

*The National
Academies of*

SCIENCES
ENGINEERING
MEDICINE

Government-University-Industry
Research Roundtable

**RESILIENCE OF THE RESEARCH
ENTERPRISE DURING THE COVID-19
CRISIS**

**New Models of Open Research,
Data, and Collaboration**

May 28, 2020, 2:00pm - 4:00pm ET

Oren Etzioni, CEO, Allen Institute for AI
on the [COVID-19 Open Research Dataset \(CORD-19\)](#)

Barend Mons, Professor of BioSemantics,
Human Genetics Dept. Leiden University Medical
Center, on the [Virus Outbreak Data Network](#)

Ann Gabriel, SVP Global Strategic Networks
at Elsevier, moderator

Elsevier and COVID-19

Publicly available COVID-19 resources
<https://www.ncbi.nlm.nih.gov/pmc/about/covid-19/>

Coronavirus Research Hub

Welcome to the Elsevier Coronavirus Research Hub

We invite researchers and data scientists focused on Coronavirus vaccine, drug, clinical and other related research, to freely access these Elsevier solutions for your work.

[Get access >](#)

ClinicalKey[®]

Find and apply the current clinical understanding of coronavirus related pathophysiology, diagnosis and treatment.

Embase[®]

Surface drug-disease relationships, drug-drug interactions, treatments used in similar pathologies, and suitable animal models for testing.

SSRN

Quickly find up-to-the minute research on Covid-19 via this open-access online preprint community.

Text Mining

Find precise biomedical information from > 14 million full-text articles from multiple publishers, in addition to smarter searching and interrogation of the **CORD-19** dataset.

Mendeley Data

Discover, collect, share and publish COVID-19 research data

Pathway Studio[®]

In Mendeley Data investigate biological relationships between diseases (MERS and SARS), proteins and molecules, all extracted from Pathway Studio.

Professional Services

Obtain full drug candidate profiles analyzed and ranked based on your submitted criteria.

Veridata[™] EDC

Collect, and safely store, patient level data in a consistent and secure manner during clinical development and other patient-related studies.

Reaxys[®]

Search for the molecules that modulate the target proteins, find synthetic routes, scale up the synthetic routes with GMP compliance.

ELSEVIER COVID-19 HEALTHCARE HUB

[Toolkits](#) [Refresher](#) [Daily Rounds](#) [Expert insights](#) [COVID-19 guidelines](#) [Research resources](#)

Additional resources coming soon

Elsevier gives full access to its content on its COVID-19 Information Center for PubMed Central and other public health databases to accelerate fight against coronavirus

A Culture of Successful Collaboration



requires

- Trust
 - Re-examination of incentives
 - Equality in the relationship
 - Sustainability
-

Connecting Pathway Studio to COVID DiseaseMap Annotations

<https://www.linkedin.com/pulse/elsevier-models-covid19-bio-molecular-mechanisms-anton-yuryev/>

<https://www.nature.com/articles/s41597-020-0477-8>

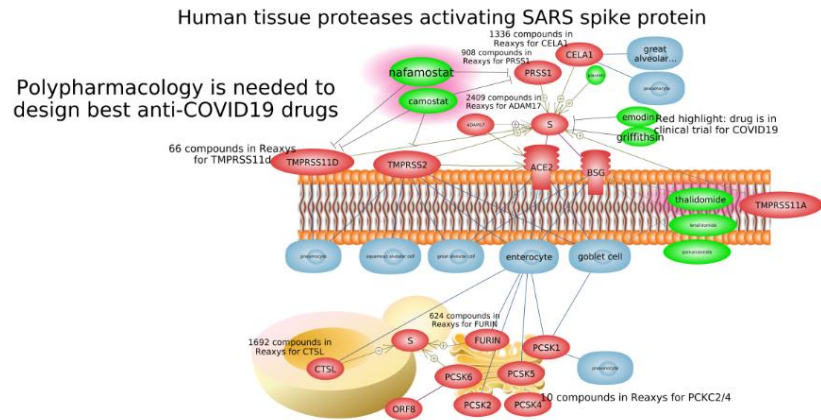


Beyond Biohacking / John Catanzaro
@Docjohnc

Neo7logix collaborates with Elsevier on PBIMA SOLVx and PBIMA / PES vaccine designs.

