



SARS-CoV-2 mRNA vaccines: Is the Risk Worth the Benefit?

Dr. Stephanie Seneff, MIT CSAIL
Panda Open Science Meeting
Tuesday, March 1, 2022

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Outline

- Overview
- Spike Protein and Neurodegenerative Disease
- Exosomes, MicroRNAs and Heart Disease
- Spike Protein and Cancer
- Spike Protein and Thrombosis
- Spike Antibodies and Autoimmune Disease
- Summary

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Overview

3

“Worse than the Disease? Reviewing Some Possible Unintended Consequences of the mRNA Vaccines Against COVID-19”*

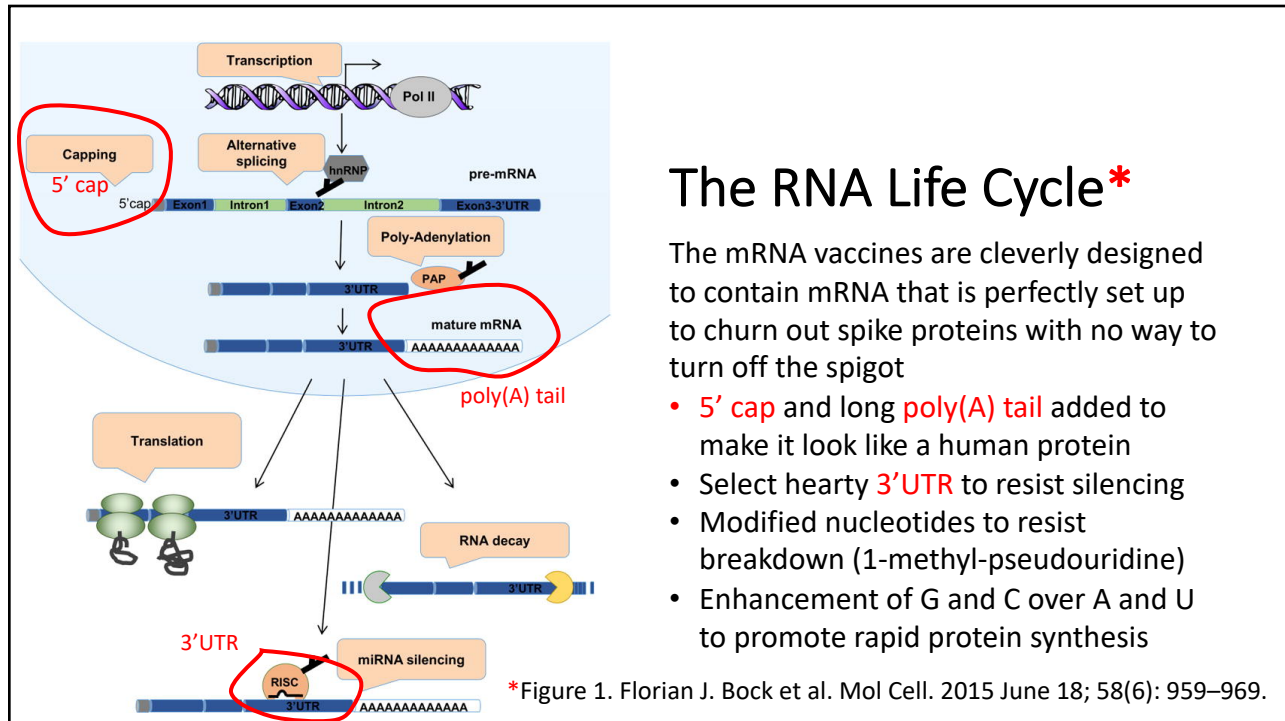
The mRNA vaccines are a poorly evaluated novel technology with many unknowns

Some potential adverse consequences:

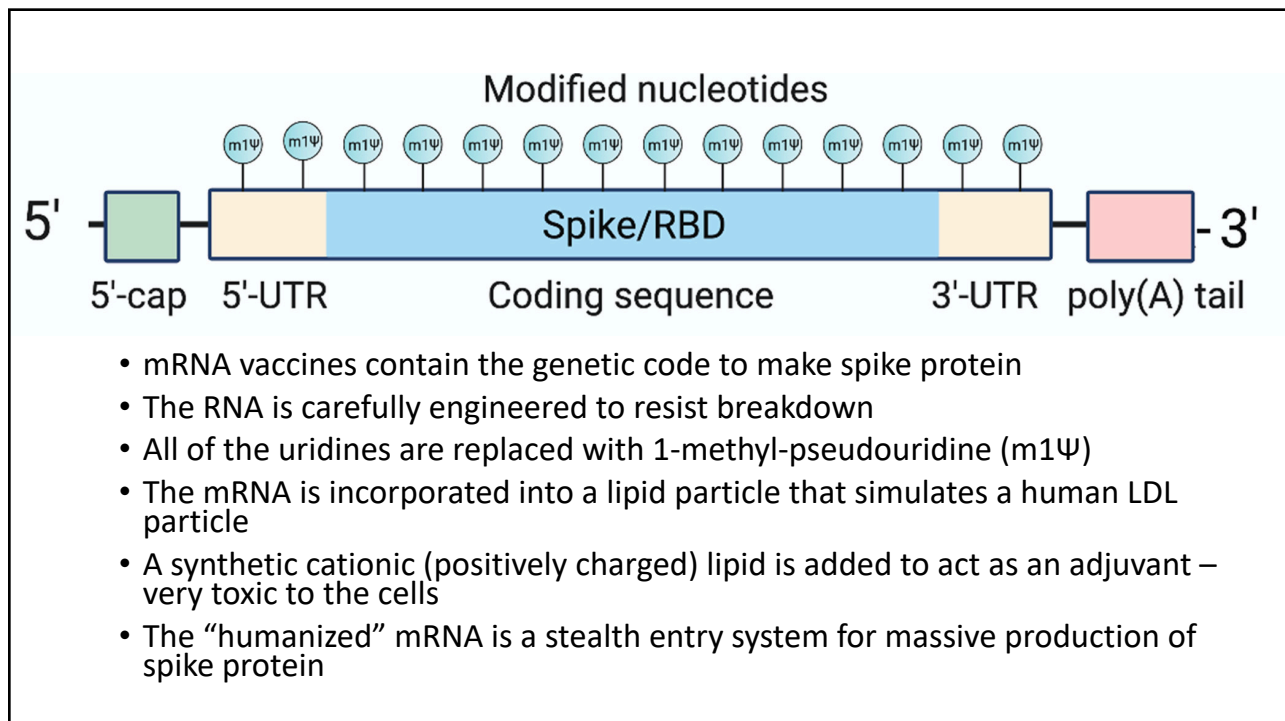
- Pathogenic priming, multisystem inflammatory disease and autoimmunity
- Allergic reactions and anaphylaxis
- Antibody dependent enhancement
- Activation of latent viral infections
- Neurodegeneration and prion diseases
- Emergence of novel variants of SARS-CoV-2
- Potential for integration of the spike protein gene into human DNA

*S Seneff and G Nigh. IJVTPR 2021; 2(1): 38-79.

