Spike Protein Risks & Aids

Jennifer R Depew, RD, June 28, 2021, last update July/8/2021
- online version is updated more frequently Spike Protein Risks & Aids - Summary List.
transcendingsquare.com * It does not have the Extras - notes I added here.

Spike protein itself is a toxin - and therefore it shouldn't be used as the vaccine antigen. It is too dangerous as a toxin as it doesn't need the virus in order to cause harm, in many ways. Children were protected from the virus because their immune function is better, especially prior to puberty, approximately age ten, but that can't help them if their own body is making a toxin. And the toxin is being put onto the surface of cells in a way that would not occur during an actual infection. There has been a large increase in children with respiratory infections in Israel, even though it is not cold/flu season there. (2)

- This post is also available to read as a: (Tabbed Document *this document).

Health Aids for special times, *10 Natural Ways to increase glutathione:* (111), Foods that may promote more butyrate producing species in the gut - groups A,B, & C: "*in four different groups: A: olive, pomolive, allolive, cranberry, apple, pomegranate, and chamomile; B: bearberry, fennel, oregano, ginger, cinnamon, antioxidant complex, rosemary, salvia, lemon verbena, grape, eucalyptus, artichoke, and green coffee; C: tea; and Basal conditions (Figure 1)*." (113) Also see Resistant StarchButyrate.

Short list of aids:

- Beta-glucan~1/3 cup mushrooms or 2 teaspoons Nutritional yeast flakes.
- Nutritional yeast flakes would also provide nucleotides which along with NAG, n-acetylglucosamine, may help us make more sialic acid, which the spike protein affects negatively.
- Dandelion tea leaf/root &/or Pine/evergreen needle tea (not yew),
- NAC - glutathione precursor, (112).
- Quercetin, resveratrol, curcumin, artemisinin, Pomegranate peel & Goji berries (catechins/EGCG) - iron chelator and other benefits, lactoferrin - also an iron chelator. If excess ferritin/iron is a concern - which it tends to be with Spike issues, avoid high iron foods.
- Bromelain - serratiopeptidase - can help clear excess mucus, protect blood vessels,
- Acetaminophen, loratadine (antihistamine).
- Nicotine - patch lozenge, gum, may have fewer toxins and lung risks than smoking or vaping - the nicotine itself is still addictive but could help protect against spike issues affecting the nicotinic Acetylcholine Receptors (nAChRs).
- Glycine (DMG), possibly heme-oxygenase-1
- Detox aids: Bentonite clay, and/or Activated Charcoal

Nutrients

- Bs, C, D, zinc, Mg, selenium, iodine, manganese, copper, boron, etc - trace minerals,
- Niacin working up to a high dose of 1000 mg twice a day can greatly increase inflammation and cellular debris removal (like spike or misfolded proteins). Niacin, & early treatment in general for SARS-CoV-2 is sensible, reduces hospitalization and mortality rate.
- Thiamine in higher doses may help if low oxygen levels are a problem - seek guidance.
- Vitamin A adequacy is important for immune function but a severe infection or liver injury may lead to excess activation of beta-carotene or vitamin A to the retinoic acid form which can cause mast cell overactivity and other problems

including skin rashes and cracks at the corners of the lips. More info - with symptom questionnaire: Retinoid Toxicity.

Diet balance - moderate carbohydrate, good protein, Omega 3's - and avoid overeating regularly. Especially a high carbohydrate balance which can stress mitochondria. It is also important for the body to be hungry enough at night, in need of nutrients, so white blood cells focus on clearing out cellular debris, instead of having to busily store excess calories as fats. It also helps protect mitochondrial function to eat more lightly and have a break from eating at night. When they have to burn glucose for energy constantly they can get overworked (magnesium helps them). See: *How Overeating May Contribute to a Metabolic "Traffic Jam,"* by Sheena Faherty.

Intermittent fasting can be beneficial, however seek guidance for safety precautions. The easiest way is to stop snacking a little sooner in the evening and have a later breakfast/brunch in the morning. Or for people like me who get moody with low blood sugar, some fennel seeds or pistachio nuts can get me going for a couple hours until a later meal with carbohydrates.

Our natural immunity can protect us when we provide plenty of nourishment, and rest.

Short list-Dosing and other details:

- **Beta-glucan~** supplement as a powder, likely least expensive what to supplement with beta-glucan, example: (134). A teaspoon of a powder is roughly five grams, 5000 milligrams. An eighth teaspoon would be roughly 625 milligrams.; Medical research has used 100-500 mg of beta-glucan for immune support research and 3 grams for cholesterol reduction. (41) In mushroom equivalents? - 0.21 - 0.53 grams per 100 grams of mushrooms (42) 1/3 cup **mushrooms** would be about 100-150 grams. Medicinal mushrooms may have more benefits than standard mushrooms and tend to be what research uses as the experimental substance, however they all have similar starch content; or 2 teaspoons Nutritional yeast flakes ~ 2 grams beta-glucan and alpha-mannan, also beneficial -
- **Nutritional Yeast Flakes** also provide **Nucleotides** which plus **NAG**, **n-acetylglucosamine** may help us make more sialic acid, needed particularly for platelets and the intestinal lining, but also throughout the body.
    - **N-acetylglucosamine (NAG)** is a specific form of glucosamine and more standardly available glucosamine supplements would not be the same. Example of a bulk powder available: (135).
    - "*N-Acetylglucosamine (GlcNAc), 2-acetamino-2-deoxy-β-d-glucose or 2-(acetylamino)-2-deoxy-d-glucose, is a monosaccharide derivative of glucose and is widely distributed worldwide.*" [...] "*In plants, GlcNAc has been found in*

bromelain**, ricin agglutinin** [*castor beans, also the source of ricin toxin] *and abrus agglutinin *[7,35–37]. In humans, GlcNAc is frequently observed in glycoproteins, such as tissue plasminogen activator [38]. It is also detected in mammalian growth factors and hormones [35], including follicle-stimulating hormone (FSH), luteinizing hormone (LH), human menopausal gonadotropin (hMP), pregnant mare serum gonadotropin, thyroid-stimulation hormone (TSH) and human chorionic gonadotropin (hCG).*" (136)

    - ****Abrus agglutinin** is from a medicinal plant used in India, and it may be helpful against cancer. (137)

- **Dandelion** tea leaf/root; &/or **Pine/evergreen** needle tea (but not yew) 3 tablespoons of needles per cup, steep in hot but not boiling water (~175'F) for 20 minutes or overnight for a stronger tea. Fennel seed in the tea adds flavor and softens the seeds, and has health benefits, included later. Star Anise may have similar phytonutrient potential as the evergreen needles and a few pieces adds a nice flavor and sweetness.
    - Amount recommended: 2-3 cups per day, of either, having some of both if tolerated may be helpful, or alternate. Diuretic effect may occur, have earlier in the day and drink plenty of water to help it wash through, removing toxins! Diuretics can be helpful if not excessive.
    - Signs of excessive acidity or tannins along with too little water, dehydration, may be an urge to urinate then only producing a small amount of urine that has a burning sensation. Drink more water, cut back on the diuretics.
- **NAC** - glutathione precursor, 500-600 mg may be recommended preventatively, or higher doses may be given intravenously to hospitalized patients (112, 133), **Vit. C**, **zinc, selenium, magnesium sulfate**, **sulfur rich foods, garlic, cruciferous**, and **glutathione** rich foods: asparagus, okra, avocados, greens; **whey protein** for cysteine (caution glutamate source), **Milk thistle, turmeric; sleep** & **exercise!**
- **Glycine (DMG)** (daily needs may be as much as 10 grams per day, I take about five grams, a teaspoon in water daily along with **methionine**, another amino acid I need due to a gene difference. It may also be helpful in a glyphosate rich world.; possibly heme-oxygenase-1, an anti-inflammatory enzyme that may be negatively affected by glyphosate residue in our food supply, along with **tryptophan**, manganese and other trace minerals (138); also **taurine & serine,** both are protective within the brain.
- **Niacin, thiamine**, **riboflavin**, other **B vitamins, D** and/or **sunshine**. **Trace minerals**., boron, manganese, . . . except iron if elevated ferritin.
- **Quercetin, resveratrol, curcumin, artemisinin, Pomegranate peel** & **Goji berries** (catechins/EGCG) - **iron chelator** and other benefits, **lactoferrin** - also an iron chelator. If excess ferritin/iron is a concern - which it tends to be with Spike issues, **avoid high iron foods**.
- **Bromelain** - serratiopeptidase - clears mucus, protects blood vessels,
- **Acetaminophen**, **loratadine** (anti-histamine). * **Omega 3** fatty acids.
- **Nicotine** - patch lozenge, gum, may have fewer toxins and lung risks than smoking or vaping - the nicotine itself is still addictive but could help protect against spike issues affecting the nicotinic Acetylcholine Receptors (nAChRs). *If legal, **THC** products for anti-phospholipid issues.

- **Butyrate, Resistant Starches,** Probiotic & Prebiotic foods - 2-5 grams per day butyrate may be the goal, based on what a healthy microbiome and resistant starch rich diet might provide. Short-chain fatty acids (SCFAs): *5-15%* of our total calories and the epithelial cells lining our colon need even more - *60-70%* or their energy use is from SCFAs. (123) **How much resistant starch to eat? More probably, then we are eating on average.** I try to have something with resistant starch everyday, sometimes more than once, maybe with every meal would be ideal - our colon cells like to eat all day long! Potato or pasta salad, polenta or chilled amaranth would provide resistant starch, and Bubble tea! More info: Resistant Starch/Butyrate.
    - **Fennel seeds** - available as a flour or the seeds are eaten like an after dinner mint in some cultures, a pinch or two (½-1 teaspoon) is chewy and flavorful, aids digestion and freshens breath while leaving a few seeds stuck in your teeth to enjoy later!
- **Detox aids**: **Bentonite clay** (spoonful of a premade mix in glass of water - 15 ml hydrated Bentonite - *Great Plains Bentonite Detox*), and/or **Activated Charcoal,** (500 mg with meals - *Natural Elements Activated Charcoal*). - with meals or once or twice per day to help clear toxins in the GI tract.

addition "(It is important to note that a TMPRSS2 inhibitor is BROMEXINE)*." - @BidoliNicola

- Video: Professeur Sucharit Bhakdi, a microbiologist, ends the pandemic in an educational and thorough way - our natural immunity protected or will protect most of us. The novel virus is actually quite sufficiently like other coronavirus for us to have a strong immune response. Early treatment also makes a life saving difference. The second part of the video is about the risks of the spike protein injections and he strongly recommends not getting any further spike gene injections. July 6, 2021 (odysee.com)
- Immune system, an overview - https://www.hindawi.com/journals/jir/2017/2680160/

As a surface marker protein it may be likely to be mistaken by immune cells as a self protein instead of a foreign protein. Surface marker proteins are how cells identify each other and how immune cells recognize whether a cell is making typical proteins or pathogen like proteins. The immune cell would make non-neutralizing antibodies if the protein is considered a 'self' protein rather than a microbial one on the surface of an infected cell. Antibodies made in response to a pathogen or allergen would 'neutralize' the risk, signal to other immune cells that a foreign protein needs to be removed from the body and used as nutrients - whenever any of it is found in the future. Memory cells contain reminder antibodies and can quickly make lots of any that are needed if an infectious pathogen was found.

Non-neutralizing antibodies will lead to a future exposure being recognized as self and no immune response will be called for - and the injected person, child or adult, will likely have a severe case of the illness when exposed to it - ADE, *Antibody-dependent enhancement* of an infectious pathogen. (1)

> "*The elicitation of ....neutralising antibodies, is the goal of nearly every SARS-CoV-2 vaccine candidate. vaccine-elicited, antibody-dependent enhancement (ADE) of disease is likely to occur to some degree with COVID-19 vaccines.....*" "*Based on the published literature, it should have been obvious...in 2019 that there is a significant risk to vaccine research subjects that they may experience severe disease once vaccinated, while they might only have experienced a mild, self-limited disease if not vaccinated.*" (21) via @THC1001

The spike protein itself is a toxin and a preprint study has identified the S-1 subunit of the spike protein still remaining in the bodies of LongCovid survivors - as much as fifteen months after their apparent 'recovery' from having a SARS-CoV-2 infection or 'COVID-19' illness. (55) Dr Patterson discusses the research in a video presentation: (youtu.be)

LongCovid is a real condition, and likely involves autoimmune changes. G-protein coupled receptor autoimmune antibodies have been identified in unusual amounts in LongCovid patients. [82] Some autoimmune G-protein coupled receptors are normally present and may help regulate activity - an excessive amount could cause autoimmune degenerative symptoms - your own body is attacking your own healthy cells instead of just removing cells that need to be removed. This is big news because the group of G-protein coupled receptors includes many types that regulate most of normal function. They are a type of receptor that extends through the cell membranes - ring the doorbell on the outside of the cell and a complex chain of chemical reactions may occur on the inside of the cell.

Nrf2 Promoting Foods and Beverages and phytonutrients - also happen to be NF-kB inhibiting foods and phytonutrients - bonus!

"*The secret of freedom lies in educating people, whereas the secret of tyranny is in keeping them ignorant*." — Maximilien de Robespierre

*The focus of this summary is phytonutrients rather than medications so I am not listing medications unless unusual or specific and I'm aware of it - meaning only a few, not an inclusive list of medications. I am trying to provide an inclusive list of herbal medicinal plants and other nutrients and phytonutrients that may be beneficial. When the list of problem points is complete I plan to add a section listing the therapeutics, possibly grouped by symptom complaint type with self care tips. I have been busy with non-writing activities but will stick with it. Peace and love.

Good News! Most of the world have contained COVID-19 - with early treatment, including vitamin D, C, zinc, herbal treatments, and Ivermectin, hydroxychloroquine and antibiotics.

Antibiotics are helpful because the the SARS-CoV-2 virus may also infect bacteria and then when the virus replicates in the bacteria it can then re-infect the person; or it is reducing immune function and comorbid infections are more prevalent in COVID-19 patients. (83) The spike protein also can worsen symptoms of a bacterial toxin, see the section: *5) SEB toxin*.

The good news - many nations around the world have contained COVID-19 with early treatment. China had it contained within the first few months - they also provided their citizens with detailed guidance about self-care and also had a focus on good air indoor air quality. The information included which Traditional Chinese Medicinal (TCM) herbs to use for different symptom phases of the illness. Orange peel during the non-productive cough was recommended.

[missing Tweet]

Vitamin C can save lives - it helps reduce inflammatory cytokines, buffers the oxidative stress chemicals and free iron caused by inflammation, and which lead to blood vessel membrane and cell membrane breakdown throughout the body.

I tried that for myself and it helps within just 10-20 minutes. March, 2020, was when I was ill with CoV type symptoms, no tests were available at that time unless you had had contact with someone who had been to China.

> "*Delta scariant survival rates: Vaccinated - 99.8% Unvaccinated - 99.9%*
>
> *Two obvious conclusions:- 1) Jab makes no difference. 2) Delta scariant almost completely harmless.*
>
> *#EnoughIsEnough Source* - (76) *(pages 13 & 14)*" - Adam Stratford @Adam_Stratford_. (75)

The outbreak had probably already been circulating in the US far longer than expected and that affected the early estimates of what to expect. The initial estimates were based on there having been no exposure in the US prior to January when in fact it would have been circulating at least since November in international travel areas. There would already have been a gradual spread with a few extra deaths likely called pneumonia or possibly 'vaping outbreak'. See section A1.1 for more about vaping and moderation - too much oil, or flavors in addition to nicotine and/or THC have an accumulative effect that can be damaging to the lungs by increasing mucus production and lung congestion - which would make a respiratory infection risk worse too.

Early treatment saves lives and reduces the need for hospitalization - and creates less viral load, which exposes others to fewer aerosolized particles.

My own CoV story:

See the following posts for more of my illness, (exposure ~ 2/20, symptom onset 2/18, lung symptoms improved by 3/19). Many of the herbs and functional foods that I use anyway for my autoimmune conditions, also help as anti-viral or anti-inflammatories (pomegranate and citrus peel and others):

- Dietitians' responsibilities include understanding medications. March 31, 2020, Excerpt about TCM:

TCM Treatment of COVID-19, based on extensive experience in Chinese hospitals, by Adam Tate, March 20, 2020, updated March 25, 2020. (medicinetraditions.com) — This includes stages of severity of illness and examples of symptoms that occur in the different stages, and herbal recipes recommended for the specific stage and symptom set. The Chinese medical professionals have found that a combination of the traditional medicinal herb mixtures and modern medicines to be more effective than either alone for treating patients with more severe COVID19 infections.

Synergy: Whole herbs often seem to work well or even better than single extracts as the various phytonutrients in the herb may work together synergistically – adding up to a greater benefit together than any one would alone. Ginger is one of them, and is a very potent anti-inflammatory root vegetable that contains over 400 medically active phytonutrients.

Acupuncture recommendations are also included for milder illness and some strategies for improving air quality within an apartment. For anyone questioning the validity of acupuncture – the Meridian network was found to represent an additional vascular system that develops in an embryo/fetus before the blood vessels and lymphatic vessels and somewhat is associated with the other vascular networks. Nodes in the acupuncture vascular system are involved in stem cell production and stimulating acupuncture points may benefit health in part by stimulating our own stem cell production. (2) And it may stimulate our own internal production of opiates also. (3)

- Treatments vs 'a cure'. April 3, 2020. This follow-up post goes into more chemical detail about how some of the phytonutrients that I used may have helped block the SARS-CoV-2 virus in different ways. My usual supplements included several anti-viral nutrients or herbs/phytonutrients.

For more about surface marker proteins and immunomodulators:

- **see**: Artemisinin, arteannuin-B, sgp130Fc and COVID-19.
- Immunomodulators include Nrf2 Promoting Foods/nutrients, see above graphic. (5, 6) They also inhibit an inflammatory protein pathway called NF-kB. The two chemical pathways share a circadian protein and have to take turns roughly, so anything that promotes one, is also inhibiting the other.
- Lifestyle choices also may be promoting the inflammatory pathway and protein, leading to more cytokines and immune response. My book draft, *Tipping the Clock Towards Health*, (9), also linked in the Artemisinin... post goes into more detail about the lifestyle changes that may be needed to reduce chronic inflammation.

