

Update on vaccines

DR C. STAEHELIN, DR F. JACQUERIOZ

WITH THE COLLABORATION OF DR A. ALLGÖWER AND DR M. DUBROCA

Vaccines in Switzerland

CURRENT CONTRACT WITH PHARMACEUTICAL COMPANIES

Pfizer/BioNTech : 6 millions de doses

Moderna : 13,5 millions de doses pour 2021 /
7 millions de doses pour 2022

//

Curevac: 5 millions de doses

Novavax: 6 millions de doses

AstraZeneca : 5,3 millions de doses

CURRENTLY APPROVED *OR PENDING*

Pfizer/BioNTech

Moderna

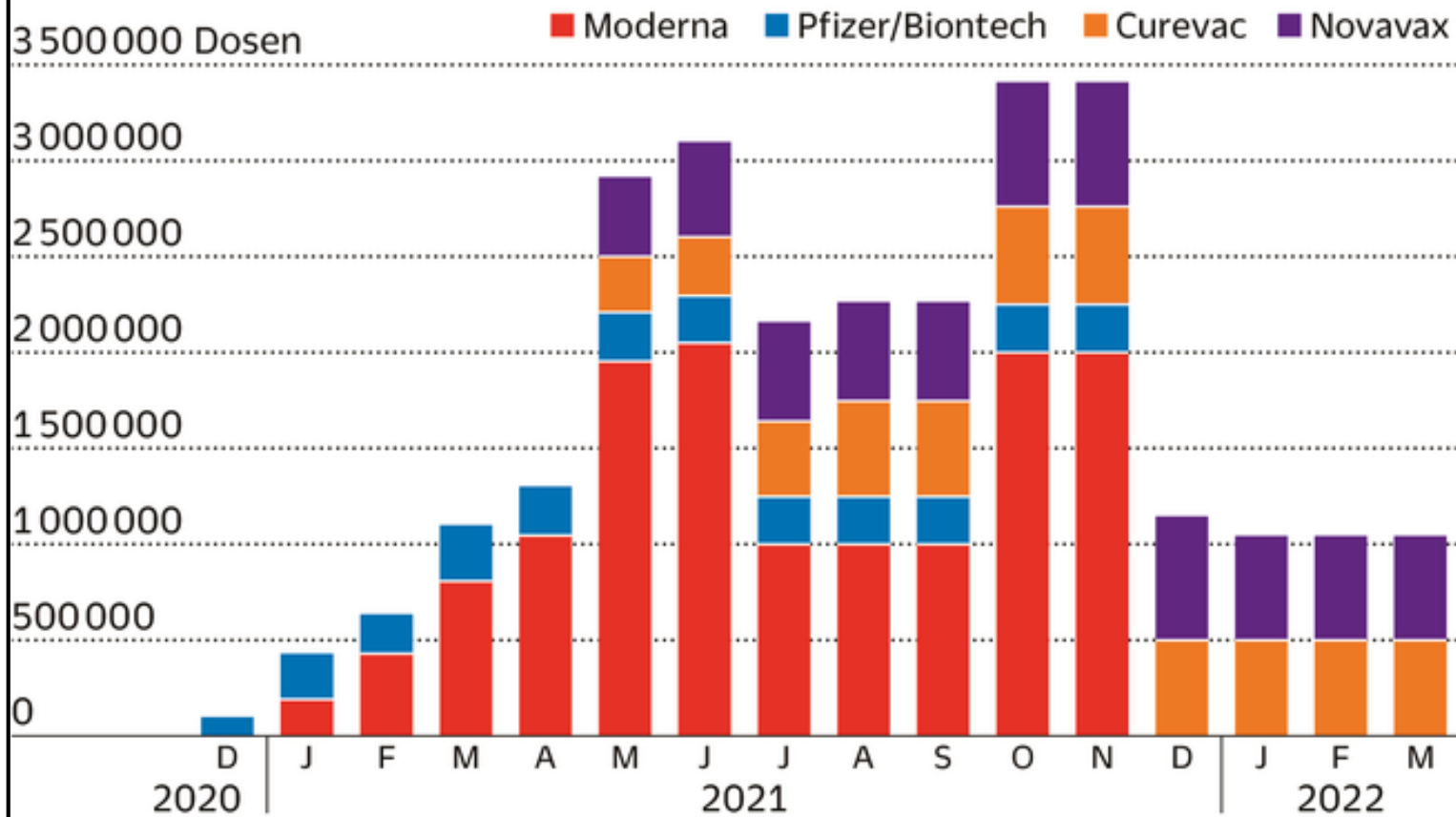
Johnson & Johnson (not used)

