MOSS NUTRITION

Long COVID Support Strategies

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T cell abnormalities

Muscle abnormalities

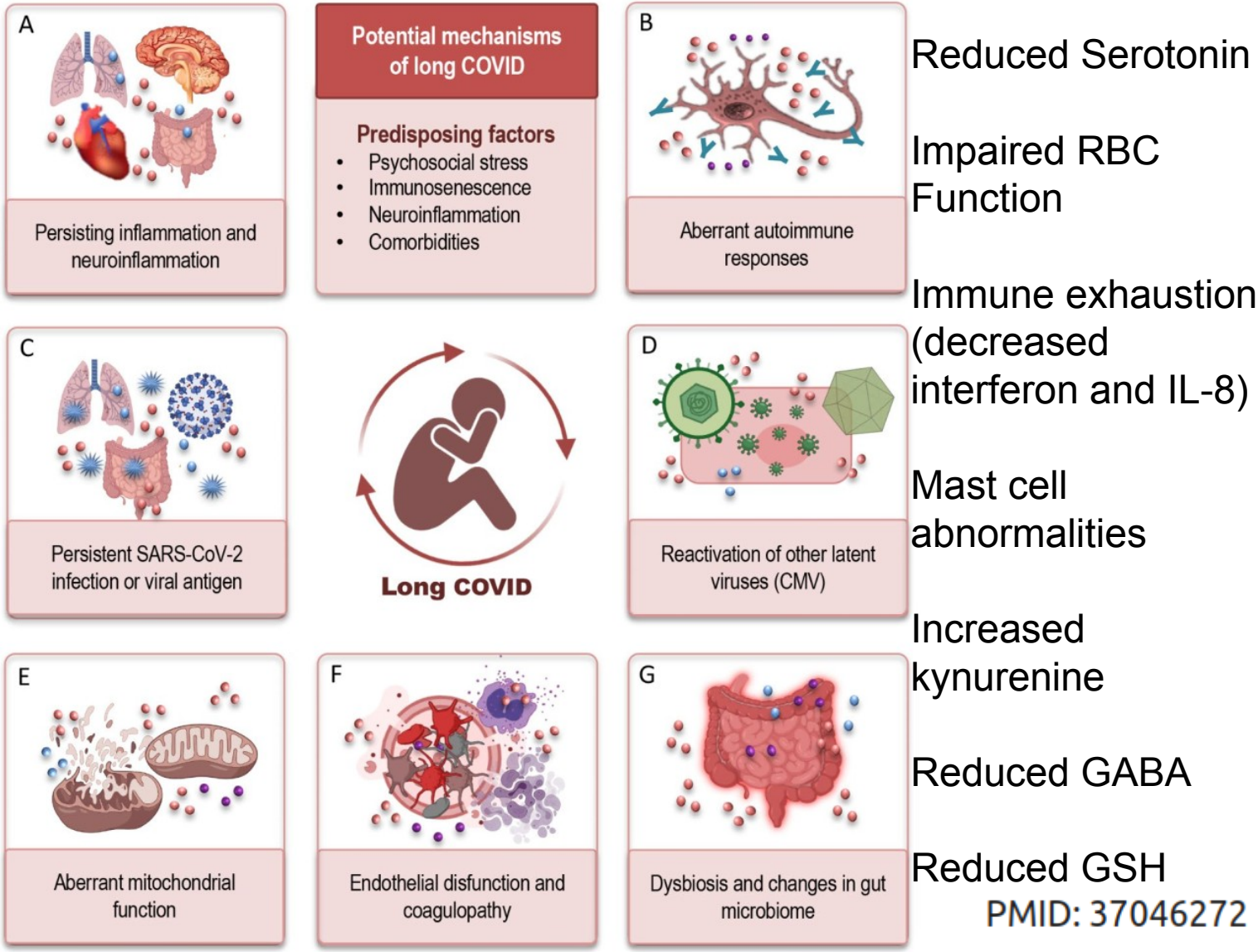
Decreased oxygen delivery to tissues

Oxidative stress

Autonomic dysfunction

Dendritic cell deficiency

Hormonal dysregulation



Reduced Serotonin

Impaired RBC Function

Immune exhaustion (decreased interferon and IL-8)

Mast cell abnormalities

Increased kynurenine

Reduced GABA

Reduced GSH

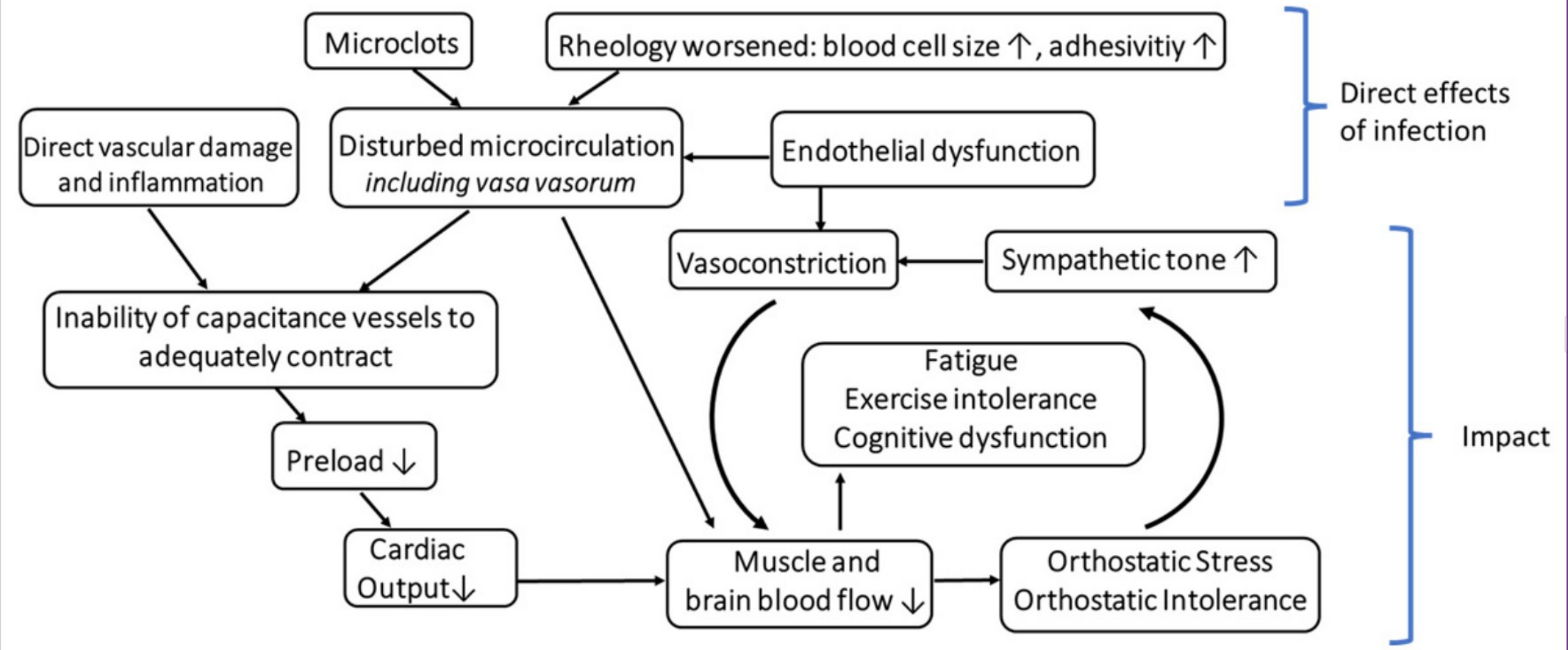
PMID: 37046272

medicina

MDPI

Hypothesis

Orthostatic Intolerance after COVID-19 Infection: Is Disturbed Microcirculation of the Vasa Vasorum of Capacitance Vessels the Primary Defect?



Angiogenesis
https://doi.org/10.1007/s10456-022-09850-9

ORIGINAL PAPER

Persistent capillary rarefication in long COVID syndrome

Irina Osiaevi[1] · Arik Schulze[1] · Georg Evers[1] · Kimon Harmening[1] · Hans Vink[2] · Philipp Kümpers[3] · Michael Mohr[1] · Alexandros Rovas[3]

