

Clinical Trial on the Impact of VCO as Adjuvant Against COVID-19

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Health and Economic Benefits of VCO During COVID-19 and Beyond
Webinar: December 08, 2020





Outline

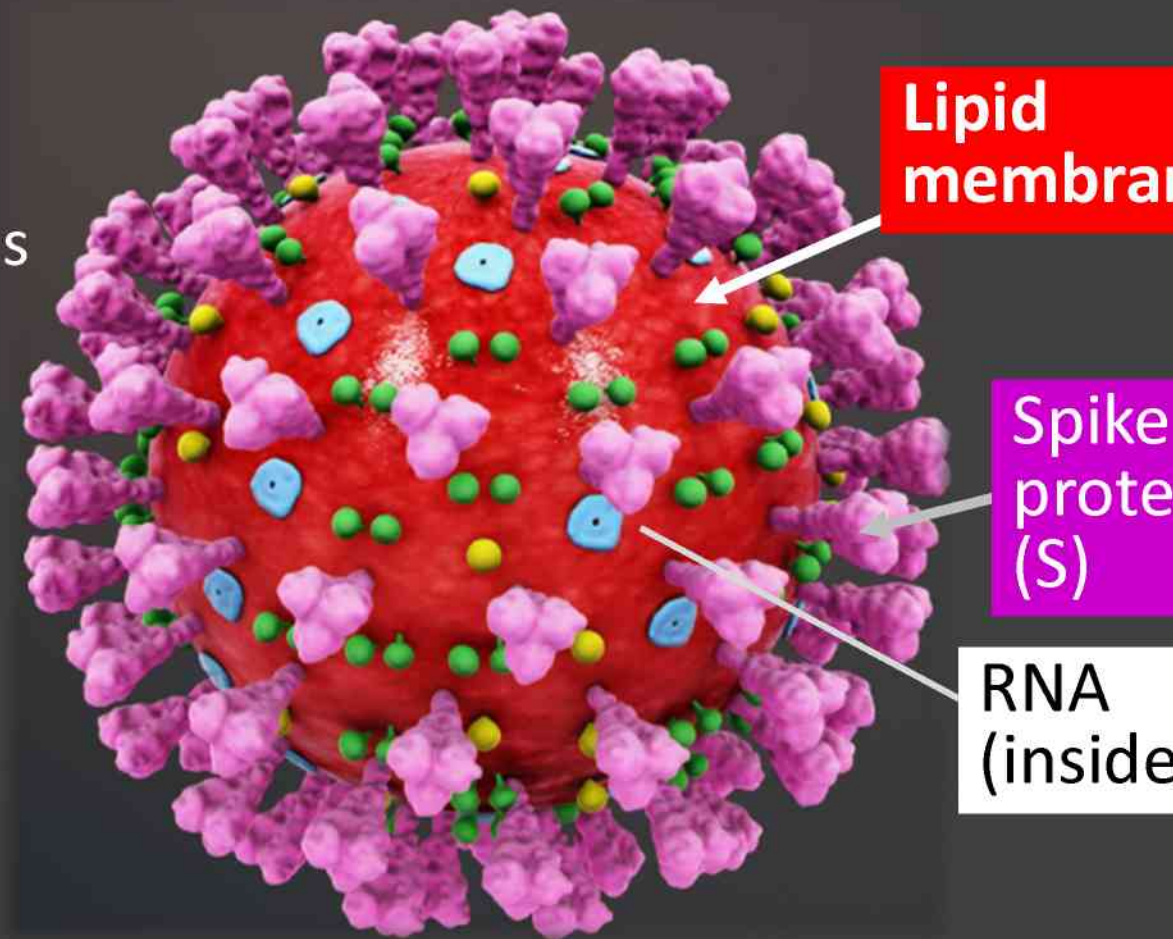
1. COVID-19 is a Multi-Faceted Disease
 2. VCO is a Multi-Functional Adjuvant
 3. Surviving COVID-19 and Beyond
- 

background

Severe Acute Respiratory Syndrome Coronavirus 2 (**SARS-CoV-2**) is the virus that causes the **COVID-19** disease.

The **spike protein (S)** enables the virus to attach to ACE2 receptors of the body's cells and release the **viral RNA** inside the host cell.

