**
Perلمان, S. & Zhao, J. Human coronavirus EMC is not the same as severe acute respiratory syndrome coronavirus. *mBio* 4, (2013). Of note, coronavirus infection of the **respiratory tract** and renal system has been described in chickens infected with another coronavirus, infectious bronchitis virus (IBV) (9), common. The **SARS-CoV** receptor, ACE2, is present at high levels in the human kidney, and **SARS-CoV** was detected 00515-12. Unlike **SARS-CoV**, HCoV-EMC can directly infect bat cells. As important, HCoV-EMC does not enter cells.
Add to Favorites Cite
- Human coronavirus EMC does not require the SARS-coronavirus receptor and maintains broad replicative capability in mammalian cell lines.**
Müller, M. A. et al. Human coronavirus EMC does not require the SARS-coronavirus receptor and maintains broad replicative capability in mammalian cell lines. *mBio* 3, (2012). Knowledge of the receptor is highly critical because the restriction of the SARS receptor to deep compartments of the human **respiratory tract** limited the spread of SARS transmissibility of SARS. Our data show that HCoV-EMC does not need the **SARS-CoV** receptor to infect human against **CoV** host switching, preventing humans from acquiring novel **CoVs** easily (1, 11). The **SARS-CoV** utilizes
Add to Favorites Cite
- Effects of coronavirus infections in children.**
Principi, N., Bosis, S. & Esposito, S. Effects of coronavirus infections in children. *Emerg Infect Dis* 16, 183-8 (2010). As mentioned above, SARS-CoV does not seem to cause extrarespiratory problems in children, but all of the other HCoVs can be associated with signs and symptoms involving organs and systems other than the **respiratory tract** the infections caused by **SARS-CoV** and that of other HCoV infections. **SARS-CoV** emerged in November 2002 against **SARS-CoV** was low in children and adults (29) this result indicates that **SARS-CoV** not only
Add to Favorites Cite
- Identification of new respiratory viruses in the new millennium.**
Berry, M., Garnfield, J. & Fielding, B. C. Identification of new respiratory viruses in the new millennium. *Viruses* 7, 996-1019 (2015).

respiratory airway

is associated with open tracheal system trachea, lamina propria of trachea, ...
View Association Map

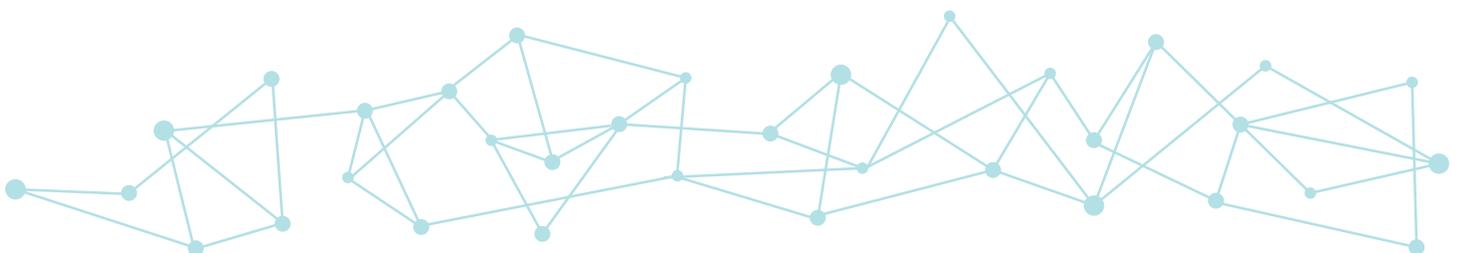
More about this Concept...

Concept	respiratory airway
Concept Source	
Description	
Synonyms	respiratory airway; ...
Definition	An airway through which respiratory air passes in organisms.

AILANI: The Keyword Search delivers a specific epithelial SARS-CoV receptor as major difference to MERS-CoV and HCoV-EMC. The drill-down on “respiratory airways” as anatomic structure of interest reveals differences in affected anatomic region and cell types between HCoV-EMC and SARS-CoV.

How to avoid 2019 corona virus transmission?

AILANI retrieves a CDS Newsfeed that answers Frequently asked Questions including transmission.



How does SARS-CoV compare to MERS?

Home Search How does SARS-CoV compare to MERS? Details Higher sensitivity... interferon treatment Feedback

AILANI

Results found by keywords (243) AI suggestions (8)