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them to fight infection instead! The nAChR receptors can be activated by nicotine (patch or gum would work too).
- Solutions, potential herbal or nutrient treatments ae included throughout, and a few medications, and more are included in a section on inflammation. The treatments ideas will be collected in a third section which is only just begun - work in progress

Section 2: Inflammation itself damages.

- A) Inflammation itself adds to endothelial and epithelial tissue breakdown.
    - Aa) Cannabinoids are part of the cell membrane and their release during inflammation as messenger chemicals, leads to breakdown of membranes and an excess of free arachidonic acid.
    - Ab) My own patient story - case study:
    - Ac) Endothelial - inner layer of blood vessels; Epithelial - outer epidermis layer of our skin.
- B) Blood clots, heart attack or stroke are more of a risk when there is membrane breakdown - or spike protein present.
- C) Microtubule dysfunction, depolymerization - glyphosate?
    - Ca) Spike Protein seems to disrupt microtubules in the extracellular fluid, by depolymerization possibly,
    - Cb) Microtubules helped you at conception - and every day ever since!
    - Cc) Glyphosate and COVID-19
    - Cd) Methylation gene differences may leave some people more at risk for epigenetic conditions, POTS, may be one, and therefore may be reversible! Glyphosate may be involved in epigenetic risks.
    - Ce) Glyphosate may also add to histamine excess.
- D) Histamine excess and mast cell over-activity can add to membrane breakdown and cause other odd symptoms unrelated to skin health.
- E) Vaccine or viral challenge to the immune system may cause a chronic Retinoid Toxicity problem - can cause skin rashes and a wide range of other symptoms.
- F. Why are healthy people who exercise a lot, more at risk for LongCovid? No exercise is also a risk for worse hypoxia and toxin build up. - Inflammatory myokines created by the muscles during intense exercise would worsen inflammation, likely including the risk of inflammasome creation - polyphenols are protective.
    - Fa) No exercise is also a risk - too little oxygen and nutrient flow to tissue increases the hypoxia risk. Moderate Exercise can help both issues, along with polyphenols.
    - Fb) Sexual release is healthy for immune function, and is also good exercise that promotes lymphatic flow. Emotional connection increases the effect. Endocannabinoid production is also increased.
    - Fc) Autoimmune disease is more common for people with female DNA.
    - Fd) Gender and biologic DNA sex are different and can be mismatched during prenatal development.

Section 3: Therapeutics, Symptoms, & Lifestyle factors that effect our health.

- A1) Air quality
    - A1.1) Vaping, Smoking, and second and thirdhand smoke.

    - A1.2 - Mold
    - A1.3 - Poor ventilation, air fresheners, decorative candles - solution vanilla or essential oils instead.
- B1) Hypoxia and gentle movement - strenuous exercise and myokine inflammation.
    - B1.1) Types of Exercise, including examples of moderately paced exercise.
    - B1.2) Ways to keep moving even when you can't move & LongCovid Fingers/Toes:
    - B1.3) Nutrients, Phytonutrients, and Foods that may help recovery after exercise.
- To Be Continued

Section 1: Ways the Spike protein is toxic, or similar to a known toxin, and the receptors that it may be affecting negatively.

1) Furin Cleaving of Spike into two parts, increases access to many receptors.

Spike protein can split into two parts that can access some of our receptors or do other damage: An S1 and S2, and an N section that is more benign; the S sections are filament shaped -spiky -which can fit into the 'keyhole' of a receptor. and each may access receptors or perform other damage individually too. Shedding risk may also be increased as the separate part may be more free to travel in the blood plasma and eventually be excreted or exhaled - more research by independent teams is needed.

Meet the SARS-2 virus and its S1 and S2 spike protein subunits - the S1 subunit can further divide into N and C terminal domains (NTD, CTD), all of which may take part in receptor binding - a versatile pathogen:

"*SARS-CoV-2 S is similar to its 'predecessor', SARS-CoV-1 S, with a 76% aa identity with SARS-Urbani S and 80% identity with bat SARS-CoV ZXC21 S and ZC45 S [194], and 98% identity with bat RaTG13 [32,195], conserving several N-linked glycosylation sites [194]. During synthesis, the protein may be cleaved into the S1 (head and receptor binding) and S2 (membrane embedded stalk and fusion) subunits by either host or viral proteases [196], or it can be left as a full-length S protein, requiring cleavage at S1/S2 upon receptor binding [197]. If cleaved, these subunits then remain noncovalently bound to each other [193]. The S1 subunit can be further divided into the N-terminal domain (NTD) and C terminal domain (CTD), both of which participate in receptor binding [198]. The S1/S2 structure then trimerizes with 2 other S1/S2 molecules to form the complete S protein [196,198]*" (64)

The disease is milder, attenuated, if the novel furin cleavage section is removed from the spike gene sequence, and the immunity generated by the modified virus is still active against the wild-type SARS-CoV-2 virus, (37), Speculation - which could make it a useful live-vaccine candidate - use a more benign cold virus against the dangerous one. However I would be concerned that any novel spike protein, is too much S-protein.

- "*I really don't understand why do they need to keep the PRRA site in the sequence for the vaccines ? Without this furin cutting site, there won't be so much S1 shedding, and the toxicity won't be so bad.*"

2) Prion risk & 'Shedding' - shedding in this sense is about the spike protein, not a full virus. The spike itself may induce protein folding, a prion disease risk,

- adding to inflammation and cellular debris that needs to be removed by white blood cells - if they had time.

It seems that the S-protein may be transmissible, possibly even as an aerosol, possibly lasting as long as fifteen months in a small group study of COVID-19 survivors with long term symptoms - LongCovid, (55), whether they, or patients, people recently injected with a CoV gene treatment,

- More on this topic is included in the post, with video links and other resources: *Shedding of the spike protein - a communicable prion disease risk?*.
- Glycine & glyphosate & misfolded proteins – Seneff article. (June 13)
- Prion like concerns about the spike protein (June 9) written on my mobile phone, brief, lots of links.

Prion conditions involve misfolded proteins and include more than the somewhat familiar 'Mad Cow Disease', Parkinson's Disease, Alzheimer's dementia, and autism may have misfolded proteins and inflammation that leads to fibrotic scarring and eventually cell death, in strategic areas of the brain, or widespread. COVID-19 may also have prion risks involving the spike protein and its changeable configurations. (52)

Prion Protein (PrP) is a normal cellular glycoprotein in its helical shape and performs important functions. It can be triggered to misfold into a shape called a Beta sheet - which is no longer helical. Many structural proteins in the cellular and extracellular matrix form sturdy long rod-like forms due to many subunits joined together in a spiraling helix. DNA has a double helix joined like a ladder with nucleotides. The rod-like glycoproteins act like a fibrous network that adds structure and can function as guidance for cellular activity. See the second part, section *C) microtubules* for more about cellular matrix proteins.

> "*The cellular, non-pathogenic form of PrP has been implicated in protective functions against oxidative stress, hypoxia, ischemia, excitotoxicity, or hypoglycemia, and linked to disorders, such as schizophrenia, bipolar disorder, depression, certain forms of dementia with cerebellar disorder, and cancer (Raeber et al. 1997; Walz et al. 1999; Vassallo and Herms 2003; McLennan et al. 2004; Roucou et al. 2004; Weise et al. 2004, 2006, 2008; Shyu et al. 2005; Spudich et al. 2005; Weis et al. 2008; Hinton et al. 2013). PrP is ubiquitously expressed by most, if not all cell types in mammals, and is a prominent protein in the brain (Prusiner 1998). It is a glycosylphosphatidylinositol-linked cell surface glycoprotein consisting of two major domains: the flexible N-terminal domain containing the octarepeat region and the globular C-terminal membrane-proximal domain with a high percentage of α-helices (Prusiner 1998). Conversion of the helical structures into β-sheet structures generates the pathogenic PrP form which further converts cellular PrP into scrapie PrP resulting in deprivation of cellular PrP functions and leading to accumulation of insoluble proteinaceous aggregates which are deleterious to nervous system functions (Wille et al. 2002; Weissmann and Flechsig 2003; Govaerts et al. 2004; Miura et al. 2005)*." (106)

- Ideas that might be protective against misfolded protein concerns include: **Pomegranate peel, citrus peel, dandelion leaf tea, pine/evergreen needle tea** (not yew tree needles->poisonous),

vitamin C, glycine, niacin, thiamine and **other B vitamins, mitochondrial support,** (54) **magnesium, phospholipids** and **adequate protein,** other foods and phytonutrients.

- **Dandelion** has been a medicinal herb and salad green for centuries and was brought to the American continent on purpose - for salad, and good health. The beneficial nutrients are found in all parts of the plant. (69) The greens are best when young as the taste gets more bitter in the older larger leaves. Dry the larger leaves for tea. Drying increases the phytonutrient content somewhat. The milky sap that oozes from the stems is also bitter, maybe avoid tasting that. The roots are roasted and used similarly to chicory root as a coffee substitute. The flowers are edible for salads or garnish and are described as having a mild flavor. (69)
- "*...the main phytochemicals of dandelion are sesquiterpene lactones, taraxacin and taraxasterol*." (69) Taraxasterol was first identified in an herb used in Traditional Chinese Medicine called *Taraxacum officinale* - now better known as dandelions. (73) My backyard is covered with a medicinal ancient Chinese herb - which may be helpful for Rheumatoid arthritis conditions involving IL-1β cytokines (also a problem cytokine in COVID19). (73)
- **Artemisinin** is also a sesquiterpene-lactone and was discovered in a herb used in traditional Chinese Medicine. It is now used as an anti-malarial, but it is also an iron chelator. Other medicinal benefits of artemisinin include: "*anti-inflammatory, anticancer and antiviral effects. Artemisinin has been studied in many models of inflammatory disease mainly due to its pharmacological action on multiple signaling pathways.[96] In neuroinflammation, it could inhibit LPS-induced release of TNFα, IL-6, MCP-1 and NO in BV-2 microglia through mechanisms that involve modulatory effects on NF-κB signaling.[97] These effects have been confirmed in an Alzheimer's disease (AD) mouse model, which showed that artemisinin B improved cognitive function and reduced levels of inflammatory cytokines in the hippocampus and the cortex.[98] Artemisinin has also been shown to produce promising anti-inflammatory effects in the cardiovascular system,[99,100] and in arthritis.[101] These observations suggest that artemisinin is a major source of drug repurposing to treat inflammatory conditions.*" (72)
- Suramin - a phytonutrient extracted from pine, cypress, spruce or Arbor Vitae evergreen needles (do not use yew needles). "*We show that the chemical compound Suramin induced aggregation of PrP in a post-ER/Golgi compartment and prevented further trafficking of PrP(c) to the outer leaflet of the plasma membrane. Instead, misfolded PrP was efficiently re-routed to acidic compartments for intracellular degradation. In contrast to PrP(Sc) in prion-infected cells, PrP aggregates formed in the presence of Suramin did not accumulate, were entirely sensitive to proteolytic digestion, had distinct biophysical properties, and were not infectious. The prophylactic potential of Suramin-induced intracellular re-routing was tested in mice. After intraperitoneal infection with scrapie prions, peripheral application of Suramin around the time of inoculation significantly delayed onset of prion disease.*" (103)
- To make evergreen needle tea see link in: *Shedding of the spike protein - a communicable prion disease risk?*.
- "*Vitamin C had been shown to significantly decrease serum TNFα and IL-1β levels and increased superoxide dismutase, catalase, and glutathione levels in a rat ARDS model supporting its antioxidant effect [7]. Additionally, vitamin C also enhances lung epithelial barrier function by promoting epigenetic and transcriptional expression of protein channels at the alveolar capillary membrane that regulate alveolar fluid clearance, which*

include aquaporin-5, cystic fibrosis transmembrane conductance regulator, epithelial sodium channel, and the Na + /K + -ATPase pump [8]." (105) *Glutathione helps us remove misfolded proteins in prion diseases. [Ref needed] The beneficial effects of Prion protein (PrP) within cells involves glutathione metabolism. Having adequate glutathione levels seems protective against degenerative Prion protein conditions.

- Therapeutic goals - improve autophagy, removal of old cells and cellular debris, and support mitochondrial function. Dysfunction of mitochondria tends to precede diagnoses of neurologic conditions that involve misfolded protein.
- To function well, every day, mitochondria need plenty of niacin and many water soluble B vitamins, ascorbic acid (vitamin C), also magnesium, CoQ10, and other cofactors. In times of inflammation even more would be needed for glycolysis of glucose. In a marine animal study of several combination treatments, niacin, NAC and glucose, provided the best mitochondrial support. (84) Also see the post: Niacin may help prevent or treat migraines.
- **Mitochondrial support** - **gallic acid** from **Goji berries**, (56) **pomegranate peel extract**, (57), and red raspberries, is beneficial in many ways including mitochondrial support.
- Regarding total flavonoids extract from Lyceum barbarum L, Goji Berries - the extract protected both mitochondrial membrane fluidity, and red blood cell shape from the damaging effects of iron oxide, Fe2+ cysteine:

Goji Berries: "Abstract: *The protective effects of total flavonoids from Lycium Barbarum L. (TFL) on lipid peroxidation in mitochondria and red blood cells (RBC) induced by oxygen radicals produced by Fe2+ cysteine system were investigated. The mitochondria lipid peroxidation (measured as malondialdehyde, MDA) was significantly inhibited by TFL with a dose-response relation between the concentrations of 0.025 and 2.0 mg/ml, and the fluidity of mitochondria membrane was also protected effectively. It was observed by scan electron microscope, that the shape of RBC in the Fe2+ system was damaged significantly. The shape of RBC was remained with the addition of TFL*."

- Pomegranate peel extract, microencapsulated: "*This study aims to evaluate the effect of MPPE on brown adipose tissue (BAT) mitochondrial structure and function and metabolic alterations related to obesity in mice fed a high-fat diet (HFD).*" . . . "*In conclusion, MPPE prevented HFD-induced excessive body weight gain and associated metabolic disturbances, potentially by activating complex IV activity and preserving mitochondrial cristae structure in BAT in mice fed with a HFD*."
- Part of the benefit of pomegranate peel phytonutrients, and therefore goji and raspberries also, is conversion by microbiome species into other more absorbable metabolites - urolithin-A (UA). UA and UB can cross the blood brain barrier and reduce neuroinflammation and promote growth of hippocampal cells - the type damaged in Alzheimer's dementia. See: Pomegranate, neuroinflammation, antimicrobial, metal chelator. *more about iron chelators in section 9, pomegranate is a source of EGCG and some quercetin probably. B phytonutriens are zinc ionophores also, which has anti-viral benefits.

3) The S1 and S2 parts of the Spike protein activate a defense against pathogens pathway, "*alternative complement pathway*" - which increases inflammatory signals and NLRP3 Inflammasome creation,

- see 4) for more about inflammasomes - our cellular device for killing infected cells - but what if it is autoimmune disease and one of our good cells? Oh dear.

- *"SARS-CoV-2 spike proteins bind heparan sulfate and activate the alternative complement pathway on cell surfaces." "the SARS-CoV-2 spike protein (subunit 1 and 2), but not the N protein, directly activates the alternative pathway of complement (APC)."*

4) Allergy to the spike protein is a risk, & developing autoimmune & other allergies may be more likely because of the increased immune activity,

- and increase inflammation.

Spike protein is likely to cause an allergy response (or autoimmune) and create a cell killing type of protein complex called NLRP3 Inflammasomes, and possibly an anaphylactic reaction upon re-exposure (think booster shots or exposure to the virus at some time in the future), see: NLRP3 Inflammasomes & Spike Protein.

The SARS-CoV-2 virus spike protein, the E protein section, causes activation of NLRP3 Inflammasome creation, and resulting increase in inflammation can also signal further creation of them:

"*The IC activity of E protein [168] as well as those of the other accessory viroporins, 3a and 8a [160], activate the NLRP3 inflammasome by effluxing Ca2+ from the lumen of the ER/ERGIC/Golgi, altering the homeostatic levels of cytosolic Ca2+ [168,180] and resulting in upregulation and secretion of pro-inflammatory TNF-α, IL-1β, IL-6 and IL-18 [160,181]. ER stress [182] and ROS production [183] are also activators of the NLRP3 inflammasome, and due to E protein's regulation of ER stress they may also activate NLRP3 through an alternative mechanism*." (64)

- **Phytonutrients that may inhibit NLRP3**: **quercetin** which is found in citrus peel, also can help inhibit production or activity of the inflammatory NLRP3 inflammasome which has been found to be elevated during more severe COVID19 illness. **Sulfarophane** (broccoli, cruciferous veg), **resveratrol** (grape skins, etc), **EGCG** (green tea, pomegranate peel, 36), **curcumin** (turmeric/curry powder), **gensenoside** (ginseng), **emodin** (aloe vera gel), **mangiferin** (mango) and **genipin** (from a fruit used as a Traditional Chinese Medicinal). (1.17*)
- **Phytonutrients and nutrients that may promote p53 activity**: include **zinc, artemisinin** (wormwood herb), **goldenseal** (berberine**,** also found in a few other herbs), **Black seed oil** (**Nigella sativa**), **ginger** (6-gingerol), **feverfew, chamomile,** and **cordyceps mushrooms**. (2.18*)
- Currently I have increased my own use of black seed oil - spoonful am and pm and I am using it topically am and pm and if itchy, - I seem to have developed shingles. So far the treatment plan is helping. The bumps flatten out rather than getting bigger and turning into a sore. **Black Cumin – Nigella sativa**, *Antidiabetic, analgesic, anticancer, **antimicrobial**, anti-inflammatory, antioxidant, spasmolytic, gastro-protective, etc. (Ahmad et al. 2013)*. (9*) - Ref link (9*) & more healthy foods listed in Shedding...*.

4a) Regarding the autoimmune aspects - another section is needed - in the meantime: LongCovid is a real condition, and likely involves autoimmune changes. G-protein coupled receptor autoimmune antibodies have been identified in unusual amounts in LongCovid patients. [82] Some autoimmune G-protein coupled receptors are normally present and may help regulate activity - an excessive amount

could cause autoimmune degenerative symptoms - your own body is attacking your own healthy cells instead of just removing cells that need to be removed. This post discusses the cannabinoid type of G-protein coupled receptors: Cannabinoids are made with the BHMT gene (and others).

