Vaccines and pandemics: COVID-19 is neither the last nor the worst

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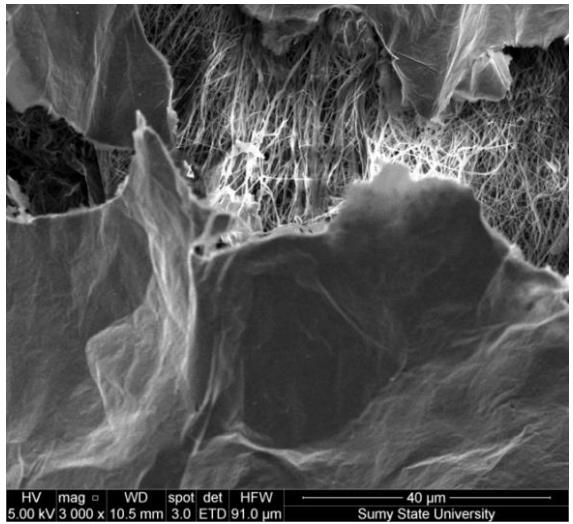
Jean Monnet Support to Associations EUforUA

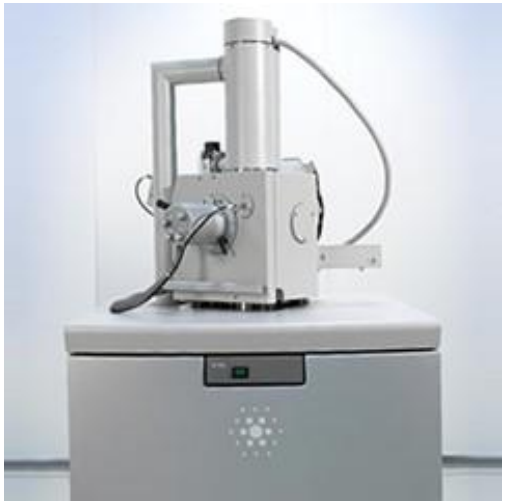
https://www.cdc.gov/coronavirus/2019-ncov/images/vaccines/HCW_vaccine_page_transp-300x236-1.png

Biomedical Research Center

Medical Institute of Sumy State University

- Cell culture laboratory
- Microbiological laboratory
- ELISA laboratory
- Chemical and toxicological laboratory





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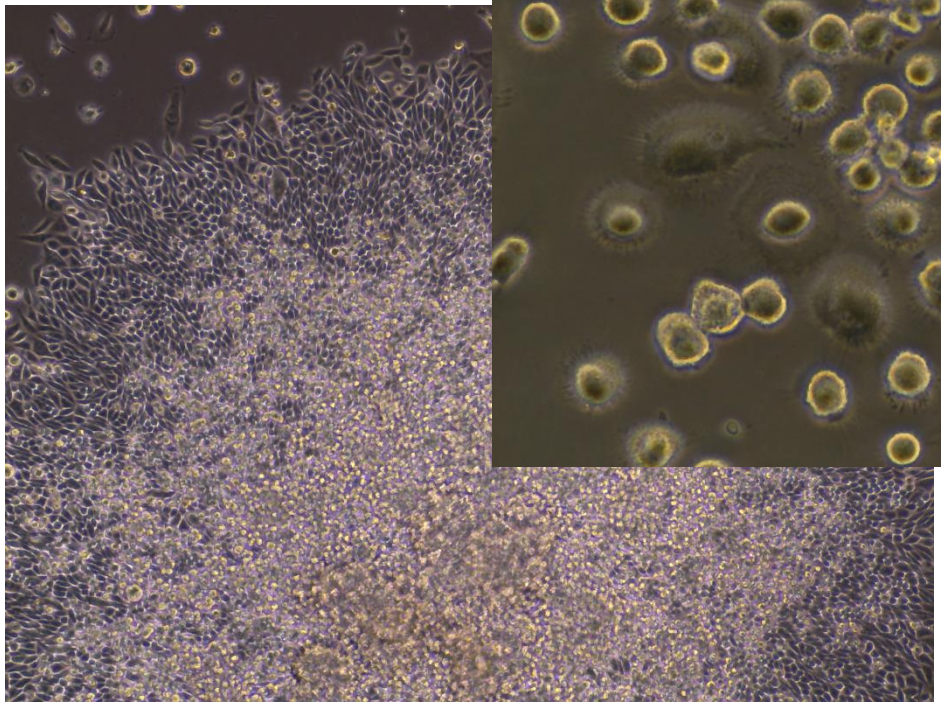
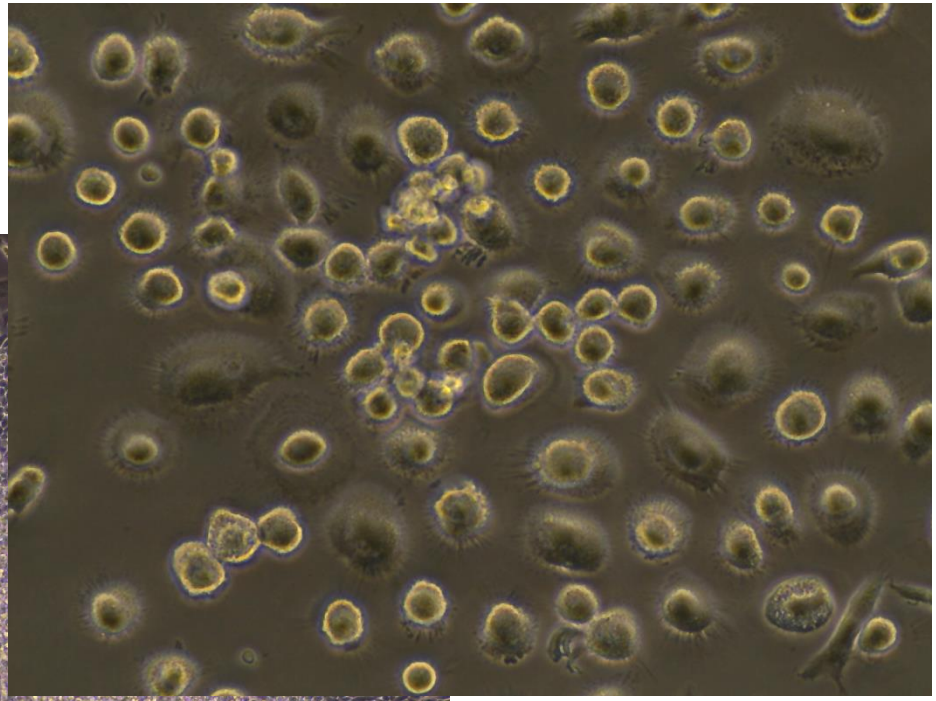
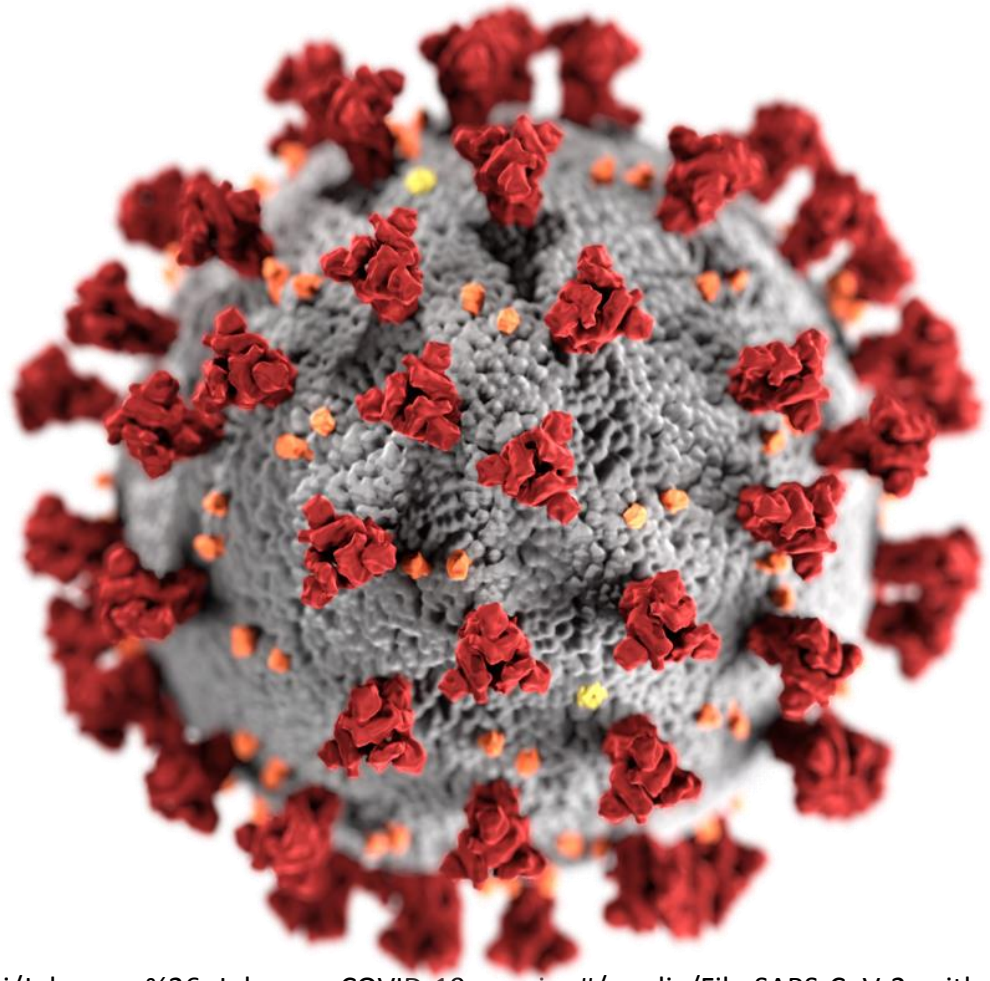
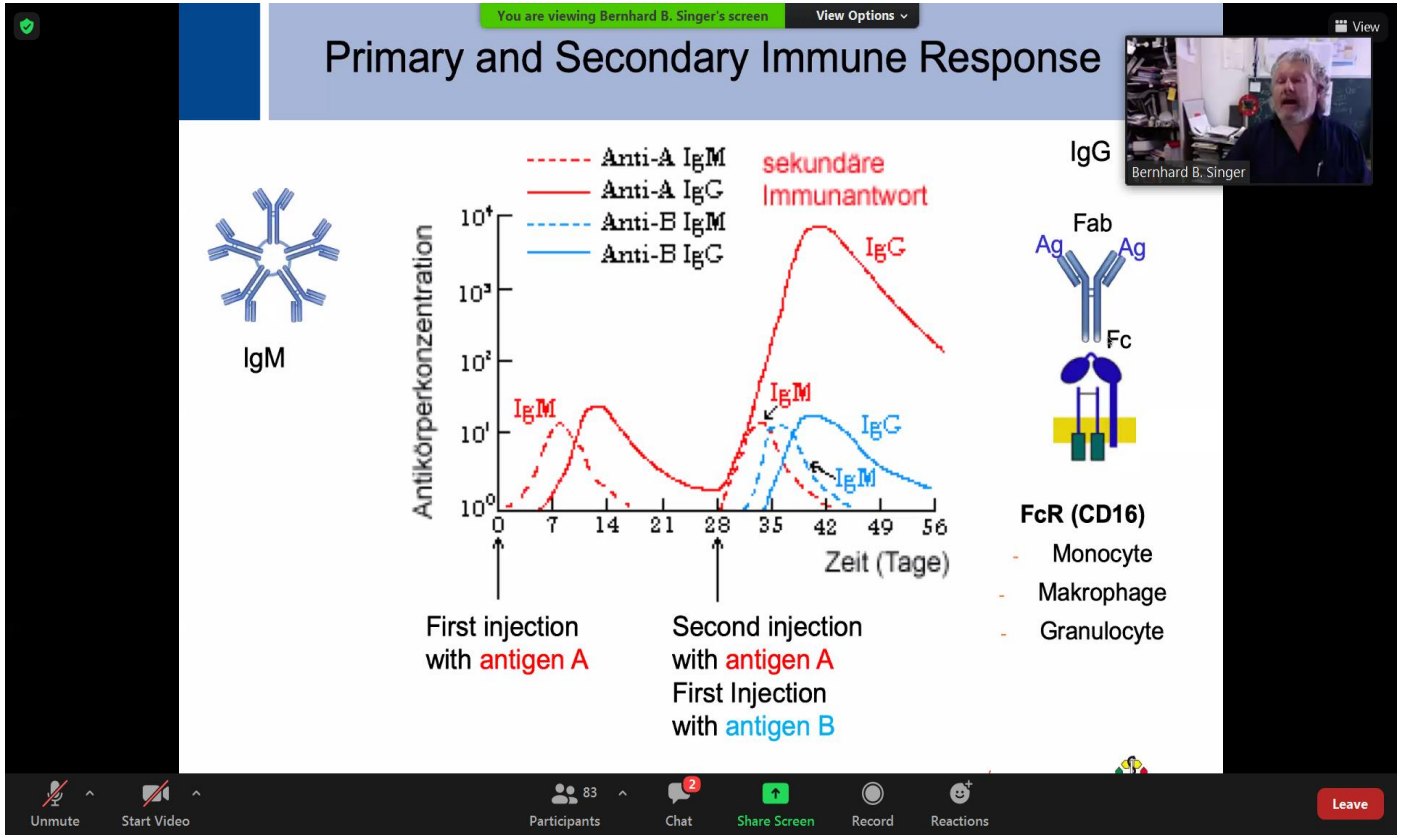


