Defunk the Bunk 1.0

Case 7
Obliteration

A modRNA Mechanism:
Distribution, Duration, and Immune Response to the Covid-19 Vaccines

Bret Swanson · March 2024

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Dark Horse

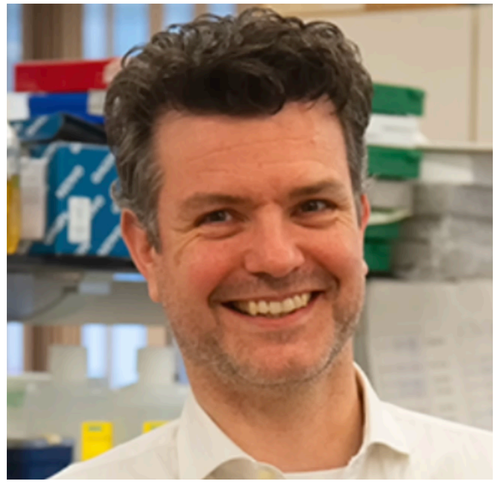
vs.

Debunk and
the Funky Bunch

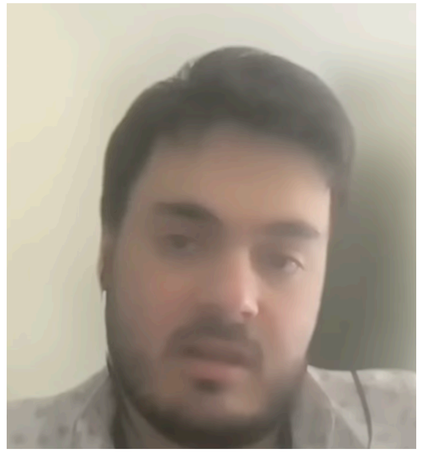
Dr. Bret Weinstein

Dr. Dan Wilson

Dr. Cindy Leifer



Dr. Marc Veldhoen



Dr. Edward Nirenberg

Immune attack of transfected cells

Dr. Bret Weinstein proposed one mechanism (among several) by which the Covid-19 modRNA vaccines cause harm:

1. Tens or hundreds of billions of lipid nanoparticles (LNPs), which encapsulate hundreds of billions or trillions of modRNA strands, can distribute widely in the body and transfect many cells in many organs.

2. Those transfected cells produce and display the foreign Spike protein.

3. Like **in**fected cells, **trans**fected cells which display foreign antigens are targeted for destruction by our immune system. Lymphocytes find, attack, and often kill those Spike-presenting cells.

4. If those cells are in sensitive tissues instead of merely your deltoid muscle, the Covid-19 modRNA vaccines can cause widespread damage in vital organs such as the heart, brain, kidneys, lungs, and blood vessels, etc.

“The fact that there is no targeting of those mRNAs so they can land in any cell, means that every time you attempt to vaccinate somebody with that technology, you are inviting an autoimmune attack on the tissue that happens to pick up the lipid nanoparticle…”

“If the vaccine stayed in your deltoid when they injected it, well then, ***the cells that will be attacked by your immune system*** *are in your arm, and you can afford to lose them. Once we knew that the vaccine circulated around the body, it should be clear to anyone who understands how immunity develops that this is going to cause an autoimmune disorder in any tissue that transcribes it, and if that tissue happens to be your heart, it’s going to be a devastating problem.”*

– Dr. Bret Weinstein

modRNA Vaccine Problems

Lipid nanoparticle (LNP)
- broad biodistribution
- broad, off-target transfection

N1 methylpseudouridine (m1Ψ)
- mRNA persistence, 2-6 months plus
- large but unknown Spike production
- ribosomal frameshifting

Spike protein
- hemagglutination (clotting)
- P53 interference, ↓DNA repair

DNA contamination
- SV40 promoter/enhancer
- cell dysregulation
- endotoxin contamination
- potential genome integration

The focus of today's presentation

Primary immune reaction
- cytotoxic attack on off-target transfected cells
- extreme endothelial damage

Immune dysregulation
- imprinting / OAS
- tolerance / IgG4 class-switch
- vaccine enhanced disease (VAED)

Immune suppression
- T cell depletion, TLR-binding
- viral reactivation, shingles, cancer

Autoimmune reactions
- thrombocytopenia
- lupus, diabetes, Sjogren's, etc.
- multi-inflammation, thyroiditis, nephritis, hepatitis, neuritis, etc.

“these cells will be killed.”

– Dr. Marc Veldhoen

“Those cells will be replaced once they are damaged.”

– Dr. Marc Veldhoen

“To deprive cytosolic pathogens of their cellular host, cytotoxic T cells target the infected host cell for death.”

“Cytotoxic T cells are selective serial killers of targets expressing a specific antigen.”

– Janeway’s Immunobiology,
9th Edition

Major acknowledgement, remaining disputes

1. Debunk the Funk's three immunologists **acknowledge** infected/transfected cells are targeted for destruction by our immune system.

2. They **deny**, however, the modRNA vaccine circulates around the body or persists beyond a short period. They **deny** it transfects cells or damages tissues beyond the shoulder.

3. In his description of immune attack on cells displaying foreign antigens, Weinstein on several occasions used the term "autoimmune" instead of immune. While it may have been imprecise, it does not alter the fundamental thesis nor the key disputes. (Autoimmune reactions are in fact an additional major problem, to be discussed later.)

4. The immediate questions, therefore, are **breadth** of distribution, **duration** of modRNA and Spike, **efficiency** of transfection, **robustness** of immune response, and **evidence of harm**.

5. In other words, which cells in which tissues, over what time period, are transfected and attacked? Further, is the microscopic evidence consistent with the macroscopic, or epidemiological, evidence?

P.S. Additional questions of highly complex immune dysregulation, autoimmunity, DNA contamination, Spike pathologies, and other modRNA activity remain.

“The vaccine does not circulate.”

– Dr. Marc Veldhoen

“It’s not going to the brain, to the heart. It’s not.”

– Dr. Edward Nirenberg

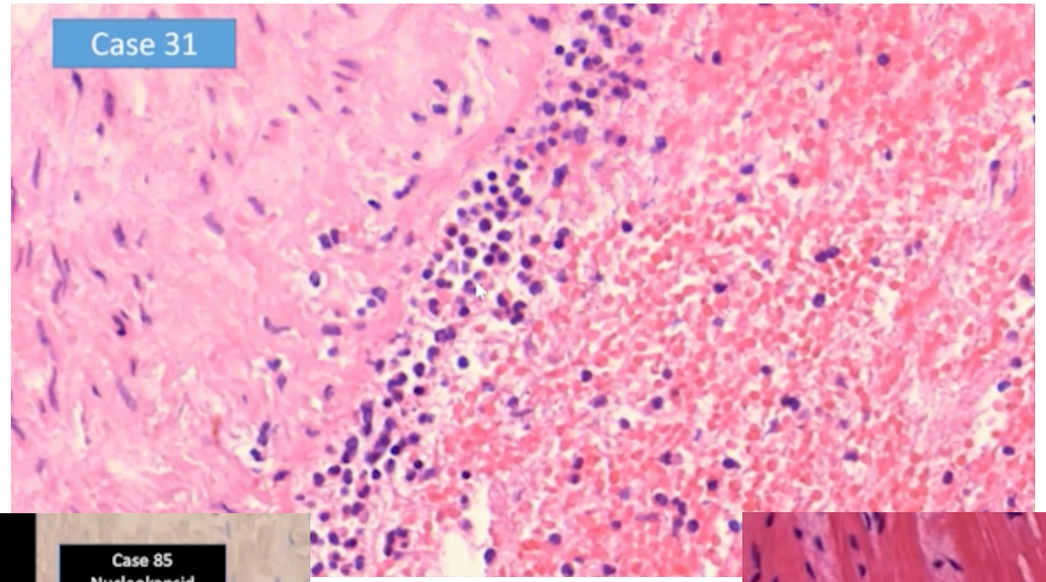
“There’s no evidence that there’s this massive immune response against the heart cells.”

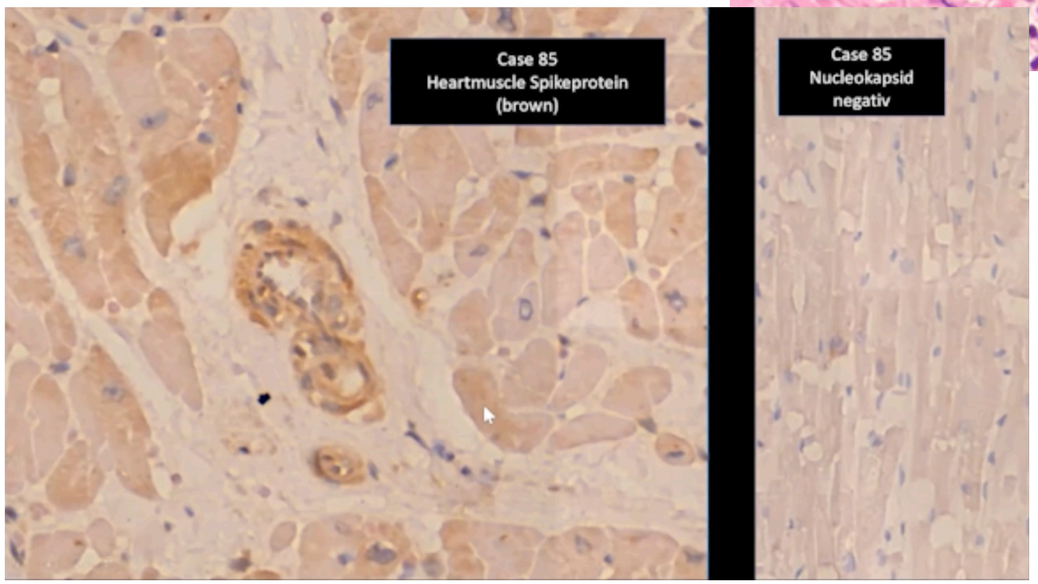
– Dr. Cindy Leifer

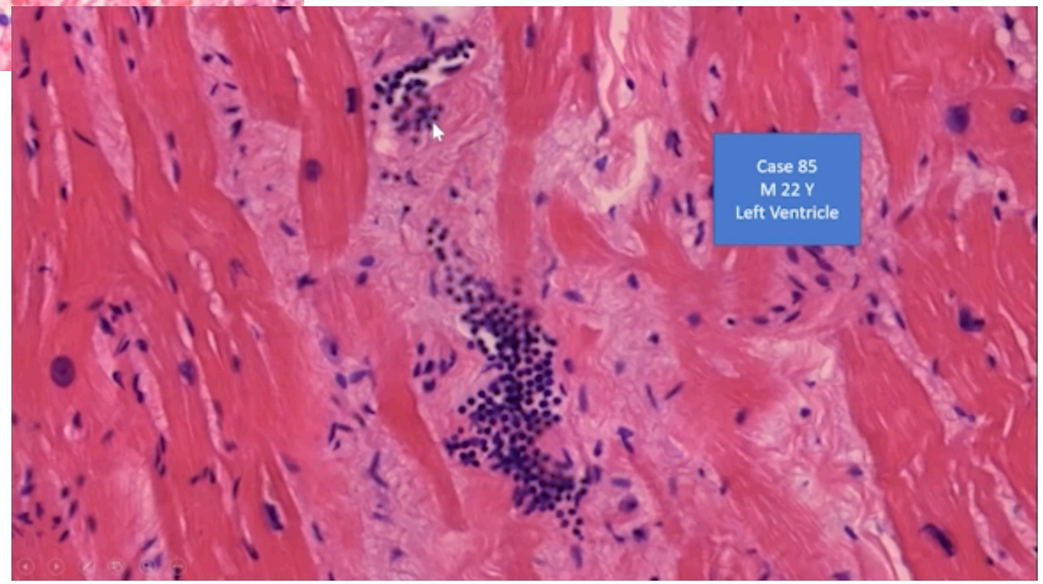
“We don’t see…T cells targeting the heart. That has been looked at extensively. It clearly isn’t there.”

– Dr. Edward Nirenberg

Spike and lymphocytes in heart







https://rumble.com/v2jbj16-arne-burkhardt-presentation-to-the-ccca.html

T cell inflammation of heart

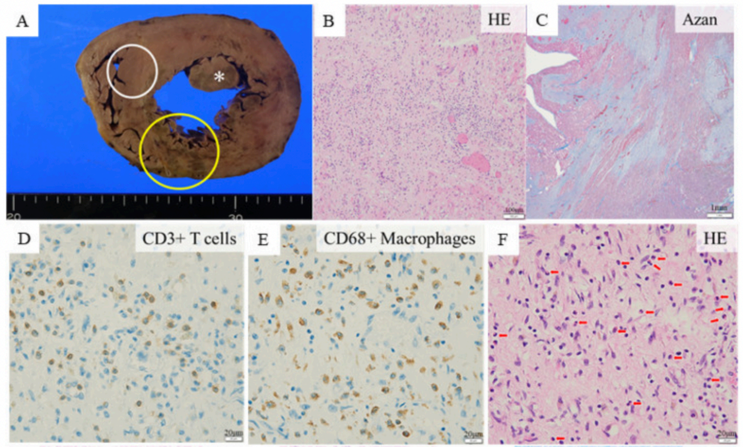
JOURNAL of CARDIOLOGY CASES

Submit

An autopsy case report of fulminant myocarditis: Following ...

PDF [2 MB]

An autopsy revealed asymmetric left ventricular hypertrophy, thickening of the right ventricular wall (550 g; LV wall, 11–16 mm; RV wall, 5–7 mm), myxomatous degeneration of the posterior leaflet of the mitral valve, and hypertrophy of the posteromedial papillary muscle (Fig. 3A). Microscopic findings revealed that cardiac myocytolysis and widespread fibrosis were observed (Fig. 3B, C) and significant mixed inflammatory infiltration (T cells, macrophages, and eosinophils) was observed in the left ventricular free wall and the anterior potion of the ventricular septum (Fig. 3D–F), which led to the diagnosis of myocarditis. There was no evidence of CD138+ CD79a+ CD20– plasmocytes. Although asymmetric left ventricular hypertrophy was observed, cardiac muscle cell disorganization that is characteristic of hypertrophic cardiomyopathy was not observed. In contrast to the left ventricular free wall, the posterior potion of the ventricular septum and right ventricular free wall had almost no inflammatory cell infiltration or fibrosis, and almost normal myocardium was maintained (Fig. 3G, H). Additionally, the posterior papillary muscles showed a similar inflammatory cell infiltrate at the left ventricular myocardium, with extensive and severe fibrosis (Fig. 3I).



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CASE REPORT

Pathology International WILEY

An autopsy case of fulminant myocarditis after severe acute respiratory syndrome coronavirus 2 vaccine inoculation

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Abstract

A 61-year-old woman without significant medical history developed fever 3 days after severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination and went into shock the next day. She was negative for SARS-CoV-2 mRNA in real-time polymerase chain reaction (PCR). Finally, she died 10 days after vaccination. At autopsy, the heart showed moderate dilatation of both ventricles, and the myocardium showed an uneven color change and decreased elasticity. Histologically, severe myocarditis with extensive myocytolysis was observed. The myocarditis showed severe inflammatory cell infiltration with T-lymphocyte and macrophage predominance, and in addition to the inflammatory cells described above, vast nuclear dust accompanying neutrophilic infiltration was observed. In the bone marrow and lymph nodes, hemophagocytosis was observed. In postmortem examination, nucleic acids of any cardiotropic viruses including SARS-CoV-2 were not detected using multivirus real-time PCR system. We discussed the relationship between the possible immune reaction after vaccination and the myocarditis observed in this case from immunopathological viewpoints. This mRNA vaccine is the first applied nucleic acid vaccine for humans, and its mechanism of efficacy and immune acquisition remain unclear. We hope the accumulation of more detailed analyses of the similar cases to reveal the mechanism of this kind of adverse reaction.

KEYWORDS

cytotoxic T-cells, hypercytokinemia, myocarditis, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination

Vaccine modRNA in heart; circulating Spike

Circulation
Volume 147, Issue 11, 14 March 2023; Pages 867-876
https://doi.org/10.1161/CIRCULATIONAHA.122.061025

ORIGINAL RESEARCH ARTICLE

Circulating Spike Protein Detected in Post–COVID-19 mRNA Vaccine Myocarditis

Editorial, see p 877

Lael M. Yonker, MD *, Zoe Swank, PhD*, Yannic C. Bartsch, PhD*, Madeleine D. Burns, MS, Abigail Kane, MD, Brittany P. Boribong, PhD, Jameson P. Davis, BS, Maggie Loiselle, BS, Tanya Novak, PhD, Yasmeen Senussi, MBBS, Chi-An Cheng, PhD, Eleanor Burgess, MS, Andrea G. Edlow, MD, Janet Chou, MD, Audrey Dionne, MD, Duraisamy Balaguru, MD, Manuella Lahoud-Rahme, MD, Moshe Arditi, MD, Boris Julg, MD, PhD, Adrienne G. Randolph, MD, Galit Alter, PhD, Alessio Fasano, MD †, and David R. Walt, PhD †

Background: Cases of adolescents and young adults developing myocarditis after vaccination with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)–targeted mRNA vaccines have been reported globally, but the underlying immunoprofiles of these individuals have not been described in detail.

Methods: From January 2021 through February 2022, we prospectively collected blood from 16 patients who were hospitalized at Massachusetts General for Children or Boston Children's Hospital for myocarditis, presenting with chest pain with elevated cardiac troponin T after SARS-CoV-2 vaccination. We performed extensive antibody profiling, including tests for SARS-CoV-2–specific humoral responses and assessment for autoantibodies or antibodies against the human-relevant virome, SARS-CoV-2–specific T-cell analysis, and cytokine and SARS-CoV-2 antigen profiling. Results were compared with those from 45 healthy, asymptomatic, age-matched vaccinated control subjects.

Results: Extensive antibody profiling and T-cell responses in the individuals who developed postvaccine myocarditis were essentially indistinguishable from those of vaccinated control subjects, despite a modest increase in cytokine production. A notable finding was that markedly elevated levels of full-length spike protein (33.9±22.4 pg/mL), unbound by antibodies, were detected in the plasma of individuals with postvaccine myocarditis, whereas no free spike was detected in asymptomatic vaccinated control subjects (unpaired *t* test; $P<0.0001$).

