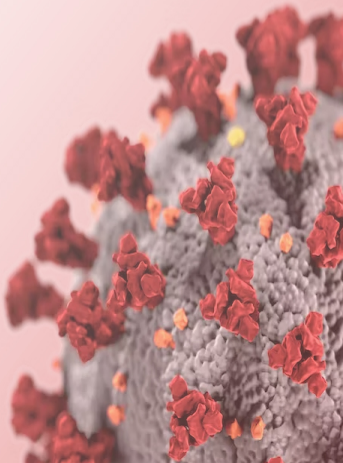
FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

UNDERSTANDING & TREATING
SPIKE PROTEIN-INDUCED DISEASES

October 14-16, 2022 • Orlando, Florida

MOLECULAR and IMMUNOLOGICAL PATHOGENESIS of SPIKE-INDUCED HARMS

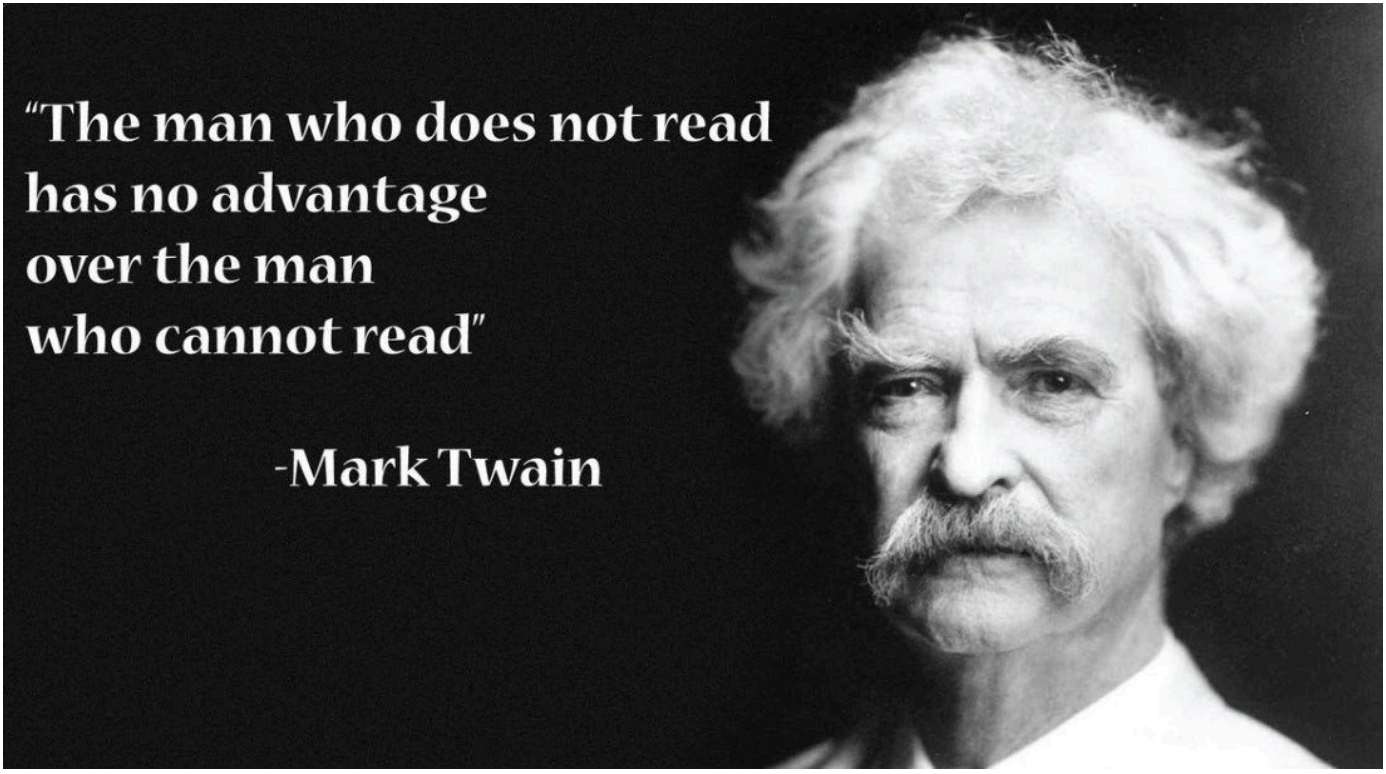


Presented By:

Ryan Cole, MD AP/CP
CEO/Medical Director,
Cole Diagnostics

CONFLICTS OF INTEREST

- NONE
- VIEWS are my own
- Dialogue


"The man who does not read
has no advantage
over the man
who cannot read"
-Mark Twain


OF COURSE
"ALL SCIENTISTS
AGREE" WHEN YOU
CENSOR THE ONES
WHO DONT

INTEGRITY IN SCIENCE

- INTEGRITY IS THE DISTANCE BETWEEN OUR LIPS AND OUR ACTIONS
- “PRIMUM NON NOCERE”
- ASK THE QUESTION, THEN DO THE SCIENCE WITH NO FEAR OF THE REPERCUSSIONS.

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

WHAT IS THE SPIKE?

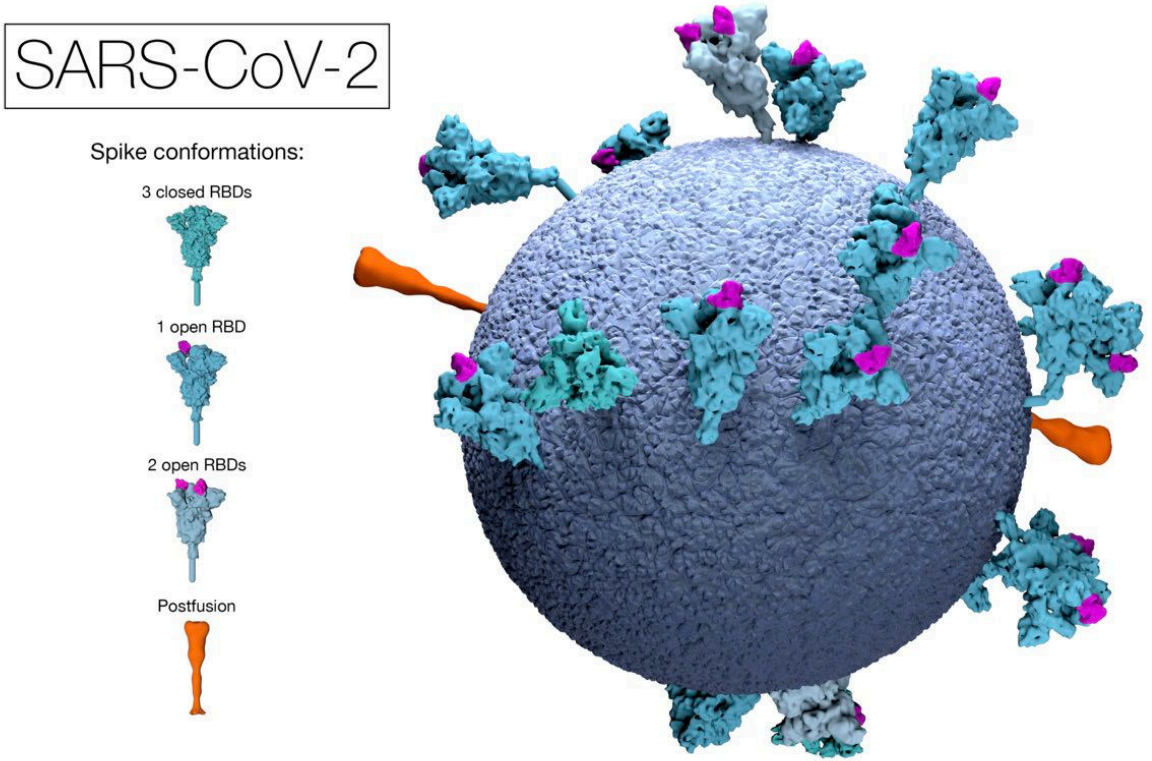
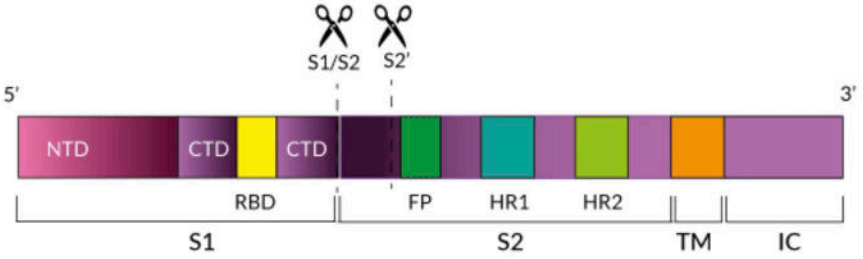
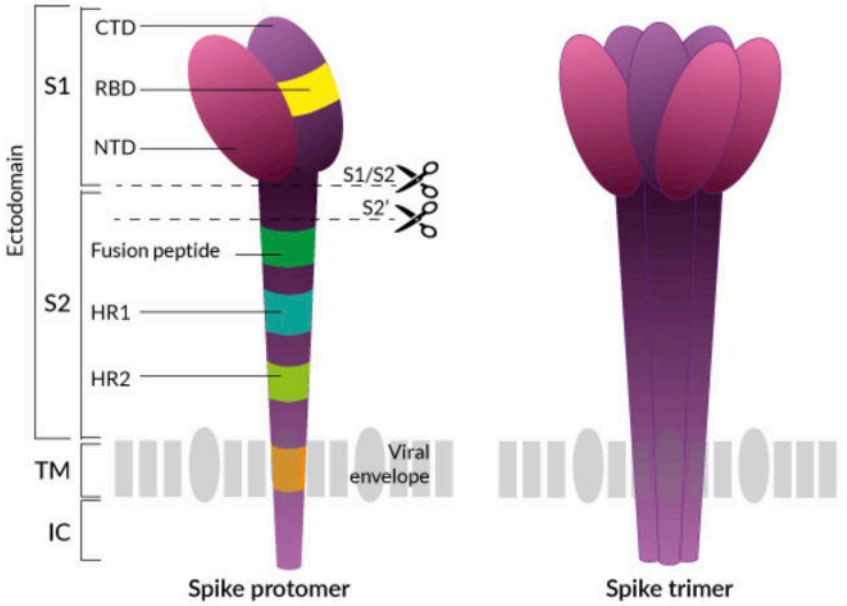


Image courtesy of MRC Laboratory of Molecular Biology. Ke, Z., Briggs, J. et al. Nature (2020).

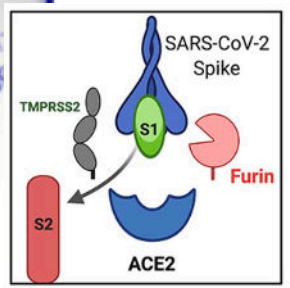




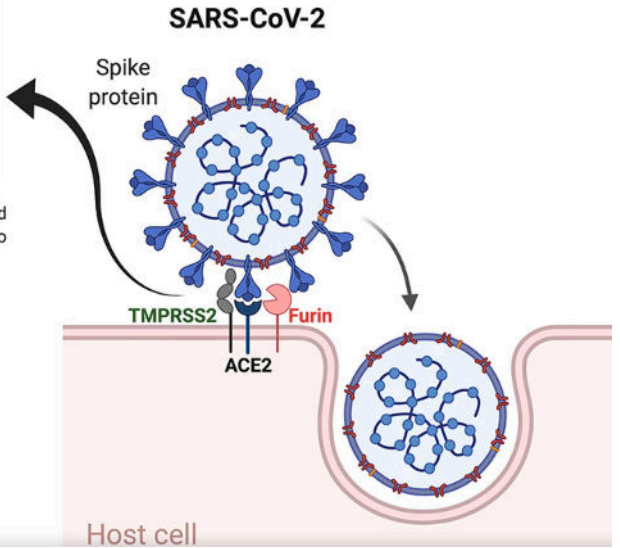
InvivoGen
Innovation within reach

FLCCC ALLIANCE
EDUCATIONAL CONFERENCE
2022

The protective coating of sugars, shown in blue. Courtesy of ACS Publications.



S1/S2 subunits cleavage by furin and SARS-CoV-2 genomes penetrate into the host cell

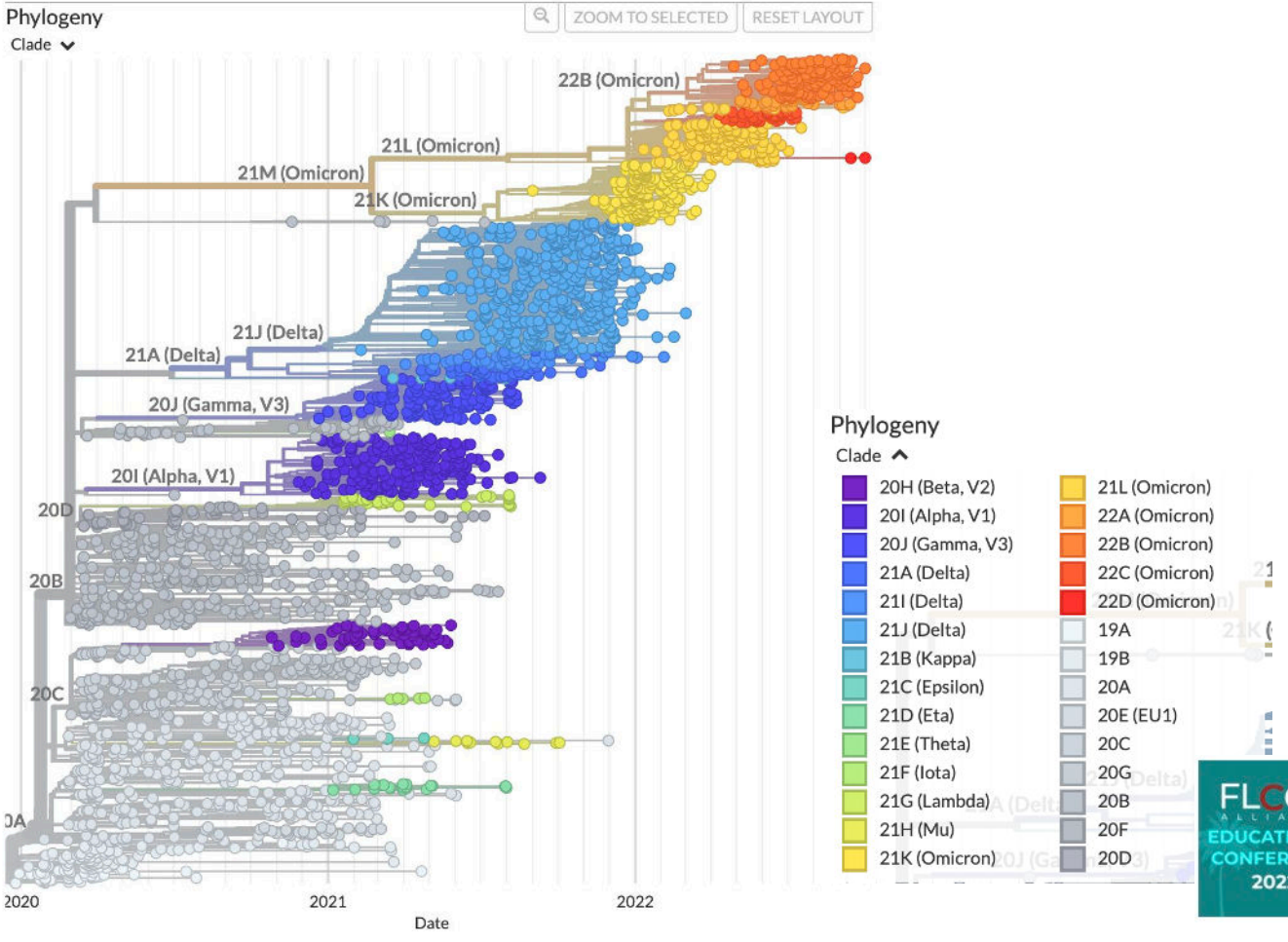


From the journal Clinical Chemistry and Laboratory Medicine (CCLM)
https://doi.org/10.1515/cclm-2020-0727

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Built with nextstrain/ncov. Maintained by the Nextstrain team. Enabled by data from GenBank.

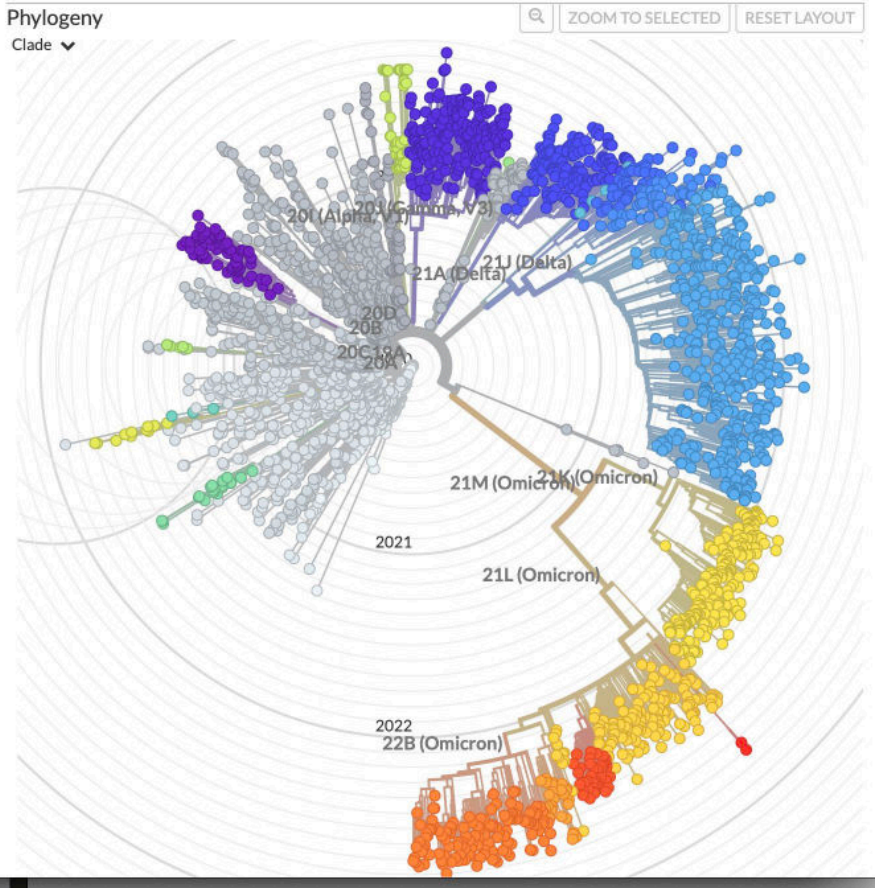
Showing 2744 of 2744 genomes sampled between Dec 2019 and Oct 2022.

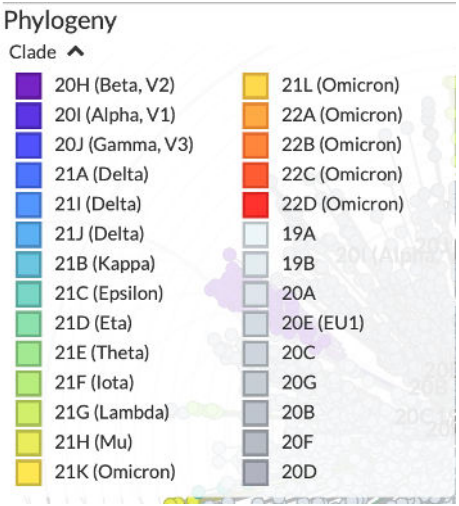


Genomic epidemiology of SARS-CoV-2 with subsampling focused globally since pandemic start

Built with nextstrain/ncov. Maintained by the Nextstrain team. Enabled by data from GenBank.

Showing 2744 of 2744 genomes sampled between Dec 2019 and Oct 2022.



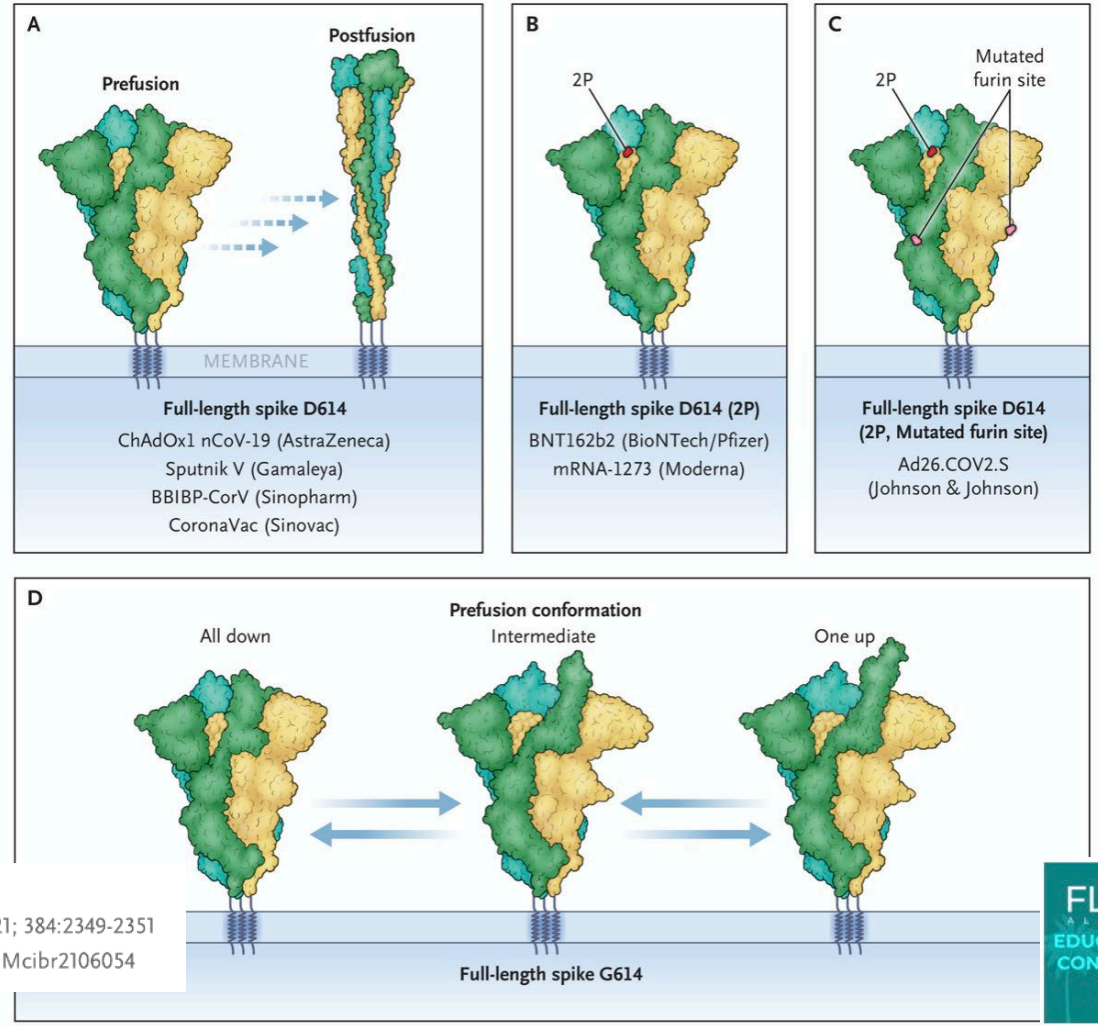


FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

WHICH SPIKE?

