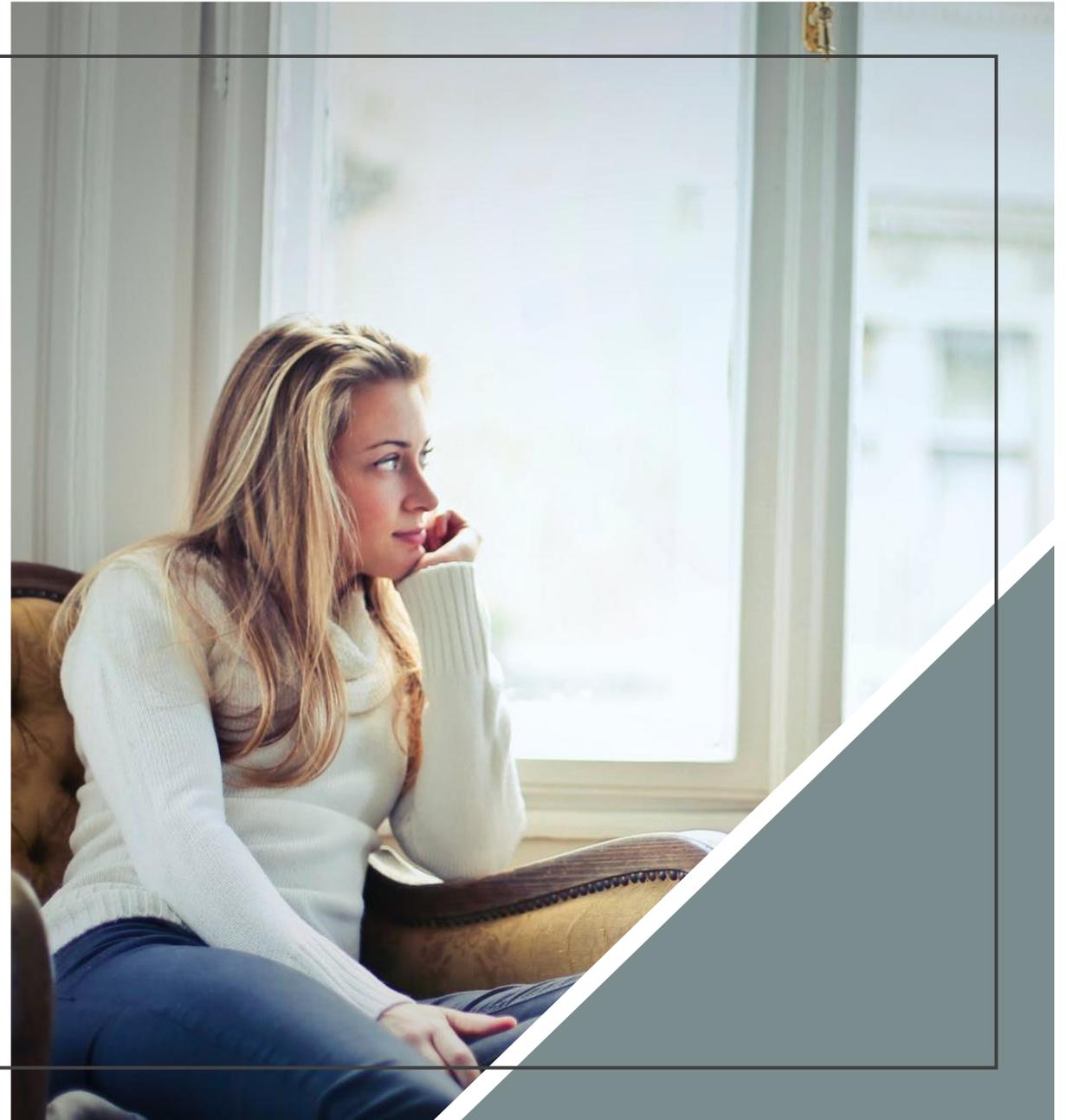


Keeping Your Immune System Strong in a Time of Pandemic

Dr. John Hughes, DO

March 18, 2020



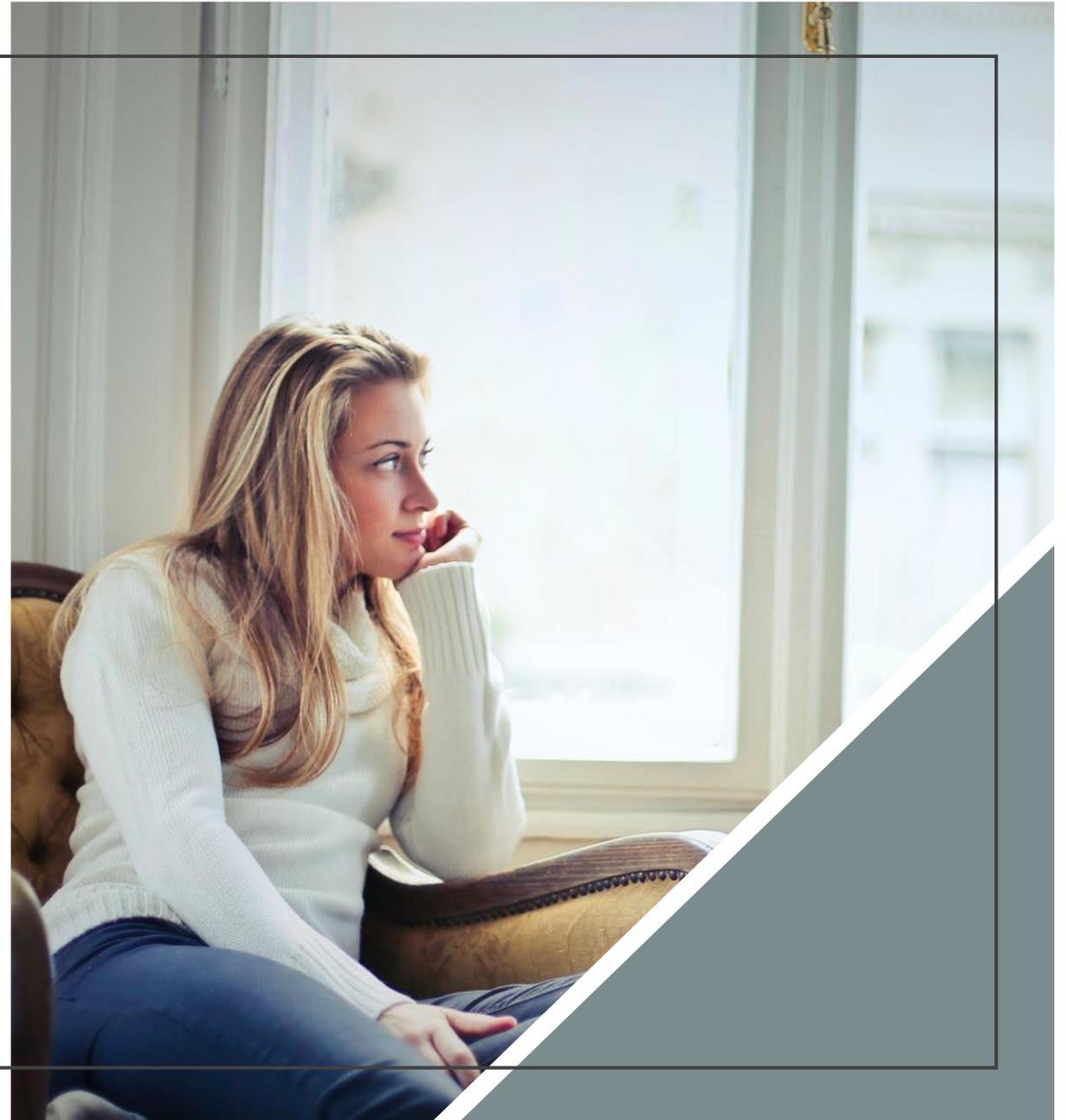
The Immune System

Bacteria

Viruses

Coronavirus

Strengthening Your Immune System



When
people
around you
are sick...





The Immune System

- Protects your body from harmful substances
 - bacteria, viruses, fungi, & toxins
- Recognizes, neutralizes, & removes
- Two categories: innate & adaptive

Lymph Nodes

In the lymph nodes are the cells (lymphocytes) of the immune system. These recognise and eliminate invading pathogens

White Blood Cells

How white blood cells attack pathogens both in the blood itself and in other tissues of the body

Respiratory System

The Cilia (fine hair-like projections) line the airway and move mucus and contaminants upward and out of the respiratory tract.

Spleen

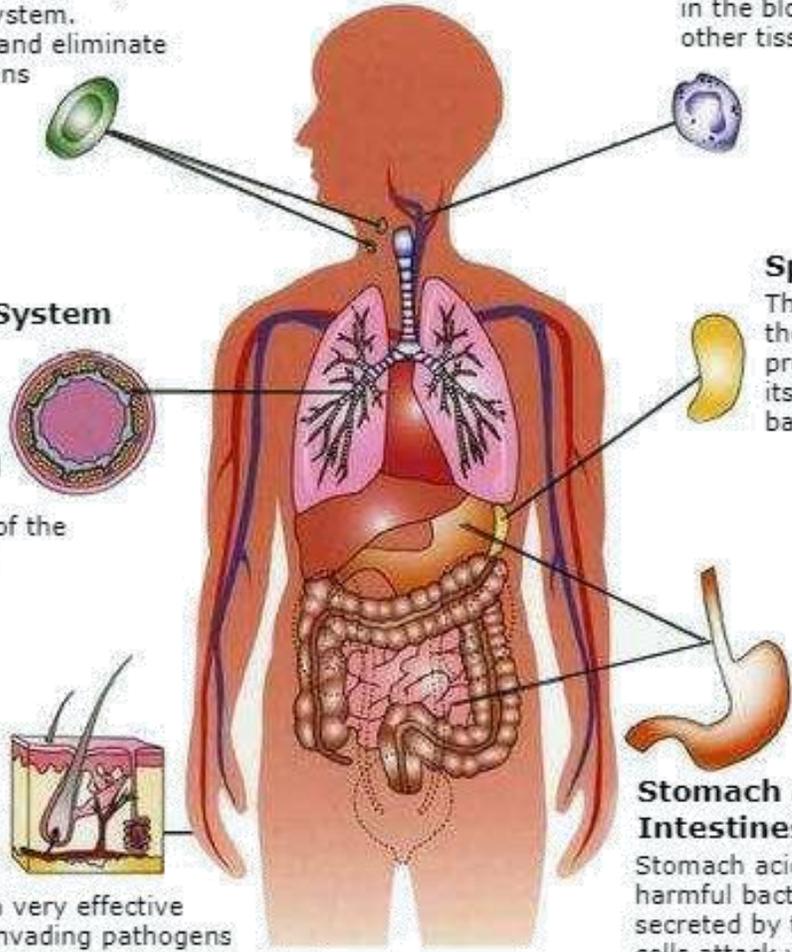
The Spleen assists the body in protecting itself against bacterial infections

Skin

The skin forms a very effective barrier against invading pathogens

Stomach and Intestines

Stomach acid kills most harmful bacteria. Antibodies secreted by the intestinal cells attack viruses and other pathogens that have landed in the intestinal tract.