Plotting of capillaries and feed vessels showed that the number of capillaries perfused in long COVID patients **was comparable to that of critically ill COVID-19 patients** and did not respond adequately to local variations of tissue metabolic demand. Conclusions: Our current data strongly suggest that COVID-19 leaves a persistent capillary rarefication even **18 months after infection.**

glycocalyx · Microvascular health score

Abbreviations

Angpt-2 Angiopoietin-2

Biochemical Journal (2022) **479** 1653–1708
https://doi.org/10.1042/BCJ20220154

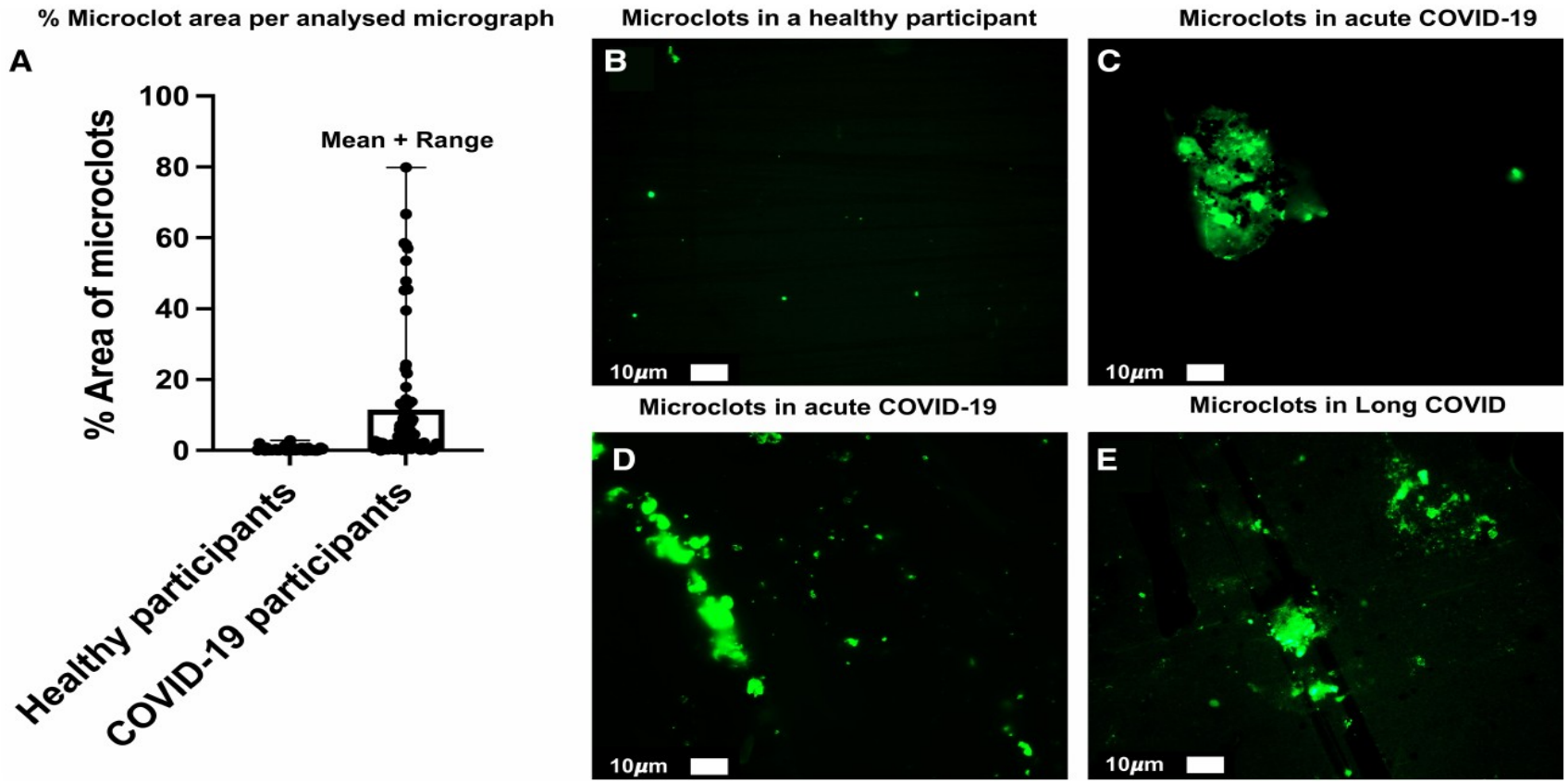


Figure 7. (**A**) % area distribution of microclots in plasma from participants with acute COVID-19 (taken from raw data as in [87]). (**B**) Representative micrograph of microclots in plasma from a healthy individual. (**C**,**D**) Representative micrographs of microclots in plasma from acute COVID-19 participants (taken from raw data as in [87]). (**E**) Representative micrograph of microclots in plasma from participants with Long COVID (taken from raw data in [422]).

PORTLAND PRESS

Biochemical Journal (2022) **479** 1653–1708
https://doi.org/10.1042/BCJ20220154

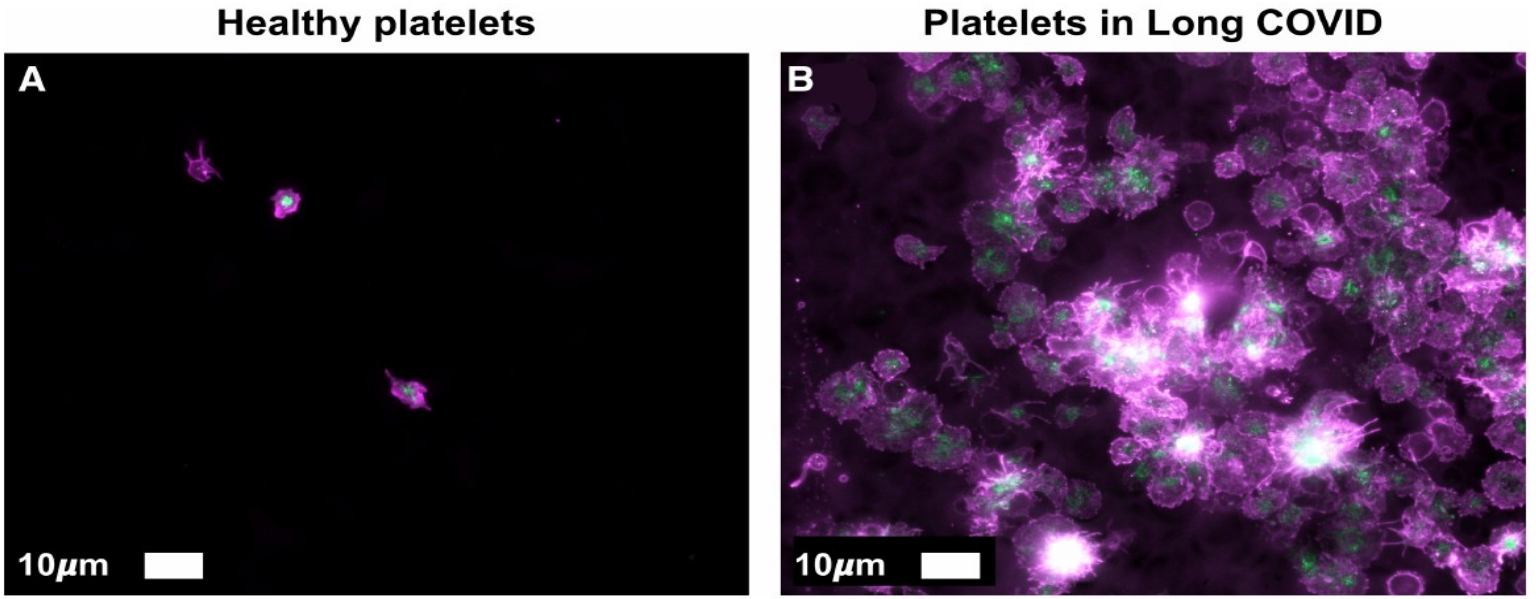


Figure 11. Platelet hyperactivation noted in a healthy individual (A) and an individual with Long COVID with severe platelet hyperactivation (B).

Haematocrit samples were exposed to the two fluorescent markers, CD62P (PE-conjugated) (platelet surface P-selectin) (IM1759U, Beckman Coulter, Brea, CA, U.S.A.) and PAC-1 (FITC-conjugated) (340507, BD Biosciences, San Jose, CA, U.S.A.). CD62P is a marker for P-selectin that is either on the membrane of platelets or found inside them. PAC-1 identifies platelets through marking the glycoprotein IIb/IIIa (gpIIb/IIIa) on the platelet membrane. Samples were viewed using a Zeiss Axio Observer 7 fluorescent microscope with a Plan-Apochromat 63x/1.4 Oil DIC M27 objective (Carl Zeiss Microscopy, Munich, Germany). (Unpublished data; Ethics from Stellenbosch University Human Ethics Committee (HREC) number 9521.).