5) SEB toxin - Spike protein may be similar to superantigen staphylococcal enterotoxin B

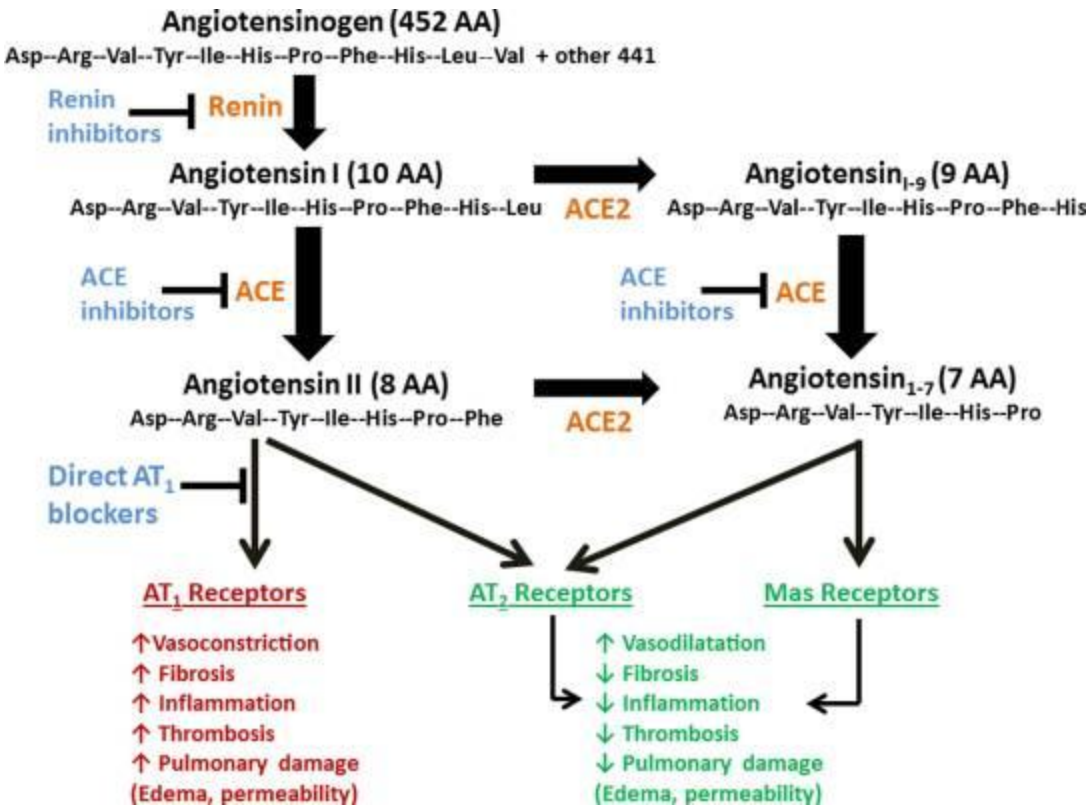
- and increase inflammation:

- "*The binding epitope on S harbors a sequence motif unique to SARS-CoV-2 (not present in other SARS-related coronaviruses), which is highly similar in both sequence and structure to the bacterial superantigen staphylococcal enterotoxin B*" (38) Thread by @gerdosi.
- **Activated Charcoal** and/or **Bentonite Clay** and plenty of water can help bind with SEB toxin and remove it from the digestive tract. (40) My own recent symptom flair-up did improve when I added Bentonite Clay - and then got even better when I added a nicotine patch to my daily routine (see NACHR receptor bullet point).

6) ACE2 Receptors - Spike protein attaches to ACE2 receptors, and TMPRSS receptors (also listed 10) TMPRSS...).

- and increases inflammation.

When a receptor gets blocked the normal action that it performs can't happen. Receptors are a little like an on/off switch or lever that can be controlled from the outside of a cell to perform actions on the inside, including affecting whether genes in the cell nucleus will transcribe proteins. If too many are blocked then body function may be affected or mood and how would depend on the receptor type and what its normal functions are.



Caption: ACE2 dysfunction leads to increased inflammation and clotting risks (thrombosis) because it helps regulate the actions of ACE1 receptors (red list). A severe COVID19 infection or presence of spike protein can disrupt ACE2 receptor function by blocking the receptors and eventually killing the cell that has that type of receptor. "*Figure 1 Counter-regulatory effects of angiotensin1-7 on angiotensin II.*" (Verdecchia, 2020) (77)

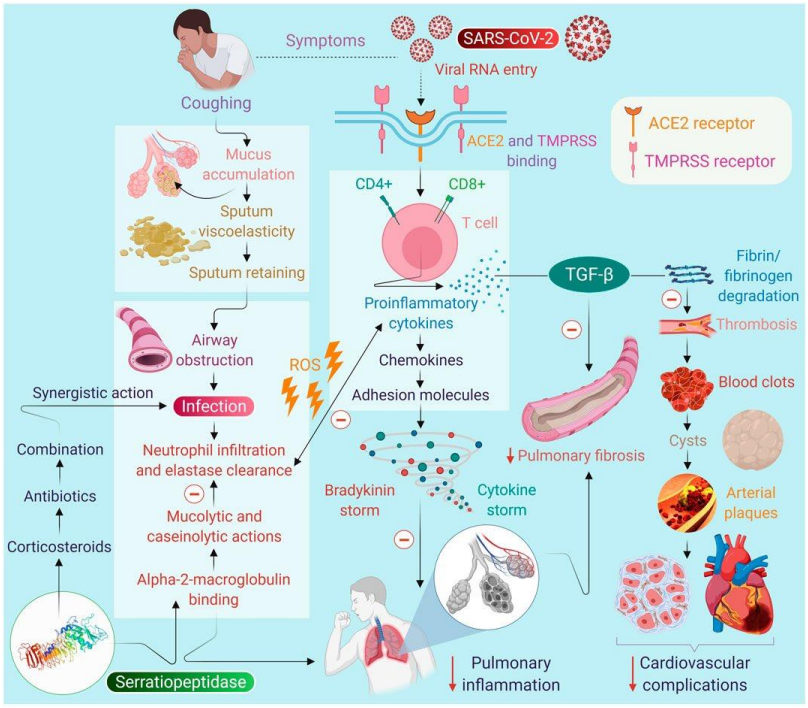
When the spike protein enters at the ACE2 receptor on a cell the function of that ACE2 receptor is stopped - which leads to inflammation and lung congestion if the damaged ACE2 receptors are on lung cells. The inflammation and damage would occur anywhere the cells were damaged and also add to a general inflammatory state throughout the body. (77)

- **For more about ACE2 receptor function and potential effects on the body, see**: ACE2, Diarrhea, & COVID19 – it gets complicated.

Potential Solutions - provide soluble ACE2 receptors so the virus attaches to those, leaving cells alone; block entry to the ACE2 receptor with ARB medications, pomegranate peel extract or serratiopeptidase (bromelain):

- Soluble ACE2 receptors exist and might work as a spike blocker - by taking it up instead of having it access cells with ACE2 receptors. *The focus of this summary is phytonutrients rather than medications so I am not listing medications unless unusual or specific and I'm aware of it - meaning only a few, not an inclusive list of medications, trying for an inclusive list of herbal and other nutrients that may be beneficial.

- ARBs - a type of blood pressure medication that would safely block the ACE2 receptors with minimal side effects beyond lightheadedness if standing up quickly (lower blood pressure - but taking it more often than typical does not lower the blood pressure even more - see Marshall Protocol. (4) I used Benicar three times a day for a year and a half while following the Marshall Protocol and it made a huge benefit for my health.
- and Pomegranate peel – anti-COVID19, may block ACE2 receptor access to the SARS-CoV-2 virus.
- **Serratiopeptidase** (**bromelain** - an enzyme found in raw pineapple) is an enzyme that breaks down mucus and does other beneficial actions: blocks entry to the ACE2 receptor and TMPRSS receptor; reduces oxidative stress; inhibits TGF-beta from causing pulmonary fibrosis/fibrotic scarring of lung tissue; inhibits breakdown of fibrin/fibrinogen; and inhibits inflammatory Bradykinin storm, see graphic below. - via Frank Herrman @fjherrmannEU



Serratiopeptidase - bromelain. *I am not sure of the source of this graphic, If you know, tell me and I will add the link/reference.

- "*Serratiopeptidase (EC No 3.4.24.40) has a long history in medicine and is widely used to combat various kinds of inflammation and inflammatory disorders [41]. Serratiopeptidase or serrapeptase is a protein (proteolytic) enzyme isolated from the non-pathogenic enterobacteria Serratia E15 found in silkworms. Serratiopeptidase often prescribed in various specialties like surgery, orthopedics, otorhinolaryngology, gynecology and dentistry for its anti-inflammatory, anti-endemic and analgesic effects [42]. In the research in recent years, exploration illustrated enzyme also plays a vital role in the management of atherosclerosis as it does possess fibrinolytic and caseinolytic properties [43]. Like most enzymes, serratiopeptidase also possesses broad substrate*

affinity and has been to be reported therapeutically useful in the management of pain and inflammation. " (72)

- Serratiopeptidase was found helpful in an arthritis, animal based model, for anti-inflammatory and anti-arthritic purposes. (73)

7) nAChR Receptors - Spike protein attaches to & disrupts nAChRs.

- and increases inflammation.

The nicotinic Acetylcholine Receptors are located in important areas of the brain and throughout the body. Thinking and movement can be affected by disruption of the cholinergic system. It also would increase inflammation. Use of nicotine medicinally to activate the alpha7 subunit type of nAChR receptors has been studied for the purposes of reducing inflammation. (78, 79)

- **See**: Snake venom toxin in the spike protein?
- Nicotine can block this receptor. I have felt better since starting a half a Step 1 nicotine patch per day (provides 10.5 mg or about a half a pack a day equivalent nicotine). The patches fall off, I just stick it on in the morning with a band-aid, (and should pick up some latex free medical tape instead, I am now out of band-aids), and take off the old one. So far it hasn't bothered my sleep and I want spike protein blockage all of the time ideally.

8) Dectin-1 receptors - Spike protein can attach to Dectin-1.

- and increases inflammation.

The dectin-1 receptors are involved in pathogen recognition, so it makes sense that they would be a target for a pathogen to evade - or attack directly and disable the protective response. By providing our dectin-1 receptors with an agonist, an activating ligand, plenty of them in fact, enough to activate our Dectin-1 receptors then that would be to our benefit by helping our defense and protecting our dectin-1 receptors from being entered and disabled by SARS-CoV-2 virus or other pathogens we might happen across - within our intestines is a primary location of dectin-1 receptors. (80)

- - via Walter M Chestnut, @parsifaler, (3). Twitter Thread, referencing: (14, 15, 16), can also be viewed here: (3a). - the normal ligands for Dectin-1 receptors (17) include the starch refined **Beta-Glucan** (from Nutritional Yeast), **Nutritional Yeast Flakes**, **yeast breads**, like a strong sourdough baguette, and **mushrooms**, with research for the medicinal Ganoderma (19), Maitake and Shitake mushrooms (20) showing benefits as immunomodulators and for enhancement of immune function.

How much beta-glucan? Medical research has used 100-500 mg of beta-glucan for immune support research and 3 grams for cholesterol reduction. (41) In mushroom equivalents? - 0.21 - 0.53 grams per 100 grams of mushrooms (42) So three ounces of fresh mushrooms may provide 200-500 milligrams of beta-glucan. In nutritional yeast equivalents? The carbohydrates in nutritional yeast are alpha-mannan and beta-glucan - both of which are beneficial for health.

Fiber content is 4 grams out of 16 total - 25%, if that is half beta-glucan then two teaspoons of Nutritional Yeast (~16 gr) may be providing 2 grams of beta-glucan and 2 grams of alph mannan. (44)

- "*Studies show that adding alpha-mannan and beta-glucan to animal feed can reduce the frequency of infections from pathogenic bacteria like E. coli and Salmonella in pigs, as well as reduce tumor formation in mice (16, 17). Beta-glucan and alpha-mannan help protect against infection in several ways (16): They stop pathogenic bacteria from attaching to the lining of the intestines. They stimulate immune cells, making them more effective at fighting infection. They attach to certain types of toxins that yeast can produce in food crops and reduce their harmful effects.*" (43)
- Beta glucan is just a starch, it is safe for use: "*In one study, men with high cholesterol who consumed 15 grams of beta-glucan derived from yeast daily for eight weeks lowered their total cholesterol levels by 6% (18Trusted Source).*" (43)
- Background information about what can activate the Dectin-1 receptors - ligands may be agonists - activate it, or antagonists - inhibit the receptor. "*At present the only known ligand for Dectin-1 is β-1,3 and β-1,6 linked glucans which are expressed by a number of organisms including yeast, fungi, plants and a small number of bacteria [8]. Although 50% of the fungal cell wall consist of β-glucans, it was previously believed that the β-glucans were buried under a layer of mannosylated proteins. However, more recent studies suggest that in some regions of the cell wall β-glucans are exposed and accessible to bind Dectin-1 [20].*" (17)
- Beta-glucan is a large branched molecule, and larger ones seem more beneficial: "*Although there is ample evidence that Dectin-1 binds β-glucans, less clear is what constitutes the minimal length of β-glucan required for binding. It appears that monomers or short oligosaccharides are not sufficient. Instead, affinity for Dectin-1 depends on whether the β-glucans adapt a helical or triple-helical confirmation, the degree of branching and the molecular mass [23].*" (17)
- There are also non carbohydrate suspected ligands that haven't been well identified yet, one is a protein. (17)
- The Dectin-1 receptor and beta-glucans are involved in immune function as immunomodulators. (18) Pathogens frequently have devised methods to disable or evade the host's immune functions. "*According to pre-clinical studies, β-1,3/1,6-glucan derived from baker's yeast may offer increased immuno-surveillance, although the human evidence is weaker...* " (18)

9) Hepcidin similarity; Spike protein may enter cells at ferroportin and increase iron loss from cells,

- and increase inflammation and blood vessel membrane breakdown.

Spike protein may enter cells by mimicking hepcidin and ferroportin - which may also lead to excessive free iron or ferritin levels. Excessive free iron or ferritin requires cellular storage. If there is excessive amounts it causes oxidative damage - rusting - inflammation. Excess iron oxidation within our cells can lead to death of the cell eventually. *See the next section for other

ways membrane breakdown may be occurring due to inflammation itself. Hepcidin is needed to help iron enter cells. "*In fact, it has been remarked by a number of commentators that "hepcidin is to iron, what insulin is to glucose" (Grover, 2019)*" (53)

Inflammatory membrane breakdown leads to increased risk of blood clots, stroke and heart attack because of changes in iron storage also, (49), called anemia of chronic infection or inflammation, but it seems more excessively than typical in COVID patients. See Thread by Walter M Chestnut, @parsifaler, (50, links, 49, 51, 52, 53) regarding the possibility that the spike protein increases this effect by mimicking a protein called hepcidin that is involved in the natural process. (53) The body does it to protect iron from pathogens, who also need it for growth. The spike protein may be doing it to enter cells at a receptor that hepcidin can interact with - ferroportin.

Iron chelators can help with the excessive ferritin and free iron associated with chronic inflammation or infection, or spike protein mimicking hepcidin - whatever the reason there is too much free iron - the solution is still going to include iron chelators. Giving blood is also used when iron overload is a problem in a person who is healthy, but for someone with symptoms of anemia, more mature blood cells are needed, not fewer. Immature blood cells that can't carry oxygen tend to be associated with anemia of chronic infection.

- **Iron chelators: Artemisinin**, **quercetin**, **EGCG**, **resveratrol**, **turmeric** and **lactoferri**n- an isolate from milk that has not been found to be an allergy concern for people with milk protein sensitivity.
- **Vitamin C** can help. See: Anemia of Inflammation, IL-6, Hepcidin, Iron and Vitamin C.
- See: Iron and Anemia of Chronic Infection - for a brief explanation.

10) TMPRSS receptors - Spike protein enters at the TMPRSS receptors,

- and increases inflammation

The TMPRSS receptors are associated with ACE2 receptors on cell surfaces, see 6) ACE2 receptors. They are also near the androgen receptor gene and may explain why men are more at risk for severe COVID-19, and why prostate cancer patients on Androgen Deprivation Therapy were spared from more severe CoV illness on average.

"*A recent study by Montopoli et al. analyzed data on 9280 SARS-CoV-2 positive patients, of which 4532 (44%) males and 118 (1.3%) with prostate cancer [22]. Males developed more severe complications, were more frequently hospitalized (men 60% and women 40%), and accounted for more deaths (men 62% and women 38%). Prostate cancer patients receiving androgen deprivation therapy (ADT) had a significantly lower risk of SARS-CoV-2 infection compared with patients who did not receive ADT (odds ratio: 4.05; 95% CI: 1.55–10.59).*" (81)

11) LPS toxicity enhanced by Spike protein,

- and increases inflammation.

Spike protein enhances bacterial LPS toxicity, "*This study shows that it binds and aggregates bacterial lipopolysaccharide, exacerbating (innate, TLR4) inflammatory signaling.*" @gerdosi, (27):

Background info: "*Lipopolysaccharides (LPS) are the major elements of the cell walls of gram-negative bacteria; they are endotoxins, which cause a strong response in normal animal immune systems and have been used in inducing immune stress in animal models [1]. LPS activates monocytes/macrophages to secrete various inflammatory cytokines [2], stimulates microglia, and decreases glutamatergic transmission that leads to memory deficits [3]. LPS also damages the intestinal barrier function [4], restricts the expression of innate immune receptors in intestinal epithelial cells [5], and enhances neutrophilic lung inflammation and pulmonary edema [6].*" (23)

- Copper loaded chitosan is also discussed as a possible therapeutic rather than using antibiotics (a standard used for bacterial endotoxin LPS problems which is now limited for use in chickens; agriculture industry article). (23)
- Immunomodulators that promote Nrf2 help reduce risk from LPS.
- Nrf2 Promoting Foods/nutrients, see above graphic. (5, 6)
- Quercetin, an Nrf2 promoting phytonutrient, has been found helpful against LPS toxicity in an animal based study. (85)

Mushrooms are protective: "**Mushroom polysaccharides** are seen as a biological regulator with various physiological activities obtained from the mycelium of ascomycetes and basidiomycetes Subphylum mushroom (Agaricus bisporus, agaric, Ganoderma lucidum, etc.) through deep liquid fermentation. They play an important role in regulating animal immune function through stimulating natural killer cells involving neutrophils and macrophage dependent immune system responses, in addition to modifying receptors such as those of dectin-1, toll-like receptor-2, scavengers and lactosylceramides [14]. Studies on poultry have shown that mushroom polysaccharides can enhance the specific immunoglobulin level of Eimeria tenella infected chickens [15], stimulate the growth of immune organs such as the spleen, thymus and bursa [16], and positively modify the intestinal microbiota in infected chickens [17]." *Eimeria tenella also makes lipopolysaccharide. (23)

12) Sialic acid - Spike Protein attached to Sialic acid, disrupting function on the surface of platelets, possible cause of hemocytopenia; & within the intestines.