The Immune System

Lymphocytes and Phagocytes

- The three types of lymphocytes
 1. **T cells** (Thymus derived, good for viruses)
 - Specific, Adaptative Immune response
 2. **B cells** (Bone Marrow derived, make antibodies)
 - Specific, Adaptative Immune response
 3. **Natural killer cells** (good for tumors and viruses)
 - Nonspecific, innate immune response
- **Phagocytes** (e.g. mast cells, monocytes, macrophages)
 - Eat up viral laden cells and old, injured immune cells



The Innate Immune System

- Activated by antigens
- Provides a general defense = Non-specific
- Physical barriers such as skin, chemicals in the blood, and immune system cells that attack foreign cells in the body
- Fights using natural killer cells and phagocytes (“eating cells”)



The Adaptive Immune System

- Antigen-Specific
- An army of immune cells *specifically designed* attack that antigen
- Makes antibodies to specifically fight germs previously encountered
- Constantly adapting - fight bacteria or viruses that change over time



Bacteria

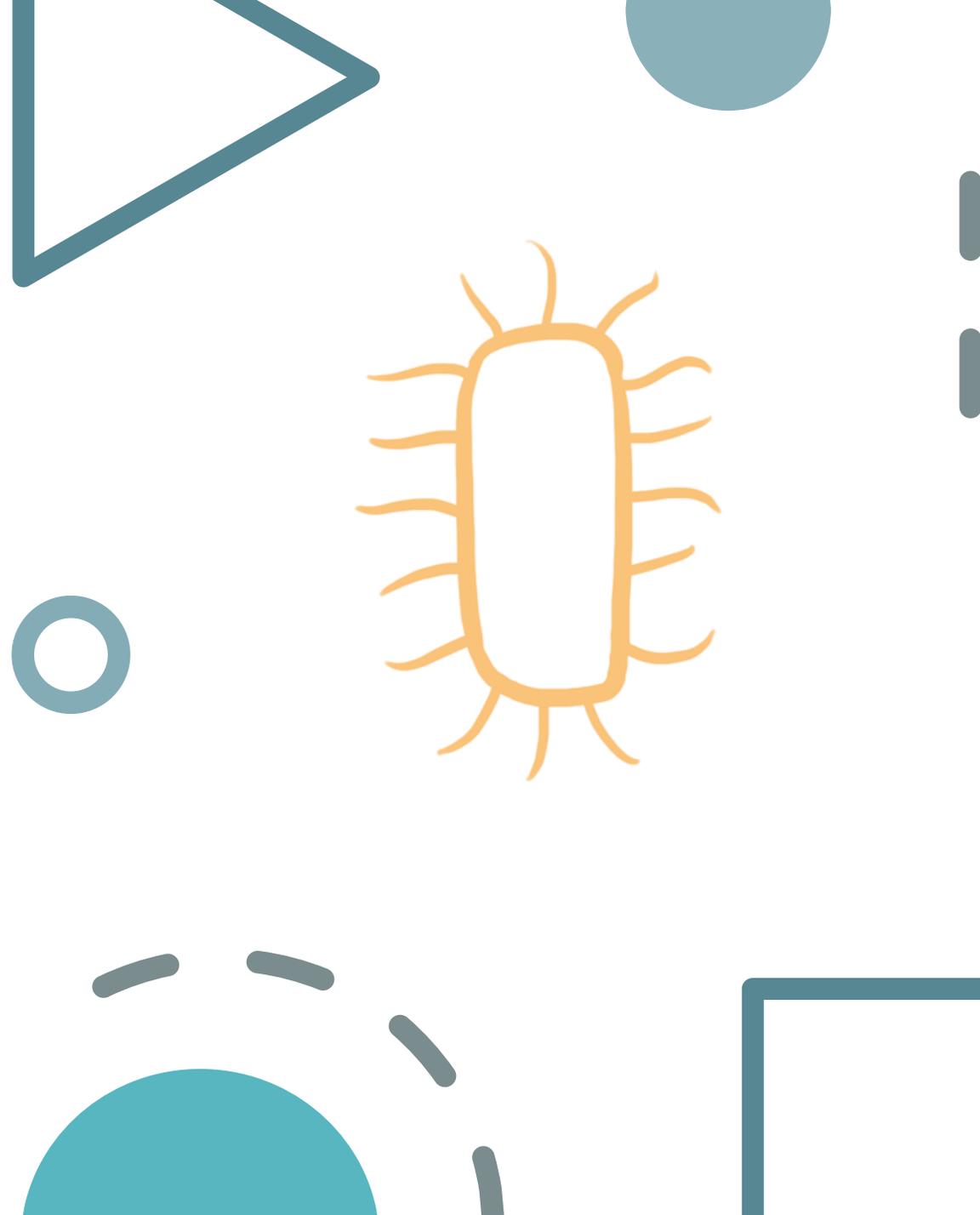


What Are Bacteria?

- Microscopic, single-celled organisms
- Thrive in diverse environments - soil, the ocean, our gut
- Rigid wall, rubbery membrane surrounding the fluid inside

Bacteria Facts

- Help digest food, destroy disease-causing microbes, fighting cancer cells
- Reproduce on their own
- Existed for about 3.5 billion years
- Can survive extreme heat & cold, radioactive waste, and the human body
- There are about 10x more microbial cells than human cells in our bodies
- Fewer than 1% of bacteria cause diseases in people





Bacterial Infections

- Acquired from other people, through the environment, or from eating/drinking contaminated food/water
- Localized symptoms: pain, swelling, redness, or organ dysfunction
- Generalized symptoms: fevers, chills, and fatigue
- Minor: strep throat, ear infections
- Life-threatening: meningitis, encephalitis



Bacterial Infection Treatment

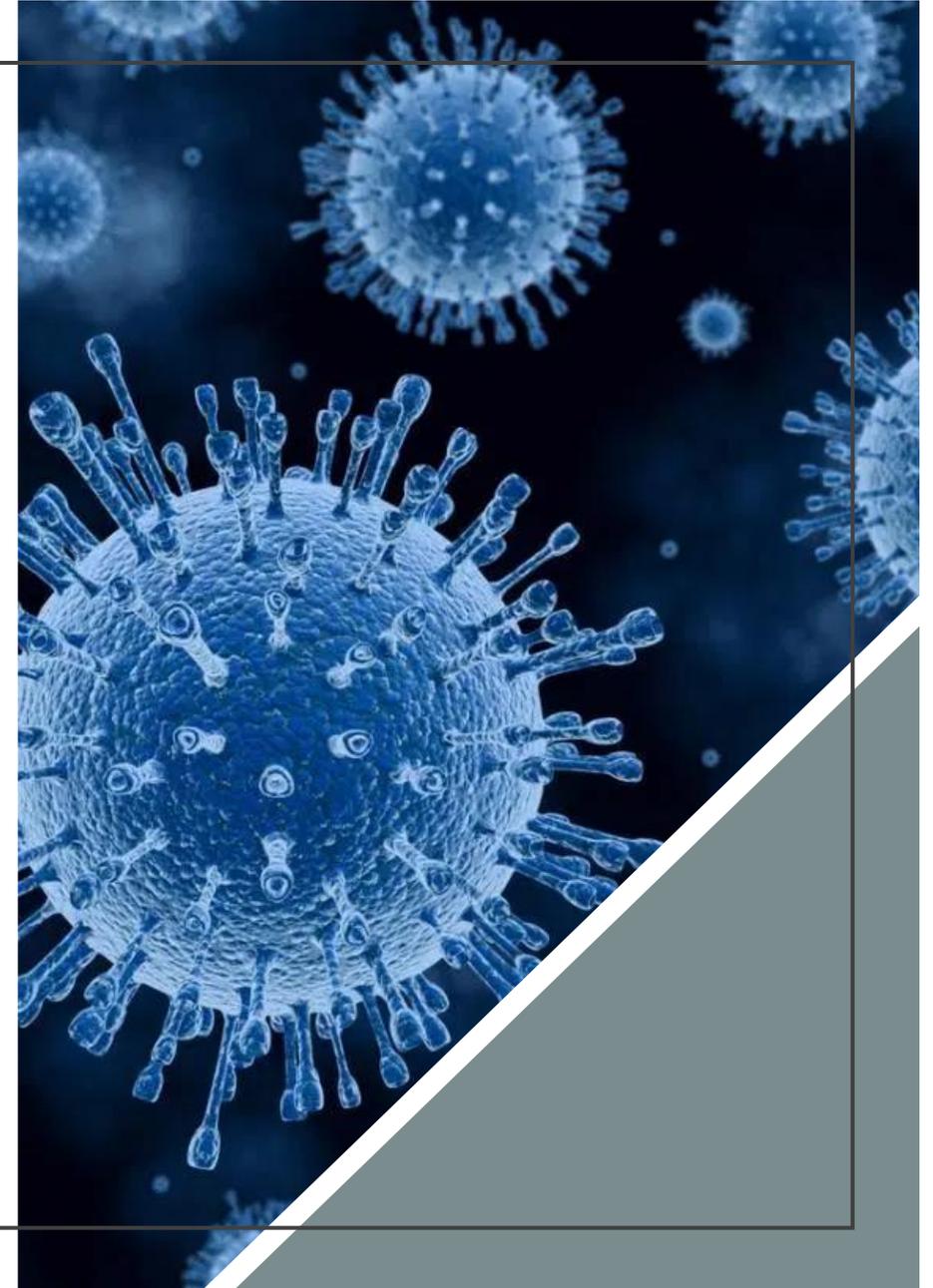
- Resolve quickly, even without treatment
- Mainstream: Antibiotics and supportive care: pain or anti-inflammatory medication
- Improper use of antibiotics has promoted the spread of antibiotic-resistant bacteria
- Alternative: Garlic, honey, ginger, echinacea, goldenseal, clove, oregano