Question Answering Combined Per page 25 Results 8

- more virulent**
On the other hand, MERS-CoV is **more virulent** than SARS-CoV.
Meulen, J. et al. Human monoclonal antibody combination against SARS coronavirus: synergy and coverage of escape mutants. *PLoS Med* 3, (2006).
Prediction of Intrinsic Disorder in MERS-CoV/HCoV-EMC Supports a High Oral-Fecal Transmission.
- side-by-side**
Using a **side-by-side** comparison of SARS-CoV and MERS-CoV M proteins, we discovered that the extent by which the MERS-CoV M protein suppressed IFN- β promoter activity was lower than that by SARS-CoV M protein.
Muller, M. A. et al. Human monoclonal antibody combination against SARS coronavirus: synergy and coverage of escape mutants. *mBio* 3, (2012).
Middle East respiratory syndrome coronavirus M protein suppresses type I interferon expression through the inhibition of TBK1-dependent phosphorylation of IRF3.
- zoonotic viruses**
Both SARS-CoV and MERS-CoV are **zoonotic viruses**, and their presumed origin is in bats.
Chow, K. Y. C. et al. Molecular advances in severe acute respiratory syndrome-associated coronavirus (SARS-CoV). *Genomics Proteomics Bioinformatics* 1, 247-62 (2003).
Replicative Capacity of MERS Coronavirus in Livestock Cell Lines.
- similar**
The coronavirus responsible for Middle East Respiratory Syndrome (MERS-CoV) is **similar** to SARS-CoV. A better understanding of the features of SARS-CoV would help to guide control measures and treatment for **similar** diseases, such as MERS-CoV (3, 4).
McBride, R. & Fading, B. C. The role of severe acute respiratory syndrome (SARS) coronavirus accessory proteins in virus pathogenesis. *Virology* 4, 2902-23 (2012).
Thin-Section Computed Tomography Manifestations During Convalescence and Long-Term Follow-Up of Patients with Severe Acute Respiratory Syndrome (SARS).
- higher sensitivity to pegylated interferon treatment**
However, MERS-CoV was observed to have **higher sensitivity to pegylated interferon treatment**, compared with SARS-CoV.
Berry, M., Gamieldien, J. & Fielding, B. C. Identification of new respiratory viruses in the new millennium. *Virology* 7, 596-1019 (2015).
State of Knowledge and Data Gaps of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in Humans.
- does not induce an early type I IFN response**

higher sensitivity to pegylated interferon treatment
is associated with ...
View Association Map
More about this Answer...

AILANI: The Keyword Search delivers a number of differences from host – pathogen interactions, or co-morbidities. The Artificial Intelligence algorithm directly delivers difference in virulence, effects on host genes and immune response, animal origin and drug sensitivity.

Home Search How does SARS-CoV compare to MERS? Molecular Biology Immune system process Feedback

AILANI

Results found by keywords (121) AI suggestions (8)

Refine results

- Document Source
- Document Subjects
- Year
- Keywords
- Diseases
- Molecular Biology

Selected items: 0 Export Add to Favorites

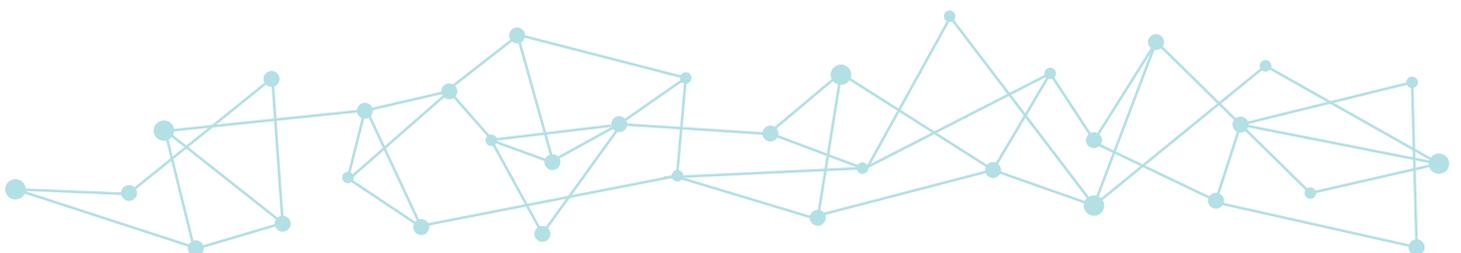
- Emergence of the Middle East respiratory syndrome coronavirus.**
Coleman, C. M. & Frieman, M. B. Emergence of the Middle East respiratory syndrome coronavirus. *PLoS Pathog* 9, (2013).
DP44 has many diverse functions in glucose homeostasis, **TCR activation**, neurotransmitter function, and modulation of cardiac signaling (19).
of SARS-CoV. Infection experiments in cell culture showed that MERS-CoV does not use the SARS-CoV receptor zoonotic origins between MERS-CoV and SARS-CoV, initial experiments on MERS-CoV focused on direct comparison.
Add to Favorites Cite
- MERS-coronavirus replication induces severe in vitro cytopathology and is strongly inhibited by cyclosporin A or interferon- α treatment.**
de Witte, A. H. et al. MERS-coronavirus replication induces severe in vitro cytopathology and is strongly inhibited by cyclosporin A or interferon- α treatment. *J Gen Virol* 94, 1749-1760 (2013).
Covs, including SARS-CoV, appear to have evolved a variety of mechanisms to block or evade such **antiviral responses** (reviewed by Perlman & Netland, 2009; Zhong et al., 2012).
of SARS-CoV isolate Frankfurt 13. MERS-CoV (strain EMC/2012) and MHV (strain A59). The SARS-CoV and with SARS-CoV (c) or MERS-CoV (c) is shown. Our data revealed that, in the same cell line, MERS-CoV infection.
Add to Favorites Cite
- Middle East respiratory syndrome (MERS): a new zoonotic viral pneumonia.**
Cunha, C. B. & Opa, S. M. Middle East respiratory syndrome (MERS): a new zoonotic viral pneumonia. *Virology* 5, 650-4 (2014).
interferon- α 2b and ribavirin reduce coronavirus replication and moderates the host's **immune response** in experimental studies in monkeys, but there is no definitive treatment for MERS in humans.
syndrome (SARS). This new coronavirus variant was termed SARS-CoV. The intermediate host of SARS-CoV was the exposure to SARS. I.e., anti-SARS-CoV antibodies appears to confer some protective immunity to MERS-CoV, i.e.
Add to Favorites Cite
- X-Ray Structure and Enzymatic Activity Profile of a Core Papain-like Protease of MERS Coronavirus with utility for structure-based drug design.**