- and increasing inflammation.

Sialic acid is an electrically active surface glycoprotein. We need it lining our intestinal lining to help keep it open. The electric charges on the opposing sides repel each other the way two magnets will act if oriented with the negative or positive sides facing each other. Strong emulsifiers in modern foods, whether natural or commercial, may also disrupt Sialic acid function along the intestinal lining and increase bowel symptoms.

Disrupting the Sialic acid makes the platelet blood cells more likely to clump with each other or along the sides of a blood vessel. Unfortunately for health the spike protein can bind with sialic acid on cell surfaces and block its function and that includes platelets. Platelets are a type of red blood cells that are involved in clotting. When platelets are dysfunctional, which de-sialylation would cause, increased blood clotting may occur in some areas of the body and bleeding may also be occurring elsewhere due to a lack of functional platelets. Dysfunction of platelets would further worsen lack of sialylation on other cells, such as the intestinal lining, because platelets can help build sialic acid on the exterior of other cells

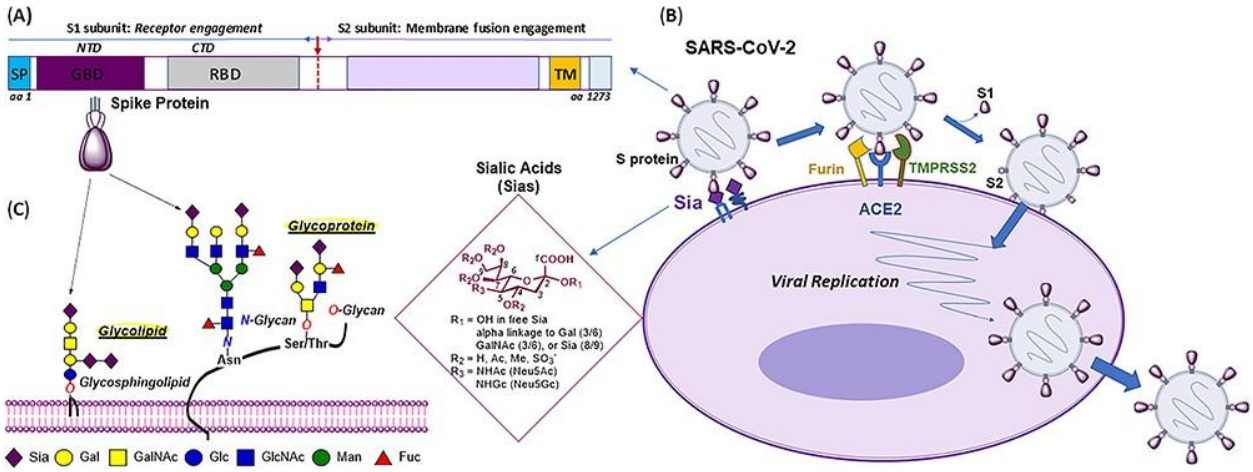
Platelets have a role in building sialic acid from the exterior of cells. It is a biochemical that we have to make for ourselves and can not get directly from a supplement or food. Dysfunction of sialic acid production seems to be involved in breast, liver and colon cancer, alcoholism, and chronic inflammation. (92)

"*The archetypical mammalian glycosyltransferase that constructs cell surface and secreted glycans is usually regarded as a resident of the endoplasmic reticulum-Golgi secretory apparatus, the intracellular site for nascent glycan assembly. However, sizable pools of extracellular glycosyltransferases exist, particularly in systemic circulation. Among the most studied of these blood-borne, soluble enzymes is the sialyltransferase ST6Gal-1 that constructs the α2,6-sialyl linkage to terminal Gal(β1,4)GlcNAc structures. Altered ST6Gal-1 levels in the blood have long been associated with a wide array of clinical conditions, such as the acute phase response (1,–4), chronic inflammation (5), alcoholism (6, 7), and malignancies including breast (4, 8), liver (9, 10), and colon cancers (11, 12). Liver produces much of the blood-borne ST6Gal-1, where its expression and secretion are responsive to circulatory factors such as glucocorticoids and IL-6 (2, 13).*" (92)

CMP-sialic acid from dying cells can be reused, platelets help with this. (92)

"*Coupled with LC/MS product analysis, we confirm that activated platelets are effective suppliers of sugar precursors to efficiently drive extracellular ST6Gal-1 sialylation under physiologic conditions. Taken together, the data strongly implicate platelets as important regulators in extrinsic ST6Gal-1 remodeling of target cell glycans by controlling access to the required sugar donor substrate for extracellular ST6Gal-1 catalysis*." (92)

- For more information about Sialic acid and red blood cells, see: *Neurominic acid was known first as Sialic acid*. Reference links to be added - via Walter M Chestnut, @parsifaler - (86, 87, 88, 89, 90)

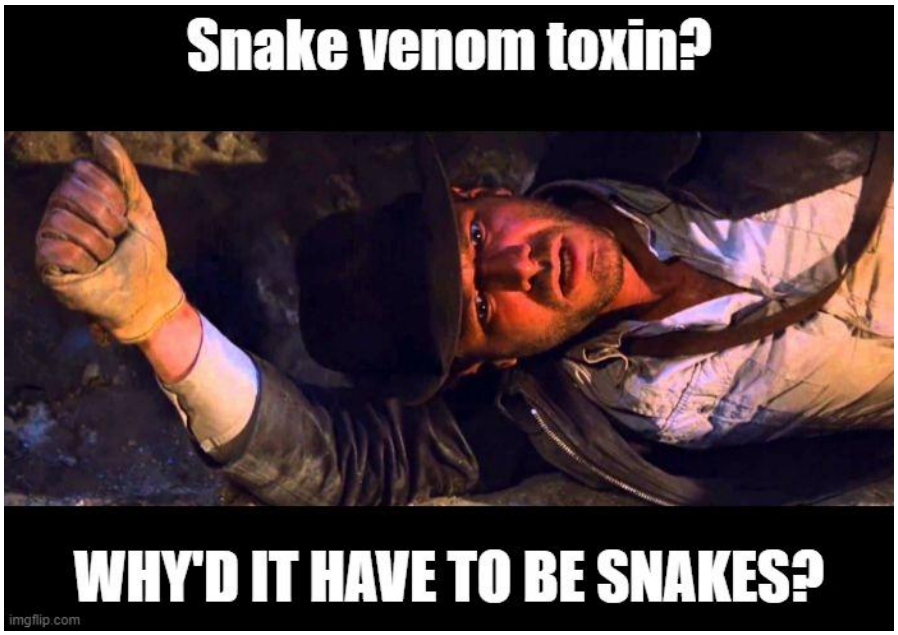


Caption: Spike protein attaching to sialic acid (Sia) and the TMPRSS receptors *also see 10) TMPRSS. (90)

This is not good news. Sialic acid is prevalent in breast milk and also in brain gangliosides. (94)

Sialic acid is needed by microglia in the brain. Lack of it adds to neuroinflammation in the brain and risk of Alzheimer's dementia. (95)

To Be Continued.

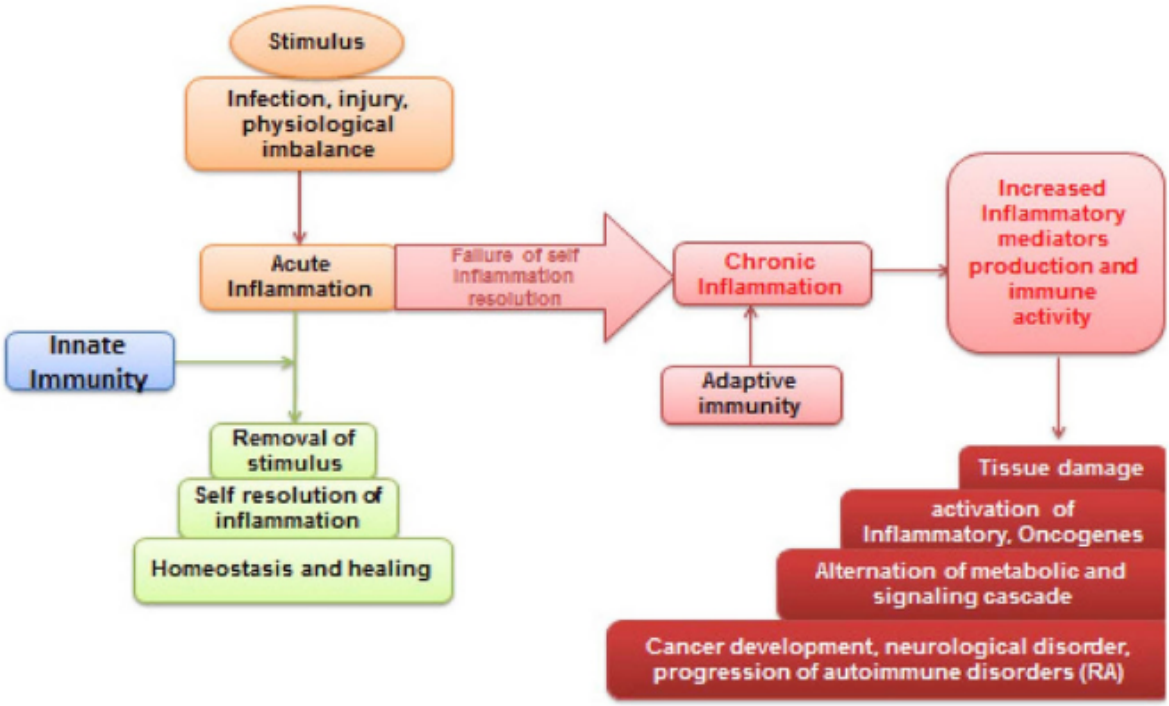


Snake Venom toxin? "Why'd it have to be snakes?" - Indiana Jones.
(See: Snake venom toxin in the spike protein?)

*as you can see the spike protein is an Indiana Jones style marathon booby trap with many, many ways to disrupt our health - and I am not done yet, but need to sleep. Also the inflammation itself is damaging to our blood vessels and gastrointestinal tract:

Section 2: Inflammation itself damages

- blood vessel membranes and other tissue - and our own muscle activity creates inflammatory chemicals, and so does emotional stress - peace and love to you.



"*Fig. 1. A detailed overview of various causes resulting in inflammation.*" (Tiwari, 2016)

"*Fig. 1. A detailed overview of various causes resulting in inflammation. Both environmental and endogenous factors are equally associated with the generation of inflammatory mediators and these mediators further affect tissues of normal homeostasis by affecting blood and lymph flow.*"
(Tiwari, 2016) (Z2)

Inflammation within the body can result from internal events due to health or emotions or strenuous exercise or illness, or due to external pollutants or the infectious pathogen.

Germ Theory is the medical focus, a pathogen causes a disease; Terrain Theory is the functional health approach - an imbalanced system will promote harmful excessive growth of microbes that are present

safely during normal health. Inflammation can affect immune function acutely - failing to respond to an infection; and then it becomes a chronic immune problem with ongoing inflammation and possible a low level, latent infection. Many pathogens may be present in a dormant state and may flair up during increased stress levels.

Breathe, think calm thoughts,.
"*Que sera sera*, *Whatever will be will be*," (74) truly, it will be whatever happens.
Worrying doesn't change that - trying to change things might change things for the better though.
Work towards positive, hope for the best
and that mental mindset may be healthier for inflammation levels too.

A) Inflammation itself adds to endothelial and epithelial tissue breakdown.

Membranes include our skin on the outside and all the interior digestive linings, and all the membranes around cells, and those which make up blood vessels. Membranes help protect us by blocking entry to most things and carefully allowing in only certain minerals. Magnesium is essential for membrane ion channels to be able to stop excessive entry of minerals such as calcium. (101) An excessive amount of calcium within cells can cause overactivity and lead to cell death.

The extracellular fluid and surface glycoproteins are also critically important for protecting us by filling the gaps between cells. Insufficient protection and a 'leaky gut' or 'leaky blood brain barrier' might occur. Pathogens or toxic chemicals may be able to enter the brain. In general Ivermectin is a very safe medication because it is a large molecule and generally does not enter the brain unless in an overdose situation - or possibly for anyone with a leaky blood brain barrier due to chronic infection or inflammation. (96) The Spike protein and inflammation both may be increasing the risk of a leaky blood brain barrier being present in severe COVID-19 or LongCovid.

Many nutrients are needed for support of health throughout the body, especially during times of infection or inflammation when needs for some nutrients are greatly increased.

"*SCCM & ASPEN...rec... COVID19 patients requiring ICU care (2, 3). Multiple micronutrients (e.g., vitamins C and E, copper, zinc, thiamin, carnitine and others), protein & fluid balance are likely all involved in mitigating & treating the inflammatory response induced by COVID19*" (101)

Deficiency of thiamin, vitamin B1, can cause psychosis when severe (Wernicke-Korsakoff syndrome) and a variety of symptoms including tachycardia (rapid heart rate) before the psychosis symptom stage. The need for thiamin is greatly increased during infection, but typically is rarely a deficiency in normal health. Malnutrition in anorexia nervosa or severe alcoholism are the most common reasons for a severe thiamin deficiency. It can cause brain stem damage if left untreated with thiamine supplements. The amount needed during a severe infection would not be available from food alone. (99) High dose thiamin during chronic inflammation or infection might also improve oxygen levels. (100) Thiamin is part of the Marik Protocol for Intravenous Vitamin C therapy for sepsis shock/cytokine storm, along with

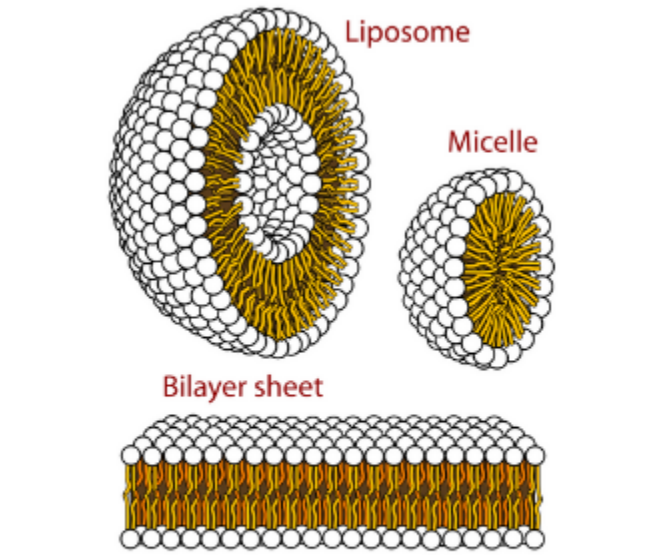
hydrocortisone, a steroid medication. (102) The high dose vitamin C and thiamin is also helpful without the hydrocortisone.

I experienced thiamine deficiency symptoms of racing heart and disoriented feeling, while I was having an anorexic appetite due to very low zinc levels. Low zinc causes a lack of appetite and may even cause swallowing to be physically difficult - dry throat, hard to swallow the food. So ... I happened to be taking a 300 mg supplement anyway when I got sick with (untested) Covid-19, and I still take it, most days, just part of my "*I'm an autoimmune patient*" lifestyle.

Niacin may also be critically important to have in higher doses for inflammation. There will be a section on mitochondria and endolysosomes - energy and detoxification requires plenty of niacin, magnesium, vitamin C, and the rest of the B vitamin team.

Aa) Cannabinoids are part of the cell membrane and their release during inflammation as messenger chemicals, leads to breakdown of membranes and an excess of free arachidonic acid.

Arachidonic acid is the fatty acid half of the CBD/2-AG molecule. Cannabinoids themselves are active signaling chemicals and they also may be transformed into eicosanoids. (58) Our body can also make eisosanoids (58) and anti-inflammatory cannabinoids from the beneficial omega 3 an 6 fatty acids. (60, 61) Cannabinoids are a combination of a fatty acid and a phospholipid. Which means they can dissolve in both oil or water - which is helpful for membranes. Membranes are formed from a double layer, with the fatty acid on the interior and the phospholipid on the exterior. See image below. (61)



Phospho-Lipid bilayer structures.

By Mariana Ruiz Villarreal ,LadyofHats - Own work, Public Domain, https://commons.wikimedia.org/w/index.php?curid=3032610

"*Lipid Bilayer Structures*," By Mariana Ruiz Villarreal ,LadyofHats - Own work, Public Domain, https://commons.wikimedia.org/w/index.php?curid=3032610 (62, 63)

Inflammation itself adds to endothelial and epithelial tissue breakdown in part because the inflammatory release of stored cannabinoids leaves empty spots in the membrane and the surrounding phospholipids have to cling together tighter. So give the body more cannabinoids - they are needed to build membranes, and or more phospholipids, (1CED), and omega 3 and specific omega 6 fatty acids. (60, 61) Patients experiencing LongCovid symptoms may have an endocannabinoid imbalance or deficiency due to the inflammation process. Symptoms and conditions associated with endocannabinoid deficiency are listed in this post: (1CED), along with food sources of cannabinoids and phospholipids or other phosphate nutrients.

Omega 3 and omega 6 fatty acids: Or give the body more omega-3 fatty acids and the beneficial omega-6's (GLA, CLA) while not overdoing polyunsaturated vegetable oils and an excess of omega-6, which is common in modern diets. Excess omega 6 in ratio to omega 3 fatty acids is inflammatory. (59) This generally means we need to add more omega 3 foods or a supplemental oil, and pay attention to the types of vegetable oils we choose. Olive oil is likely the least inflammatory choice, along with coconut oil in moderation. Single capsules of omega 3 are really not enough of the EPA and DHA omega 3's. I use a spoonful of a flavored fish oil as my main source. Salmon, sardines, krill oil, tuna fish, omega 3 rich eggs, are some of the main dietary sources. Some can be converted by the body from a precursor in walnuts or flax meal, however a significant percentage of people can't convert much of it, so the animal sources are more likely to benefit health.