Curevac (mRNA)

Novovax

Impfstoffe gegen das Coronavirus

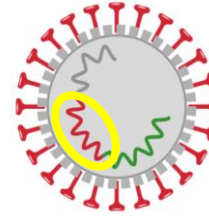
Erwartete Lieferungen nach Hersteller



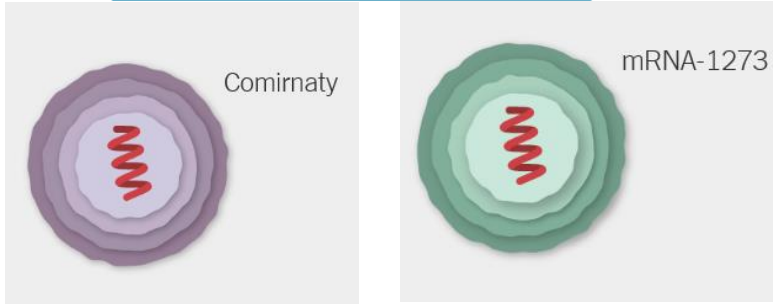
Quelle: VBS, Logistikbasis der Armee; Planungsstand 11. 2. 2021

... information is always outdated...

Vaccines against Covid-19



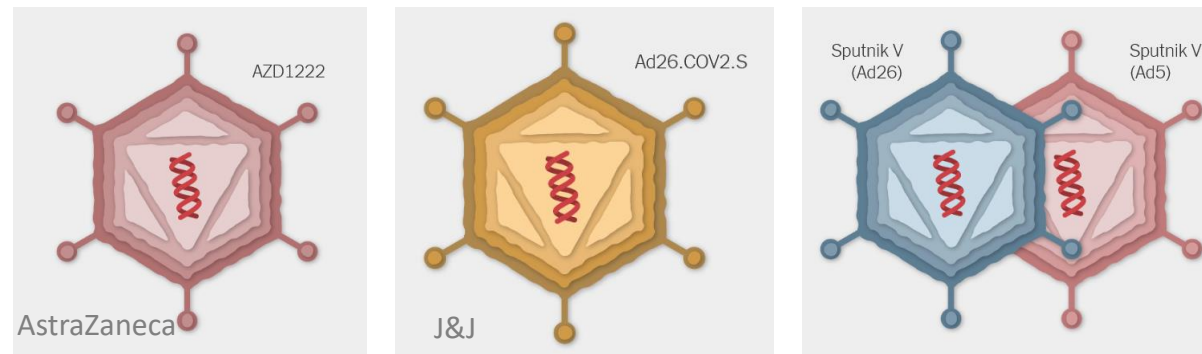
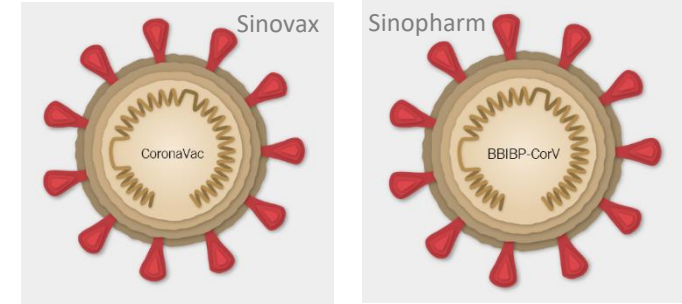
Messenger RNA vaccines