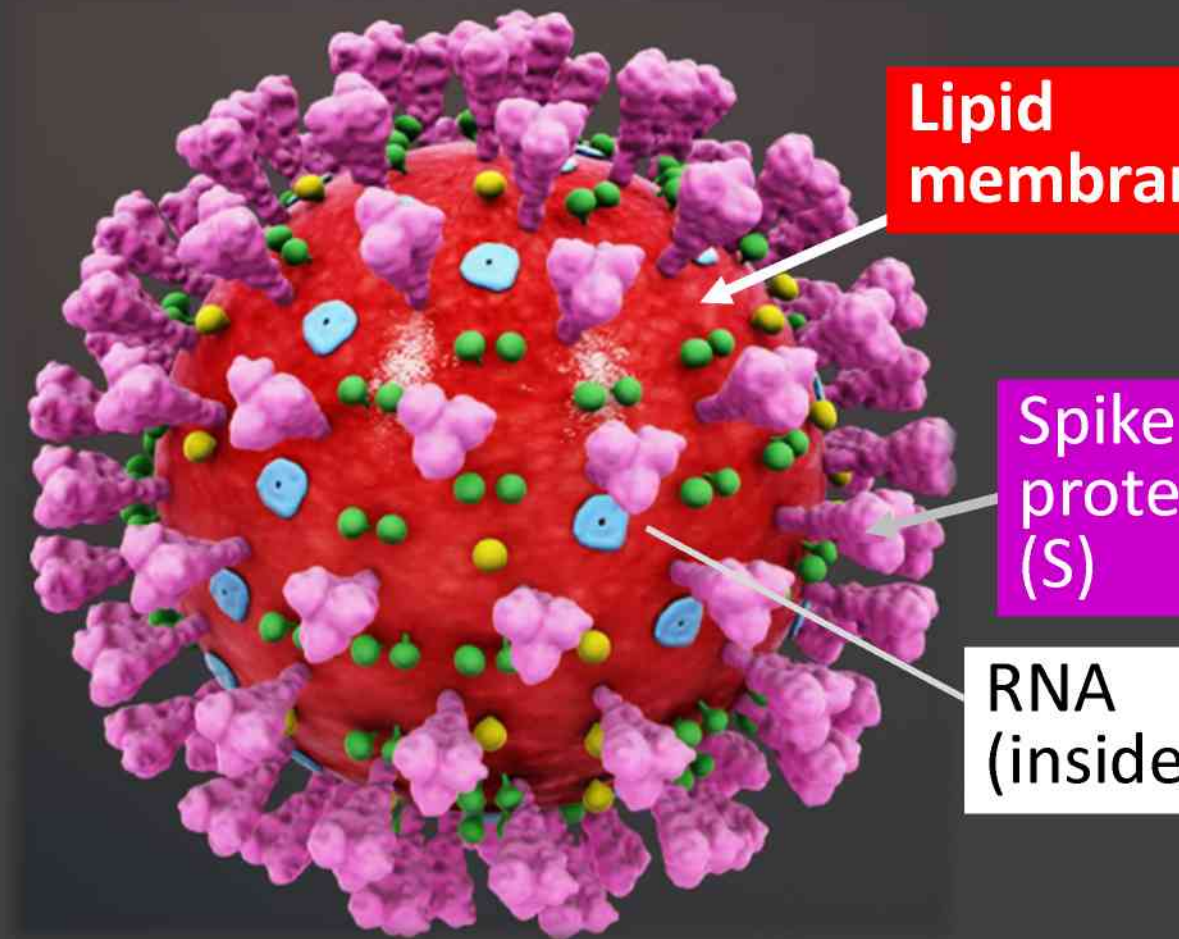
SARS-CoV-2 has a **lipid membrane** which is not subject to mutation. This virus can be effectively inactivated by lipid solvents.



SARS-CoV-2

Antiviral Strategies

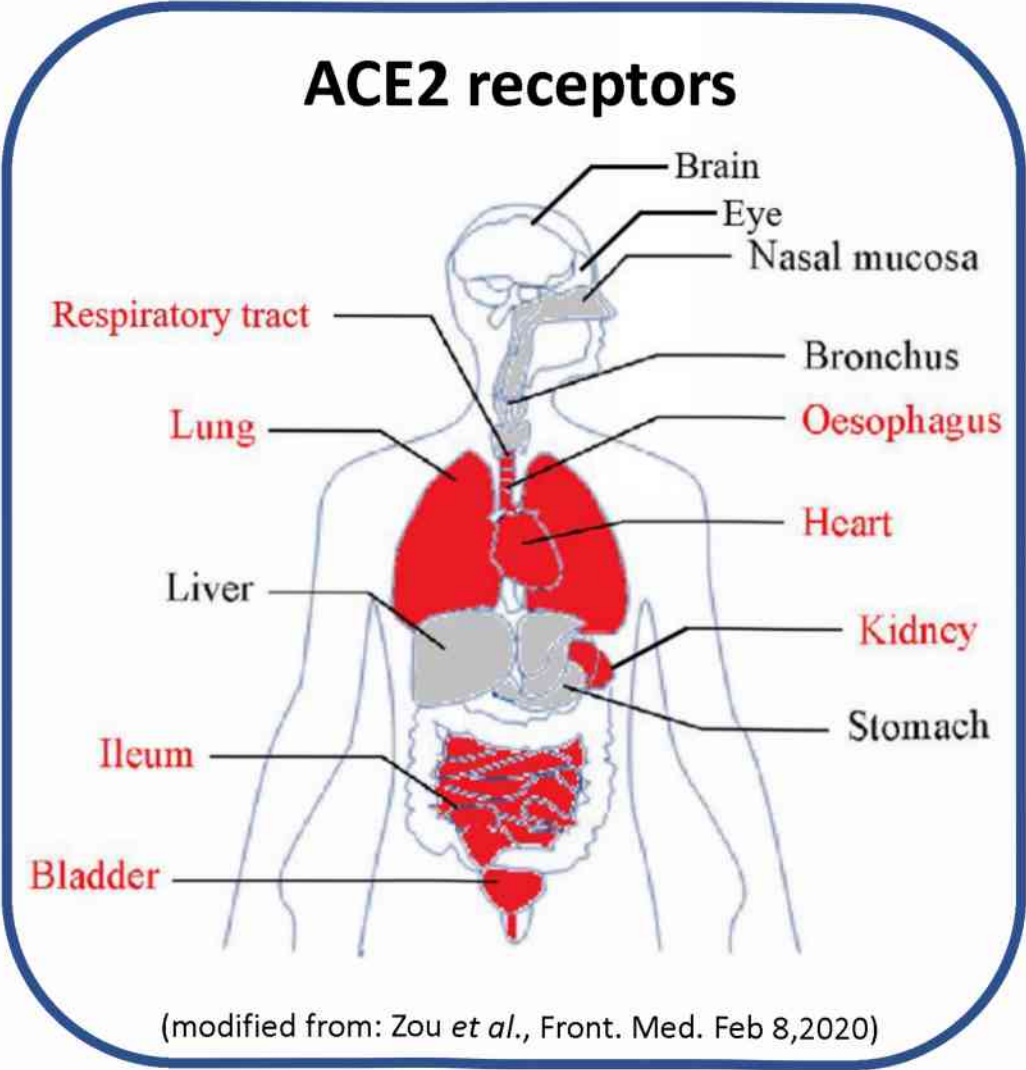
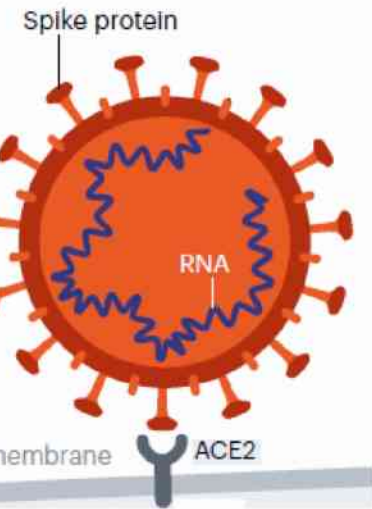
Target proteins }
Target DNA / RNA } Drugs & Vaccines
Target lipid membrane }