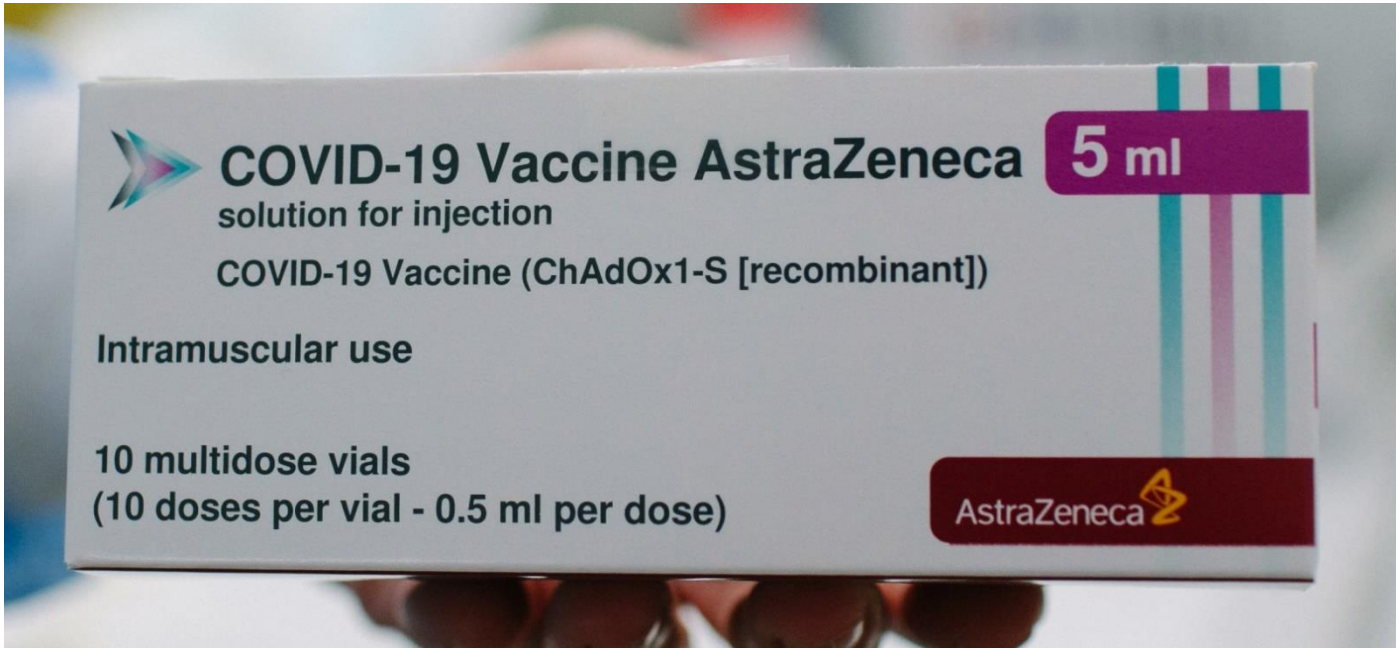




https://en.wikipedia.org/wiki/Johnson_%26_Johnson_COVID-19_vaccine#/media/File:SARS-CoV-2_without_background.png



Lecture of Prof. B. Singer on 18Mar2021 – BRC archives



The vaccine is marketed under the brand name **Covishield** by the Serum Institute of India.

https://en.wikipedia.org/wiki/Oxford%E2%80%93AstraZeneca_COVID-19_vaccine

AstraZeneca COVID-19 vaccine

Simian (chimpanzee) adenovirus vector
Replication-deficient
Contains the full-length codon-optimised coding sequence of SARS-CoV-2 spike protein along with a tissue plasminogen activator (tPA) leader sequence.

Two doses four to twelve weeks apart
WHO : 8 to 12 weeks after the first for optimum efficacy.

The efficacy of the vaccine is 76.0% at preventing symptomatic COVID-19 beginning at 22 days following the first dose and 81.3% after the second dose.

https://en.wikipedia.org/wiki/Oxford%E2%80%93AstraZeneca_COVID-19_vaccine

https://en.wikipedia.org/wiki/Pan_(genus)

seruminstitute.com/product_covishield.php

HOME | ABOUT US | PRODUCTS | R & D | MILESTONES | NEWS | CSR | HEALTH FAQ | CONTACT US | CAREERS | POONAWALLA GROUP

Coronavirus disease (COVID-19): Vaccines

Serum - Protection from birth onwards

PRODUCTS SUPPLIED OVERSEAS | PRODUCTS SUPPLIED IN INDIA | PRODUCT LIST | PRODUCT PIPELINE

BACK

ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant)

COVISHIELD™

PRODUCT INSERT

SII

For the use only of a Registered Medical Practitioner or a Hospital or a Laboratory.

ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant)

COVISHIELD®

1 NAME OF THE MEDICINALPRODUCT

COVISHIELD™
ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant)

2 QUALITATIVE AND QUANTITATIVE COMPOSITION
One dose (0.5 ml) contains:
ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant) 5 × 10viral particles (vp)
*Recombinant, replication-deficient chimpanzee adenovirus vector encoding the SARS-CoV-2 Spike (S) glycoprotein. Produced in genetically modified human embryonic kidney (HEK) 293 cells
This product contains genetically modified organisms (GMOs).
For the full list of excipients, see section 6.1.
Both **COVISHIELD™** (manufactured by Serum Institute of India Pvt Ltd) and COVID-19 Vaccine AstraZeneca (manufactured by AstraZeneca) are ChAdOx1 nCoV- 19 Corona Virus Vaccines (Recombinant).

click HERE for detailed product insert information (PDF)

COVISHIELD®

FACT SHEET

SII

FACT SHEET FOR VACCINE RECIPIENT

APPROVED FOR RESTRICTED USE IN EMERGENCY SITUATION OF
ChAdOx1 nCoV- 19 Corona Virus Vaccine (Recombinant)

COVISHIELD®

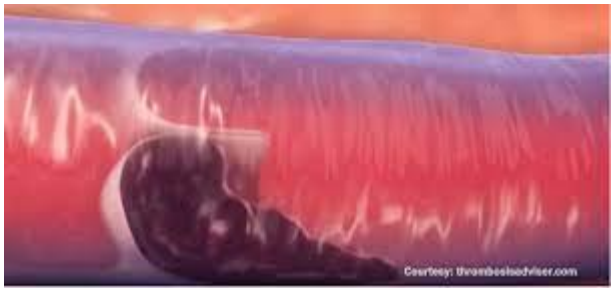
IN PREVENTION OF (COVID-19) DISEASE
IN INDIVIDUALS 18 YEARS OF AGE AND OLDER

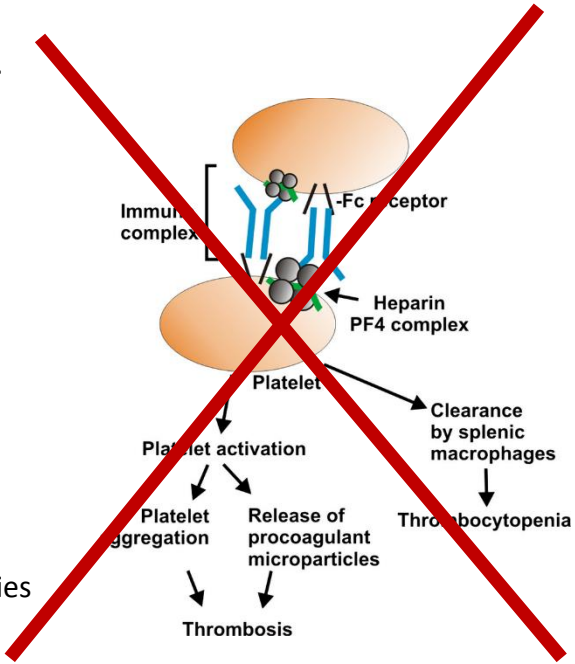
click HERE for detailed Fact Sheet (PDF)

https://www.seruminstitute.com/product_covishield.php

Thromboembolic events

The estimated number of doses of vaccine administered in the UK by 31st March was 20.2 million giving an overall case incidence of 4.4 per million doses





Autoimmune Heparin-induced thrombocytopenia (aHIT) is caused by antibodies that bind to complexes of **heparin** and platelet factor 4 (PF4), activating the platelets and promoting a prothrombotic state.

www.heart.org/-/media/images/health-topics/video-thumbnails/vte-signs-and-symptoms.jpg?h=515&w=937&hash=35B7F9370A4722538C5F6E2E07F2000687C566CB
www.researchgate.net/figure/Heparin-induced-thrombocytopenia-a-syndrome-mediated-by-FcgRIIa-In-heparin-induced_fig3_283262804
www.glasgowlmc.co.uk/download/Links/test/2021/16_apr/COVID-ASTRA-ZENECA-VACCINE-THROMBOEMBOLIC-EVENTS-WITH-CONCURRENT-LOW-PLATELET-COUNTS.pdf

VAXZEVRIA/COVID-19 Vaccine AstraZeneca: link between the vaccine and the occurrence of thrombosis in combination with thrombocytopenia

Dear Healthcare Professional,

AstraZeneca AB in agreement with the European Medicines Agency and the <National Competent Authority > would like to inform you of the following:

Summary

- **A causal relationship between the vaccination with Vaxzevria and the occurrence of thrombosis in combination with thrombocytopenia is considered plausible.**
- **Although such adverse reactions are very rare, they exceeded what would be expected in the general population.**
- **No specific risk factors have been identified at this stage.**
- **Healthcare professionals should be alert to the signs and symptoms of thromboembolism and or thrombocytopenia and inform vaccinees accordingly.**
- **The use of this vaccine should be in accordance with official national recommendations.**

www.ema.europa.eu/en/documents/dhpc/direct-healthcare-professional-communication-dhpc-vaxzevria-previously-covid-19-vaccine-astrazeneca_en-0.pdf

Johnson & Johnson COVID-19 vaccine

- requires only one dose
- does not need to be stored frozen

[Ad26.COV2.S]

https://en.wikipedia.org/wiki/Johnson_%26_Johnson_COVID-19_vaccine#Ethical_concerns

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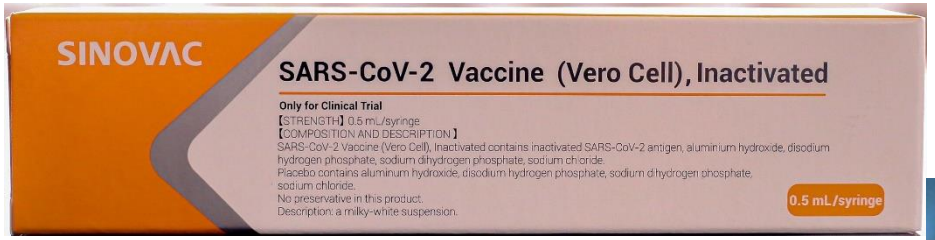
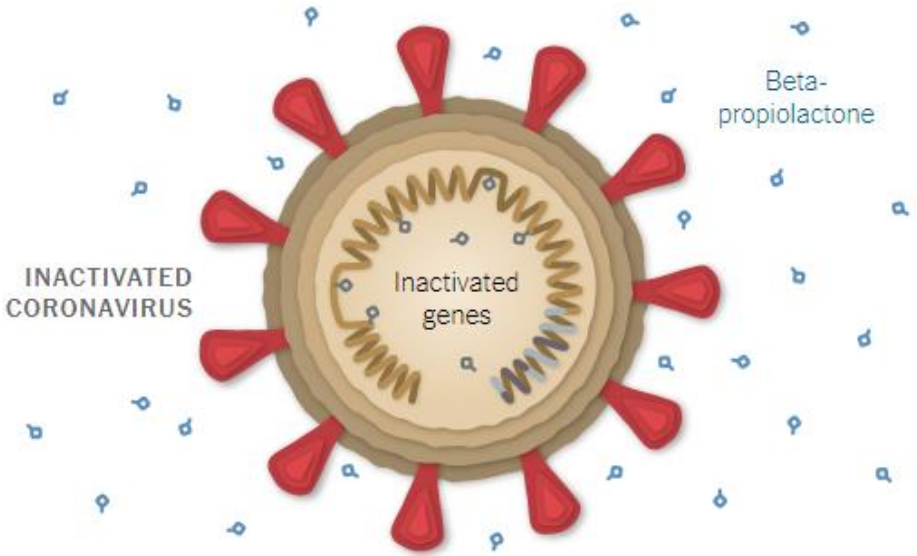
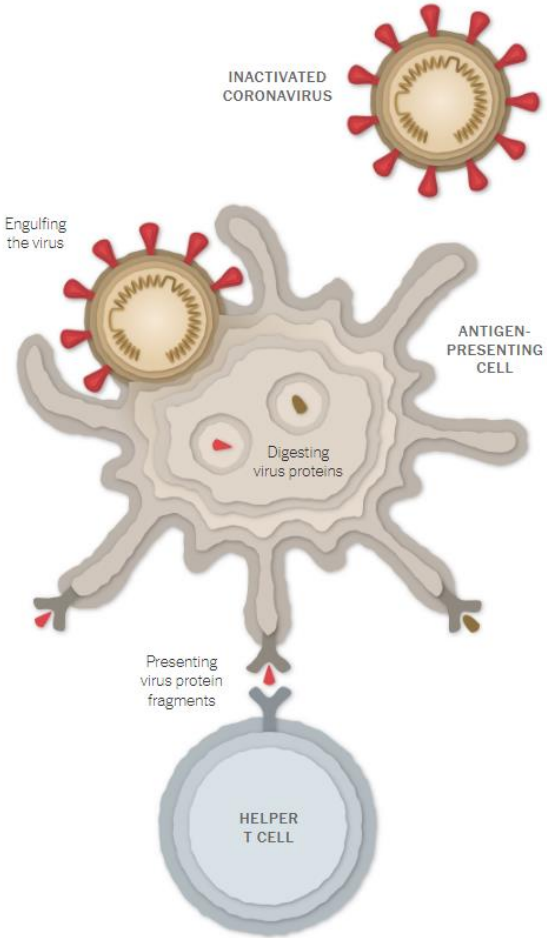
Convidecia

AD5-nCOV





https://edition.cnn.com/2021/05/07/china/china-philippines-vaccines-climate-mic-intl-hnk/index.html
https://static01.nyt.com/images/2020/12/22/us/sinovac-covid-19-vaccine-promo-1608688564032/sinovac-covid-19-vaccine-promo-1608688564032-videoSixteenByNineJumbo1600-v9.png
https://en.wikipedia.org/wiki/CoronaVac



https://www.nytimes.com/interactive/2020/health/sinovac-covid-19-vaccine.html

Україна отримала ще пів мільйона доз вакцини CoronaVac (Фото: REUTERS/Valentyn Ogirenko)

В Україну прибули ще пів мільйона доз вакцини CoronaVac виробництва китайської фармацевтичної компанії Sinovac Biotech.