Protein-based vaccines



Inactivated Coronavirus vaccines



Adenovirus-based vaccines

Phase 1–2 Trial of a SARS-CoV-2 Recombinant Spike Protein Nanoparticle Vaccine

C. Keech, G. Albert, I. Cho, A. Robertson, P. Reed, S. Neal, J.S. Plested, M. Zhu, S. Cloney-Clark, H. Zhou, G. Smith, N. Patel, M.B. Frieman, R.E. Haupt, J. Logue, M. McGrath, S. Weston, P.A. Piedra, C. Desai, K. Callahan, M. Lewis, P. Price-Abbott, N. Formica, V. Shinde, L. Fries, J.D. Lickliter, P. Griffin, B. Wilkinson, and G.M. Glenn

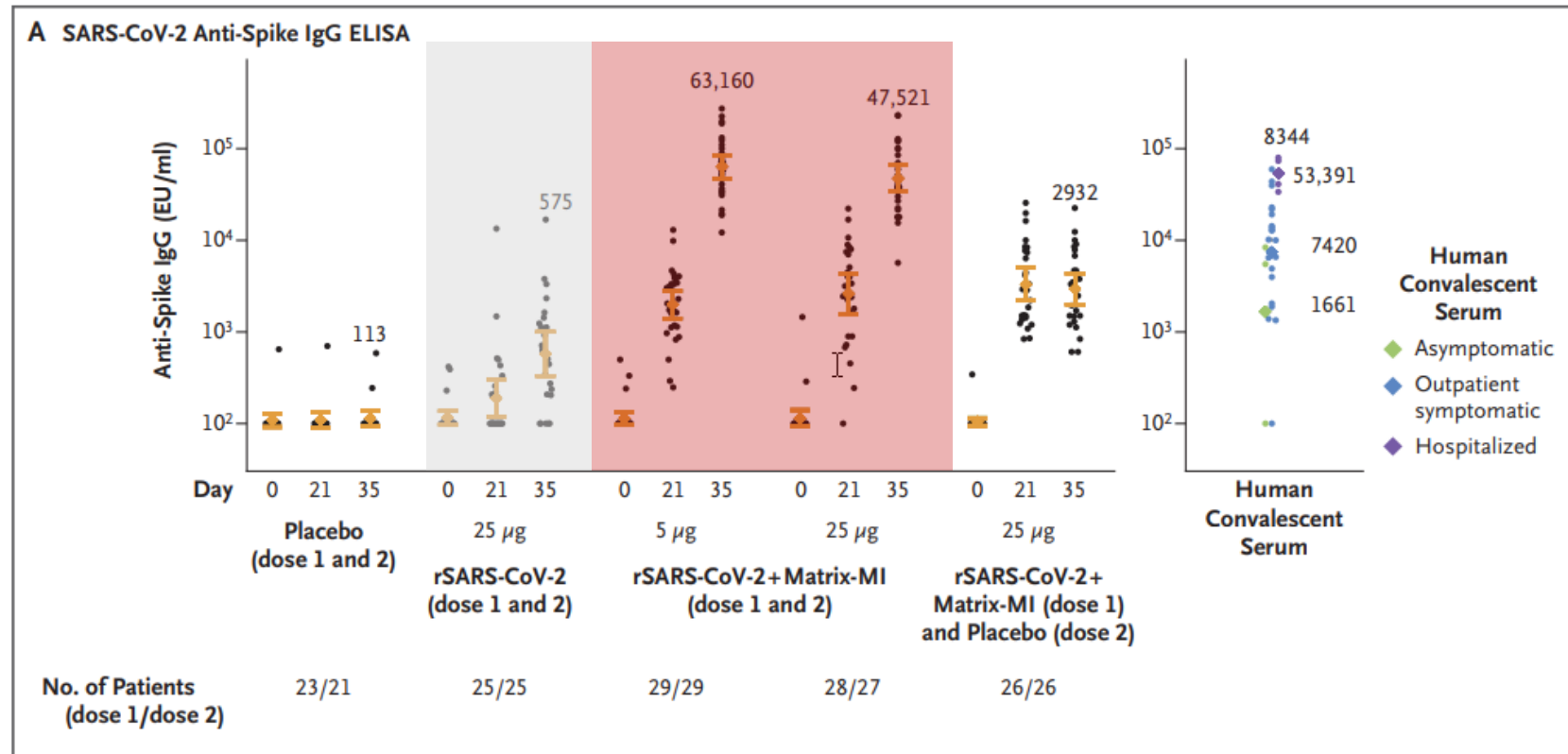
rSARS-CoV-2 recombinant nanoparticle vaccine