- 1CED. Clinical Endocannabinoid Deficiency, (CED), and phospholipids. - list of symptoms and conditions likely related to deficiency of cannabinoids or imbalance, food sources of cannabinoids and phospholipids, a precursor nutrient.
- 2CED. Cannabinoids & blood vessels – and LongCovid. - THC protects against damage during hypoxia - move more, gently, it hurts, and don't use CBD or not without THC also. The imbalance may be too much of the 2-AG free, released from the broken down membranes (CBD equivalent), and too little of the protective anandamide (THC equivalent)
- 3CED. Cannabinoids are made with the BHMT gene (and others). - there may be an ethnic difference in risk for BHMT gene alleles and that can cause inability to make some cannabinoids and to breakdown others, leaving an deficiency overall and possibly dysfunction due to imbalance.
- 4CED. Starvation or Addiction?.
- THC also helps with T-cell mediated chronic autoimmune myocarditis. (31)
- Cannabidiol (CBD) did help diabetic cardiopathy. (32) More on CBD and cardiovascular health research. (33)

Ab) My own patient story - case study:

Personally, I am a medical marijuana patient in a 'legal' US state. It helped while I was sick with untested CoV like illness early outbreak. I did have to stop smoking in order to heal and was unable to smoke afterwards for several months. Asthma like symptoms had developed. Citrus peel helped quickly. It is being studied for use in asthma and Metabolic Syndrome. See: Citrus Peel. It helps me a lot, with MCAS/Histamine problems it turns out, due to a genetic double allele in my BHMT gene. (3CED) A combination of inhaled THC and CBD inhibit mast cells better than if ingested, and that is what I've noticed. However ingested is better than none.

I continued to use THC & CBD oil drops and just ate a small bud of flower daily, a few times probably (making tea with it would have been more potent). My 'LongCovid' finger tip symptoms (2CED) did not begin until I traveled out of the legal state and stopped using THC but continued the CBD drops. Reading more led me to increase my finger motions (Jazz hands - dance move) in order to increase oxygen flow to the fingers (they have less circulation than the thumb), and I stopped using the CBD. My finger pain improved but did not return to my previous normal until I was able to start using my standard amount of medical marijuana on a daily basis.

If a Type 1 diabetic patient needs insulin to survive - they are not called an addict. If a person genetically is unable to make a substance, such as vitamin C (all humans can not make it due to a gene difference - guinea pigs can make it but still benefit from more in their diet, especially if they are sick), then it is considered an essential nutrient. (1CED) Substances that typically can be made internally are called endogenous - we also have endogenous opioid like pain killing chemicals. If the person due to age, infirmity, or genetics can not make a substance that is typically able to be metabolized from food or other chemicals, and it is essential for health, then it is called a conditional nutrient. Endogenous cannabinoids are a conditional nutrient - essential from external sources for some people all of the time - genetic difference, or essential for some people during an illness or during aging when nothing is being made as well as it used to be made or repaired. (3CED, 4CED)

The wood paper industry wanted to stop the hemp paper (and rope and sail cloth) industry in the early 1900s - and the wood mogul owned newspapers...Reefer Madness propaganda was born. Later US impeached President Nixon wanted a reason to arrest "hippies" and people of African ethnicity and marijuana was declared of no medical value - he lied. Many people have died. It is overdue to change the US designation of cannabis and cannabinoids from the lie: "no medical value" (cannabis has been used medically for over 2000 years); to a controlled substance with medical value, more similar to opioids which are used medically as pain killers. Cannabinoids do so much more than opioids within our body - every function of the body is effected by cannabinoids - they are a little like the candy coating on the chocolate drop *that won't melt in your hand, it melts in your mouth* (M &M's, TM), except the opposite - the fatty acids are the interior of the membrane - to be impermeable to water, and the exterior is water soluble - our body is almost seventy percent water - thanks microtubules for giving us some structure in addition to the support of our skeleton. Our cells need their outer layer to be flexible, yet semi-solid, and water resistant on the exterior surfaces.

Ac) Endothelial - inner layer of blood vessels; Epithelial - outer epidermis layer of our skin.

Endothelial & epithelial - our skin inside and out: Blood vessel membranes, endothelial tissue, get discussed a lot - blood clots and bleeding risks, however the intestinal lining, epithelial tissue, also may be damaged and reduced nutrient absorption then occurs, adding to nutrient deficiencies, skin rashes are more obvious and images have been shared - think B vitamins, deficiency of many will cause skin rashes, and omega 3 fatty acids in the diet or supplement help with skin and membrane health. Topically, aloe vera gel may help, and grapeseed oil with a few drops of essential oils such as frankincense, rosemary, tea tree oil, pine oil added for their healing powers - potent, 2-6 drops of a total combination per ounce of massage oil. Ideally rub on moist skin after a bath or after using aloe vera gel first. The oil seals in moisture in the skin, but doesn't add any extra moisture to dry skin.

"*Intestinal inflammatory response has been shown to cause intestinal epithelium dysfunction,and reduce the absorption of nutrients in animals, through altering the permeability of the naturalbarrier [35]. The reduction of intestinal inflammatory response may contribute to improved growthperformance [36].*" (23)

- **Glycine** could help protect the membrane linings throughout the body. *see the following glyphosate section.
- **Mucilaginous foods - see** ACE2..., Gumbo File – anti-inflammatory and possibly anti-cancer, G8. Cookies & Bean Soup (cookie variations with golden flax meal as an egg substitute)
- **Hydrolyzable tannins** (ACE2..., 2.18, 3.2, G13. Pomegranate)
- **Fiber**, **Water**,
- **Vitamin C** - Anemia of Inflammation, IL-6, Hepcidin, Iron and Vitamin C. - limiting iron in the diet may be helpful and use of iron chelators is the typical treatment for anemia of chronic infection/inflammation. Iron chelators include: artemisinin, quercetin, EGCG, resveratrol, turmeric, and lactoferrin is a milk based iron chelator that has not been found an allergy risk for people with a milk protein allergy.
- **Resveratrol**, **vinpocetine**, other phytonutrients - "*7.1 Cerebrovascular Disease: Vinpocetine (ethyl-apovincamine-22-oate, VP), is a derivative of the alkaloid vincamine (commercial name Cavinton), used in the treatment of ischemic stroke and other cerebrovascular disease (Lin et al., 2014), also was found that when vinopepsin was encapsulated shown positive influence in the aggregation blood and plasms and also changes in the viscosity of the whole blood. However, one of the disadvantages of VIN is its poor solubility in water and in the intestinal tract.*" (35)
- **Ionic silicon** (24)
- **Magnesium sulfate**, and sulfur containing phytonutrients.

B) Blood clots, heart attack or stroke are more of a risk when there is membrane breakdown - or spike protein present.

- **Membrane breakdown leads to increased risk of blood clots, stroke, heart attack, (49) and autoimmune antibodies** developing due to intestinal lining allowing protein to pass through; toxins may also be more likely to enter the brain and cause further inflammation and membrane breakdown.
- Internal bruising is a bleed that has to clot, clots then can break off and enter the bloodstream where they may eventually get stuck and stop oxygen and nutrients from reaching tissue - in the heart or brain is the most deadly risk, however clots may damage other areas of the body too.
- **Syncytial clusters, pinocytosis**: The spike protein also increases risk of clotting by connecting cells directly together, a little like molecular velcro or a bungee cord with hooks at each end. (93)
- Pomegranate peel catechins – inhibition of NET formation - NET formation is part of the clotting process that may become overactive in COVID-19.

C) Microtubule dysfunction, depolymerization - glyphosate?

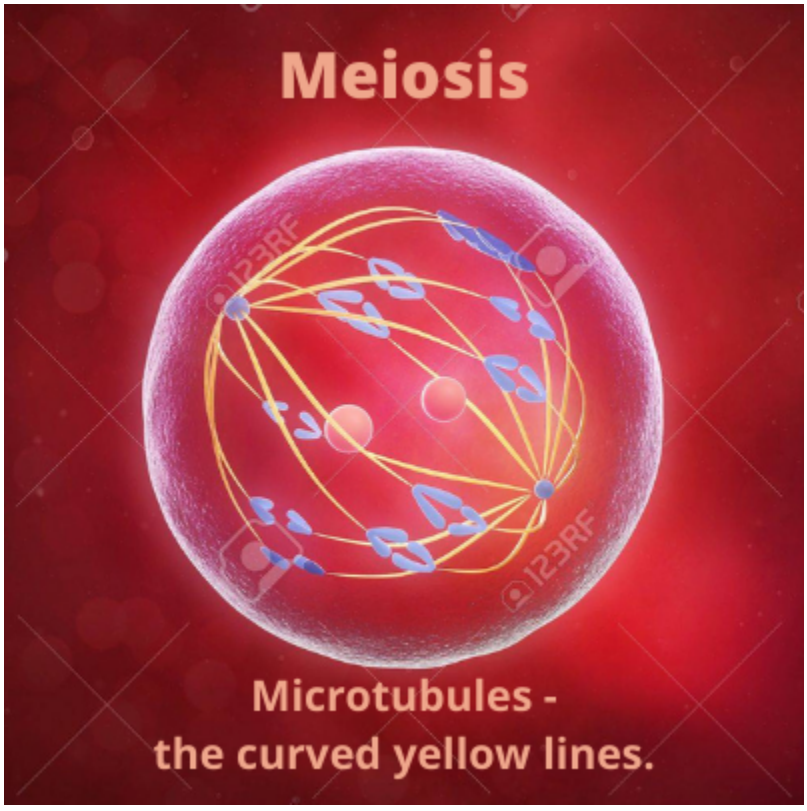
Ca) Spike Protein seems to disrupt microtubules in the extracellular fluid, by depolymerization possibly,

Twitter Thread by Claudia-Gertrud Krings, @cgkrings, (45), **or due to glyphosate residue**.

The microtubule problem is not seen in everyone, suggesting to me that there may be a difference in the people - which may be **glyphosate** incorporated in microtubules instead of glycine. They are both similarly shaped amino acids which can be used to make proteins, however the glyphosate has a side group that disrupts function of a receptor opening/protein fold. Molecules of glycine are small and are often found at the point where a protein chain folds to make a receptor opening - add a glyphosate instead and the receptor opening is permanently blocked - dysfunctional.

Why is this bad? Because the end of microtubules typically contain a glycine based area that helps control pathogen risks, (47), and glyphosate disrupts that function. (46) So the spike protein may be disruptive to microtubules - or it may be that some people have microtubules made with glyphosate that are more prone to malfunction when they are needed for the immune functions, or it may be a combination of both - spike protein disrupts microtubules, particularly those that contain glyphosate.

Microtubules are the scaffolding and cranes of our extracellular and intracellular matrix - which is gelatin like - watery and fluid but with some solidity too. Microtubules direct activity by connecting things where they need to be. If the hook end of the crane is dysfunctional - then nothing can be moved around, such as a pathogen needing to be sent to a white blood cell for removal perhaps. - overview, not my specialty except they are essential for cellular division and growth of all cells.



"Meiosis. Computer artwork of the first meiotic division." (https://www.superstock.com/stock-photos-images/4128R-25424) The yellow curved lines are microtubules directing the movement of the dividing genes within a cell's nucleus.

- "*As **mitosis** progresses, the **microtubules** attach to the chromosomes, which have already duplicated their DNA and aligned across the center of the cell. The spindle tubules then shorten and move toward the poles of the cell. As they move, they pull the one copy of each chromosome with them to opposite poles of the cell.*" (48)

Cb) Microtubules helped you at conception - and every day ever since!

Mitosis is the division and replication of the nuclear DNA before cell division occurs. If our microtubules are dysfunctional - then nothing else is going to work well either, certainly not growing a new baby, which is my specialty - prenatal, lactation, and early childhood nutrition counselor and educator.

- The rest of the construction crew: "*Microtubules are involved in mechanical support, cytoplasmic organization, and several cellular processes by interacting with diverse microtubule-associated proteins such as plus-end tracking proteins, motor proteins, and tubulin-folding cofactors. A number of the cytoskeleton-associated proteins (CAPs) contain the CAP-glycine-rich (CAP-Gly) domain, which is evolutionarily conserved and generally considered to bind to α-tubulin to regulate the function of microtubules*."

If a major regulatory protein needed for cell division is dysfunctional, then new cells are not going to be able to be grown - for wound healing, immune support, or conception of a new life (a baby).

Glyphosate residue in health is a topic that has had minimal research. Not looking for answers - means that answers you don't want to hear, or be heard, are not found. Well-funded independent research is needed - 'trusted peer-reviewed journals' are compromised.

- Urinary levels of glyphosate residue can be checked, and increased levels were associated with worse Non-Alcoholic Fatty Liver Disease. (Gly.19*, 20*)

Cc) Glyphosate and COVID-19

Excerpt : Take home point for severe – COVID-19 patients: Consider testing the urine output for presences of glyphosate residue, test kits can be ordered by clinicians or through a health company, example (greatplains.mymedlab.com/great-plains-tests/glyphosate–2);

- and if it is present in excess consider adding a heme-oxygenase-1 inhibitor to their care: Heme oxygenase-1 (HO-1) inhibitors include metalloporphyrins (Mps) and imidazole dioxolane derivatives, (13);
- in addition to following some of the other tips for helping reduce intake of more glyphosate and providing extra methylation support and di-methyl glycine.
- This post got long [12 page document version] so I'm copying the section of possible aids if excessive glyphosate is a concern: ***Curcumin***, ***Garlic*** (source of sulfur containing phytonutrients), ***Vitamin C***, ***Probiotics*** (fermented foods, yogurt, live active culture pickles), ***Methyl tetrahydrofolate*** – (this is the bioactive form of folic acid), ***Cobalamin – methyl B12***, ***Glutathione (GSH)*** (an antioxidant that we make for ourselves when healthy, **NAC, N-acetyl-cysteine** is a precursor, or liposomal glutathione can be better absorbed. Glutathione is typically broken down in the intestines otherwise. **Alpha lipoic acid** and Superoxide dismutases (SODs) are additional antioxidant support for the body. (26)), ***Taurine*** (another amino acid), ***Epsom salt baths***, source of

magnesium and sulfate., ***Manganese*** *containing foods, Eat organically grown foods* when possible. (9)

- See: Resistant Starch/Butyrate and Microbiome for more about probiotics and helping our microbiome be healthier species = so they help us defend against pathogenic species and mae butyrate for us.

Those tips were collected prior to COVID-19 and the Seneff theory about heme-oxygenase-1 potentially being defective and acting as an inflammatory peroxidase instead of being an anti-inflammatory benefit. The garlic, and sulforaphane containing produce can act as Nrf2 promoters which might also lead to increased heme-oxygenase-1, since it is part of the anti-inflammatory pathways, and which in normal function acts as an anti-inflammatory enzyme. The citrus and pomegranate polyphenols might also increase Nrf2 and heme-oxygenase-1 production. >>> test urine for glyphosate seems like an essential first step before proceeding with other standard anti-inflammatory treatments other than vitamin C and quercetin – both of which can help reduce an overexpression of Nrf2 (which occurs in a few types of cancer). (30)

Cd) Methylation gene differences may leave some people more at risk for epigenetic conditions, POTS, may be one, and therefore may be reversible! Glyphosate may be involved in epigenetic risks.

Epigenetic changes may also be involved in Covid19 or LongCovid - POTS is a focus of this, and actin, another type of regulatory protein, and glyphosate may be a factor in epigenetic problems - the good news though, is that epigenetic changes can change back to normal - with adequate methyl donor nutients. Methylation gene differences may be a factor in who is more at risk for POTS or other epigenetic related issues. **Methyl B12** and **folate** would be needed instead of standard non-methylated supplements. **Choline** and **betaine** are also methyl donors and avoid BPS. It is a problem chemical from environmental and food sources that takes methyl groups.

Ce) Glyphosate may also add to histamine excess.

- See: Glyphosate increases histamine, both may be a factor in COVID19

D) Histamine excess and mast cell over-activity can add to membrane breakdown and cause other odd symptoms unrelated to skin health.

- **Histamine excess and mast cell over-activity** would be caused by an allergy like response to the spike protein, mentioned initially, in the first section. See for an overview and links to further info: MCAS/Histamine.

E) Vaccine or viral challenge to the immune system may cause a chronic Retinoid Toxicity problem - can cause skin rashes and a wide range of other symptoms.

Retinoid Toxicity: Viral or vaccine challenges to the immune system may lead to a change that causes the liver to over-convert vitamin A and beta-carotene to the active retinoic acid form - which can activate mast cells too and add to a histamine excess.

Histamine normally is a modulator, helping us to maintain an even middle for many things in the brain and body. Histamine excess can cause a variety of symptoms including hyper-excitability. Whether angry, sad, suicidal - whatever mood is present is escalated in the brain with no modulation from normal levels of histamine, instead just a spiraling excess that only passes with enough time to calm down. It is not normal 'anger' though may appear that way, more of an autistic meltdown. Memory of what happened during is fragmented due to the overexcited brain not forming new memories well. Flu like symptoms of inflammation may be experienced the next day after one of the mood meltdowns occurred.

*I have had this and avoiding both the histamine triggers and beta-carotene/vitamin A has mostly gotten my 'mystery' symptoms under control with fewer and milder mood upsets.

- See this document, Retinoid Toxicity, for a series of posts and a symptom survey.

Retinoid toxicity affects a range of body functions so the symptoms can just seem vague and be called hypochondria - and eventually lead to liver and kidney damage, dementia, and or paralysis. I'll pass, thanks anyway. The solution is odd for a dietitian, but also simple - avoid vitamin A and beta-carotene rich foods (simple for a dietitian, but a lot of change from standard meals).

F. Why are healthy people who exercise a lot, more at risk for LongCovid? No exercise is also a risk for worse hypoxia and toxin build up.

- Inflammatory myokines created by the muscles during intense exercise would worsen inflammation, likely including the risk of inflammasome creation - polyphenols are protective.