- WUHAN
- EARLY VARIANTS
- CURRENT OMICRON
- WHICH MECHANISMS?
- VACCINE SPIKE

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022



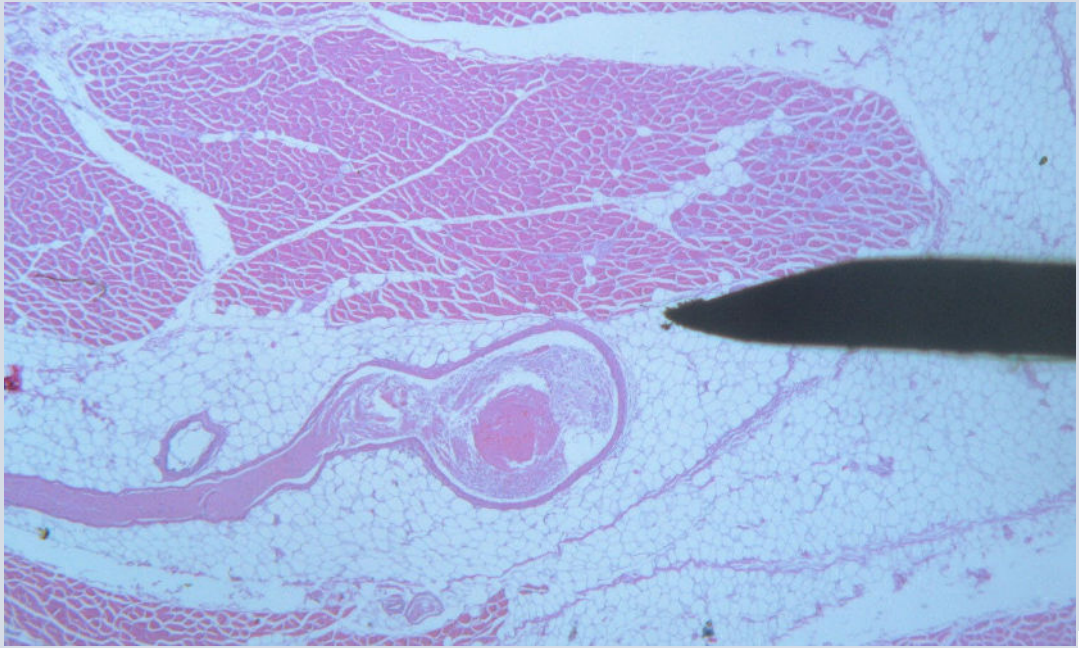
June 17, 2021
N Engl J Med 2021; 384:2349-2351
DOI: 10.1056/NEJMcibr2106054

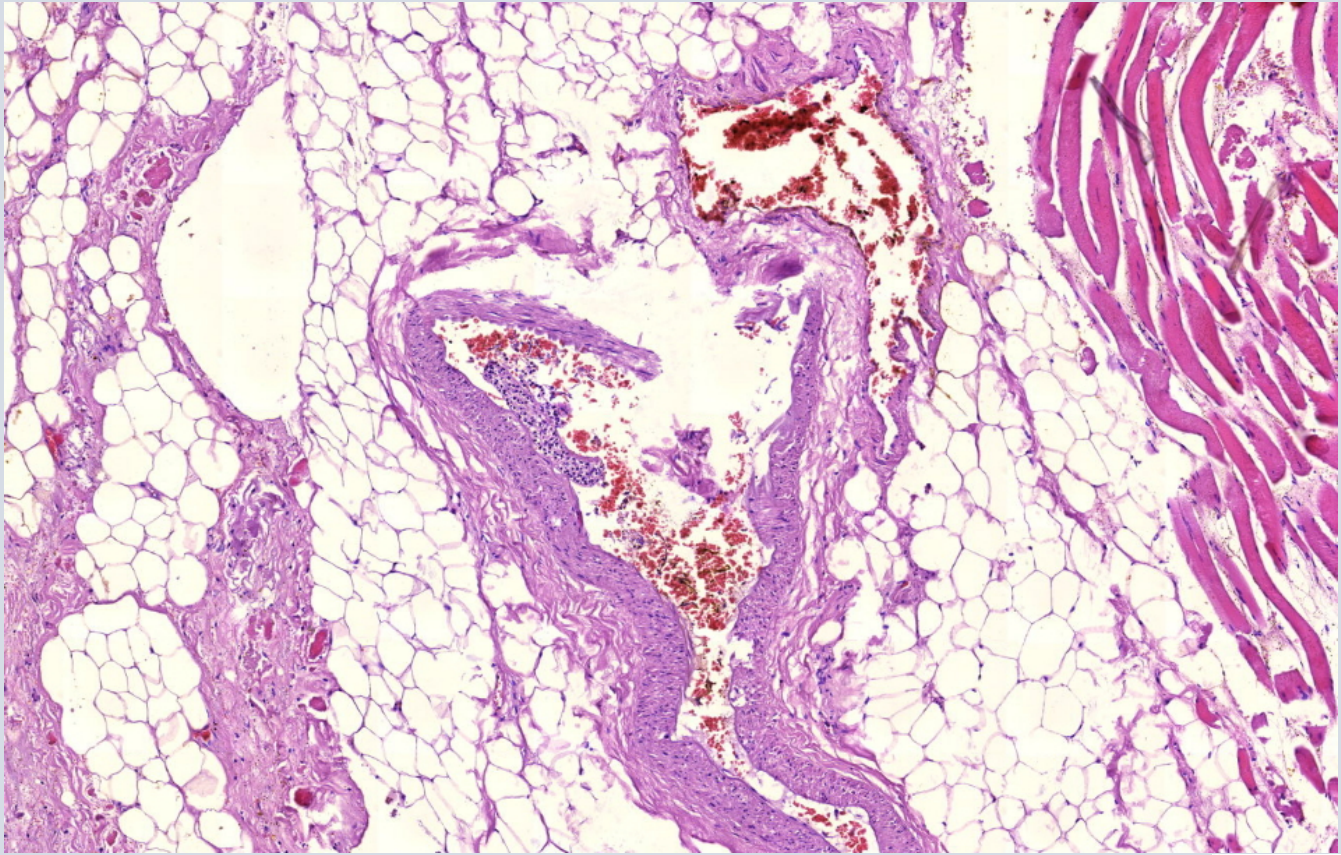
THE SPIKE PERSISTS IN THE BODY

- The “investigational vaccines” code for spike
- Spike does not stay only in the deltoid muscle
- Spike circulates for weeks - Harvard study, Ogata et al
- Spike persists - Stanford Cell study - Roltgen, et al
- Burkhardt et al - Germany autopsy series

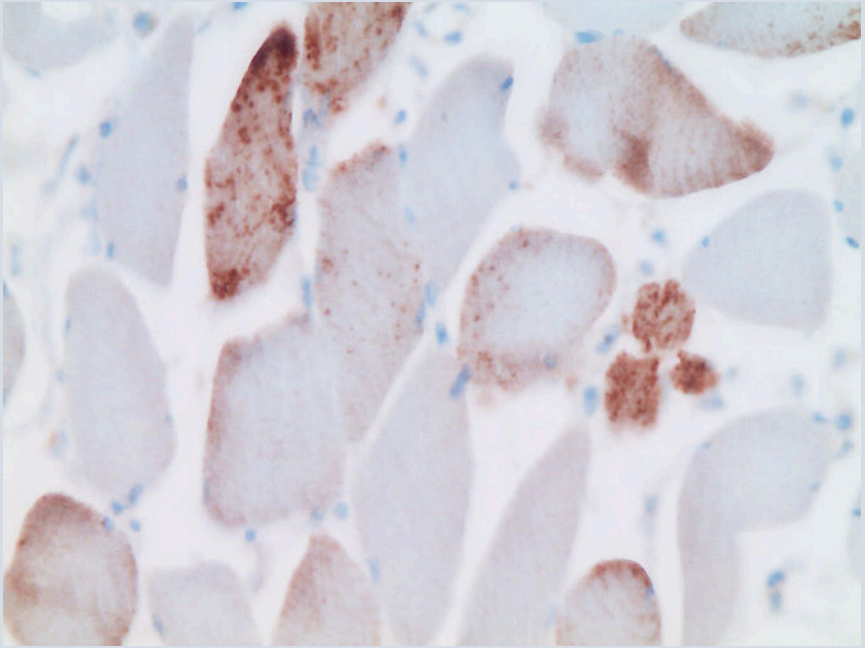
FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Deltoid muscle with superimposed injection needle





Expression of spike protein in deltoid muscle



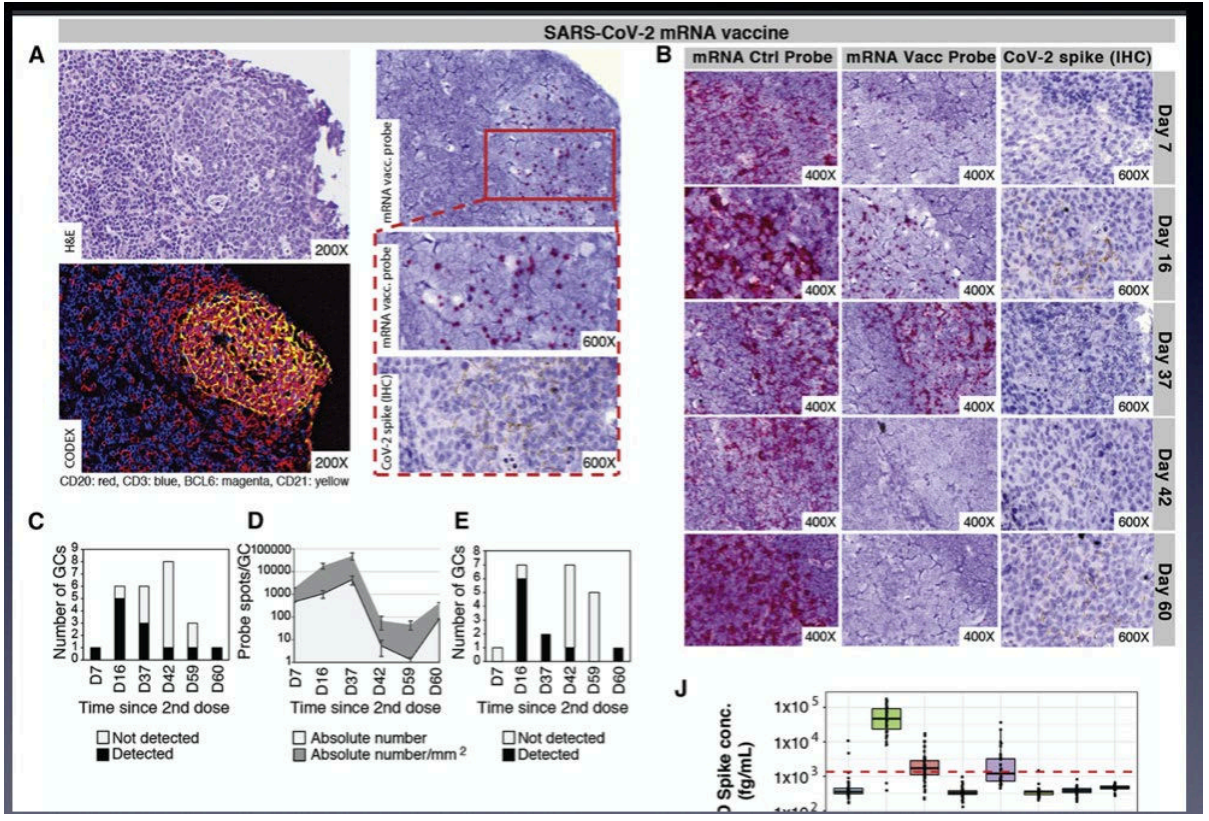
> Food Chem Toxicol. 2022 Jun;164:113008. doi: 10.1016/j.fct.2022.113008. Epub 2022 Apr 15.

Innate immune suppression by SARS-CoV-2 mRNA vaccinations: The role of G-quadruplexes, exosomes, and MicroRNAs

Stephanie Seneff [1], Greg Nigh [2], Anthony M Kyriakopoulos [3], Peter A McCullough [4]

Affiliations + expand

PMID: 35436552 PMCID: PMC9012513 DOI: 10.1016/j.fct.2022.113008



> J Immunol. 2021 Nov 15;207(10):2405-2410. doi: 10.4049/jimmunol.2100637. Epub 2021 Oct 15.

Cutting Edge: Circulating Exosomes with COVID Spike Protein Are Induced by BNT162b2 (Pfizer–BioNTech) Vaccination prior to Development of Antibodies: A Novel Mechanism for Immune Activation by mRNA Vaccines

Sandhya Bansal [1], Sudhir Perincheri [2], Timothy Fleming [1], Christin Poulson [1], Brian Tiffany [1], Ross M Bremner [1], Thalachallour Mohanakumar [3]

Affiliations + expand

PMID: 34654691 DOI: 10.4049/jimmunol.2100637

dose. Transmission electron microscopy of exosomes also demonstrated spike protein Ags on their surface. Exosomes with spike protein and Abs decreased in parallel after four months. These

WHEN IS PRODUCTION OF THE SPIKE STOPPED IN THE BODY?

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

OVERVIEW -SPIKE HARMS VIRUS AND "VACCINES"

- INNATE IMMUNE SYSTEM ALTERATION
- VASCULAR DAMAGE
- CLOTTING/THROMBOSIS/THROMBOCYTOPENIA
- MYOCARDITIS/CARDIAC HARM
- MITOCHONDRIAL HARMS
- NEUROLOGIC DAMAGE

OVERVIEW -SPIKE HARMS VIRUS AND "VACCINES"

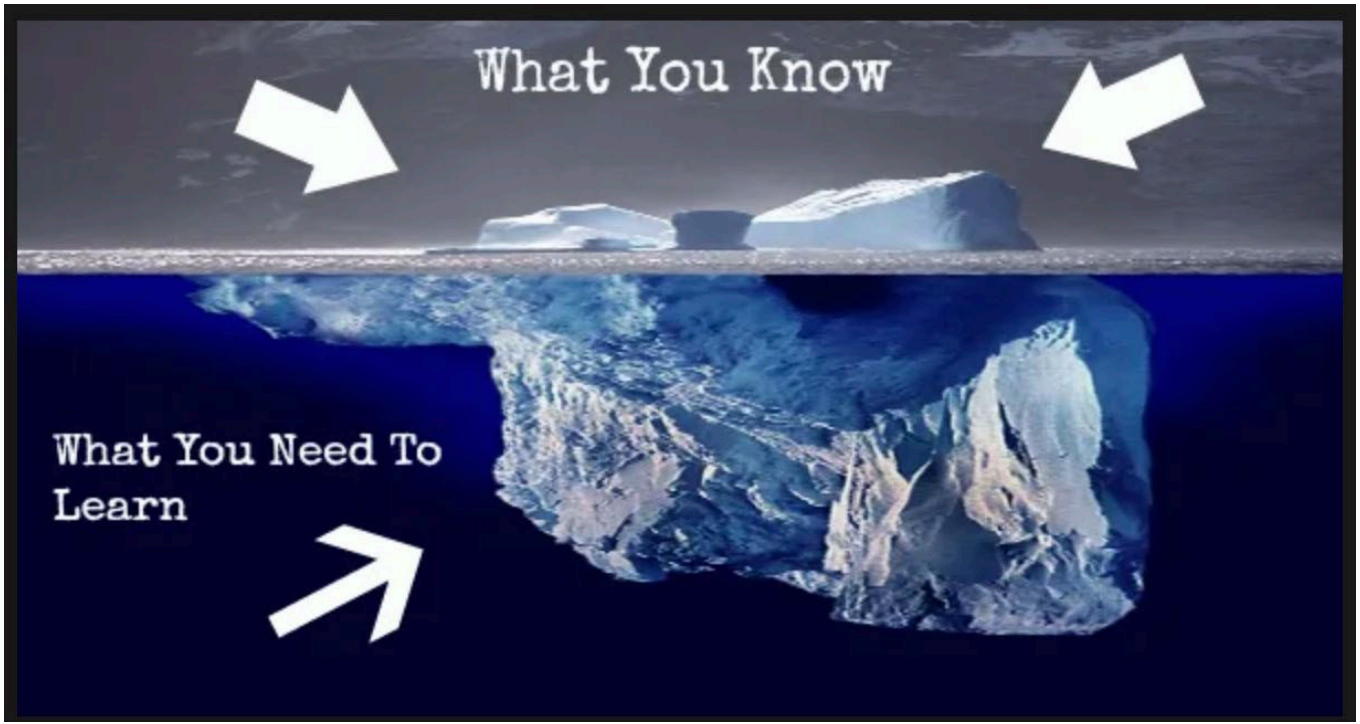
- ORGAN DAMAGE/METABOLIC ALTERATION
- VIRAL REACTIVATION
- ANTIBODY DEPENDENT CELLULAR CYTOTOXICITY
- IMMUNE IMPRINTING/ANTIBODY DEPENDENT ENHANCEMENT/ORIGINAL ANTIGENIC SIN
- REPRODUCTIVE SYSTEM ALTERATIONS
- DNA MISMATCH REPAIR ALTERATIONS

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

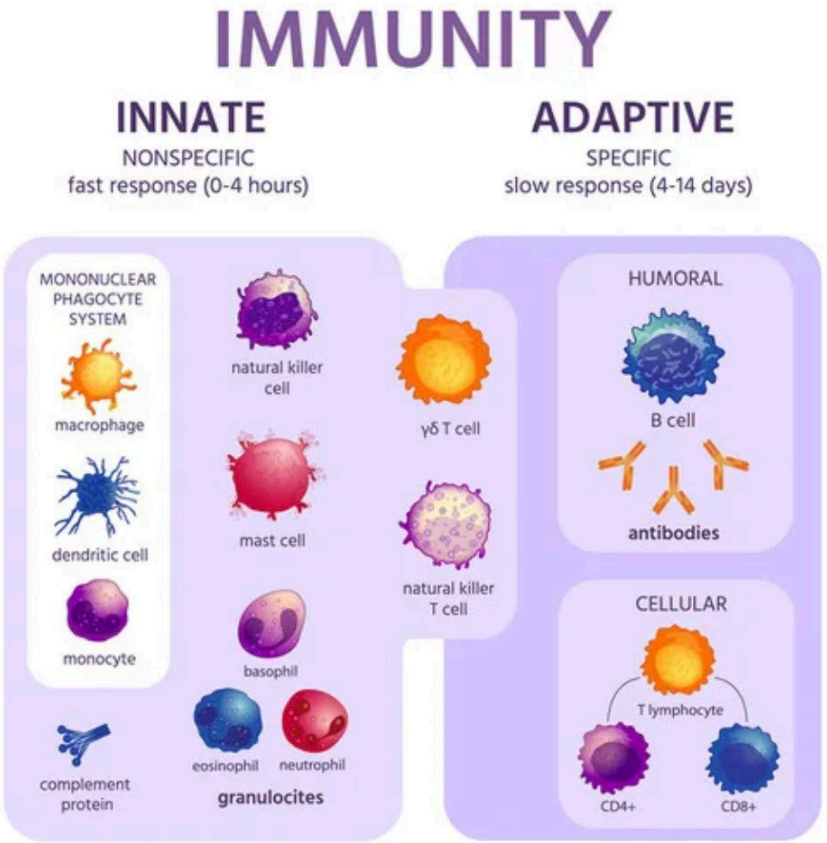
OVERVIEW -SPIKE HARMS VIRUS AND "VACCINES"

- AUTOIMMUNE DISEASE INDUCTION
- CANCER GENE BINDING AND OTHER MECHANISMS
- INTERFERON SUPPRESSION/ALTERATION
- ETC., ETC., ETC.

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022


What You Know
What You Need To Learn

INNATE IMMUNE SYSTEM ALTERATION



medRxiv
THE PREPRINT SERVER FOR HEALTH SCIENCES
CSH Cold Spring Harbor Laboratory BMJ Yale

The BNT162b2 mRNA vaccine against SARS-CoV-2 reprograms both adaptive and innate immune responses

F. Konstantin Föhse, Büsranur Geckin, Gijs J. Overheul, Josephine van de Maat, Gizem Kilic, Ozlem Bulut, Helga Dijkstra, Heidi Lemmers, S. Andrei Sarlea, Maartje Reijnders, Jacobien Hoogerwerf, Jaap ten Oever, Elles Simonetti, Frank L. van de Veerdonk, Leo A.B. Joosten, Bart L. Haagmans, Reinout van Crevel, Yang Li, Ronald P. van Rij, Corine GeurtsvanKessel, Marien I. de Jonge, Jorge Domínguez-Andrés, Mihai G. Netea

doi: https://doi.org/10.1101/2021.05.03.21256520

> *The mRNA BNT162b2 vaccine induces complex functional reprogramming of innate immune responses, which should be considered in the development and use of this new class of vaccines," writes the team.*

> Food Chem Toxicol. 2022 Jun;164:113008. doi: 10.1016/j.fct.2022.113008. Epub 2022 Apr 15.

Innate immune suppression by SARS-CoV-2 mRNA vaccinations: The role of G-quadruplexes, exosomes, and MicroRNAs

Stephanie Seneff [1], Greg Nigh [2], Anthony M Kyriakopoulos [3], Peter A McCullough [4]

Affiliations + expand

PMID: 35436552 PMCID: PMC9012513 DOI: 10.1016/j.fct.2022.113008

Version 3. medRxiv. Preprint. 2021 Aug 9 [revised 2021 Oct 29].
doi: 10.1101/2021.08.08.21261763

Neuro-COVID long-haulers exhibit broad dysfunction in T cell memory generation and responses to vaccination

Lavanya Visvabharathy,[1,*¶] Barbara Hanson,[1,3] Zachary Orban,[1] Patrick H. Lim,[1] Nicole M. Palacio,[2] Rishi Jain,[1] Jeffrey R. Clark,[1] Edith L. Graham,[1] Eric Michael Liotta,[1] Pablo Penaloza-MacMaster,[2] and Igor J. Koralnik[1,*]

New Results

Pre-exposure to mRNA-LNP inhibits adaptive immune responses and alters innate immune fitness in an inheritable fashion

Zhen Qin, Aurélie Bouteau, Christopher Herbst, Botond Z. Igyártó

doi: https://doi.org/10.1101/2022.03.16.484616

VASCULAR/ENDOTHELIAL DAMAGE

Small vessels

- Endothelialitis, most prominently in heart, lungs and brain
- Aggregation of erythrocytes, bleeding, hemosiderosis into vessel wall
- Complex-formation of amyloid-spikeprotein-fibrin in vessels - amyloidosis
- Thrombocyte aggregates and microthrombi
- Obliteration

Spike Protein- VASCULAR HARMS

- Impairs endothelial function
- Increases endothelial cell inflammatory signaling
- Endothelial protein cell surface binding can elicit clotting cascades

SPIKE - VASCULAR INFLAMMATION

Circulation Research > Vol. 128, No. 9 > SARS-CoV-2 Spike Protein Impairs Endothelial Function via Downreg...