Essential content on ARDS genetic variations and predisposition to previous SARS infection identified by Anton Yuryev, Elsevier. [lnkd.in/fp6NiUW](https://www.linkedin.com/in/fp6NiUW)

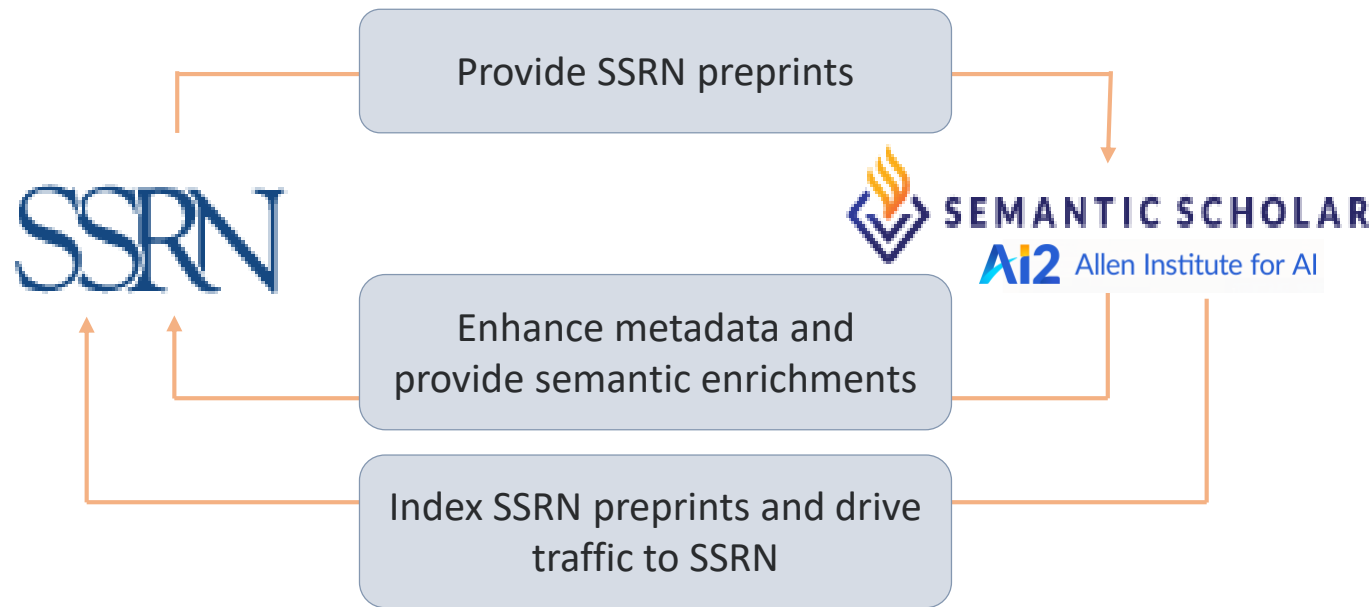
12:53 PM · Mar 28, 2020 · [LinkedIn](#)



Elsevier models for COVID-19 molecular mechanisms from Pathway Studio

- Elsevier Data Scientists working on Pathway Studio had been building and sharing cellular pathway models for COVID19 to support e.g. drug repurposing efforts
- A collaborator at Dana Farber/HMS noted that there was an overlap at the University of Luxembourg's 'Disease Map' project and connected us
- Both teams are now working on making data interoperable
- This allows wider use of Pathway Studio work, and more and better data for DiseaseMap project

Beyond CORD-19 - Collaboration with Semantic Scholar



Semantic Scholar

- Scan research with automatic extraction of abstracts, tables, figures, and citations
- Understand a paper's impact with statistics
- View related GitHub repositories, clinical trial data, presentations, videos, and other supplemental content to help reproduce the results of a paper and put it in context

- Providing Semantic Scholar (S2) a portion of SSRN content, in economics, in exchange of a feed that includes enriched data; S2 will index data and link back to SSRN for FT access
 - Year long pilot, including data & results evaluation period.
- + SSRN: Improve quality of metadata; uncover new semantics; speed development and demonstrate new approach to tech collaborations
- + SS: Accelerated development built on high-quality curated data

FAIR Data

Your data is FAIR with Mendeley Data

When collaborating with the research community to develop Mendeley Data, we followed the FAIR data principles to increase the exposure of research data.