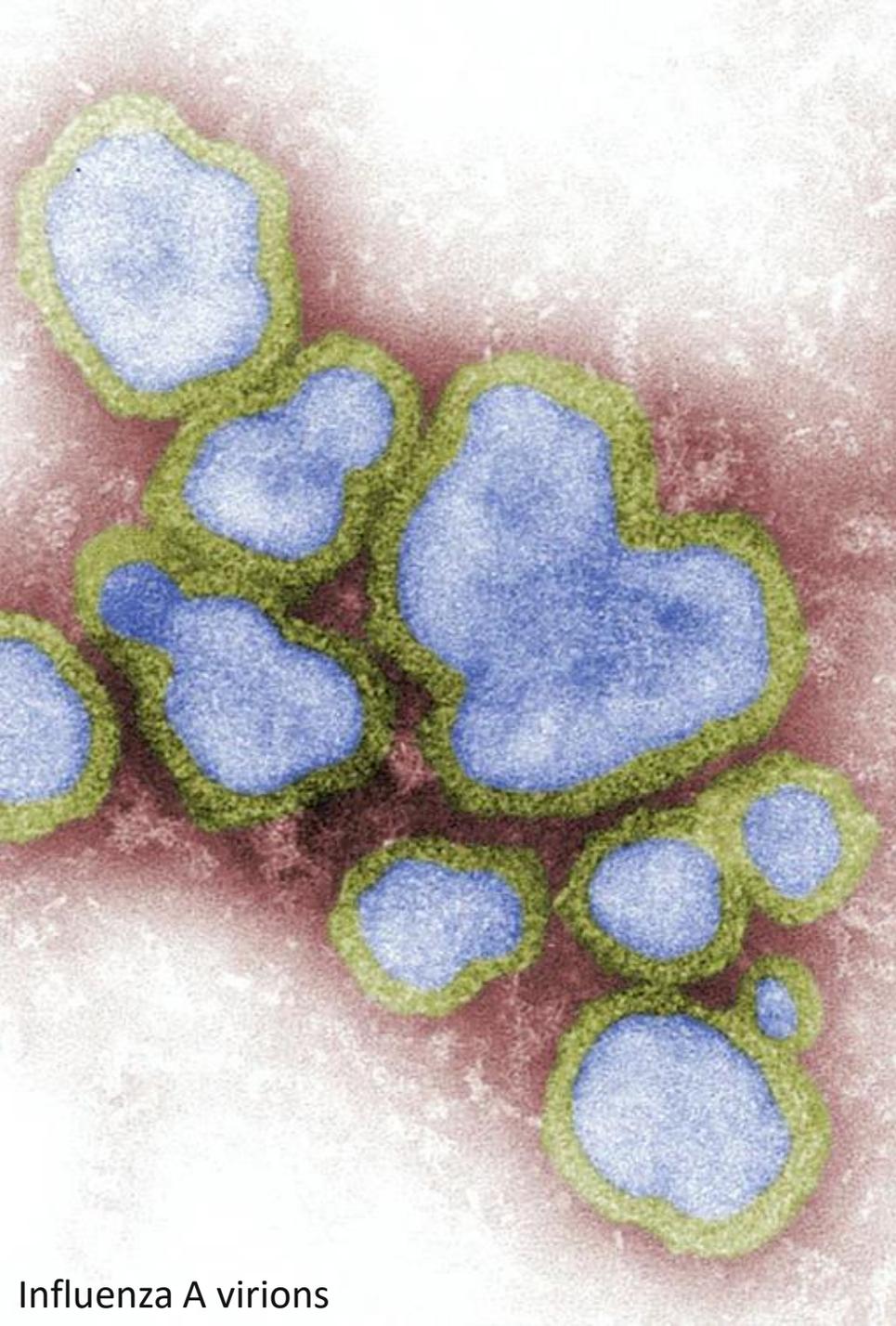


Viruses

What Are Viruses?

- Built with protein coat & core of genetic material: RNA or DNA
- Unlike bacteria, viruses can't survive without a host
- They can only reproduce by attaching themselves to cells
- They reprogram the cells to make new viruses or turn normal cells into malignant or cancerous cells