EE ACCESS

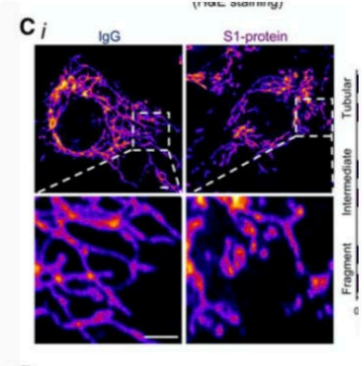
PDF/EPUB

ols Share

SARS-CoV-2 Spike Protein Impairs Endothelial Function via Downregulation of ACE 2

Yuyang Lei, Jiao Zhang, Cara R. Schiavon, Ming He, Lili Chen, Hui Shen, Yichi Zhang, Qian Yin, Yoshitake Cho, Leonardo Andrade, Gerald S. Shadel, Mark Hepokoski, Ting Lei, ... See all authors

Originally published 31 Mar 2021 | https://doi.org/10.1161/CIRCRESAHA.121.318902 | Circulation Research. 2021;128:1323–1326



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

BRIEF RESEARCH REPORT article

Front. Cardiovasc. Med., 11 June 2021

Sec. Cardiovascular Metabolism

https://doi.org/10.3389/fcvm.2021.687783

SARS-CoV-2 Spike Protein Induces Degradation of Junctional Proteins That Maintain Endothelial Barrier Integrity

 Somasundaram Raghavan, Divya Borsandra Kenchappa and  M. Dennis Leo*

Department of Pharmaceutical Sciences, University of Tennessee Health Science Center, Memphis, TN, United States

Article | Open Access | Published: 04 December 2020

CD147-spike protein is a novel route for SARS-CoV-2 infection to host cells

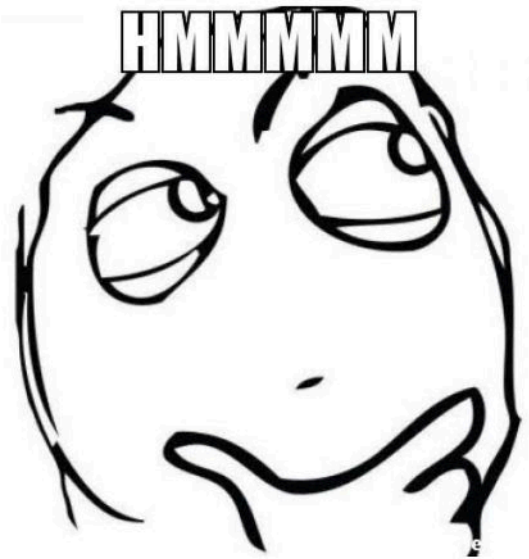
Ke Wang, Wei Chen, ... Zhi-Nan Chen + Show authors

Signal Transduction and Targeted Therapy **5**, Article number: 283 (2020) | Cite this article

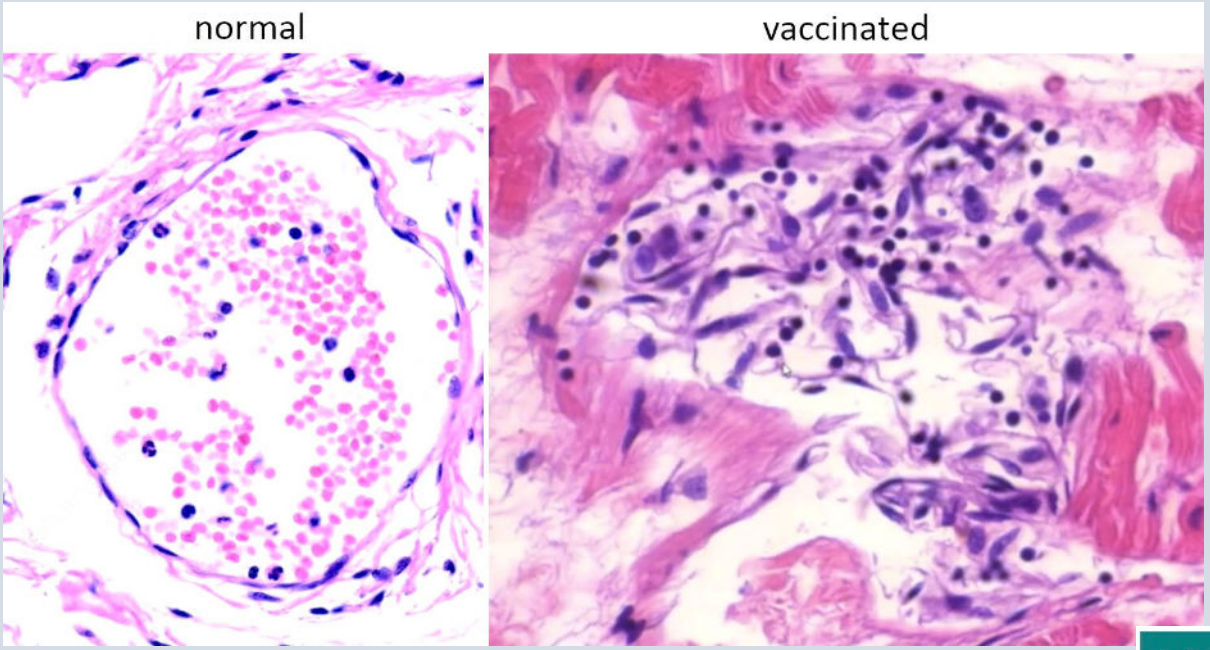
CD147 -

Immunoglobulin super family

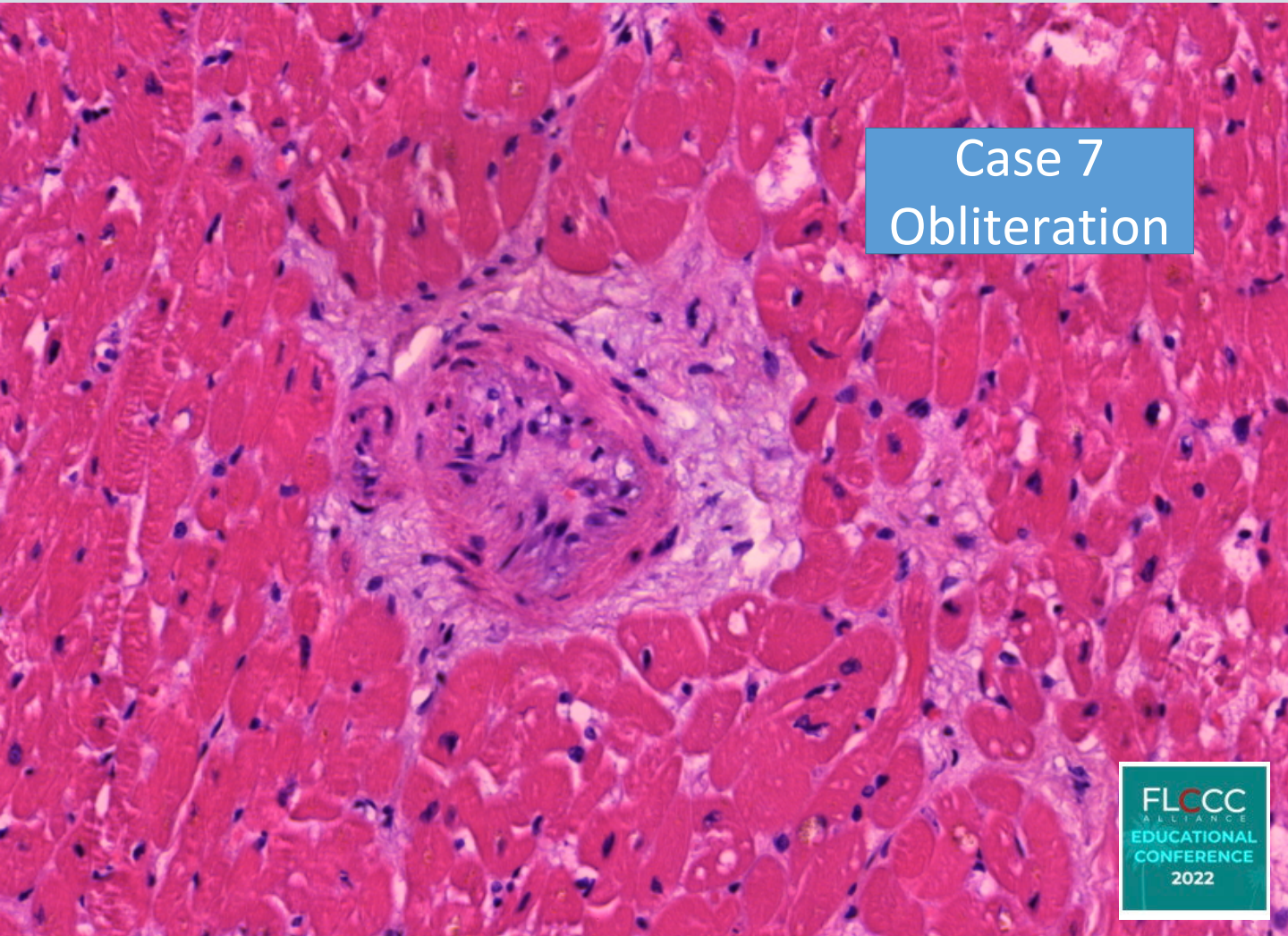
- Expressed on Platelets, RBCs, Endothelial Cells, Lymphocytes, Macrophages, Fibroblasts, etc.
- Also unregulated on many cancer cells
- Spike S1 binds CD147
- IVM also competitively binds CD147



Endothelial stripping and destruction in a venule after vaccination (case 1)



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022


Case 7
Obliteration
FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022

Journals / Viruses / Volume 13 / Issue 10 / 10.3390/v13102021

Open Access Article

Spike Proteins of SARS-CoV-2 Induce Pathological Changes in Molecular Delivery and Metabolic Function in the Brain Endothelial Cells

by Eun Seon Kim [1,2,†], Min-Tae Jeon [1,†], Kyu-Sung Kim [1,2,†], Suji Lee [1,3,†], Suji Kim [1] and Do-Geun Kim [1,*]

J Biol Chem. 2022 Mar;298(3):101695. doi: 10.1016/j.jbc.2022.101695. Epub 2022 Feb 7.

The spike protein of SARS-CoV-2 induces endothelial inflammation through integrin α5β1 and NF-κB signaling

Juan Pablo Robles [1], Magdalena Zamora [2], Elva Adan-Castro [2], Lourdes Siqueiros-Marquez [2], Gonzalo Martinez de la Escalera [2], Carmen Clapp [2]

Affiliations + expand

PMID: 35143839 PMCID: PMC8820157 DOI: 10.1016/j.jbc.2022.101695

Abstract 10712: Observational Findings of PULS Cardiac Test Findings for Inflammatory Markers in Patients Receiving mRNA Vaccines

Steven R Gundry

Originally published 8 Nov 2021 | https://doi.org/10.1161/circ.144.suppl_1.10712 | Circulation. 2021;144:A10712

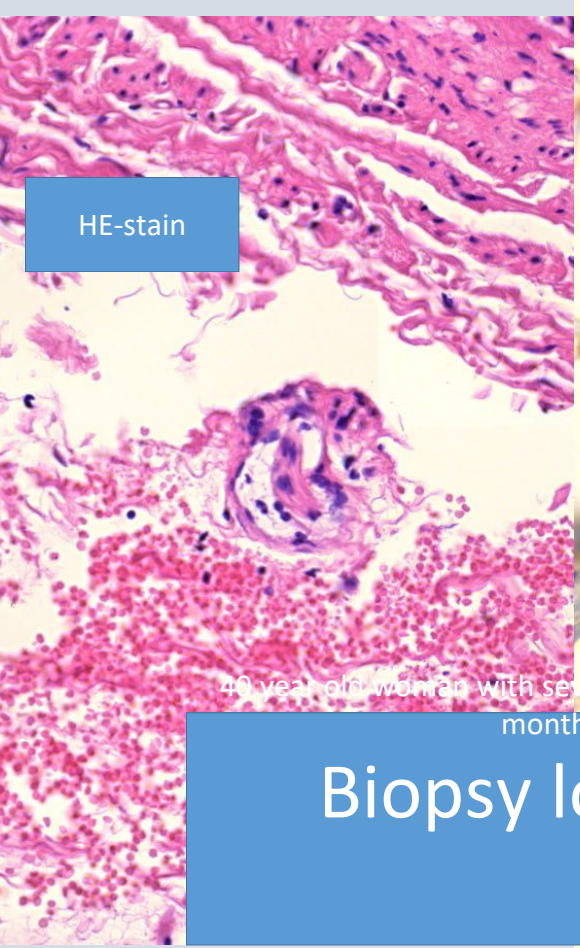
This article has an expression of concern

is corrected by

November 16, 2021
Vol 144, Issue
Suppl_1

Abstract

This clinic has been using the PULS Cardiac Test (Predictive Health Diagnostics Co., Irvine, CA) a clinically utilized



HE-stain

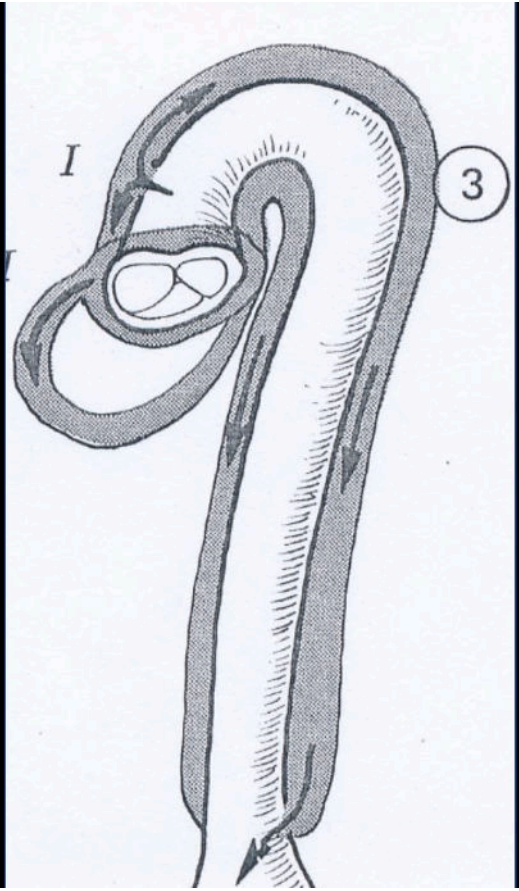
Spikeproteine

40 year old woman with severe circulatory disorder of the lower leg after 8 month p.i. Covid-19 vaccination

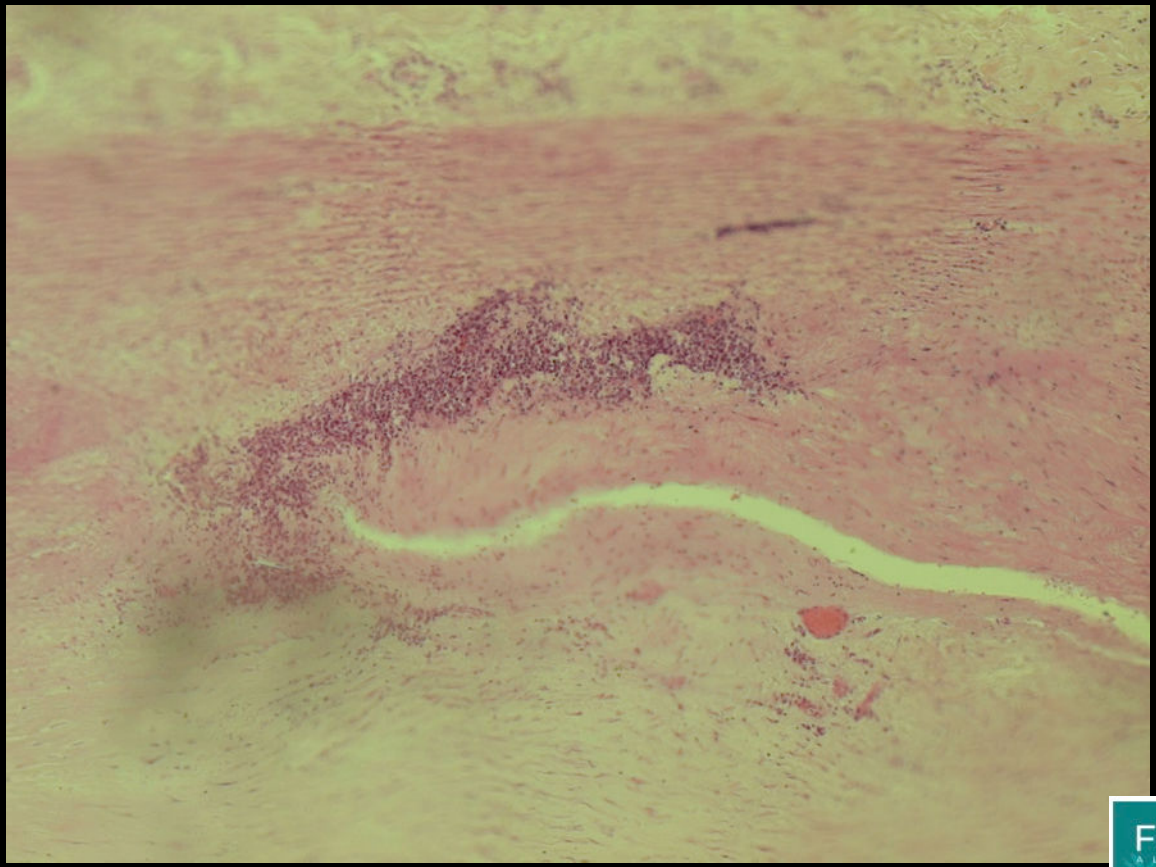
Biopsy lower leg – skin - muscle

No autolysis !!

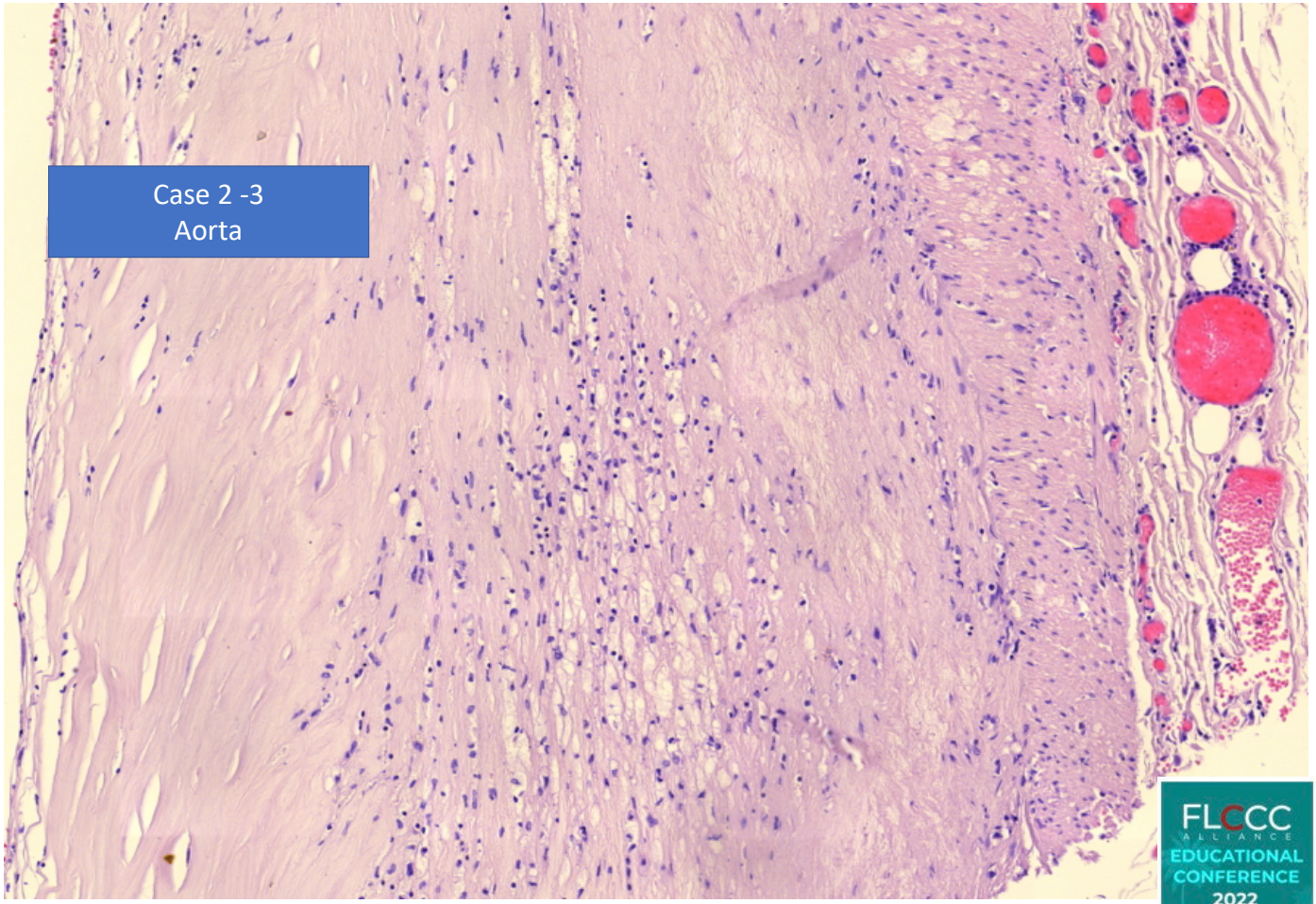
FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022



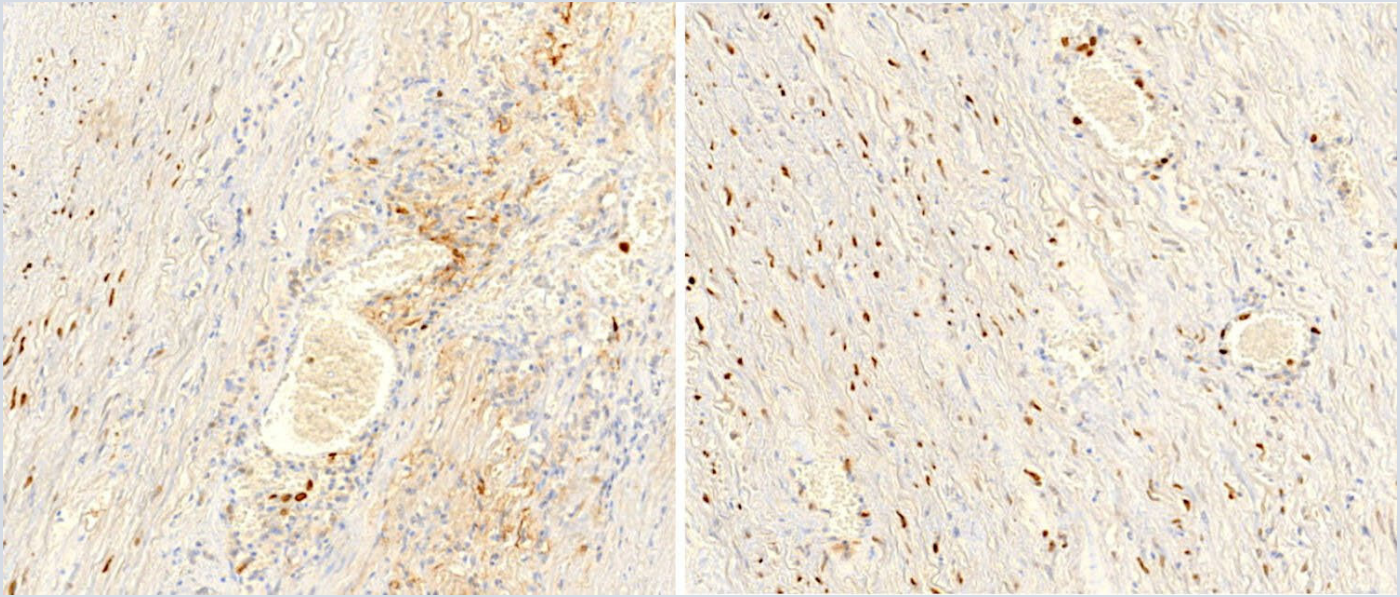
Aortic dissection in a man of 56 years, Co 46/21 days after first/second injection Case 31



Excised aortic wall segment


Case 2 -3
Aorta
FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022

Spike protein is expressed in myofibroblasts near the lymphocyte infiltrates within the aorta (case 10)