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The Action is in the Germinal Centers*

- The germinal center (GC) is a specialized microstructure that forms in secondary lymphoid tissues (e.g., lymph nodes and spleen)
 - produce long-lived antibody-secreting plasma cells and memory B cells
 - provide protection against reinfection
- Within the GC, B cells undergo somatic mutation to achieve successful selection
 - B cell clones that bind antigen with high affinity emerge from this process
- *However, this mutation process can also be dangerous, as it can create autoreactive clones that can cause autoimmunity*

*Marisa Stebeegg et al. Frontiers in Immunology 2018; 9: Article 2469.

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"Nucleoside-modified mRNA vaccines induce potent T follicular helper and germinal center B cell responses"*

- "Nucleoside-modified" means that all the uridines in the mRNA were replaced with 1-methyl-pseudouridine
 - This replacement resulted in robust synthesis of protein from the mRNA code (protected RNA from degradation)
- Result was a very strong antibody response due to formation and maintenance of *germinal centers in the spleen*
- Another study showed that repeated exposure to antigen (foreign protein) through immunization resulted in increased susceptibility to *prion protein exposure***
 - Attributed to *expansion of splenic germinal centers*

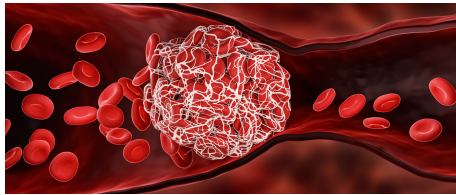
*Norbert Pardi et al. J. Exp. Med. 2018 Vol. 215 No. 6 1571–1588

**Juliane Bremer et al., PLoS ONE 2009; 4(9): e7160.

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The mRNA in the vaccines is long-lasting and induces strong IgG response*

- Lymph nodes of vaccine recipients show abundant germinal centers
- Vaccination induces *stronger IgG response* than the disease
- The mRNA from the vaccines and spike proteins remain in germinal centers in lymph nodes for up to 60 days



A strong IgG response can lead to platelet activation and blood clots!!

*Katharina Röltgen et al. Cell January 25, 2022 [Epub ahead of print]. <https://doi.org/10.1016/j.cell.2022.01.018>

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Spike Protein and Neurodegenerative Disease

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The Big Picture

- A natural infection starts in the nose and lungs and never makes it into general circulation if the immune system is healthy
- Injection of spike mRNA nanoparticles into deltoid muscle bypasses mucosal and vascular barriers
- Immune cells take up mRNA nanoparticles and carry them into the lymph system, ultimately into the spleen
- Immune cells in the spleen release large quantities of spike protein displayed on the surface of exosomes
- These exosomes disperse throughout the body, but, especially, travel to the brain to deliver the toxic prion-like spike protein to neurons
- Inflammatory response in the brain induces neurological damage

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DarkHorsePodcast - Dr. Brett Weinstein, Dr. Robert Malone and Mr. Steve Kirsch*

- There was no evaluation of reproductive toxicity or genotoxicity in animals before the mRNA vaccines were authorized for humans
- A FOIA request from doctors in Canada yielded a Pfizer study written in Japanese
- The lipid nanoparticles went everywhere in the body but were found in especially high concentrations in the animals' *lymph nodes, spleen, ovaries, adrenal glands, liver and bone marrow.*

Dr. Malone is an early developer of mRNA vaccine technology

https://www.youtube.com/watch?v=-_NNTVJzqtY (CENSORED)

Part 1: <https://www.brighteon.com/fc163ab1-82f9-4f2b-b921-7b877923f315>

Part 2: <https://www.brighteon.com/00b257ec-2077-40b6-88a9-93d8d8451959>

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[Trends Neurosci.](#) 2020 Dec; 43(12): 931–933.

Published online 2020 Oct 21. doi: [10.1016/j.tins.2020.10.009](https://doi.org/10.1016/j.tins.2020.10.009)

Is COVID-19 a Perfect Storm for Parkinson's Disease?

[Patrik Brundin](#),^{1,*} [Avindra Nath](#),² and [J. David Beckham](#)³

- Loss of smell is a common early symptom of Parkinson's and of COVID-19
- Virus can gain access to brain along nerve fibers
 - Olfactory nerve
 - Vagus nerve
- Neuroinvasion of SARS-COV-2 could upregulate α -synuclein
 - High levels of α -synuclein leads to misfolding and toxicity
- Dopaminogenic neurons in substantia nigra express high levels of the ACE2 receptor

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Is COVID-19 a Perfect Storm for Parkinson's Disease?

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- V

Three independent case reports have described the development of Parkinson's disease following COVID-19.*

 - vagus nerve
- Neuroinvasion of SARS-COV-2 could upregulate α -synuclein
 - High levels of α -synuclein leads to misfolding and toxicity
- Dopaminogenic neurons in substantia nigra express high levels of the ACE2 receptor

* Ernesto Estrada *Viruses* 2021; 13: 897.

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Exosomes and Parkinson's Disease*