SARS-CoV-2

SARS-CoV-2, ACE2, COVID-19

SARS-CoV-2



- ### COVID-19
- Respiratory (ARDS)
 - Gastrointestinal sys
 - Heart
 - Kidney
 - CNS / Brain
 - Liver
 - Lungs
 - Endothelial cells



Cytokine Storm

Strategies Against COVID-19



Anti-viral

- Repurposed drugs

Immune system

- Vaccines
- Monoclonals
- Convalescent plasma

Anti-inflammatory


- Drugs
- Convalescent plasma

Strategies Against COVID-19

<i>ClinicalTrials.gov</i> (as of Nov 29, 2020)	Number of Registered Studies	Number of Studies With Posted Results
Total	359,094	46,177
Drug or Biological Intervention	154,571	33,285

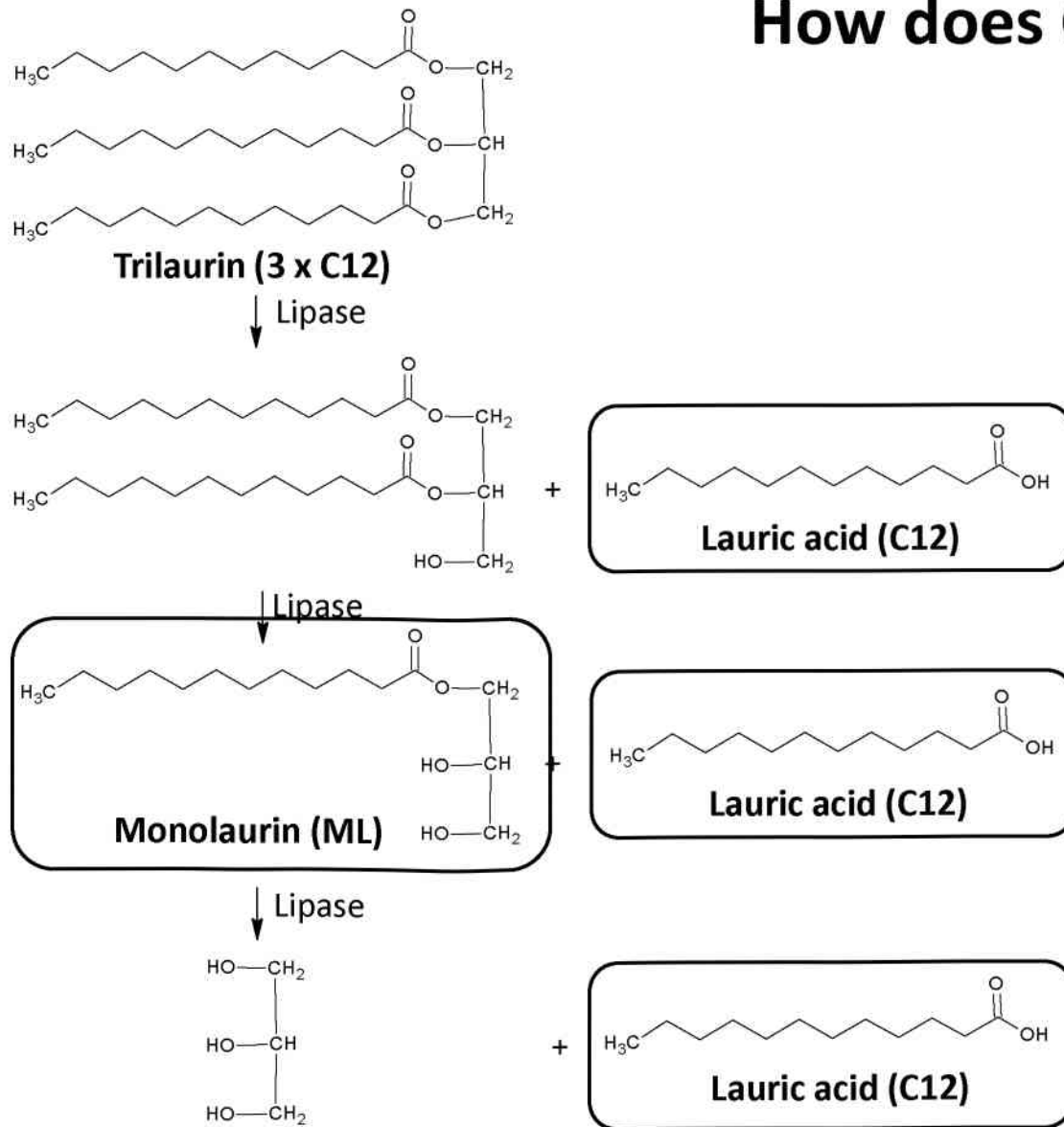


Outline

1. COVID-19 is a Multi-Faceted Disease
 2. **VCO is a Multi-Functional Adjuvant**
 3. Surviving COVID-19 and Beyond
- 

How does Coconut Oil become antiviral?