- developed by Novavax
- manufactured at Emergent Biosolutions
- constructed from the full-length (i.e. including the transmembrane domain), wild-type SARS-CoV-2 spike glycoprotein

Matrix-M1

- a saponin-based adjuvant
- manufactured by Novavax
- vaccine and adjuvant stored 2°C to 8°C

+ adjuvans → titers x ~100
«dose sparing»



Novavax against “WT” and variant B.1.1.7 (alpha)

N= 15187 (PBO vs NVX-CoV2373)

27.2% ≥ 65 yrs

44.7% comorbidities

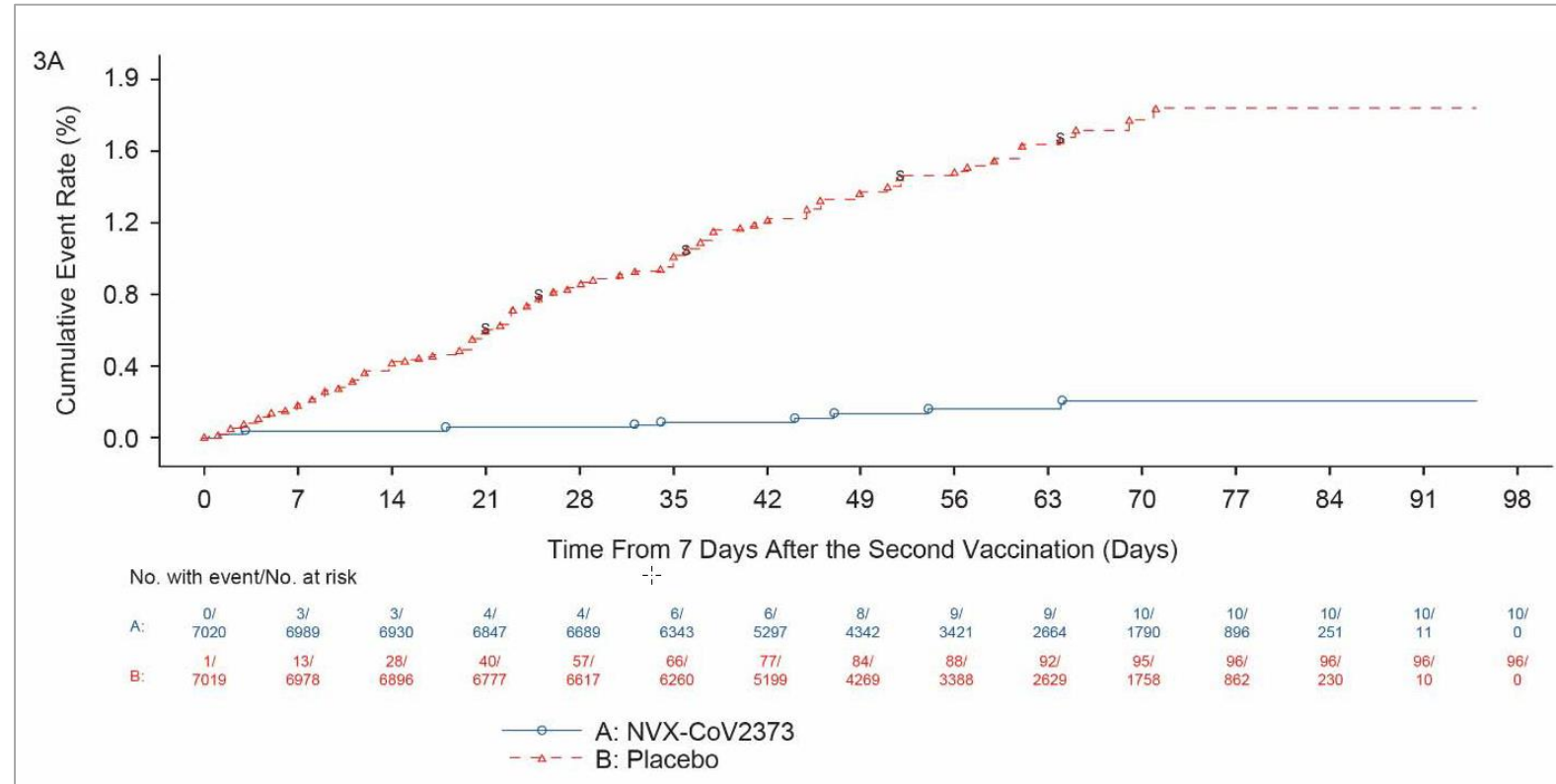
Vaccine efficacy