Findable

- All published datasets are assigned a DOI
- Deep indexing of over 10 million datasets from more than 35 repositories

Accessible

- All data can be shared publicly under one of 16 licences or privately with colleagues
- Data is accessible via Mendeley Data APIs



Our commitment to making data effective

Elsevier is committed to making data effective, and developing better research data management processes and systems to support data sharing. The Mendeley Data platform helps researchers discover, collect, and share research data with the **FAIR Data Principles** at the core of the solution.

Interoperable

- Data can be pushed or pulled via the Mendeley Data APIs
- Mendeley Data accepts a vast number of different file formats to be added to datasets

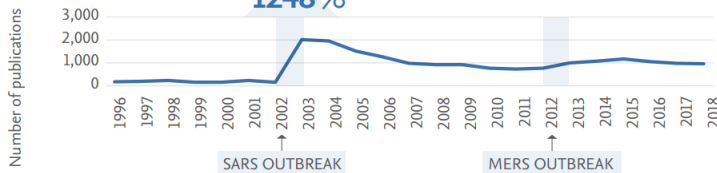
Reusable

- Deep indexing and customizable metadata ensures datasets are thoroughly documented for reuse
- Institutions and communities can add specific custom metadata fields relevant for that domain
- Steps-to-reproduce the data are part of the data description

Virus Outbreak Data Network (VODAN)

Demand for Data; Growth in Publications

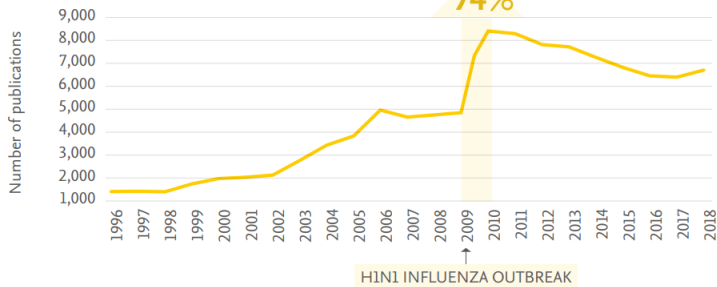
CORONAVIRUSES



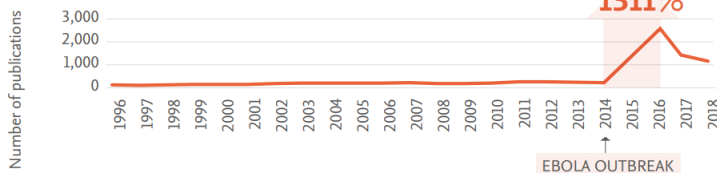
Infectious disease research spikes following an outbreak

Following an outbreak of a disease, we see a sharp spike in disease-specific publications, showcasing the research community's remarkable ability to quickly respond to public health needs. This is evidenced by a rise in publication counts following outbreaks of SARS, Influenza A (H1N1), Ebola and Zika virus.