- Coconut oil becomes antiviral and antibacterial after ingestion and hydrolysis with lipase enzyme
- The antiviral and antibacterial compounds include lauric acid (C12) and monolaurin (ML), and capric acid (C10) and monocaprin providing wide spectrum activity.
- Coconut oil contains 45-53% lauric acid and 7-8% capric acid.



VCO Anti-viral Studies



Anti-viral

(from literature)

In vitro: destroys virus membrane
Animal: Effective vs. Avian flu

Immune system

(from literature)

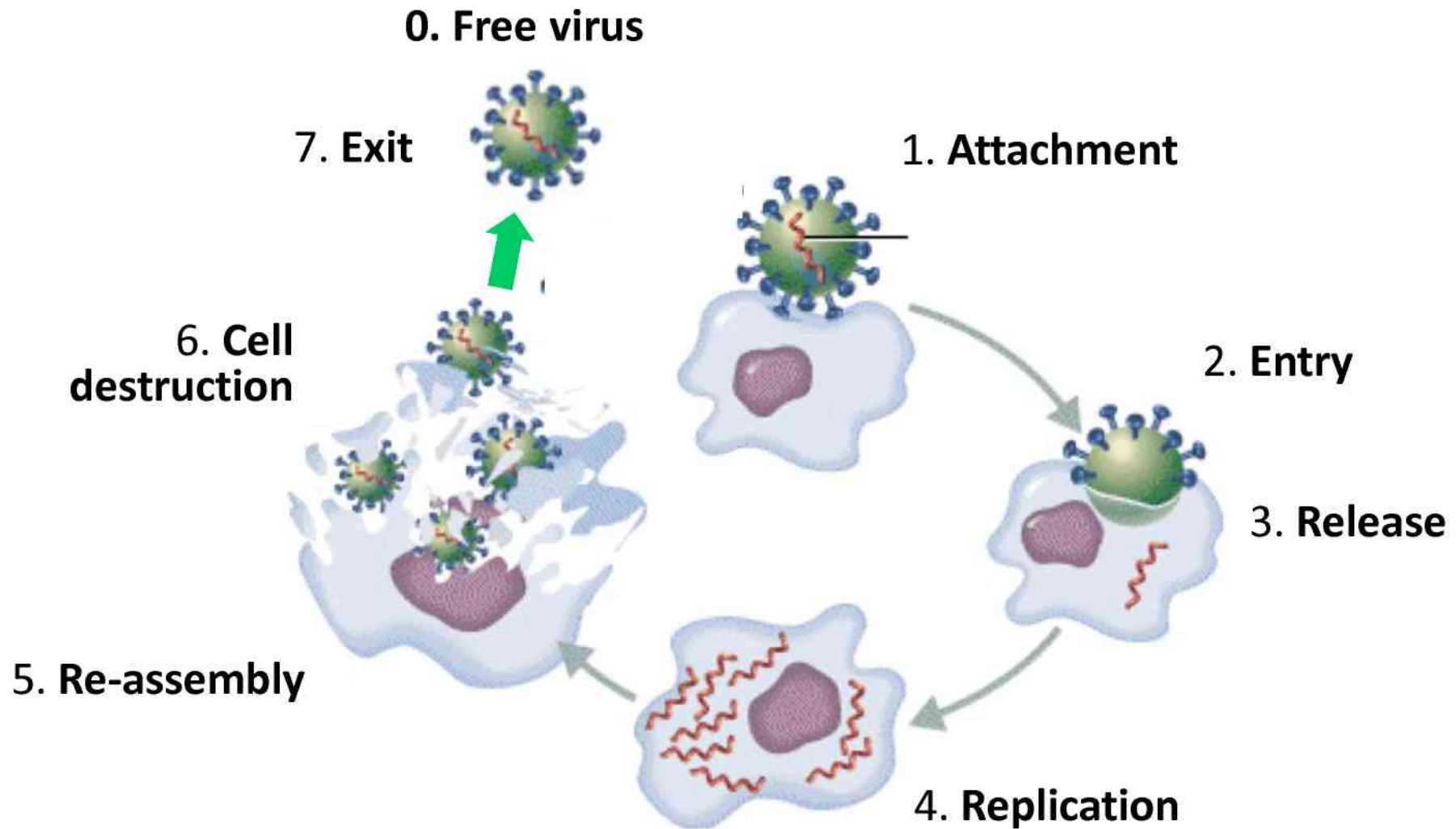
- *In vitro*: T cell ↑
- Clinical: HIV: CD4/CD8 ↑

Anti-inflammatory

(from literature)