PMID: 36963989

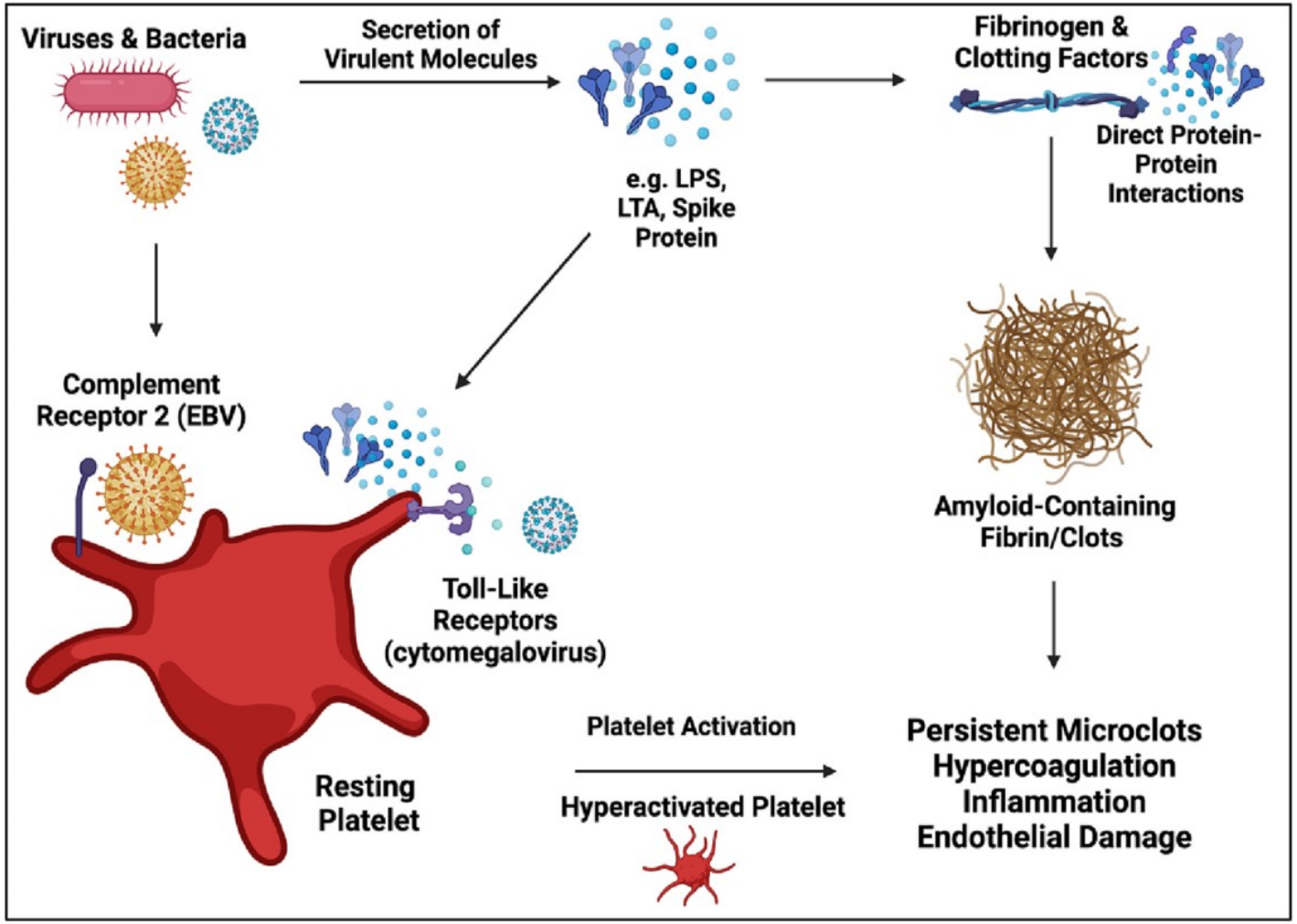
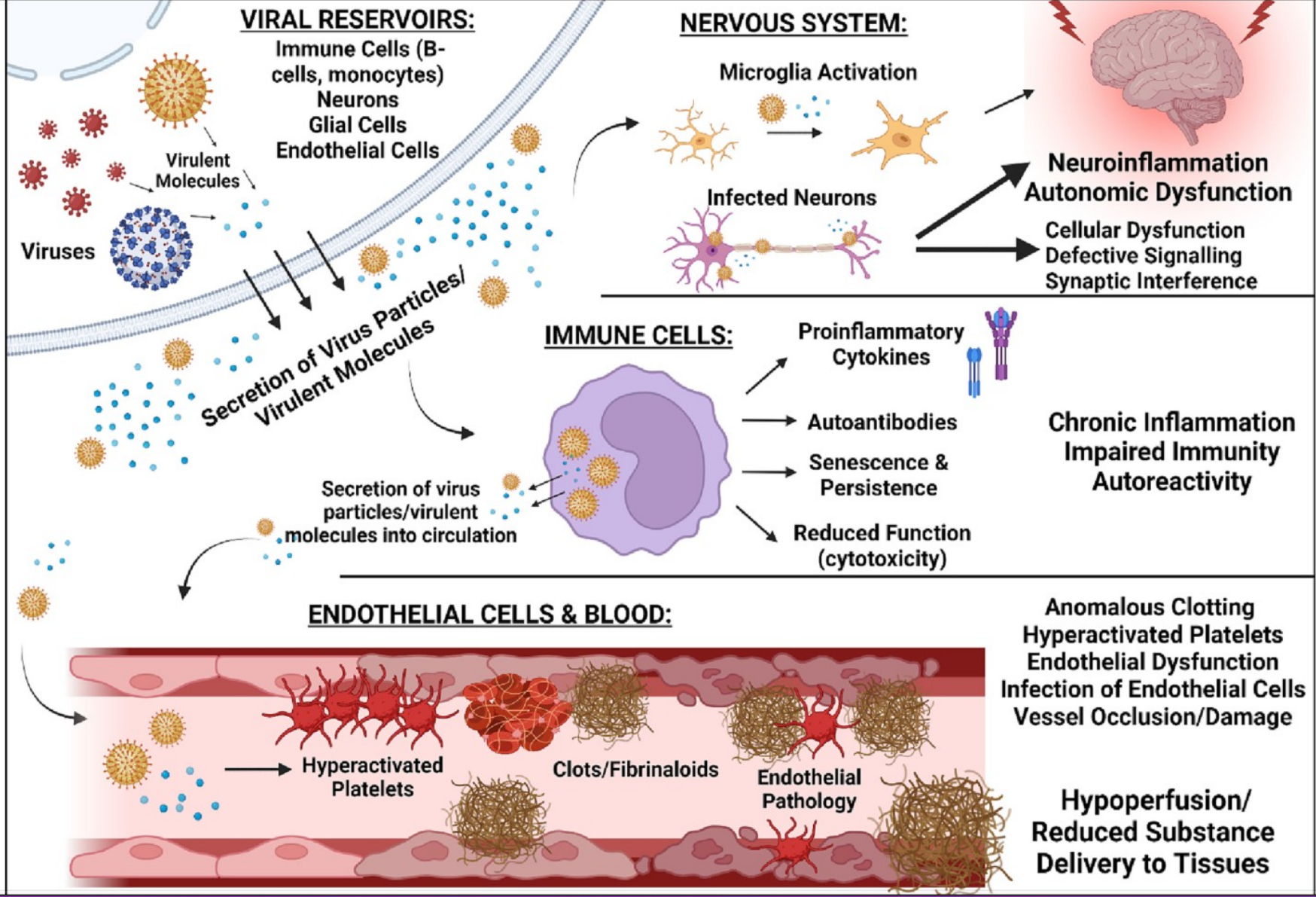


Fig. 1. The influence of microbes on the coagulation system. Microbes and their secreted molecules can directly interact with platelets and clotting proteins (clotting factors and fibrinogen) to induce platelet activation, hypercoagulation, inflammation, anomalous clotting (amyloid containing clots and fibrinaloids), and subsequent endothelial damage. Herpes viruses, including EBV and cytomegalovirus, interact with platelets via toll-like and complement receptors. Created using Biorender.com.



PMID: 36963989

Mango (Mangifera indica)

- Rich in polyphenols
- Sirt-1 – antioxidant, endothelial function, anti-inflammatory, metabolism
- AMPK – improved muscle glucose uptake and fatty acid oxidation, hepatic fatty acid oxidation, lipid homeostasis, balances blood sugar, endothelial function
- eNOS – endothelial function, energy, antioxidant
- Mitochondrial neogenesis

Thieme

Careflow

Effects of *Mangifera indica* (Careless) on Microcirculation and Glucose Metabolism in Healthy Volunteers

A commercial Mangifera indica fruit powder (Careflow) showed beneficial acute effects on microcirculation in a randomized, double-blind, crossover pilot study. A daily dose of 100 mg or 300 mg of the fruit powder was compared to placebo after supplementation for 4 weeks. **Microcirculatory reactive hyperemia flow increased, especially in the 100 mg group** ($p = 0.025$).

Grape Seed Extract (Vitis vinifera)

- Polyphenols: procyanidins, flavonoids, and catechins
- Protects the endothelium against oxidative stress
- Vasorelaxation (NO)
- Decreases vascular permeability
- Antiangiogenic (Inhibits VEGF)
- Anti-inflammatory (NF-kB)

Pharmacological Research
Volume 175, January 2022, 105905

Review

The effect of grape (*Vitis vinifera*) seed extract supplementation on flow-mediated dilation, blood pressure, and heart rate: A systematic review and meta-analysis of controlled trials with duration- and dose-response analysis

19 Clinical Trials found benefit for flow-mediated dilation, BP, and heart rate.

Sahar Foshati [a 1], Fatemeh Nouripour [b 2], Erfan Sadeghi [c 3], Reza Amani [d 4]

Anti-atherosclerotic
Nephroprotective
Anticoagulant (PAF)
Hepatoprotective
Antiviral
Antibacterial
Neuroprotective
Anti-anxiety
Adaptogen
Antitumor