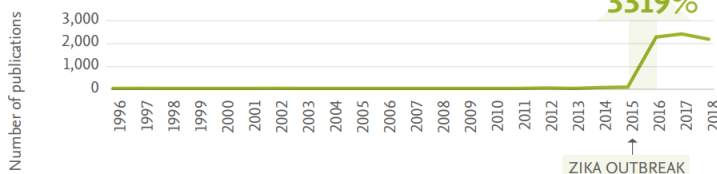
INFLUENZA



EBOLA



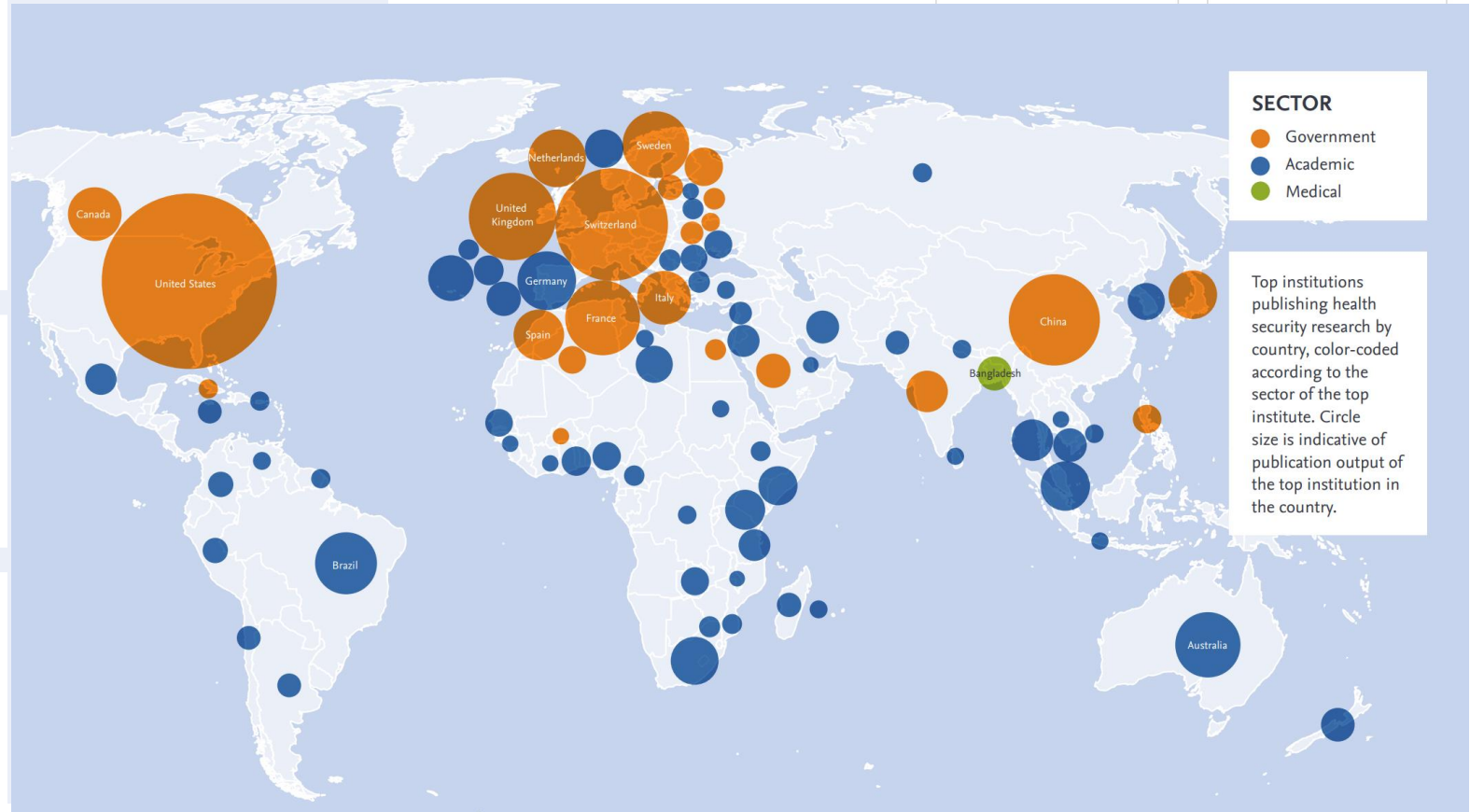
ZIKA



Chris James



Bamini Jayabalasingham,



Demand for Rapid Publication



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1.

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2.

[Pandemics Depress the Economy, Public Health Interventions Do Not: Evidence from the 1918 Flu](#)