- *In vitro*: IL-8 ↓
- Animal: iNOS ↓

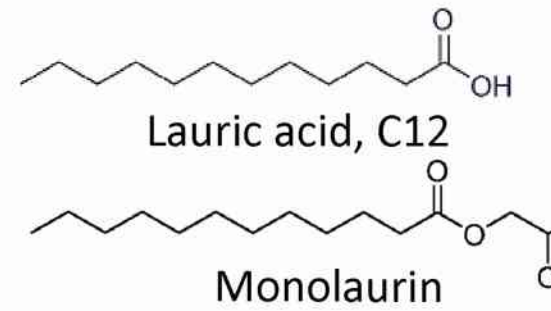
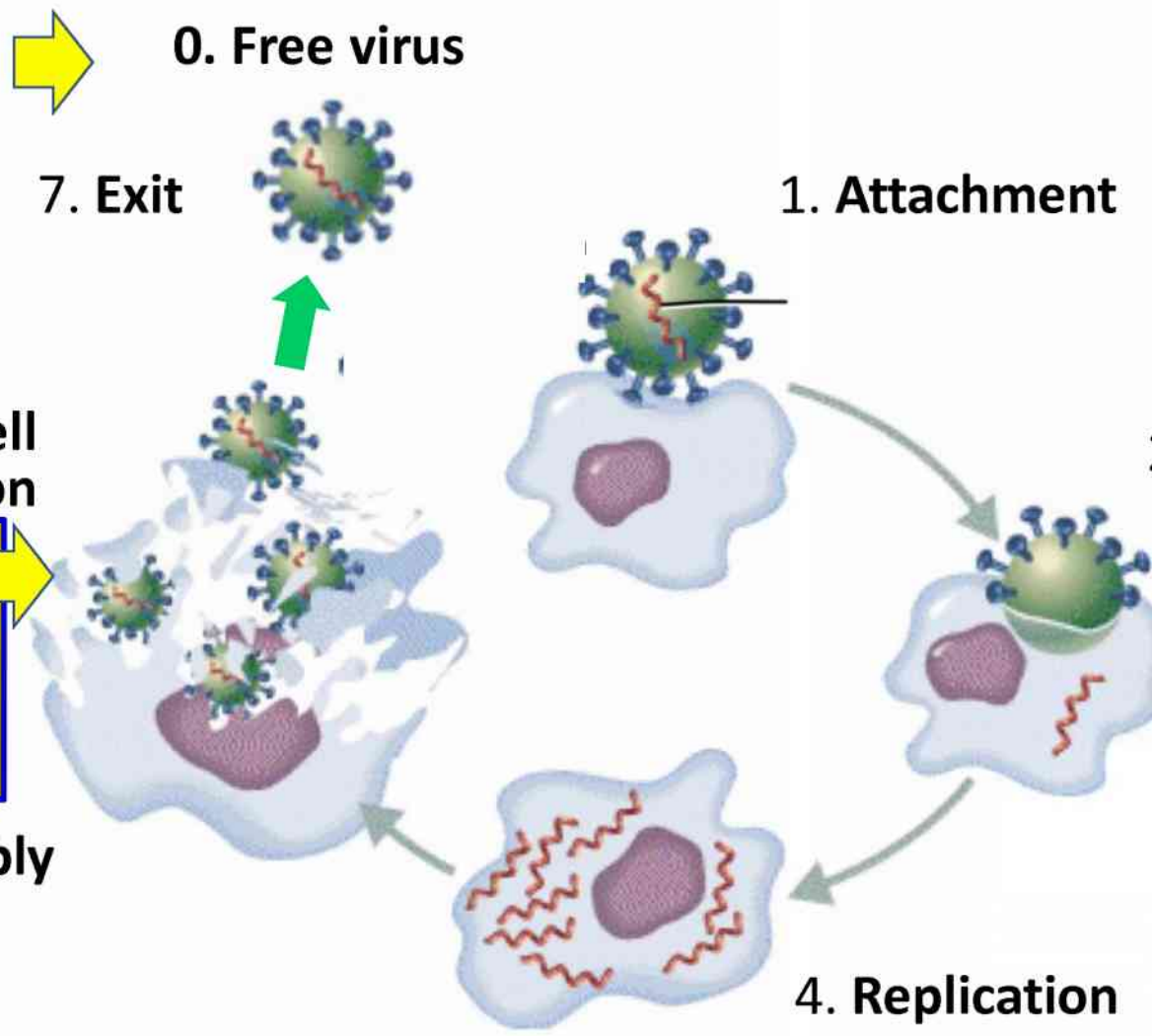
Viral lifecycle



Results from *In Vitro* Experiments vs. SARS-CoV-2

Outside the cell:
Disintegrates the virus membrane at low viral load.

Enhanced cell survival but no decrease in virus production



Results from Clinical Studies on Mild COVID-19 Cases

The Effects of Virgin Coconut Oil among Suspect and Probable Cases of COVID-19

Imelda Angeles-Agdeppa, Ph.D., Jacus S. Nacis, MBA-H, Mario V. Capanzana, Ph.D., Fabian Antonio M. Dayrit, Ph.D., Carl Vincent D. Cabanilla, Jaime Montoya. M.D.

The study was implemented in Santa Rosa Community Hospital (SRCH) and Santa Rosa Community Isolation Unit (SRCIU). It was a randomized double-blind controlled intervention trial involving 57 suspect or probable cases of COVID-19 randomly allocated into 2 groups. The Intervention Group (VCO) received the VCO mixed with standardized meals while the Control Group received the standardized meals only. The recipes for the meals were developed by the DOST- FNRI. The intervention lasted for 28 days.

Dosage of VCO

DURATION	DOSAGE
Initial Dose (Day 1-3)	0.6mL VCO /kg BW daily during breakfast
Succeeding dose (Day 4-28)	1.2 mL VCO /kg BW distributed daily during breakfast and lunch
Subjects with reported intolerance	computed VCO /kg BW distributed daily during breakfast, lunch, and dinner

Monitoring Activity

INDICATORS	FREQUENCY OF MONITORING
Occurrence of signs and symptoms (Coughing, colds, body aches, headache, loss of taste, fever)	Daily
C-Reactive Protein (CRP)	Day 1, 14, and 28