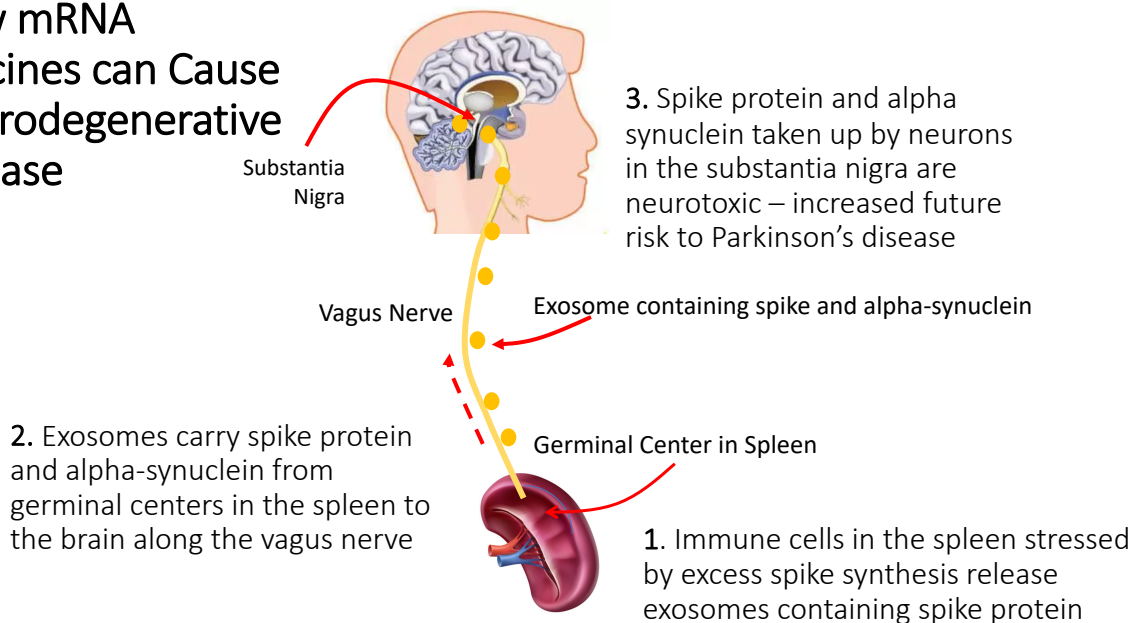
- Parkinson's disease often begins in the gut as an immune reaction to prion-like proteins produced by pathogens
- The spike protein is a prion-like protein**
 - It contains 6 glycine zippers (GxxxG) – a characteristic signature of prions (The human prion protein contains 15, and amyloid beta (linked to Alzheimer's disease) contains only 4)
- Stressed immune cells in the digestive tract and spleen upregulate α -synuclein and release it packaged up in exosomes, along with foreign misfolded proteins
- The exosomes travel along the vagus nerve to the brain stem nuclei
- Damage to the substantia nigra causes Parkinson's disease
- The whole process can take years or decades before symptoms appear

*S Seneff and G Nigh. IJTPR 2021; 2(1): 38-79.

**George Tetz and Victor Tetz. Microorganisms 2022; 10: 280.

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How mRNA Vaccines can Cause Neurodegenerative Disease



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“Pilot study suggests long COVID could be linked to the effects of SARS-CoV-2 on the vagus nerve”*

“Vagus Nerve Symptoms: dysphonia (persistent voice problems), dysphagia (difficulty in swallowing), dizziness, tachycardia (abnormally high heart rate), orthostatic hypotension (low blood pressure) and diarrhoea.”

Reaction	COVID vaccines (2021)	All vaccines (2021)	Percent COVID
Diarrhoea	23,128	23,861	96.9
Tachycardia	5,524	5,653	97.7
Dizziness	69843	71648	97.5
Dysphagia	4,714	4,837	97.5
Dysphonia	1,693	1,752	96.6
Orthostatic Hypotension	172	180	95.5

*G Lladós and L Mateu. European Congress of Clinical Microbiology and Infectious Diseases (ECCMID 2022, Lisbon, 23-26 April).

*<https://www.eurekalert.org/news-releases/943102>

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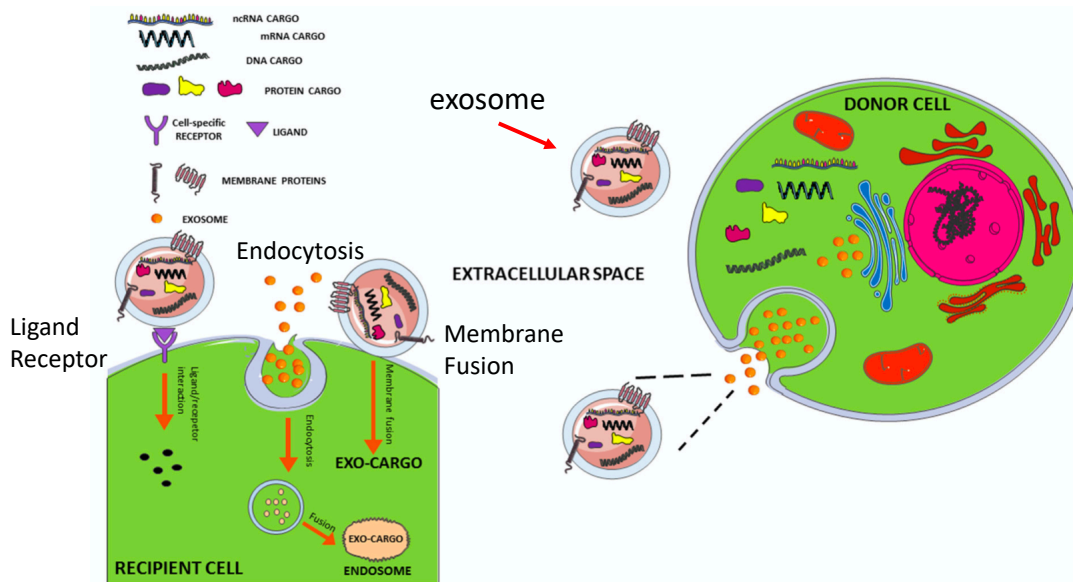
SARS-CoV-2 Spike Activates Human Microglia in the Brain via Exosomes Loaded with miRNAs*

- "SARS-CoV-2 spike transfected cells release many exosomes loaded with microRNAs such as miR-148a and miR-590"
- "MicroRNAs get internalized by human microglia in the brain"
 - Induce a strong inflammatory response
- The microRNAs disrupt type I interferon response, which is an essential part of innate immunity
- "These results uncover a bystander pathway of SARS-CoV-2 mediated CNS [central nervous system] damage through hyperactivation of human microglia"

*Ritu Mishra and Akhil C. Banerjea. *Frontiers in Immunology* 2021; 12:656700

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Exosome Transfer from Cell to Cell*



*Figure 1. Marianna D'Anca et al. Front. Aging Neurosci. 28 August 2019; 11: 232.

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Problems with the vaccine spike protein*

- "Is it possible the spike protein itself causes the tissue damage associated with Covid-19?"
- A "furin cleavage site" in the spike protein allows S1 subunit to be snipped off and released into circulation
- The S1 subunit localizes to the endothelia of microvessels in the mouse brain and is a potent **neurotoxin**."
- "So the spike S1 subunit of SARS-CoV-2 alone is capable of being endocytosed by ACE2 positive endothelia in both human and mouse brain, with a concomitant paucicellular **microencephalitis** that may be the basis for the neurologic complications of COVID-19."