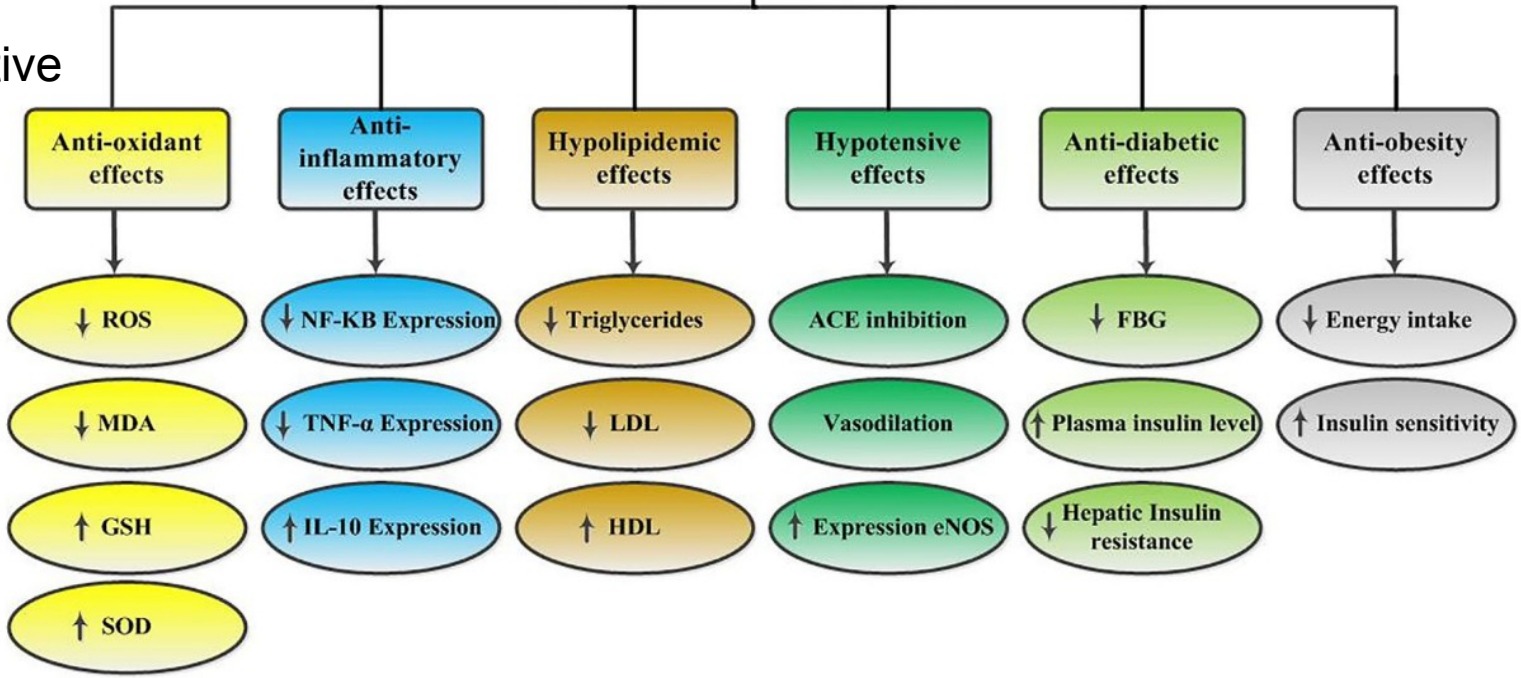


FIGURE 5 Pharmacological effects of *Ginkgo biloba* and its related mechanisms

PMID: 32097990

Published in final edited form as:
Neuroradiology. 2011 March ; 53(3): 185–191. doi:10.1007/s00234-010-0790-6.

Effects of *Ginkgo biloba* on cerebral blood flow assessed by quantitative MR perfusion imaging: a pilot study

Ameneh Mashayekh, **Dzung L. Pham**, **David M. Yousem**, **Mercedes Dizon**, **Peter B. Barker**, and **Doris D. M. Lin**
Department of Radiology, Division of Neuroradiology, Johns Hopkins University School of Medicine, 600 N. Wolfe Street/Phipps B100-D, Baltimore, MD 21287, USA

Doris D. M. Lin: ddmlin@jhmi.edu

DSC-MRI was performed in nine healthy men(mean age 61±10 years) before and after 4 weeks of 60 mg Ginkgo biloba taken twice daily.

Results: All regions combined showed a **significant increase of non-normalized CBF after Ginkgo biloba** (15% in white and 13% in gray matter, respectively, P≤0.0001).

cohort of normal elderly individuals, a mild increase in CBF is found in the left parietal–occipital WM after EGb, as well as a small but statistically significant increase in global CBF.

International Journal of Biological Macromolecules 226 (2023) 780–792

Contents lists available at ScienceDirect

International Journal of Biological Macromolecules

journal homepage: www.elsevier.com/locate/ijbiomac

Ginkgolic acids inhibit SARS-CoV-2 and its variants by blocking the spike protein/ACE2 interplay

Yusen Xiang [a,1], Guanglei Zhai [b,1], Yaozong Li [c,d], Mengge Wang [a], Xixiang Chen [a,e],

Our pseudovirus assay showed that one of the compounds, Ginkgolic acid C17:1 (GA171), significantly inhibits the entry of original SARS-CoV-2 and its variants into the ACE2-overexpressed HEK293T cells.

American Journal of Case Reports

e-ISSN 1941-5923
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DOI: 10.12659/AJCR.937094

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Accepted: 2022.08.17
Available online: 2022.XX.XX
Published: 2022.XX.XX

Alleviation of Post-COVID-19 Cognitive Deficits by Treatment with EGb 761®: A Case Series

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F

E 1 Udo A. Zifko
E 1 Muhammad Yacob
BE 1 Benedikt J. Braun
EF 2 Gunnar Paul Harald Dietz

1 Department of Neurology, Evangelical Hospital Vienna, Vienna, Austria
2 Department of Neurology, University of Medicine Göttingen, Göttingen, Germany

In many studies, EGb 761(Gingko biloba) has been demonstrated to protect endothelial cells, to have potent anti-inflammatory effects, and to enhance neuroplasticity. Three women and 2 men, aged 26 to 59 years (average age 34.6 years), presented with **concentration and attention deficits, cognitive deficiencies, and/or fatigue** 9-35 weeks after infection. A daily dose of 2×80 mg of EGb 761 **did not cause any detectable adverse effects**, and it **substantially improved or completely restored cognitive deficits** and, when initially present, also other symptoms, such as **fatigue and hyposmia,** within an observation period of up to 6 months.

diseases

MDPI

Case Report

A Multimodal Approach in the Treatment of Persistent Post-COVID

Tobias Romeyke [1,2]

The physiotherapeutic and physical interventions (**whole-body hyperthermia, foot reflex zone massage, lymphatic drainage**, as well as other naturopathic therapy methods(liniment with Solum oil, **ozone therapy**)) were well-accepted by the patient and rated Positively. A total of **five hyperthermia applications** were performed. Exercise therapy was used with the aim of **strength conditioning and endurance**, energetic stimulation, and improvement in cognition and coordination. The patient was also looked after **psychotherapeutically, and the pain therapist treated her with acupuncture**. Naturally, we also administered healing earth and the trace elements of selenium, zinc, and **gingko biloba**.

Review > Infect Disord Drug Targets. 2023;23(4):e230223213955.
doi: 10.2174/1871526523666230223112045.

Potential of Black Seeds (*Nigella sativa*) in the Management of Long COVID or Post-acute Sequelae of COVID-19 (PASC) and Persistent COVID-19 Symptoms - An Insight

Naina Mohamed Pakkir Maideen [1], Abdurazak Hassan Jumale [1], Ibrahim Ramadan Barakat [1], Ayesha Khalifa Albasti [1]

Affiliations + expand

PMID: 36825730 DOI: 10.2174/1871526523666230223112045

Black Cumin Seed Oil Softgels

1,000-3,000 mg per day in 2-3 divided doses with meals.

Inherent effect of *N. sativa* in long COVID management.

Microcirculation Strategies

- Green leafy vegetables
- 85%-92% dark chocolate. 20 grams/day maximum. Be careful with patients who have issues with histamine or caffeine.
- Blueberries, strawberries, raspberries, and blackberries
- 1/2-1 clove of fresh garlic
- Turmeric and ginger as spices
- Green tea – 3-4 cups/day (caution with caffeine or histamine issues)

- Ginkgo Biloba
- Grape Seed Extract
- Mango Extract
- Black Cumin Seed Oil
- Curcumin
- Korean Ginseng

molecules

MDPI

Article

Degradative Effect of Nattokinase on Spike Protein of SARS-CoV-2

Takashi Tanikawa [1,*,†], Yuka Kiba [2,†], James Yu [3], Kate Hsu [3], Shinder Chen [3], Ayako Ishii [4], Takami Yokogawa [2], Ryuichiro Suzuki [5], Yutaka Inoue [1] and Masashi Kitamura [2,*]

When cell lysates transfected with S protein were incubated with nattokinase, the S protein was degraded in a dose- and time-dependent manner. Thus, our findings suggest that nattokinase exhibits potential for the inhibition of SARS-CoV-2 infection via S protein degradation.

viruses

MDPI

Article

The Combination of Bromelain and Acetylcysteine (BromAc) Synergistically Inactivates SARS-CoV-2

Javed Akhter [1,2,†], Grégory Quéromès [3,†], Krishna Pillai [2,†], Vahan Kepenekian [1,4,†], Samina Badar [1,5], Ahmed H. Mekkawy [1,2,5], Emilie Frobert [3,6,‡], Sarah J. Valle [1,2,5,‡] and David L. Morris [1,2,5,*,‡]