… we will receive a total of 20 million doses of Pfizer vaccine this calendar year.

nv.ua/ukr/ukraine/events/vakcinaciya-v-ukrajini-ukrajina-otrimala-shche-500-tisyach-doz-preparatu-coronavac-novini-ukrajini-50158976.html

#COVAX plans to provide vaccines for 20% Ukrainians by the end of the year https://uni.cf/32FbsYM

COVID-19 Vaccines Global Access - COVAX

Interim Distribution Forecast as of 3 February 2021 (doses)[17]

AMC: Advance Market Commitment; SFP: Self-Financing Participants

Participant	SFP/AMC	AstraZeneca SII	AstraZeneca SK Bioscience	Pfizer–BioNTech	Total
India	AMC	97,164,000	-	-	97,164,000
Pakistan	AMC	17,160,000	-	-	17,160,000
Nigeria	AMC	16,008,000	-	-	16,008,000
Indonesia	AMC	-	13,708,800	-	13,708,800
Bangladesh	AMC	12,792,000	-	-	12,792,000
Brazil	SFP	-	10,672,800	-	10,672,800
Ethiopia	AMC	8,928,000	-	-	8,928,000
Congo, Dem. Rep.	AMC	6,948,000	-	-	6,948,000
Mexico	SFP	-	6,472,800	-	6,472,800
Philippines	AMC	-	5,500,800	117,000	5,617,800
Egypt	AMC	-	5,138,400	-	5,138,400
Vietnam	AMC	-	4,886,400	-	4,886,400
Myanmar	AMC	4,224,000	-	-	4,224,000
Iran	SFP	-	4,216,800	-	4,216,800
Kenya	AMC	4,176,000	-	-	4,176,000
Uganda	AMC	3,552,000	-	-	3,552,000
Sudan	AMC	3,396,000	-	-	3,396,000
South Africa	SFP	-	2,976,000	117,000	3,093,000
Afghanistan	AMC	3,024,000	-	-	3,024,000
South Korea	SFP	-	2,596,800	117,000	2,713,800
Colombia	SFP	-	2,553,600	117,000	2,670,600
Uzbekistan	AMC	2,640,000	-	-	2,640,000
Angola	AMC	2,544,000	-	-	2,544,000
Mozambique	AMC	2,424,000	-	-	2,424,000
Ghana	AMC	2,412,000	-	-	2,412,000
Ukraine	AMC	-	2,215,200	117,000	2,332,200
Yemen	AMC	2,316,000	-	-	2,316,000

https://en.wikipedia.org/wiki/COVAX

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https://antiworldnews.files.wordpress.com/2012/04/thefuture.jpg

Published: 12 January 2018

mRNA vaccines — a new era in vaccinology

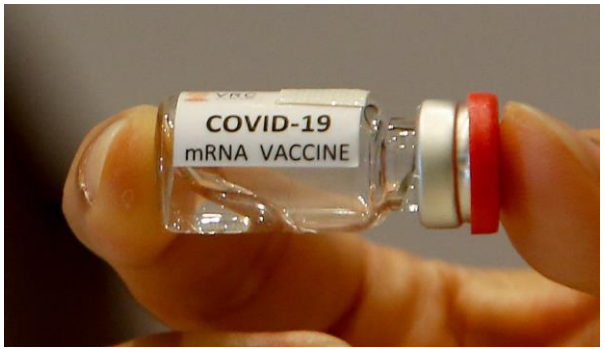
Norbert Pardi, Michael J. Hogan, Frederick W. Porter & Drew Weissman

Nature Reviews Drug Discovery **17**, 261–279(2018) | Cite this article

1.64m Accesses | **524** Citations | **4714** Altmetric | Metrics

Key Points

- Recent improvements in mRNA vaccines act to increase protein translation, modulate innate and adaptive immunogenicity and improve delivery.
- mRNA vaccines have elicited potent immunity against infectious disease targets in animal models of influenza virus, Zika virus, rabies virus and others, especially in recent years, using lipid-encapsulated or naked forms of sequence-optimized mRNA.
- Diverse approaches to mRNA cancer vaccines, including dendritic cell vaccines and various types of directly injectable mRNA, have been employed in numerous cancer clinical trials, with some promising results showing antigen-specific T cell responses and prolonged disease-free survival in some cases.
- Therapeutic considerations and challenges include scaling up good manufacturing practice (GMP) production, establishing regulations, further documenting safety and increasing efficacy.
- Important future directions of research will be to compare and elucidate the immune pathways activated by various mRNA vaccine platforms, to improve current approaches based on these mechanisms and to initiate new clinical trials against additional disease targets.



https://cdn.aarp.net/content/dam/aarp/health/drugs_supplements/2020/12/1140-mnra-covid-vaccine.imgcache.rev.web.900.513.jpg

https://www.nature.com/articles/nrd.2017.243

Katalin Karikó, a senior vice president at BioNTech overseeing its mRNA work, in her home office in Rydal, Penn.
JESSICA KOURKOUNIS FOR THE BOSTON Gglobe

https://www.statnews.com/2020/11/10/the-story-of-mrna-how-a-once-dismissed-idea-became-a-leading-technology-in-the-covid-vaccine-race/
https://european-biotechnology.com/up-to-date/latest-news/news/biontech-and-fosun-pharma-kick-off-chinese-covid-19-trials.html

Research Highlight | Published: 12 January 2021

AUTOIMMUNITY

mRNA vaccine shows promise in autoimmunity

Alexandra Flemming

Nature Reviews Immunology **21**, 72(2021) | Cite this article

Indian doctors warn against cow dung as COVID cure

https://www.reuters.com/article/uk-health-coronavirus-india-cows/indian-doctors-warn-against-cow-dung-as-covid-cure-idUSKBN2CS05N

https://www.wbur.org/endlessthread/2019/05/03/scabs-pus-puritans

April 27, 2021
3:00 PM EEST

Americas

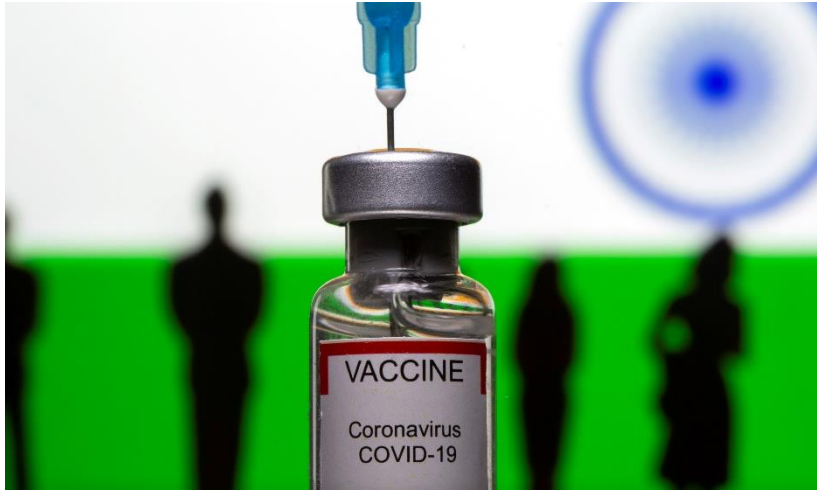
Brazil health regulator rejects Russia's Sputnik vaccine

3 minute read

Reuters, Ricardo Brito, Polina Ivanova

https://www.reuters.com/world/americas/brazil-health-regulator-anvisas-technical-staff-recommend-against-importing-2021-04-26/
https://images.moneycontrol.com/static-mcnews/2020/11/Sputnik-V-vaccine-770x433.jpg?impolicy=website&width=770&height=431
https://i.pinimg.com/236x/96/53/50/9653507aad03cd3077fe1aa4d9105c2a--tato-danger.jpg

https://i.pinimg.com/236x/0d/af/f5/0daff57ed0bbdce1f12a00512fa2c36a.jpg



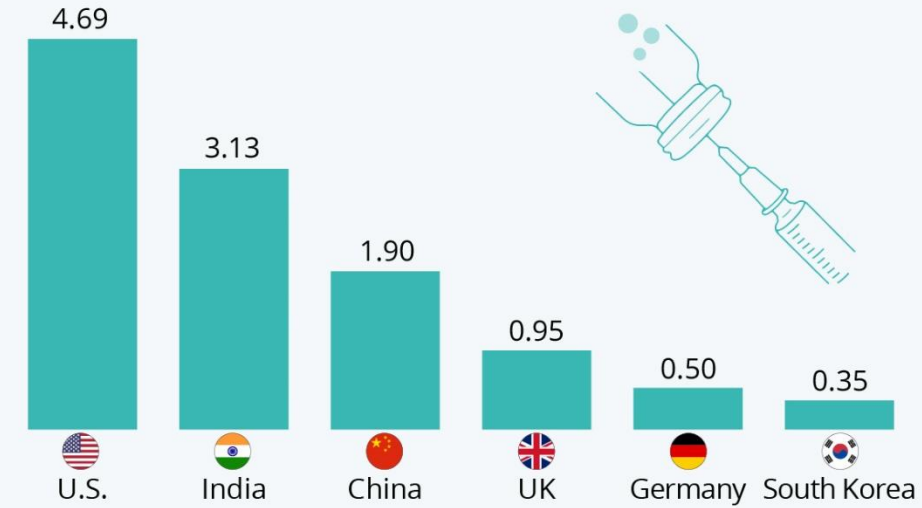
300 million COVID-19 vaccine doses for 15 billion rupees ($205.62 million).