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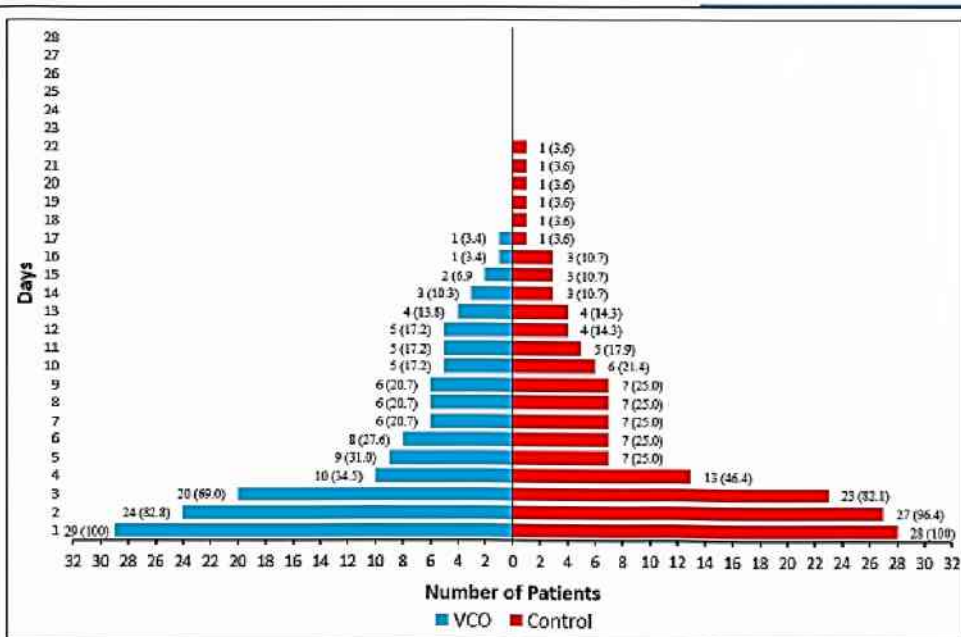


Figure 1. Percentage of patients with diminishing symptoms per group per day

Recovery in COVID-19 related symptoms was more rapid in the VCO group vs. Control group.

- 5 out of 29 patients in the VCO group manifested improvement as early as day 2 of intervention compared to only 1 from the Control group.
- Participants in the VCO group showed no more symptoms at day 18, while symptoms persisted some patients in the Control group until day 23.



Results from Clinical Studies on Mild COVID-19 Cases

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The mean level of C-reactive protein (CRP) in the VCO group dropped much more rapidly compared to the Control group.

The CRP of the VCO group normalized rapidly by day 14 and continued to drop until day 28. In comparison, the CRP level in the Control group dropped more slowly and stayed at the borderline until day 28.

This means that the VCO group experienced improvement from infection or inflammation within 14 days after start of VCO intervention.

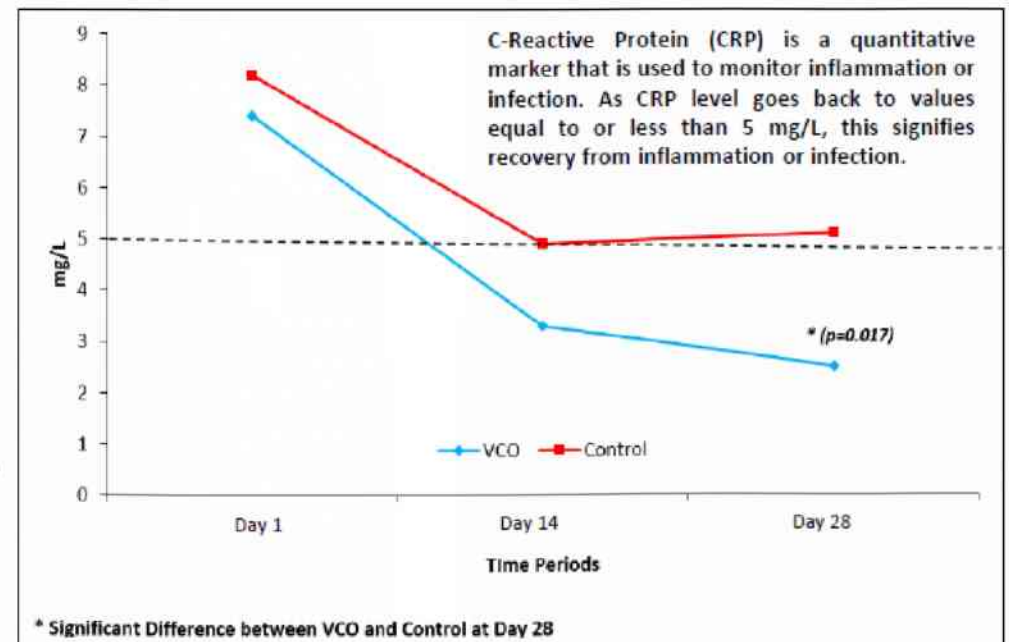
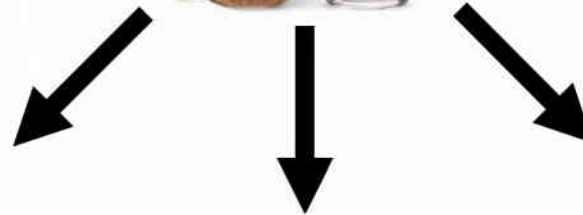


Figure 2. Mean CRP levels by time periods



VCO Antiviral and Anti-COVID-19 Studies



Anti-viral

(from literature)

In vitro: destroys virus membrane
 Animal: Effective vs. Avian flu

***In vitro* vs SARS-CoV-2**
Virucidal at low virus concentration
Enhances cell survival

Anti-inflammatory

(from literature)

- *In vitro*: IL-8 ↓
- Animal: iNOS ↓

Clinical trial on mild COVID-19 sub
 • **COVID-19 symptoms ↓**
 • **CRP ↓**

Immune system

(from literature)

- *In vitro*: T cell ↑
- Clinical: HIV: CD4/CD8 ↑



Philippine Council for Health
 Research and Development
 (PCHRD)

- *In vitro* Study on the Efficacy of Lauric Acid and Derivatives Against SARS-CoV-2 (ADMU)
- The Beneficial Effects of VCO among Suspect and Probable Cases of COVID-19 (FNRI-DOST)



Philippine Coconut
 Authority (PCA)

- Analysis and supply of VCO used in clinical study

Virgin Coconut Oil is a Multi-Functional Adjuvant

Adjuvant (to assist, auxiliary)

General definition: A substance that enhances the effect of a particular medical treatment.