UK: 89.7% and no hosp. or deaths

100% against severe COVID-19

96.4% WT

86.3% B.1.1.7



Efficacy of NVX-CoV2373 Covid-19 Vaccine against the B.1.351 Variant

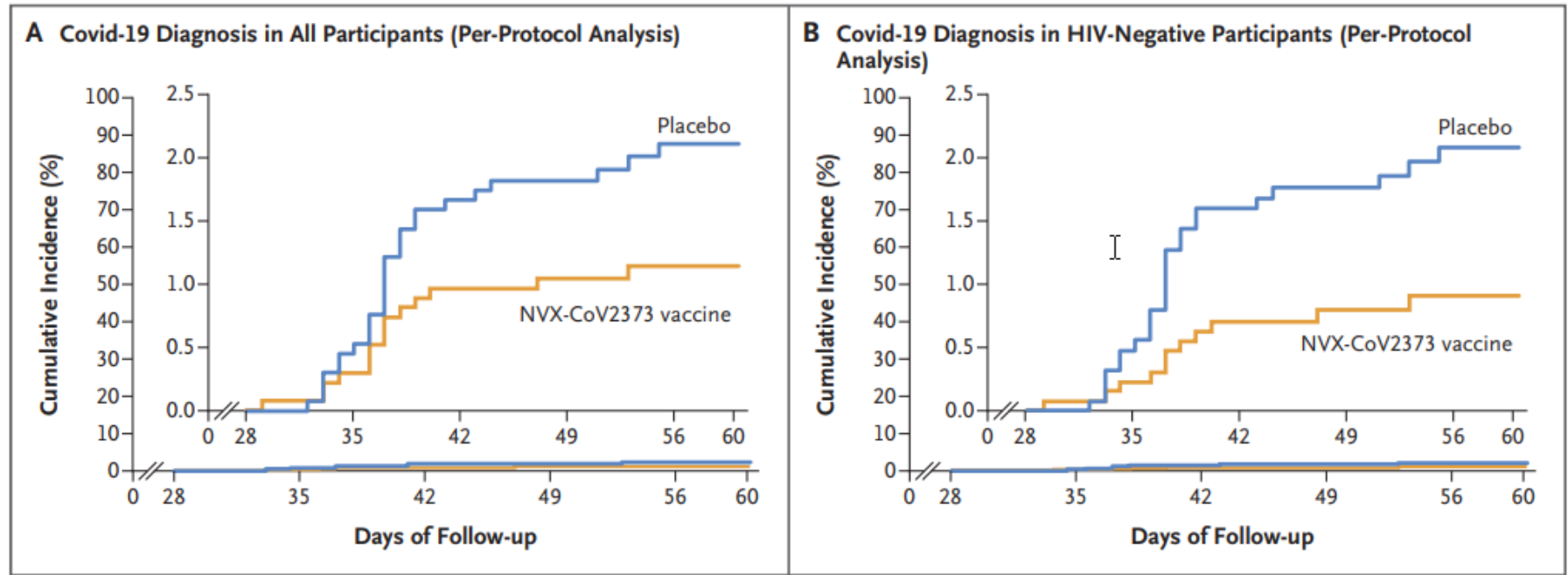
V. Shinde, S. Bhikha, Z. Hoosain, M. Archary, Q. Borhat, L. Fairlie, U. Lall, M.S.L. Masilela, D. Moodley, S. Hanley, L. Fouche, C. Louw, M. Tameris, N. Si A. Goga, K. Dheda, C. Grobbelaar, G. Kruger, N. Carrim-Ganey, V. Baillie, T. de Oliveira, A. Lombard Koen, J.J. Lombaard, R. Mngqibisa, A.E. Borhat,