0.69 USD per dose

https://www.reuters.com/world/india/india-govt-seals-deal-300-mln-biological-e-covid-19-vaccine-doses-2021-06-03

Where Coronavirus Vaccines Will Be Produced

Estimated coronavirus vaccine production capabilities in 2020 and 2021 by country (in billion doses)



Source: Airfinity via DW

statista

http://cdn.statcdn.com/Infographic/images/normal/23885.jpeg

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Contents

dd a country...

Sort by Total vaccinations

United States	301.64M
India	228.04M
Brazil	71.69M
United Kingdom	67.99M
Germany	54.24M
France	40.06M
Italy	38.18M
Canada	26.1M
Chile	19.46M
Israel	10.6M
Hungary	9.25M
Mongolia	3.4M
Bahrain	1.83M
World	2.15B
Asia	1.21B

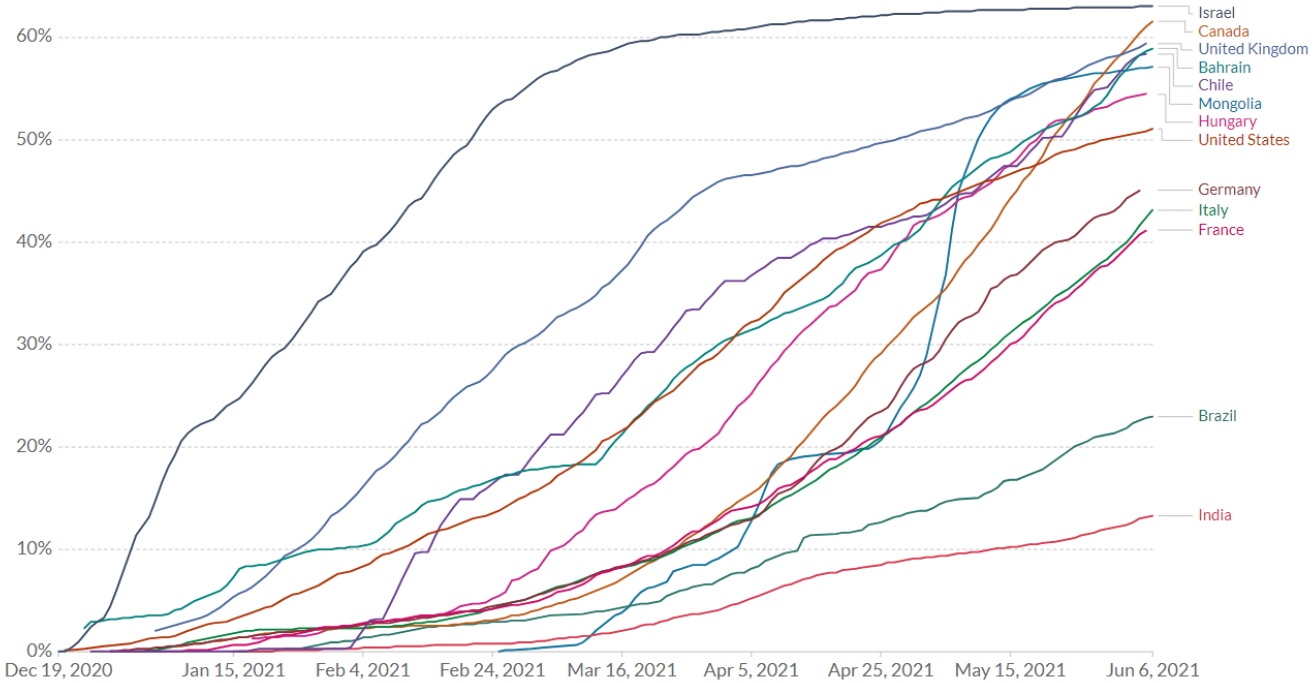
Clear selection

Share of people who received at least one dose of COVID-19 vaccine

Share of the total population that received at least one vaccine dose. This may not equal the share that are fully vaccinated if the vaccine requires two doses.

Our World in Data

LINEAR LOG



Source: Official data collated by Our World in Data

CC BY

▶ Dec 19, 2020 — Jun 6, 2021

CHART MAP TABLE SOURCES DOWNLOAD

https://ourworldindata.org/covid-vaccinations

https://github.com/owid/covid-19-data/blob/master/public/data/vaccinations/us_state_vaccinations.csv

Vaccinations by location

From Our World in Data · Last updated: 1 day ago

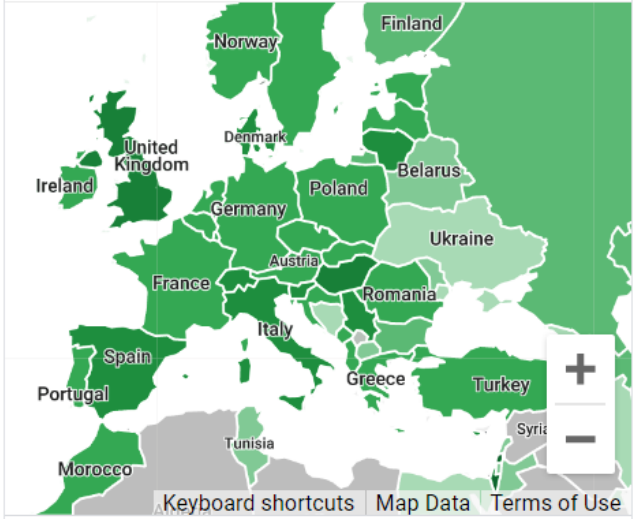
Worldwide

Doses given	Fully vaccinated	% of population fully vaccinated
1.98B	437M	5.6%
+34.4M	+5.04M	+0.1%

Location	Doses given↓	Fully vaccinated	% of population fully vaccinated
Ukraine	**1.18M**	**133K**	**0.3%**
China (Mainland)	682M	-	-
United States	296M	136M	41.4%
India	213M	43.6M	3.2%
Brazil	68.2M	22.3M	10.6%

Map of vaccinations

From Our World in Data · Last updated: 2 days ago



% of people fully vaccinated · About this data

Statistics

Vaccinations by location

From Our World in Data · Last updated: 1 day ago

Worldwide

Doses given	Fully vaccinated	% of population fully vaccinated
1.3B	314M	4.0%
+12.4M	+2.78M	

Location	Doses given ↓	Fully vaccinated	% of population fully vaccinated
Ukraine	**863K**	**446**	**-**
China (Mainland)	324M	-	-
United States	260M	114M	34.8%
India	168M	34.5M	2.5%
United Kingdom	53M	17.7M	26.5%

This data shows the total number of doses given in each location. Since some vaccines require more than one dose, the number of fully vaccinated people is likely to be lower. '+' shows data reported yesterday · About this data

https://github.com/owid/covid-19-data/blob/master/public/data/vaccinations/us_state_vaccinations.csv

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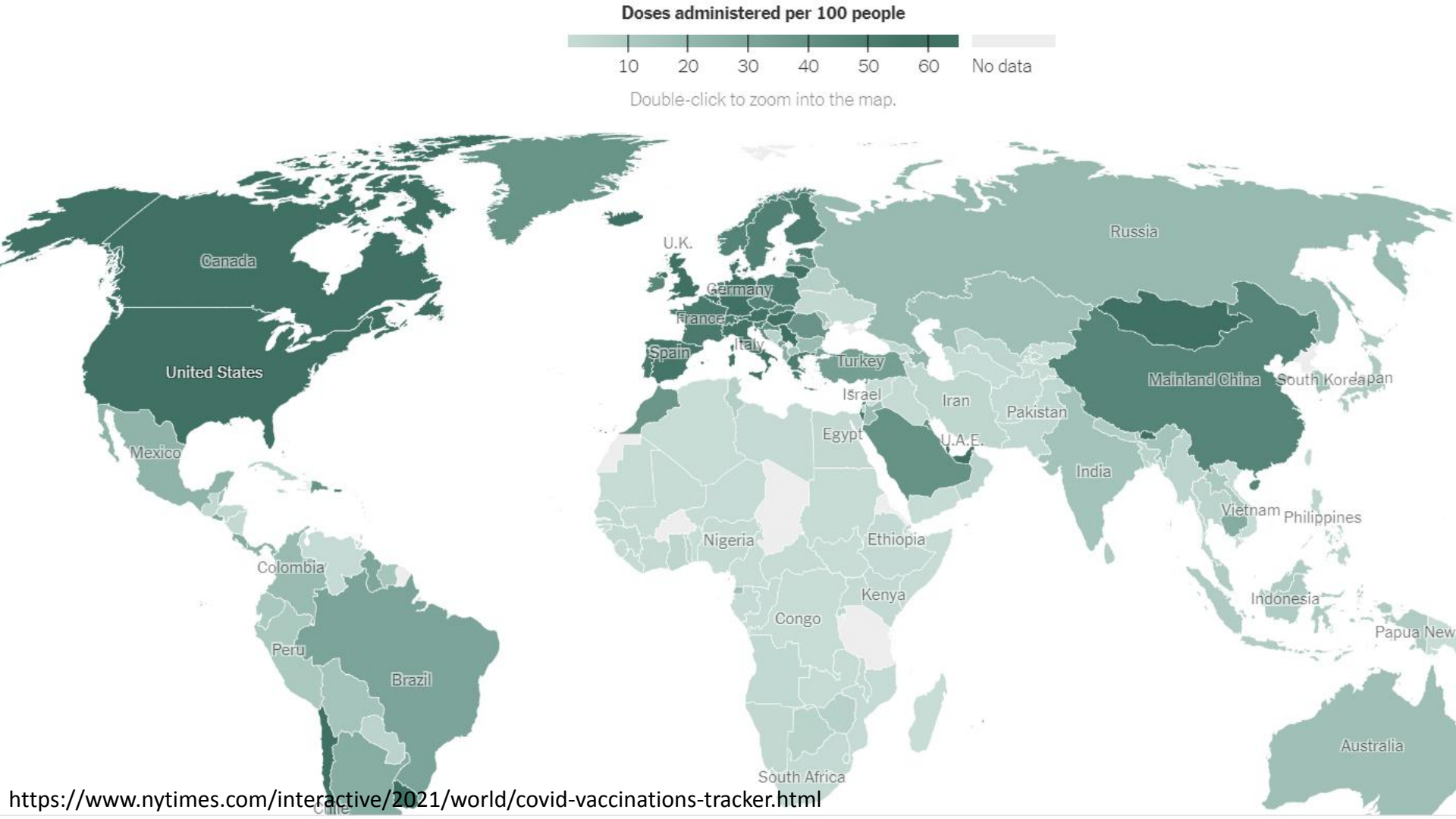