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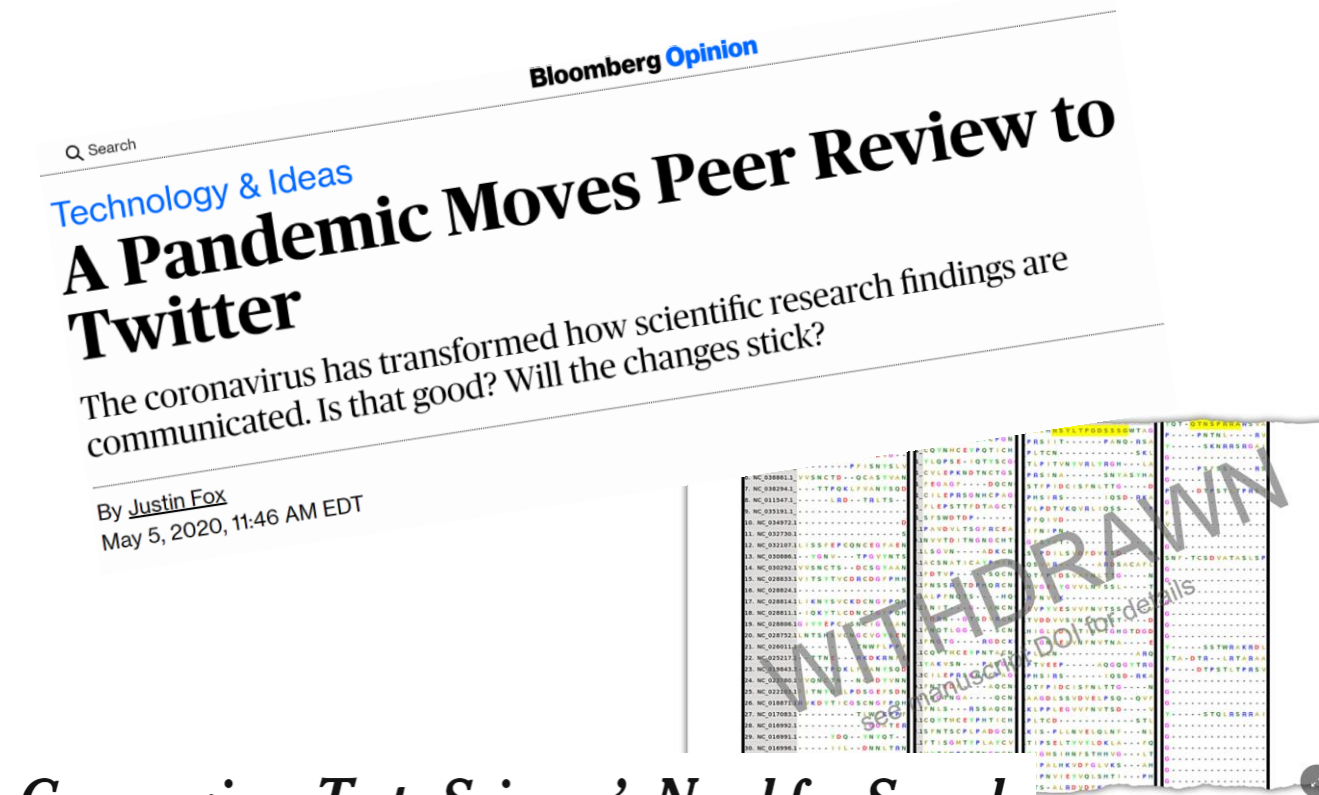
Number of pages: 49 • Posted: 26 Mar 2020 • Last Revised: 13 Apr 2020

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Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York and Massachusetts Institute of Technology (MIT) - Sloan School of Management

Maintaining Public Trust as Science Accelerates



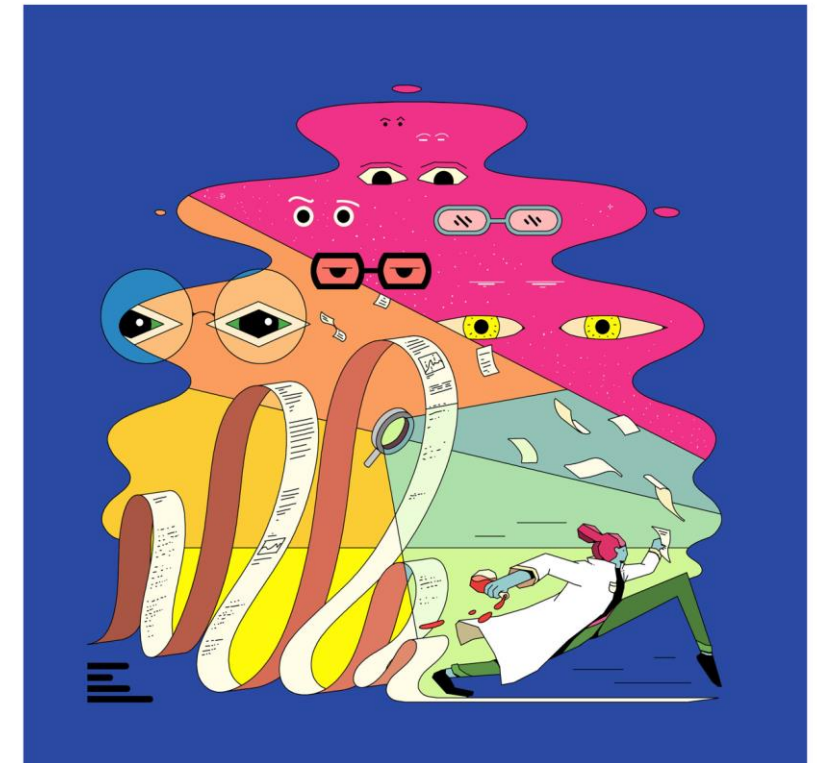
Coronavirus Tests Science's Need for Speed Limits