VASCULAR DAMAGE/CLOTTING/THROMBOSIS/VITT

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022


VWR
SCIENTIFIC INSTRUMENTS & CHEMICALS

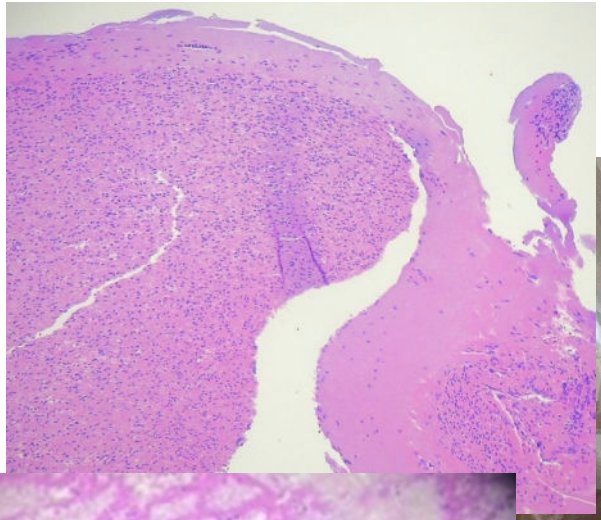

LABORATORY APPARATUS, FURNITURE
SCIENTIFIC INSTRUMENTS & CHEMICALS

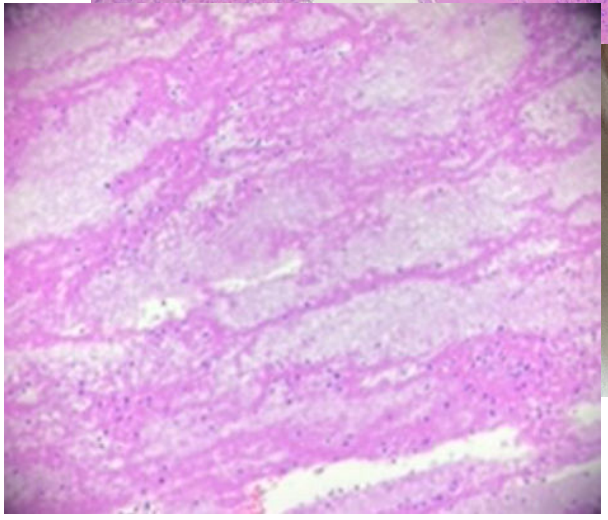

SCIENTIFIC INSTRUMENTS
VWR


VWR

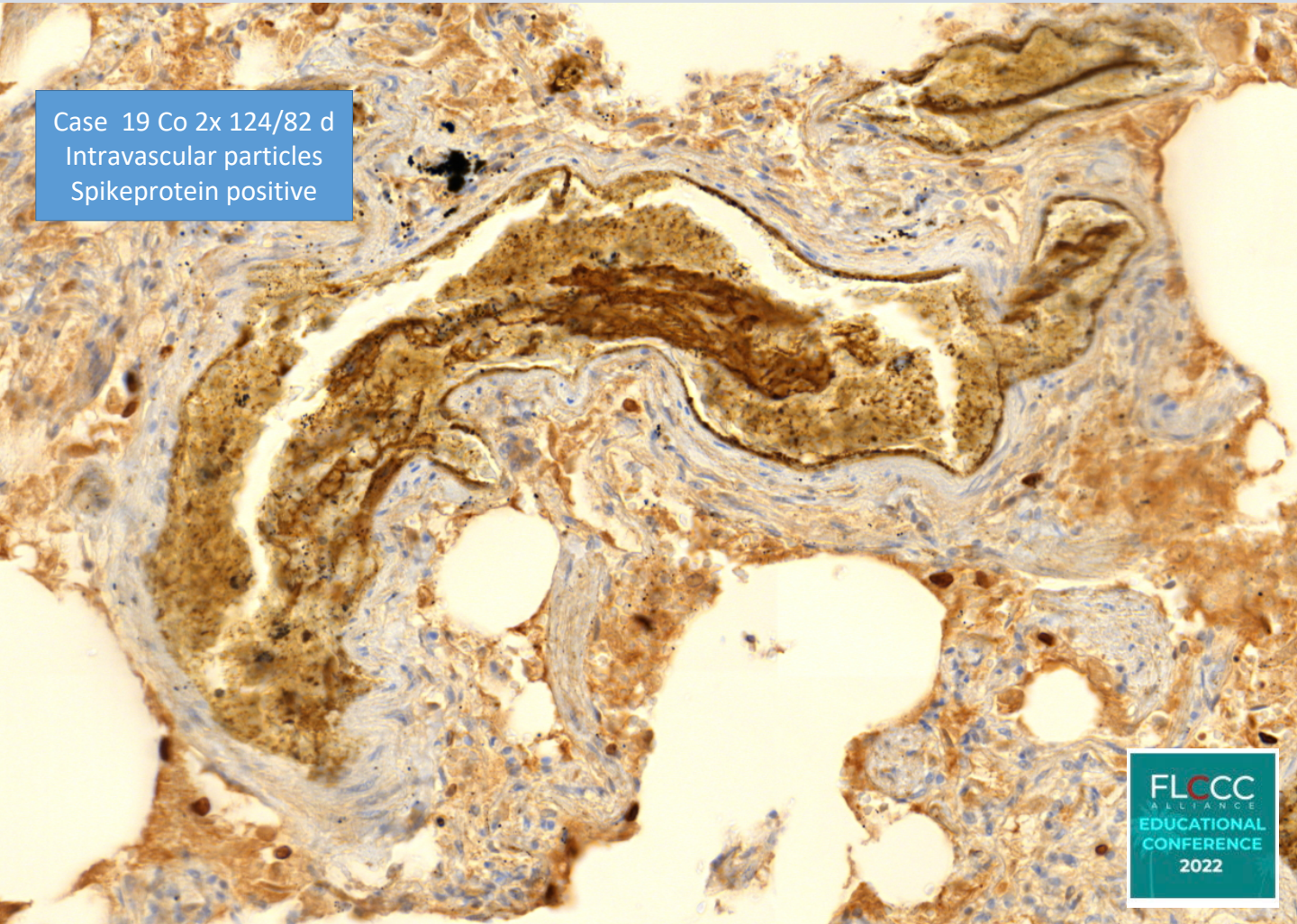

LABORATORY APPARATUS, FURNITURE
SCIENTIFIC INSTRUMENTS & CHEMICALS


SCIENTIFIC INSTRUMENTS & CHEMICALS





FLCCC ALLIANCE
EDUCATIONAL CONFERENCE 2022


Case 19 Co 2x 124/82 d
Intravascular particles
Spikeprotein positive
FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022


FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022

medRxiv
THE PREPRINT SERVER FOR HEALTH SCIENCES

SARS-CoV-2 spike protein S1 induces fibrin(ogen) resistant to fibrinolysis: Implications for microclot formation in COVID-19

Lize M. Grobbelaar, Chantelle Venter, Mare Vlok, Malebogo Ngoepe, Gert Jacobus Laubscher, Petrus Johannes Lourens, Janami Steenkamp, Douglas B. Kell, Etheresia Pretorius

doi: https://doi.org/10.1101/2021.03.05.21252960

Now published in *Bioscience Reports* doi: 10.1042/bsr20210611

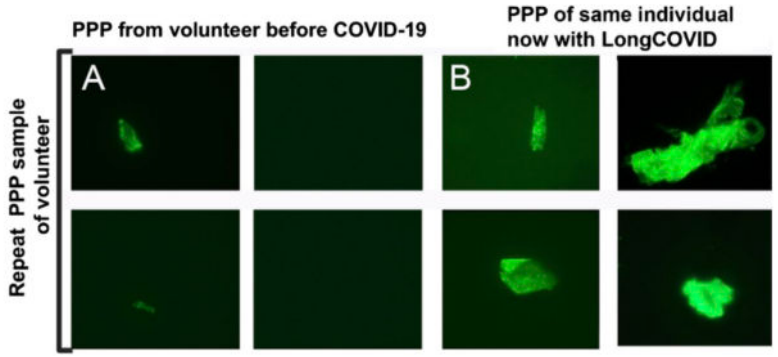
Cardiovascular Diabetology

Original investigation | Open Access | Published: 23 August 2021

Persistent clotting protein pathology in Long COVID/Post-Acute Sequelae of COVID-19 (PASC) is accompanied by increased levels of antiplasmin

Etheresia Pretorius, Mare Vlok, Chantelle Venter, Johannes A. Bezuidenhout, Gert Jacobus Laubscher, Janami Steenkamp & Douglas B. Kell

Cardiovascular Diabetology **20**, Article number: 172 (2021) | Cite this article



Amyloidogenesis of SARS-CoV-2 Spike Protein

Sofie Nyström* and Per Hammarström*

Cite this: *J. Am. Chem. Soc.* 2022, 144, 20, 8945–8950
Publication Date: May 17, 2022
https://doi.org/10.1021/jacs.2c03925

Review > Biochem J. 2022 Feb 17;479(4):537-559. doi: 10.1042/BCJ20220016.

A central role for amyloid fibrin microclots in long COVID/PASC: origins and therapeutic implications

Douglas B Kell [1 2 3], Gert Jacobus Laubscher [4], Etheresia Pretorius [3]

Affiliations + expand

PMID: 35195253 PMCID: PMC8883497 DOI: 10.1042/BCJ20220016

medRxiv
THE PREPRINT SERVER FOR HEALTH SCIENCES

CSH Cold Spring Harbor Laboratory BMJ Yale

Prevalence of amyloid blood clots in COVID-19 plasma

Etheresia Pretorius, Chantelle Venter, Gert Jacobus Laubscher, Petrus Johannes Lourens, Janami Steenkamp, Douglas B Kell

doi: https://doi.org/10.1101/2020.07.28.20163543

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Cytokine Growth Factor Rev. 2021 Aug; 60: 52–60.
Published online 2021 May 28. doi: 10.1016/j.cytogfr.2021.05.001
PMCID: PMC8159713
PMID: 34090785

Antiphospholipid antibodies and risk of post-COVID-19 vaccination thrombophilia: The straw that breaks the camel's back?

Rossella Talotta[a,*] and Erle S. Robertson[b]

Am J Hematol. 2021 May; 96(5): 534–537.
Published online 2021 Mar 9. doi: 10.1002/ajh.26132
PMCID: PMC8014568
PMID: 33606296

Thrombocytopenia following Pfizer and Moderna SARS-CoV-2 vaccination

Eun-Ju Lee,[1] Douglas B. Cines,[2] Terry Gernsheimer,[3] Craig Kessler,[4] Marc Michel,[5] Michael D. Tarantino,[6] John W. Semple,[7] Donald M. Arnold,[8] Bertrand Godeau,[5] Michele P. Lambert,[9,10] and James B. Bussel[11]

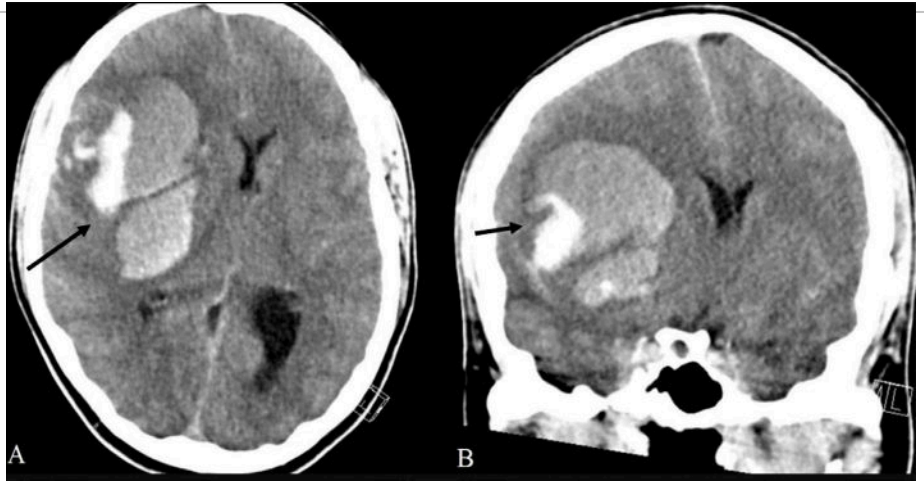
Author information Article notes Copyright and License information Disclaimer

AMERICAN COLLEGE of CARDIOLOGY®

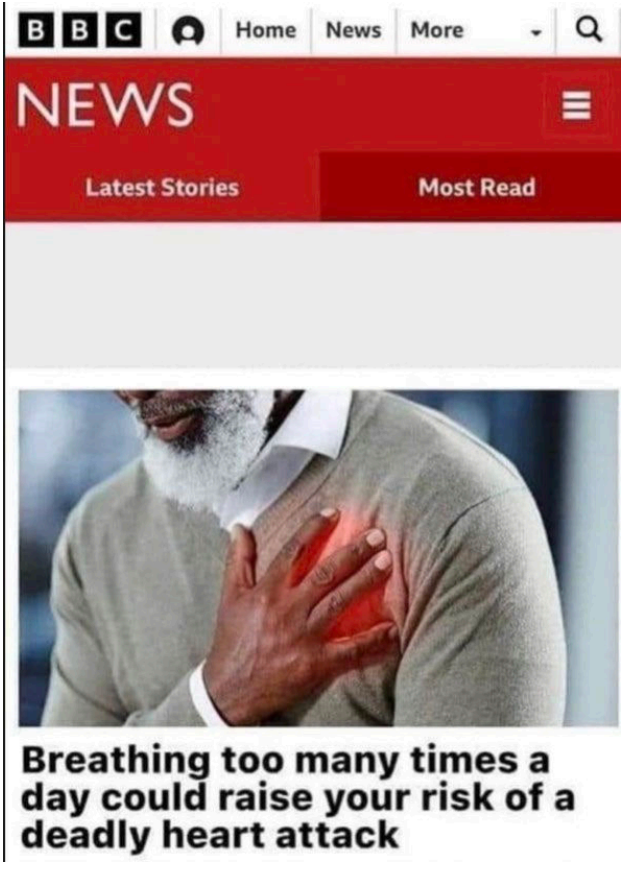
Vaccine-induced Thrombotic Thrombocytopenia (VITT) and COVID-19 Vaccines: What Cardiovascular Clinicians Need to Know

Jun 08, 2021

Cardiology Magazine

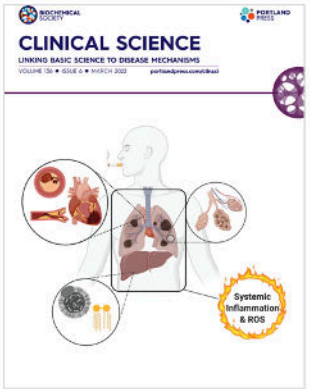


MYOCARDITIS/CARDIAC HARM



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Volume 136, Issue 6
March 2022



COMMENTARY | MARCH 29 2022

SARS-CoV-2 spike protein causes cardiovascular disease independent of viral infection

John D. Imig

Check for updates

Clin Sci (Lond) (2022) 136 (6): 431–434.

https://doi.org/10.1042/CS20220028 **Article history**

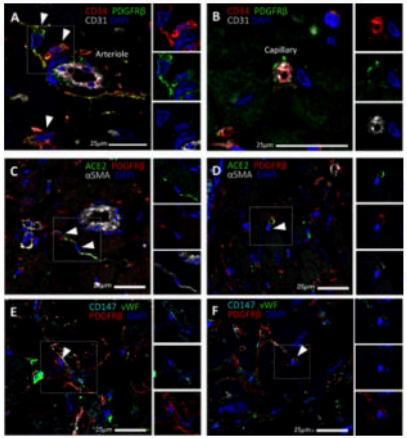
Connected Content

This is a commentary on: The SARS-CoV-2 Spike protein disrupts human cardiac pericytes function through CD147 receptor-mediated signalling: a potential non-infective mechanism of COVID-19 microvascular disease

News | Coronavirus (COVID-19) | February 09, 2022

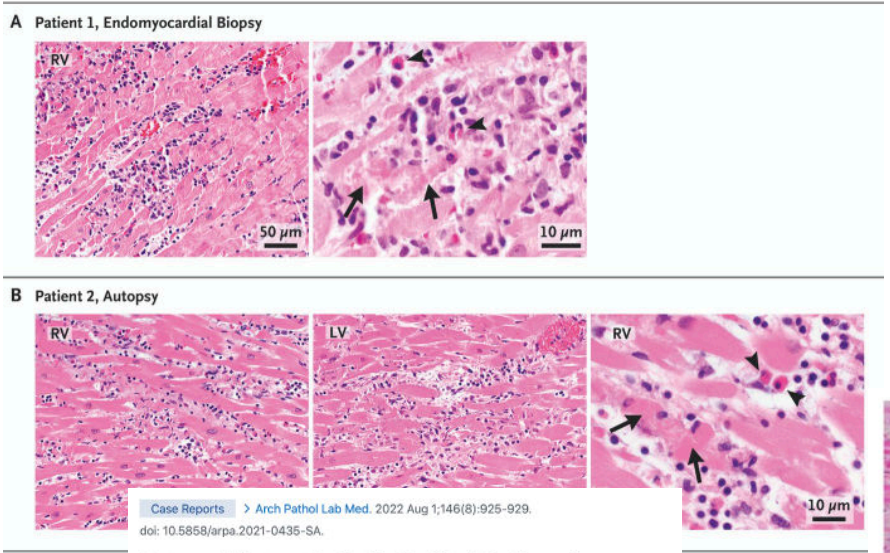
SARS-CoV-2 Spike Protein Binds to Heart's Vascular Cells Potentially Contributing to Severe Microvascular Damage

A new study has shown how SARS-CoV-2 may contribute to severe microvascular damage seen in severely-ill COVID-19 patients by transforming human heart vascular cells into inflammatory cells, without infecting them



DAIC
Diagnostic and Interventional Cardiology

FLCCC ALLIANCE
EDUCATIONAL CONFERENCE
2022



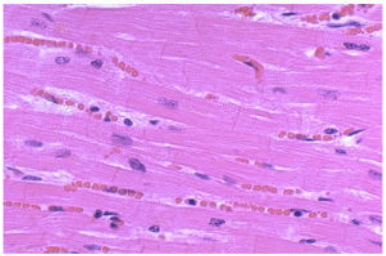
Case Reports > Arch Pathol Lab Med. 2022 Aug 1;146(8):925-929.
doi: 10.5858/arpa.2021-0435-SA.

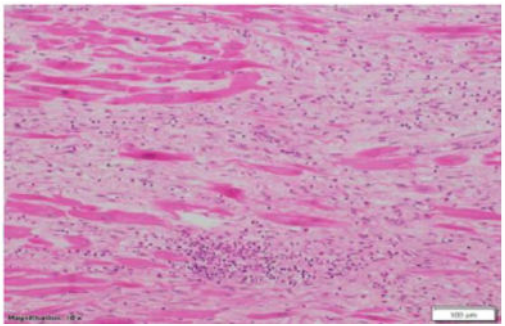
Autopsy Histopathologic Cardiac Findings in 2 Adolescents Following the Second COVID-19 Vaccine Dose

James R Gill [1 2], Randy Tashjian [3 4], Emily Duncanson [5]

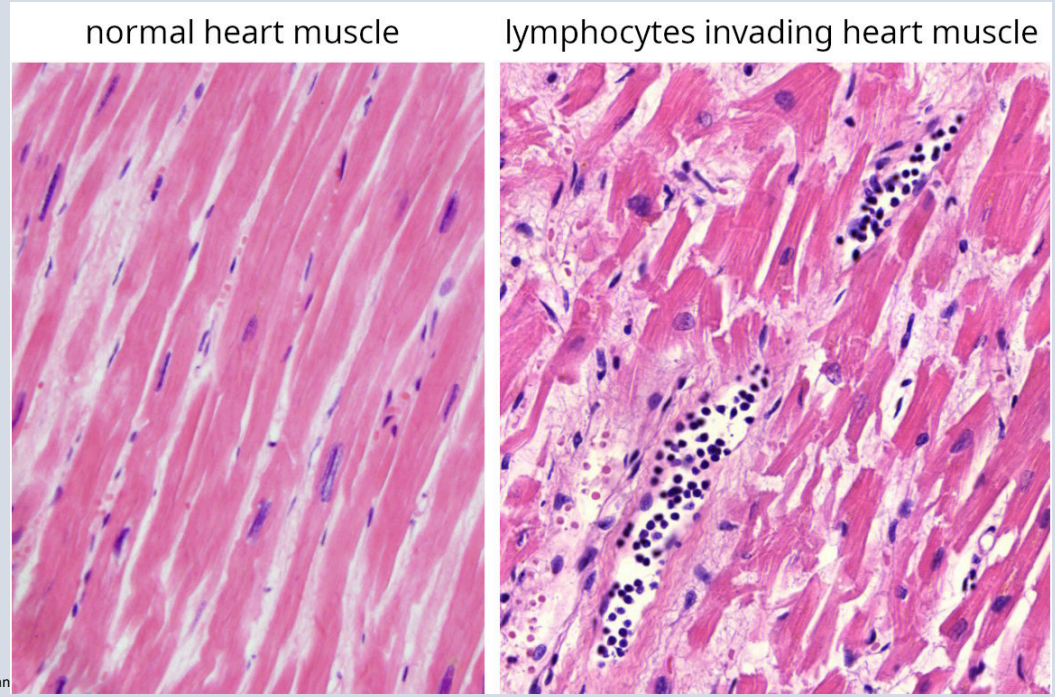
Affiliations + expand

PMID: 35157759 DOI: 10.5858/arpa.2021-0435-SA

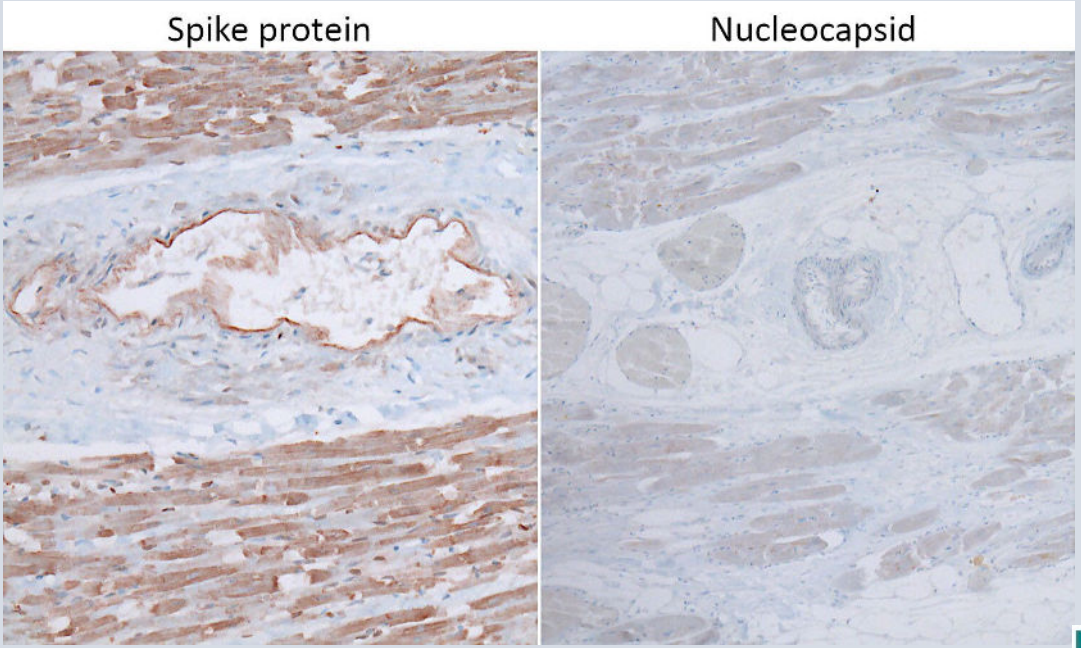




Lymphocytes invading heart muscle tissue (case 20)



Spike protein vs. nucleocapsid expression in heart muscle (immunohistochemistry)



Cardiovascular Effects of the BNT162b2 mRNA COVID-19 Vaccine in Adolescents

Suyanee Mansanguan , Prakaykaew Charunwatthana , Watcharapong Piyaphanee , Wilanee Dechkhajorn , Akkapon Poolcharoen , Chayasin Mansanguan *

Version 1 : Received: 7 August 2022 / Approved: 8 August 2022 / Online: 8 August 2022 (10:40:23 CEST)

How to cite: Mansanguan, S.; Charunwatthana, P.; Piyaphanee, W.; Dechkhajorn, W.; Poolcharoen, A.; Mansanguan, C. Cardiovascular Effects of the BNT162b2 mRNA COVID-19 Vaccine in Adolescents. *Preprints* **2022**, 2022080151 (doi: 10.20944/preprints202208.0151.v1).

iScience

CellPress
OPEN ACCESS

Article

SARS-CoV-2 infection enhances mitochondrial PTP complex activity to perturb cardiac energetics

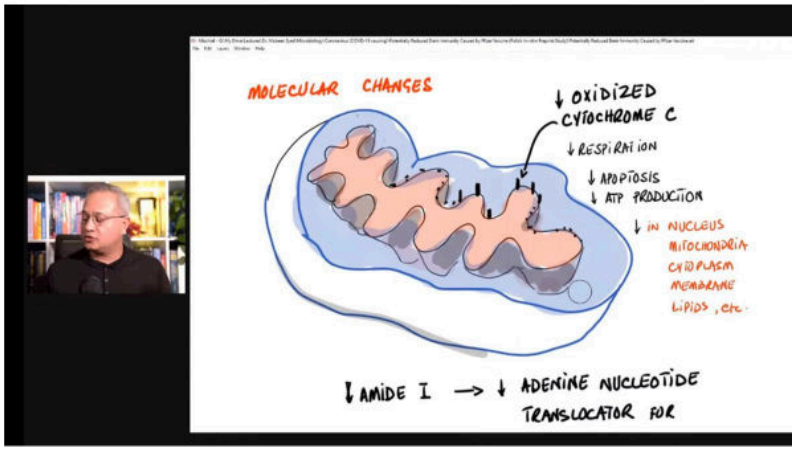
Karthik Ramachandran,[1,10] Soumya Maity,[1,10] Alagar R. Muthukumar,[2] Soundarya Kandala,[1] Dhanendra Tomar,[3]

was suppressed by cyclosporin A treatment. Our findings reveal that SARS-CoV-2 viral proteins suppress cardiomyocyte mitochondrial function that disrupts cardiomyocyte Ca^{2+} cycling and cell viability.