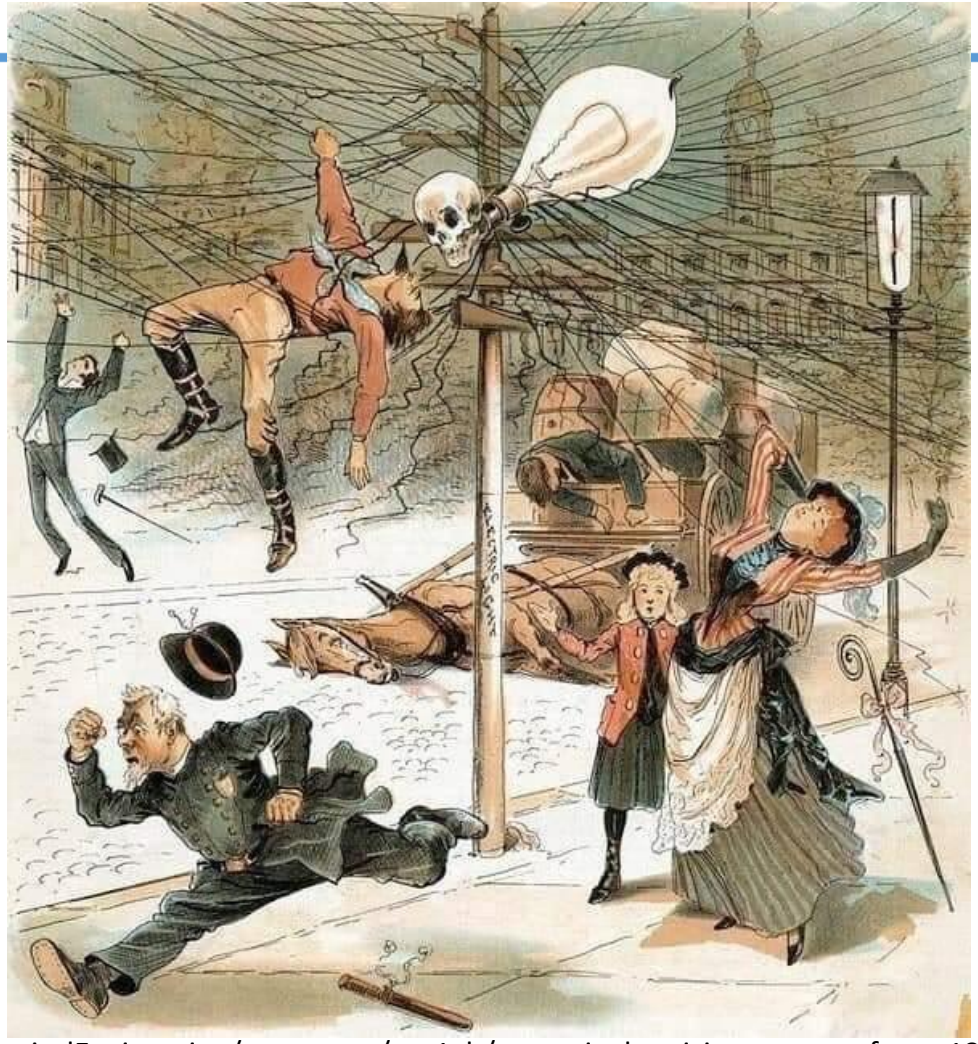
https://www.nytimes.com/interactive/2021/world/covid-vaccinations-tracker.html

Vaccinations by country

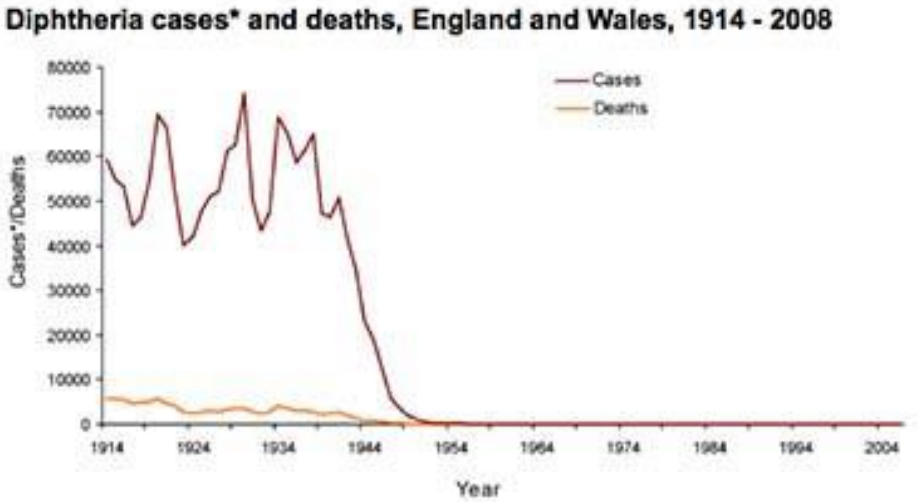
Israel

	Doses administered		Pct. of population	
	▼ Per 100 people	Total	Vaccinated	Fully vaccinated
World	**28**	2,148,383,821	–	–
Israel	117	10,598,448	60%	57%

https://www.nytimes.com/interactive/2021/world/covid-vaccinations-tracker.html



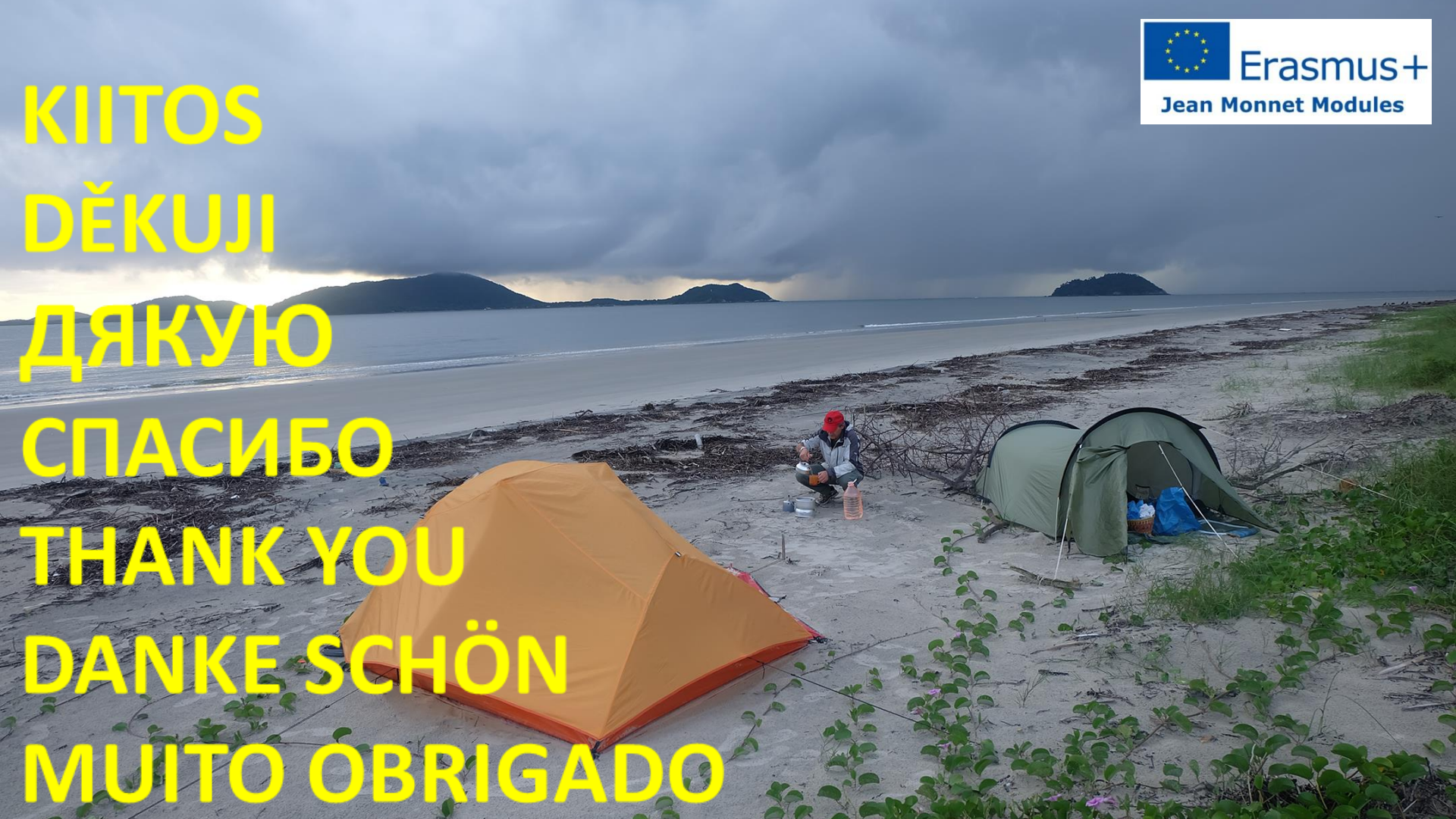
https://www.reddit.com/r/ElectricalEngineering/comments/egx1gb/an_anti_electricity_cartoon_from_1889/