Conclusions: Immunoprofiling of vaccinated adolescents and young adults revealed that the mRNA vaccine–induced immune responses did not differ between individuals who developed myocarditis and individuals who did not. However, free spike antigen was detected in the blood of adolescents and young adults who developed post-mRNA vaccine myocarditis, advancing insight into its potential underlying cause.

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ARTICLE OPEN

Check for updates

Duration of SARS-CoV-2 mRNA vaccine persistence and factors associated with cardiac involvement in recently vaccinated patients

Aram J. Krauson[1], Faye Victoria C. Casimero[1,2], Zakir Siddiquee[1] and James R. Stone[1,2]✉

At the start of the COVID-19 pandemic, the BNT162b2 (BioNTech-Pfizer) and mRNA-1273 (Moderna) mRNA vaccines were expediently designed and mass produced. Both vaccines produce the full-length SARS-CoV-2 spike protein for gain of immunity and have greatly reduced mortality and morbidity from SARS-CoV-2 infection. The distribution and duration of SARS-CoV-2 mRNA vaccine persistence in human tissues is unclear. Here, we developed specific RT-qPCR-based assays to detect each mRNA vaccine and screened lymph nodes, liver, spleen, and myocardium from recently vaccinated deceased patients. Vaccine was detected in the axillary lymph nodes in the majority of patients dying within 30 days of vaccination, but not in patients dying more than 30 days from vaccination. Vaccine was not detected in the mediastinal lymph nodes, spleen, or liver. Vaccine was detected in the myocardium in a subset of patients vaccinated within 30 days of death. Cardiac ventricles in which vaccine was detected had healing myocardial injury at the time of vaccination and had more myocardial macrophages than the cardiac ventricles in which vaccine was not detected. These results suggest that SARS-CoV-2 mRNA vaccines routinely persist up to 30 days from vaccination and can be detected in the heart.

npj Vaccines (2023)8:141 ; https://doi.org/10.1038/s41541-023-00742-7

Myocarditis

JAMA Cardiology | Search All | Enter Search Term

April 20, 2022

SARS-CoV-2 Vaccination and Myocarditis in a Nordic Cohort Study of 23 Million Residents

Øystein Karlstad, MScPharm, PhD[1]; Petteri Hovi, MD, PhD[2]; Anders Husby, MD, PhD[3,4]; et al

» Author Affiliations | Article Information

JAMA Cardiol. 2022;7(6):600-612. doi:10.1001/jamacardio.2022.0583

Cardiovascular Assessment up to One Year After COVID-19 Vaccine–Associated Myocarditis

Clement Kwong-man Yu, Sabrina Tsao, Carol Wing-kei Ng, Gilbert T. Chua, Kwok-lap Chan, Julia Shi, Yumi Yuk-ting Chan, Patrick Ip, Mike Yat-wah Kwan and Yiu-fai Cheung

Originally published 31 Jul 2023 | https://doi.org/10.1161/CIRCULATIONAHA.123.064772 | Circulation. 2023;148:436–439

Circulation

International Journal of *Molecular Sciences*

MDPI

Article

Intramyocardial Inflammation after COVID-19 Vaccination: An Endomyocardial Biopsy-Proven Case Series

Christian Baumeier [1,*], Ganna Aleshcheva [1], Dominik Harms [1], Ulrich Gross [1], Christian Hamm [2,3], Birgit Assmus [3], Ralf Westenfeld [4], Malte Kelm [4], Spyros Rammos [5], Philip Wenzel [6], Thomas Münzel [6], Albrecht Elsässer [7], Mudather Gailani [8], Christian Perings [9], Alae Bourakkadi [10], Markus Flesch [11], Tibor Kempf [12], Johann Bauersachs [12], Felicitas Escher [1,13,14] and Heinz-Peter Schultheiss [1]

Clinical Research in Cardiology (2023) 112:431–440
https://doi.org/10.1007/s00392-022-02129-5

ORIGINAL PAPER

Autopsy-based histopathological characterization of myocarditis after anti-SARS-CoV-2-vaccination

Constantin Schwab[1] · Lisa Maria Domke[1,2] · Laura Hartmann[1,2] · Albrecht Stenzinger[1] · Thomas Longerich[1] · Peter Schirmacher[1]

ESC European Society of Cardiology

European Journal of Heart Failure (2023) **25**, 1871–1881
doi:10.1002/ejhf.2978

RESEARCH ARTICLE

Sex-specific differences in myocardial injury incidence after COVID-19 mRNA-1273 booster vaccination

Natacha Buergin[1], Pedro Lopez-Ayala[1], Julia R. Hirsiger[2], Philip Mueller[1], Daniela Median[1], Noemi Glarner[1], Klara Rumora[1], Timon Herrmann[1], Luca Koechlin[1], Philip Haaf[1], Katharina Rentsch[3], Manuel Battegay[4], Florian Banderet[5,6], Christoph T. Berger[2,7], and Christian Mueller[1]*

Myocarditis caused by cytotoxic lymphocytes

Science Immunology

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Cytokinopathy with aberrant cytotoxic lymphocytes and profibrotic myeloid response in SARS-CoV-2 mRNA vaccine–associated myocarditis

ANIS BARMADA, JON KLEIN, ANJALI RAMASWAMY, NINA N. BRODSKY, JILLIAN R. JAYCOX, HASSAN SHEIKHA, KATE M. JONES, VICTORIA HABET, MELISSA CAMPBELL, [...], AND CARRIE L. LUCAS +13 authors Authors Info & Affiliations

SCIENCE IMMUNOLOGY • 5 May 2023 • Vol 8, Issue 83 • DOI: 10.1126/sciimmunol.adh3455

Immunopathology signatures in myocarditis

Myocarditis and/or pericarditis are rare adverse cardiac events observed after SARS-CoV-2 mRNA vaccination with a predilection for adolescent and young adult males. To investigate the pathogenesis of myopericarditis in this setting, Barmada and Klein *et al*. used unbiased immune profiling techniques to search for immune signatures that distinguished patients who developed myopericarditis from healthy vaccinated controls. Immune events associated with myopericarditis included elevated systemic levels of cytokines, an increased frequency of activated T and NK cells, and induction of inflammatory monocytes with profibrotic features. Neither immune targeting of cardiac autoantigens nor enhanced clonal expansion of B and T lymphocytes was detected. These findings provide deeper insights into the chain of events that can rarely lead to myopericarditis in the mRNA vaccine setting. —IRW

Abstract

Rare immune-mediated cardiac tissue inflammation can occur after vaccination, including after SARS-CoV-2 mRNA vaccines. However, the underlying immune cellular and molecular mechanisms driving this pathology remain poorly understood. Here, we investigated a cohort of patients who developed myocarditis and/or pericarditis with elevated troponin, B-type natriuretic peptide, and C-reactive protein levels as well as cardiac imaging abnormalities shortly after SARS-CoV-2 mRNA vaccination. Contrary to early hypotheses, patients did not demonstrate features of hypersensitivity myocarditis, nor did they have exaggerated SARS-CoV-2–specific or neutralizing antibody responses consistent with a hyperimmune humoral mechanism. We additionally found no evidence of cardiac-targeted autoantibodies. Instead, unbiased systematic immune serum profiling revealed elevations in circulating interleukins (IL-1β, IL-1RA, and IL-15), chemokines (CCL4, CXCL1, and CXCL10), and matrix metalloproteases (MMP1, MMP8, MMP9, and TIMP1). Subsequent deep immune profiling using single-cell RNA and repertoire sequencing of peripheral blood mononuclear cells during acute disease revealed expansion of activated CXCR3$^+$ cytotoxic T cells and NK cells, both phenotypically resembling cytokine-driven killer cells. In addition, patients displayed signatures of inflammatory and profibrotic CCR2$^+$ CD163$^+$ monocytes, coupled with elevated serum-soluble CD163, that may be linked to the late gadolinium enhancement on cardiac MRI, which can persist for months after vaccination. Together, our results demonstrate up-regulation in inflammatory cytokines and corresponding lymphocytes with tissue-damaging capabilities, suggesting a cytokine-dependent pathology, which may further be accompanied by myeloid cell–associated cardiac fibrosis. These findings likely rule out some previously proposed mechanisms of mRNA vaccine––associated myopericarditis and point to new ones with relevance to vaccine development and clinical care.

Myocarditis

Autopsy Histopathologic Cardiac Findings in 2 Adolescents Following the Second COVID-19 Vaccine Dose

James R. Gill, MD; Randy Tashjian, MD; Emily Duncanson, MD

• ***Context.***—**Myocarditis in adolescents has been diagnosed clinically following the administration of the second dose of an mRNA vaccine for coronavirus disease 2019 (COVID-19).**

Objective.—**To examine the autopsy microscopic cardiac findings in adolescent deaths that occurred shortly following administration of the second Pfizer-BioNTech COVID-19 dose to determine if the myocarditis described in these instances has the typical histopathology of myocarditis.**

Design.—**Clinical and autopsy investigation of 2 teenage boys who died shortly following administration of the second Pfizer-BioNTech COVID-19 dose.**

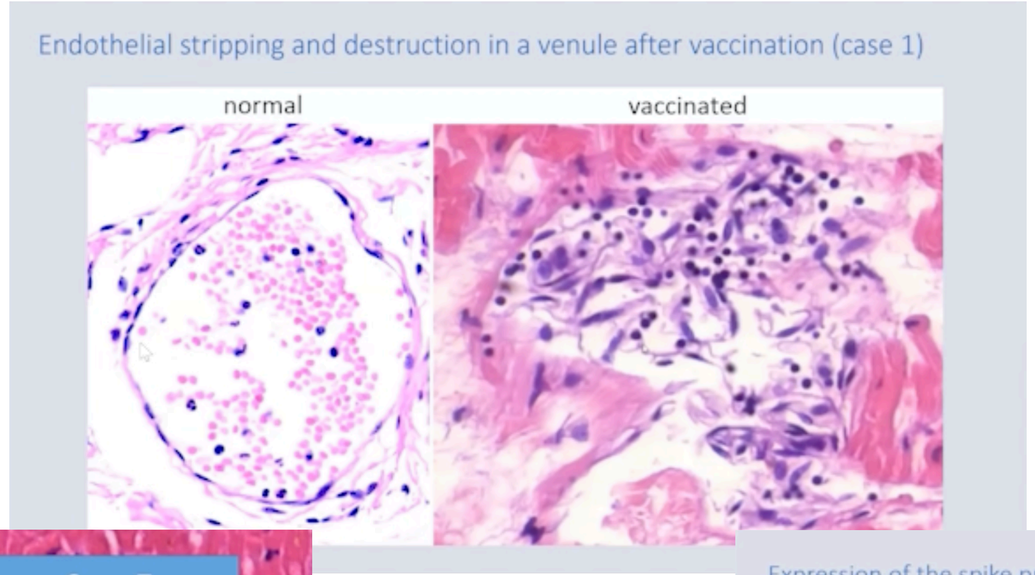
Results.—**The microscopic examination revealed features resembling a catecholamine-induced injury, not typical myocarditis pathology.**

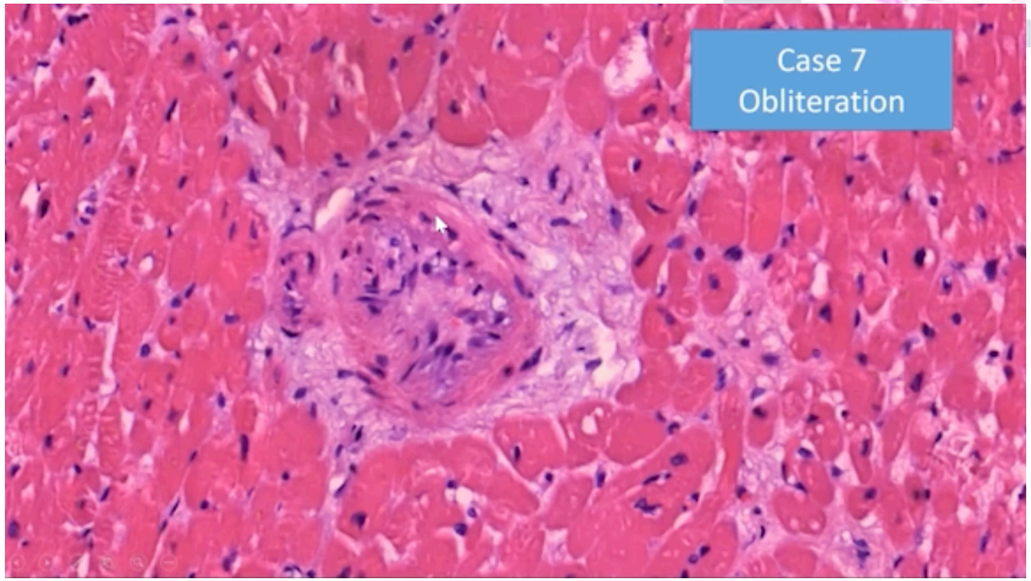
Conclusions.—**The myocardial injury seen in these postvaccine hearts is different from typical myocarditis and has an appearance most closely resembling a catecholamine-mediated stress (toxic) cardiomyopathy. Understanding that these instances are different from typical myocarditis and that cytokine storm has a known feedback loop with catecholamines may help guide screening and therapy.**

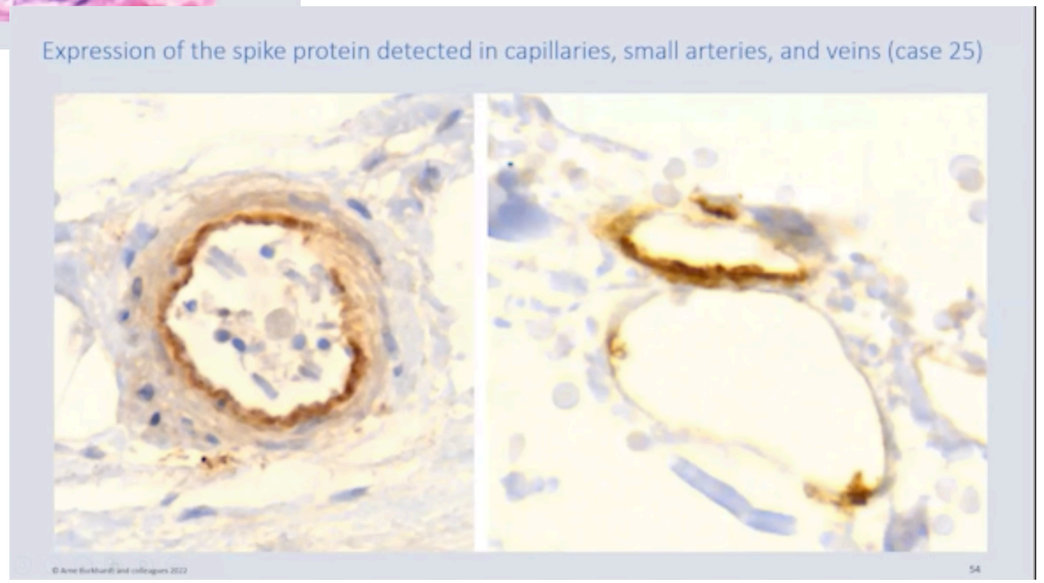
(*Arch Pathol Lab Med.* 2022;146:925–929; doi: 10.5858/arpa.2021-0435-SA)

https://meridian.allenpress.com/aplm/article/146/8/925/477788/Autopsy-Histopathologic-Cardiac-Findings-in-2

Spike and lymphocytes in blood vessels







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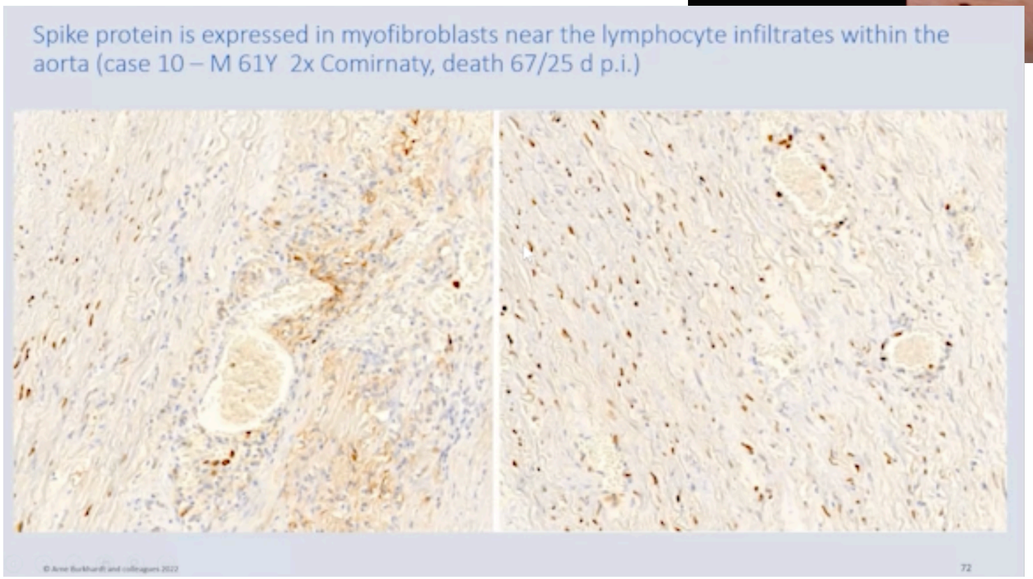
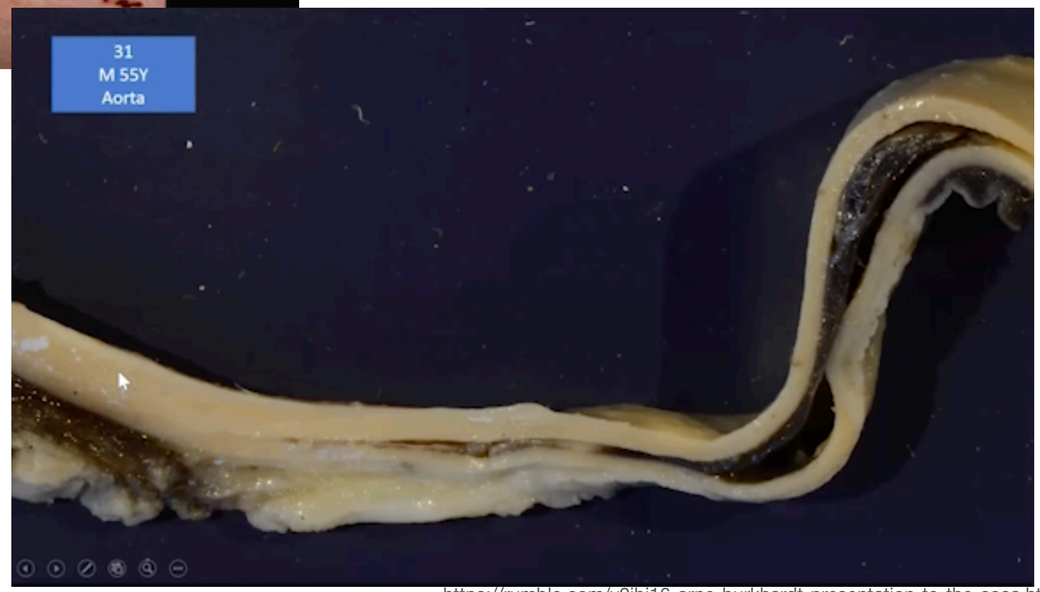
Spike and lymphocytes in aorta