N = 4387 (PBO vs. NVX)
30% seropos. at BL →

N=2684 for efficacy data
- 6% HIV positiv
- 93% variant

Vaccine efficacy
49.4% (HIV+ und HIV-)
60% (HIV-)

Novavax against variant B.1.351 (Beta)



Vaccines against B.1.617.2 (Delta)

	B.1.1.7. (α) After dose 1	B.1.1.7. (α) After dose 2	B.1.617.2 (β) After dose 1	B.1.617.2 (β) After dose 2
Pfizer	49.2%	93.4%	33.2%	87.9%
ChAdOx1	51.4%	66.1%	32.9%	59.8%

= inactivated,
adjuvanted

Total:
40-45/100'000

Worth a shot

A look at how the vaccines fared in the real-world test

COVAXIN

■ Of the **9.3 million** who received the first dose of Covaxin, **4,208 tested positive**

■ Of the **1.7 million** who got the second dose, **695 tested positive**

COVISHIELD

■ Of the **100.3 million** who received the first dose, **17,145 tested positive**

■ Of the **15 million** who got the second dose, **5,014 tested positive**




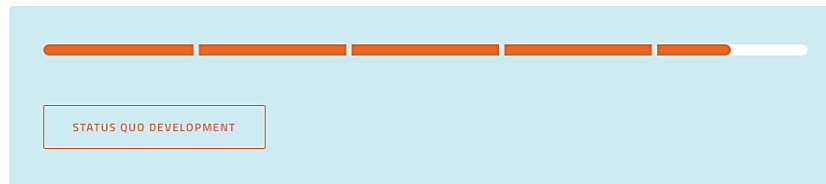
= ChAdOx1

total:
17-33 /100'000

Slide Frederique

CureVac's mRNA-based vaccine against Covid-19 CVnCOV

 mRNA-based
prophylactic vaccines



COVID-19



PARTNER



PARTNER

Covid: les difficultés de CureVac pourraient contrarier la vaccination dans l'UE



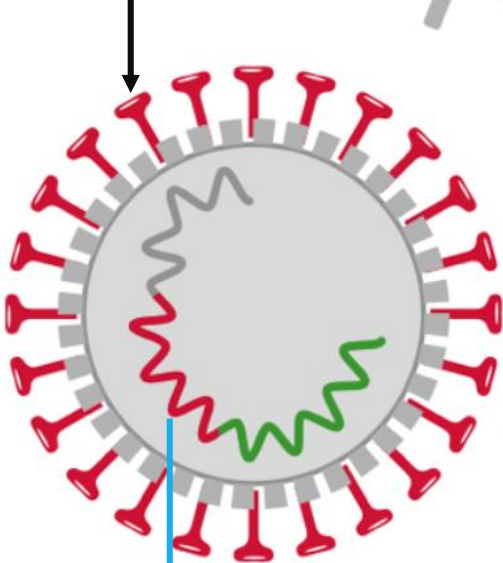
Publié le : 06/05/2021 - 08:34 Modifié le : 06/05/2021 - 08:33



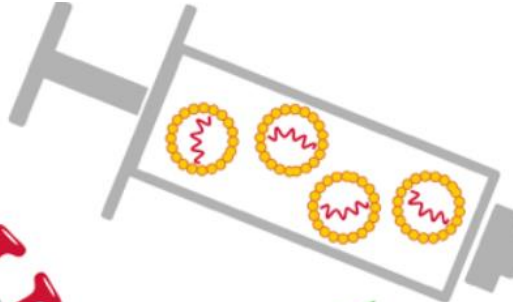
Sans être indispensable à l'objectif de vacciner 70% des habitants adultes de l'UE d'ici à juillet, le vaccin de CureVac pourrait fournir une aide conséquente THOMAS KIENZLE AFP/Archives

Messenger RNA vaccine: how it works?