*<https://beta.regulations.gov/document/FDA-2020-N-1898-0246>

Comment from J. Patrick Whelan MD PhD
Food and Drug Administration on Dec 8, 2020

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"Alzheimer's-like signaling in brains of COVID-19 patients"*

- Symptoms of long-haul COVID include brain fog, reduced consciousness, and tingling and prickling sensations related to nerve damage
- The spike protein binds to ACE2 receptors in the brain and disables them
- SARS-CoV-2 infection activates inflammatory signaling and oxidative stress pathways in the brain
- Reduced ACE2 activity has been associated with tau hyperphosphorylation and increased amyloid beta in animal models of Alzheimer's disease

The COVID vaccines deliver spike protein to the brain via exosomes

*Steve Reiken et al. Alzheimer's & Dementia Feb 3, 2022 [Epub ahead of print]. <https://doi.org/10.1002/alz.12558>

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"COVID-19 Vaccine Associated Parkinson's Disease, A Prion Disease Signal in the UK Yellow Card Adverse Event Database."*

"All the COVID-19 vaccines on the market contain spike protein or its nucleic acid sequence creating a possible catastrophic epidemic of prion disease in the future."

"This analysis should serve as an urgent warning to those mindlessly following advice of politicians and public health officials regarding COVID immunization."

*J Bart Classen. J Med - Clin Res & Rev. 2021; 5(7): 1-6.

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VAERS Adverse Events Related to Neurodegeneration, 2021*

Condition	COVID vaccines (2021)	All vaccines (2021)	Percent COVID
Memory Impairment	1,681	1,720	97.7
Amnesia	1,360	1,419	95.8
Mobility Decreased	8,974	9,742	92.1
Alzheimer's	37	39	94.9
Parkinson's Disease	91	97	93.8
Dysphagia (Difficulty Swallowing)	4,711	4,835	97.4
Anosmia (Loss of Smell)	3,657	3,677	99.5

*US Vaccine Adverse Event Reporting System: <http://wonder.cdc.gov/vaers.html>

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Towards the emergence of a new form of the neurodegenerative Creutzfeldt-Jakob disease: Sixteen cases of CJD declared a few days after a COVID-19 "vaccine" Jab

Jean Claude Perez, PhD Maths§Computer Science Bordeaux University ; Retired (IBM European Research center on Artificial Intelligence Montpellier France) ; Bordeaux metropole France; <https://orcid.org/0000-0001-6446-2042> France

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Claire Moret-Chalmin, MD. Neurologist, 13 rue Roger Martin du Gard 60600 Clermont France clmoret@gmail.com

Luc Montagnier MD. Virologist, Fondation Luc Montagnier Quai Gustave-Ador 62 1207 Genève, Switzerland

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Exosomes, MicroRNAs and Heart Disease

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The Big Picture

- Stressed immune cells release *exosomes* containing *microRNAs* that signal to tissue cells and can induce an inflammatory response
 - In particular, *miR-155* plays a special role in SARS-CoV-2, facilitated by spike
- The spike protein S1 subunit detaches and becomes free to bind to ACE2 receptors which are present at high levels in the heart
 - The suppression of ACE2 by spike S1 causes upregulation of angiotensin II, which induces inflammation (myocarditis) and cardiovascular disease
- S1 has been found in COVID-19 patients long after the virus is cleared, and is believed to play a critical role in “long-haul COVID”
- S1 has also been found in the vasculature following vaccination
- miR-155 overexpression is linked to worse outcomes in heart attack

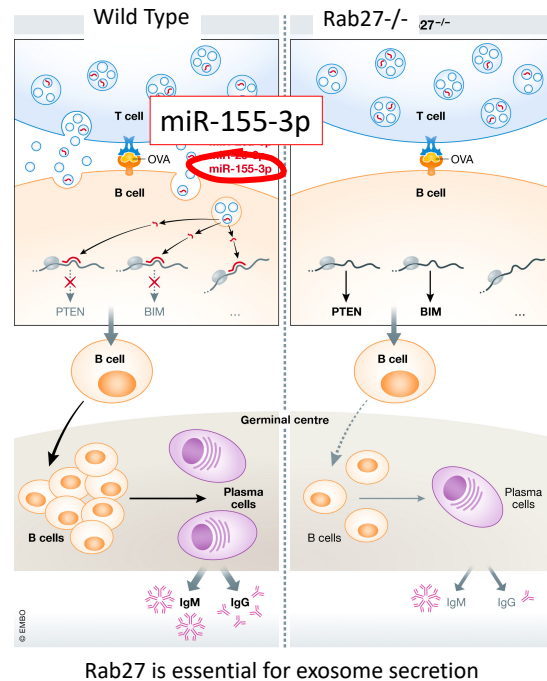
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“Exosomes take (germinal center stage)”*

- Horizontal transfer of *microRNAs* via *exosomes* from T to B cells is necessary for germinal center formation and efficient antibody production
- *miR-155-3p* silences PTEN and BiM, supporting B cell maturation and proliferation
- *However, miR-155 is also associated with many autoimmune diseases***

*Figure 1. Jennifer Pérez-Boza and Dirk M Pegtel. EMBO Rep 2020; 21: e50190

**Salar Pashangzadeh et al. Frontiers in Immunology 2021; 12: 669382



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A role for miRNA-155 in SARS-CoV-2*

“Small RNA profiling showed strong expression of the immunity and inflammation-associated microRNA miRNA-155 upon infection with both viruses” (SARS-CoV and SARS-CoV-2)

“SARS-CoV-2 elicited approximately *two-fold higher stimulation* of the interferon response compared to SARS-CoV ..., and induction of cytokines such as CXCL10 or IL6.”

Interferon- γ upregulates miR-155**

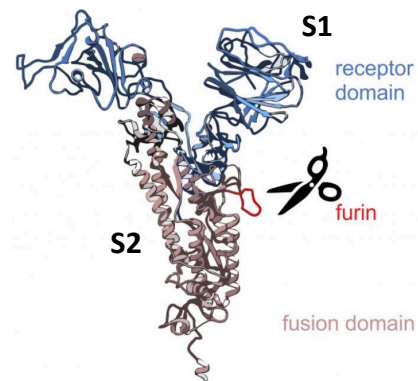
*Wyler Emanuel et al. bioRxiv preprint. May 5, 2020.
doi: <https://doi.org/10.1101/2020.05.05.079194>.