immune system process
is associated with immune response, B cell selection, ...
View Association Map
More about this Concept...
Concept Immune system process
Concept Source Gene Ontology (GO)
Description "Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." (GO:0002002, GO:0002003, GO:0002004, GO:0002005)
Synonyms immune system process; ...
Definition
Proteins with Function
Individual Proteins 12701

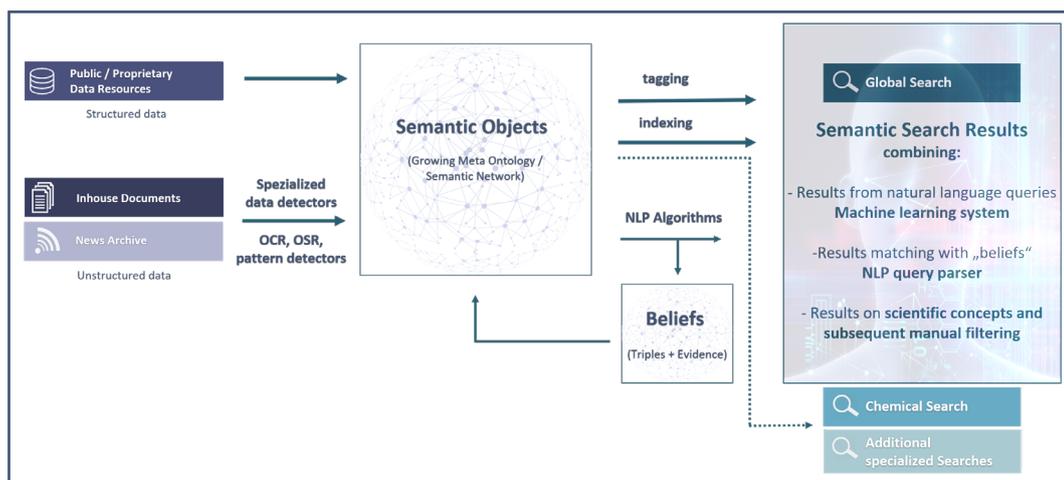
immune system process
activation of immune response
antigen processing and presentation
immune effector process
immune response
leukocyte activation
leukocyte migration
lymphocyte costimulation

https://ai.biomedx.de/SEMSE_REF/boom_portal/bin/view/SemanticSearch/WebHome

Drilling down into the “Immune system process” part of the Keyword Search Results reveals a host of specific molecular and cellular and drug-response differences between MERS-CoV and SARS-CoV.



How does AILANI work?



Based on the semantic core technology of Biomax, AILANI provides an extensible search framework that automatically maintains a growing and evolving semantic network. This “meta-ontology” supplements and extends more than 60 life science ontologies that are automatically updated and can be extended with any additional public or proprietary ontology with just a few mouse clicks.

There are many different ways to connect structured and non-structured data resources to the system. The system can interface with existing document management systems. Relational databases can be connected directly. Web services can be accessed and crawlers can sift through shared data repositories.

Repositories of scanned documents are analyzed using optical character recognition (OCR) and documents that were previously subjected to OCR can be re-analyzed using current advanced neural network-based algorithms to improve results.

Specialized “data detectors” detect and extract data types and patterns specific to any business area.

For example, in chemistry and pharmacology, two-dimensional chemical structures embedded in scanned reports are detected using optical structure recognition (OSR), extracted and translated into searchable chemical notations. Corporate identifiers can be detected with specialized pattern detectors and represented as

“semantic objects”; in this way, any one of these objects can become a focal point related to all associated real-world data.

Concepts represented by ontologies and other “semantic objects” in the knowledge network are tagged and indexed for fast search access. Text analysis with natural language processing algorithms extract enriched triples, so-called “beliefs” of typed associations between the managed semantic objects.

The extracted beliefs describe the semantics of an association between “real-world” objects typically found in specific domains (like the life sciences, materials sciences or chemistry). These associations are enriched with sentences that support the assertion and additional meta-data, for example a ranking score. Beliefs augment the managed body of knowledge and over time build up to establish a priceless corporate-wide repository of knowledge.

Acknowledgement

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