Recombinant spike and envelope SARS-CoV-2 proteins were disrupted by BromAc. Spike and envelope protein disulfide bonds were reduced by Acetylcysteine. In in vitro whole virus culture of both wild-type and spike mutants, SARS-CoV-2 demonstrated a concentration-dependent inactivation from BromAc treatment but not from single agents.

pharmaceuticals

MDPI

Article

Efficacy of Adaptogens in Patients with Long COVID-19: A Randomized, Quadruple-Blind, Placebo-Controlled Trial

Irina Karosanidze [1], Ushangi Kiladze [1], Nino Kirtadze [1], Mikhail Giorgadze [1], Nana Amashukeli [1], Nino Parulava [1], Neli Iluridze [1], Nana Kikabidze [1], Nana Gudavadze [1], Lali Gelashvili [1], Vazha Koberidze [1], Eka Gigashvili [1], Natela Jajanidze [1], Naira Latsabidze [1], Nato Mamageishvili [2], Ramaz Shengelia [2], Areg Hovhannisyan [3] and Alexander Panossian [4,*]

One hundred patients who experienced at least three of nine Long COVID symptoms in the 30 days before randomization were included in the study of the efficacy of **Rhodiola, Eleutherococcus, and Schisandra** supplementation for two weeks. Adaptogens decreased the **duration of fatigue and pain in 50% of patients**. **Significant relief of severity of all Long COVID symptoms**. A clinical assessment of blood markers showed significantly **lower IL-6** in the treatment group. Furthermore, a significant difference between the placebo and adaptogen treatment was observed for creatinine: **Adaptogens significantly decreased blood creatinine** compared to the placebo, suggesting prevention of **renal failure progression** in Long COVID.

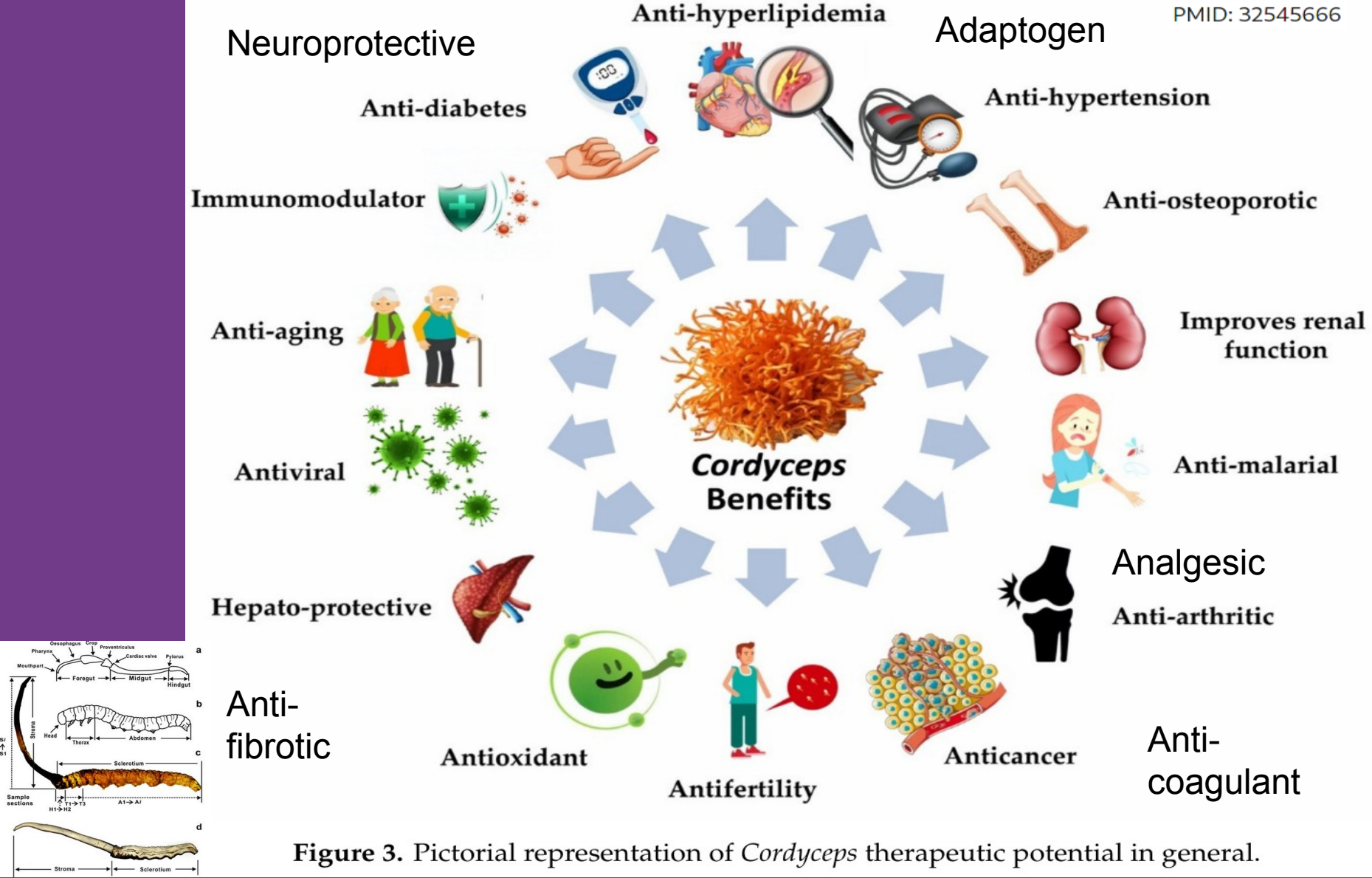


Figure 3. Pictorial representation of *Cordyceps* therapeutic potential in general.