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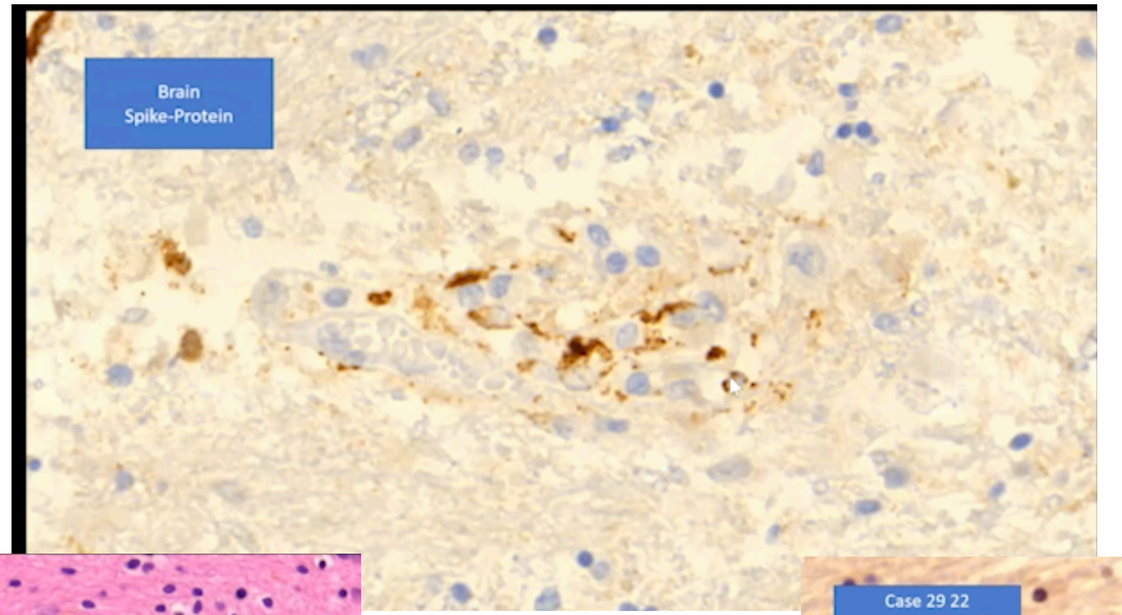
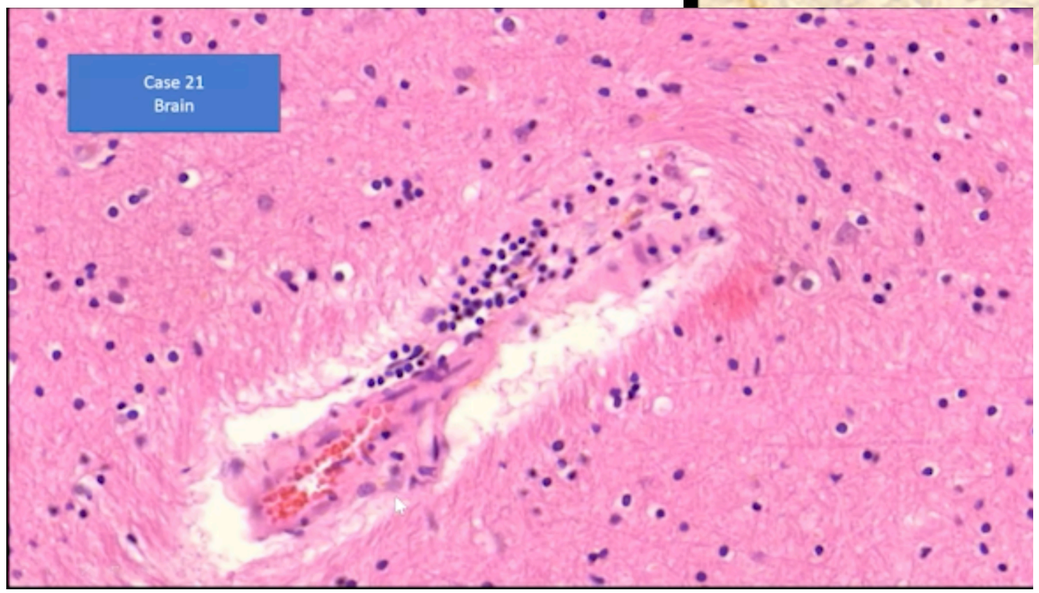
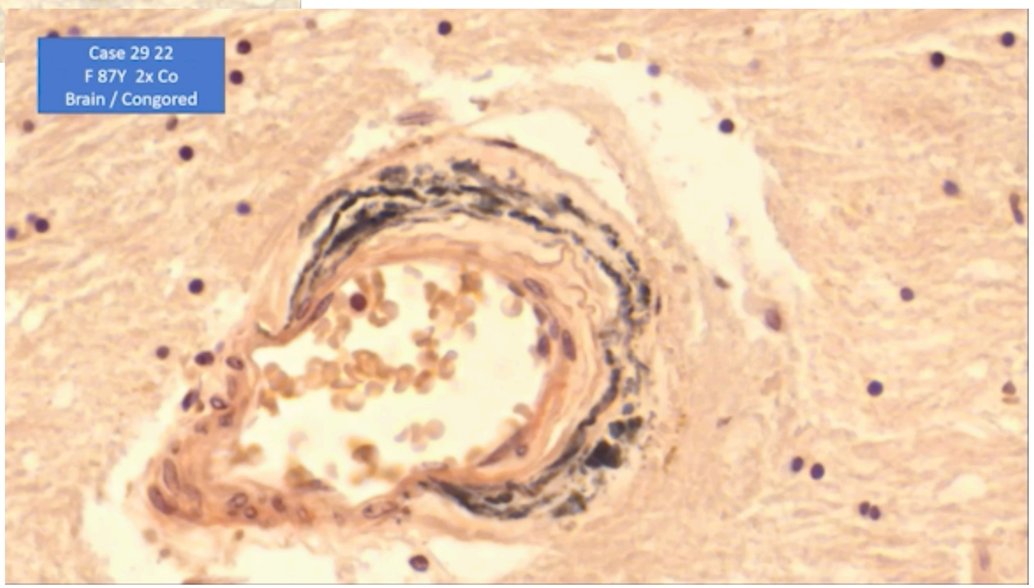
Spike and lymphocytes in brain







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Spike and lymphocytes in both *heart* and *brain*

vaccines

MDPI

Case Report

A Case Report: Multifocal Necrotizing Encephalitis and Myocarditis after BNT162b2 mRNA Vaccination against COVID-19

Michael Mörz

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Abstract: The current report presents the case of a 76-year-old man with Parkinson's disease (PD) who died three weeks after receiving his third COVID-19 vaccination. The patient was first vaccinated in May 2021 with the ChAdOx1 nCov-19 vector vaccine, followed by two doses of the BNT162b2 mRNA vaccine in July and December 2021. The family of the deceased requested an autopsy due to ambiguous clinical signs before death. PD was confirmed by post-mortem examinations. Furthermore, signs of aspiration pneumonia and systemic arteriosclerosis were evident. However, histopathological analyses of the brain uncovered previously unsuspected findings, including acute vasculitis (predominantly lymphocytic) as well as multifocal necrotizing encephalitis of unknown etiology with pronounced inflammation including glial and lymphocytic reaction. In the heart, signs of chronic cardiomyopathy as well as mild acute lympho-histiocytic myocarditis and vasculitis were present. Although there was no history of COVID-19 for this patient, immunohistochemistry for SARS-CoV-2 antigens (spike and nucleocapsid proteins) was performed. Surprisingly, only spike protein but no nucleocapsid protein could be detected within the foci of inflammation in both the brain and the heart, particularly in the endothelial cells of small blood vessels. Since no nucleocapsid protein could be detected, the presence of spike protein must be ascribed to vaccination rather than to viral infection. The findings corroborate previous reports of encephalitis and myocarditis caused by gene-based COVID-19 vaccines.

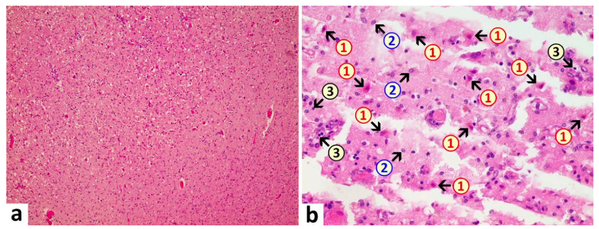


Figure 2. Frontal brain. Already in the overview image (**a**), prominent vacuolations with increased parenchymal cellularity are evident, indicative of degenerative and inflammatory processes. At higher magnification (**b**), acute brain damage is visible with diffuse and zonal neuronal and glial cell death, activation of microglia, and inflammatory infiltration by granulocytes and lymphocytes. 1: neuronal deaths (cells with red cytoplasm); 2: microglial proliferation; 3: lymphocytes. H&E stain. Magnification 40× (**a**) and 200× (**b**).

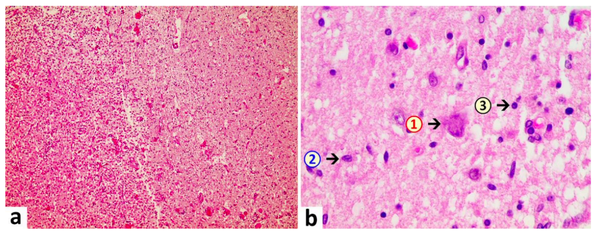


Figure 3. Brain, Nucleus ruber. In the overview image (**a**), note pronounced focal necrosis with increased cellularity, indicative of ongoing inflammation and glial reaction. At higher magnification (**b**), death of neuronal cells is evident and associated with an increased number of glial cells. Note activation of microglia and presence of inflammatory cell infiltrates, predominantly lymphocytic. 1: neuronal death with hypereosinophilia and destruction of cell nucleus with signs of karyolysis (nuclear content being distributed into the cytoplasm); 2: microglia (example); 3: lymphocyte (example). H&E stain. Magnification 40× (**a**) and 400× (**b**).

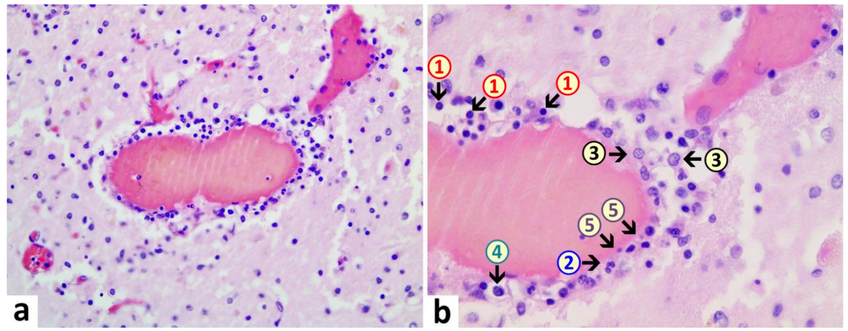


Figure 4. Brain, periventricular vasculitis. Cross section through a capillary vessel showing prominent signs of vasculitis. The endothelial cells (5) show swelling and vacuolation and are increased in number with enlargement of nuclei, indicative for activation. Furthermore, presence of mixed inflammatory cell infiltrates within the endothelial layer, consisting of lymphocytes (1), granulocytes (2), and histiocytes (4). The adjacent brain tissue also shows signs of inflammation (encephalitis) with presence of lymphocytes as well and activated microglia (3). H&E. Magnification: 200× (**a**) and 400× (**b**).

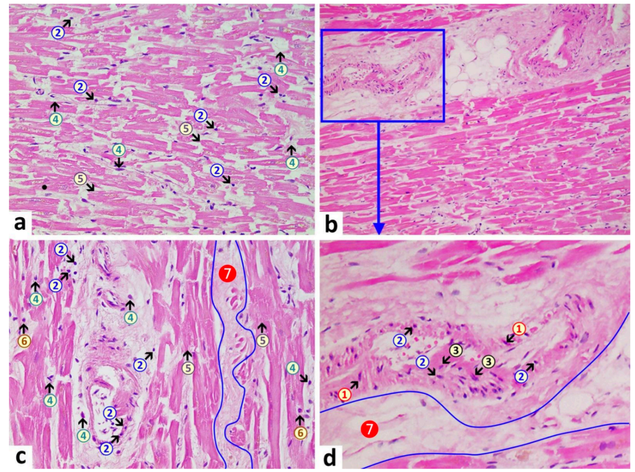


Figure 5. Heart left ventricle. (**a**): Mild lympho-histiocytic myocarditis.Pronounced interstitial edema (7) and mild lympho-histiocytic infiltrates (2 + 4). Signs of cardiomyocytic degeneration (5) with cytoplasmic hypereosinophilia and single contraction bands. (**d**): Arteriole with signs of acute degeneration and associated inflammation, associated by lymphocytic infiltrates (2) within the vascular wall, endothelial swelling and vacuolation (3), and vacuolation of vascular myocytes with signs of karyopyknosis (1). Within the vascular lumen (**d**), note plasma coagulation/fibrin clots adhering to the endothelial surface, indicative of endothelial damage. 1: pyknotic vascular myocytes, 2: lymphocytes, 3: swollen endothelial cells, 4: macrophages, 5: necrotic cardiomyocytes, 6: eosinophilic granulocytes, 7 (blue line): interstitial edema. H&E stain. Magnification: 200× (**a**) and (**c**), 40× (**b**), and detailed enlargement (**d**).

Lipid nanoparticles (LNPs) “transfect off-target tissues”

PNAS | NOW READING: Combinatorial design of ionizable lipid nanoparticles for muscle-selective...

RESEARCH ARTICLE | MEDICAL SCIENCES

Combinatorial design of ionizable lipid nanoparticles for muscle-selective mRNA delivery with minimized off-target effects

Jingan Chen, Yue Xu, Muye Zhou, +7, and Bowen Li Authors Info & Affiliations

Edited by Craig Hawker, University of California Santa Barbara, Santa Barbara, CA; received June 5, 2023; accepted October 30, 2023

December 7, 2023 | 120 (50) e2309472120 | https://doi.org/10.1073/pnas.2309472120

Significance

Lipid nanoparticles (LNPs) crucial for delivering mRNA (messenger RNA)-based therapies including COVID-19 mRNA vaccines can oftentimes inadvertently transfect off-target tissues, leading to potential safety issues. To facilitate tissue-specific mRNA delivery with improved precision, our study presents a platform to quickly create chemically diverse lipids for building LNPs. This method successfully identifies iso-A11B5C1, a lipid that, when incorporated into LNPs, enables efficient muscle-focused mRNA delivery while minimizing off-target delivery to other tissues. Intriguingly, despite limited transfection in lymph nodes, intramuscular administration of mRNA delivered by these LNPs can trigger potent cellular immune responses, of which the efficacy is further validated in a melanoma vaccine model. This work advances methods for muscle-specific mRNA delivery and prompts rethinking of mRNA vaccine designs.

Moderna on “off-target toxicity”

nature reviews
drug discovery

Review Article | Published: 23 January 2024

Strategies to reduce the risks of mRNA drug and vaccine toxicity

Dimitrios Bitounis, Eric Jacquinet, Maximillian A. Rogers & Mansoor M. Amiji

— Show fewer authors

Nature Reviews Drug Discovery (2024) | Cite this article

Abstract

mRNA formulated with lipid nanoparticles is a transformative technology that has enabled the rapid development and administration of billions of coronavirus disease 2019 (COVID-19) vaccine doses worldwide. However, avoiding

Abstract

mRNA formulated with lipid nanoparticles is a transformative technology that has enabled the rapid development and administration of billions of coronavirus disease 2019 (COVID-19) vaccine doses worldwide. However, avoiding unacceptable toxicity with mRNA drugs and vaccines presents challenges. Lipid nanoparticle structural components, production methods, route of administration and proteins produced from complexed mRNAs all present toxicity concerns. Here, we discuss these concerns, specifically how cell tropism and tissue distribution of mRNA and lipid nanoparticles can lead to toxicity, and their possible reactogenicity. We focus on adverse events from mRNA applications for protein replacement and gene editing therapies as well as vaccines, tracing common biochemical and cellular pathways. The potential and limitations of existing models and tools used to screen for on-target efficacy and de-risk off-target toxicity, including in vivo and next-generation in vitro models, are also discussed.

Minimization of off-target effects

To lower the risk of off-target effects in the development of mRNA therapeutics, it is possible to inhibit mRNA expression in a cell-specific manner or improve organ-specific uptake of LNP–mRNA. The former strategy is enabled by endogenous microRNAs (miRs), which are short, non-coding RNA molecules that naturally inhibit the translation of mRNA and thus regulate gene expression in a cell- and disease-specific manner[194]. Incorporation of a miR binding site in

The evidence of widespread ***endothelial*** damage and ***coagulapathy*** is overwhelming.

vaccines MDPI

Case Report

A Case of Acute Pulmonary Embolus after mRNA SARS-CoV-2 Immunization

Nathaniel E. Wiest [1], Gretchen S. Johns [2] and Eric Edwards [3,*]

pathogens MDPI

Case Report

Renal Thrombotic Microangiopathy in Concurrent COVID-19 Vaccination and Infection

Marco De Fabritiis [1], Maria Laura Angelini [1], Benedetta Fabbrizio [2], Giovanna Cenacchi [3,4], Claudio Americo [1], Stefania Cristino [1], Maria Francesca Lifrieri [1], Maria Cappuccilli [5], Alessandra Spazzoli [1], Loretta Zambianchi [1] and Giovanni Mosconi [1,*]

"Kidney biopsy revealed ultrastructural evidence of ***severe endothelial cell injury*** suggestive of a starting phase of TMA."