https://denispombriant.medium.com/lets-make-an-antiserum-for-corona-virus-bb1a96dc5808

Stay healthy!
And get a COVID19 shot!!!

Jean Monnet Support to Associations EUforUA



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Jean Monnet Modules

Hum Gene Ther. 2019 Feb;30(2):168-178. doi: 10.1089/hum.2018.145. Epub 2018 Oct 2.

Purification of mRNA Encoding Chimeric Antigen Receptor Is Critical for Generation of a Robust T-Cell Response

Jessica B Foster [1 2], Namrata Choudhari [3 4], Jessica Perazzelli [1], Julie Storm [1], Ted J Hofmann [1], Payal Jain [3 4], Phillip B Storm [2 3 4 5], Norbert Pardi [6], Drew Weissman [6], Angela J Waanders [1 2 4], Stephan A Grupp [1 2], Katalin Karikó [7], Adam C Resnick [2 3 4 8], David M Barrett [1 2]

Affiliations + expand

PMID: 30024272 PMCID: PMC6383579 DOI: 10.1089/hum.2018.145

Free PMC article

https://pubmed.ncbi.nlm.nih.gov/30024272/

Abstract

T cells made with messenger RNA (mRNA) encoding chimeric antigen receptor (CAR) offer a safe alternative to those transduced with viral CARs by mitigating the side effects of constitutively active T cells. Previous studies have shown that mRNA CAR T cells are transiently effective but lack persistence and potency across tumor types. It was hypothesized that the efficacy of mRNA CARs could be

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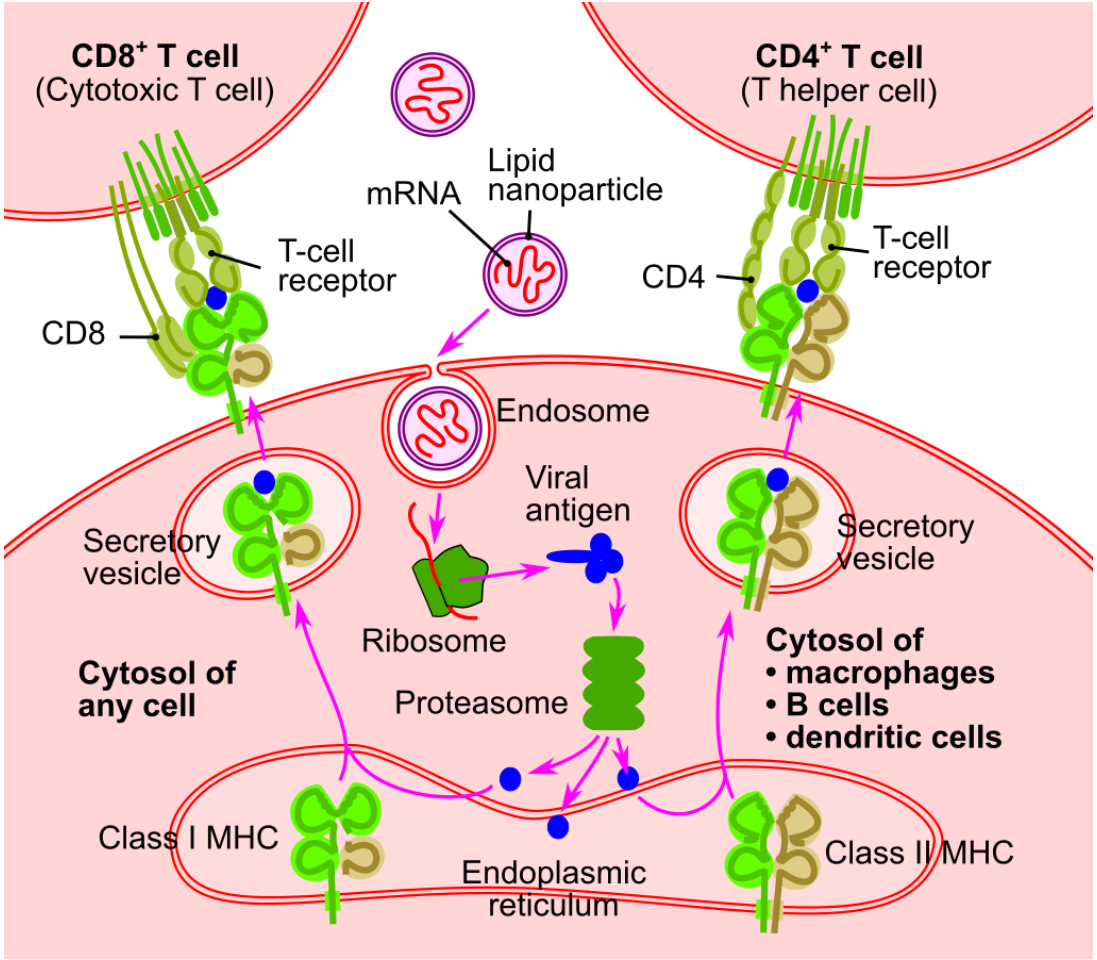
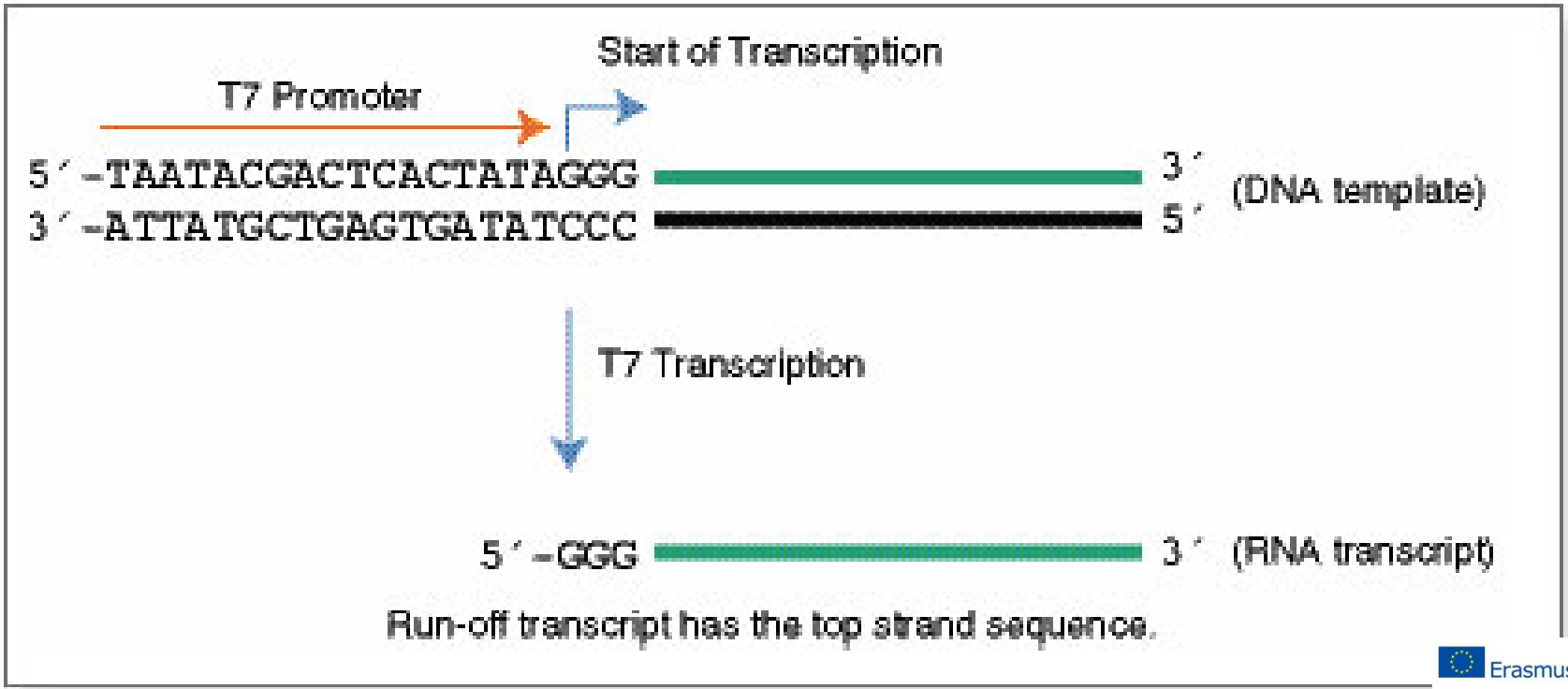
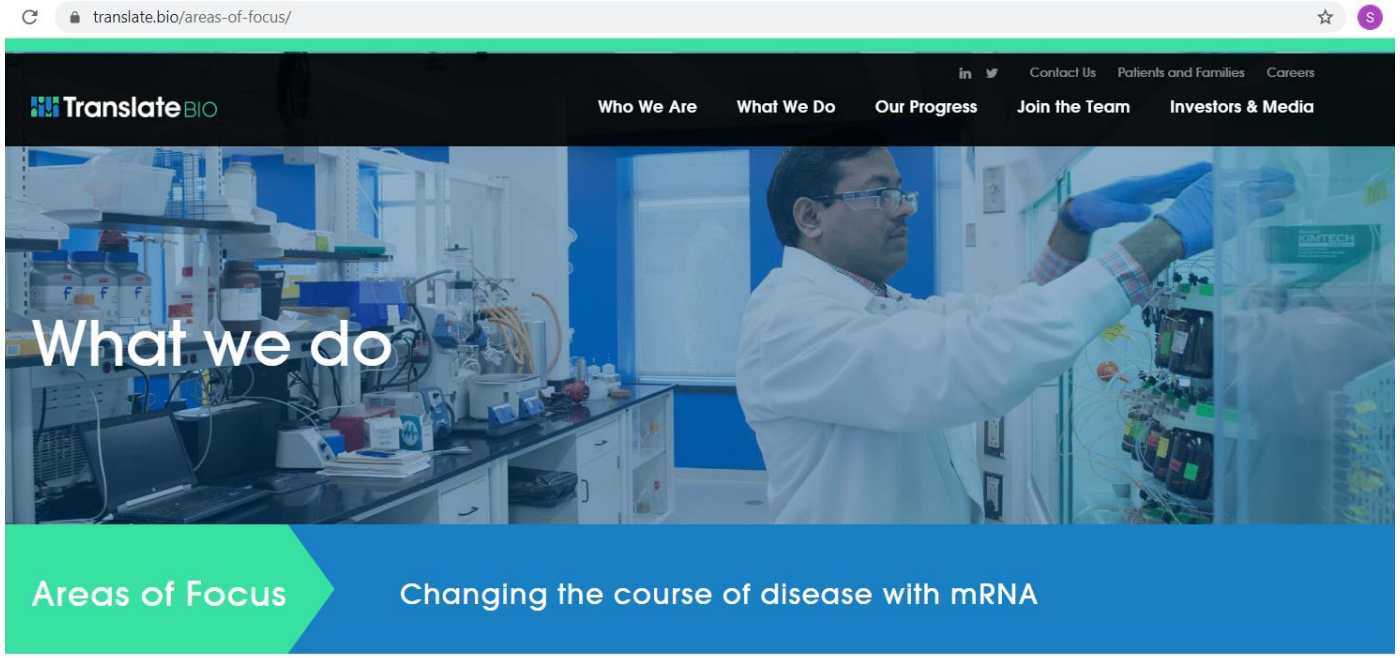