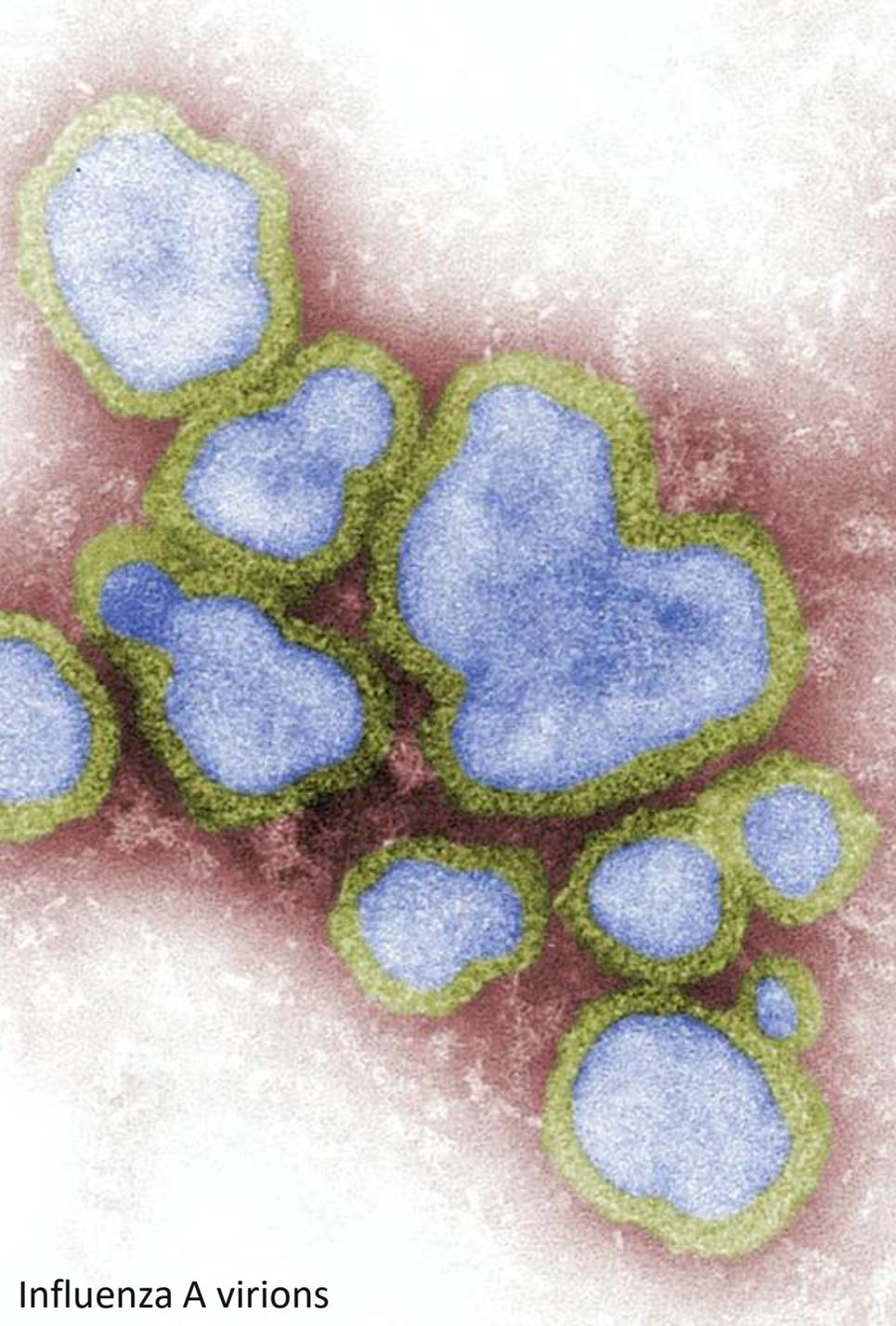




Influenza A virions

Viral Infections

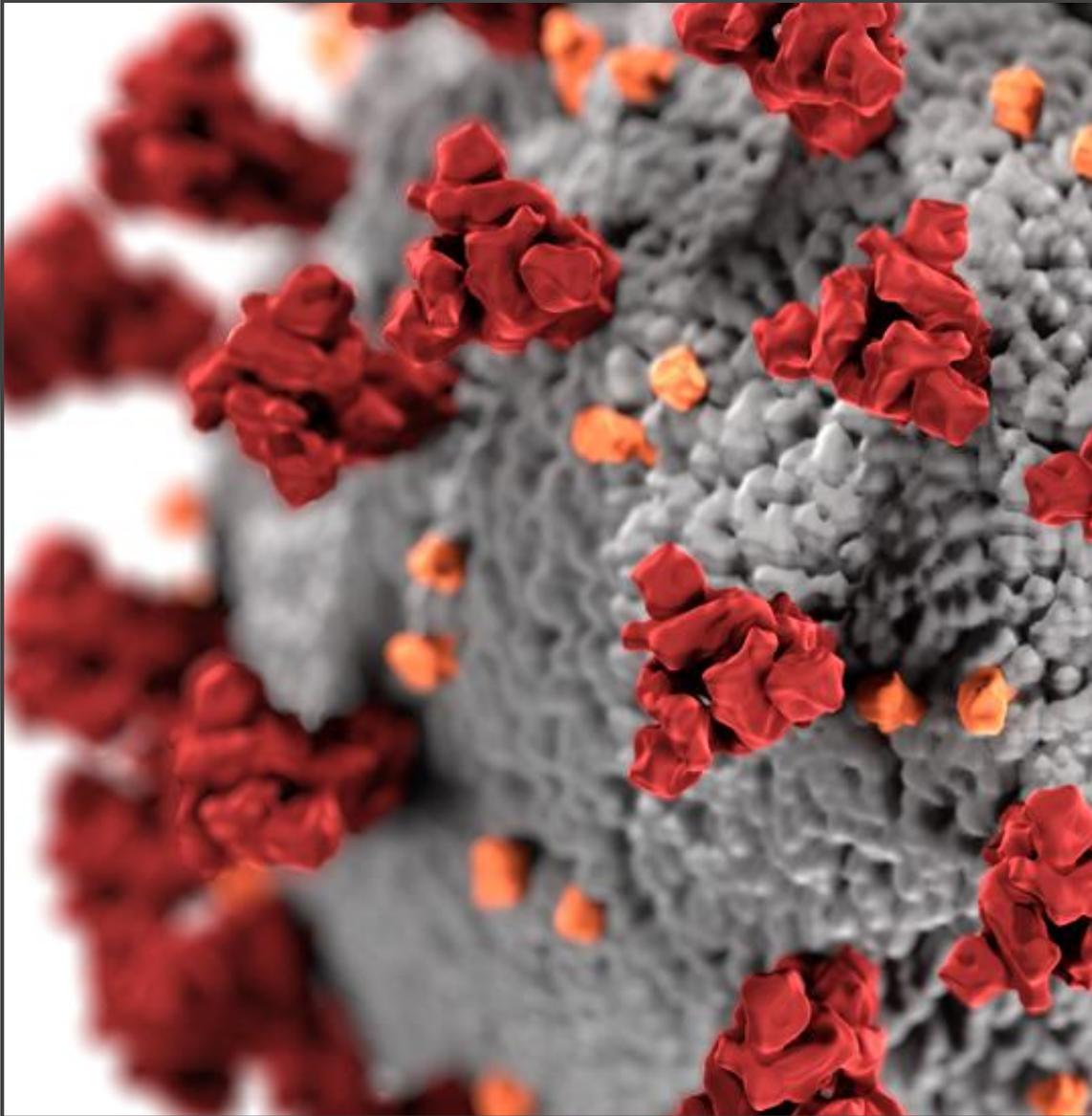
- Spread through touch, saliva, or even the air
- Contaminated food and water
- Transmitted through sexual contact or by sharing contaminated needles
- Insects including ticks and mosquitoes can act as "vectors"
- Respiratory, skin, foodborne, sexually transmitted, EBV



Influenza A virions

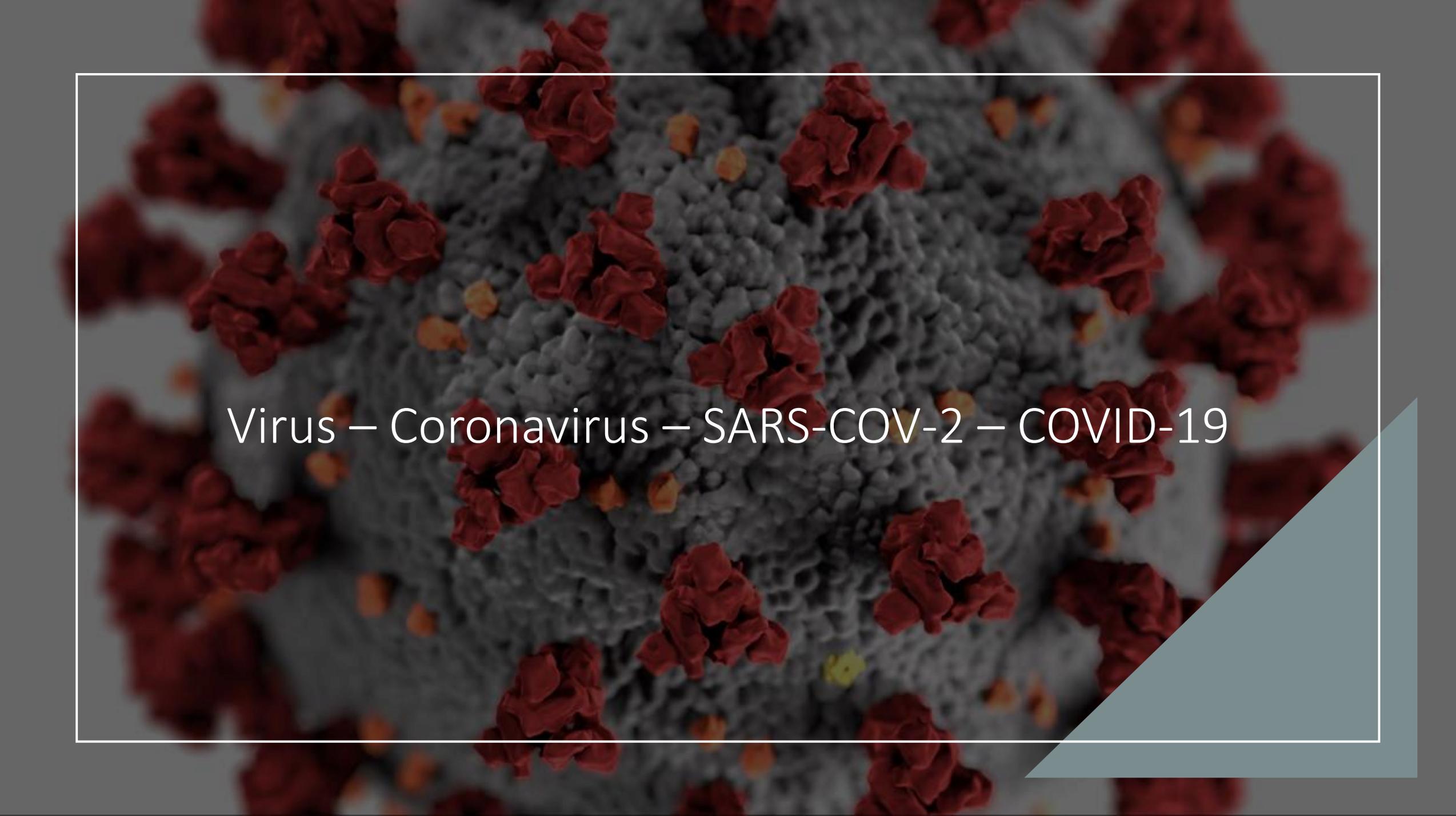
Viral Infection Treatment

- Many resolve on their own without treatment
- Treatment focuses on symptom relief, not fighting the virus
- Antibiotics are not effective against viruses
- Antivirals work by inhibiting the production of virus particles

A detailed 3D rendering of a coronavirus particle. The surface is covered in a dense, textured grey layer of proteins. Numerous red, crown-shaped structures, representing the characteristic spike proteins, are scattered across the surface. Some smaller orange and yellow structures are also visible, likely representing other viral components.

Coronavirus

Coronaviruses are a large family of viruses. Some coronaviruses cause cold-like illnesses in people, while others cause illness in certain types of animals, such as cattle, camels, and bats. Some coronaviruses, such as canine and feline coronaviruses, only infect animals and don't infect humans.



Virus – Coronavirus – SARS-COV-2 – COVID-19

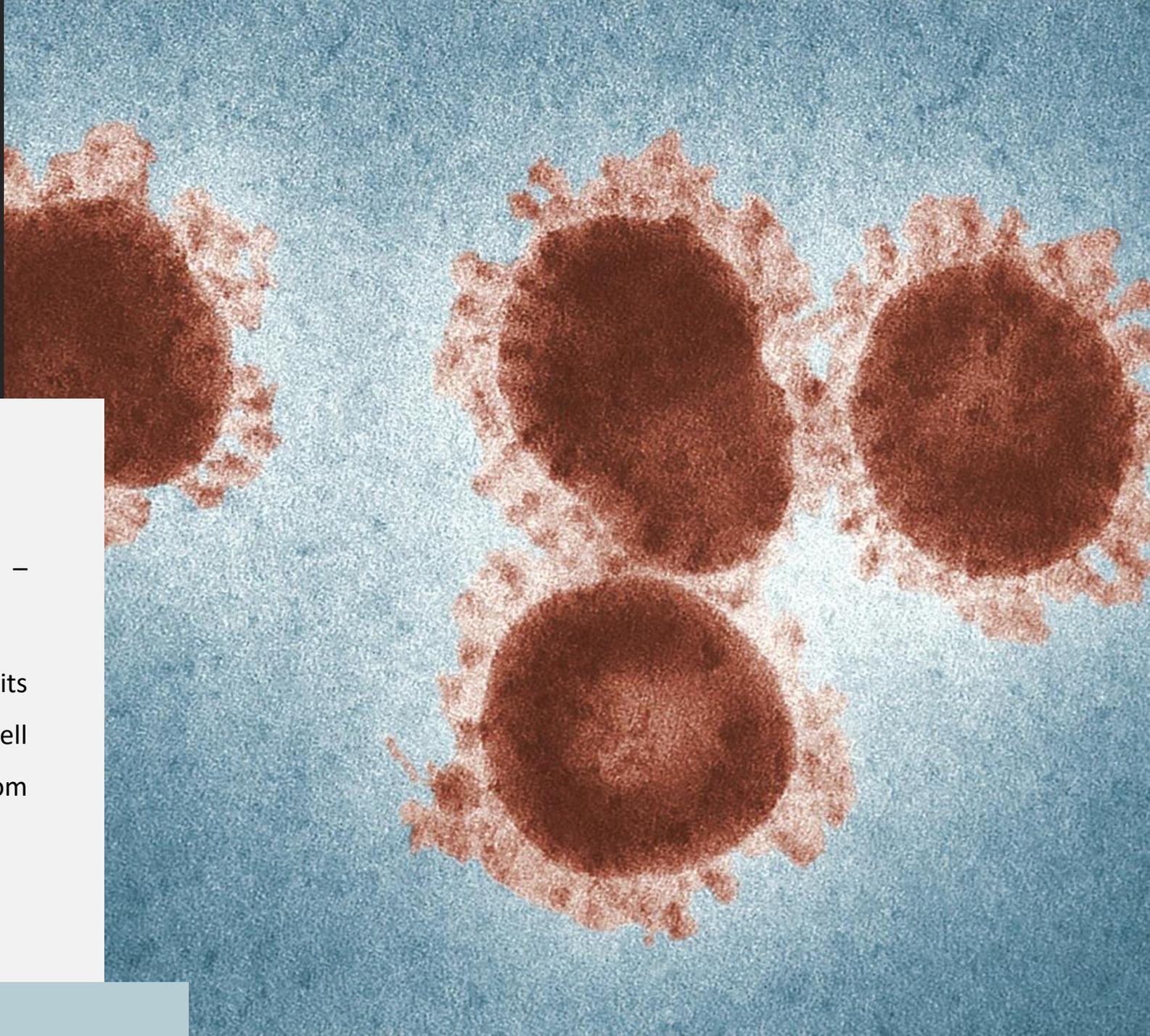
SARS-COV-2 (virus) COVID-19 (disease)