Journal of *Clinical Medicine*

Article

Retinal Hemorrhage after SARS-CoV-2 Vaccination

Hyo Song Park [1], Yeojue Byun [2], Suk Ho Byeon [1], Sung Soo Kim [1], Yong Joon Kim [1,*] and Christopher Seungkyu Lee [1,*]

DOI: 10.7759/cureus.21665

A Case of Diffuse Alveolar Hemorrhage With COVID-19 Vaccination

Alisha Sharma [1] , Binayak Upadhyay [2] , Rabin Banjade [3] , Bidhya Poudel [1] , Pankaj Luitel [1] , Bidhisa Kharel [4]

1. Internal Medicine, AMITA Health Saint Francis Hospital, Evanston, USA 2. Internal Medicine, Divison of Hospital Medicine, University of Kentucky College of Medicine, Lexington, USA 3. Internal medicine, AMITA Health Saint Francis hospital, Evanston, USA 4. Medicine, College of Medical Science, Bharatpur, NPL

Circulation Journal
Circ J 2022; **86:** 1145
doi:10.1253/circj.CJ-21-1055

Deep Vein Thrombosis and Pulmonary Thrombosis After BNT162b2 mRNA SARS-CoV2 Vaccination

Chisato Sawatari, MD; Nobutake Kurebayashi, MD; Shuji Morikawa, MD; Satoru Iwashima, PhD

We report a rare case of a 14-year-old male presenting with deep vein thrombosis after receiving the SARS-CoV2 vaccine. The day after receiving the second dose of the vaccine, 23 days after the first vaccination, the patient visited Chutoen Medical Center complaining of pain in the lower region of his left leg. He had no family history of juvenile thrombosis or a medical history of thrombosis. Physical examination revealed height

> Scand J Rheumatol. 2022 Mar;51(2):154-155. doi: 10.1080/03009742.2021.1961401. Epub 2021 Sep 28.

Large-vessel giant cell arteritis after COVID-19 vaccine

A Mejren [1 2], C M Sørensen [2], L C Gormsen [3], R S Tougaard [2 4], B D Nielsen [2 4]

Affiliations + expand

PMID: 34582316 DOI: 10.1080/03009742.2021.1961401

Home > Ophthalmology and Therapy > Article

Retinal Vein Occlusion Following Two Doses of mRNA-1237 (Moderna) Immunization for SARS-Cov-2: A Case Report

Case Report | Open access | Published: 09 December 2021 | **11**, 453–458 (2022)

diseases MDPI

Case Report

Case Report: Two Case Reports of Pulmonary Hypertension after mRNA COVID-19 Vaccination

Robert D. Sullivan [1,*], Nataliia V. Shults [2] and Yuichiro J. Suzuki [3,*]

"Pulmonary hypertension is a serious disease characterized by ***damage to lung vasculature*** and restricted blood flow through narrowed arteries from the right to left heart."

The evidence of widespread ***endothelial*** damage and ***coagulapathy*** is overwhelming.

Received: 14 July 2022 | Revised: 26 December 2022 | Accepted: 24 February 2023

DOI: 10.1002/iid3.807

REVIEW ARTICLE

Immunity, Inflammation and Disease Open Access WILEY

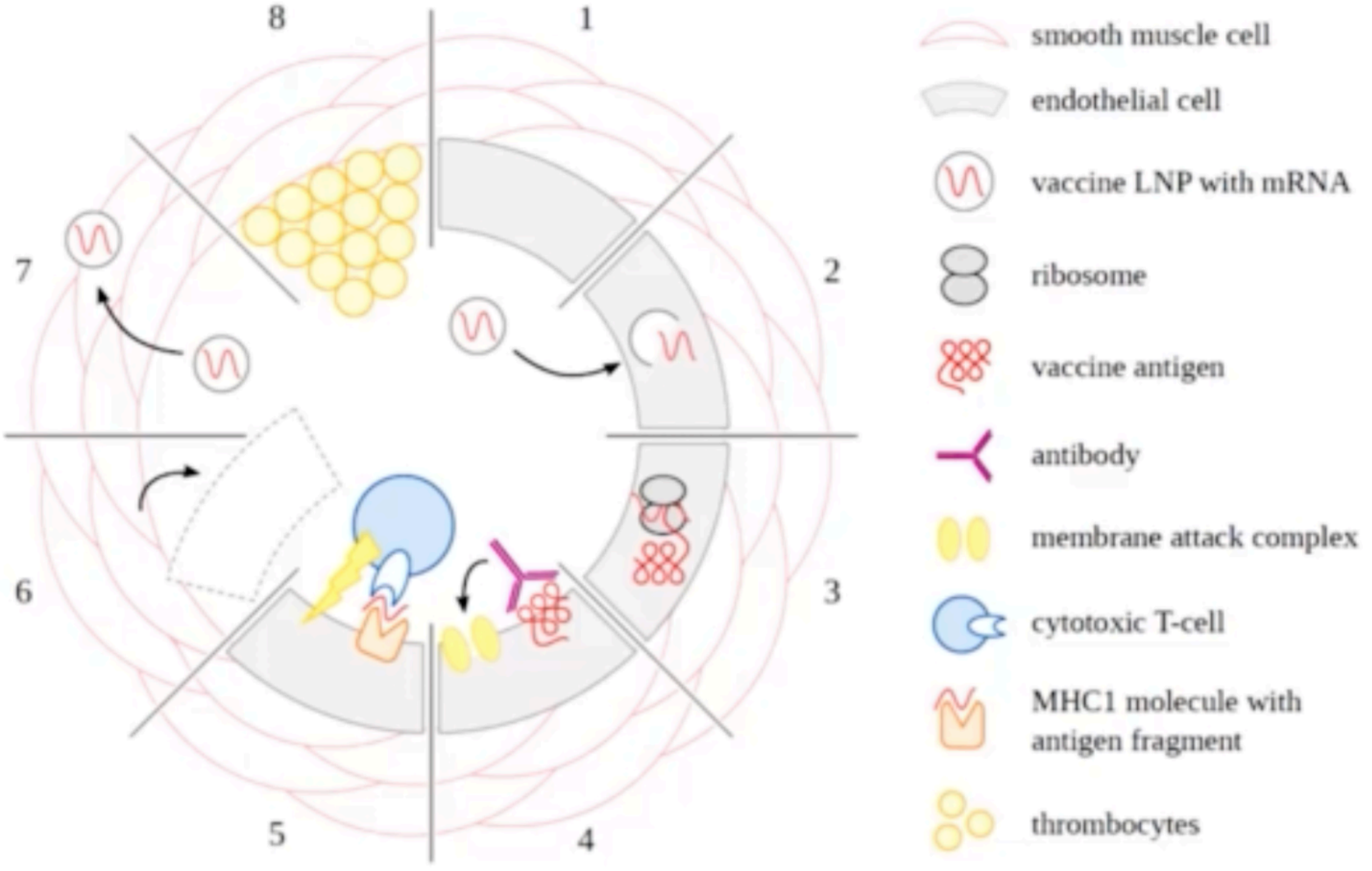
Adverse events following COVID-19 mRNA vaccines: A systematic review of cardiovascular complication, thrombosis, and thrombocytopenia

Farah Yasmin[1] | **Hala Najeeb**[1] | **Unaiza Naeem**[1] | **Abdul Moeed**[1] | **Abdul Raafe Atif**[1] | **Muhammad Sohaib Asghar**[2] | **Nayef Nimri**[3] | **Maryam Saleem**[3] | **Dhrubajyoti Bandyopadhyay**[4] | **Chayakrit Krittanawong**[5] | **Mohammed Mahmmoud Fadelallah Eljack**[6] | **Muhammad Junaid Tahir**[7] | **Fahad Waqar**[3]

Results

A total of 81 articles analyzed confirmed cardiovascular complications post-COVID-19 mRNA vaccines in 17,636 individuals and reported 284 deaths with any mRNA vaccine. Of 17,636 cardiovascular events with any mRNA vaccine, 17,192 were observed with the BNT162b2 (Pfizer–BioNTech) vaccine, 444 events with mRNA-1273 (Moderna). Thrombosis was frequently reported with any mRNA vaccine ($n = 13{,}936$), followed by stroke ($n = 758$), myocarditis ($n = 511$), myocardial infarction ($n = 377$), pulmonary embolism ($n = 301$), and arrhythmia ($n = 254$). Stratifying the results by vaccine type showed that thrombosis (80.8%) was common in the BNT162b2 cohort, while stroke (39.9%) was common with mRNA-1273 for any dose. The time between the vaccination dosage and the first symptom onset averaged 5.6 and 4.8 days with the mRNA-1273 vaccine and BNT162b2, respectively. The mRNA-1273 cohort reported 56 deaths compared to the 228 with BNT162b2, while the rest were discharged or transferred to the ICU.

Immunological mechansims of harm by mRNA vaccines



smooth muscle cell

endothelial cell

vaccine LNP with mRNA

ribosome

vaccine antigen

antibody

membrane attack complex

cytotoxic T-cell

MHC1 molecule with antigen fragment

thrombocytes

Soruce: Dr. Sucharit Bhakdi

More than **3,500** published case reports and case series of Covid-19 vaccine injuries.

Total case reports	**3,598**
Myo/pericarditis	436
Hematological	715
Dermatological	603
Immune / Misc.	1,080
Neurological	634
Lymphadenopathy	130

Link to 3,598 Case Reports

Additional source: https://www.react19.org/science

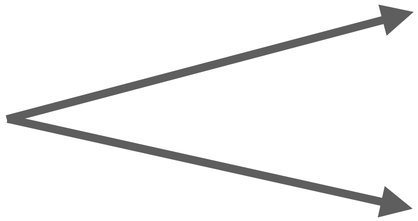
75 Autopsies
Show Distribution and Cytotoxicity

Professor Arne Burkhardt, a German pathologist, and 10 international colleagues performed second opinion autopsies on 75 people who died after modRNA vaccination.

Of the 75, 31 had been broadly judged cardiac deaths. Burkhardt et al found both Spike protein (specifically from modRNA vaccines) and lymphocytic infiltration of the damaged heart and surrounding tissues in all 31.

31

All 31 cardiac were ***vaccine-induced***



16 “microangiopathy” w stenosis / dissection

15 myopericarditis

https://rumble.com/v2jbj16-arne-burkhardt-presentation-to-the-ccca.html

75 Autopsies
Show Distribution and Cytotoxicity

“most alarming” is “destruction” and “obliteration” of large vessels, such as the aorta.

– Professor Arne Burkhardt

75 Autopsies
Show Distribution and Cytotoxicity

Burkhardt et al found vaccinal Spike protein and lymphocytes in the heart (myocardium, ventricles, vessels), brain, lungs, testes, large blood vessels, capillaries, skin, kidneys, lymph nodes and vessels, thyroid, prostate, and spleen.

Of the 75, they found 58 were likely caused by modRNA vaccine: 21 beyond reasonable doubt; 37 probable; 14 possible; 1 ruled out; 2 not evaluable.

21 beyond doubt

37 probable

14 possible

3 excluded / unevaluable

58 deaths

or

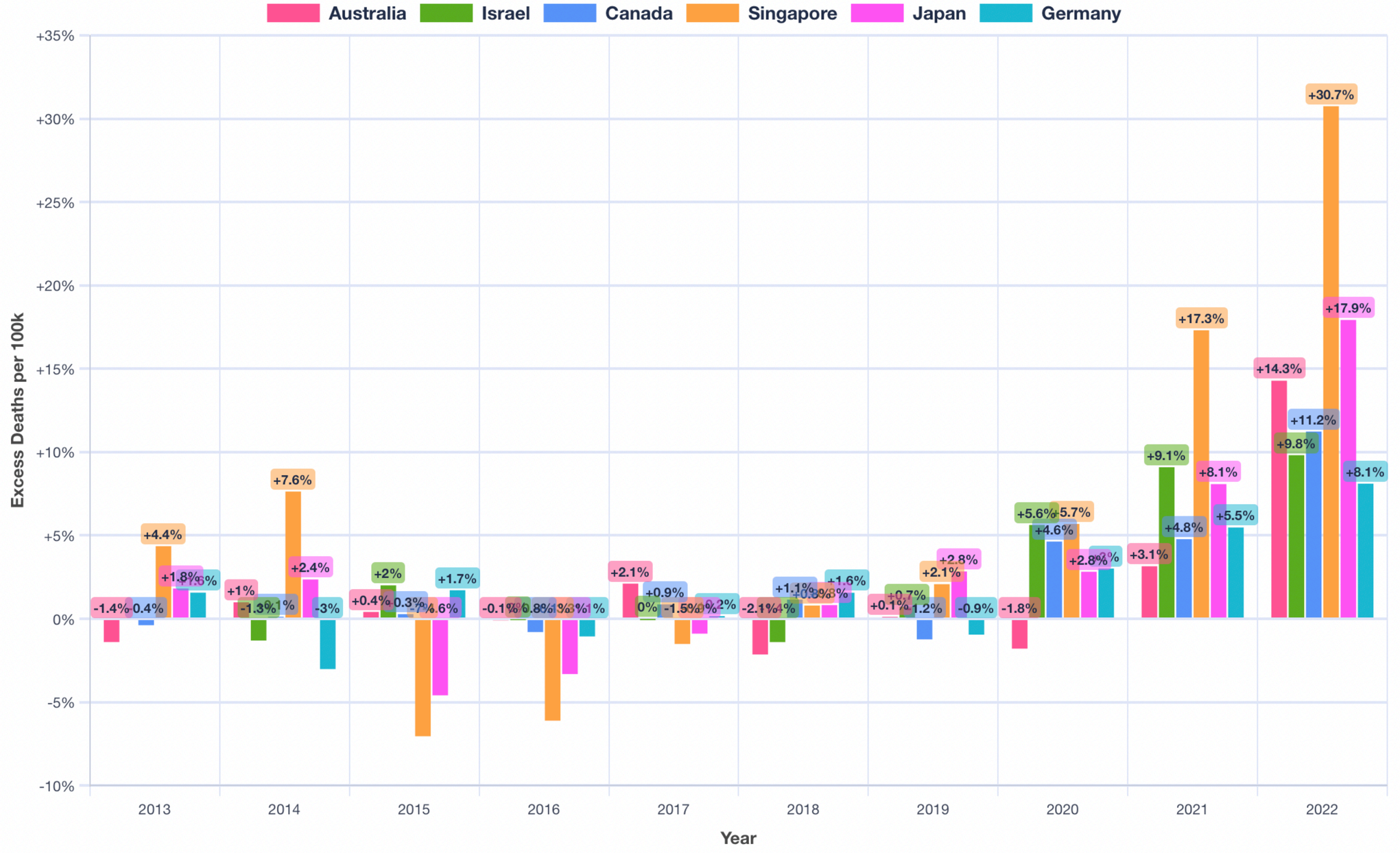
77%

likely caused by modRNA vaccine

https://rumble.com/v2jbj16-arne-burkhardt-presentation-to-the-ccca.html

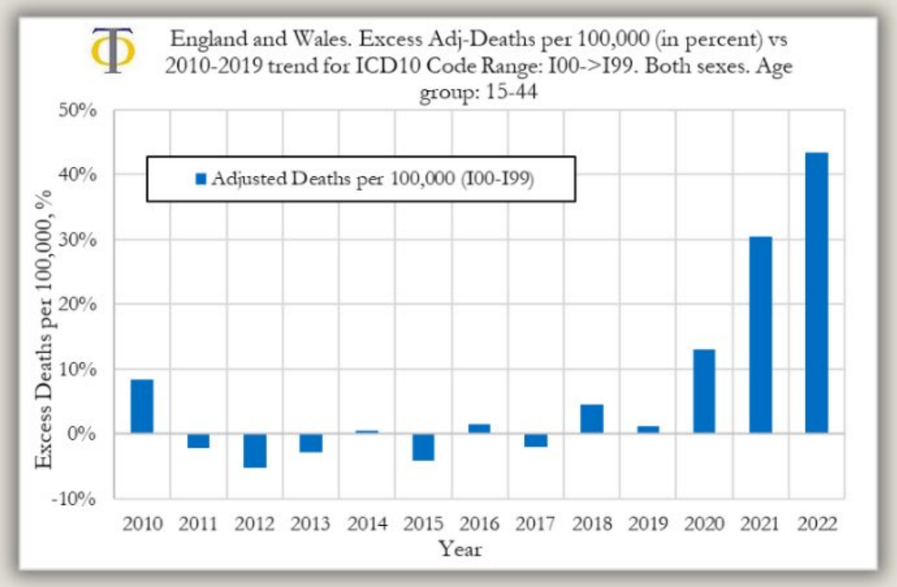
MORTALITY WATCH

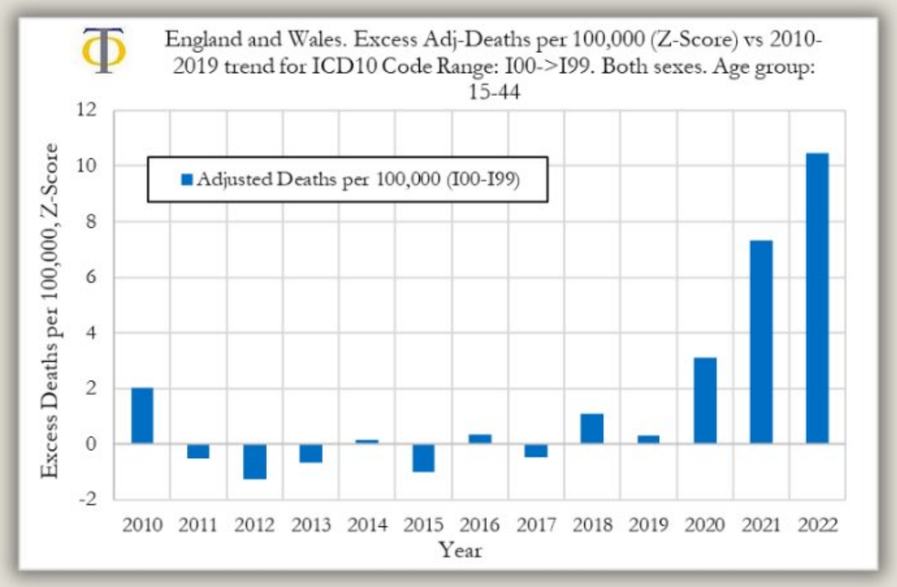
Crude Excess Mortality



Full analysis of this Humanity Project at phinancetechnologies.com. DIRECT LINK: bit.ly/UKCardio15-44

UK Death & Disability Analysis: Cardiovascular Diseases, Ages 15-44





Excess adjusted deaths rates for diseases of the circulatory system for ages 15 to 44, in England and Wales.