Our muscles make a type of cytokine too, and more during extreme exercise. "*Skeletal muscle is a major source of [...] release of IL-6 from muscle can mediate metabolic processes. IL-6 is, therefore, the first identified "myokine" released from muscle that can now be termed an endocrine organ*." (9*)

- Dr. Samuel Yanuck also discussed myokines in his cogenceimmunology.com video course, Episode M5/V4. (Registration required.)
- Top athletic types have seemed more at risk for LongCovid than average. Polyphenols in the diet helps the body with post exercise recovery and reduces IL-6 and a blueberry supplement helped stop inflammasome production. (12*) The real magic is in our foods.
- Vitamin C and E also were found beneficial for reducing post exercise recovery from the cytokine increase (IL-6, which is one of the ones commonly elevated in severe COVID-19): "*Role of vitamin C and E supplementation on IL-6 in response to training ... the higher the fitness level, the lower the increase in exercise-induced plasma IL-6*." (10*)
- Dopamine excess may also increase inflammatory IL-6, (11*) - so overexcitement, over use of the internet perhaps may be too much EMF, too much blue light in the evening hours, and too much dopamine.
- Excerpt - references 9*-12*, and more information about NLRP3 Inflammasomes & Spike Protein.

Fa) No exercise is also a risk - too little oxygen and nutrient flow to tissue increases the hypoxia risk. Moderate Exercise can help both issues, along with polyphenols.

The solution to exhaustion is exercise? Yes, but very gradually. For more information and exercise ideas see the following section: *B1) Hypoxia and gentle movement - strenuous exercise and myokine inflammation.*

If anemia symptoms are present - extreme fatigue, breathlessness, and a racing heart rate after minimal, walking from room to room activity - then no, even mild exercise is going to be strain. Do some very gentle stretching exercises in bed or in your chair to help lymphatic flow an take iron chelators and avoid iron rich foods if the problem is elevated ferritin rather than iron deficiency due to blood loss or lack in the diet, (included in section *9) Hepcidin*).

Once anemia is improved, continue gradually increasing walking and stretching type exercises and use of light weights to gently increase strength. The motion improves lymphatic flow and supports detoxification. Immune function increases with regular moderate exercise. The temporary drop in immune function after exercise will recover more rapidly with polyphenols in the diet and is less severe of a drop after moderate exercise than after strenuous exercise. (12*)

Fb) Sexual release is healthy for immune function, and is also good exercise that promotes lymphatic flow. Emotional connection increases the effect. Endocannabinoid production is also increased.

While taboo, the topic of sexual health is important, and I've already mentioned the taboo topics of vitamin C, D, and zinc and other early treatments that might help a viral illness, or inflammatory toxin, - so full speed ahead. Sexual release, orgasm, whether with someone or alone, increases our natural pain killing endorphins (endogenous opioids); the feel good bonding hormones - oxytocin (female) and vasopressin (male); and other neurotransmitters; and increases immune function, maybe because of the risk of STD infections, or in case a baby is conceived (research in men, small group 68); and it helps increase endocannabinoid production. To conceive a baby and have it implant successfully on the uterine lining, the uterine bearing person needs to have adequate cannabinoids - but not too much, and the sperm donating person also needs to have adequate cannabinoids - but not too much. Mother Nature has systems in place that work - humans need to stop making up laws that violate Mother Nature's laws.

"*But masturbation has also been found to stimulate the production of endocannabinoids, according to The Journal of Sexual Medicine. These neurotransmitters are a part of the endocannabinoid system, which plays a critical role in regulating the body. Stimulating the endocannabinoid system — like through an orgasm — may have positive effects on the immune system, inflammation, and the stress response.*" (67)

Simply relaxing can reduce stress, touch can be even more effective. (66) A trained massage therapist is a health professional and deserves the respect of other health professionals and all other people. Jesus washed the feet of lepers - are you better than Jesus? In Buddhism washing someone's feet with a sandalwood water solution is considered a sign of respect and spirituality (roughly, not sure). Western culture advertising focuses on negatives and fear because it has been found to sell products. You can buy many types of foot baths in the US, but a foot massage is socially dangerous to offer as a professional service, (females get murdered, too often). Health tip - go get a massage, once a month or week if you can afford it, or once a day even. I do a self foot massage with grape seed oil and a few drops of essential

oils (Rosemary, Frankincense, Pine, Tea Tree) most days. The feet are very rich in nerves and are particularly beneficial for a massage or absorbing magnesium sulfate from an Epsom salt footsoak.

Touch, affectionate or intimate, may be most effective for stress reduction when it is from a friendly or loved social connection. (Ref: W. Reich) Emotional connection increases the relaxation response. Mindfulness training or meditative exercise like walking, cycling, jogging or dancing may also increase the relaxation response, over time. The brain literally needs to practice new habits in order to build new pathways - that are calming instead of easily irritable. Practicing the basic concept of gratitude instead of blaming can be a mental route to mindfulness - be grateful the sun is shining, plants need sunshine, be grateful the rain is falling, plants need rain. (Not helpful in a flood, be grateful for the rowboat, or floating door.)

Fc) Autoimmune disease is more common for people with female DNA.

Females tend to be more at risk for autoimmune disease, possibly because of pregnancies, or sexual contact while being vitamin D deficient, and/or magnesium deficient. Magnesium is needed for vitamin D metabolism, and women may need more of both nutrients than men, due to menstrual strain on health - women have to regrow the uterine lining each month. Having some children (but not so many it is depleting and if adequate nourishment is available), and breast-feeding the babies for 6-9 months or more, can improve long term health status of women by reducing the number of months of heavy menstrual flow over the course of the life-time. The placenta has more vitamin D than other organs and the overall vitamin D level tends to increase during pregnancy. It is needed to help the immune system be "Tolerant" of foreign DNA (the fetus) and prevent autoimmune antibodies being created either by the pregnant person's body against the fetal DNA, or by the fetus against the pregnant person's DNA. If the pregnant person is vitamin D deficient than the fetus will be to and it has an immune system too, depending on the gestational age. Section *4) Allergies* includes more about allergy risks.

Sexual differences exist in the male and female immune responses, with variables occurring based both on the gene differences, and later on hormonal differences in puberty, meaning both genes and hormones affect sexuality and immune function. Females tend to be more prone to autoimmune disease. Early childhood environmental and microbiome differences can also affect sex-dependent effects on immune function. (65)

Fd) Gender and biologic DNA sex are different and can be mismatched during prenatal development.

Controversial topic - genetic sex can be different than the person's hormone directed innate gender behaviors. This does not mean there is 'no difference' between genders - it means gender and genetic sex organs can be mismatched. The prenatal hormones surrounding a developing fetus also affect the later innate gender behavior, in addition to hormonal increase at puberty. Children who were affected prenatally generally show distinct gender behavior differences from their biological sex group. Social messaging and peer pressure may be confusing for adolescents and adults; gender is somewhat innate - male sexual mannerisms include thrusting the hips in 'mounting behavior', while female sexual mannerisms may include caregiving instincts and possibly a desire to attract mounting behavior (be mounted). The urge to mate is very strong as the biological drive is to reproduce for the next generation.

"*The sex of an individual is defined by the differential organization of chromosomes, reproductive organs, and sex steroid levels; it is distinct from gender, which includes behaviours and activities that are determined by society or culture in humans*." (65)

An example of social expectations about gender - high heels were invented by rich men and were worn by rich men to indicate their powerful status - who cares if the shoes are disabling when you have lots of servants to do everything for you? Rich females started wearing high heels too - to be more emancipated, more equal in power to men, somewhat - it was an early move towards women's liberation (or was it an embrace of a disabling and physically limiting social indicator about gender and power?). My goal in life has been to avoid all types of jobs that would have an expectation or requirement that I wear nylons and high heels - so far I am 100% successful - I did get fired over my shoes in one front of the restaurant job (no loss). High heels tend to deform toes, and the Achilles tendon. Just say no to disabling social constructs - is my opinion and advice.

Is health complicated - yes. Is an "illness" likely to have only one cause? No. If an unhealthy person gets sick, then to get healthy again, they may need to get healthy in the first place, and that is far more complex than "*Eat right and exercise*".

- Treatments vs 'a cure'. April 3, 2020. This follow-up post goes into more chemical detail about how some of the phytonutrients that I used may have helped block the SARS-CoV-2 virus in different ways. My usual supplements included several anti-viral nutrients or herbs/phytonutrients.

Section 3: Therapeutics, Symptoms, & Lifestyle factors that effect our health.

A1) Air quality

A1.1) Vaping, Smoking, and second and thirdhand smoke.

Vaping is a different story and deserves a subsection in respiratory health/indoor air quality section; or see the series of posts I wrote:

- Vaping and TRP channel activators. Oct. 21, 2019
- Vaping Risks, Part 2: ELP pneumonia and oils. Oct. 22, 2019
- Vaping, Part 3: Combined risks – oils and TRP channel activators. Oct. 23, 20129
- Moderation. Oct. 27, 2019 - Excerpt: ""*The dose makes the poison*." - attributed to Paracelsus , Swiss physician and chemist from about 500 years ago. The full quote: "*All things are poison and nothing is without poison; only the dose makes a thing not a poison.*" Even water and oxygen are poisonous in too large a dose. (1)"
- Moderation is the key point to the series, and turned into another series. EMF exposure, screen time for young children, and trying to reduce that type of excess is included within this post of the moderation series.

- The sub key points are that the oil base used in vape solution can build up in the lungs and cause a lung condition. The flavored vape oils add irritants - delightful taste or odor that belongs in the nose or mouth where the body is equipped to cope with them - they cause TRP channel activation, mucus release and would be washed away, and the person would stop eating or breathing the irritant as it would be obviously irritating. In the lungs there might be a congested feeling that keeps getting worse and more breathless because the lungs are filling with mucus. Add in a nicotine and THC vaper and that is yet more additive burdens on the lungs. The people most at risk seemed to b the more frequent users and those who used multi-flavor products and both nicotine and THC vapes.

To continue in the air quality theme - secondhand smoke is the leftover smoke during smoking. It contains formaldehyde and other toxins that increase inflammation and chronic degenerative disease risk. Thirdhand smoke is the lingering odor and formaldehyde and toxins that stays on every dusty and fabric surface and gets into the paint layers. Second and third-hand smoke are also risky to health, not just firsthand smoking - aka, smoking, and inhaling.

A1.2 - Mold

Moldy bathrooms, washing machines, laundry drain tubs, kitchen counters, sponges (soak in bleach water, ~ 2 tablespoons per quart of water, or otherwise sterilize them regularly). Continually damp carpets or walling in bathrooms sometimes may be hiding a black-mold problem underneath or inside the wall. Mold can cause significant health risks that go undiagnosed for years - vague symptoms of brain fog, can't quite think well, tired, low grade cough. Chronic aspergillosis has become more common and does eventually lead to death due to fibrotic scarring type of lung damage.

A1.3 - Poor ventilation, air fresheners, decorative candles - solution vanilla or essential oils instead.

Closed off rooms that never have open windows and fresh air leading to stale and/or dusty rooms can also be unhealthy but not as severe a risk. Excessive use of decorative candles that are burnt regularly can increase formaldehyde and smoke toxin levels and may include lead in cheaper products (within the wick). Excessive use of scented air fresheners and frequent use of other commercial cleansers may also increase volatile chemical load in the air. Vanilla or essential oils would scent with less risk, and possibly be calming (vanilla) or have other health benefits.

- Essential oils, benefits and how to use safely - blog, videos, and a book by Dr. Eric Zielinski, D.C and his wife Sabrina Ann, "Mama Z" is available: (naturallivingfamily.com/category/remedies). *I am unaffiliated, simply aware as I have listened to one of their video series, and found their guidance helpful and the the information provided was thorough and easy to follow.
- "*Waft*" - my high-school chemistry class was not ideal for learning chemistry but the lesson on the importance of wafting stood out - he spent way too long, on the other hand - moderation. The nose is equipped to cope with irritants that gently enter the exterior of the nose. Sniffing a perfume or unknown chemical may forcefully cause the irritants or toxins to reach far back into the nasal cavity and likely all the way into the lungs. How to waft - gently wave your hand over the substance, or use a paper fan, so that a gentle breeze carries any odor particles to your nose which is not directly over the substance. Thank you tenth grade chemistry teacher.

B1) Hypoxia and gentle movement - strenuous exercise and myokine inflammation.

The viral infection (see *6) Hepcidin*) and the inflammation it causes (sections *Aa*-c) and F) and *Fa*)), both increase risk for hypoxia, add some nutrient deficiencies, and then membrane break down occurs and isn't easy to repair, because of the nutrient deficiencies, and the body is busy being inflamed and trying to fight an infection instead. The body needs all the help it can get when fighting an infection, not debates about double blind clinical studies regarding nutrients known for over a 100 years to be essential for human survival.

B1.1) Types of Exercise, including examples of moderately paced exercise.

Movement is life - the human body is designed to be active and climb trees - when is the last time you climbed a tree? I did a few weeks ago - well a big oak branch supported by a large shrub - but I'm old enough to know my limits. Yoga can be gentle and gradually build to more strenuous poses. Qi gong is a flowing movement style of exercise that is yoga like except poses are not held and contralateral movement tends to be included - the right and left side of the body are doing opposite movements instead of the same - it is good for the brain. Walking and hiking in nature are very meditative and good for heart and lung strength. Some weight lifting or ditch digging (same thing, more useful) is also helpful for bone strength as the bone matrix needs weight bearing work to remain strong. The body provides what is needed for the work that is being done - couch potatoes may resemble the work that they do. Recognition is the first step towards change - you - are in charge of you (ideally).

See the earlier F) & Fa) sections on exercise and myokines. Strenuous exercise increase inflammation and the muscles create myokines, which are similar to inflammatory cytokines that can be damaging. There is also a drop in immune function temporarily. Athletic people have been more at risk for LongCovid symptoms or flair ups. That is the way autoimmune patients have to survive - moderately. Today may be a good energy day, but overdo it and tomorrow will be a in bed feeling slightly flu-ish day. It is important to pace oneself and take as many breaks as needed to sit down and rest and let the breathing and heart rate slow down. Polyphenols in the diet help, and or as a snack prior to or after exercising can help the body to recover more rapidly from the drop in immune function and have less of a reduction. Regular moderate exercise overall increases immune function.

B1.2) Ways to keep moving even when you can't move & LongCovid Fingers/Toes.

LongCovid Fingers/toes: At the other end of the spectrum of exercise - people who do very little movement are also going to be more at risk for ill health and physical degeneration. Gentle movement, even waving painful finger back and forth will help the body keep some oxygenated blood flowing through the area. No movement of the muscles and there is less flow of blood and little movement of lymphatic fluid, which needs muscle power to get it to lymph nodes for detoxifying and removal of infectious microbes.

This post includes more information about my own experience and medical research that I found helpful: *Cannabinoids & blood vessels – and LongCovid*, and the earlier sections on membrane health. More THC may be critically important and not having just CBD. It likely has to do with the inflammatory response releasing too much of the CBD equivalent endocannabinoid 2-AG from membrane storage and more of the anandamide equivalent THC would be protective against the damage caused by low oxygen

conditions - hypoxia. Movement helps blood flow get to the fingers and toes, where there is less circulation than in the thumbs, big toes, and the rest of the body.

- See the section on membranes and inflammation, A) and Aa). Section Ab) has a post about my own LongCovid fingers experience: 2CED. *Cannabinoids & blood vessels – and LongCovid*.
- Some people may genetically need an external source of cannabinoids because they can't make them all - this group includes me and may be ethnically skewed with some groups more likely to have that type of gene difference and other groups less likely. See: *Cannabinoids are made with the BHMT gene (and others)*.

Ideas for exercise when you can't move much at all: Gentle leg lifts in bed; having the legs propped up on pillows for better lymphatic drainage; gentle exercise sitting in a chair or with the support of a wall; or for patients confined to a bed - help them move safely with the guidance of a physical therapist. A caregiver following the PT exercise instructions can move the patient's arms, legs, and body through a range of motions each day, to help their health and prevent bed sores. Pressure sores occur on bony spots that are being laid on or sat on all of the time, blood flow is reduced and skin break down can occur that is difficult to heal in a frail patient.

B1.3) Nutrients, Phytonutrients, and Foods that may help recovery after exercise.

- Vitamin C helps reduce the cytokine or myokine production and protects against oxidative chemicals produced during inflammation. It protects against the damaging effects of free iron on cells of the body or blood vessel membranes. Reminder - vitamin C is essential to survival and humans can't make it. An animal based study of the effects of vitamin C on influenza infection used genetically modified mice that can't make vitamin C. Given the flu, and no vitamin C - they died within a week. Tears, and blessings for their parting. "*Since the in vivo anti-viral effect is still controversial, we investigated whether vitamin C could regulate influenza virus infection in vivo by using Gulo (-/-) mice, which cannot synthesize vitamin C like humans. First, we found that vitamin C-insufficient Gulo (-/-) mice expired within 1 week after intranasal inoculation of influenza virus (H3N2/Hongkong)*." (110)
    - **Vitamin C food sources include**: cabbage, tomatoes, green peppers, broccoli, asparagus, peas, kale, & citrus, strawberries, kiwi, papayas, cantaloupe. (Vit C Fact Sheet)
- Polyphenol rich foods include many colorful fruits, vegetables, herbs and spices. The polyphenol nutrients tend to include the pigment colors of the plants. See Phytonutrients and Nrf2 Promoting Foods.
    - **Quercetin food sources include**: red onion, onion, garlic, kale, tomatoes, asparagus, broccoli, capers, nuts and seeds, red grapes, cherries, olive oil. Herbal supplements also containing quercetin include St John's Wort, Gingko biloba, and American Elder. (WebMd)
- Zinc has anti-inflammatory and other roles in immune function and genetic transcription of odor and taste receptors. Bitter taste receptors throughout the body do mechanical or other functions when activated explaining why so many bitter tasting medicines have medicinal effects - so do many foods with bitter tasting phytonutrients, such as the original source of quinine medications - Tonic water - a tonic for health - not just a mixed

drink mixer. "*Zinc in human plays an important role in cell mediated immunity and is also an antioxidant and anti-inflammatory agent. Zinc supplementation studies in the elderly have shown decreased incidence of infections, decreased oxidative stress, and decreased generation of inflammatory cytokines*." (107)

- **Zinc food sources include**: oysters, meats, poultry, dairy, cashews, pumpkin seeds. Other beans, nuts and seeds would also have some as vegan sources. Meats have more than the vegan sources, while oysters have so much zinc that it might risk excess if eaten regularly in large servings. (Zinc Fact Sheet).