- COVID-19 is a betacoronavirus, like MERS and SARS
- All three of these viruses have their origins in bats.
- The first infections were linked to a live animal market, but the virus is now spreading from person to person.



Coronavirus

- Single stranded RNA virus (like the Rhinovirus – causes the common cold)
- This is an enveloped virus, which means that its outermost covering is derived from the host cell membrane. The coronavirus derives its name from this fact.





Environmental Aspects of Coronavirus

Conquering COVID-19 by Dr. Dan Lee Dimke, PHD

<https://www.bitchute.com/video/CwDVXcjroych/>

This film is debatable on the effectiveness but does bring up some important points:

- Areas with warm air/warmer temperatures tend to have less cases of the coronavirus
- Warm moist fluids are advocated for common colds as well as corona viral symptoms
- Cold temperatures can burden the immune system

Effects of Temperature and Humidity on SARS Coronavirus from 2003

- The dried virus on smooth surfaces retains its viability for over 5 days at temperatures of 22–25°C and relative humidity of 40–50% (typical air-conditioned environments).
- Virus viability is rapidly lost at higher temperatures and humidity (e.g., 38°C, and relative humidity of >95%).
- SARS coronavirus stability in a low temperature, low humidity environment facilitates transmission in subtropical area (such as Hong Kong) ***during the spring and in air-conditioned environments.***
- Asian countries in tropical areas (such as Malaysia, Indonesia or Thailand) with high temperature and high relative humidity environment did not have major community outbreaks of SARS and so far, not the COVID-19.

Effects of Cold Temperatures on the Immune System

- Yale University has found when the core body temperature inside the nose falls by 5 degrees C, the immune system does not work as well to fight the cold virus.
- One in five people carries the rhinovirus, the most frequent cause of the common cold, in the nasal passages at any one time.
- “We found that the innate immune response to the rhinovirus is impaired at the lower body temperature compared to the core body temperature,” said Akiko Iwasaki, an immunobiology expert at Yale.

Effects of RFR (Radio Frequency Radiation) on the Immune System

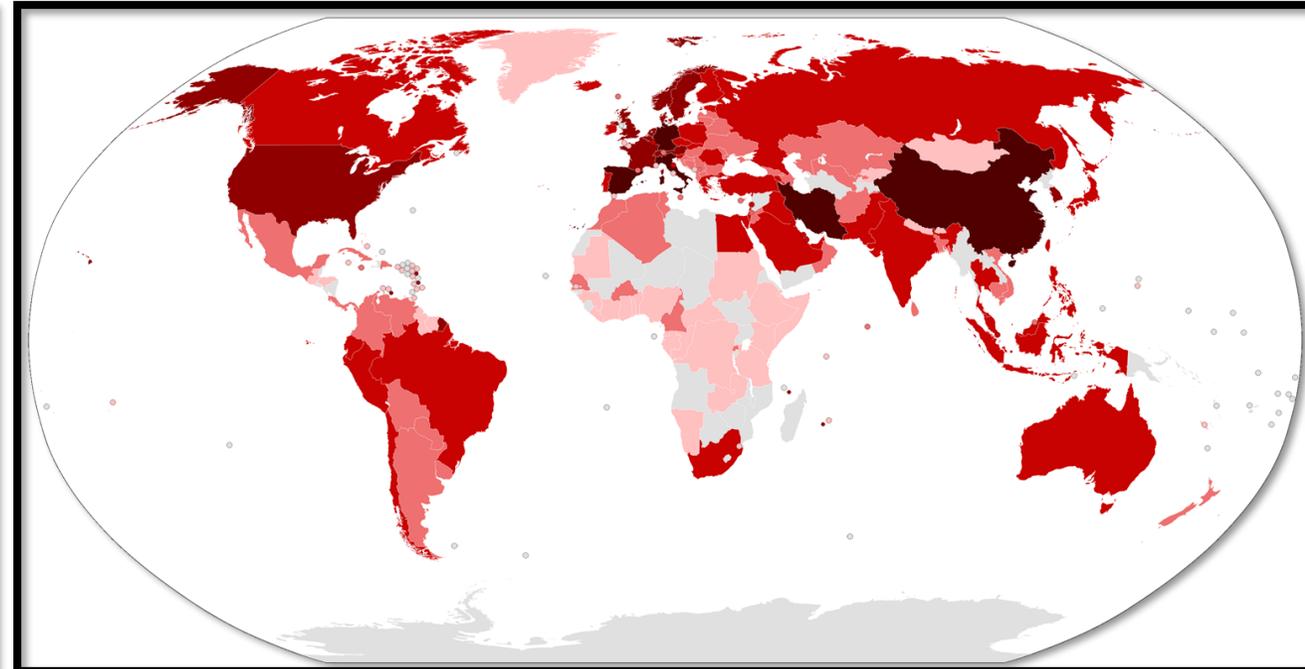
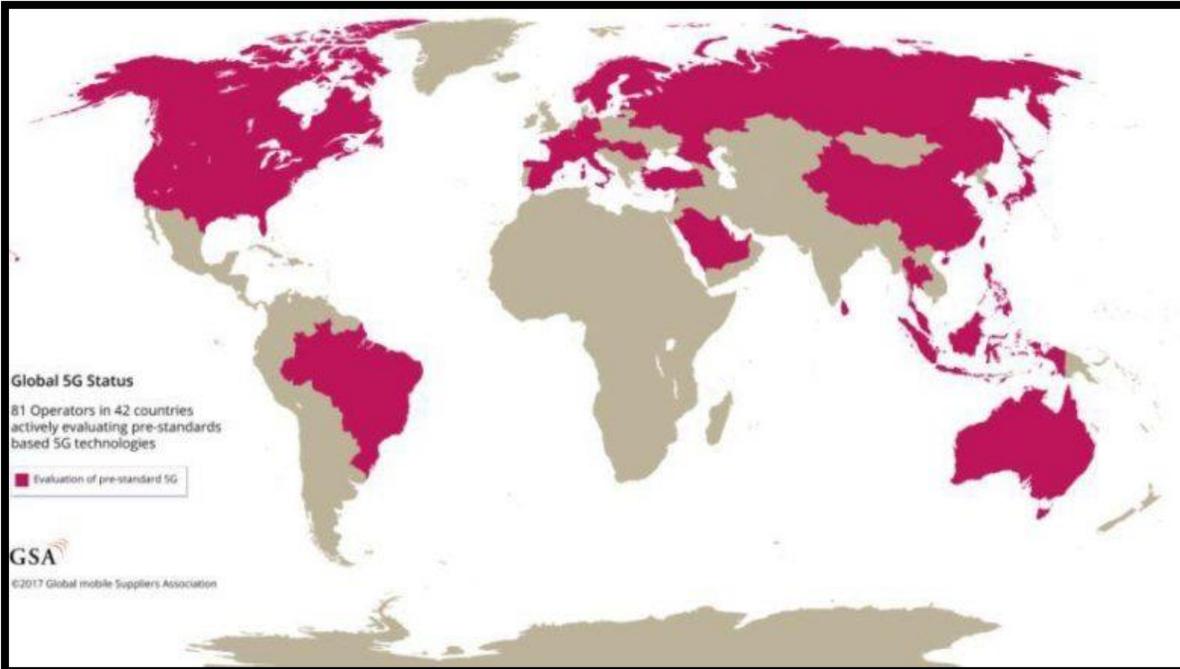
- “Numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans. Damage goes well beyond the human race, as there is growing evidence of harmful effects to both plant and animal life.”
- From “We Have No Reason to Believe 5G Is Safe”

Effects of RFR (Radio Frequency Radiation) on the Immune System

- 5G Millimeter waves are mostly absorbed within a few millimeters of human skin and in the surface layers of the cornea.
- Short-term exposure can have adverse physiological effects in the peripheral nervous system, the immune system and the cardiovascular system
- From “We Have No Reason to Believe 5G Is Safe”

5G World Map

COVID-19 World Map



Map of total confirmed cases as of 18 March 2020

<https://www.iteto5g.com/5g-network-map/>

https://en.wikipedia.org/wiki/2019%E2%80%9320_coronavirus_pandemic



1. Infects and multiplies in cells lining the airway
2. Kicks the immune system into action
3. Triggers a wave of local inflammation
4. Recruits immune cells to eradicate the pathogen
5. Immune response then recedes, and patients recover