Left: Relative deviation from trend, percent.
Right: Deviation from trend Z-Score.

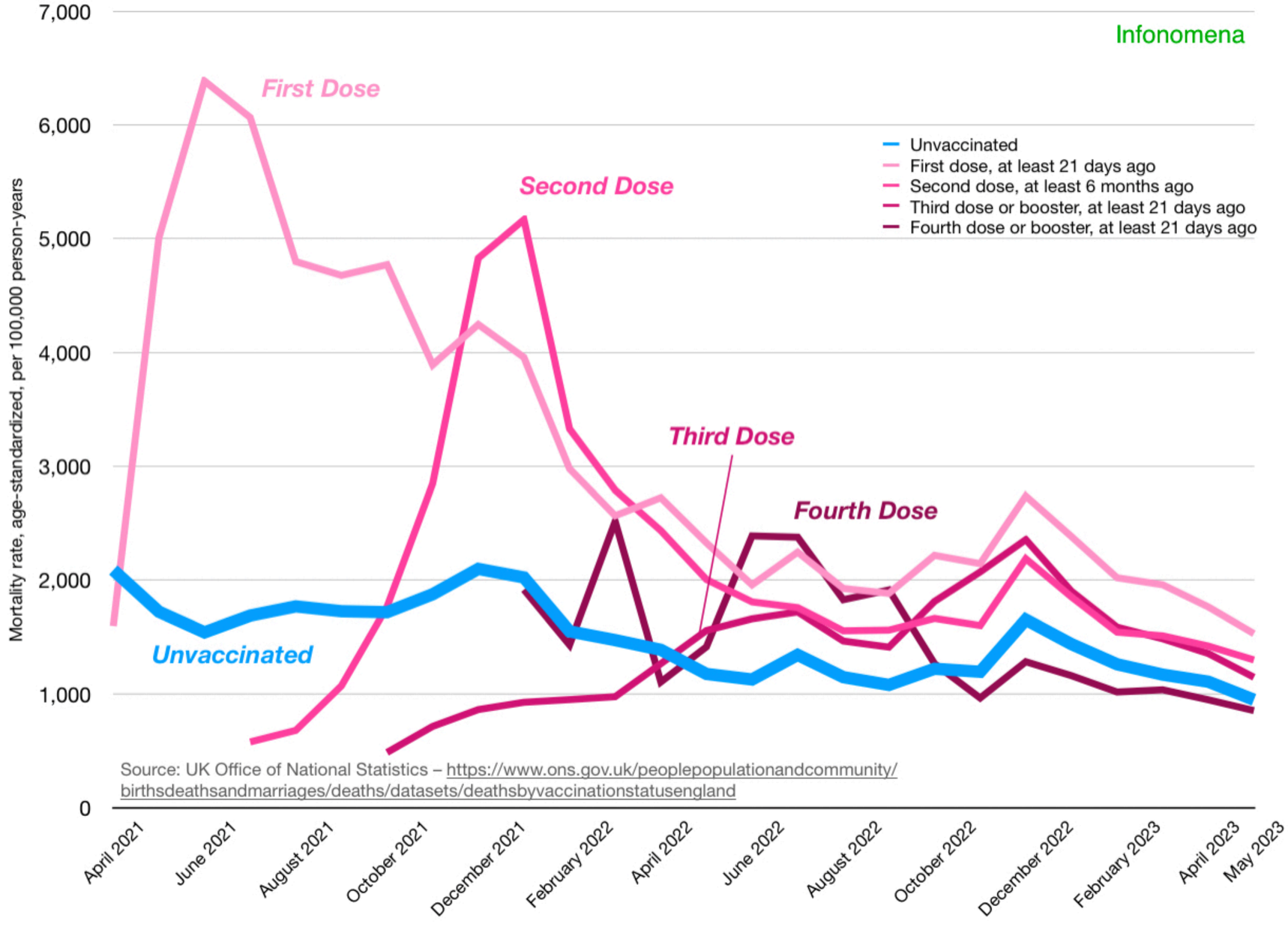
Data Source: UK Office of National Statistics (ONS)

Summary:

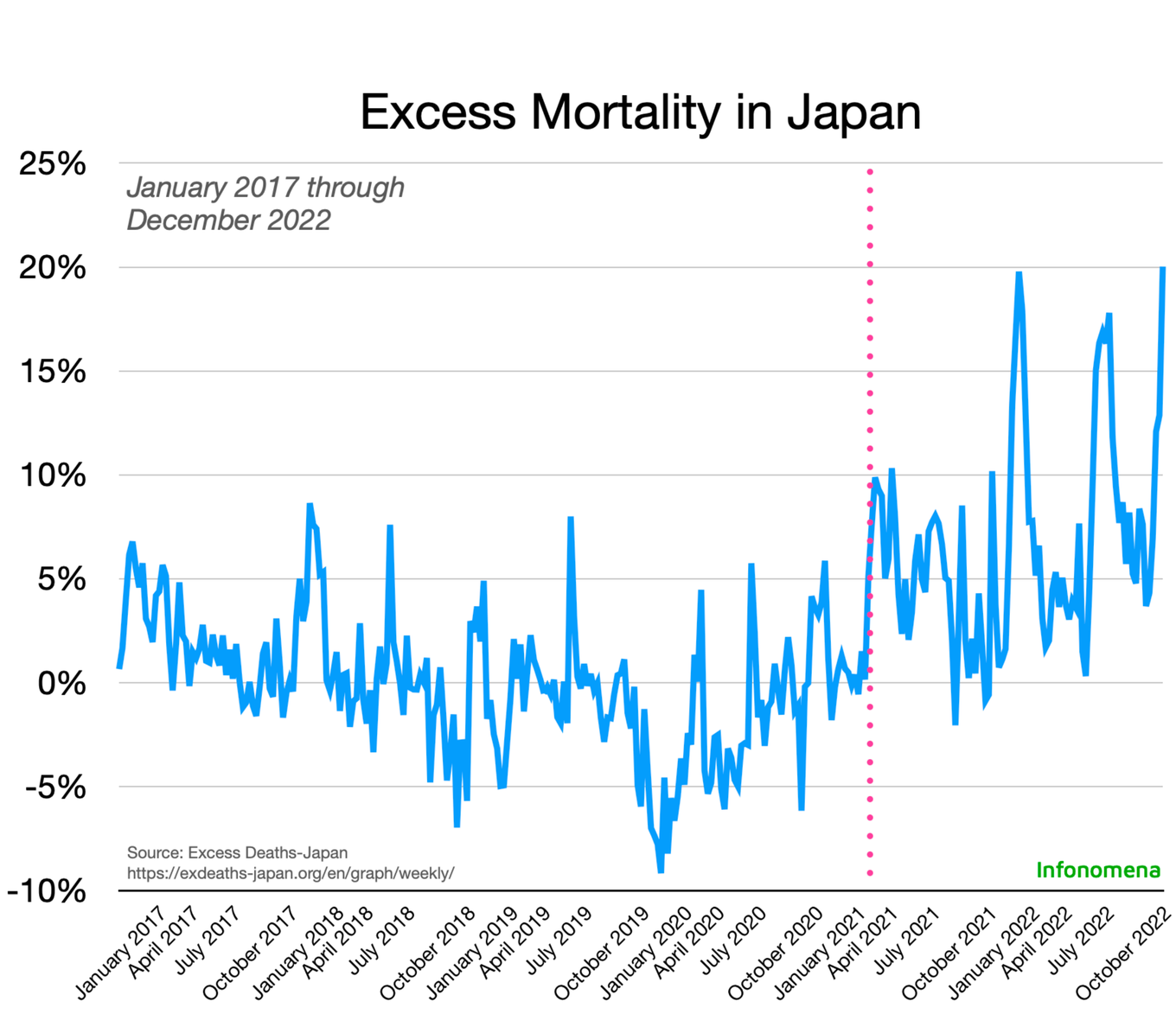
- Our analysis shows that the excess death rates from cardiovascular diseases rose by about 13% in 2020, 30% in 2021, and about 44% in 2022.
- The excess mortality from cardiovascular deaths in 2021 and 2022 are highly statistically significant with Z-scores of 7.5 and 10.5, respectively. These are very strong signals.
- These signals are corroborated by similar findings when measuring rises in the fraction of deaths from cardiovascular diseases relative to all other deaths with classified causes (see full report at phinancetechnologies.com).

Phinance Technologies

Mortality Rate in England by Covid Vaccination Status



Source: UK Office of National Statistics – https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/datasets/deathsbyvaccinationstatusengland


Excess Mortality in Japan
January 2017 through
December 2022
25%
20%
15%
10%
5%
0%
-5%
-10%
Source: Excess Deaths-Japan
https://exdeaths-japan.org/en/graph/weekly/
Infonomena
January 2017
April 2017
July 2017
October 2017
January 2018
April 2018
July 2018
October 2018
January 2019
April 2019
July 2019
October 2019
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October 2020
January 2021
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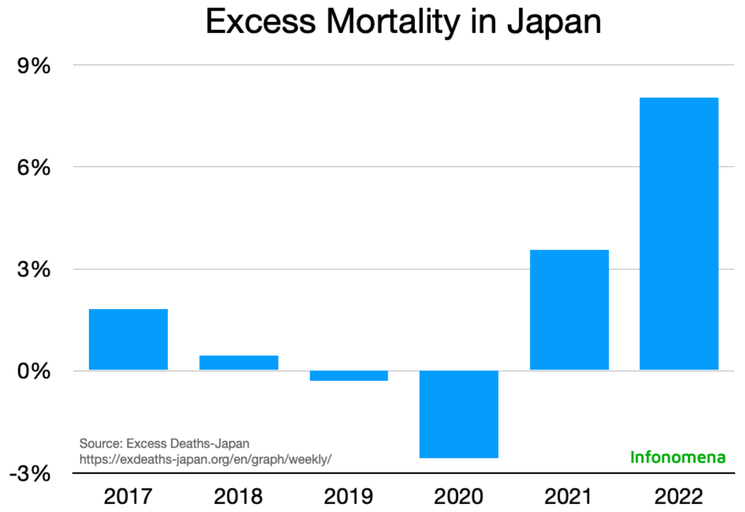
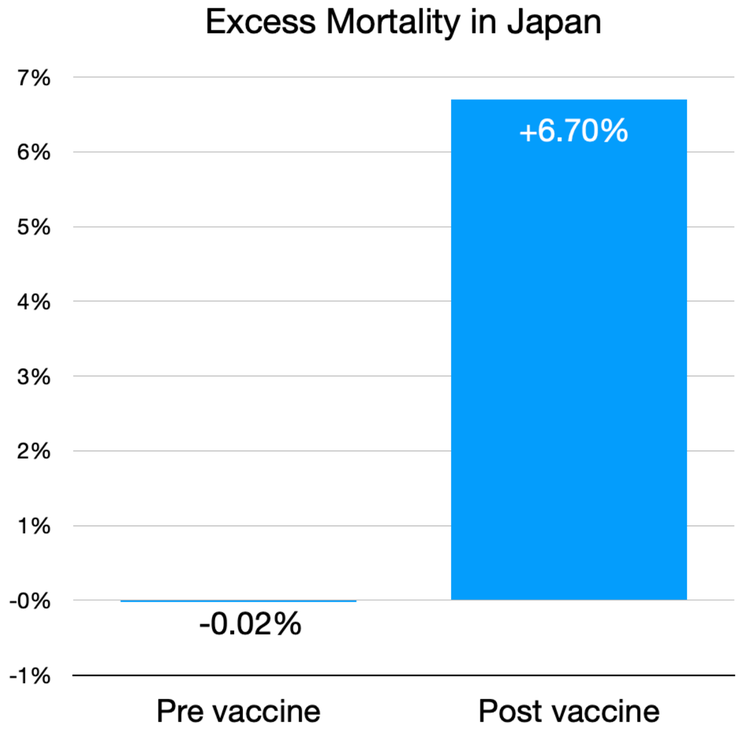
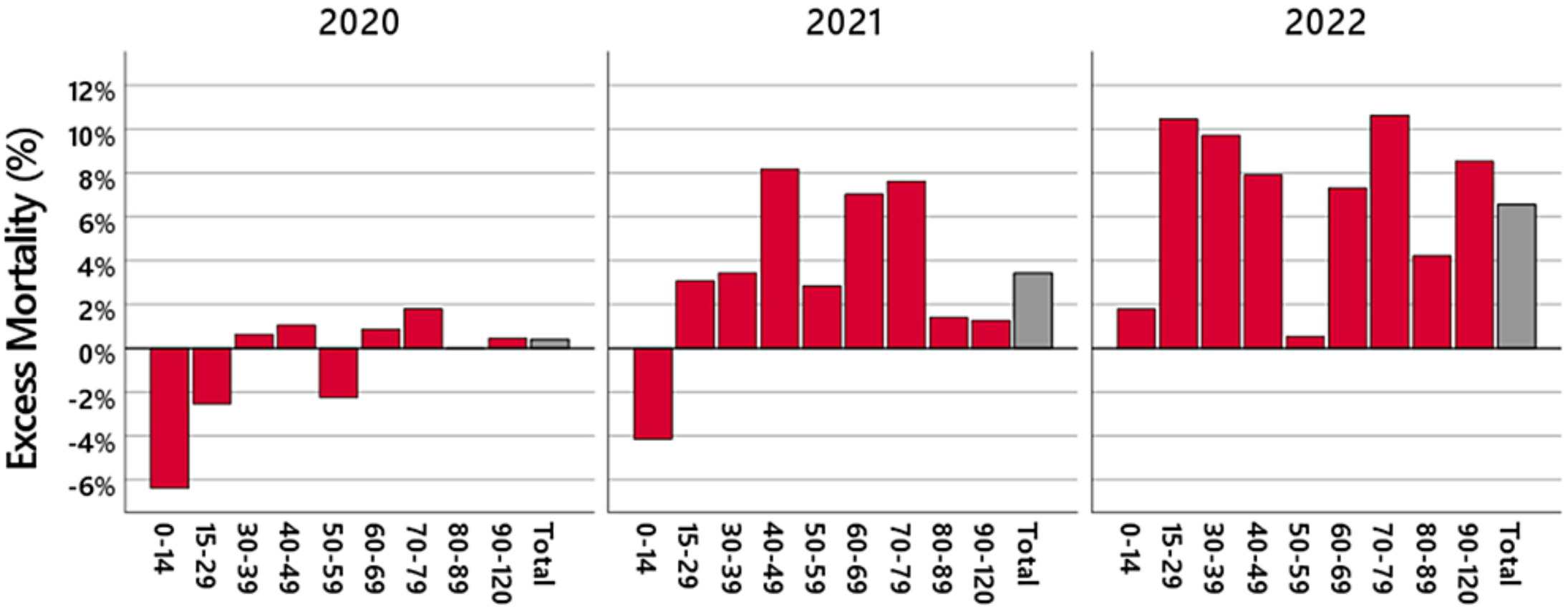
January 2022
April 2022
July 2022
October 2022


Excess Mortality in Japan
9%
6%
3%
0%
-3%
Source: Excess Deaths-Japan
https://exdeaths-japan.org/en/graph/weekly/
Infonomena
2017
2018
2019
2020
2021
2022


Excess Mortality in Japan
7%
6%
5%
4%
3%
2%
1%
-0%
-1%
+6.70%
-0.02%
Pre vaccine
Post vaccine

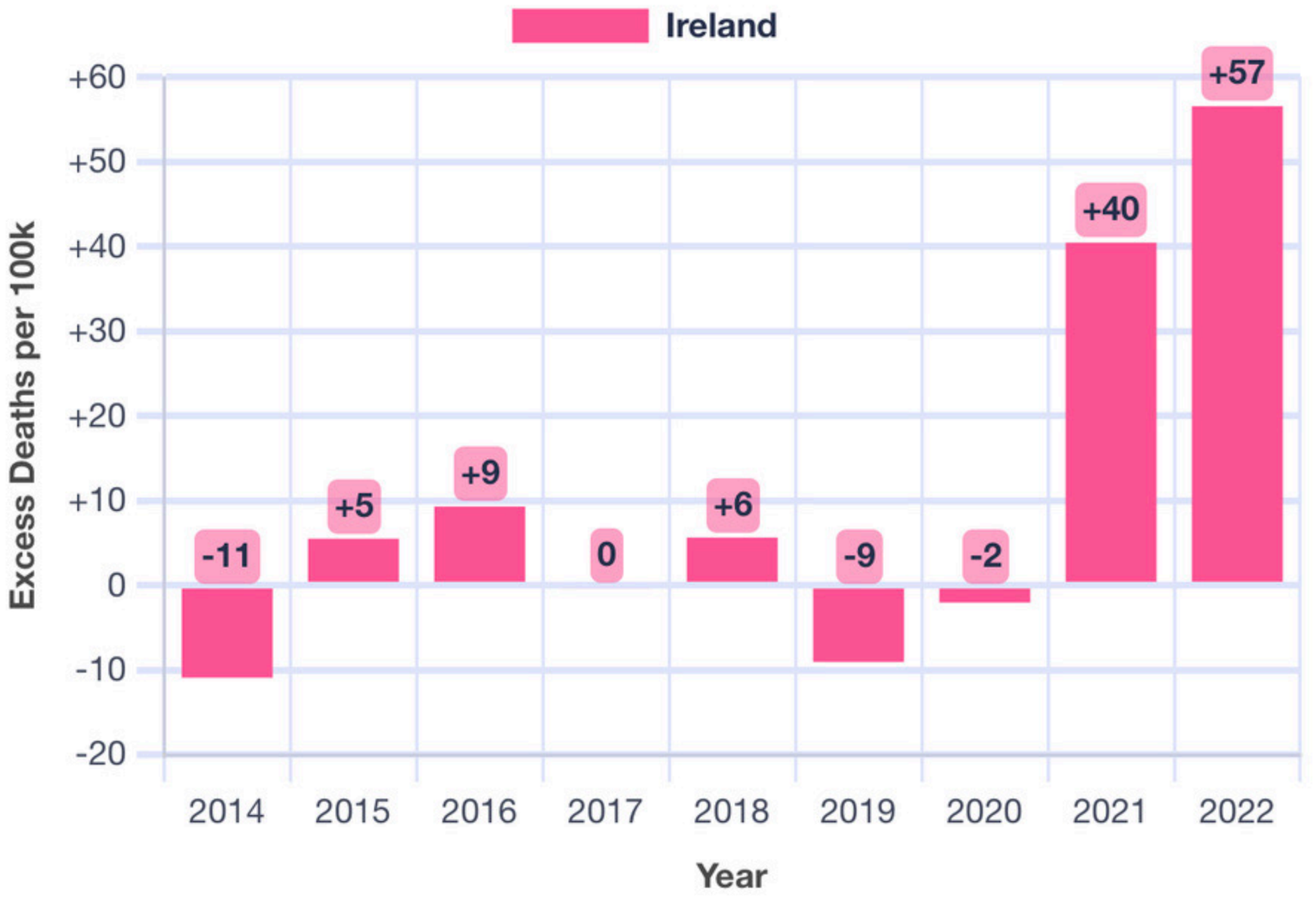
Excess Mortality in Germany



Source: Kuhbandner C, Reitzner M (May 23, 2023) Estimation of Excess Mortality in Germany During 2020-2022. Cureus 15(5): e39371. doi:10.7759/cureus.39371