Others mentioned in section Ac), include more information about vitamin C:

- **Glycine** could help protect the membrane linings throughout the body. *see the following glyphosate section.
- **Mucilaginous foods – see** ACE2..., Gumbo File – anti-inflammatory and possibly anti-cancer, G8. Cookies & Bean Soup (cookie variations with golden flax meal as an egg substitute)
- **Hydrolyzable tannins** (ACE2..., 2.18, 3.2, G13. Pomegranate)
- **Fiber**, **Water**,
- **Vitamin C** – Anemia of Inflammation, IL-6, Hepcidin, Iron and Vitamin C. – limiting iron in the diet may be helpful and use of iron chelators is the typical treatment for anemia of chronic infection/inflammation. Iron chelators include: artemisinin, quercetin, EGCG, resveratrol, turmeric, and lactoferrin is a milk based iron chelator that has not been found an allergy risk for people with a milk protein allergy.
  - "*Vitamin C had been shown to significantly decrease serum TNFα and IL-1β levels and increased superoxide dismutase, catalase, and glutathione levels in a rat ARDS model supporting its antioxidant effect [7]. Additionally, vitamin C also enhances lung epithelial barrier function by promoting epigenetic and transcriptional expression of protein channels at the alveolar capillary membrane that regulate alveolar fluid clearance, which include aquaporin-5, cystic fibrosis transmembrane conductance regulator, epithelial sodium channel, and the Na + /K + -ATPase pump [8].*" (105) *Glutathione helps us remove misfolded proteins in prion diseases.
- **Resveratrol**, **vinpocetine**, other phytonutrients – "*7.1 Cerebrovascular Disease: Vinpocetine (ethyl-apovincamine-22-oate, VP), is a derivative of the alkaloid vincamine (commercial name Cavinton), used in the treatment of ischemic stroke and other cerebrovascular disease (Lin et al., 2014), also was found that when vinopepsin was encapsulated shown positive influence in the aggregation blood and plasma and also changes in the viscosity of the whole blood. However, one of the disadvantages of VIN is its poor solubility in water and in the intestinal tract.*" (35)
- **Ionic silicon** (24)
- **Magnesium sulfate**, and sulfur containing phytonutrients.

Others mentioned in 2) Prion risk and Spike 'shedding' include mitochondrial support and also includes information about the benefits of dandelion and artemisin.

- **Mitochondrial support** - **gallic acid** from **Goji berries**, (56) **pomegranate peel extract**, (57), and red raspberries, is beneficial in many ways including mitochondrial support.

To be Continued

Disclaimer: Opinions are my own and the information is provided for educational purposes within the guidelines of fair use. While I am a Registered Dietitian this information is not intended to provide individual health guidance. Please see a health professional for individual health care purposes.

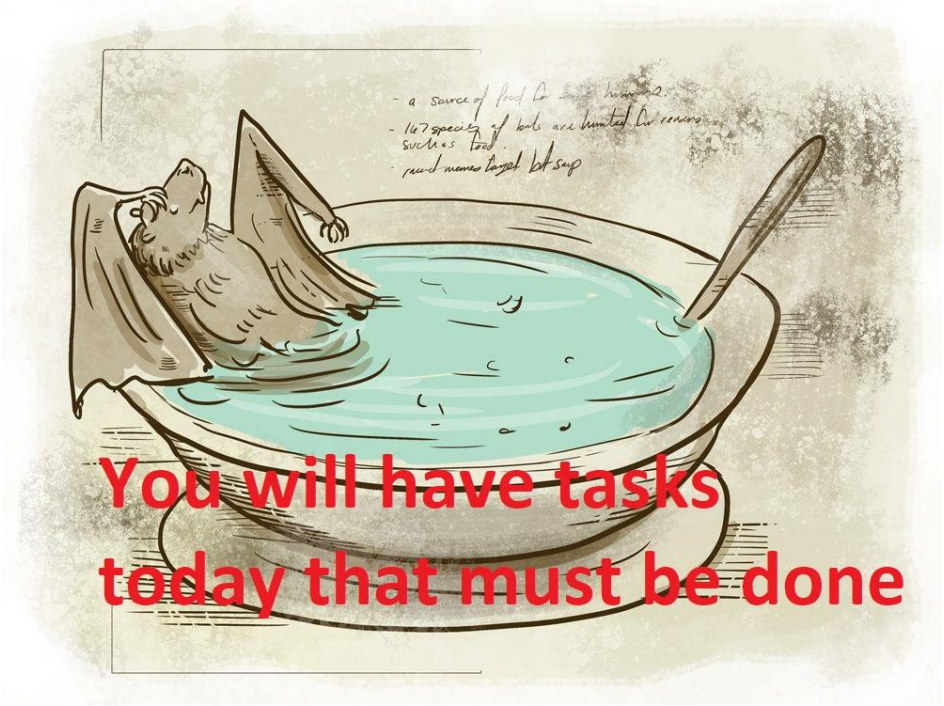
Resources & Reference Lists

Resources

- Medical Alliance: FLCCC - Frontline COVID-19 Critical Care Alliance, COVID19CriticalCare.com
  - About: "*The FLCCC Alliance – On a Mission to Save Thousands & Slow the Pandemic (A brief self-introduction; Jan 19, 2021)*
    - *The FLCCC Alliance was organized in March, 2020 by a group of highly published, world renowned Critical Care physician/scholars – with the academic support of allied physicians from around the world – to research and develop lifesaving protocols for the prevention and treatment of COVID-19 in all stages of illness. Their MATH+ Hospital Treatment Protocol – introduced in March, 2020, has saved tens of thousands of patients who were critically ill with COVID-19. Now, the FLCCC's new I-Mask+ Prophylaxis and Early At-Home Outpatient Treatment Protocol with ivermectin has been released – and is a potential solution to the global pandemic.*" (covid19criticalcare.com/about)

Patent by Ralph Baric, Agnihothram Suhakar, and Yount Boyd, of North Carolina University, for a chimeric spike protein, Grant: 2018/02/06, coincidentally:

- ***PubChem* Methods and compositions for chimeric coronavirus spike proteins(Patent)**
- "*1 Abstract: The present invention provides compositions and methods comprising a chimeric coronavirus spike protein.Google Patents*" (https://pubchem.ncbi.nlm.nih.gov/patent/US9884895)



"You will have tasks today that must be done." - Dr. Fauci, email (meme source unknown artist)

The North Carolina University (NCU) and international team research article published in 2015 about gain of function research on the bat virus that makes up the main part of the SARS-CoV-2 viral gene sequence - the article linked in Dr. Fauci's email about tasks needing to be done:

- Menachery, V., Yount, B., Debbink, K. et al. A SARS-like cluster of circulating bat coronaviruses shows potential for human emergence. Nat Med 21, 1508–1513 (2015). https://doi.org/10.1038/nm.3985 https://www.nature.com/articles/nm.3985
- The full list of authors and their homebase location: Vineet D Menachery, (NCU, US), Boyd L Yount Jr, (NCU, US), Kari Debbink, (NCU, US), Sudhakar Agnihothram, (FDA, US), Lisa E Gralinski, (NCU, US), Jessica A Plante, (NCU, US), Rachel L Graham, (NCU, US), Trevor Scobey, (NCU, US), Xing-Yi Ge, (Wuhan, China), Eric F Donaldson, (NCU, US), Scott H Randell, NCU, US), Antonio Lanzavecchia, (Zurich, Switzerland),

Wayne A Marasco, (Harvard, US), Zhengli-Li Shi (Wuhan, China), & Ralph S Baric (NCU, US).

About Cellular Serial Passage for bioengineering viral mutations:

We don't have a smoking gun, we have a smoking mink pandemic - serial passaging in ferrets and mice must have been used to develop the ACE2 receptor mutations in the SARS-COV-2 spike sequence. Ferrets are very similar to minks, and mink populations have been the only ones that have been very susceptible to the SARS-CoV-2 virus - and they were very susceptible - suggesting that ferrets were used to increase the reactivity of the spike protein with the ACE2 receptors in humans and ferrets. Ferrets were chosen because there are close similarities to humans in the reactions to SARS coronavirus.

- Sirotkin K, Sirotkin D. Might SARS-CoV-2 Have Arisen via Serial Passage through an Animal Host or Cell Culture?: A potential explanation for much of the novel coronavirus' distinctive genome. *Bioessays*. 2020;42(10):e2000091. doi:10.1002/bies.202000091 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7435492/
- part I: *Molecular Evidence for COVID-19's Engineered Origins*. June 2, 2021, https://harvard2thebighouse.substack.com/p/molecular-evidence-for-covid-19s
- *part II: Understanding COVID-19 and Seasonal Influenza as Quasispecies Mutant Swarms Reveals the Quantum Origins and Cryptic Fates of Human Pandemics*. April 1, 2021, https://harvard2thebighouse.substack.com/p/part-ii-understanding-covid-19-and
- *Understanding COVID-19 and Seasonal Influenza as Quasispecies Mutant Swarms Reveals the Quantum Origins and Cryptic Fates of Human Pandemics*. https://harvard2thebighouse.substack.com/p/understanding-covid-19-and-seasonal -- "*Quasispecies mutant swarms*" -that's one unit of speech, a noun with adjectives ;-) - close living/working quarters with a large mass of people or animals of the same species, promotes more mutations among the similar strains of virus/bacteria that are found within the population, particularly for RNA virus which don't involve DNA replication. Viral and bacterial mutations may be more likely in part because they may end up sharing genetic code when replicating or being replicated.

- "*SARS-CoV-2 has extensive capacity to evolve to evade neutralizing antibodies targeting a small number of antigenic regions*." - Dr. John B. @DrJohnB2 - https://twitter.com/DrJohnB2/status/1412482410143436804?s=20
    - Van Egeren D, Novokodko A, Stoddard M, et al., Risk of rapid evolutionary escape from biomedical interventions targeting SARS-CoV-2 spike protein. *PLOS one* Published: April 28, 2021, https://doi.org/10.1371/journal.pone.0250780 https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0250780
- This topic was discussed in part, in the introduction - the CoV injections are more likely to promote mutations due to the limited number of proteins included (the spike protein), as well as being likely to induce a non-neutralizing type of antibody that would make a future infection more dangerous instead of a neutralized non-risk - *ADE, Antibody-dependent enhancement [of virulence]*.
- Karthik K, Senthilkumar TMA, Udhayavel S, Raj GD. Role of antibody-dependent enhancement (ADE) in the virulence of SARS-CoV-2 and its mitigation strategies for the development of vaccines and immunotherapies to counter COVID-19. *Hum Vaccin Immunother*. 2020 Dec 1;16(12):3055-3060. doi: 10.1080/21645515.2020.1796425. Epub 2020 Aug 26. PMID: 32845733; PMCID: PMC7484565. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7484565/

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2. 18. Susan G. Wynn, DVM, Barbara Fougere, *Veterinary Herbal Medicine*, Elsevier Health Sciences, Nov 29, 2006 https://books.google.com/books?id=iLbZDzumqt0C&pg=PA327&lpg=PA327&dq=sassafras+leaves+hydrolyzable+tannins&source=bl&ots=qSTuWQ1XbN&sig=ACfU3U0cgrerOFCe7IFXq2xp49NPrgXKuQ&hl=en&sa=X&ved=2ahUKEwjC5u73rZ_nAhXBB80KHQEXAXUQ6AEwDXoECA4QAQ#v=onepage&q=sassafras%20leaves%20hydrolyzable%20tannins&f=false Hydrolyzable tannins: Sassafras leaves book page – Agrimony (*Agrimonia eupatoria)*, Tormentil, (*Potentilla tormentilla*) , Blackberry, (*Rubus fructosis*), Cranesbill, (*Geranium maculatum*), Artichoke, Bayberry, Bilberry, Black cohosh, Blue Flag, Borage, Cascara, Cassia, Chamomile (German), Cinnamon, Clivers, Comfrey, Cornsilk, Elder, Ephedra, Eucalyptus, Eyebright, Feverfew, Gentian, Hawthorn, Hops, Horse chestnut, Juniper, Marshmallow, Meadowsweet, Nettle, Pilewort, Plantain, Poplar, Prickly Ash, Raspberry, Rhubarb, Sage, Sassafras, Saw palmetto, Skullcap, Slippery elm, St. John's Wort, Tansy, Thyme, Uva ursi, Valerian, Vervain, Willow, Witch Hazel, Yarrow, Yellow Dock. book page
3. 2** the source in 2.18 makes it slightly unclear that gallotannins/ellagitannins in pomegranate peel are hydrolyzable tannins, not condensed tannins as catechins are referred to in the 2.18 text. Hydrolyzable tannins have medicinal value and can be an irritant in excess.
    1. "*Hydrolysable tannins (HTs) are an important group of secondary plant metabolites that include simple gallic acid derivatives, gallotannins (GTs), and ellagitannins (ETs). HTs exhibit anti-cancer, anti-angiogenic, antioxidant, anti-inflammatory, and anti-ulcerative properties.*"
    2. *Hydrolysable tannin*, sciencedirect.com, https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/hydrolysable-tannin
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End of Reference List

Extras

Herpangina & dengue virus & TCM RDN, loratidine & acetaminophen:

- *"Herpangina is a sudden viral illness in children. It causes small blister-like bumps or sores (ulcers) in the mouth. They are often in the back of the throat or the roof of the mouth. Herpangina is often seen in children between the ages 3 and 10. It is seen most often in the summer and fall."* Caused by a virus, most common: *Coxsackie viruses A and B, Enterovirus 71, Echovirus, Herpangina in Children,* StanfordChildrens.org, https://www.stanfordchildrens.org/en/topic/default?id=herpangina-90-P01855

Traditional Chinese herbal injections used for treatment of herpangina: Reduning injection (RDN), Shuanghuanglian injection (SHL), Tanreqing injection (TRQ), Xiyanping injection (XYP), and Yanhuning injection (YHN),

- Duan X, Wang H, Wu J, Zhou W, Wang K, Liu X. Comparative Efficacy of Chinese Herbal Injections for the Treatment of Herpangina: A Bayesian Network Meta-Analysis of Randomized Controlled Trials. *Front Pharmacol*. 2020;11:693. Published 2020 May 15. doi:10.3389/fphar.2020.00693 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7242616/

RDN- antiviral herbal medicine ReDuNing (RDN), Loratadine (LRD) and Acetaminophen were tested for Dengue virus: Shahen M, Guo Z, Shar AH, Ebaid R, Tao Q, Zhang W, Wu Z, Bai Y, Fu Y, Zheng C, Wang H, Shar PA, Liu J, Wang Z, Xiao W, Wang Y. Dengue virus causes changes of

MicroRNA-genes regulatory network revealing potential targets for antiviral drugs. BMC Syst Biol. 2018 Jan 4;12(1):2. doi: 10.1186/s12918-017-0518-x. Erratum in: BMC Syst Biol. 2018 Feb 23;12 (1):21. PMID: 29301573; PMCID: PMC5753465. https://pubmed.ncbi.nlm.nih.gov/29301573/

Liver injury & phytonutrients

Subramanya SB, Venkataraman B, Meeran MFN, Goyal SN, Patil CR, Ojha S. Therapeutic Potential of Plants and Plant Derived Phytochemicals against Acetaminophen-Induced Liver Injury. *Int J Mol Sci*. 2018;19(12):3776. Published 2018 Nov 28. doi:10.3390/ijms19123776
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6321362/ *extensive list of phytonutrients with typical dose used, MoA/benefits & "**CYP2E1 Inhibition:" yes or no**

"*Current clinical therapy for APAP-induced liver toxicity is the administration of N-acetyl-cysteine (NAC), a sulphydryl compound an approved drug which acts by replenishing cellular glutathione (GSH) stores in the liver*." "*Phytochemicals mitigate necrotic cell death and protect against APAP-induced liver toxicity by restoring the cellular antioxidant defense system, limiting oxidative stress and subsequently protecting mitochondrial dysfunction and inflammation. Recent experimental evidence indicates that these phytochemicals also regulate differential gene expression to modulate various cellular pathways that are implicated in cellular protection.*" "*Excessive metabolites formation depletes GSH from liver, therefore the treatment of APAP toxicity is based on replenishing GSH stores in the liver by the use of glutathione precursor; N-acetylcysteine (NAC), a sulphydryl compound [20]. NAC is the only drug approved and available as an antidote for APAP-induced hepatotoxicity, that seems to be effective only when it is administered either orally or intravenously within 10h of APAP overdose [21]*"

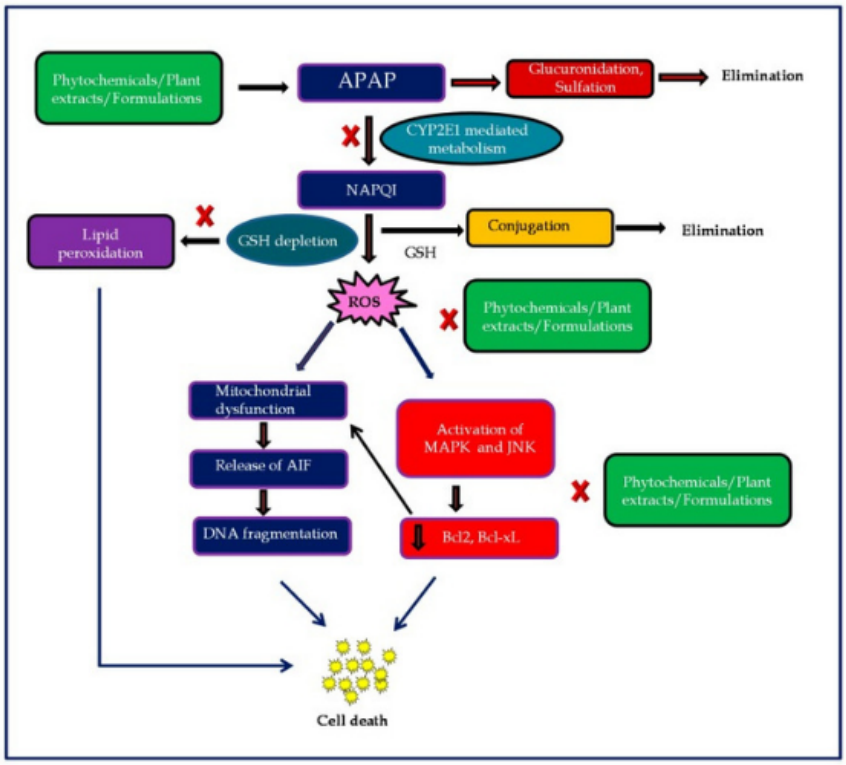


Fig. 1 Schematic representation of phytochemical attenuate acetaminophen-induced liver toxicity. (Subramanya, 2018)

GSH = glutathione

How bats carry viruses without getting sick.