MITOCHONDRIAL HARMS

SPIKE HARM

MITOCHONDRIAL DAMAGE



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

> J Neuroimmune Pharmacol. 2021 Dec;16(4):770-784. doi: 10.1007/s11481-021-10015-6.
Epub 2021 Oct 2.

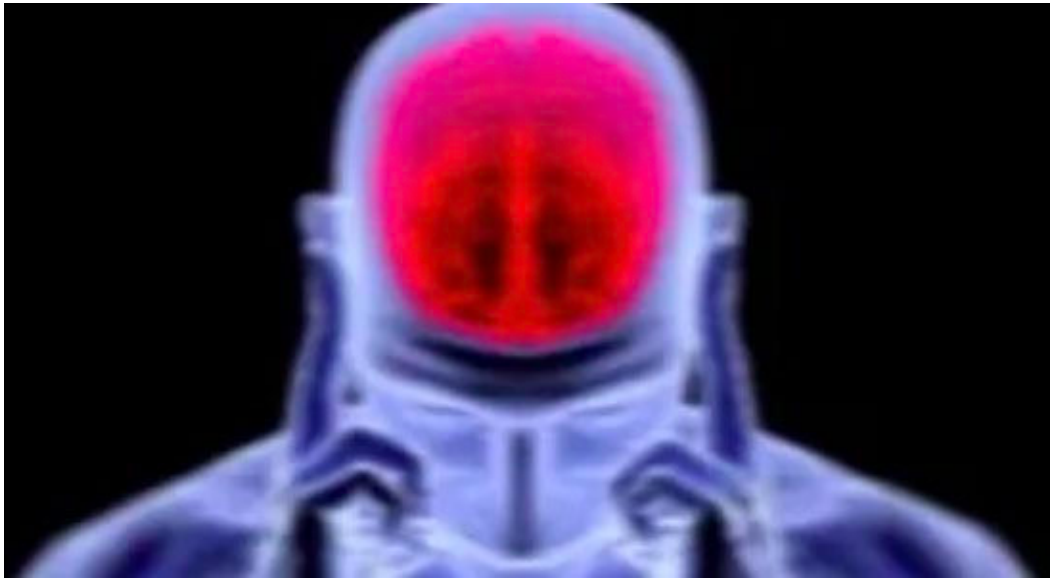
Mitochondrial Dynamics in SARS-COV2 Spike Protein Treated Human Microglia: Implications for Neuro-COVID

Erin Clough [1], Joseph Inigo [2], Dhyan Chandra [2], Lee Chaves [1], Jessica L Reynolds [1], Ravikumar Aalinkeel [1], Stanley A Schwartz [1], Alexander Khmaladze [3], Supriya D Mahajan [4]

Affiliations + expand

PMID: 34599743 PMCID: PMC8487226 DOI: 10.1007/s11481-021-10015-6

SPIKE - NEUROLOGIC DAMAGE



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

J Neurol. 2022; 269(3): 1093–1106.
Published online 2021 Sep 4. doi: 10.1007/s00415-021-10780-7
PMCID: PMC8417681
PMID: 34480607

COVID-19 mRNA vaccination leading to CNS inflammation: a case series

Mahsa Khayat-Khoei,[1] Shamik Bhattacharyya,[1] Joshua Katz,[2] Daniel Harrison,[1] Shahamat Tauhid,[1] Penny Bruso,[3] Maria K. Houtchens,[1] Keith R. Edwards,[3] and Rohit Bakshi[1]

vaccines

Open Access Case Report

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

by Michael Mörz

Institute of Pathology 'Georg Schmorl', The Municipal Hospital Dresden-Friedrichstadt, Friedrichstrasse 41, 01067 Dresden, Germany

Academic Editor: Sung Ryul Shim

Vaccines **2022**, *10*(10), 1651; **https://doi.org/10.3390/vaccines10101651**

Received: 31 August 2022 / Revised: 25 September 2022 / Accepted: 27 September 2022 / Published: 1 October 2022

(This article belongs to the Special Issue **Adverse Events of COVID-19 Vaccines**)

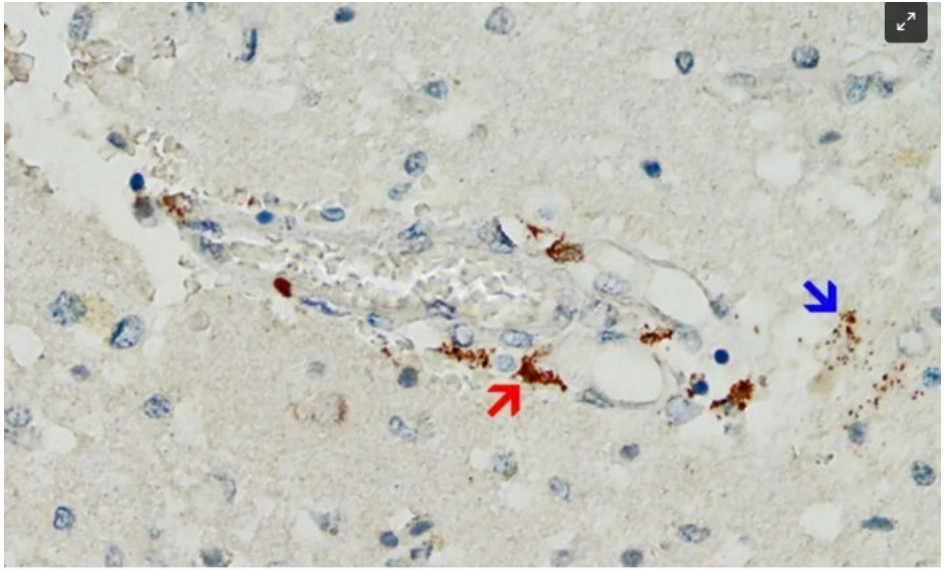


Figure 9. Frontal brain. Positive reaction for SARS-CoV-2 spike protein. Cross section through a capillary vessel (same vessel as shown in Figure 11, serial sections of 5 to 20 µm). Immunohistochemical reaction for SARS-CoV-2 spike subunit 1 detectable as brown granules in capillary endothelial cells (red arrow) and individual glial cells (blue arrow). Magnification: 200×. Source: MDPI-

nature neuroscience

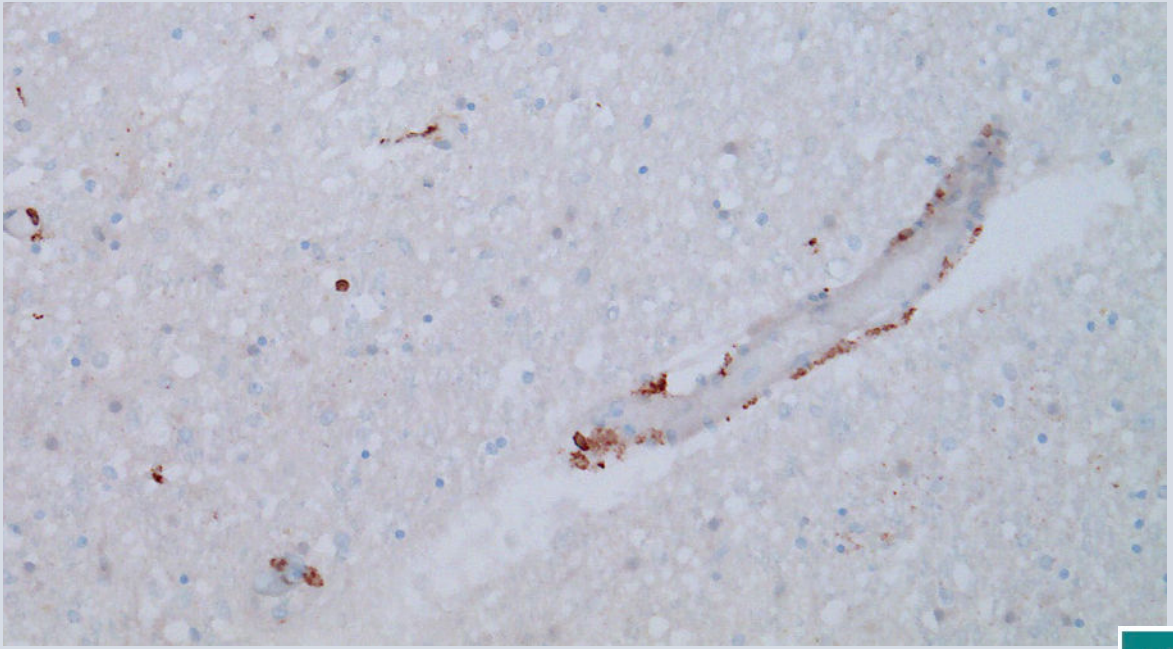
Article | Published: 16 December 2020

The S1 protein of SARS-CoV-2 crosses the blood–brain barrier in mice

Elizabeth M. Rhea, Aric F. Logsdon, Kim M. Hansen, Lindsey M. Williams, May J. Reed, Kristen K. Baumann, Sarah J. Holden, Jacob Raber, William A. Banks ✉ & Michelle A. Erickson

Nature Neuroscience **24**, 368–378 (2021) | Cite this article

Expression of spike protein in small brain vessels

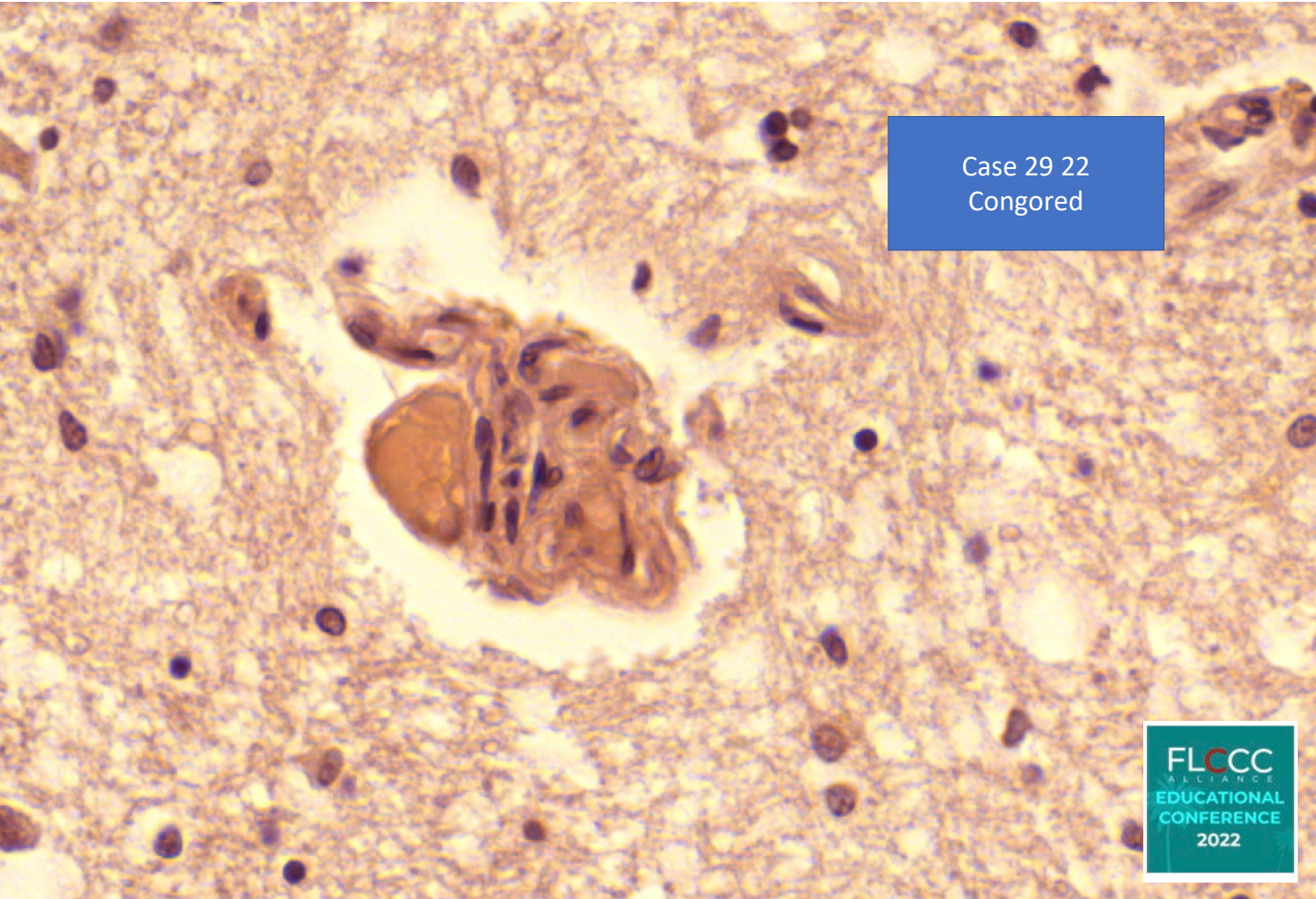


Biochem Biophys Res Commun. 2021 May 21; 554: 94–98.
Published online 2021 Mar 24. doi: 10.1016/j.bbrc.2021.03.100
PMCID: PMC7988450
PMID: 33789211

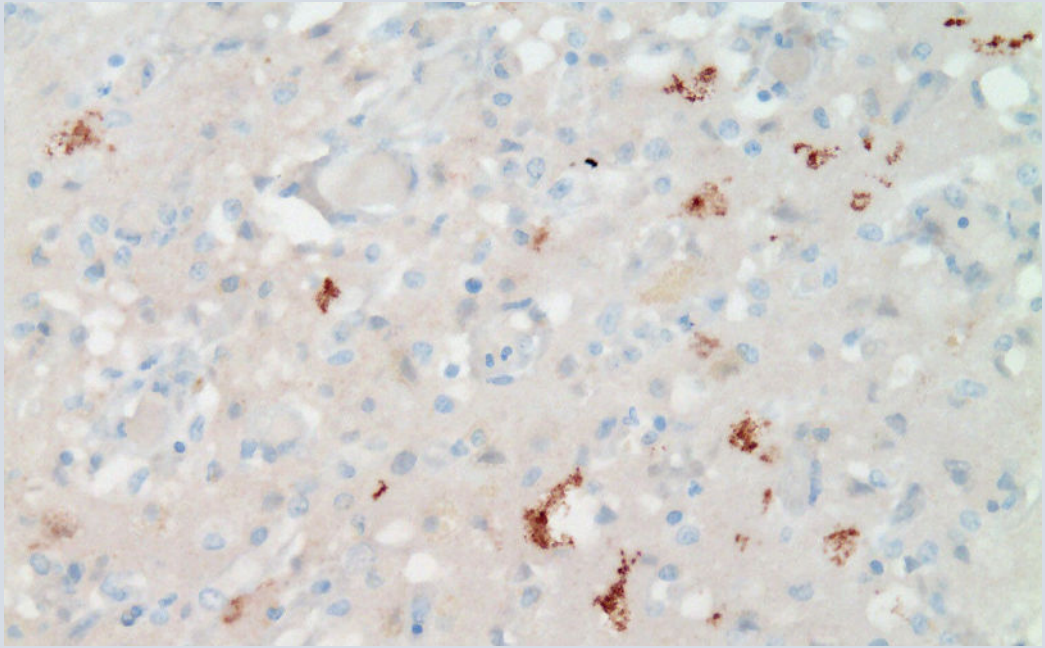
SARS-CoV-2 spike protein interactions with amyloidogenic proteins: Potential clues to neurodegeneration

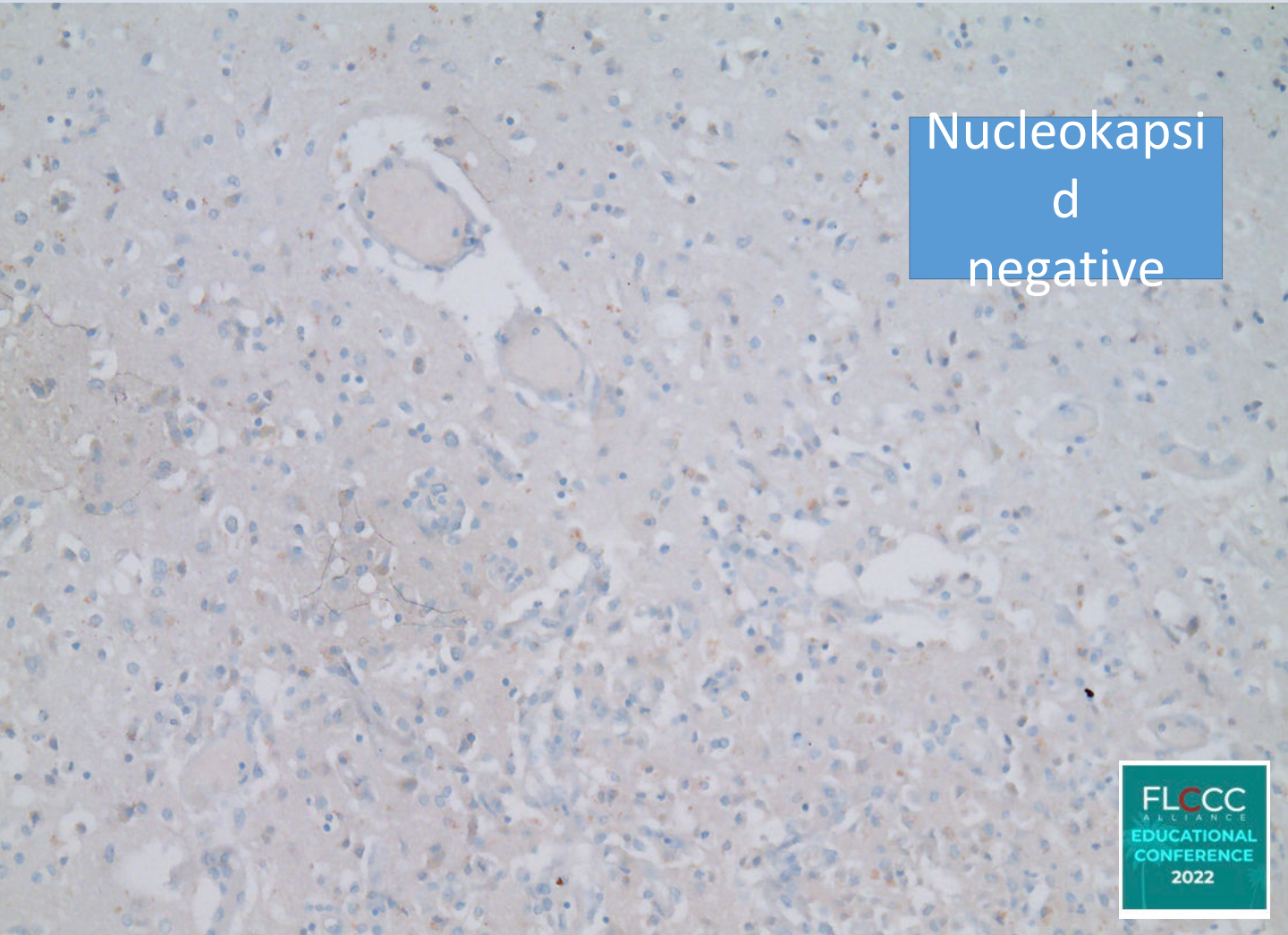
Danish Idrees[a,*] and Vijay Kumar[b,**]

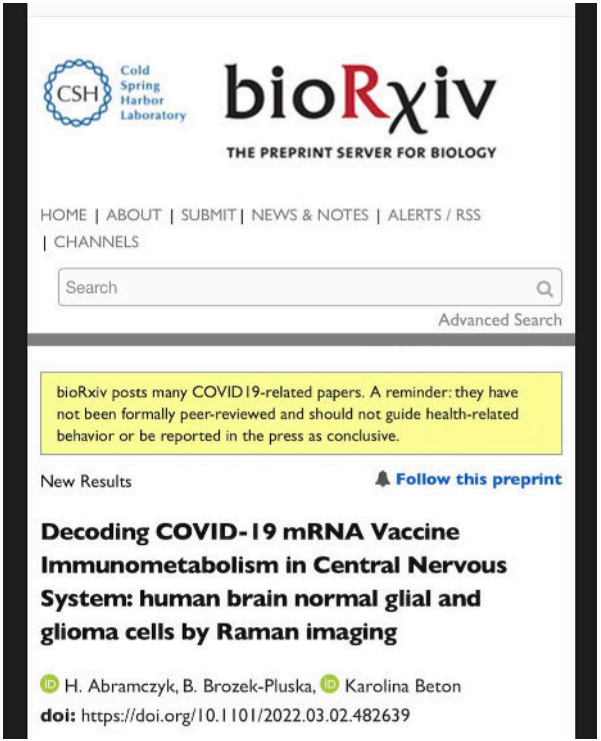
The post-infection of COVID-19 includes a myriad of neurologic symptoms including neurodegeneration. Protein aggregation in brain can be considered as one of the important reasons behind the neurodegeneration. SARS-CoV-2 Spike S1 protein receptor binding domain (SARS-CoV-2 S1 RBD) binds to heparin and heparin binding proteins. Moreover, heparin binding accelerates the aggregation of the pathological amyloid proteins present in the brain. In this paper, we have shown that the SARS-CoV-2 S1 RBD binds to a number of aggregation-prone, heparin binding proteins including Aβ, α-synuclein, tau, prion, and TDP-43 RRM. These interactions suggests that the heparin-binding site on the S1 protein might assist the binding of amyloid proteins to the viral surface and thus could initiate aggregation of these proteins and finally leads to neurodegeneration in brain. The results will help us to prevent future outcomes of neurodegeneration by targeting this binding and aggregation process.


Case 29 22
Congored
FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022

Expression of spike protein in brain tissue







Cold Spring Harbor Laboratory

bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

HOME | ABOUT | SUBMIT | NEWS & NOTES | ALERTS / RSS | CHANNELS

Search

Advanced Search

bioRxiv posts many COVID19-related papers. A reminder: they have not been formally peer-reviewed and should not guide health-related behavior or be reported in the press as conclusive.