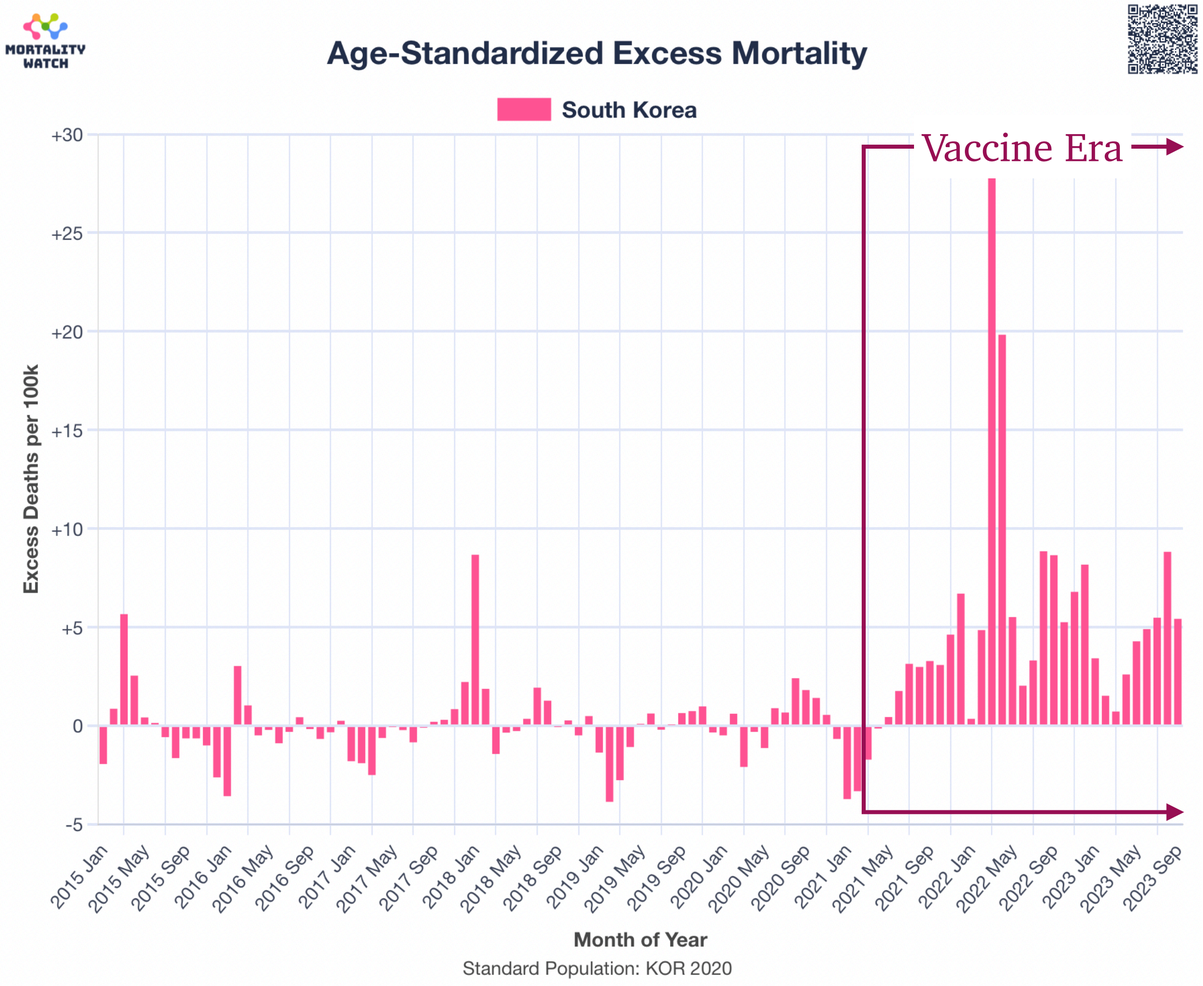
MORTALITY WATCH

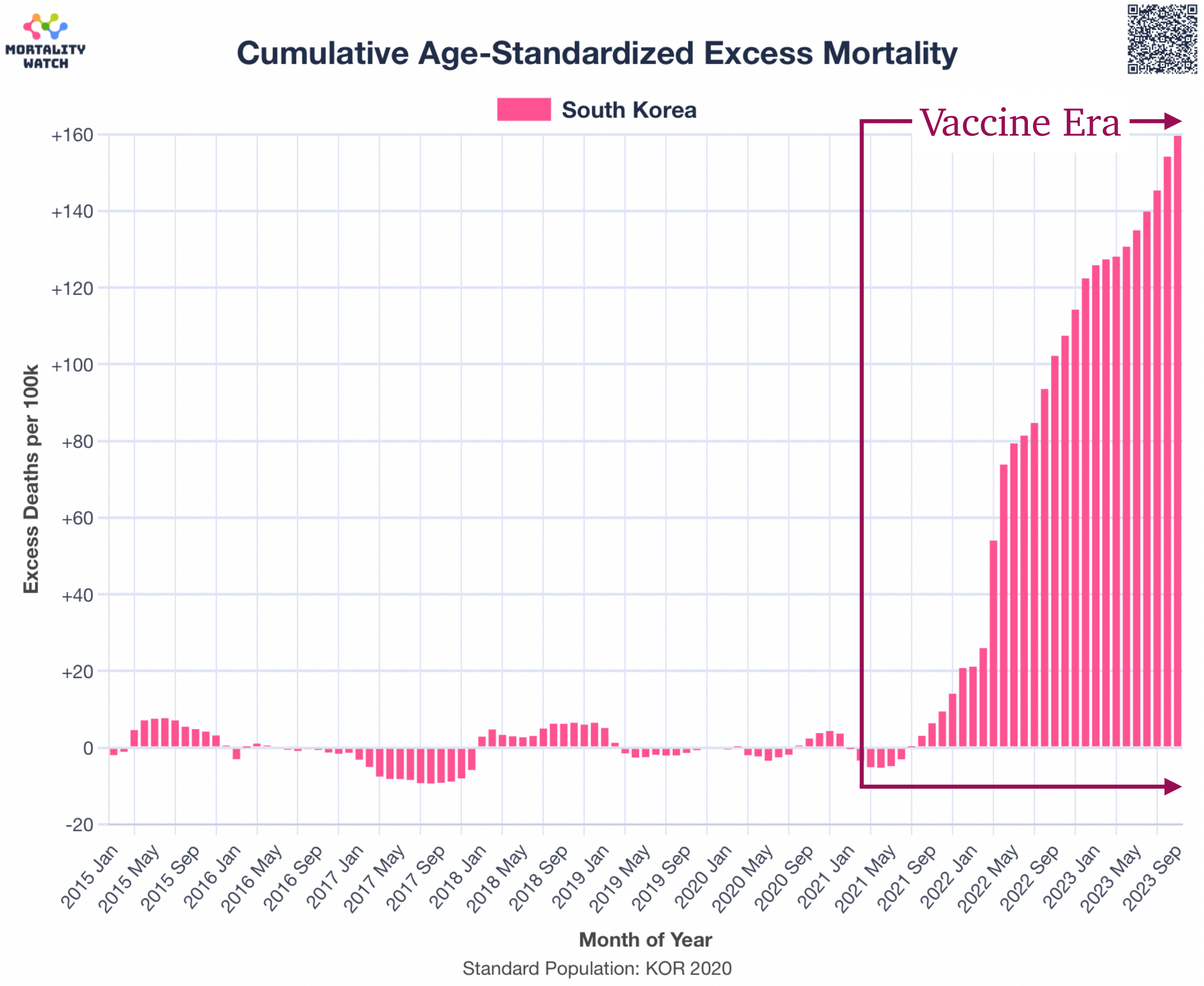
Crude Excess Mortality



January 1st - December 31st

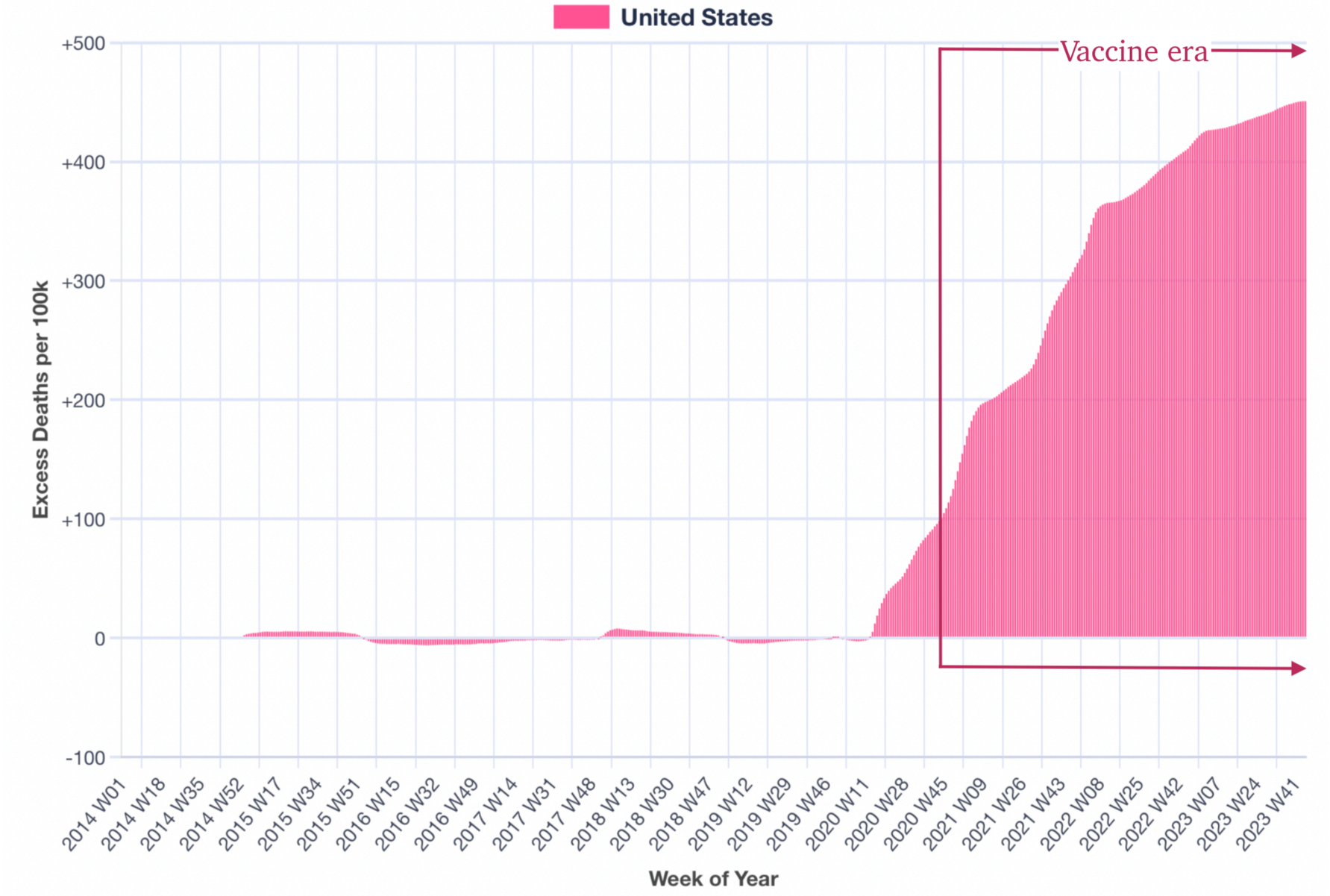
Excess Mortality in South Korea





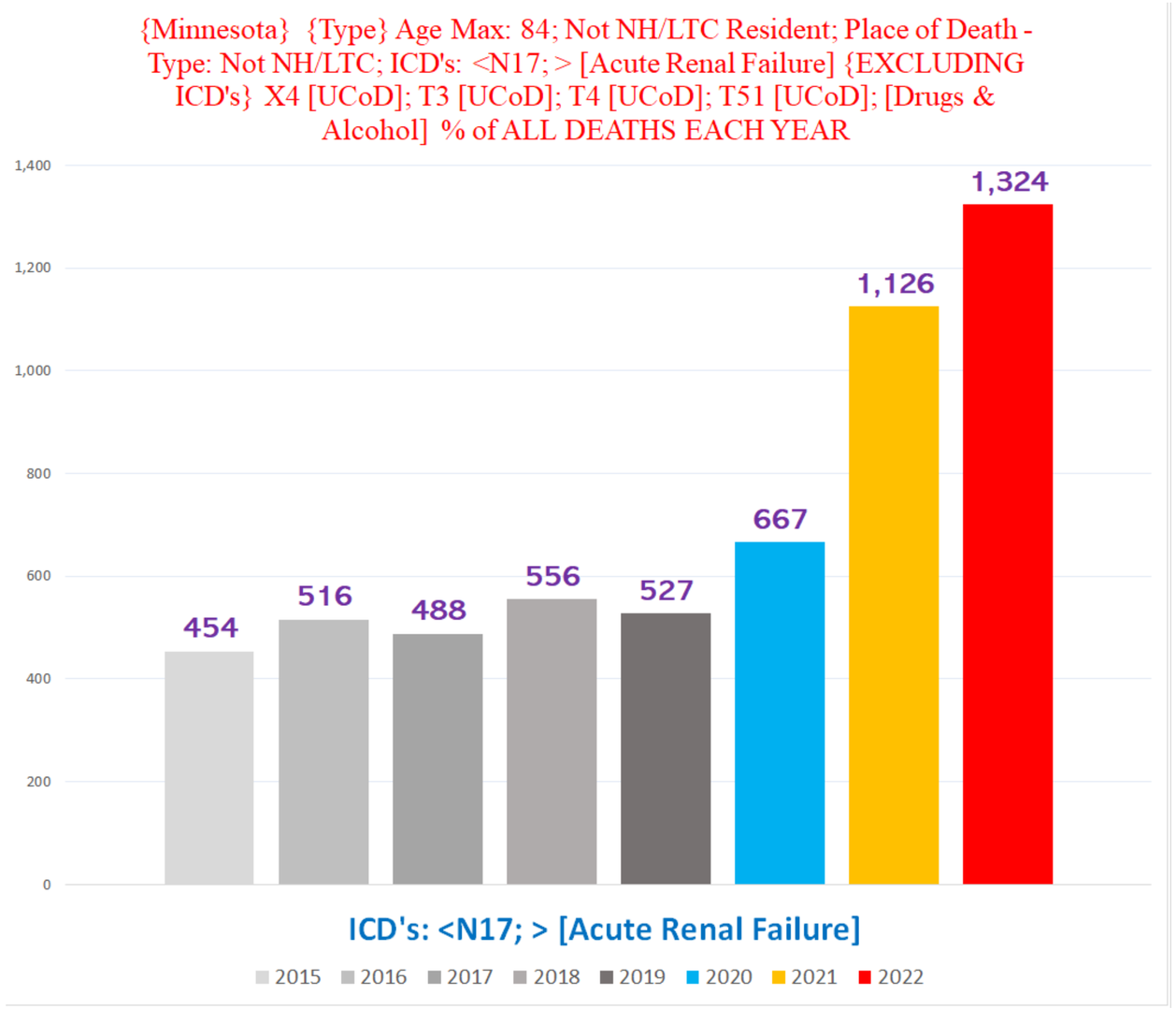
MORTALITY WATCH

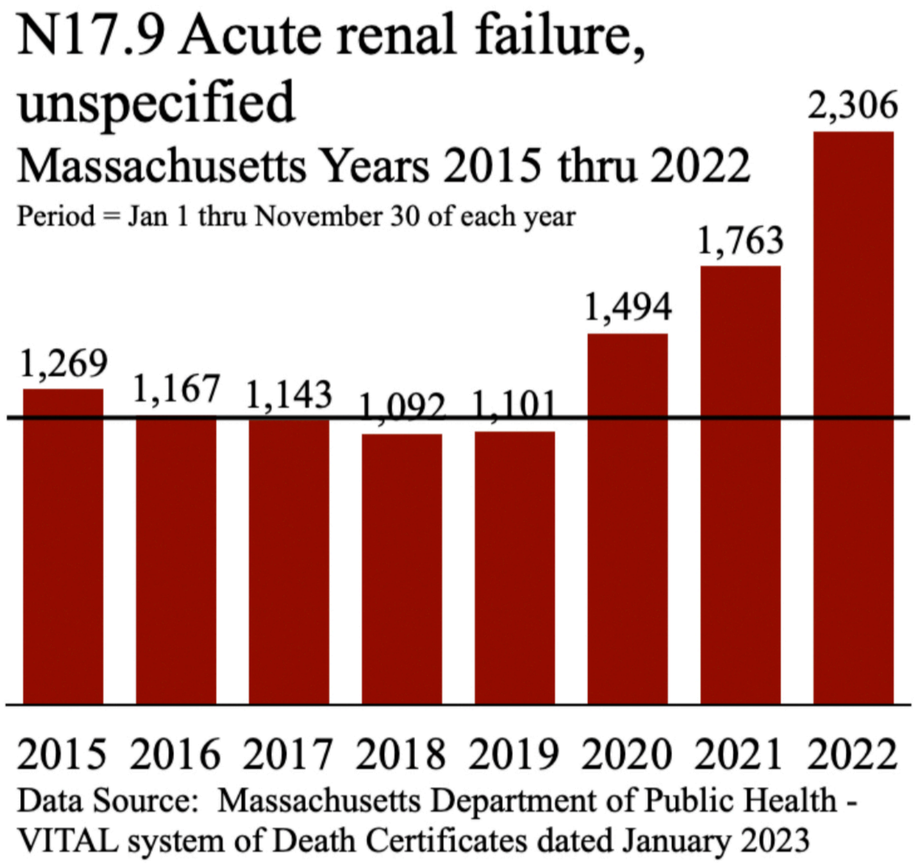
Cumulative Age-Standardized Excess Mortality