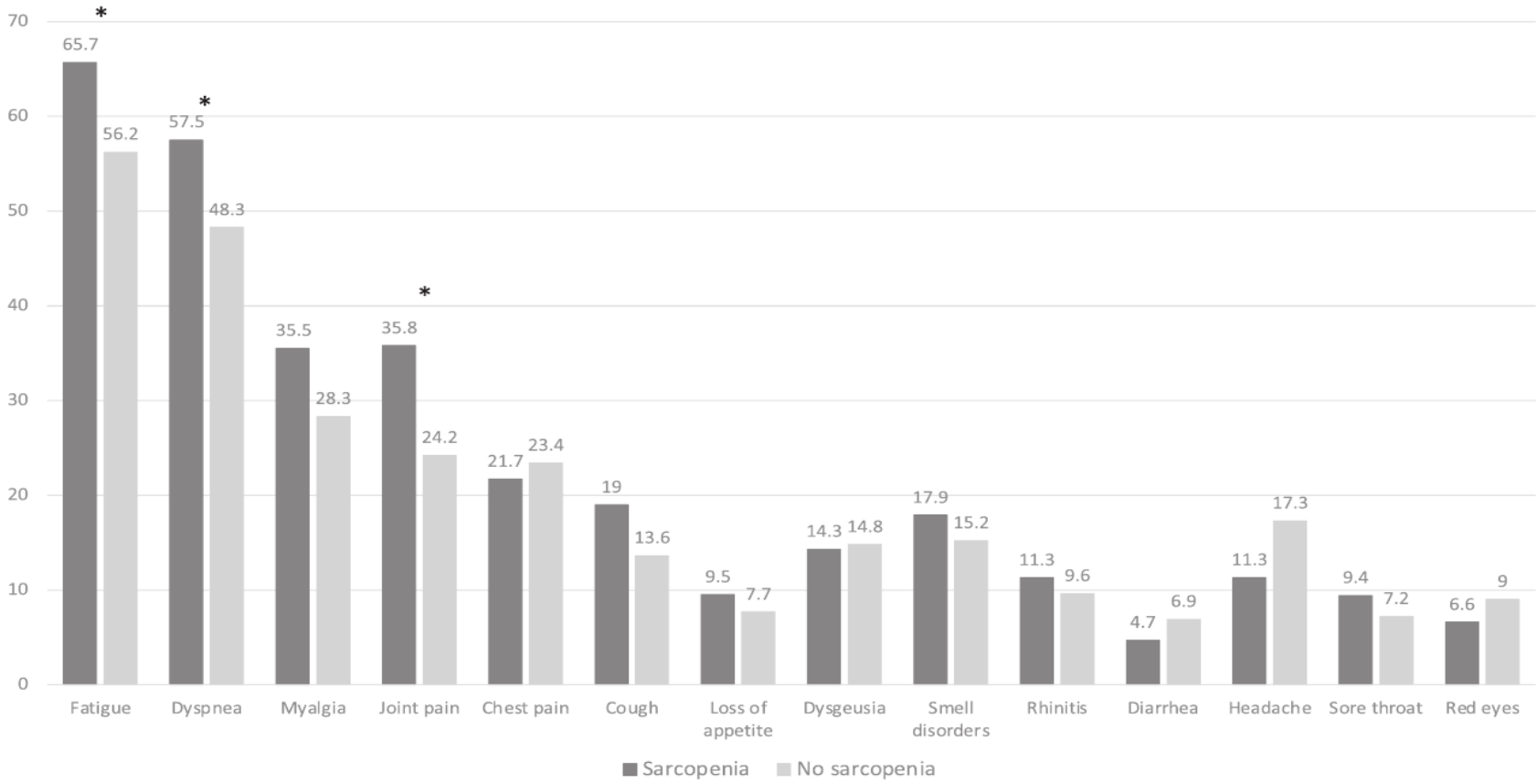
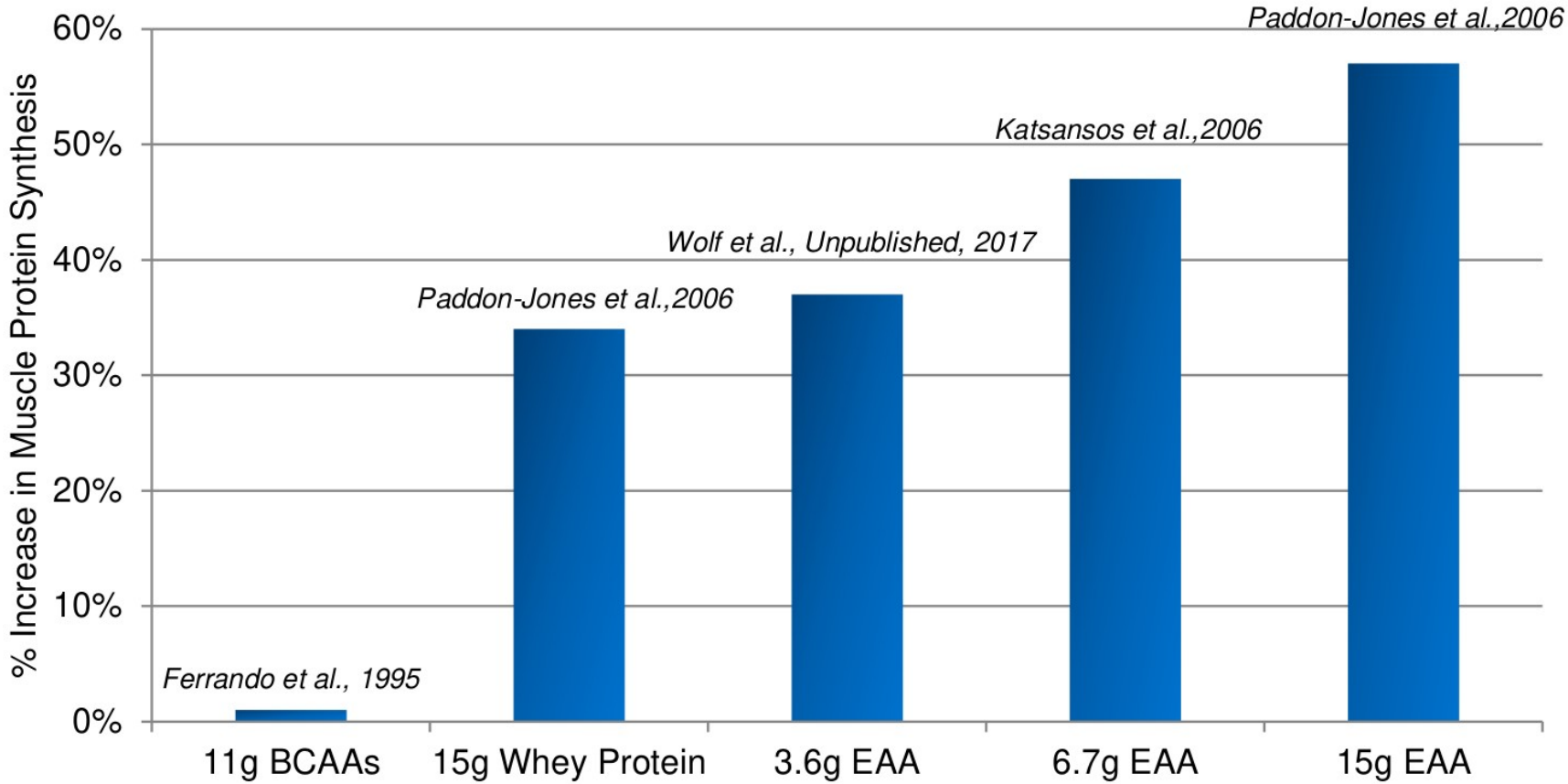


Figure 2 Prevalence of persistent COVID-19-related symptoms according to the presence of sarcopenia ($^{*}\leq 0.05$).

PMID: 35698920

Reginator Summary of Clinical Studies



Reginator contains 9 EAA + Arginine

*EAA=Essential Amino Acids

Experimental Gerontology 48 (2013) 1303–1310

Contents lists available at ScienceDirect

Experimental Gerontology

journal homepage: www.elsevier.com/locate/expgero

Effect of calcium β-hydroxy-β-methylbutyrate (CaHMB) with and without resistance training in men and women 65+ yrs: A randomized, double-blind pilot trial

Jeffrey R. Stout [a,*], Abbie E. Smith-Ryan [b], David H. Fukuda [a], Kristina L. Kendall [c], Jordan R. Moon [d], Jay R. Hoffman [a], Jacob M. Wilson [e], Jeffery S. Oliver [f], Vikkie A. Mustad [f]

[a] Institute for Exercise Physiology and Wellness Research, University of Central Florida, Orlando, FL, USA
[b] Department of Exercise and Sport Science, University of North Carolina, Chapel Hill, NC, USA
[c] Department of Health and Kinesiology, Georgia Southern University, Statesboro, GA, USA
[d] United States Sports Academy, Daphne, AL, USA
[e] Department of Exercise and Sport Science, University of Tampa, Tampa, FL, USA
[f] Abbott Nutrition, Columbus, OH, USA

Conclusion: CaHMB improved strength and MQ without RE.

demonstrated that RE significantly improved total LM (4.3%), LE60 (22.8%), LE180 (21.4%), HG (9.8%), and GUG (10.2%) with no difference between treatment groups. At week 24, only CaHMB group significantly improved FM (−3.8%) and MQ_{HG} (7.3%); however there was no treatment main effect for these variables.
Conclusion: CaHMB improved strength and MQ without RE. Further, RE is an effective intervention for improving all measures of body composition and functionality.

1. Introduction

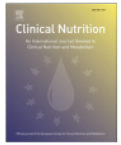
It has been reported that one in three elderly over the 65 years of age suffers a fall each year (Doherty, 2003; Pijnappels et al., 2008). Age-related muscle loss has been associated with significant reductions in strength and power, yielding an increase in fall rates and thus accidental deaths (Doherty, 2003; Marcus, 1995). With a previously estimated $18.5 billion in annual health care costs in the United States (Janssen

Clinical Nutrition 32 (2013) 704–712

Contents lists available at SciVerse ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu



Randomized control trials

Effect of β-hydroxy-β-methylbutyrate (HMB) on lean body mass during 10 days of bed rest in older adults

Nicolaas E.P. Deutz [a,*], Suzette L. Pereira [b], Nicholas P. Hays [a], Jeffery S. Oliver [b], Neile K. Edens [b], Chris M. Evans [a], Robert R. Wolfe [a]

[a] Center for Translational Research in Aging & Longevity, Donald W. Reynolds Institute on Aging, University of Arkansas for Medical Sciences

Results: With the exclusion of one subject, **treatment with HMB prevented the decline in LBM over bed rest.**

Conclusions: In healthy older adults, **HMB supplementation preserves muscle mass during 10 days of bed rest. (1.5 grams twice a day.)**

Palmitoylethanolamide (PEA)

- PEA is an endogenous endocannabinoid receptor agonist and a simple fatty acide amide.
- PEA can improve immune system function without increasing inflammation. PEA also regulates fatty acid metabolism, reduces oxidation of fats, and inhibits excessive nitric oxide.
- PEA may contribute to enhanced muscle recovery and improved cognition, mood and sleep.
- PEA may be indicated for anti-aging, immunoenhancement, brain health, allergies, and joint health.

Palmitoylethanolamide (PEA)

- PEA also affects endocannabinoid (eCB) signaling through peroxisome proliferator-activated receptor alpha (PPAR-α) activation. It does so by inducing the expression of anti-inflammatory proteins such as IκBα, which inhibits NF-κB translocation.
- PEA is widely distributed around the body appearing in the adrenal glands, diaphragm, spleen, kidney, testis, lung, liver, heart, plasma, erythrocytes, retina and heart.
- It penetrates the blood brain barrier, primarily accumulating in the hypothalamus and pituitary and presenting also in the white matter, brain stem, cerebellum and brain cortex.