Adjuvant therapy: treatment used after primary treatments

Drug adjuvant: to increase the efficacy or potency of drugs when given at the same time

Immunological adjuvant: to improve the immune response of a vaccine (or the body = immunomodulator?)



Outline

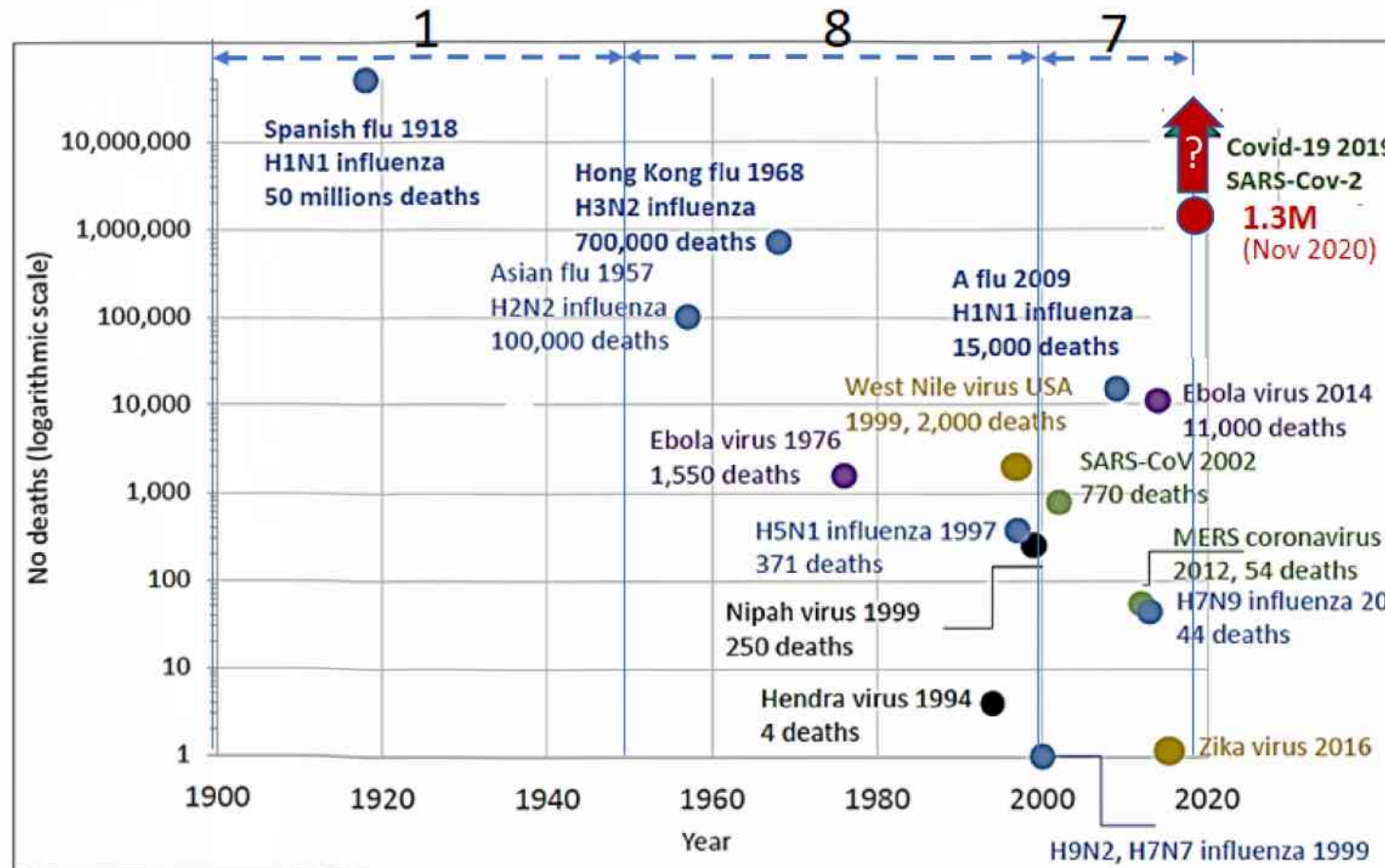
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 3. **Surviving COVID-19 and Beyond**
- 

Surviving COVID-19 and Beyond: Viral pandemics have been increasing

From 1900 – 1950, there was only 1 viral pandemic.

From 1950 - 2000, there were 8 viral pandemics.

From 2000 – 2019, there have been 7 viral pandemics.



(from: Emergence of zoonotic diseases and environmental changes, Gwenaël Vourc'h, May 5 2020)

Surviving COVID-19 and Beyond: We need a response that is sustainable

- **Operation Warp Speed (US):** almost \$10 B
- **OECD:** US\$137B estimate for global vaccine development
- **Drug development:** \$1B per drug, 10 years (estimate)
- **Vaccine:** \$3 to \$60 per dose (estimate)
- ~~**Remdesivir:** \$3,000 per course~~

Surviving COVID-19 and Beyond: We need solutions that are effective, affordable and appropriate



(New York City, Time Magazine)



(Philippines, CNN Philippines)



(Rio de Janeiro City, Guardian)



(Italy, Harvard Business Review)



(Zimbabwe, AP News)



(India, The New York Times)

Surviving COVID-19 and Beyond: We need vaccines that are effective, affordable and appropriate