Standard Population: USA 2020

Accute renal failure in Minnesota and Massachusetts





~ 1,840 Excess Acute renal failure deaths from January 1, 2021 to November 30, 2022 in Massachusetts alone
54% Excess in 2021
100% Excess in 2022

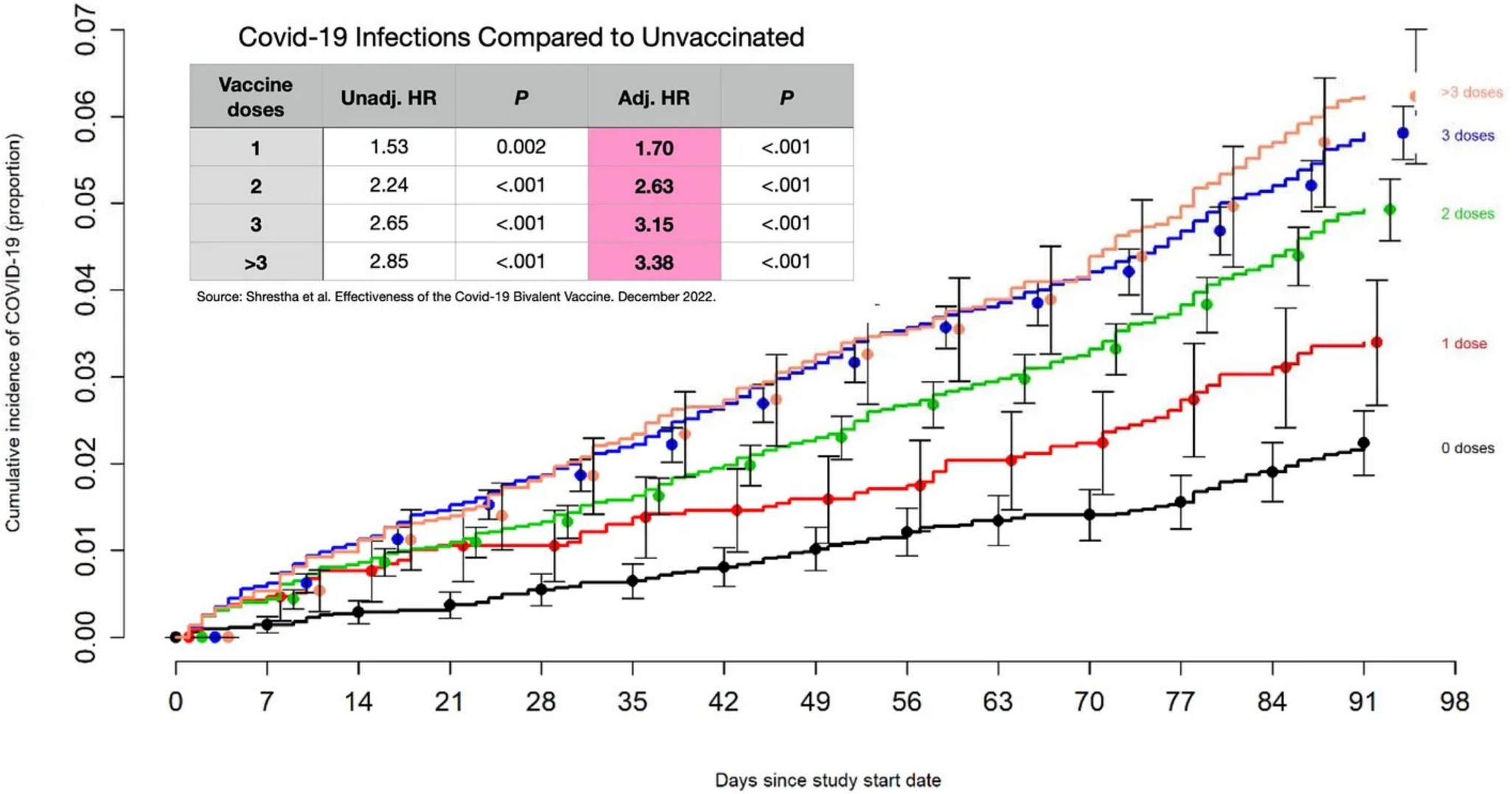
Source: John Beaudoin

More Vaccine Doses, More Covid-19 Infections

Covid-19 Infections Compared to Unvaccinated

Vaccine doses	Unadj. HR	*P*	Adj. HR	*P*
1	1.53	0.002	**1.70**	<.001
2	2.24	<.001	**2.63**	<.001
3	2.65	<.001	**3.15**	<.001
>3	2.85	<.001	**3.38**	<.001

Source: Shrestha et al. Effectiveness of the Covid-19 Bivalent Vaccine. December 2022.



The Cleveland Clinic followed 51,011 employees and found each vaccine dose “boosted” one’s chances of catching Covid.

“the mRNA in the vaccine is identical to the RNA in your cells.”

– Dr. Drew Weismann,
Nobel Prize 2023,
speaking in January 2021

1. Weismann won the Nobel Prize for altering the vaccine modRNA so it's ***NOT*** like human mRNA.

2. Natural mRNA breaks down quickly. Weismann and Kariko replaced 100% of uracils (U) with N1-methyl-pseudouridine (m1Ψ) to (a) reduce inflammation and (b) extend the mRNA's useful life – so it has time to make enough protein. This **synthetic modRNA** does not break down quickly like natural mRNA. It is not "identical."

3. The Nobel Committee insisted there can be no non-immediate adverse effects because mRNA is "transient."

4. But they just awarded the world's most prestigious prize specifically for making mRNA ***far less*** transient.

5. 100% m1Ψ substitution also interrupts ribosomal translation, producing off-target proteins.

“the RNA is degraded, probably within a week, it’s completely gone.”

– Dr. Drew Weismann,
Nobel Prize 2023,
speaking in January 2021

Vaccine mRNA and Spike can persist for at least 2 to 6 months

Received: 29 April 2023 | Revised: 29 July 2023 | Accepted: 15 August 2023

DOI: 10.1002/prca.202300048

Proteomics Clinical Applications

RAPID COMMUNICATION

Detection of recombinant Spike protein in the blood of individuals vaccinated against SARS-CoV-2: Possible molecular mechanisms

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[2]ISB–Ion Source & Biotechnologies Srl, Bresso, Italy

[3]Marsanconsulting Srl. Public Health Company, Napoli, Italy

[4]Andrology Unit and Service of LifeStyle Medicine in Uro-Andrology, Local Health Authority (ASL) Salerno, Salerno, Italy

[5]Long COVID-19 Foundation, Brookfield Court, Garforth, UK

[6]Department of Emergency Medicine, Royal Sussex County Hospital, University Hospitals Sussex, Brighton, UK

[7]Department of Biology, University of Naples Federico II, Napoli, Italy

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Email: marina.piscopo@unina.it

Carlo Brogna, Department of Research, Craniomed group facility Srl, Bresso, 20091, Italy.
Email: dir.brogna@craniomed.it

Abstract

Purpose: The SARS-CoV-2 pandemic prompted the development and use of next-generation vaccines. Among these, mRNA-based vaccines consist of injectable solutions of mRNA encoding for a recombinant Spike, which is distinguishable from the wild-type protein due to specific amino acid variations introduced to maintain the protein in a prefused state. This work presents a proteomic approach to reveal the presence of recombinant Spike protein in vaccinated subjects regardless of antibody titer.

Experimental design: Mass spectrometry examination of biological samples was used to detect the presence of specific fragments of recombinant Spike protein in subjects who received mRNA-based vaccines.

Results: The specific PP-Spike fragment was found in 50% of the biological samples analyzed, and its presence was independent of the SARS-CoV-2 IgG antibody titer. The minimum and maximum time at which PP-Spike was detected after vaccination was 69 and 187 days, respectively.

Conclusions and clinical relevance: The presented method allows to evaluate the half-life of the Spike protein molecule "PP" and to consider the risks or benefits in continuing to administer additional booster doses of the SARS-CoV-2 mRNA vaccine. This approach is of valuable support to complement antibody level monitoring and represents the first proteomic detection of recombinant Spike in vaccinated subjects.

Cell

CellPress OPEN ACCESS

Article

Immune imprinting, breadth of variant recognition, and germinal center response in human SARS-CoV-2 infection and vaccination

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SUMMARY

During the SARS-CoV-2 pandemic, novel and traditional vaccine strategies have been deployed globally. We investigated whether antibodies stimulated by mRNA vaccination (BNT162b2), including third-dose boosting, differ from those generated by infection or adenoviral (ChAdOx1-S and Gam-COVID-Vac) or inactivated viral (BBIBP-CorV) vaccines. We analyzed human lymph nodes after infection or mRNA vaccination for correlates of serological differences. Antibody breadth against viral variants is lower after infection compared with all vaccines evaluated but improves over several months. Viral variant infection elicits variant-specific antibodies, but prior mRNA vaccination imprints serological responses toward Wuhan-Hu-1 rather than variant antigens. In contrast to disrupted germinal centers (GCs) in lymph nodes during infection, mRNA vaccination stimulates robust GCs containing vaccine mRNA and spike antigen up to 8 weeks postvaccination in some cases. SARS-CoV-2 antibody specificity, breadth, and maturation are affected by imprinting from exposure history and distinct histological and antigenic contexts in infection compared with vaccination.

Vaccine mRNA in breast milk

JAMA Pediatrics

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Research Letter

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September 26, 2022

Detection of Messenger RNA COVID-19 Vaccines in Human Breast Milk

Nazeeh Hanna, MD[1]; Ari Heffes-Doon, MD[1]; Xinhua Lin, PhD[2]; et al

» Author Affiliations | Article Information

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Vaccine mRNA in placenta and cord blood

Transplacental transmission of the COVID-19 vaccine messenger RNA: evidence from placental, maternal, and cord blood analyses postvaccination

RESULTS: The vaccine mRNA was detected in the 2 placentas evaluated (Table) using quantitative ddPCR and ISH. The localization of the vaccine mRNA was mainly in the villus stroma (Figure 1B and D) with a notably high signal in the decidua of patient 1 (Figure 1A) when compared with that of patient 2 (Figure 1C). Using WES, the spike protein expression was detected in the placenta of patient 2, but not in patient 1 as demonstrated in the Figure 2A. Furthermore, the vaccine mRNA was detected in the umbilical cord and maternal blood of patient 1 using ddPCR (Table). Unfortunately, no umbilical cord or maternal blood samples were available for analysis for patient 2. Finally, the integrity of the vaccine mRNA varied across different samples. In the placentas, 23% and 42% of the original integrity were retained in patients 1 and 2, respectively (Table). The vaccine mRNA in the maternal blood showed a high integrity level of 85%; however, in the umbilical cord blood, it decreased to 13% of the original vaccine mRNA' integrity (Figure 2C and D).

CONCLUSION: Our findings suggest that the vaccine mRNA is not localized to the injection site and can spread systemically to the placenta and umbilical cord blood. The detection of the spike protein in the placental tissue indicates the bioactivity of the vaccine mRNA that reach the placenta. Notably, the vaccine mRNA was largely fragmented in the umbilical cord blood and, to a lesser extent, in the placenta. These 2 cases demonstrate the ability of the COVID-19

m1Ψ causes frameshifting, potential autoimmunity

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Article | Open access | Published: 06 December 2023

N^1-methylpseudouridylation of mRNA causes +1 ribosomal frameshifting

Thomas E. Mulroney, Tuija Pöyry, Juan Carlos Yam-Puc, Maria Rust, Robert F. Harvey, Lajos Kalmar, Emily Horner, Lucy Booth, Alexander P. Ferreira, Mark Stoneley, Ritwick Sawarkar, Alexander J. Mentzer, Kathryn S. Lilley, C. Mark Smales, Tobias von der Haar, Lance Turtle, Susanna Dunachie, Paul Klenerman, James E. D. Thaventhiran ✉ & Anne E. Willis ✉

Nature (2023) | Cite this article

Abstract

In vitro-transcribed (IVT) mRNAs are modalities that can combat human disease, exemplified by their use as vaccines for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). IVT mRNAs are transfected into target cells, where they are translated into recombinant protein, and the biological activity or immunogenicity of the encoded protein exerts an intended therapeutic effect[1,2]. Modified ribonucleotides are commonly incorporated into therapeutic IVT mRNAs to decrease their innate immunogenicity[3,4,5], but their effects on mRNA translation fidelity have not been fully explored. Here we demonstrate that incorporation of N^1-methylpseudouridine into mRNA results in +1 ribosomal frameshifting in vitro and that cellular immunity in mice and humans to +1 frameshifted products from BNT162b2 vaccine mRNA translation occurs after vaccination. The +1 ribosome frameshifting observed is probably a consequence of N^1-methylpseudouridine-induced ribosome stalling during IVT mRNA translation, with frameshifting occurring at ribosome slippery sequences. However, we demonstrate that synonymous targeting of such slippery sequences provides an effective strategy to reduce the production of frameshifted products. Overall, these data increase our understanding of how modified ribonucleotides affect the fidelity of mRNA translation, and although there are no adverse outcomes reported from mistranslation of mRNA-based SARS-CoV-2 vaccines in humans, these data highlight potential off-target effects for future mRNA-based therapeutics and demonstrate the requirement for sequence optimization.

“the vaccine doesn’t affect your DNA.”

– Dr. Drew Weismann,
Nobel Prize 2023,
speaking in January 2021

DNA contamination

In early 2023, Kevin McKernan discovered large amounts of DNA contamination in the modRNA Covid-19 vaccines, both Pfizer/BNT and Moderna. He also found the SV40 enhancer/promoter sequence in Pfizer/BNT, which Pfizer/BNT did not disclose to regulators. Numerous labs around the world have now confirmed McKernan's results. Moderna's own patents acknowledge the "insertional mutagenesis" risk of DNA plasmid contamination from the E. coli manufacturing process. LNP packaging makes previous FDA amount limits on DNA obsolete.

In early 2024, McKernan preliminarily found chromosomal integration of DNA from the modRNA vaccines in human cell lines. See summary in 12 minute presentation here: https://x.com/TheChiefNerd/status/1761129932929868192?s=20.

Nepetalactone Newsletter

Deep sequencing of the Moderna and Pfizer bivalent vaccines identifies contamination of expression vectors designed for plasmid amplification in bacteria

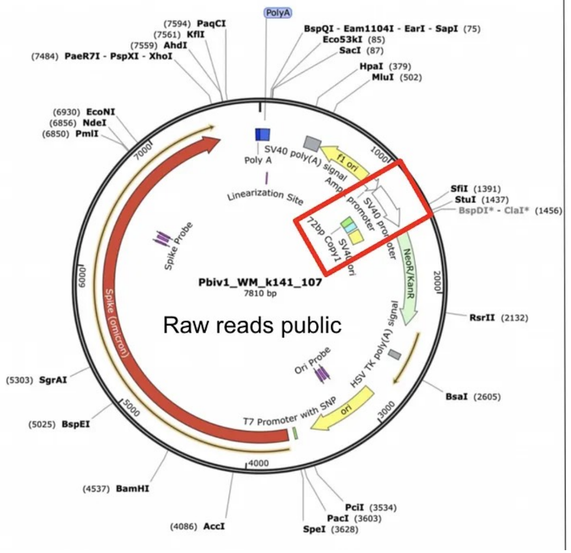
ANANDAMIDE
FEB 15, 2023

https://anandamide.substack.com/p/curious-kittens

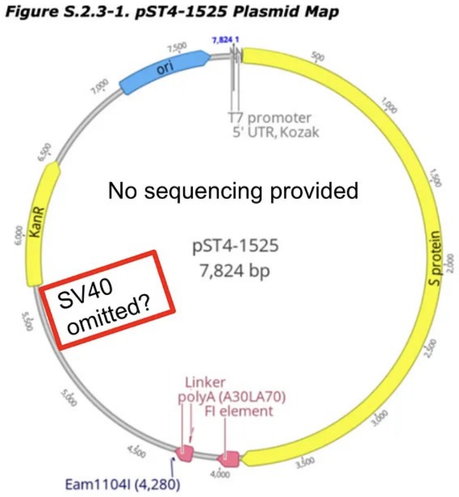
Source: Kevin McKernan

https://anandamide.substack.com/p/vaccine-targeted-qpcr-of-cancer-cell

Independent Illumina sequencing

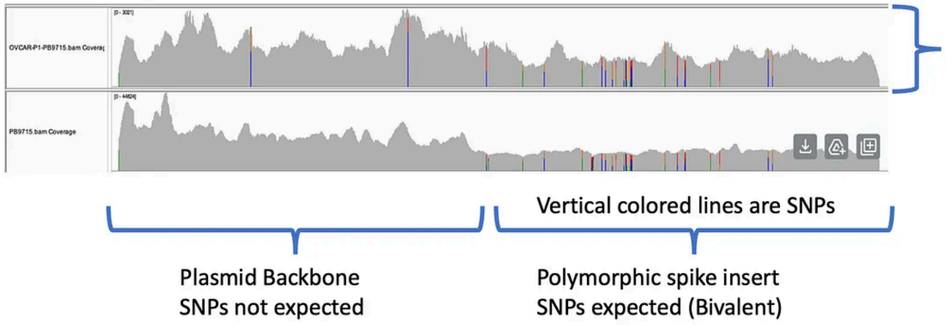


What was disclosed to the EMA



The sequence of the vaccine in the cells has a few SNPs in the plasmid backbone that don't exist in the direct sequencing of the vaccine itself.

The left half side of the IGV plot is the vector. The right side we expect SNPs as the Pbiv reference was constructed from a bivalent vaccine which was condensed into one homozygous consensus reference.
The top track is the vax in OvCar.
The bottom is the vax alone.