Immunomodulatory

Anti-pyretic

Anti-epileptic

Antibacterial

Inhibits Mast Cell Activation

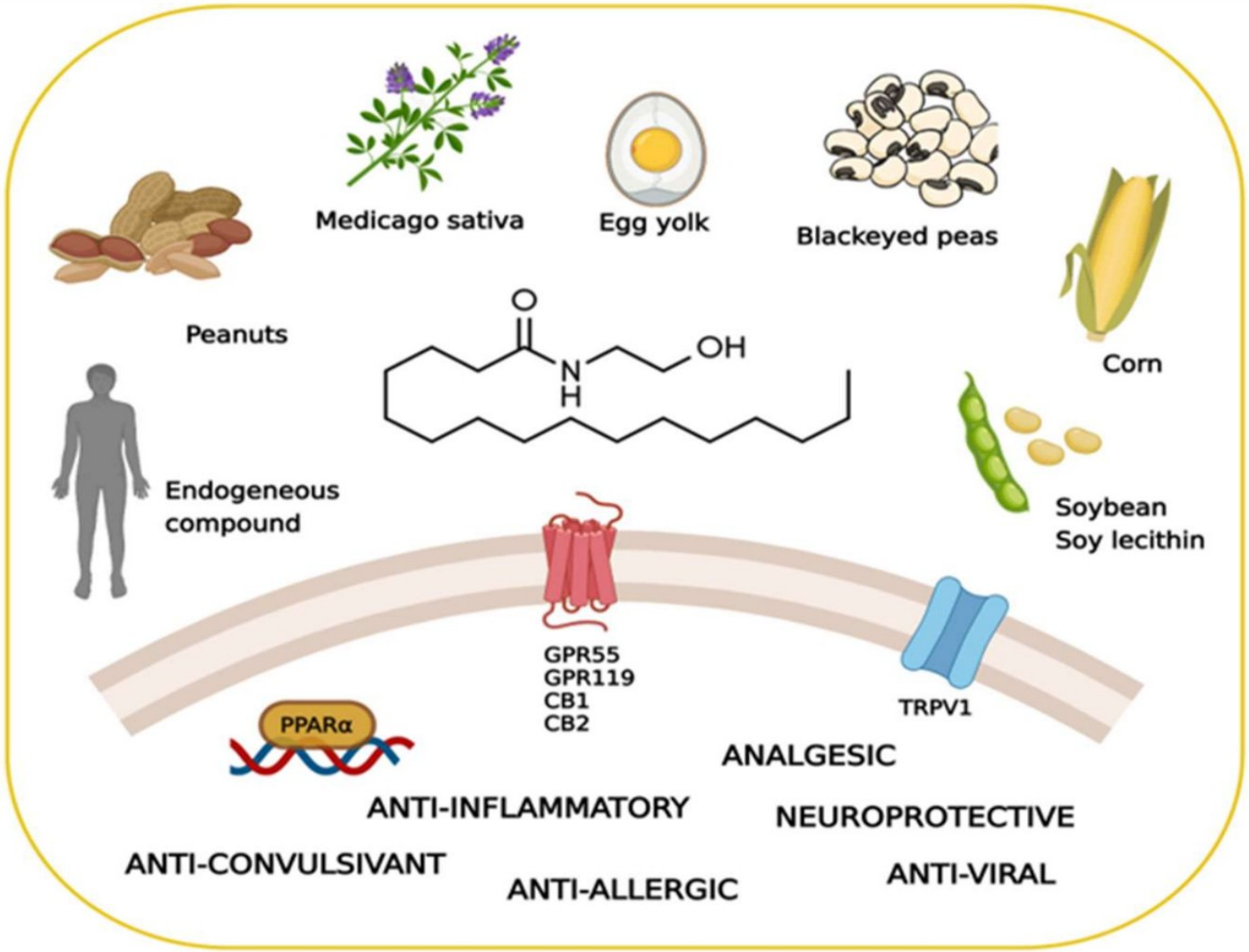


Figure 1. Key facts on palmitoylethanolamide (PEA), including its main sources, molecular targets, and effects. Created with BioRender.com (accessed on 22 July 2022).

PMID: 36139030

Research Article

iMedPub Journals
www.imedpub.com

Journal nutraceuticals and Food Science

2020
Vol.5 No.2:3

DOI: 10.36648/nutraceuticals.5.2.3

Increased Absorption of Palmitoylethanolamide Using a Novel Dispersion Technology System (LipiSperse®)

David Briskey[1,2*], Alistair R Mallard[1,2] and Amanda Rao[2]

One group consumed a single 300 mg dose of PEA together with the LipiSperse® delivery technology (commercially referred to as Levagen Plus), while the other group consumed a single 300 mg dose of unprocessed PEA. Blood samples were taken at baseline and 30, 45, 60, 70, 90, 120, 180, 240 minutes post ingestion. **The Levagen Plus formulation significantly increased plasma PEA concentration above baseline concentrations by 1.75 times that of the standard formulation** ($p<0.05$). The maximum concentration of PEA was observed at 45 minutes post ingestion. Conclusion: These results indicate that by using the LipiSperse® delivery system, PEA absorption is increased above the standard formulation.

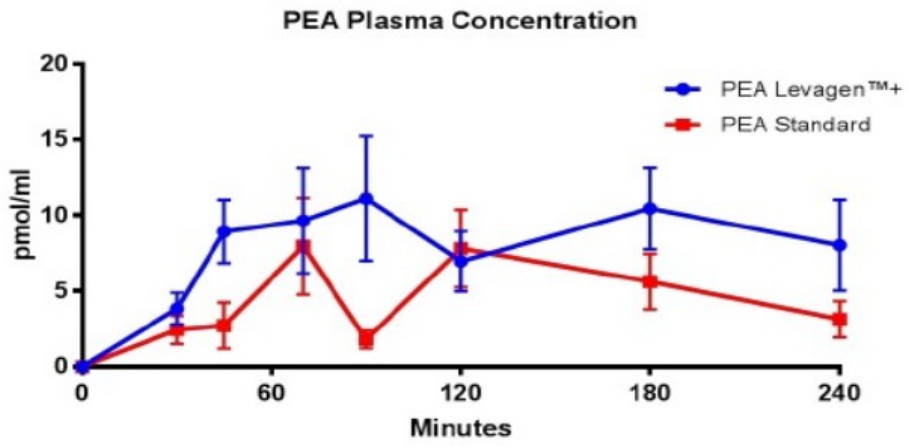


Figure 2: Plasma concentration time curves for PEA after a single 300 mg dose of the two different PEA preparations. Concentrations are expressed in pmol/mL ± SE. n=14 per group.

Contents lists available at ScienceDirect

Clinical Neurophysiology

journal homepage: www.elsevier.com/locate/clinph

Co-ultramicronized palmitoylethanolamide/luteolin normalizes $GABA_B$-ergic activity and cortical plasticity in long COVID-19 syndrome

Methods: Thirty-nine patients suffering from **persistent cognitive difficulties and fatigue after mild COVID-19 were randomly assigned to receive either PEA-LUT 700 mg + 70 mg or PLACEBO**, administered orally bid for eight weeks.

Conclusions: **Eight weeks of treatment with PEA-LUT restore GABAB activity and cortical plasticity** in long Covid patients.

medical sciences

MDPI

Article

The Use of Palmitoylethanolamide in the Treatment of Long COVID: A Real-Life Retrospective Cohort Study

Loredana Raciti [1], Rosaria De Luca [2], Gianfranco Raciti [1], Francesca Antonia Arcadi [2] and Rocco Salvatore Calabrò [2,*]

We included only long COVID patients who were treated with PEA 600 mg two times daily for about 3 months. A substantial difference in the PCFS score between the two groups at baseline and after treatment with PEA were found. Our findings encourage the use of PEA as a potentially effective therapy in patients with long COVID.