**Yu-An Hsu et al. Chin J Physiol 2016; 59(6): 315-322.

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SARS-CoV-2 S1 of spike persists up to 15 months post-infection in immune cells expressing an Fcγ receptor*

- Enzymatic cleavage of the spike protein by furin proteases causes the S1 segment to be released and circulate freely in the vasculature
 - S1 is the part that binds to ACE2 receptors
- S1 survives in the immune cells long after infection has cleared
- Could be the cause of *“long-haul COVID.”*



*Bruce K. Patterson et al. bioRxiv July 9, 2021. doi: 10.1101/2021.06.25.449905.

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Pfizer Vaccine mRNA can get Converted to DNA in Human Liver Cells*

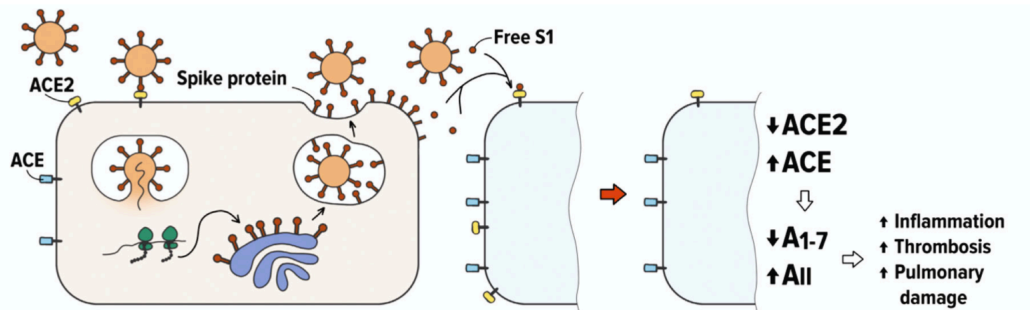
- In vitro study on human liver cells
- Pharmacokinetic distribution studies of Pfizer mRNA vaccines in rats showed that up to 18% of the total dose distributes to the liver
- The human retrotransposon LINE-1 is a cellular endogenous reverse transcriptase, able to convert RNA to DNA.
 - It represents ~17% of the human genome
 - LINE-1 expression is elevated by the Pfizer vaccine in human cells
- Vaccine-derived DNA (found in the liver cells) may be integrated into the host genome and affect the integrity of genomic DNA, which may potentially mediate genotoxic side effects

*Markus Aldén et al. Current Issues in Molecular Biology 2022, 44, 1115–1126.

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“Free SARS-CoV-2 Spike Protein S1 Particles May Play a Role in the Pathogenesis of COVID-19 Infection”*

- S1 molecules carry intact RBD domains, and their binding to ACE2 may induce ACE2 downregulation and deleterious downstream effects



*Andrey V. Letarov et al. Biochemistry (Moscow) 2020 Dec 30: 1–5.

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“Free SARS-CoV-2 Spike Protein S1 Particles May Play a Role in the Pathogenesis of COVID-19 Infection”*

- S1 molecules carry intact RBD domains, and their binding to ACE2 may induce ACE2 downregulation and deleterious downstream effects

Eleven out of 13 health care workers had detectable levels of spike protein and/or S1 in their blood plasma as early as 1 day and up to 28 days following the first mRNA vaccine, with a peak level on average after five days. **

**Ogata et al. Clinical Infectious Diseases 2021; ciab465. [Epub ahead of print] doi: 10.1093/cid/ciab465.

*Andrey V. Letarov et al. Biochemistry (Moscow) 2020 Dec 30: 1–5.

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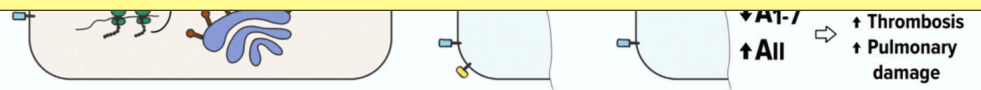
“Free SARS-CoV-2 Spike Protein S1 Particles May Play a Role in the Pathogenesis of COVID-19 Infection”*

- S1 alone caused COVID-19-like lung symptoms in mice humanized with ACE2 receptor: Immune cell infiltration, cytokine storm, impaired barrier function.***

S1 alone caused COVID-19-like lung symptoms in mice humanized with ACE2 receptor: Immune cell infiltration, cytokine storm, impaired barrier function.***

***Ruben M. L. Colunga Biancatelli et al.

Am J Physiol Lung Cell Mol Physiol 2021; 321: L477–L484.

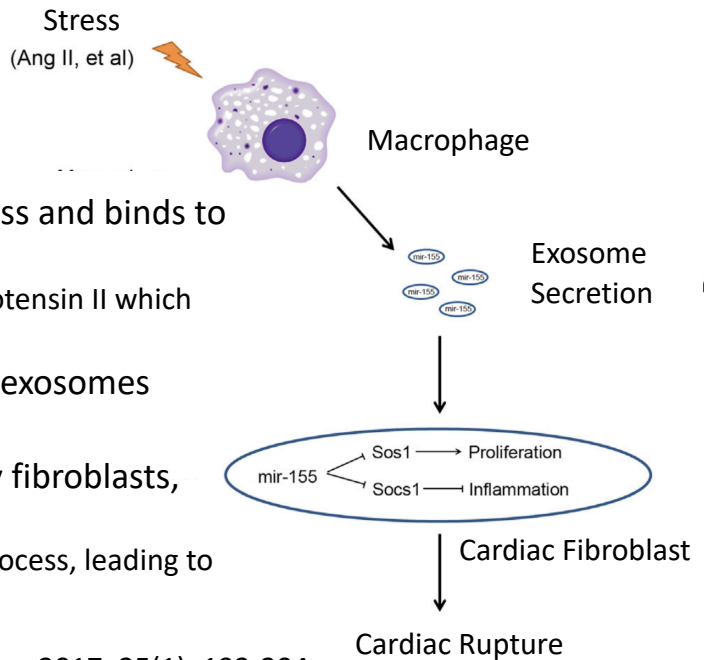


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How Spike Protein can Cause Cardiac Issues*

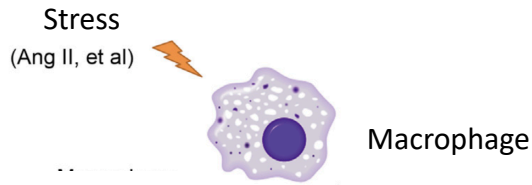
- Spike protein S1 unit causes stress and binds to ACE2 receptors, disabling them
 - This causes accumulation of Angiotensin II which activates macrophages
- Macrophages secrete abundant exosomes containing miR-155
- These exosomes are taken up by fibroblasts, suppressing their proliferation
 - This interferes with the healing process, leading to cardiac rupture



*Chunxiao Wang et al. Molecular Therapy 2017; 25(1): 192-204.