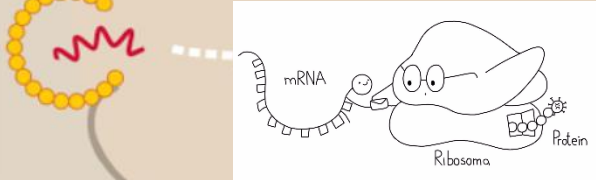
Proteine S «spike»



mRNA of protein S «spike»



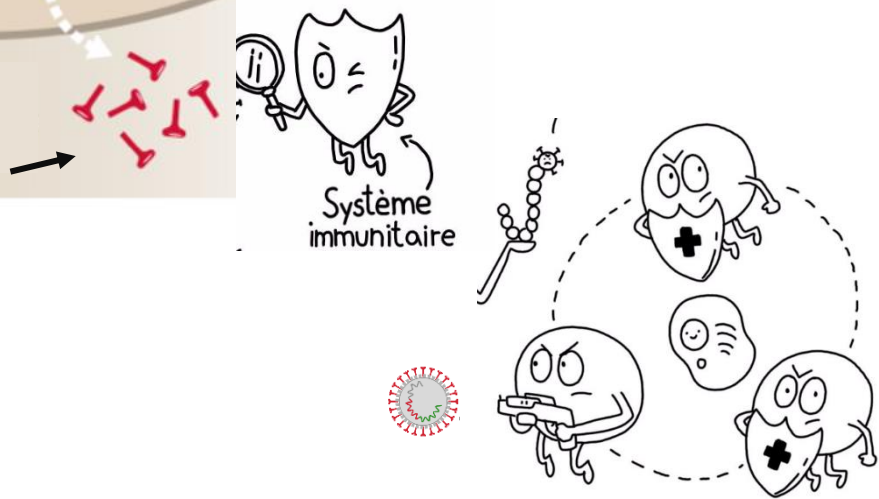
muscle cell



DNA in the nucleus cell / genetic heritage
-> not contact with the mRNA vaccine

Protein S «spike»

Last for 24-48 hours
Then the mRNA is naturally degraded



Recognition and elimination of the virus

Messenger RNA vaccines

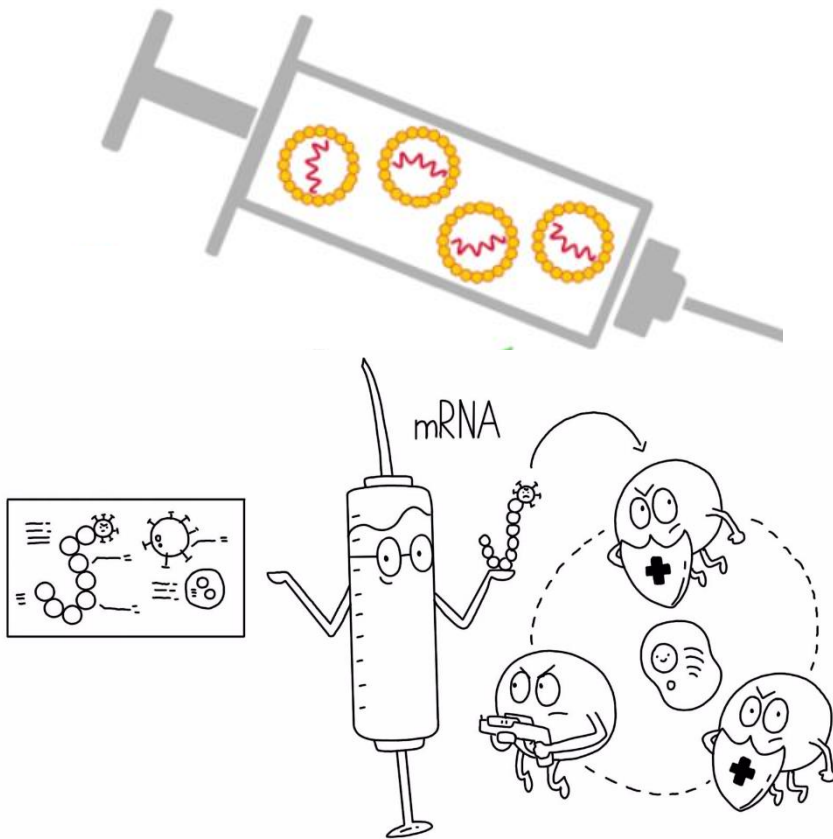
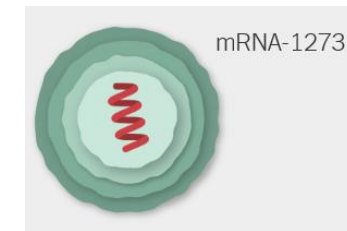
Both are approved by Swissmedic and administered in Switzerland