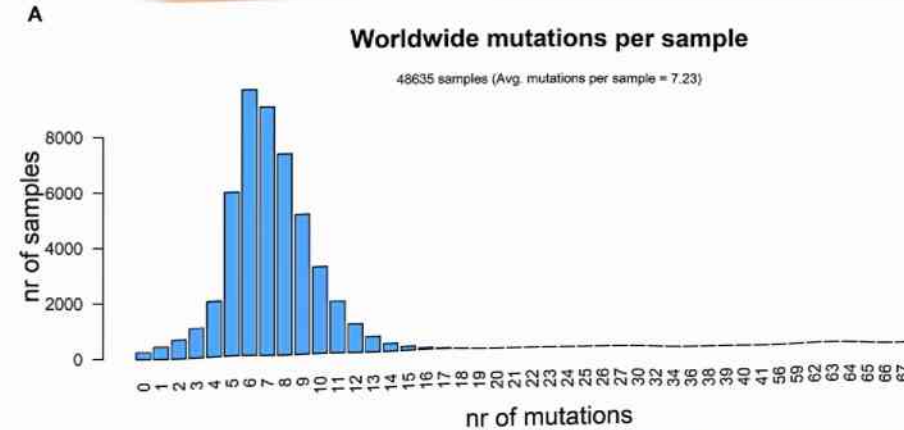
Frontiers in Microbiology | July 2020 | Volume 11 | Article 1800

Geographic and Genomic Distribution of SARS-CoV-2 Mutations

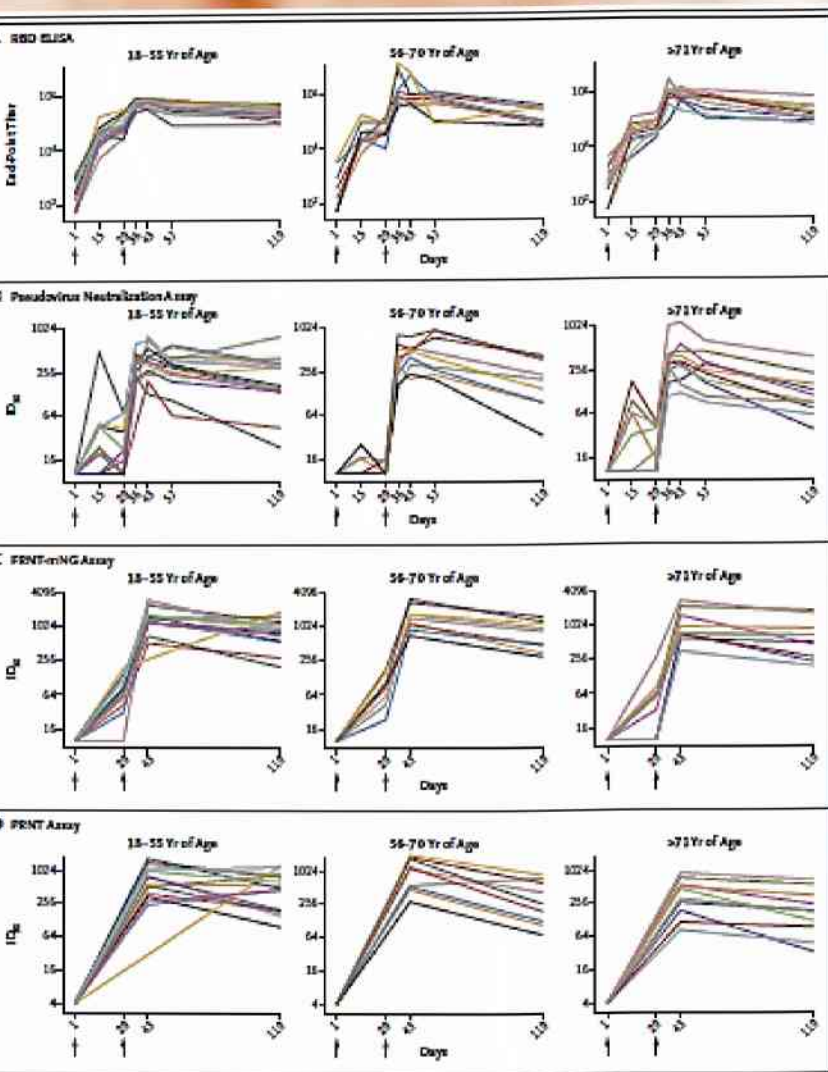
Daniele Mercatelli[†] and Federico M. Giorgi^{*†}

“The emergence of new mutations may force the development of new antiviral therapies, as well as the adaptation of current ones to tackle the new molecular structures of the virus.”

- Will current vaccines be effective against:
 - A mutated SARS-CoV-2 virus?
 - SARS-CoV-2 viruses from different parts of the world?



Surviving COVID-19 and Beyond: We need vaccines that are effective, affordable and long-lasting



Time Course of SARS-CoV-2 Antibody Binding and Neutralization Responses after mRNA-1273 Vaccination: Day 1 to 119 (4 mos)

- How long does vaccine protection last?

(ref: Widge et al., Durability of Responses after SARS-CoV-2 mRNA-1273 Vaccination. NEJM, December 3, 2020)

Surviving COVID-19 and Beyond: The coconut can improve our health

European Scientist

Covid 19 and the elephant in the room

By Aseem Malhotra - 16.04.2020

Obesity and chronic metabolic disease are killing COVID -19 patients.

The UK and USA, where more than 60% of adults are overweight or obese, have high mortality rates.

South Korea, which has low prevalence of obesity, experienced low mortality rate.

Healthy products from the Coconut



- Coconut meat: diet and many other preparations, DCN
- Coconut milk
- Coconut oil
- Coconut water
- Nata de coco
- Coco sugar

Surviving COVID-19 and Beyond: GO COCONUTS!

- In summary:
 - VCO has antiviral, immunomodulatory and anti-inflammatory activities
 - VCO is an affordable, readily available and healthy functional food
- We should increase support for R&D for VCO
 - Is VCO effective in protecting persons with comorbidities
 - Can VCO improve the efficacy of vaccines
- We should increase support for the coconut industry and the coconut farmer



Surviving COVID-19 and Beyond: COCONUT SOLIDARITY TRIAL