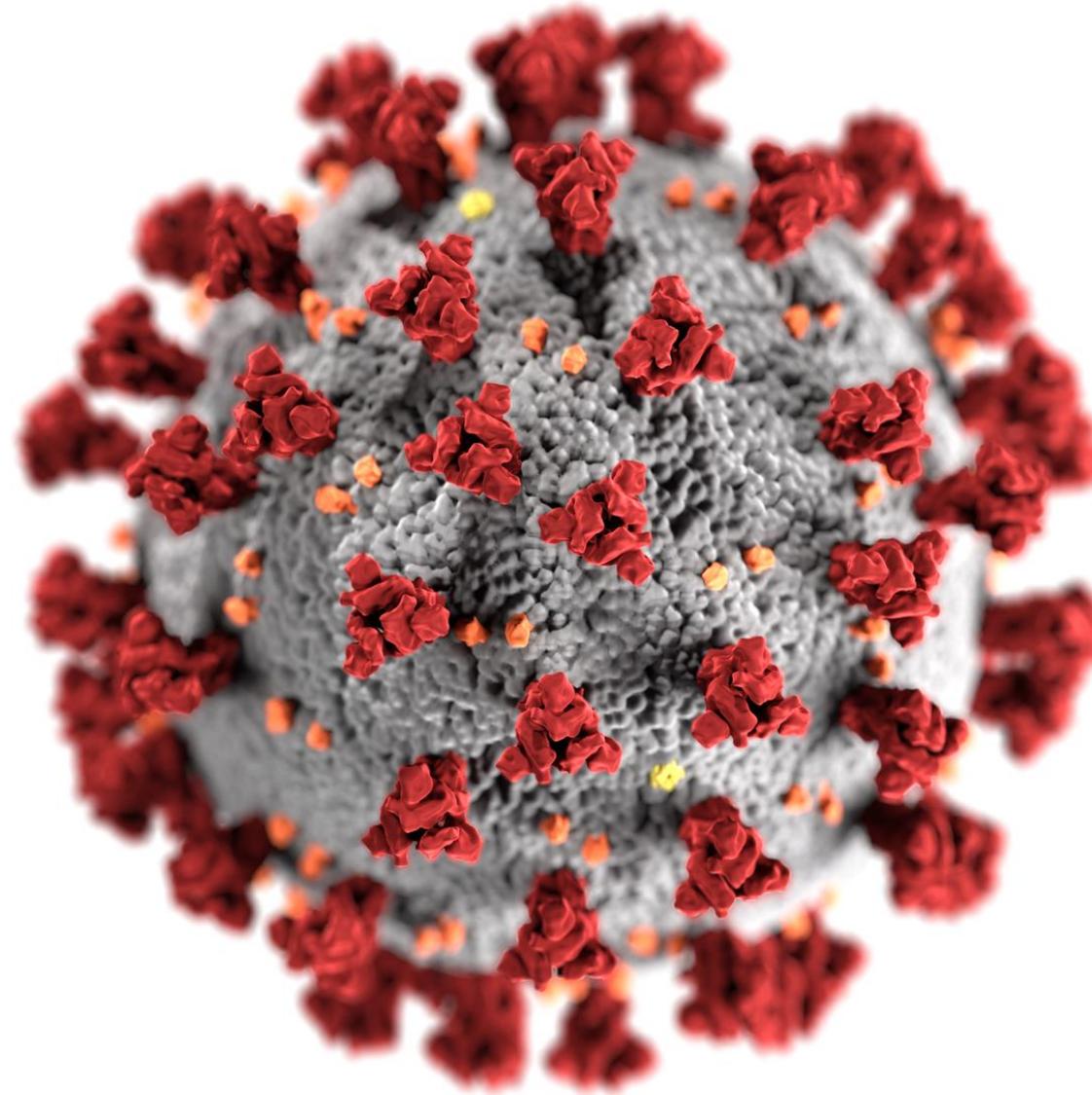
COVID-19 and the Immune System



Dysfunctional Immune Responses

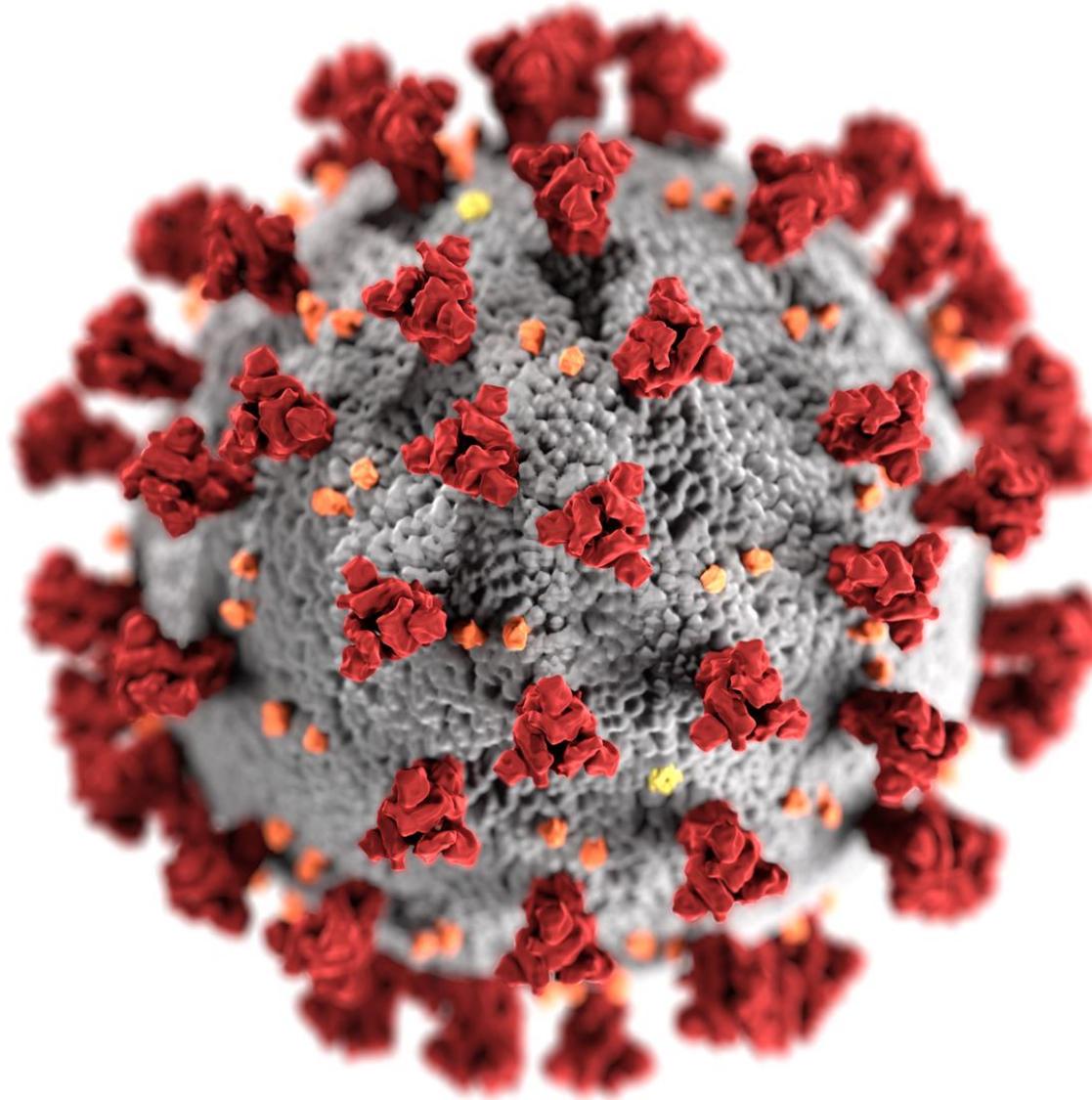
- Overproduction of immune cells and their signaling molecules
- Flood of immune cells into the lung
 - Pneumonia
 - Shortness of Breath
 - Inflammation of the airway
- Local inflammation can turn into widespread inflammation of the lungs aka cytokine storm
- Virus replicates faster than the immune system can respond





COVID-19 and The Immune System

"We showed that even though COVID-19 is caused by a new virus, in an otherwise healthy person, **a robust immune response across different cell types was associated with clinical recovery**, similar to what we see in influenza," Professor Kedzierska said.