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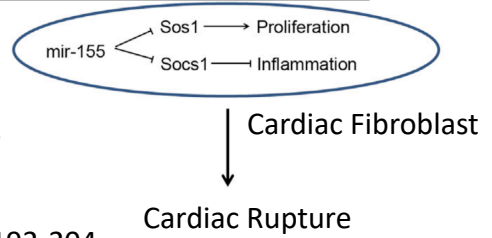


- Spike protein binds to ACE2
- This activates the ACE2 pathway
- Macrophages containing miR-155

Spike-protein "pseudoviruses" cause endothelial damage by downregulating ACE2**

**Yuyang Lei et al. Circulation Research 2021; 128: 1323-1326.

- These exosomes are taken up by fibroblasts, suppressing their proliferation
 - This interferes with the healing process, leading to cardiac rupture



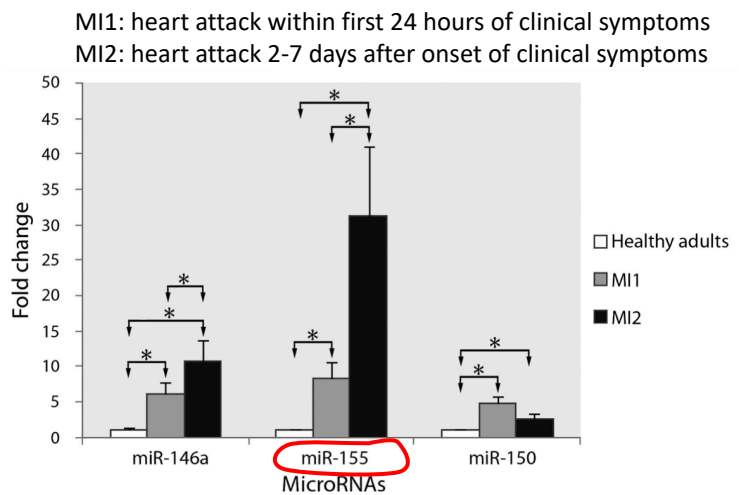
*Chunxiao Wang et al. Molecular Therapy 2017; 25(1): 192-204.

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miR-155 overexpression linked to worse outcomes in heart attack*

- Measured three miRNA levels in autopsy samples of 50 patients with MI

“innate immunity resulting in an intense inflammatory reaction plays an important role in the pathogenesis of the VR [ventricular rupture] after MI [myocardial infarction] in humans.”



*Figure 1. Nina Zidar et al. Disease Markers 2011; 31: 259-265.

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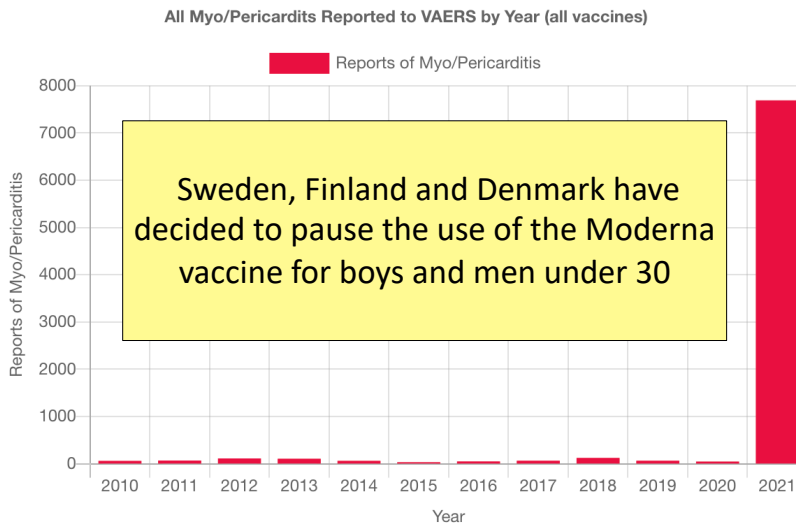
VAERS Reports involving heart issues in 2021*

Symptom	Covid-19 Vaccines	All Vaccines	Percent COVID-19
Myocarditis	2,322	2,361	98.3
Cardiac Arrest	1,319	1,371	96.2
Arrhythmia	1,069	1,087	98.3
Myocardial Infarction	2,224	2,272	97.9
Cardiac Failure	1,156	1,190	97.1
Tachycardia	6,743	6,890	97.9
Cardiomyopathy	330	337	97.9
Total	15,163	15,580	97.7

*Analyses from <http://wonder.cdc.gov/vaers.html>

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Myocarditis Reports in VAERS*



Through September 24, 2021

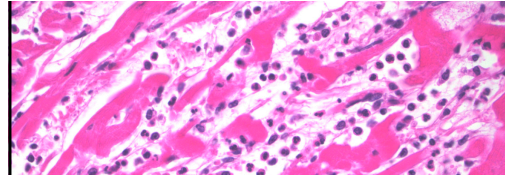
- 16-and-over vaccination began December 14, 2020
- 12-15-year-old vaccination began May 10, 2021

*<https://openvaers.com/covid-data/myo-pericarditis>

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“Autopsy Histopathologic Cardiac Findings in Two Adolescents Following the Second COVID-19 Vaccine Dose”*

- Two teenage boys were found dead in bed 3 and 4 days after receiving the second dose of the Pfizer-BioNTech COVID-19 vaccine
- Neither boy complained of fever, chest pain, palpitations, or dyspnea (difficulty breathing)
- Unique cardiac findings in Boy A included myocardial fibrosis (scarring) and in Boy B cardiac hypertrophy (enlarged heart)
- Neither boy was positive for SARS-CoV-2



*JR Gill et al. Arch Pathol Lab Med 2022 Feb 14. [Epub ahead of print] doi: 10.5858/arpa.2021-0435-SA

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Spike Protein and Cancer

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Article

SARS-CoV-2 Spike Impairs DNA Damage Repair and Inhibits V(D)J Recombination In Vitro

Hui Jiang ^{1,2,*} and Ya-Fang Mei ^{2,*}

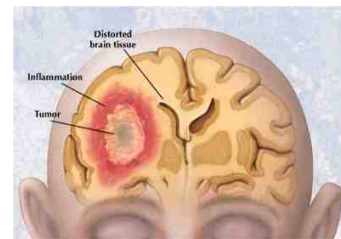
"Mechanistically, we found that the spike protein localizes in the nucleus and inhibits DNA damage repair by impeding key DNA repair protein BRCA1 and 53BP1 recruitment to the damage site."*

*Hui Jiang and Ya-Fang Mei, *Viruses* 2021; 13: 2056.