“The Pfizer mRNA vaccine is contaminated with the plasmid DNA vector…”

“Each shot has about 200 billion pieces of genomic DNA encapsulated in the lipid nanoparticle.”

“I have transfected billions of cells with DNA fragments during my career and I have an informed intuitive sense (based on data and experience) for the in vivo cancer risks posed by low level DNA contamination in these [modRNA] products. I suspect the risk is similar to smoking and lung cancer or excessive sun exposure and melanoma.”

“About 7% of cells transfected with linear pieces of DNA stably integrate said DNA into their genomes.”

– Dr. Phillip Buckhaults
University of South Carolina

https://rumble.com/v3kcmr4-dr.-phillip-buckhaults-testimony-on-dna-contamination-in-pfizers-mrna-vacci.html

Integration of coronavirus vaccine contaminated DNA into human cell line genome

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Hiroshi Arakawa
March 4, 2024 04:09

The essence of the problem with contaminated DNA in coronavirus vaccines is their potential to modify the human genome. To test this possibility, Dr. Ulrike Kaemmerer conducted an experiment in which corona vaccines were administered to MCF7 and OVCAR-3 cancer cell lines. Dr. McKernan, who was consulted by Dr. Kaemmerer, conducted an experiment to detect contaminant DNA from these cell lines. He reports on his blog the first case of contaminating DNA integration into the genome of a cancer cell line. I was interested in this, so I decided to re-analyze the DNA recombination event that Dr. McKernan had identified. In this article, we will also introduce the analysis results.

Independent analysis from Hiroshi Arakawa in Japan supports preliminary finding of ***potential*** genomic integration.

Now, what follows is my own re-analysis.

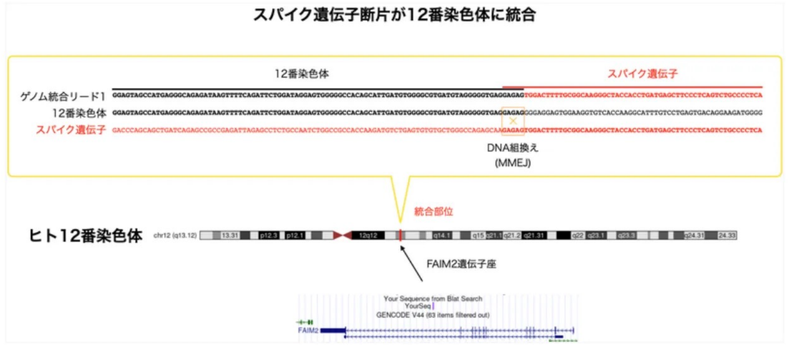

Figure 3

The top of the array in Figure 3 is the read. If you align this read with chromosome 12 (black) and the spike gene of the Pfizer coronavirus vaccine (red), you can see that chromosome 12 (black) is switched to the spike gene (red) in the middle of the read. And there is a short identical sequence (in this case GAGAG) where it switches. It can be seen that the contaminated DNA and the human genome were recombined by microhomology-mediated end joining (MMEJ). Since MMEJ involves multiple DNA repair enzymes within the cell, this recombination is not an in vitro artifact (erroneous product), and the genetic recombination is thought to have occurred within the cell.

Although the genome integrations observed here are the first two in experiments using cultured cells, the specific identification of the recombinant sequences of contaminated DNA with the human genome is a major advance. Further verification experiments will likely continue in the future. It is not known at which gene loci on the genome the genome integration shown in Figure 6 actually occurs. This is truly a "shotgun attack on the genome." What happens in cultured cells can also occur in normal cells, and a wide variety of abnormalities can occur depending on the site of genome integration. The first predicted abnormality is the induction of cancer or malignant transformation. Various genetic diseases then become apparent over a long period of time.

Factors known to cause genome damage include, for example, radiation exposure, but genome modification by contaminated DNA is due to artificially created gene fragments, and is different from random mutations caused by radiation. are different. This experiment using cultured cells can be said to be a microcosm of genome integration of contaminated DNA. The reality is that "transfection experiments with contaminated DNA" have been carried out on vast numbers of people around the world in the name of vaccination. Human genome modification is the most serious cause of harm caused by mRNA drugs, and in the future it will probably be etched in history as humanity's "original sin."

Autoimmunity

Hundreds of published case reports demonstrate large numbers of diverse autoimmune conditions induced by modRNA vaccines.

vaccines

MDPI

Case Report

Graves' Disease after mRNA COVID-19 Vaccination, with the Presence of Autoimmune Antibodies Even One Year Later

Fuminori Nakamura [1], Toru Awaya [1,*], Masahiro Ohira [2], Yoshinari Enomoto [1], Masao Moroi [1] and Masato Nakamura [1]

ELSEVIER

Therapies

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Letter to Editor

Autoimmune hepatitis following mRNA COVID-19 vaccine ☆

Ahmed Zaiem [a b], Khouloud Ferchichi [b], Ghozlane Lakhoua [a b], Widd Kaabi [a b], Imen Aouinti [a b], Sana Rebii Debbiche [a], Sarrah Kastalli [a b], Lamia Kallel [c], Ons Charfi [a b], Sihem El Aidli [a b]

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PMCID: PMC8575550

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Adult-onset Still's disease following mRNA COVID-19 vaccination

Amir Sharabi,[a,b,*,1] Shachaf Shiber,[a,1] and Yair Molad[a]

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We report two cases of severe adult-onset Still's disease (AOSD) that presented shortly after receiving the BNT162b2 mRNA Covid-19 Vaccine (Pfizer).

Insights into new-onset autoimmune diseases after COVID-19 vaccination

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ABSTRACT

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has resulted in more than 670 million infections and almost 7 million deaths globally. The emergence of numerous SARS-CoV-2 has heightened public concern regarding the future course of the epidemic. Currently, the SARS-CoV-2 Omicron variant has rapidly become globally dominant in the COVID-19 pandemic due to its high infectivity and immune evasion. Consequently, vaccination implementation is critically significant. However, growing evidence suggests that COVID-19 vaccination may cause new-onset autoimmune diseases, including autoimmune glomerulonephritis, autoimmune rheumatic diseases, and autoimmune hepatitis. Nevertheless, the causal relationship between COVID-19 vaccines and these autoimmune diseases remains to be demonstrated. In this review, we provide evidence that vaccination induces autoimmunity and summarize possible mechanisms of action, such as molecular mimicry, activation by bystanders, and adjuvants. Our objective is not to refute the importance of vaccines, but to raise awareness about the potential risks of COVID-19 vaccination. In fact, we believe that the benefits of vaccination far outweigh the possible risks and encourage people to get vaccinated.

modRNA Vaccine Problems

Lipid nanoparticle (LNP)
- broad biodistribution
- broad, off-target transfection

N1 methylpseudouridine (m1Ψ)
- mRNA persistence, 2-6 months plus
- large but unknown Spike production
- ribosomal frameshifting

Spike protein
- hemagglutination (clotting)
- P53 interference, ↓DNA repair

DNA contamination
- SV40 promoter/enhancer
- cell dysregulation
- endotoxin contamination
- potential genome integration

Primary immune reaction
- cytotoxic attack on off-target transfected cells
- extreme endothelial damage

Immune dysregulation
- imprinting / OAS
- tolerance / IgG4 class-switch
- vaccine enhanced disease (VAED)

Immune suppression
- T cell depletion, TLR-binding
- viral reactivation, shingles, cancer

Autoimmune reactions
- thrombocytopenia
- lupus, diabetes, Sjogren's, etc.
- multi-inflammation, thyroiditis, nephritis, hepatitis, neuritis, etc.

IgG4 Class Switch – Tolerance

Pascal Irrang et al. “Class switch toward noninflammatory, spike-specific IgG4 antibodies after repeated SARS-CoV-2 mRNA vaccination.” Science Immunology. December 22, 2022. https://www.science.org/doi/10.1126/sciimmunol.ade2798.

Jana Sophia Buhre et al. “mRNA vaccines against SARS-CoV-2 induce comparably low long-term IgG Fc galactosylation and sialylation levels but increasing long-term IgG4 responses compared to an adenovirus-based vaccine.” Frontiers in Immunology. January 2023. https://www.frontiersin.org/articles/10.3389/fimmu.2022.1020844/full.

Feng-Xia Gao et al. “Extended SARS-CoV-2 RBD booster vaccination induces humoral and cellular immune tolerance in mice.” iScience. December 2022. https://www.sciencedirect.com/science/article/pii/S2589004222017515.

Vladimir N. Uversky et al. “IgG4 Antibodies Induced by Repeated Vaccination May Generate Immune Tolerance to the SARS-CoV-2 Spike Protein.” Vaccines. May 17, 2023. https://www.mdpi.com/2076-393X/11/5/991.

Anika M. Valk et al. “Suppressed IgG4 class switching in dupilumab- and TNF inhibitor-treated patients after repeated SARS-CoV-2 mRNA vaccination.” October 2023. https://www.medrxiv.org/content/10.1101/2023.09.29.23296354v1.full.pdf.

Marjahan Akhtar et al. “Appearance of tolerance-induction and non-inflammatory SARS-CoV-2 spike-specific IgG4 antibodies after Covid-19 booster vaccinations.” Frontiers in Immunology. December 20, 2023. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10763240/.

Raj Kalkeri et al. “Altered IgG4 Antibody Response to Repeated mRNA versus Protein COVID Vaccines.” January 18, 2024. https://www.medrxiv.org/content/10.1101/2024.01.17.24301374v1.full.pdf.

Alberto Boretti. “mRNA vaccine boosters and imparied immune system response in immune compromised individuals: a narrative review.” Clinical and Experimental Medicine. January 27, 2024. https://link.springer.com/article/10.1007/s10238-023-01264-1.

Hui Wang et al. “An immune evasion mechanism with IgG4 playing an essential role in cancer and implication for immunotherapy.” Journal of Immunotherapy for Cancer. August 2020. https://pubmed.ncbi.nlm.nih.gov/32819973/. [Preceded Covid-19 vaccines, shows possible cancer link.]

Sources

Biodistribution and duration

Katharina Röltgen, et al. “Immune imprinting, breadth of variant recognition, and germinal center response in human SARS-CoV-2 infection and vaccination.” Cell. January 24, 2022. https://www.cell.com/cell/fulltext/S0092-8674(22)00076-9.

Aram J. Krauson, et al. “Duration of SARS-CoV-2 mRNA vaccine persistence and factors associated with cardiac involvement in recently vaccinated patients.” NPJ Vaccines. September 27, 2023. https://www.nature.com/articles/s41541-023-00742-7.

Joomi Kim. “We're still being misled about how long the mRNA vaccines last in the body.” July 19, 2022. https://joomi.substack.com/p/were-still-being-misled-about-how.

Lael M. Yonker. “Circulating Spike Protein Detected in Post-COVID-19 mRNA Vaccine Myocarditis.” Circulation. March 14, 2023. https://pubmed.ncbi.nlm.nih.gov/36597886/.

Carlo Brogna, et al. “Detection of recombinant Spike protein in the blood of individuals vaccinated against SARS-CoV-2: Possible molecular mechanisms.” Proteomics Clinical Applications. August 31, 2023. https://onlinelibrary.wiley.com/doi/10.1002/prca.202300048.

Nazeeh Hannah, et al. “Detection of Messenger RNA COVID-19 Vaccines in human breast milk.” JAMA Pediatrics. December 1, 2022. https://pubmed.ncbi.nlm.nih.gov/36156636/.

Sources

Immune response

Anis Barmada, et al. “Cytokinopathy with aberrant cytotoxic lymphocytes and profibrotic myeloid response in SARS-CoV-2 mRNA vaccine–associated myocarditis.” Science Immunology. May 5, 2023. https://www.science.org/doi/10.1126/sciimmunol.adh3455.

Elizabeth K. Graydon, et al. “Natural killer cells and BNT162b2 mRNA vaccine reactogenicity and durability.” Frontiers in Immunology. August 25, 2023. https://www.frontiersin.org/articles/10.3389/fimmu.2023.1225025/full.

Motonori Takahashi. “An autopsy case report of aortic dissection complicated with histiolymphocytic pericarditis and aortic inflammation after mRNA COVID-19 vaccination.” Legal Medicine. September 29, 2022. https://pubmed.ncbi.nlm.nih.gov/36191411/.

Arne Burkhardt. Presentation by German pathologist professor Arne Burkhardt to the Canadian Covid Care Alliance (March 6, 2023). Posted April 19, 2023. https://rumble.com/v2jbj16-arne-burkhardt-presentation-to-the-ccca.html.

Panagis Polykretis, et al. “Autoimmune inflammatory reactions triggered by the COVID-19 genetic vaccines in terminally differentiated tissues.” Autoimmunity. September 14, 2023. https://www.tandfonline.com/doi/full/10.1080/08916934.2023.2259123.

Sources

Myocarditis

James R. Gill, et al. “Autopsy Histopathologic Cardiac Findings in 2 Adolescents Following the Second COVID-19 Vaccine Dose.” Archives of Pathology and Laboratory Medicine. February 14, 2022. https://meridian.allenpress.com/aplm/article/146/8/925/477788/Autopsy-Histopathologic-Cardiac-Findings-in-2.

Constantin Schwab, et al. “Autopsy-based histopathological characterization of myocarditis after anti-SARS-CoV-2-vaccination.” Clinical Research in Cardiology. November 27, 2022. https://link.springer.com/article/10.1007/s00392-022-02129-5.

Arne Burkhardt. Presentation by German pathologist professor Arne Burkhardt to the Canadian Covid Care Alliance (March 6, 2023). Posted April 19, 2023. https://rumble.com/v2jbj16-arne-burkhardt-presentation-to-the-ccca.html.

Nicolas Hulscher, et al. “Autopsy Proven Fatal COVID-19 Vaccine-Induced Myocarditis.” Preprint. July 18, 2023. https://www.preprints.org/manuscript/202307.1198/v1.

436 Published Cardiac Case Reports. https://onedrive.live.com/view.aspx?resid=82491CE1A4498377!45488&ithint=file%2cxlsx&authkey=!AHJ7edo5miV35wc.

Sources

Myocarditis, continued…

George Joy, et al. “Prospective Case-Control Study of Cardiovascular Abnormalities 6 Months Following Mild COVID-19 in Healthcare Workers.” JACC Cardiovascular Imaging. May 8, 2021. https://pubmed.ncbi.nlm.nih.gov/33975819/

Ortal Tuvali. “The Incidence of Myocarditis and Pericarditis in Post COVID-19 Unvaccinated Patients—A Large Population-Based Study.” Journal of Clinical Medicine. April 15, 2022. https://www.mdpi.com/2077-0383/11/8/2219

Sharon Fox, et al. “COVID-19: The Heart of the Matter—Pathological Changes and a Proposed Mechanism.” Journal of Cardiovascular Pharmacology and Therapeutics. March 11, 2021. https://journals.sagepub.com/doi/full/10.1177/1074248421995356.

Suyanee Mansanguan, et al. “Cardiovascular Manifestation of the BNT162b2 mRNA COVID-19 Vaccine in Adolescents.” Tropical Medicine and Infectious Disease. August 19, 2022. https://www.mdpi.com/2414-6366/7/8/196

Natacha Buergin, et al. “Sex-specific differences in myocardial injury incidence after COVID-19 mRNA-1273 booster vaccination.” European Journal of Heart Failure. July 5, 2023. https://onlinelibrary.wiley.com/doi/epdf/10.1002/ejhf.2978

Sources

Myocarditis, continued…

Øystein Karlstad, et al. “SARS-CoV-2 Vaccination and Myocarditis in a Nordic Cohort Study of 23 Million Residents.” JAMA Cardiology. April 20, 2022. https://jamanetwork.com/journals/jamacardiology/fullarticle/2791253

Christian Baumeier, et al. “Intramyocardial Inflammation after COVID-19 Vaccination: An Endomyocardial Biopsy-Proven Case Series.” International Journal of Molecular Sciences. June 22, 2022. https://www.mdpi.com/1422-0067/23/13/6940/htm

Elisa Avolio, et al. “The SARS-CoV-2 Spike protein disrupts human cardiac pericytes function through CD147 receptor-mediated signaling: a potential non-infective mechanism of COVID-19 microvascular disease.” Clinical Science. November 22, 2021. https://portlandpress.com/clinsci/article/135/24/2667/230273/The-SARS-CoV-2-Spike-protein-disrupts-human

Lael M. Yonker, et al. “Circulating Spike Protein Detected in Post-COVID-19 mRNA Vaccine Myocarditis.” Circulation. January 4, 2023. https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.122.061025.

Jae Yeong Cho, et al. “COVID-19 vaccination-related myocarditis: a Korean nationwide study.” European Heart Journal. June 21, 2023. https://academic.oup.com/eurheartj/advance-article/doi/10.1093/eurheartj/ehad339/7188747?login=false.

Sources

Myocarditis, continued…

Clement Kwong-man Yu, et al. “Cardiovascular Assessment up to One Year After COVID-19 Vaccine–Associated Myocarditis.” Circulation. July 31, 2023. https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.123.064772.

Anis Barmada, et al. “Cytokinopathy with aberrant cytotoxic lymphocytes and profibrotic myeloid response in SARS-CoV-2 mRNA vaccine–associated myocarditis.” Science Immunology. May 5, 2023. https://www.science.org/doi/10.1126/sciimmunol.adh3455.

Takehiro Nakahara, et al. “Assessment of Myocardial 18F-FDG Uptake at PET/CT in Asymptomatic SARS-CoV-2-vaccinated and Nonvaccinated Patients.” Radiology. September 19, 2023. https://pubs.rsna.org/doi/10.1148/radiol.230743.

Rolf Schreckenberg, et al. “Cardiac side effects of RNA-based SARS-CoV-2 vaccines: Hidden cardio toxic effects of mRNA-1273 and BNT162b2 on ventricular myocyte function and structure.” British Journal of Pharmacology. October 12, 2023. https://bpspubs.onlinelibrary.wiley.com/doi/abs/10.1111/bph.16262.

Aram J. Krauson, et al. “Duration of SARS-CoV-2 mRNA vaccine persistence and factors associated with cardiac involvement in recently vaccinated patients.” NPJ Vaccines. September 27, 2023. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10533894/pdf/41541_2023_Article_742.pdf.

Defunk the Bunk 1.0

Case 7
Obliteration

A modRNA Mechanism:
Distribution, Duration, and Immune Response to the Covid-19 Vaccines

Bret Swanson · March 2024

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