Summary: Bats are known to harbor highly pathogenic viruses like Ebola or Marburg and yet they do not show clinical signs of disease. Scientists find that in bats, an antiviral immune pathway called the STING-interferon pathway is dampened, and bats can maintain just enough defense against illness without triggering a heightened immune reaction. “"We believe there is a balance between bats and the pathogens they carry," says senior author Peng Zhou. "This work demonstrated that in order to maintain a balance with viruses, bats may have evolved to dampen certain pathways."

In humans and other mammals, an immune-based over-response to one of these and other pathogenic viruses can trigger severe illness. For example, in humans, an activated STING pathway is linked with severe autoimmune diseases.

"In human history, we have been chasing infectious diseases one after another," says Zhou, "but bats appear to be a 'super-mammal' to these deadly viruses." By identifying a weakened but not defunct STING pathway, researchers have some new insight into how bats fine-tune antiviral defenses to balance an effective, but not an overt, response against viruses.”

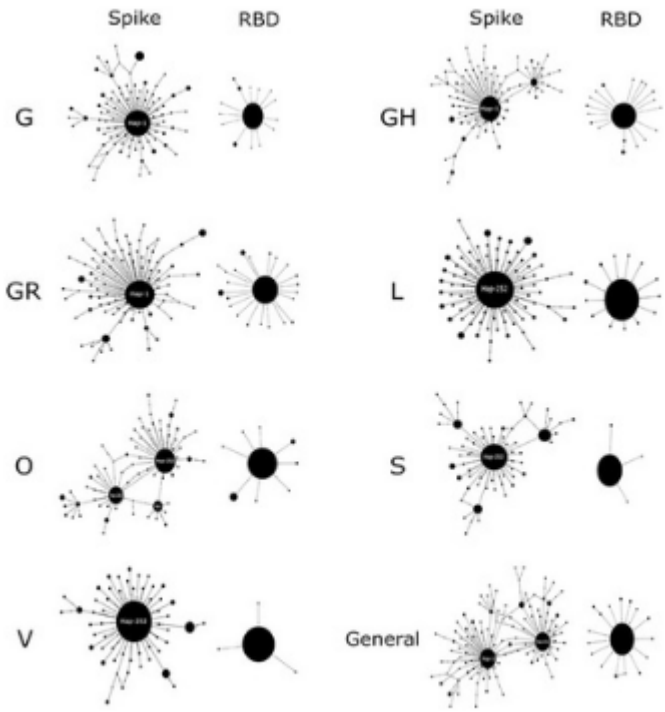
From the research article: *We demonstrate that bats have a dampened interferon response due to the replacement of the highly conserved serine residue (S358) in STING, an essential adaptor protein in multiple DNA sensing pathways. Reversing this mutation by introducing S358 restored STING functionality, resulting in interferon activation and virus inhibition.*
https://www.cell.com/cell-host-microbe/fulltext/S1931-3128(18)30041-6

"There is a clear link from the gut bacteria of insects to food energy-dependent pheromone-controlled biophysically constrained viral latency in mammals." - James Kohl,
https://rna-mediated.com/creating-biophysically-constrained-viral-latency-2/ - one of his sites

Video: *A manufactured illusion. Dr David Martin with Reiner Fuellmich 9/7/21*

https://brandnewtube.com/watch/a-manufactured-illusion-dr-david-martin-with-reiner-fuellmich-9-7-21_hPChWe1no7nxGDM.html

Quasiswarm



Evolutionary analysis of SARS-CoV-2 spike protein for its different clades. Fig. 1, (Pereson, 2021)

Quasiswarm:

Evolutionary analysis of SARS-CoV-2 spike protein for its different clades. Fig. 1 (Pereson, 2021)

Matías J. Pereson, Diego M. Flichman, Alfredo P. Martínez, Patricia Baré, Gabriel H. Garcia, Federico A. Di Lello. Evolutionary analysis of SARS-CoV-2 spike protein for its different clades. First published: 29 January 2021 https://doi.org/10.1002/jmv.26834
https://onlinelibrary.wiley.com/doi/10.1002/jmv.26834

EMF & CoV

The Link between Electrical Properties of COVID-19 and Electromagnetic Radiation
By Awaad K. Al Sarkhi, Published: March 14th 2021, DOI: 10.5772/intechopen.96815
https://www.intechopen.com/online-first/the-link-between-electrical-properties-of-covid-19-and-electromagnetic-radiation

Water and DNA magnetic force

http://www.realhomeopathy.com/interview-with-nobel-prize-winner-dr-luc-montagnier.html

Graphene Oxide

"*we realize the ultimate goal of the operation being carried out, and that is that graphene oxide nanoparticles act as nanobiosensors once they are installed in neurons, so that they do two basic functions: the first is to collect the neuronal electrophysiological effects, these are the electrical signals of our impulses and thoughts. That is to say, to do a brain mapping at the same time that can also neuromodulate behaviors, emotions and feelings.*" La Quinta Columna explains what exactly is the 'brain tsunami' that the never isolated SARS-CoV-2 will cause JULY 09, 2021 https://www.orwell.city/2021/07/brain-tsunami.html?m=1

Follow the money too:
https://www.cnn.com/2021/05/21/business/covid-vaccine-billionaires/index.html
Breakthrough cases increasing:
https://www.cnbc.com/2021/06/25/covid-breakthrough-cases-cdc-says-more-than-4100-people-have-been-hospitalized-or-died-after-vaccination.html

Annexin A2

**proof: Marisol Zuniga, Claudia Gomes, Steven E. Carsons, Michael T. Bender, Paolo Cotzia, Qing Robert Miao, David C. Lee, Ana Rodriguez. Autoimmunity to Annexin A2 predicts mortality among hospitalised COVID-19 patients. *European Respiratory J.* 2021; DOI: 10.1183/13993003.00918-2021
https://erj.ersjournals.com/content/early/2021/07/01/13993003.00918-2021

Fang YT, Lin CF, Liao PC, Kuo YM, Wang S, Yeh TM, Shieh CC, Su IJ, Lei HY, Lin YS. Annexin A2 on lung epithelial cell surface is recognized by severe acute respiratory syndrome-associated coronavirus spike domain 2 antibodies. Mol Immunol. 2010 Feb;47(5):1000-9. doi: 10.1016/j.molimm.2009.11.019. Epub 2009 Dec 16. PMID: 20015551; PMCID: PMC7112629. https://pubmed.ncbi.nlm.nih.gov/20015551/

Avenali L, Narayanan P, Rouwette T, et al. Annexin A2 regulates TRPA1-dependent nociception. *J Neurosci*. 2014;34(44):14506-14516. doi:10.1523/JNEUROSCI.1801-14.2014 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4212057/

HO1 - https://pubmed.ncbi.nlm.nih.gov/10854275/

https://www.researchgate.net/publication/344001988_The_role_of_carbon_monoxide_and_heme_oxygenase-1_in_COVID-19

Platelets & endothelium Hamilos M, Petousis S, Parthenakis F. Interaction between platelets and endothelium: from pathophysiology to new therapeutic options. *Cardiovasc Diagn Ther*. 2018;8(5):568-580. doi:10.21037/cdt.2018.07.01 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6232347/

Didase = acetaminophen or paracetamol
https://www.medindia.net/drug-price/paracetamol-combination/didase-325plus50plus10.htm

"*Bromelain in pineapple is a type of enzyme known as a protease, which breaks other proteins apart by cutting the chains of amino acids. Even more specifically, bromelain is a cysteine protease, meaning that it breaks apart proteins wherever they have a cysteine amino acid [21]. Bromelain, the pineapple protease, selectively prevents proinflammatory prostaglandins' biosynthesis obviously via indirect intervention. Endogenous proteases which accompany trauma or repeated exposure to too much stress significantly raise the relative proportions of those prostaglandins which have inflammatory symptoms*"

Zee K, Qureshi S. POTS and Antiphospholipid Syndrome: An Unlikely Association. Case Reports in Rheumatology. 2021 ;2021:9942668. DOI: 10.1155/2021/9942668. https://europepmc.org/article/PMC/PMC8112930 "*Antiphospholipid syndrome is a rare complication of postural orthostatic tachycardia syndrome. Clinically, the presentation has overlapping symptoms of both diseases, with lightheadedness or syncope when moving from a supine to a standing position as well as blood clots, headache, or pregnancy complications in women. This case presentation involves a 39-year-old patient identified as female who has been diagnosed with POTS and elevated anticardiolipin antibodies.*"

Nucleotides

https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/nucleotides

Brain imaging before & after CoV

Preprint Brain imaging before and after COVID-19 in UK Biobank, https://www.medrxiv.org/content/10.1101/2021.06.11.21258690v2 "*We identified significant effects of COVID-19 in the brain with a loss of grey matter in the left parahippocampal gyrus, the left lateral orbitofrontal cortex and the left insula. When looking over the entire cortical surface, these results extended to the anterior cingulate cortex, supramarginal gyrus and temporal pole. We further compared COVID-19 patients who had been hospitalised (n=15) with those who had not (n=379), and while results were not significant, we found comparatively similar findings to the COVID-19 vs control group comparison, with, in addition, a greater loss of grey matter in the cingulate cortex, central nucleus of the amygdala and hippocampal cornu ammonis (all |Z|>3). Our findings thus consistently relate to loss of grey matter in limbic cortical areas directly linked to the primary olfactory and gustatory system.*"

Grey Matter & pomegranate juice

Ross, M.M., Cherkerzian, S., Mikulis, N.D. *et al.* A randomized controlled trial investigating the impact of maternal dietary supplementation with pomegranate juice on brain injury in infants with IUGR. *Sci Rep* 11, 3569 (2021). https://doi.org/10.1038/s41598-021-82144-0 https://www.nature.com/articles/s41598-021-82144-0

Quercetin & autoimmune disease

Shen P, Lin W, Deng X, et al. Potential Implications of Quercetin in Autoimmune Diseases. Front Immunol. 2021;12:689044. Published 2021 Jun 23. doi:10.3389/fimmu.2021.689044 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8260830/

Grapefruit juice & Ivermectin

Need good P-glycoprotein to have safe use of Ivermectin. P-gp protects the brain from toxins. Phytonutrient in grapefruit juice inhibits it, that's why some medications have the caution to not drink grapefruit juice. https://journals.plos.org/plosntds/artic... https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/p-glycoprotein
"First Pass Metabolism..." Article in the Sciencedirect overview of P-glycoprotein - grapefruit has furano-coumarins, is fairly unique for it, not in all citrus, or all fruit https://sciencedirect.com/topics/pharmac...

del Mar Sáez-De-Ocariz M, McKinster CD, Orozco-Covarrubias L, Tamayo-Sánchez L, Ruiz-Maldonado R. Treatment of 18 children with scabies or cutaneous larva migrans using ivermectin. Clin Exp Dermatol. 2002 Jun;27(4):264-7. doi:

10.1046/j.1365-2230.2002.01050.x. PMID: 12139665.
https://pubmed.ncbi.nlm.nih.gov/12139665/

Histamine & neurological degenerative disease

Nuutinen S, Panula P. Histamine in neurotransmission and brain diseases. Adv Exp Med Biol. 2010;709:95-107. doi: 10.1007/978-1-4419-8056-4_10. PMID: 21618891
https://pubmed.ncbi.nlm.nih.gov/21618891/ "*Brain histamine levels are decreased in Alzheimer's disease patients whereas abnormally high histamine concentrations are found in the brains of Parkinson's disease and schizophrenic patients. Low histamine levels are associated with convulsions and seizures. The release of histamine is altered in response to different types of brain injury: e.g. increased release of histamine in an ischemic brain trauma might have a role in the recovery from neuronal damage. Neuronal histamine is also involved in the pain perception. Drugs that increase brain and spinal histamine concentrations have antinociceptive properties. Histaminergic drugs, most importantly histamine H3 receptors ligands, have shown efficacy in many animal models of the above-mentioned disorders*."

Glucan and Mannan

Korolenko TA, Bgatova NP, Vetvicka V. Glucan and Mannan-Two Peas in a Pod. *Int J Mol Sci*. 2019;20(13):3189. Published 2019 Jun 29. doi:10.3390/ijms20133189
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6651133/

High dose thiamine - cautions EDS

https://www.edsperspectives.com/cautions

Niacin / HDL / Lipolysis

Inhibition of lipolysis (by flush niacin in literally minutes) literally inhibits collection of lipid deposits, which #SARS_CoV_2 enters and replicates through
https://twitter.com/nia3in/status/1402024122025234434?s=20

Serine
D-Serine protects brain NMDA receptors from excess glutamate issues:
https://pubmed.ncbi.nlm.nih.gov/18564180/

spike issue: Spontaneous binding of potential COVID-19 drugs (Camostat & Nafamostat) to human serine protease TMPRSS2
https://www.sciencedirect.com/science/article/pii/S2001037020305602

VAERS

@tillnextime2, I found this on an open source platform i am sure the person who made it would welcome feedback he designed it to search VAERS data by numerous variables .

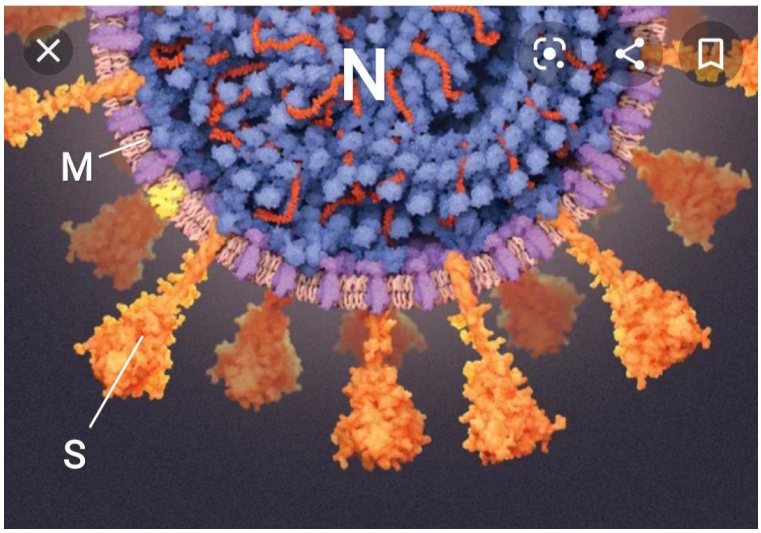
@arkmedic i think his contact is in there https://rlstoner.shinyapps.io/VAERS_Dashboard/

https://twitter.com/tillnextime2/status/1415563503503650816?s=20

SARS-CoV-2 genomic analysis
https://threadreaderapp.com/thread/1361669981302317057.html

IDENTIFICATION OF THE HIGHLY INFECTIVE GENOMIC COMPOSITION OF SARS COV 2 RNA:

SARS COV 2 is a particular chimeric "armored" virus, consisting of external protuberances of S (Spike) coated, externally, by glycans and, inside these protuberances, the TGEV bacteria (E. Coli bacterium, of gastroenteritis) have been identified and HIV retroviruses.



👉The outer membrane M has the TMPRSS2 protein which, associated with ACE2, allows the same protein S to enter the host cells.
This mechanism is well explained by the process of fusion of the M membrane with the plasma membrane of the cell.

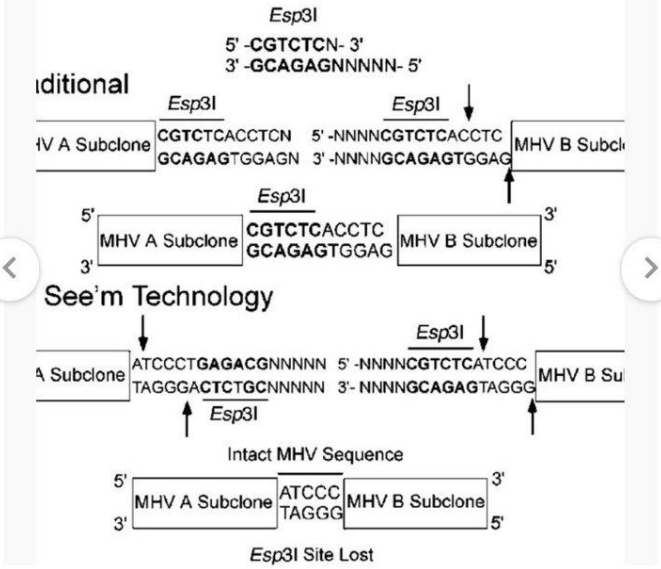
(It is important to note that a TMPRSS2 inhibitor is BROMEXINE).

👉The inner nucleus N is instead composed of highly pathogenic viral genomes such as: MVH / HCV (Hepatitis C) an RNA virus belonging to the Flavivirus / Eie Yoelii family (malaria, such as ZIKA), and the viral sequences provided by the recombination of SARS with endogenous BaT CoV, such as: Marburg, Nipah, Hendra and Lyssavirus (rabies).

SARS COV 2 CONSTRUCTION PROCESS:

👉The fundamentals.

- The construction process of SARS COV 2 makes use of 👉 "no-see-um" technology, developed by R. Baric, which allows the assembly of large DNAs, from smaller subclones, without the incorporation of



Use of Esp3I in the traditional and " no-see-um " approaches. The traditional approach to the use of Esp3I involves the ligation of two fragments containing identical Esp3I restriction sites, resulting in a ligation product with an intact Esp3I site remaining. In the " no-see-um " approach, a simple reverse orientation of the restriction sites allows for the specific removal of the Esp3I site from the two fragments, resulting in a ligation product lacking the engineered restriction site. The use of the " no-see-um " technology allows for the assembly of large DNAs from smaller subclones without the incorporation of unique restriction sites into the genome. (Yount et al. 2002)

Prion & Bacteriophage concerns

George Tetz interview
https://www.drperlmutter.com/the-empowering-neurologist-david-perlmutter-m-d-and-dr-george-tetz/