New Results

Follow this preprint

Decoding COVID-19 mRNA Vaccine Immunometabolism in Central Nervous System: human brain normal glial and glioma cells by Raman imaging

H. Abramczyk, B. Brozek-Pluska, Karolina Beton

doi: https://doi.org/10.1101/2022.03.02.482639

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Journals / Viruses / Volume 13 / Issue 10 / 10.3390/v13102021

Open Access Article

Spike Proteins of SARS-CoV-2 Induce Pathological Changes in Molecular Delivery and Metabolic Function in the Brain Endothelial Cells

by Eun Seon Kim [1,2,†], Min-Tae Jeon [1,†], Kyu-Sung Kim [1,2,†], Suji Lee [1,3,†], Suji Kim [1] and Do-Geun Kim [1,*]

ORGAN DAMAGE/METABOLIC ALTERATIONS

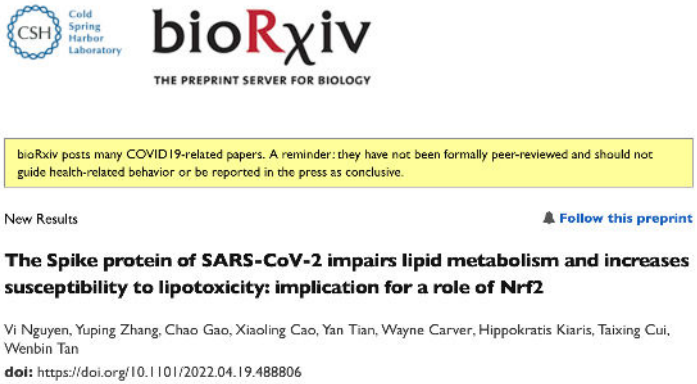
FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

SPIKE HARM

ORGAN DAMAGE

- Heart, Lung, Liver

SARS-CoV-2 spike protein disrupts lipid metabolism resulting in liver, heart & kidney damage



Cold Spring Harbor Laboratory

bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

bioRxiv posts many COVID19-related papers. A reminder: they have not been formally peer-reviewed and should not guide health-related behavior or be reported in the press as conclusive.

New Results

Follow this preprint

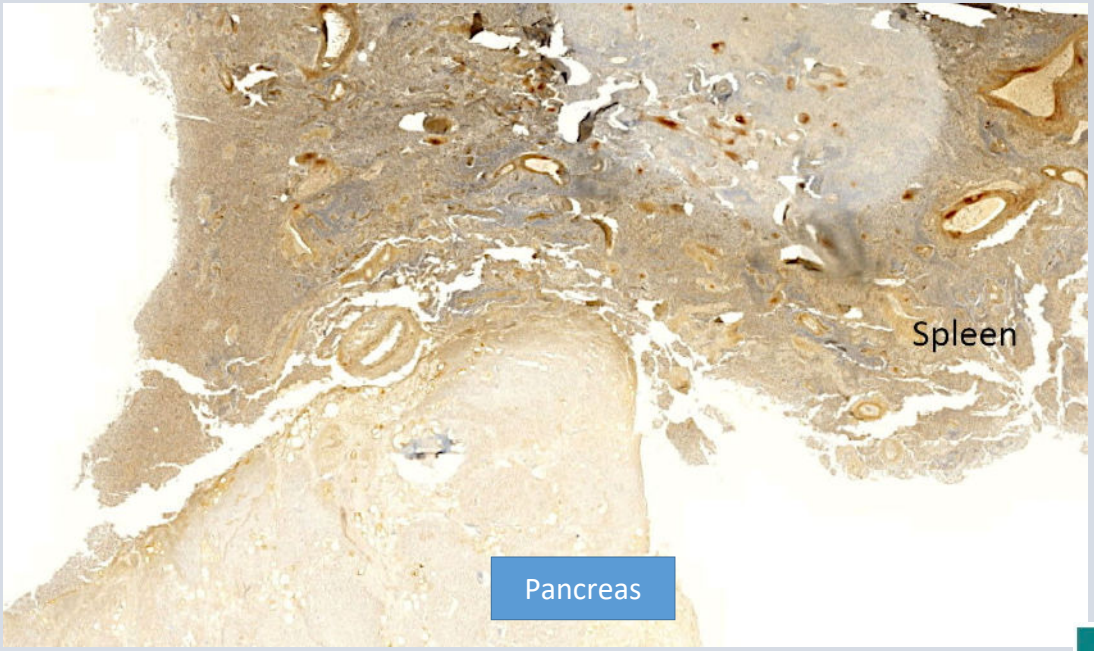
The Spike protein of SARS-CoV-2 impairs lipid metabolism and increases susceptibility to lipotoxicity: implication for a role of Nrf2

Vi Nguyen, Yuping Zhang, Chao Gao, Xiaoling Cao, Yan Tian, Wayne Carver, Hippokratis Kiaris, Taixing Cui, Wenbin Tan

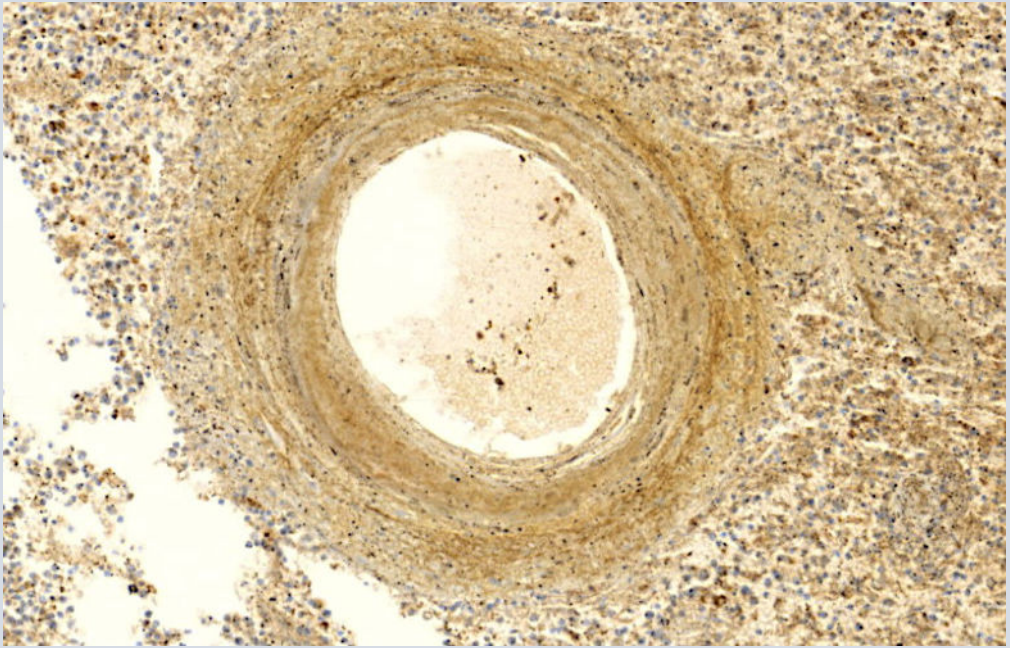
doi: https://doi.org/10.1101/2022.04.19.488806

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Case 10 (spleen and pancreas at low magnification): high level of spike protein expression in the spleen



Expression of spike protein in a spleen artery and surrounding tissue



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Spike damage in liver

HEPATOLOGY AASLD

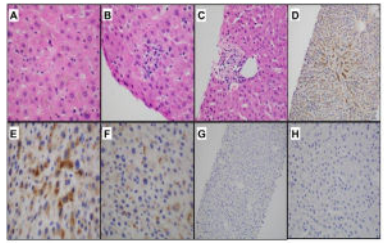
Original ARTICLE | Free Access

Liver injury after SARS-CoV-2 vaccination: Features of immune-mediated hepatitis, role of corticosteroid therapy and outcome

Cumali Efe, Anand V. Kulkarni, Benedetta Terziroli Beretta-Piccoli, Bianca Magro, Albert Friedrich Stättermayer, Mustafa Cengiz, Daniel Clayton-Chubb, Craig Lammert ... See all authors

First published: 14 May 2022 | https://doi.org/10.1002/hep.32572

Staffan Wahlin and Thomas D. Schiano share senior authorship.



JOURNAL OF HEPATOLOGY EASL Submit Claim Log in Registe

LETTER TO THE EDITOR | VOLUME 77, ISSUE 2, P556-558, AUGUST 01, 2022

PDF [973 KB] Figures

Severe *de novo* liver injury after Moderna vaccination – not always autoimmune hepatitis

Chan Maung Nyein • Zi Hui Sherilyn Liew • Wei-Qiang Leow • Poh Sheng Joe Yeong • Gim Hin Ho

Show footnotes

Published: April 16, 2022 • DOI: https://doi.org/10.1016/j.jhep.2022.03.041 • Check for updates

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

SPIKE HARM

LUNG DAMAGE

AMERICAN JOURNAL OF PHYSIOLOGY
american physiological society
LUNG CELLULAR AND MOLECULAR PHYSIOLOGY

JOURNAL HOME | ISSUES | COLLECTIONS | INFORMATION | ABOUT | SUBMIT | SUBSC

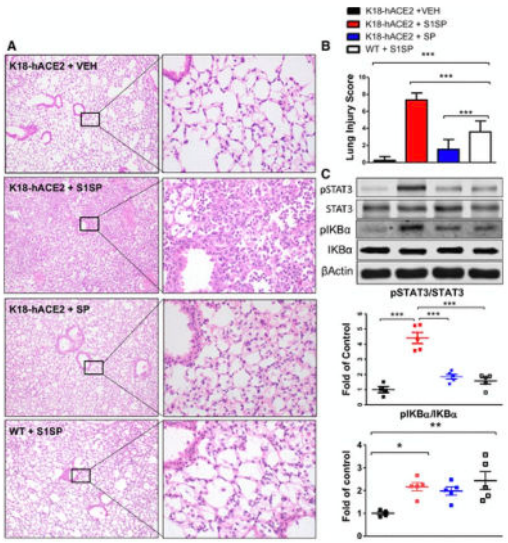
Rapid Report | The Pathophysiology of COVID-19 and SARS-CoV-2 Infection

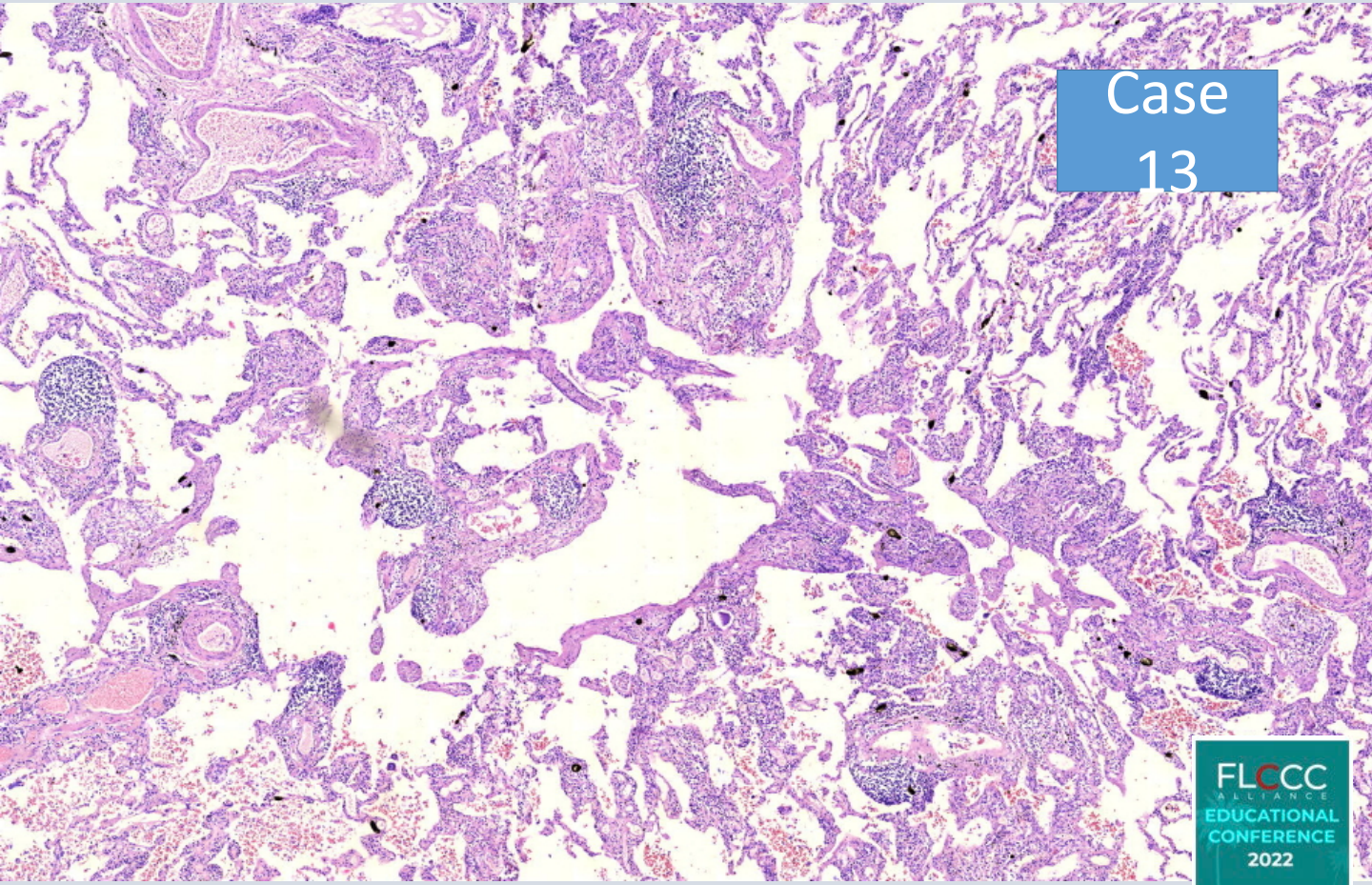
The SARS-CoV-2 spike protein subunit S1 induces COVID-19-like acute lung injury in K18-hACE2 transgenic mice and barrier dysfunction in human endothelial cells

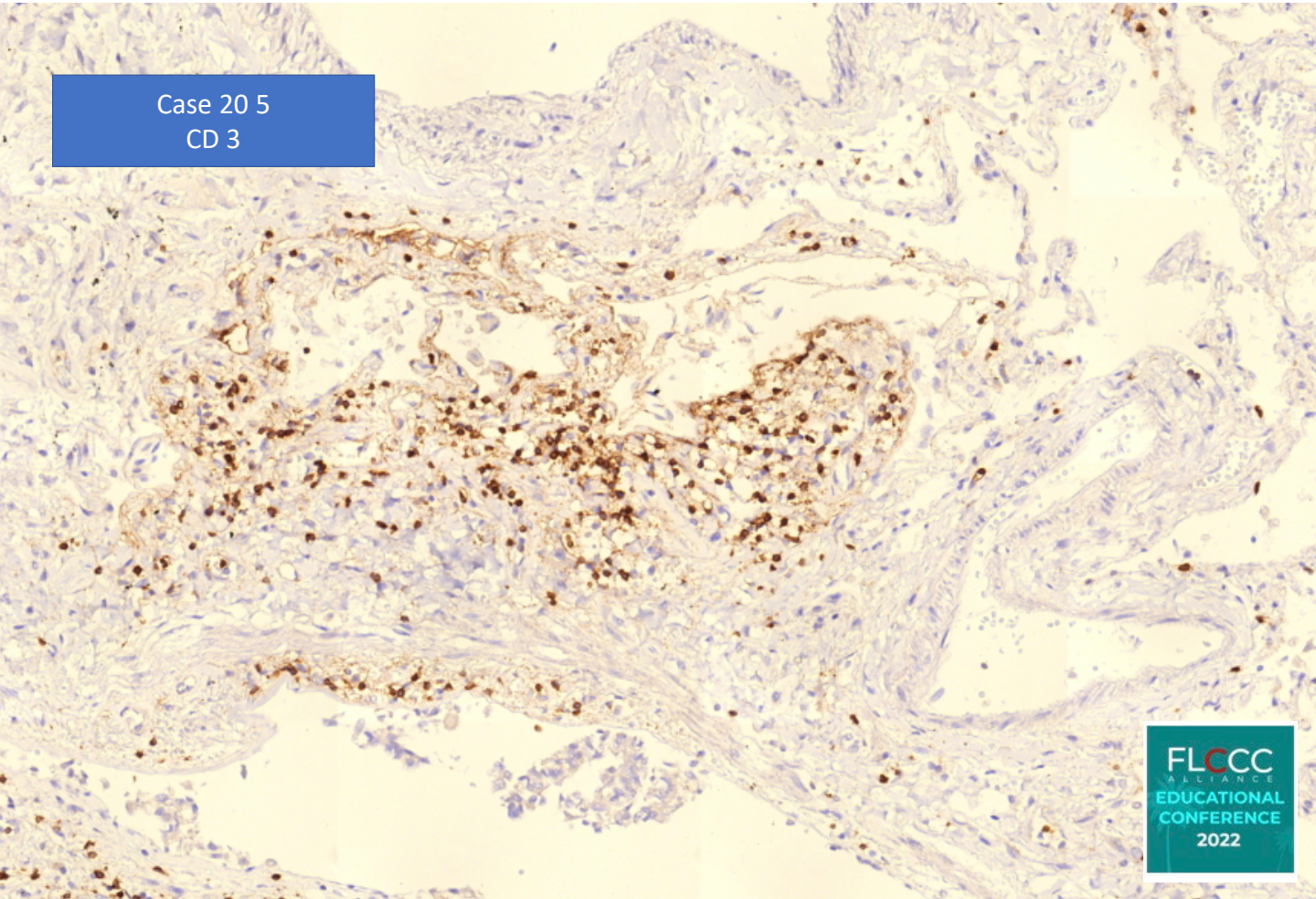
Ruben M. L. Colunga Biancatelli ,* Pavel A. Solopov ,* Elizabeth R. Sharlow, ... See all authors

10 AUG 2021 // https://doi.org/10.1152/ajplung.00223.2021

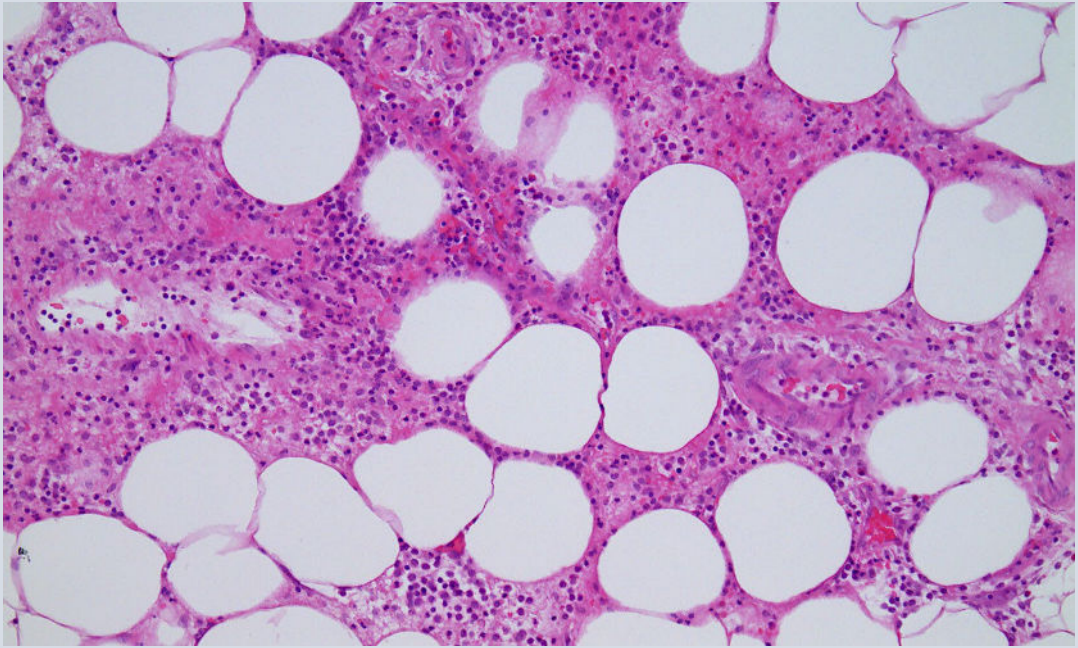
3C).



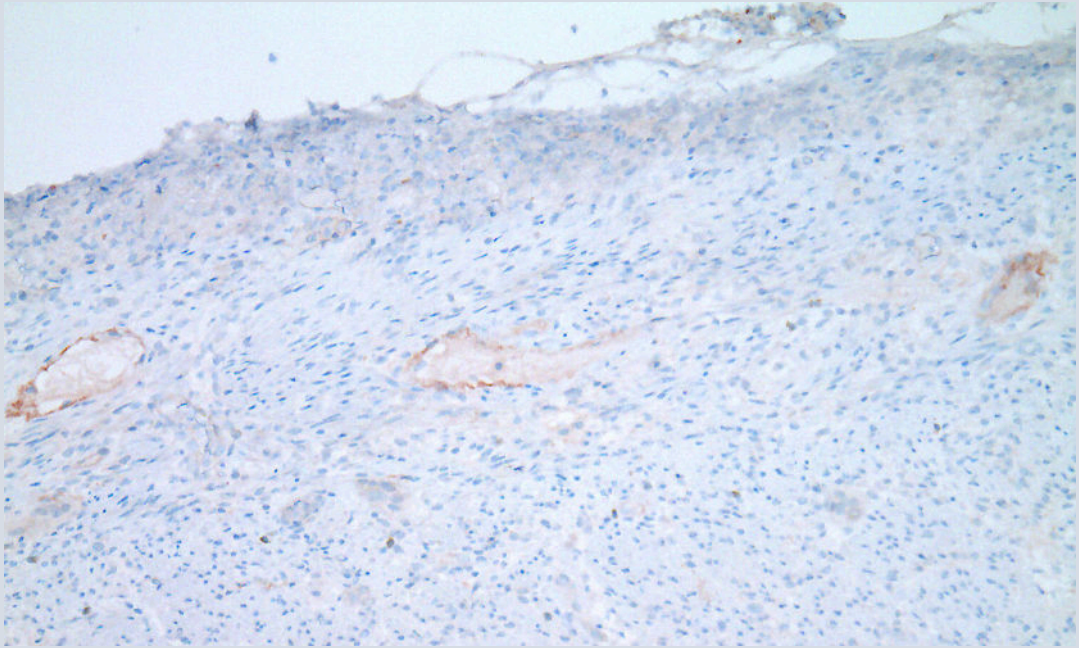

Case
13
FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022


Case 20 5
CD 3
FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022

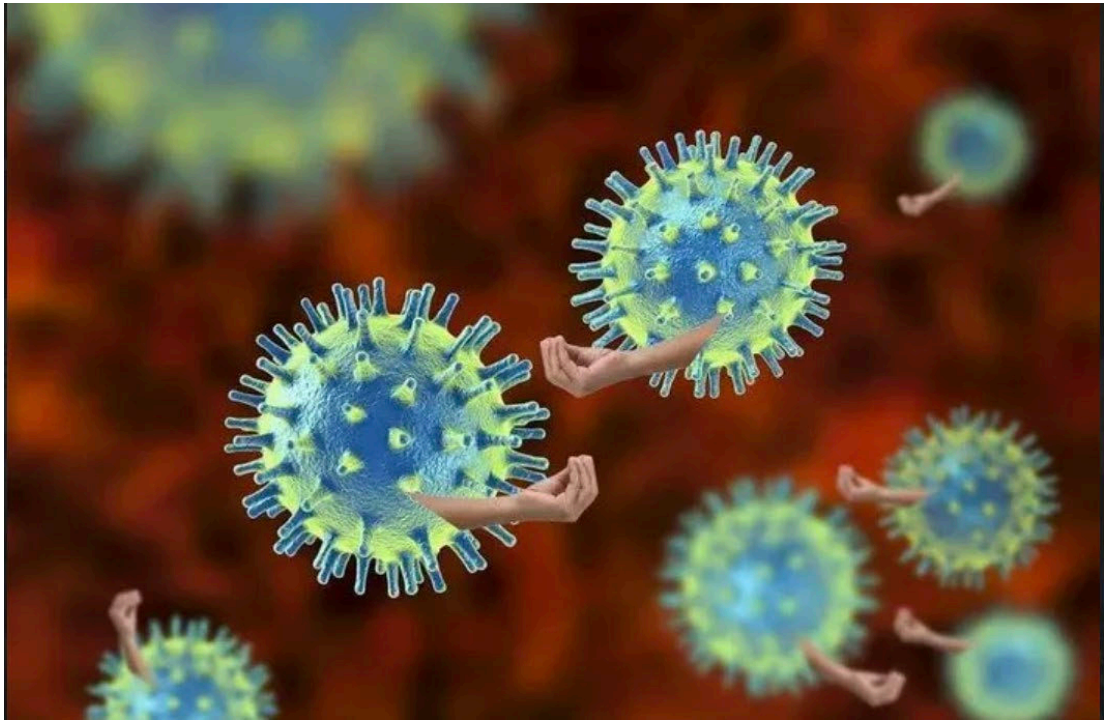
Periappendicitis



Spike protein (immunohistochemistry)



VIRAL REACTIVATION



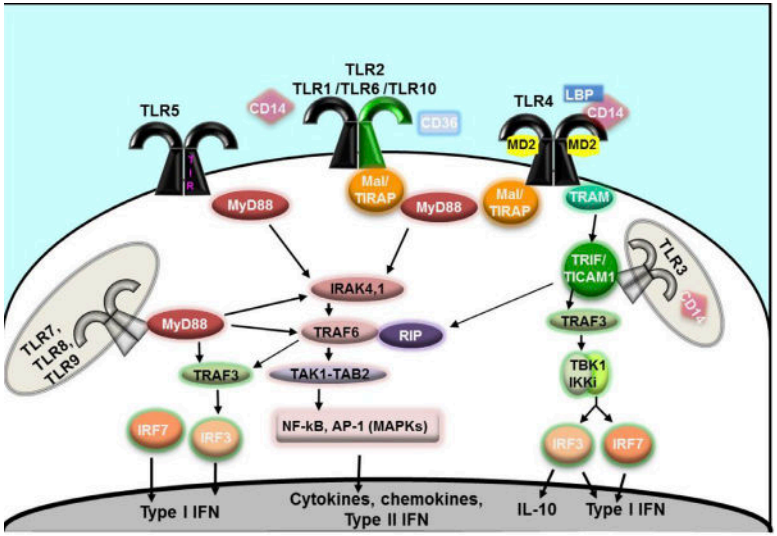
FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

SPIKE HARM

DAMAGE-
TOLL LIKE RECEPTORS

- DOWN REGULATION 3,4,7,8

- DECREASE 7,8 = Increase of latent viruses (Herpes Family viruses, Zoster, HSV1 and 2, HHV Epstein -Barr, RSV, HPV,etc.)