CORRESPONDENCE

Effectiveness of the BNT162b2 Covid-19 Vaccine against the B.1.1.7 and B.1.351 Variants

Covid-19 Vaccine Moderna (mRNA-1273)

- Strong protection
- Efficacy of 94% (symptomatic)
 - Also against variants
- 2 doses
- multi-doses vials (12 doses)
- >18 yo







CureVac's mRNA-based vaccine against Covid-19

CVnCOV

Emergency Use Listing Procedure for vaccines

<https://www.who.int/teams/regulation-prequalification/eul/eul-vaccines>

	Manufacturer / WHO EUL holder	Name of Vaccine	NRA of Record	Platform	EOI accepted	Pre-submission meeting held	Dossier accepted for review*	Status of assessment**	Anticipated decision date***
10.	 康希诺生物 CanSinoBIO	Ad5-nCoV	NMPA	Recombinant Novel Coronavirus Vaccine (Adenovirus Type 5 Vector)	✓	✓	Rolling data starting May 2021		
11.	 NOVAVAX	NVX-CoV2373/Covovax	EMA	No pre-submission meeting yet.	Submitted EOI on 23 Feb	✓			
12.	 LIREVAC أول لقاحنا للعالم First Vaccine for the World	Zorecimeran (INN) concentrate and solvent for dispersion for injection; Company code: CVnCoV/CV07050101	EMA	mNRA-based vaccine encapsulated in lipid nanoparticle (LNP)	Submitted EOI on 12 April	Planned for 15 July 2021, based on company request			
13.	Vector State Research Centre of Virology and Biotechnology	EpiVacCorona	Russian NRA	Peptide antigen	Letter received not EOI. Reply sent on 15/01/2021				
14.	Zhifei Longcom, China	Recombinant Novel Coronavirus Vaccine (CHO Cell)	NMPA	Recombinant protein subunit	Response to 2 nd EOI sent 29 Jan 2021. Additional information requested.				
15.	IMBCAMS, China	SARS-CoV-2 Vaccine, Inactivated (Vero Cell)	NMPA	Inactivated	Not accepted, still under initial development				
16.	Bharat Biotech, India	COVAXIN	DCGI	SARS-CoV-2 Vaccine, Inactivated (Vero Cell)	Submitted EOI on 19/04/2021. More information required.	To be planned May-June 2021			
17.	Clover Biopharmaceuticals	SCB-2019	EMA	Novel recombinant SARS-CoV-2 Spike (S)-Trimer fusion protein	In discussion on submission strategy and timelines				
18.	BioCubaFarma - Cuba	Soberana 01, Soberana 02 Soberana Plus	CECMED	SARS-CoV-2 spike protein conjugated chemically to meningococcal B or tetanus toxoid or Aluminum	Awaiting information on strategy and timelines for submission.				
19.	 Sinopharm / WIBP ²	Inactivated SARS-CoV-2 Vaccine (Vero Cell)	NMPA	Inactivated, produced in Vero cells					

1. Beijing Bio-Institute of Biological Products Co-Ltd
2. Wuhan Institute of Biological Products Co Ltd

* Dossier Submission dates: more than one date is possible because of the rolling submission approach. Dossier is accepted after screening of received submission.

**Status of assessment: 1. Under screening; 2. Under assessment; 3. Waiting responses from the applicant. 4. Risk-benefit decision 5. Final decision made

*** Anticipated decision date: this is only an estimate because it depends on when all the data is submitted under rolling submission and when all the responses to the assessors' questions are submitted.

Vaccines in children under 16 yo

In preparation 2-3 slides