Preprint servers and peer-reviewed journals are seeing surging audiences, with many new readers not well versed in the limitations of the latest research findings.

The New York Times Magazine

STUDIES SHOW

Coronavirus Is Forcing Medical Research to Speed Up



Research Collaboration Principles:



1. **First, do no harm.**

Make sure that the project serves the scientific community at large, and in particular the area of science you are supporting.

2. **Practice Ethical (Data) Science.**

*Consider the source, motivation and impact of the research: is it favoring one group over another? Are **Diversity and Inclusion issues** considered in participants, beneficiaries, subjects, location, topic? Can the research harm any community?*

3. **The user is always king.**

*All projects start with an understanding **who** the project is for, **what** they want to achieve, and throughout the process, validating that this solution **does indeed help** them achieve this goal.*

4. **Open if possible, closed when needed.**

Security issues are taken seriously (cf. GDPR compliance, HIPAA) but if possible, Elsevier Data Scientists publish in Open Access journals, Open Data repositories, Open source software systems, through preprints and a variety of shared development platforms.

5. **Share and share alike.**

Code, content and IP are shared with research partners (provided proper IP processes are in place for business-sensitive issues).

6. **Give credit where it's due.**

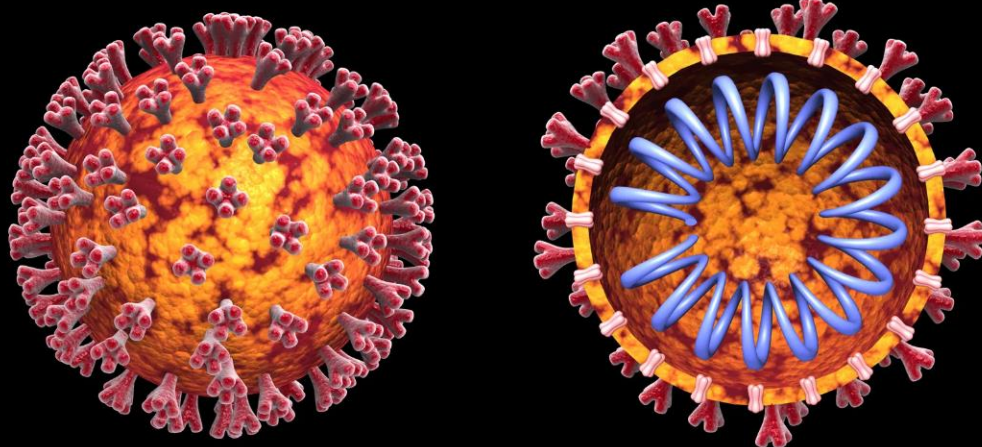
Always acknowledge contributions from everyone working on the project, allow open publication and data sharing for participants (provided there are no security or IP reasons to prevent this)

7. **Report openly on successes and failures.**

On project conclusion, a research report is made and shared, adding, if possible, an honest evaluation of successful and failed aspects of the project and the collaboration.

AI Can Help Scientists Find a Covid-19 Vaccine

Artificial intelligence has already played a vital role in the outbreak since day 1—a reminder for the first time in a while that it can be a tool for good.



Fighting COVID-19 with Open Access and AI

The CORD-19 resource attempts to accelerate scientific discovery and save lives



Oren Etzioni

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