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

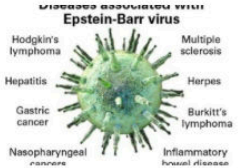
BJCP British Journal of Clinical Pharmacology

SHORT COMMUNICATION | Free Access

Association study between herpes zoster reporting and mRNA COVID-19 vaccines (BNT162b2 and mRNA-1273)

Laure-Hélène Préta, Adrien Contejean, Francesco Salvo, Jean-Marc Treluyer, Caroline Charlier, Laurent Chouchana

First published: 16 February 2022 | https://doi.org/10.1111/bcp.15280



New Study Shows That Epstein-Barr Virus Reactivation And Low Cortisol Levels Are Common In Many Long COVID Patients!

Source: Medical News - Long COVID -Epstein-Barr Virus Reactivation Aug 14, 2022 3 days ago

A new Long COVID study lead by Yale Immunology Professor Dr Akiko Iwasaki, PhD that involved 215 individuals from Mount Sinai Hospital in New York City and Yale New Haven Hospital in Connecticut has interesting found that Epstein-Barr Virus (EBV) reactivation and low co...

Read More

J Eur Acad Dermatol Venereol. 2022 Jan; 36(1): e6–e9.
Published online 2021 Oct 5. doi: 10.1111/jdv.17646
PMCID: PMC8656951
PMID: 34487581

Varicella-zoster and herpes simplex virus reactivation post-COVID-19 vaccination: a review of 40 cases in an International Dermatology Registry

R.A. Fathy,[1] D.E. McMahon,[2] C. Lee,[3] G.C. Chamberlin,[4] M. Rosenbach,[1] J.B. Lipoff,[1] A. Tyagi,[4] S.R. Desai,[5,6] L.E. French,[7,8] H.W. Lim,[9] B.H. Thiers,[10] G.J. Hruza,[11] M. Fassett,[12] L.P. Fox,[12] H.L. Greenberg,[13] K. Blumenthal,[2] and E.E. Freeman[2,4]

Vaccines (Basel). 2021 Sep; 9(9): 1013.
Published online 2021 Sep 11. doi: 10.3390/vaccines9091013

PMCID: PMC8471236
PMID: 34579250

Varicella Zoster Virus Reactivation Following COVID-19 Vaccination: A Systematic Review of Case Reports

Konstantinos Katsikas Triantafyllidis,[1,2] Panagiotis Giannos,[2,3] Imran Tariq Mian,[4] George Kyrtsonis,[5] and Konstantinos S. Kechagias[2,6,*]

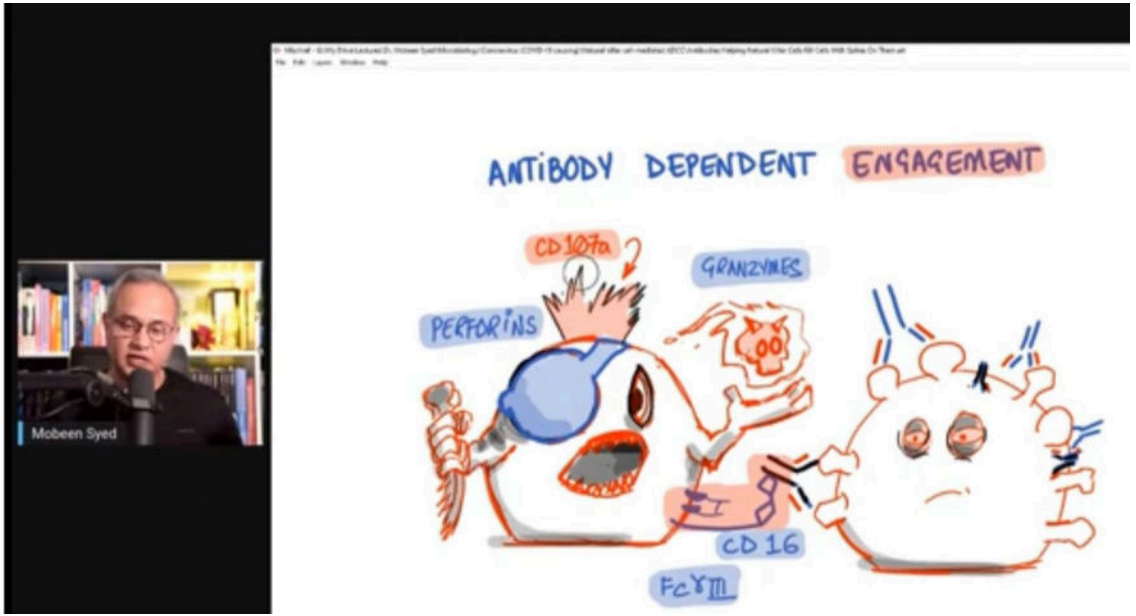
Katie B. Biello, Academic Editor

Int Med Case Rep J. 2021; 14: 573–576.
Published online 2021 Aug 29. doi: 10.2147/IMCRJ.S328482
PMCID: PMC8412816
PMID: 34512037

Hepatitis C Virus Reactivation Following COVID-19 Vaccination – A Case Report

Ruud Lensen, [1] Mihai G Netea, [2,3] and Frits R Rosendaal [4]

ANTIBODY DEPENDENT CELLULAR CYTOTOXICITY



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

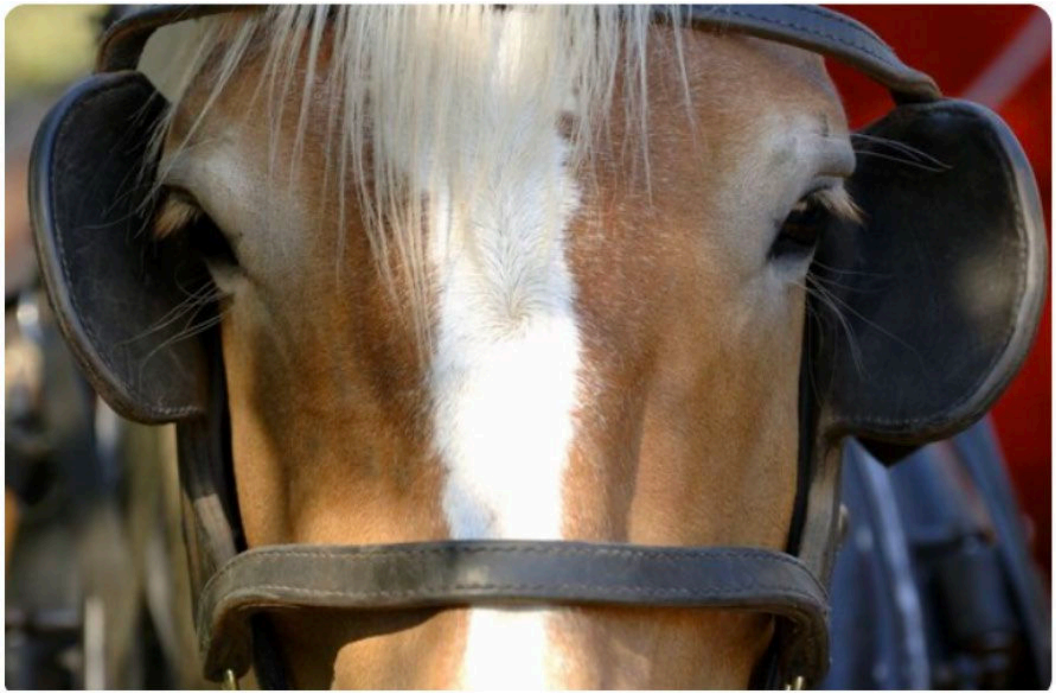
European Journal of Immunology
Basic · Clinical · Translational

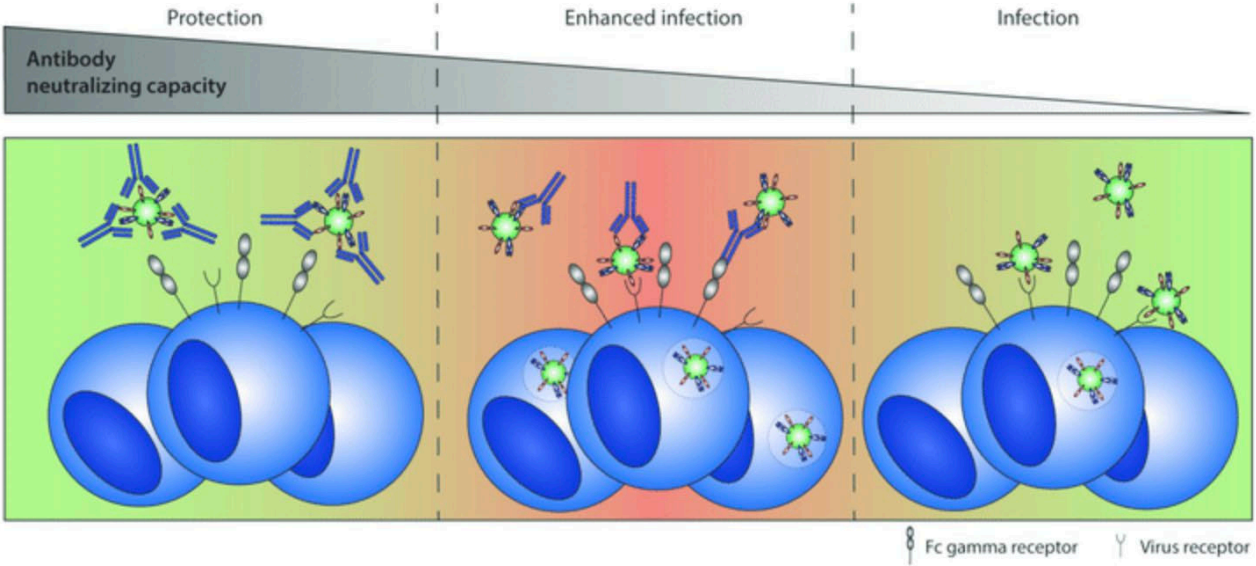
Research Article | Clinical | Open Access

Natural killer cell-mediated ADCC in SARS-CoV-2-infected individuals and vaccine recipients

Kerri Hagemann, Kristoffer Riecken, Johannes M. Jung, Heike Hildebrandt, Stephan Menzel, Madeleine J. Bunders, Boris Fehse, Friedrich Koch-Nolte ... See all authors

- IMMUNE IMPRINTING/ANTIBODY DEPENDENT ENHANCEMENT/ORIGINAL ANTIGENIC SIN





- REPRODUCTIVE SYSTEM ALTERATIONS?

FLCCC ALLIANCE
EDUCATIONAL CONFERENCE 2022

ANDROLOGY

ORIGINAL ARTICLE | Free Access

Covid-19 vaccination BNT162b2 temporarily impairs semen concentration and total motile count among semen donors

Itai Gat, Alon Kedem, Michal Dviri, Ana Umanski, Matan Levi, Ariel Hourvitz, Micha Baum

First published: 17 June 2022 | https://doi.org/10.1111/andr.13209 | Citations: 1

Cold Spring Harbor Laboratory

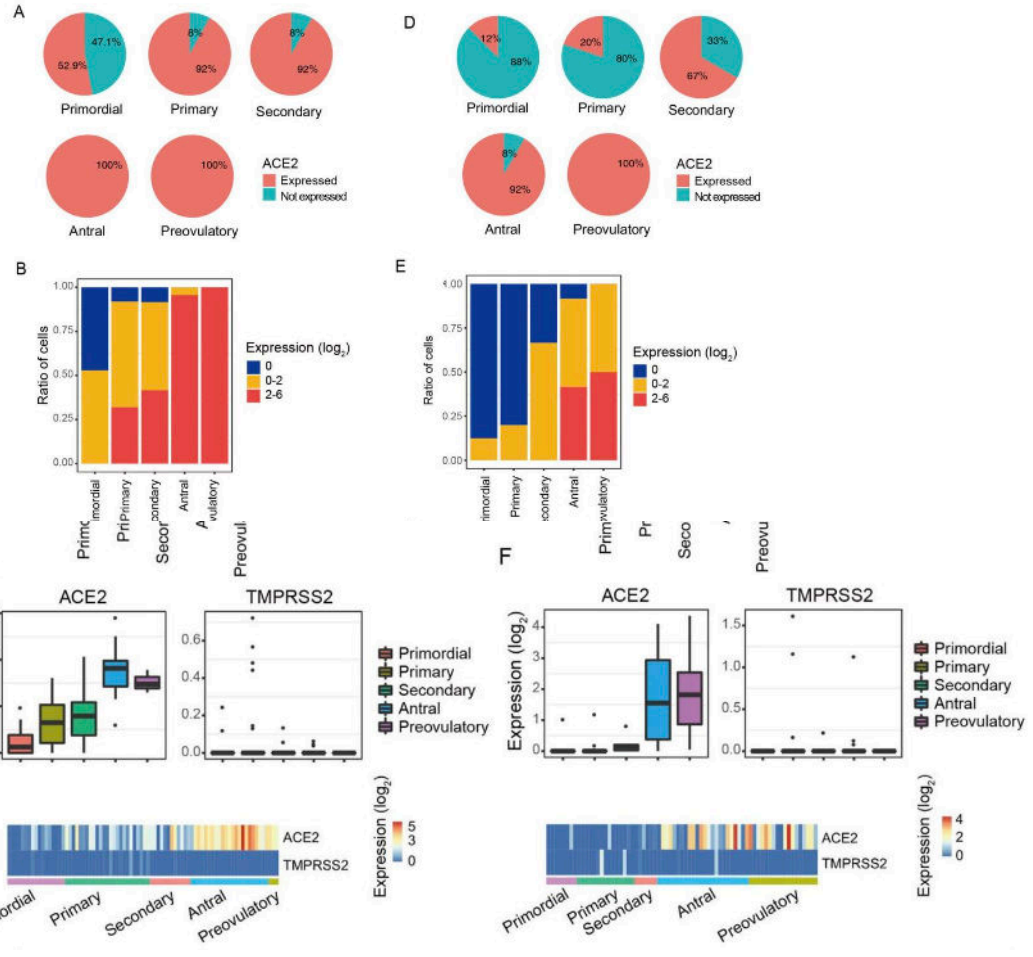
bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

Comprehensive evaluation of *ACE2* expression in female ovary by single-cell RNA-seq analysis

Siming Kong, Zhiqiang Yan, Peng Yuan, Xixi Liu, Yidong Chen, Ming Yang, Wei Chen, Shi Song, Jie Yan, Liying Yan, Jie Qiao

doi: https://doi.org/10.1101/2021.02.23.432460



COVID-19 booster shot can cause irregular menstrual periods - Health Ministry

Women and young people are more susceptible to experiencing the side effects of the booster shot, a Health Ministry study showed.

By JERUSALEM POST STAFF **Published:** FEBRUARY 9, 2022 16:52

OBSTETRICS & GYNECOLOGY

ORIGINAL RESEARCH

Association Between Menstrual Cycle Length and Coronavirus Disease 2019 (COVID-19) Vaccination

A U.S. Cohort

Edelman, Alison MD, MPH; Boniface, Emily R. MPH; Benhar, Eleonora PhD; Han, Leo MD, MPH; Matteson, Kristen A. MD, MPH; Favaro, Carlotta PhD; Pearson, Jack T. PhD; Darney, Blair G. PhD, MPH

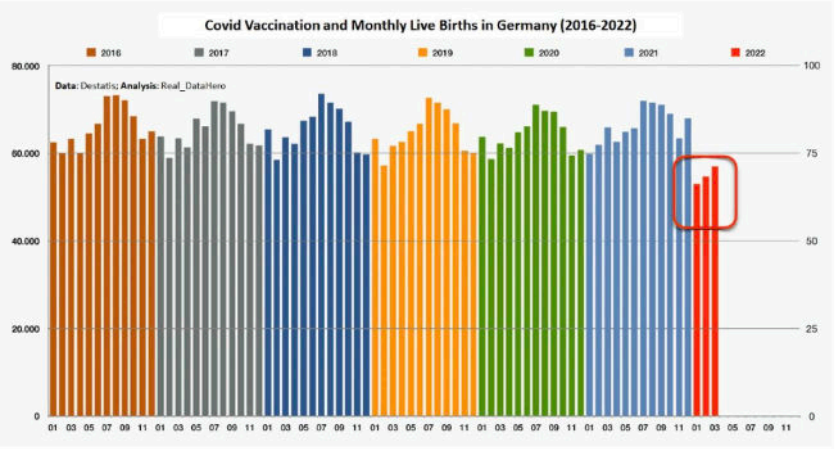
Author Information

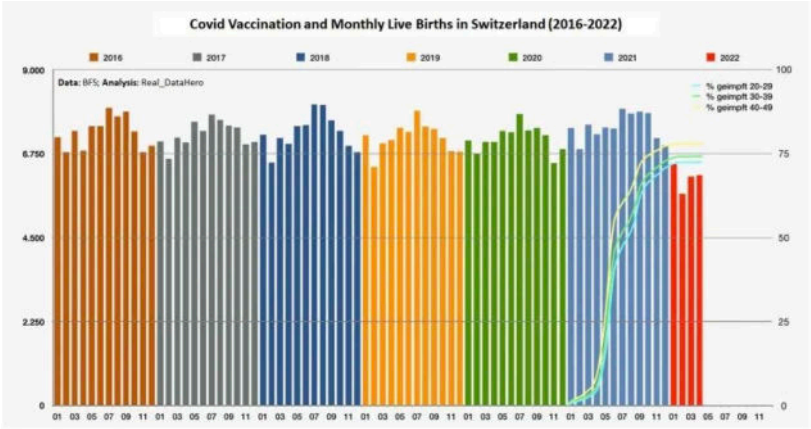
Obstetrics & Gynecology: January 5, 2022 - Volume - Issue - 10.1097/AOG.0000000000004695
doi: 10.1097/AOG.0000000000004695

Med Hypotheses. 2022 Jan 25 : 110778.
doi: 10.1016/j.mehy.2022.110778 [Epub ahead of print]
PMCID: PMC8791262
PMID: 35103033

Mitochondrial hijacking: a potential mechanism for SARS-CoV-2 to impair female fertility

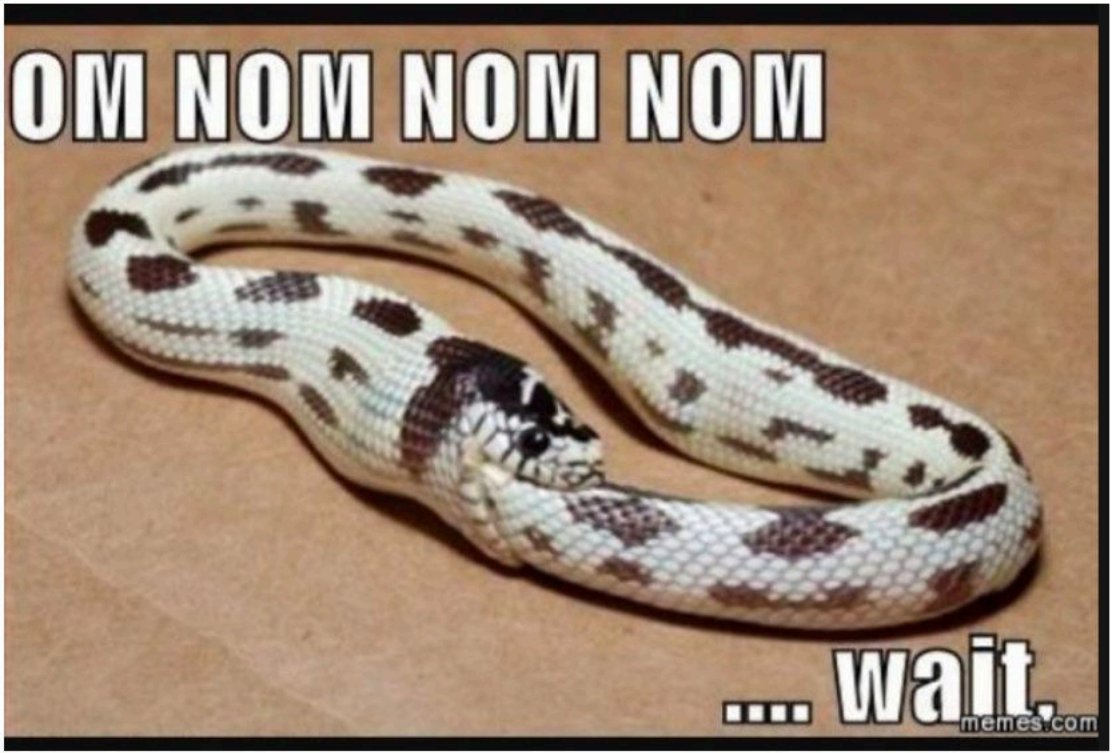
Jun Sun,[a] Qiong Liu,[a] Xinling Zhang,[a] Shu Dun,[a] and Li Liu[b,*]





Source: SWPRS

AUTOIMMUNITY and SPIKE PROTEIN



FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

viruses

Article Menu

Open Access Article

Potential Autoimmunity Resulting from Molecular Mimicry between SARS-CoV-2 Spike and Human Proteins

by Janelle Nunez-Castilla [1], Vitalii Stebliankin [2], Prabin Baral [3], Christian A. Balbin [1], Masrur Sobhan [4], Trevor Cickovski [2], Ananda Mohan Mondal [2,4,5], Giri Narasimhan [2,5], Prem Chapagain [3,5], Kalai Mathee [5,6] and Jessica Siltberg-Liberles [1,5,*]

Lancet Rheumatol. 2021 Jul; 3(7): e469–e470.
Published online 2021 Mar 30. doi: 10.1016/S2665-9913(21)00108-9

Flare of rheumatoid arthritis after COVID-19 vaccination

Katherine A Terracina[a] and Filemon K Tan[a]

Case Reports > Emerg Infect Dis. 2022 Apr;28(4):870-872. doi: 10.3201/eid2804.212585.
Epub 2022 Feb 11.