https://en.wikipedia.org/wiki/RNA_vaccine#cite_note-21



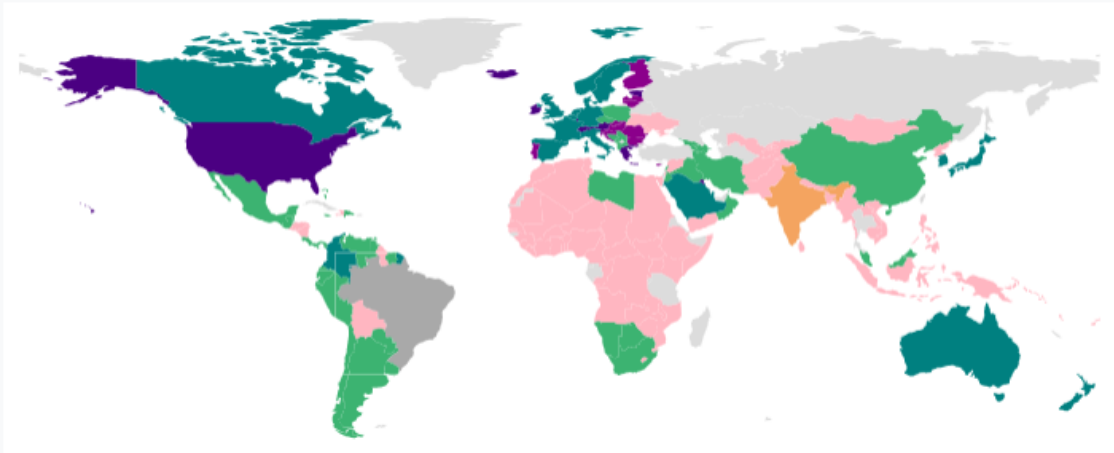
https://www.neb.com/products/e2040-hiscribe-t7-high-yield-rna-synthesis-kit#Product%20Information



Cystic Fibrosis

Cystic fibrosis (CF) is the most common fatal inherited disease in the United States. CF results in mucus buildup in the lungs, pancreas and other organs, and mortality is primarily driven by a progressive decline in lung function. There is no cure for CF.

Involvement by country



- AMC donor
- Member of the EC (AMC donor)
- Self-financing participant
- Self-financing participant and AMC donor
- AMC recipient
- AMC recipient and donor
- Not involved

https://en.wikipedia.org/wiki/COVAX

Erasmus+
Jean Monnet Programme

Biomedical Research Center

Medical Institute of Sumy State University

Curr Med Chem. 2011;18(17):2630-7. doi: 10.2174/092986711795933740.

Aluminum vaccine adjuvants: are they safe?

L Tomljenovic [1], C A Shaw

Affiliations + expand

PMID: 21568886 DOI: 10.2174/092986711795933740

Abstract

Aluminum is an experimentally demonstrated neurotoxin and the most commonly used vaccine adjuvant. Despite almost 90 years of widespread use of aluminum adjuvants, medical science's understanding about their mechanisms of action is still remarkably poor. There is also a concerning scarcity of data on toxicology and pharmacokinetics of these compounds. In spite of this, the notion that aluminum in vaccines is safe appears to be widely accepted. Experimental research, however, clearly shows that aluminum adjuvants have a potential to induce serious immunological disorders in humans. In particular, aluminum in adjuvant form carries a risk for autoimmunity, long-term brain inflammation and associated neurological complications and may thus have profound and widespread adverse health consequences. In our opinion, the possibility that vaccine benefits may have been overrated and the risk of potential adverse effects underestimated, has not been rigorously evaluated in the medical and scientific community. We hope that the present paper will provide a framework for a much needed and long overdue assessment of this highly contentious medical issue

https://pubmed.ncbi.nlm.nih.gov/21568886/

https://upload.wikimedia.org/wikipedia/commons/thumb/a/a2/Oxid_hlinit%C3%BD.PNG/440px-Oxid_hlinit%C3%BD.PNG

PRESS RELEASE

March 4, 2021

CureVac and Novartis Sign Initial Agreement on Manufacturing of COVID-19 Vaccine Candidate, CVnCoV

- Novartis plans to start manufacturing of the mRNA and bulk drug product of CureVac's COVID-19 vaccine candidate, CVnCoV, in Q2 2021
- Anticipated production of up to 50 million doses by the end of 2021 and up to a further 200 million doses in 2022 at the Novartis' manufacturing site in Kundl, Austria
- Further expansion of CureVac´s European manufacturing network expected to increase capacity

CUREVAC

the RNA people®

https://img.etimg.com/thumb/msid-79242981,width-640,resizemode-4,imgsize-97807/vaccine-trials.jpg

https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcSoiimNyGVJu7-4d91yURgQVVMKeeh2AOKOUg&usqp=CAU

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J Biol Chem. 2004 Mar 26;279(13):12542-50. doi: 10.1074/jbc.M310175200. Epub 2004 Jan 16.

mRNA is an endogenous ligand for Toll-like receptor 3

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Affiliations + expand

PMID: 14729660 DOI: 10.1074/jbc.M310175200

Free article

https://pubmed.ncbi.nlm.nih.gov/14729660/

Abstract

Toll-like receptors (TLRs) are the basic signaling receptors of the innate immune system. They are activated by molecules associated with pathogens or injured host cells and tissue. TLR3 has been shown to respond to double stranded (ds) RNA, a replication intermediary for many viruses. Here we present evidence that heterologous RNA released from or associated with necrotic cells or generated by in vitro transcription also stimulates TLR3 and induces immune activation. To assess RNA-mediated TLR3 activation, human embryonic kidney 293 cells stably expressing TLR3 and containing a nuclear factor-kappaB-dependent luciferase reporter were generated. Exposing these cells to in vitro transcribed RNA resulted in a TLR3-dependent induction of luciferase activity and interleukin-8 secretion. Treatment with in vitro transcribed mRNA activated nuclear factor-kappaB via TLR3 through