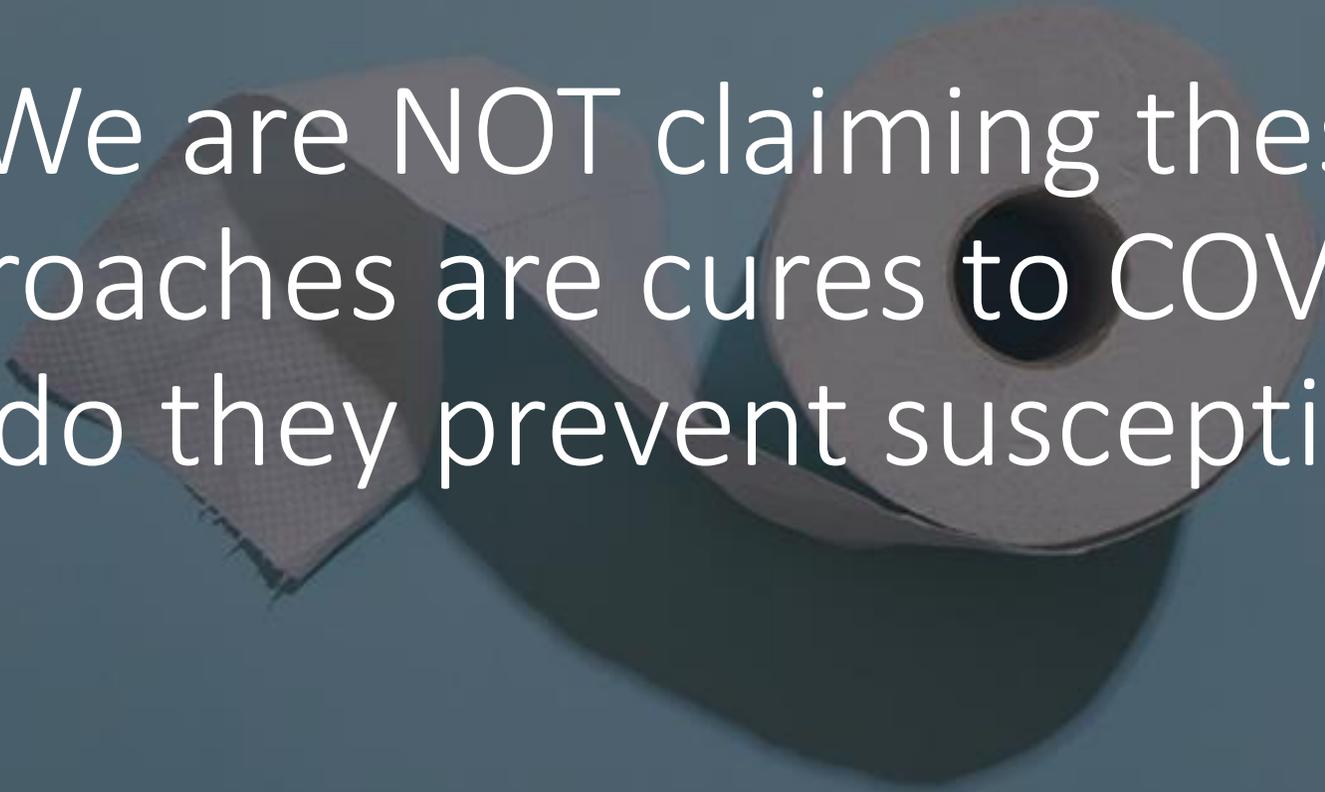
A Robust Immune Response

“The virus matters, but the host response matters at least as much, and probably more,” says Stanley Perlman, a virologist and pediatric infectious disease specialist at the University of Iowa.



How to Boost Your Immunity





We are NOT claiming these approaches are cures to COVID-19 nor do they prevent susceptibility!

Foods that Boost the Immune System

Fruits

- Citrus fruits (oranges, lemons, grapefruit)
- Papaya
- Kiwi
- Strawberries

Vegetables

- Red bell peppers
- Broccoli
- Carrots
- Green leafy vegetables
- Sweet potatoes
- Garlic
- Ginger
- Spinach
- Turmeric

Nuts / Seeds

- Almonds
- Brazil Nuts
- Sunflower Seeds
- Pumpkin Seeds
- Sesame Seeds

Other

- Beans
- Lentils
- Green Tea
- Chicken broth
- Shell-fish

AVOID: Sugar, processed meat, vegetable oils, and alcohol

Garlic

- Has been shown to have antibacterial, antifungal, and antiviral properties
- Modulates oxidative stress
- Beneficial for microflora of the gut
- Clinically, patients resolve from common colds at a quicker rate using garlic daily

Beta-Carotene (Vitamin A)

- Powerful antioxidant - inhibits the oxidation of other molecules; it protects the body from free radicals
- Reduces inflammation
- Boost immune function by increasing disease-fighting cells in the body.

Vitamin C

- Innate and adaptive immune system support – increases B- and T-cells
- Works in epithelium aka skin as oxygen scavenger
- Accumulates in phagocytic cells ultimately killing microbials
- Clears damaged immune cells
- Prevent and treat respiratory and systemic infections
- 2000-4000mg 2-6x /day depending on severity (IV vitamin C at 25,000-100,000 mg may be necessary for severely ill patients)

Vitamin D

- In airway epithelial cells, vitamin D results in a decrease in viral induction of inflammatory genes
- Reduces production of proinflammatory compounds in the body
- Reduces cytokine storm
- 5,000 – 10,000 IU per day in winter months

Vitamin E

- Vitamins C and E are antioxidants that help to destroy free radicals and support the body's natural immune response.
- Tocotrienol is best form
- 400 IU a day

Zinc

- Zinc is a mineral that can help boost white blood cells, which defend against invaders
- Increasing the intracellular Zn^{2+} concentration impairs the replication of a variety of RNA viruses
- “Corona- and arterivirus replication can be inhibited by increased Zn^{2+} levels” (Te Velthuis, et al., 2010)
- 30-50mg per day
- Best in combination with copper

IV Nutrition

- High dose vitamin C, glutathione, b-vitamins can be rapidly absorbed intravenously at much higher doses than orally
- The government of Shanghai, China has announced its official recommendation that COVID-19 should be treated with high amounts of intravenous vitamin C.
 - Dosage recommendations vary with severity of illness, from 50 to 200 milligrams per kilogram body weight per day to as much as 200 mg/kg/day.
- Vitamin C for the Treatment of Coronavirus (COVID-19)
Webinar on tomorrow: <https://isom.ca/vitamin-c-coronavirus/>

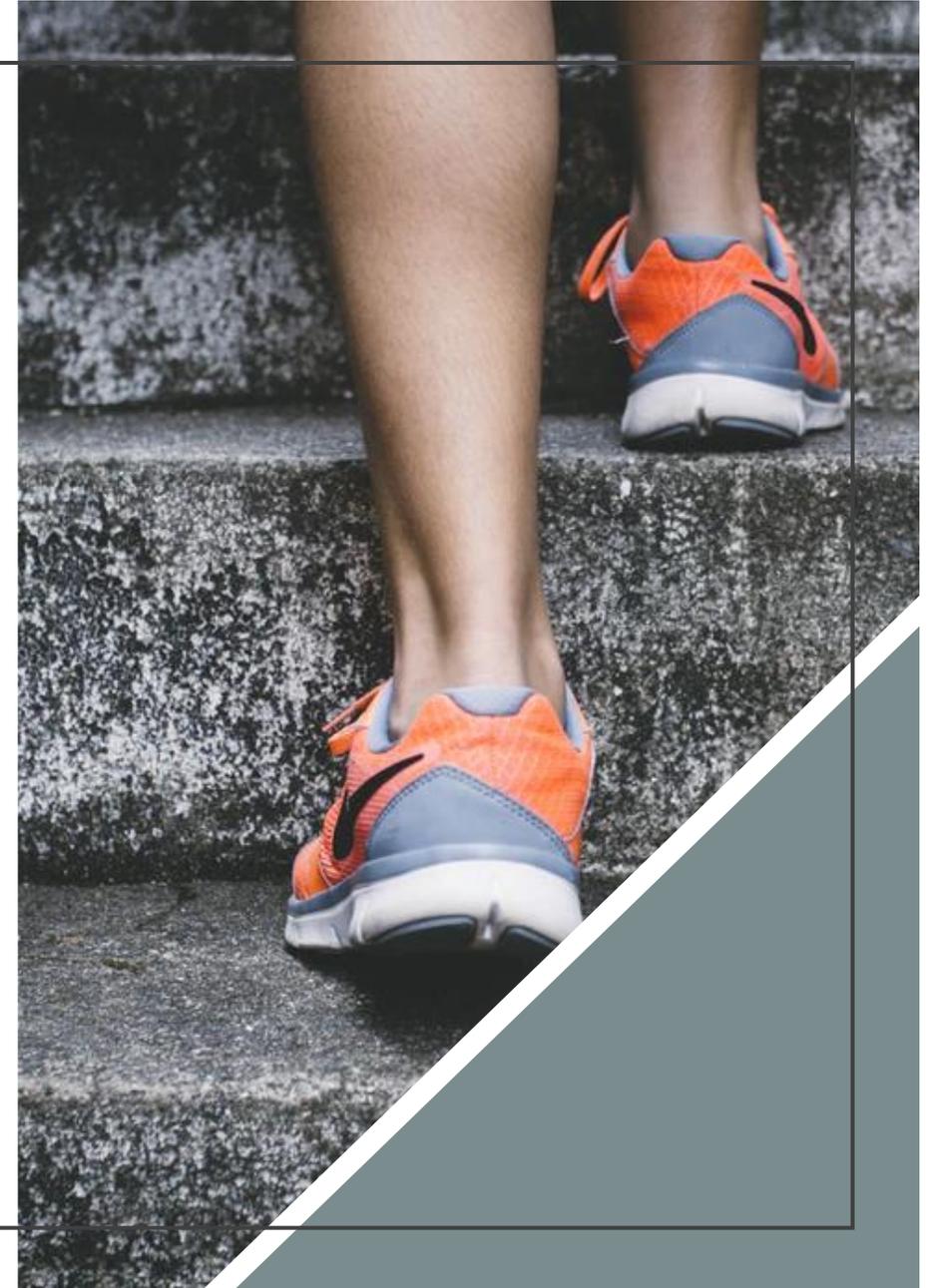
Ozone Therapy

- Creates ozonides and lipid oxidation products
- 4x stronger than hydrogen peroxide
- Act as messengers for the key biochemical and immune modulating effects of the therapy
- Safely suppresses the “cytokine storm”
- Inactivates bacteria, viruses, fungi, yeast, and protozoa
- Stimulates oxygen metabolism and immune system as well as detoxification