Multisystem Inflammatory Syndrome in Adult after First Dose of mRNA Vaccine

Yusuke Miyazato, Kei Yamamoto, Gen Yamada, Shuji Kubota, Masahiro Ishikane, Masaya Sugiyama, Mikako Ueno, Akihiro Matsunaga, Tohru Miyoshi-Akiyama, Yukihito Ishizaka, Norio Ohmagari

PMID: 35148495 PMCID: PMC8962876 DOI: 10.3201/eid2804.212585

Journal of Investigative Medicine
HIGH IMPACT CASE REPORTS
SAGE

J Investig Med High Impact Case Rep. 2021 Jan-Dec; 9: 23247096211063356.
Published online 2021 Dec 23. doi: 10.1177/23247096211063356

PMCID: PMC8724979
PMID: 34939881

Graves Disease Following the SARS-CoV-2 Vaccine: Case Series

Michael A. Weintraub, MD,[1] Barbara Ameer, PharmD, MBA,[2] and Naina Sinha Gregory, MD[1]

Case Reports > Am J Case Rep. 2022 Mar 12;23:e934833. doi: 10.12659/AJCR.934833.

Acute Calcium Pyrophosphate Crystal Arthritis of the Wrist Elicited by Anti-COVID-19 Vaccination After Carpal Tunnel Release

Filippo Andrea Giovanni Perozzo [1], Leonardo Punzi [2], Alfio Luca Costa [1], Franco Bassetto [1]

Affiliations + expand

PMID: 35277470 PMCID: PMC8924853 DOI: 10.12659/AJCR.934833

SPIKE - CANCER MECHANISM POTENTIAL

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022

Transl Oncol. 2020 Oct; 13(10): 100814.
Published online 2020 Jun 30. doi: 10.1016/j.tranon.2020.100814
PMCID: PMC7324311
PMID: 32619819

S2 Subunit of SARS-nCoV-2 Interacts with Tumor Suppressor Protein p53 and BRCA: an In Silico Study

Nishant Singh* and Anuradha Bharara Singh

Front Immunol. 2021 Jun 4;12:658428. doi: 10.3389/fimmu.2021.658428. eCollection 2021.

SARS-CoV-2 Spike Protein Suppresses ACE2 and Type I Interferon Expression in Primary Cells From Macaque Lung Bronchoalveolar Lavage

Yongjun Sui [1], Jianping Li [1], David J Venzon [2], Jay A Berzofsky [1]

Affiliations + expand

PMID: 34149696 PMCID: PMC8213020 DOI: 10.3389/fimmu.2021.658428

cancers

MDPI

Cancers (Basel). 2019 Dec; 11(12): 1943.
Published online 2019 Dec 4. doi: 10.3390/cancers11121943

PMCID: PMC6966569
PMID: 31817234

Type I Interferons and Cancer: An Evolving Story Demanding Novel Clinical Applications

Eleonora Aricò,[1] Luciano Castiello,[1] Imerio Capone,[2] Lucia Gabriele,[2] and Filippo Belardelli[3,*]

SPIKE HARM

DAMAGE - DNA REPAIR

> Viruses. 2021 Oct 13;13(10):2056. doi: 10.3390/v13102056.

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

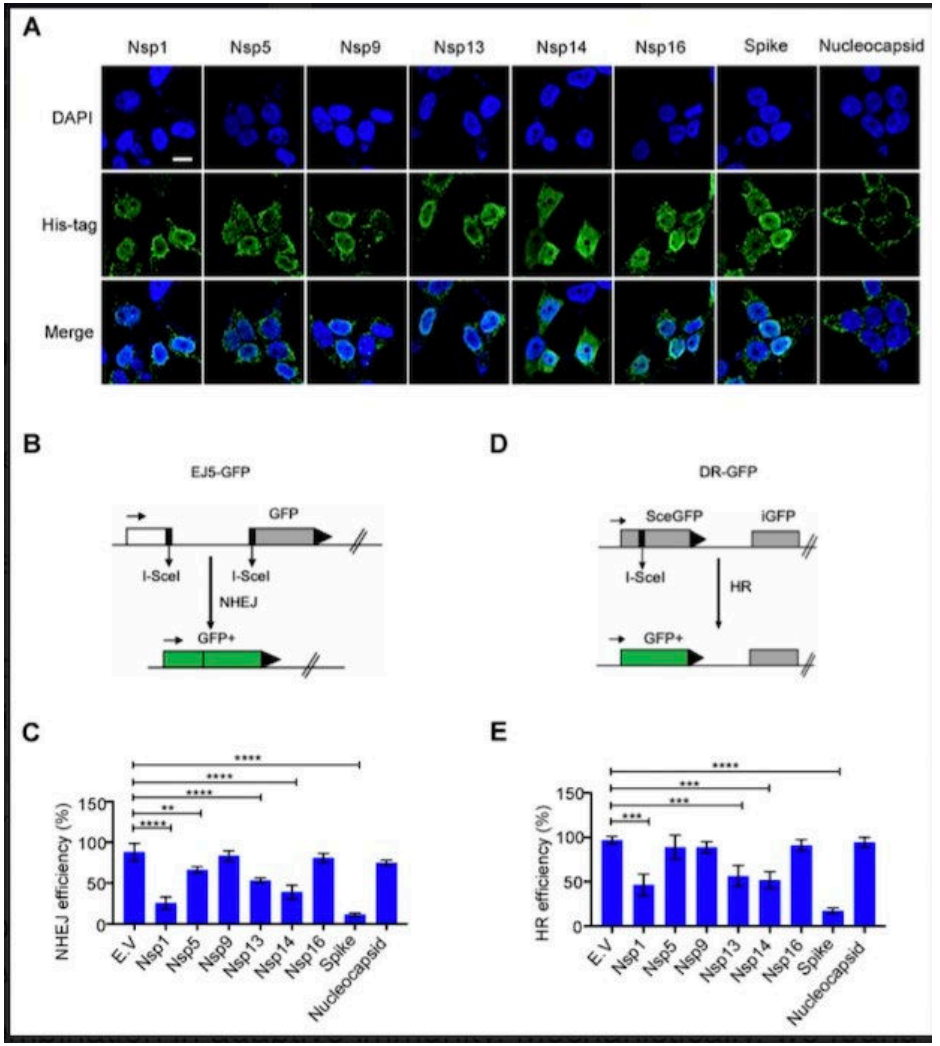
Hui Jiang [1] [2], Ya-Fang Mei [2]

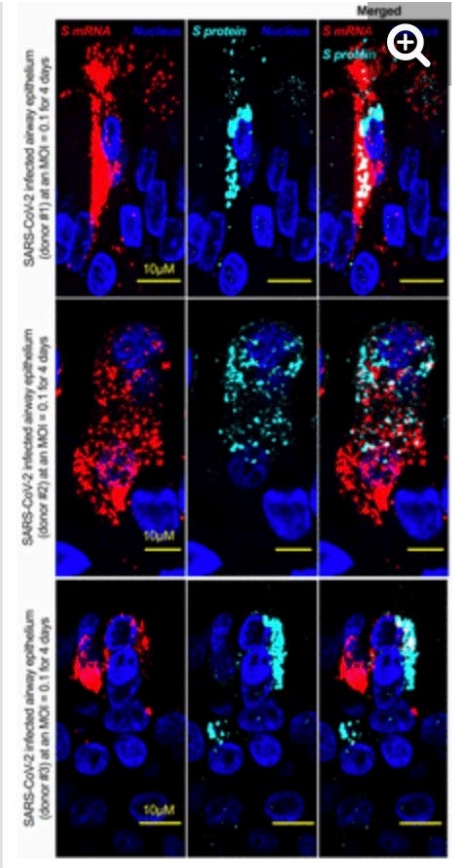
Affiliations + expand

PMID: 34696485 PMCID: PMC8538446 DOI: 10.3390/v13102056

Free PMC article

FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022





Confirmatory Results

Follow this preprint

Nuclear translocation of spike mRNA and protein is a novel pathogenic feature of SARS-CoV-2

Sarah Sattar, Juraj Kabat, Kailey Jerome, Friederike Feldmann, Kristina Bailey, Masfique Mehedi

doi: https://doi.org/10.1101/2022.09.27.509633

PERSPECTIVE article

Front. Virol., 21 February 2022 | https://doi.org/10.3389/fviro.2022.834808

MSH3 Homology and Potential Recombination Link to SARS-CoV-2 Furin Cleavage Site

Balamurali K. Ambati[1], Akhil Varshney[2], Kenneth Lundstrom[3*], Giorgio Palú[4], Bruce D. Uhal[5], Vladimir N. Uversky[6] and Adam M. Brufsky[7]

Impure mRNA in vials

per regulatory agencies

-EMA - 50ish % pure

-TGA - Australia 40-60ish% pure

Many shorter, incomplete coding and non- coding sequences present in mRNA vials i.e. - micro RNAs

Signal Transduction
and Targeted Therapy

Open Access | Published: 28 January 2016

The role of MicroRNAs in human cancer

Yong Peng ✉ & Carlo M Croce ✉

Signal Transduction and Targeted Therapy **1**, Article number: 15004 (2016)

Cancer mechanisms/drivers/contributors

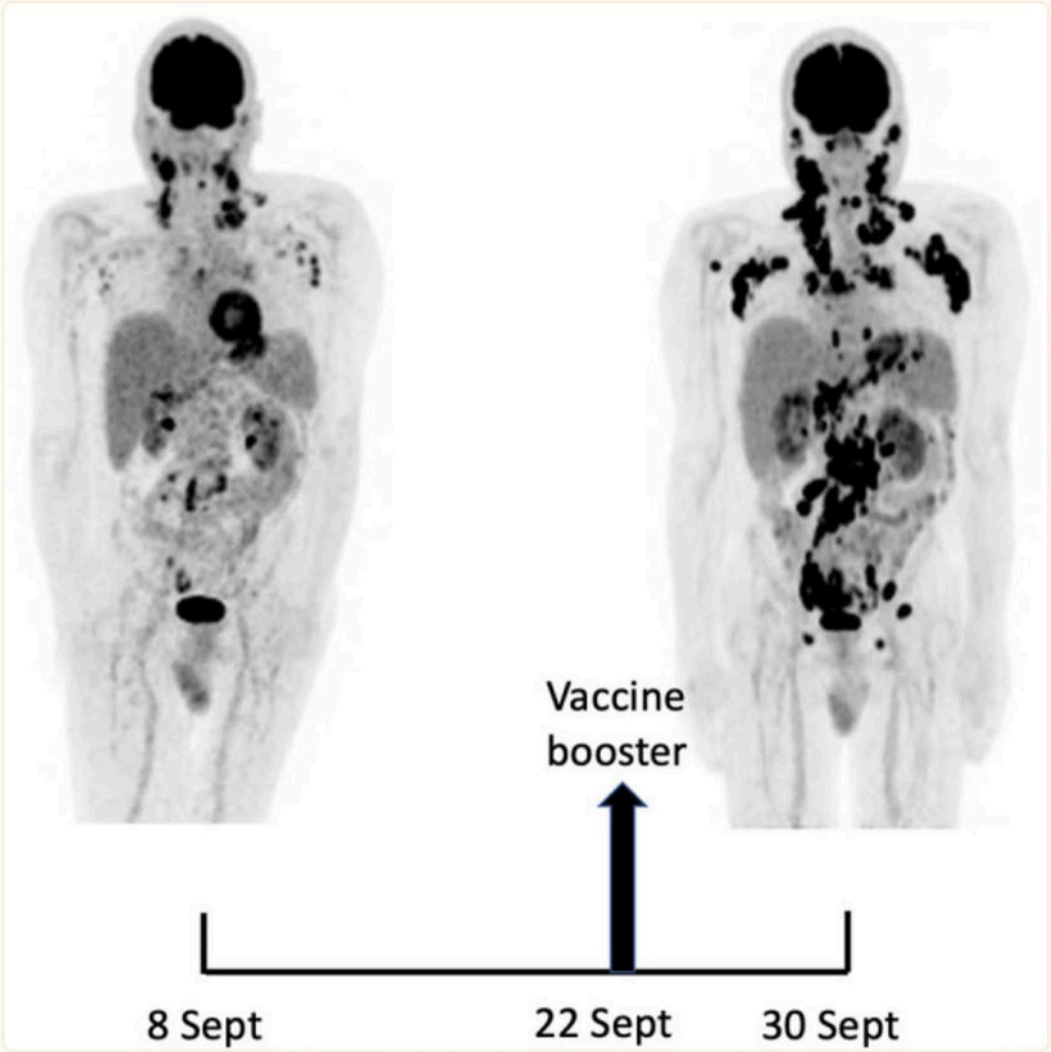
many - not comprehensive

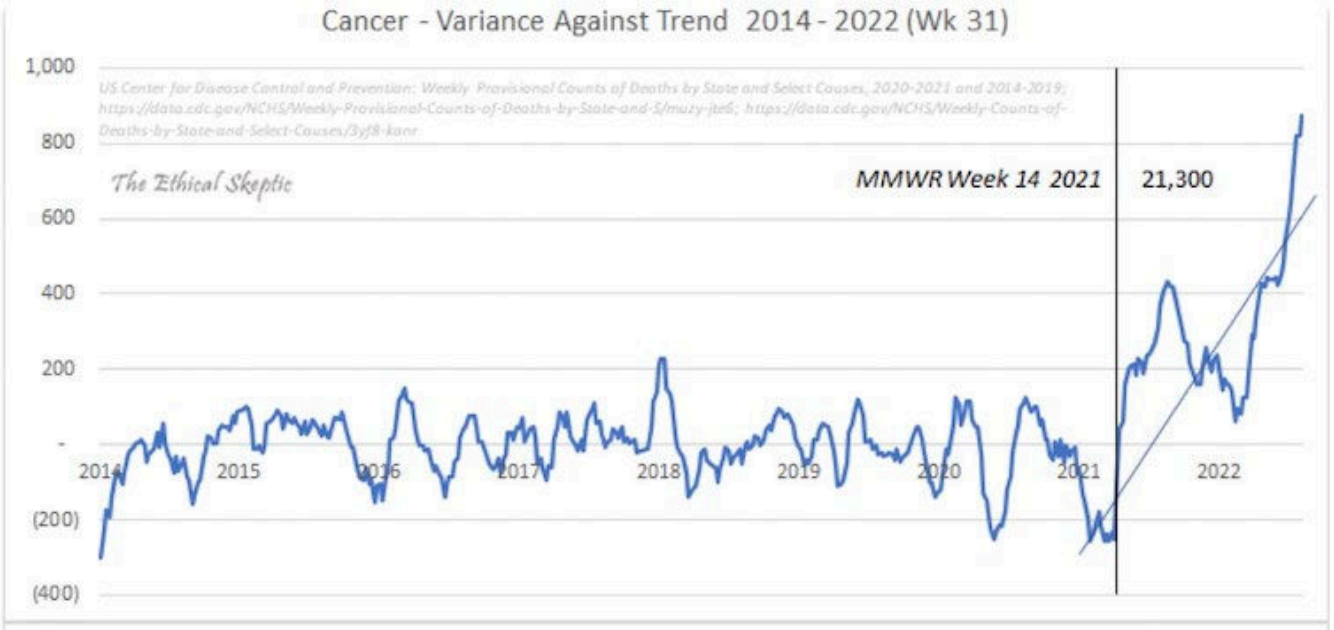
-gene mutations
-hypoxic environment
-chronic viral infections HPV, EBV, etc.
-low interferon response
-decreased cell energy mitochondrial damage
-loss of immune surveillance
-microRNA
-hormone dysregulation
-Toll like receptor alterations

Front Med (Lausanne). 2021; 8: 798095.
Published online 2021 Nov 25. doi: 10.3389/fmed.2021.798095
PMCID: PMC8656165
PMID: 34901098

Rapid Progression of Angioimmunoblastic T Cell Lymphoma Following BNT162b2 mRNA Vaccine Booster Shot: A Case Report

Serge Goldman, [1] Dominique Bron, [2] Thomas Tousseyn, [3] Irina Vierasu, [1] Laurent Dewispelaere, [4] Pierre Heimann, [4] Elie Cogan, [5] and Michel Goldman [6,*]





etc. etc. etc. OTHER HARMS

Research Letter

ONLINE FIRST FREE

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

JAMA Pediatr. Published online September 26, 2022. doi:10.1001/jamapediatrics.2022.3581

Reverse Transcription

Intracellular Reverse Transcription of Pfizer BioNTech COVID-19 mRNA Vaccine BNT162b2 In Vitro in Human Liver Cell Line

by Markus Aldén [1], Francisko Olofsson Falla [1], Daowei Yang [1], Mohammad Barghouth [1], Cheng Luan [1], Magnus Rasmussen [2] and Yang De Marinis [1,*]

[1] Department of Clinical Sciences, Lund University, 20502 Malmö, Sweden

[2] Infection Medicine, Department of Clinical Sciences, Lund University, 22362 Lund, Sweden

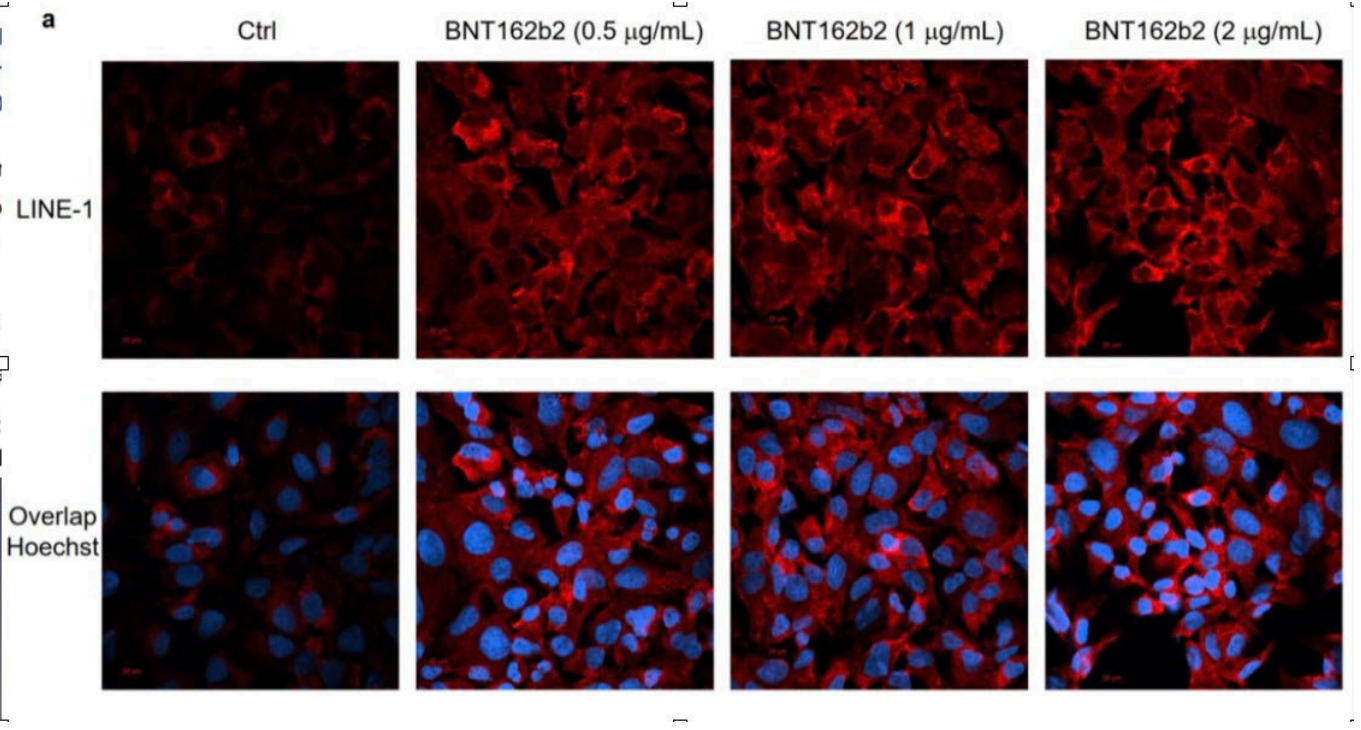
[*] Author to whom correspondence should be addressed.

Academic Editor: Stephen Malnick

Curr. Issues Mol. Biol. **2022**, *44*(3), 1115-1126; https://doi.org/10.3390/cimb44030073

Received: 18 January 2022 / Revised: 19 February 2022 / Accepted: 23 February 2022 / Published: 25 February 2022

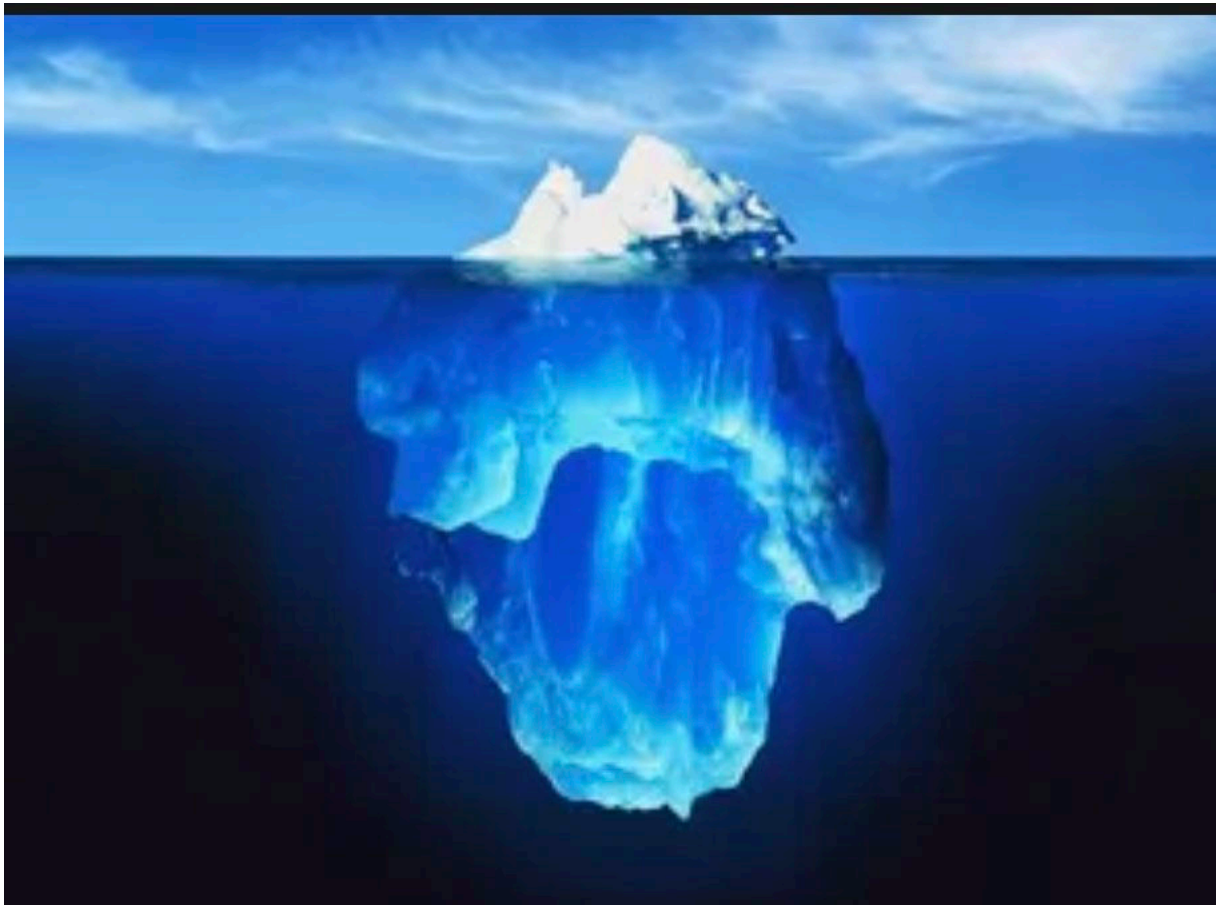
FLCCC ALLIANCE EDUCATIONAL CONFERENCE 2022



WHERE ARE ALL THE TISSUE STUDIES LOOKING FOR THE SAME? NOT JUST IN VITRO.

INTEGRITY IN SCIENCE

FLCCC ALLIANCE
EDUCATIONAL CONFERENCE
2022



FLCCC
ALLIANCE
EDUCATIONAL
CONFERENCE
2022

THANK YOU