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Glioblastoma and Other Cancers

- Glioblastoma is the most aggressive form of brain cancer
- *microRNA-148a* is linked to bad outcomes*
 - High levels were a risk indicator for shortened life span in glioblastoma patients
 - Increased cell growth, survival, migration, and invasion
- *MicroRNA-590-3p* enhances the radioresistance in glioblastoma cells**
 - miR-590-3p expression was higher in high grade than in low grade gliomas
 - miRNA-590 overexpression is also linked to breast cancer, cervical cancer, clear cell renal carcinoma and hepatocellular carcinoma

*Jungeun Kim et al. *Cancer Res.* 2014 March 1; 74(5): 1541–1553.**Long Chen et al. *Experimental and Therapeutic Medicine* 2017; 14: 1818-1824.

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VAERS reports: Total counts for various terms indicating cancer from 2021*

Symptom	Counts COVID-19 vaccines	Counts All Vaccines	Percent COVID-19
Cancer	396	403	98.3
Lymphoma	144	153	94.1
Leukaemia	155	161	96.3
Metastatic/metastasis	175	179	97.8
Carcinoma	176	187	94.1
Neoplasm	428	452	94.7
TOTAL	1,474	1,535	96.0

*<http://wonder.cdc.gov/vaers.html>

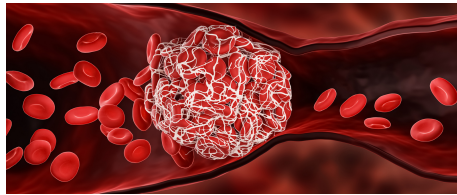
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Spike Protein and Thrombosis

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The mRNA in the vaccines is long-lasting and induces strong IgG response*

- Lymph nodes of vaccine recipients show abundant germinal centers
- Vaccination induces *stronger IgG response* than the disease
- The mRNA from the vaccines and spike proteins remain in germinal centers in lymph nodes for up to 60 days



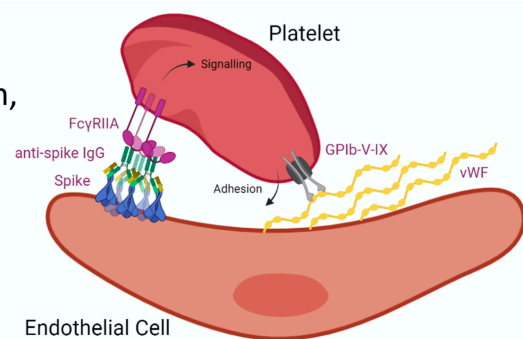
A strong IgG response can lead to platelet activation and blood clots!!

*Katharina Röltgen et al. Cell January 25, 2022 [Epub ahead of print]. <https://doi.org/10.1016/j.cell.2022.01.018>

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Thrombocytopenia & miR-148a*

- Platelets have *an Fcγ receptor* for the constant fragment of immunoglobulin G (IgG) in antigen-antibody complexes
 - Receptor activation leads to platelet activation, aggregation and thrombosis
- TULA-2 (T-cell ubiquitin ligand-2) suppresses platelet activation
 - It inhibits the platelet Fcγ receptor and protects from thrombocytopenia
- miR-148a targets TULA-2 mRNA and downregulates TULA-2 protein expression



CONCLUSION: *miR-148a overexpression can lead to heparin-induced thrombocytopenia (in the absence of heparin)*

*Yuhang Zhou et al. Blood 2015; 126(26): 2871–2881.

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Thrombocytopenia & miR-148a*

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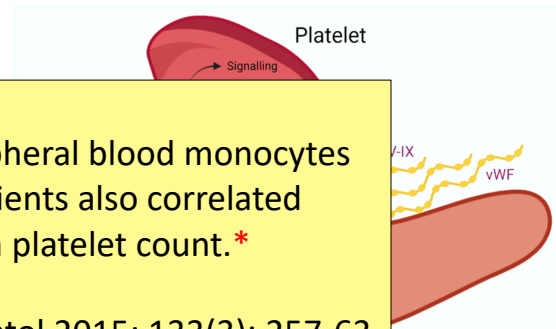
- Platelets have a high density of αIIbβ3 (ADP/Thrombin) receptors
- TLRs on platelets
- Platelets have a high density of αIIbβ3 (ADP/Thrombin) receptors
- miR-148a downregulates TLR-2 protein expression

Higher expression of *miR-155* in peripheral blood monocytes of immune thrombocytopenia patients also correlated positively with the reduction in platelet count.*

*BH Qian et al. Acta Haematol 2015; 133(3): 257-63.

CONCLUSION: *miR-148a overexpression can lead to heparin-induced thrombocytopenia (in the absence of heparin)*

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“SARS-CoV-2 elicited approximately *two-fold higher stimulation* of the interferon response compared to SARS-CoV ..., and induction of cytokines such as CXCL10 or IL6.”

Interferon-γ upregulates miR-155**

*Wyler Emanuel et al. bioRxiv preprint. May 5, 2020.
doi: <https://doi.org/10.1101/2020.05.05.079194>.

**Yu-An Hsu et al. Chin J Physiol 2016; 59(6): 315-322.

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Various types of thrombosis: VAERS reports in 2021

Symptom	Covid-19 Vaccines	All Vaccines	Percent COVID-19
Thrombosis	3,899	3,951	98.7
Deep vein thrombosis	2,275	2,297	99.0
Pulmonary thrombosis	631	646	97.7
Cerebral thrombosis	211	215	98.1
Portal vein thrombosis	89	90	98.9
Superficial vein thrombosis	81	81	100
Peripheral artery thrombosis	74	74	100
Mesenteric vein thrombosis	55	56	98.2
Venous thrombosis	41	41	100
TOTAL	7,356	7,451	98.7
Pulmonary embolism	3,100	3,137	98.8

*US Vaccine Adverse Event Reporting System: <http://wonder.cdc.gov/vaers.html>

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Spike Antibodies and Autoimmune Disease

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“Substantial Differences in SARS-CoV-2 Antibody Responses Elicited by Natural Infection and mRNA Vaccination”*