Ozone sauna
Ozone IV
Rectal ozone
Intravaginal
Ozonated water

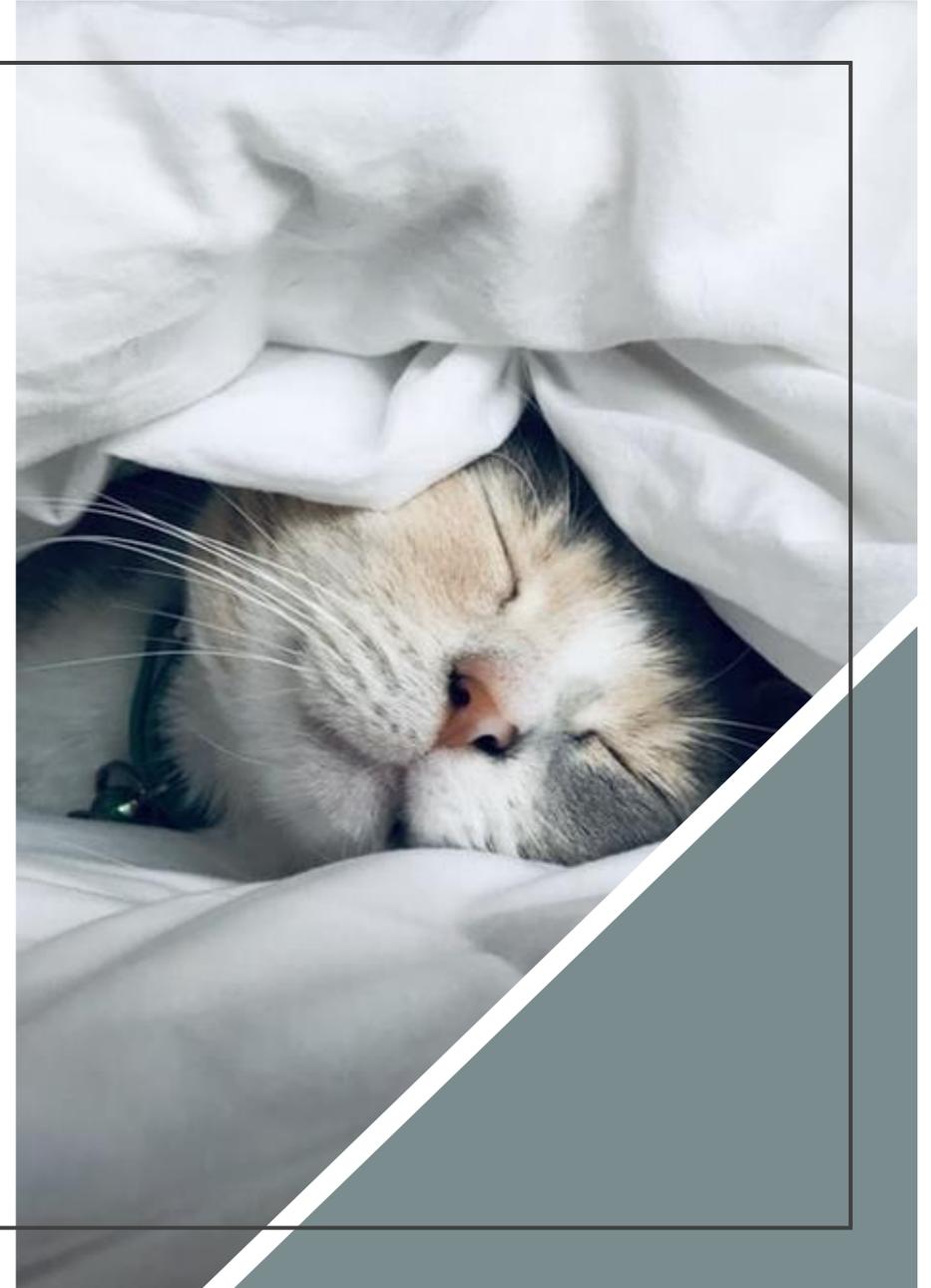
Exercise

- Promotes good blood and lymphatic circulation
- Promotes movement of the immune system cells
- 30 min to target heart rate 5 days per week
- Moderate exercise positive for immune system
- Too much / too vigorously suppresses your immune system



Sleep

- Sleep helps your T cells stick to and attack infections.
- With less sleep, your T cells are less "sticky"
- Being stressed or anxious = cortisol - negatively affects sleep quality and your immune system
- Try to get 7 to 9 hours of solid sleep each night
- Diets rich in fiber and low in saturated fat can lead to deeper, more restorative sleep
- Minerals such as calcium, magnesium, and potassium improve sleep





Mental Well-Being



THE SEVEN CHAKRAS

AND THEIR MEANINGS



Yoga and Meditation

- Lower stress hormones
- Condition the lungs and respiratory tract, stimulating the lymphatic system
- Bring oxygenated blood to the organs
- Reduce markers of inflammation
- 20 mins of meditation a day increases endorphins, decreases cortisol levels, and fosters positive states of mind to promote better health.





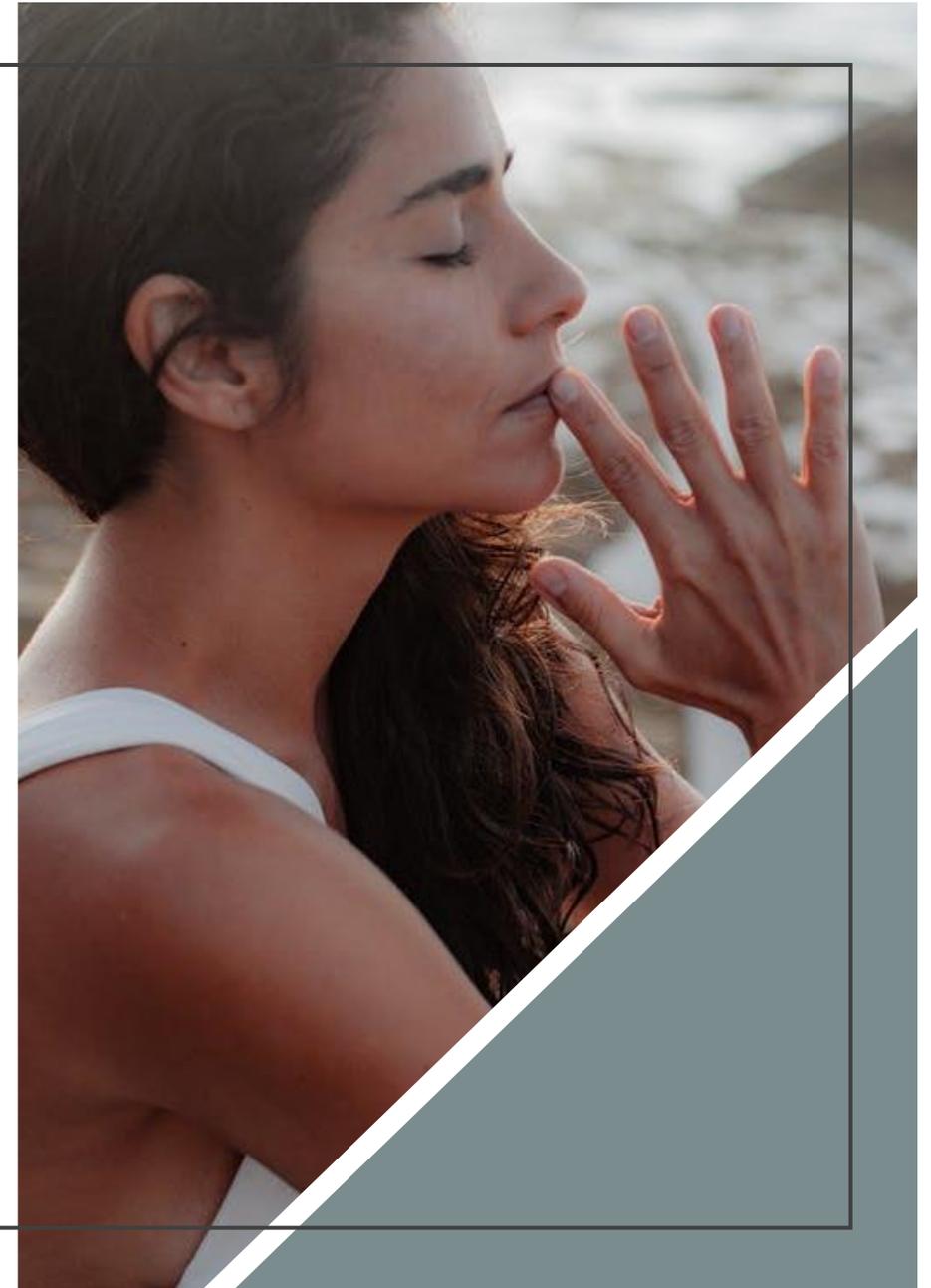
Nature

- Absorb more of certain minerals, like calcium and phosphorus as well as Vitamin D
- Improves circadian rhythms = sleep
- Organic compounds called phytoncides from plants in the air seem to boost immune function.
- Sunlight seems to energize T cells that help fight infection
- Lowers anxiety and raises serotonin
- **Helps raise your energy and keeps your mood calm, positive, and focused**

Gratitude

- Better heart health, specifically less inflammation and healthier heart rhythms
- Better well-being, a less depressed mood, less fatigue and improved sleep
- Stressed-out law students who characterized themselves as optimistic actually had more disease-fighting cells in their bodies
- Stress hormones like cortisol are 23 percent lower in grateful people
- “Gratitude works because, as a way of perceiving and interpreting life, it recruits other positive emotions that have direct physical benefits, most likely through the immune system or endocrine system.”

University of California San Diego’s School of Medicine





Resources

- National crisis hotlines: <https://www.stopitnow.org/ohc-content/crisis-hotlines> <https://www.dosomething.org/us/about/hotline-list>
- Telephone and online support groups for clients and their families (long list): <https://namimainlinepa.org/online-and-telephone-support-gr.../>
- Eating disorder online meetings: <http://eatingdisordersanonymous.org/> <https://www.alsana.com/free-online-support-group/>
- Support for military personnel and families: <https://www.mentalhealth.va.gov/MENTALHE.../get-help/index.asp> <https://www.militaryonesource.mil/...>
- Feelings games for kids: <https://pbskids.org/games/feelings/>
- 24/7 volunteer-led chat: <https://www.7cups.com/>
- SMART recovery online meetings: <https://www.smartrecovery.org/community/calendar.php...>
- AA online groups: <https://www.aa-intergroup.org/>
- List of ADAA-reviewed mental health apps: <https://adaa.org/finding-help/mobile-apps>
- Handouts, worksheets and other educational materials: http://depts.washington.edu/.../TF-.../pages/emotion_skills.html# <https://www.therapistaid.com/>



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