- After the second dose of the vaccine, antibody titers were *up to 10 times higher* than those of patients who had recovered from natural COVID-19 infection.
- This does not mean that the vaccinated people are better protected than those who recovered from the disease
- High antibody titers opens you up for autoimmune disease, especially when miR-148a is overexpressed



*Rafael Assis et al. bioRxiv preprint. May 19, 2021. doi: <https://doi.org/10.1101/2021.04.15.440089>

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“Potential antigenic cross-reactivity between SARS-CoV-2 and human tissue with a possible link to an increase in autoimmune diseases”*

Cross reaction between **spike protein antibody** and tissue proteins

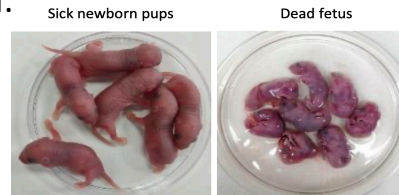
Protein/organelle	Diseases
• transglutaminase	Celiac disease
• extractable nuclear antigens	Scleroderma, <i>lupus</i>
• myelin basic protein	Multiple sclerosis, <i>autism</i>
• mitochondria	<i>Lupus</i> , primary biliary cirrhosis, hepatitis, <i>myocarditis</i>
• nuclear antigen	Sjogren's syndrome, mixed connective tissue disease, <i>lupus</i>
• myosin	<i>Myocarditis</i> , dilated cardiomyopathy, Chagas' heart disease, Kawasaki disease, rheumatic fever
• thyroid peroxidase	Hashimoto's thyroid disease
• S100B	<i>Brain metastases</i> from lung disease, epilepsy, multiple sclerosis, and <i>Parkinson's disease</i>

*Aristo Vojdani and Datis Kharrazian, Clinical Immunology 217 (2020) 108480.

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“Pathogenic antibodies induced by spike proteins of COVID-19 and SARS-CoV viruses”*

- REGN10987 is a neutralizing IgG antibody produced in response to the spike protein
- Researchers injected the antibody into the peritoneum of pregnant rats
- The offspring of the pregnancy were highly damaged:
 - Acute renal tubular injury
 - Myocardial hemorrhage (heart damage)
 - Inflammation in the brain
 - Many were born dead



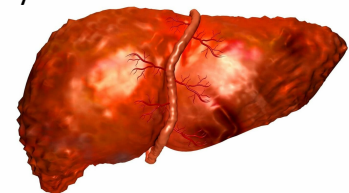
- *Antibody also bound broadly to human inflammatory tissues or cancer tissues, likely increasing the severity of preexisting disease*

*Huiru Wang et al. Research Square Jun 17, 2021. DOI: 10.21203/rs.3.rs-612103/v2.

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Autoimmune Hepatitis Following COVID-19 Vaccine: Two Case Studies

- 35-year-old woman developed autoimmune hepatitis one week post-COVID-19 vaccination (Pfizer) associated with *antinuclear* antibodies*
- 71-year-old woman noticed jaundice four days post-vaccination with Moderna vaccine**
 - Total IgG was markedly raised at 21.77g/L
 - Massive eosinophil infiltration typical of drug-induced liver injury
 - Liver enzymes elevated
- Liver injury has been linked to COVID-19 as well***



**Cathy McShane et al. Journal of Hepatology July 7, 2021 (Epub ahead of print] DOI: 10.1016/j.jhep.2021.06.044

*Fernando Bril et al. Journal of Hepatology 2021; 75: 221-255

***Jose D Debes et al. Dig Liver Dis. 2020; 52(9): 953-955.

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Adult-onset Still's disease after mRNA COVID-19 vaccine*

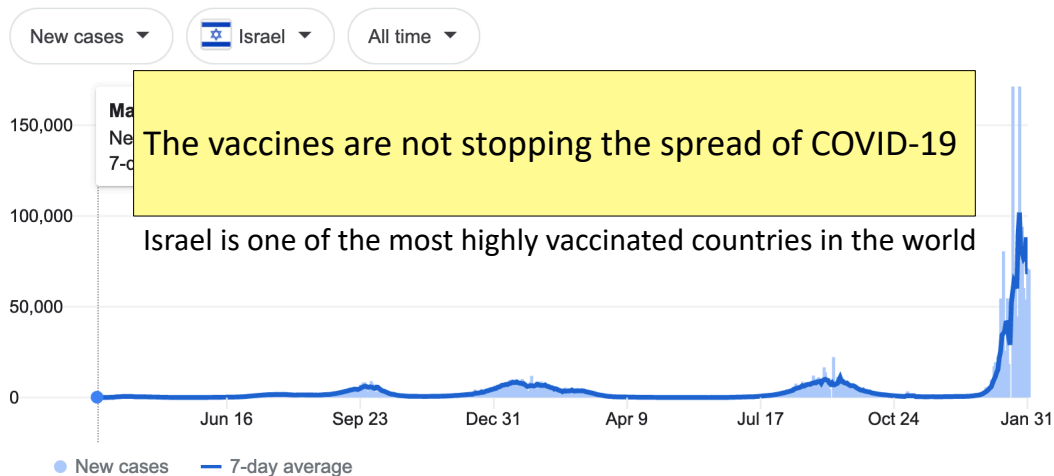
- Still's disease is a rare multisystem inflammatory disorder that mostly affects young adults (16–35 years)
- Case study: 45-year-old previously healthy woman
- Severe adult-onset Still's disease (an autoimmune disease) following mRNA vaccination
 - Onset of symptoms was 5 days following the second dose
- Symptoms included severely debilitating muscle aches and pains, joint stiffness, and pleuritis (inflammation in lungs)



*D Magliulo et al. The Lancet Rheumatology 2021; 3(1): E680-E682.

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Israel world #1 in daily COVID cases per capita, January 20, 2022



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Summary

- The mRNA vaccines are carefully crafted to induce immune cells to produce large quantities of the SARS-CoV-2 spike protein
 - The spike protein is toxic and has prion-like characteristics
- The vaccines produce a very strong antibody response in the spleen by activating germinal centers, and this increases susceptibility to neurodegenerative disease and autoimmune disease
 - Exosomes traveling from the spleen to the brain may play a decisive role
- Spike causes an inflammatory response in the brain, heart and vasculature
- There is much evidence from VAERS of mRNA vaccines causing neurodegenerative disease, cardiovascular disease, thrombosis and cancer
- The vaccines lose their effectiveness against the disease over time, especially with the emergence of variants