nutrients

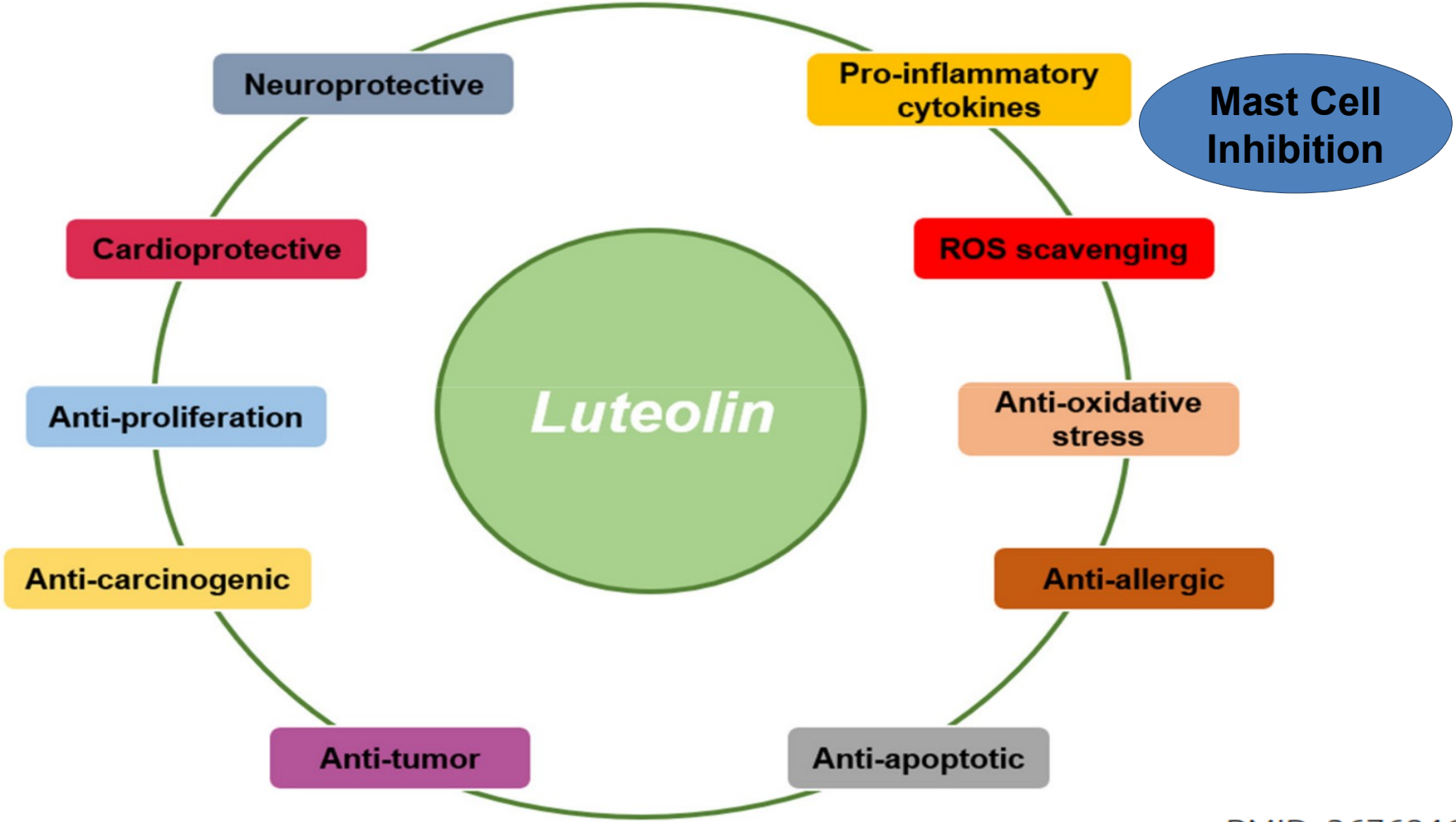
MDPI

Article

What Is the Role of Palmitoylethanolamide Co-Ultramicronized with Luteolin on the Symptomatology Reported by Patients Suffering from Long COVID? A Retrospective Analysis Performed by a Group of General Practitioners in a Real-Life Setting

Maurizio Pirro [1], Luana Ferri [1], Licia Piccioni [1], Anna Maria Bellucci [1], Federica Bartolucci [1], Arianna Russo [1], Andrea Piga [1], Paola Lucia Ciaramaglia [1], Marco Lucangeli [1], Anna Maria Russo [2], Salvatore Cuzzocrea [3] and Maurizio Evangelista [2,3,4,*]

Nine General Practitioners from the Rome area (Italy) performed a retrospective analysis in order to evaluate the role of the supplementation with Palmitoylethanolamide co-ultramicronized with Luteolin (PEALUT) on neurologic and clinical symptoms reported by their patients after COVID-19 resolution. **Supplementation with PEALUT helped to improve all patient-reported symptoms, especially pain, anxiety and depression, fatigue, brain fog, anosmia and dysgeusia, leading to an overall improvement in patients' health status.**



PMID: 36768462

biomedicines

MDPI

Review

Efficacy of Palmitoylethanolamide and Luteolin Association on Post-Covid Olfactory Dysfunction: A Systematic Review and Meta-Analysis of Clinical Studies

Anna Paola Capra [1], Alessio Ardizzone [1], Lelio Crupi [1], Fabrizio Calapai [1,2], Michela Campolo [1], Salvatore Cuzzocrea [1] and Emanuela Esposito [1,*]

PEA + Luteolin demonstrated significant efficacy in the overall recovery of the olfactory function, compared to the conventional therapy, suggesting that it could represent a possible future adjuvant treatment for PCOD. All 5 studies used 700 mg of PEA and 70 mg of Luteolin. One study showed significant improvement in brain fog.

Clinical and Experimental Medicine
https://doi.org/10.1007/s10238-022-00871-8

REVIEW ARTICLE

Check for updates

Coenzyme Q10 + alpha lipoic acid for chronic COVID syndrome

Maria Angela Barletta[1] · Gerardo Marino[1] · Barbara Spagnolo[3] · Francesco Paolo Bianchi[2] · Paola Chiara Francesca Falappone[1] · Luca Spagnolo[3] · Pietro Gatti[1]

174 patients, who had developed chronic-covid syndrome, were divided in two groups: The first one (116 patients) received coenzyme Q10 (100 mg bid + alpha lipoic acid 100 mg bid, and the second one (58 patients) did not receive any treatment. A FSS complete response was reached in 62 (53.5%) patients in treatment group and in two (3.5%) patients in control group.

A synbiotic preparation (SIM01) for post-acute COVID-19 syndrome in Hong Kong (RECOVERY): a randomised, double-blind, placebo-controlled trial

Raphaela I Lau*, Qi Su*, Ivan S F Lau, Jessica Y L Ching, Martin C S Wong, Louis H S Lau, Hein M Tun, Chris K P Mok, Steven W H Chau, Yee Kit Tse, Chun Pan Cheung, Moses K T Li, Giann T Y Yeung, Pui Kuan Cheong, Francis K L Chan†, Siew C Ng†

SIM01 (10 billion colony-forming units in sachets twice daily) or placebo orally for 6 months. At 6 months, significantly higher proportions of the SIM01 group had alleviation of fatigue, memory loss, difficulty in concentration, gastrointestinal upset, and general unwellness compared with the placebo group.

20 billion colony-forming units of three bacterial strains, B adolescentis, Bifidobacterium bifidum, and Bifidobacterium longum with three prebiotic compounds including galacto-oligosaccharides, xylo-oligosaccharides, and resistant dextrin.

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Hindawi

Research Article

Amygdala and Insula Retraining (AIR) Significantly Reduces Fatigue and Increases Energy in People with Long COVID

Results showed a significant **decrease in participants' fatigue and a significant increase in their energy after the 3-month AIR intervention**. The AIR group demonstrated a fatigue reduction effect size four times that of the active control group, and the absolute reduction in mean scores for the AIR group was more than double that of the control group. Furthermore, the AIR group showed an effect size in energy enhancement twice that of the active control group, and the absolute increase in energy mean scores for the AIR group was almost double that of the control group.

Respiratory research

BMJ Open Respiratory Research

Effect of a home-based inspiratory muscle training programme on functional capacity in postdischarged patients with long COVID: the InsCOVID trial

Patricia Palau [1], Eloy Domínguez [2], Cruz Gonzalez,[3] Elvira Bondía,[3] Cristina Albiach,[4] Clara Sastre,[5] Maria Luz Martínez,[4] Julio Núñez,[1] Laura López[6]

Twenty-six patients with long COVID and a previous admission due to SARS-CoV-2 pneumonia were randomly assigned to receive either a **12-week IMT** or usual care alone.

Conclusion: In long COVID patients with a previous admission due to SARS-CoV-2 pneumonia, **IMT was associated with marked improvement in exercise capacity and QoL.**

Pulmonary Rehab - EMST150

Inspiratory Adapter

European Review for Medical and Pharmacological Sciences 2021; 25: 5871-5875

Fatigue in post-acute sequelae of SARS-CoV2 (PASC) treated with oxygen-ozone autohemotherapy – preliminary results on 100 patients

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Results: Statistics assessed that the effects of O2-O3-AHT on **fatigue reduced PASC symptoms by 67%.** Patients following O2-O3-AHT therapy, quite completely recovered for PASC-associated fatigue, a quote amounting to about two fifths (around 40%) of the whole cohort undergoing ozone treatment and despite most of patients were female subjects, the effect was not influenced by sex distribution.

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scientific reports

OPEN

Hyperbaric oxygen therapy improves neurocognitive functions and symptoms of post-COVID condition: randomized controlled trial

Seventy-three patients were randomized to receive daily **40 session of HBOT** or sham. Following HBOT, there was a significant group-by-time interaction in **global cognitive function, attention and executive function**. Significant improvement was also demonstrated in the **energy domain, sleep, psychiatric symptoms, and pain interference**. Clinical outcomes were associated with significant **improvement in brain MRI perfusion** and microstructural changes in the supramarginal gyrus, left supplementary motor area, right insula, left frontal precentral gyrus, right middle frontal gyrus, and superior corona radiate. These results indicate that HBOT can **induce neuroplasticity** and improve cognitive, psychiatric, fatigue, sleep and pain symptoms of patients suffering from post-COVID-19 condition.

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Antihistamines improve cardiovascular manifestations and other symptoms of long-COVID attributed to mast cell activation

Fabrizio Salvucci[1], Roberto Codella[2], Adriana Coppola[3],

Methods: In all, 14 patients and 13 controls with long-COVID symptoms attributed to MCA were evaluated. Patients were treated with **fexofenadine (180 mg/day) before dinner and famotidine (40 mg/day) before bed.**

Results: Long-COVID **symptoms disappeared completely in 29% of treated patients**. There was a **significant improvement in each of the considered symptoms (improved or disappeared) in all treated patients**, and the improvement grade was significantly greater in treated patients compared to controls.

Conclusions: Our data confirm that **histamine receptors blockade may be an effective target to successfully treat long-COVID.** Our finding supports the underlying role of MCA in the pathophysiology of long-COVID.

Original research

OPEN ACCESS

Long COVID following mild SARS-CoV-2 infection: characteristic T cell alterations and response to antihistamines

Paul Glynne,[1] Natasha Tahmasebi,[2] Vanya Gant,[3] Rajeev Gupta [4,5]

All patients were offered empiric treatment trials with a combination of H1 blockers loratadine (Claritin) 10 mg two times per day or fexofenadine (Allegra) 180 mg two times per day and H2 blocker famotidine (Pepcid) 40 mg once daily or nizatidine 300 mg once daily for a minimum of 4 weeks as part of their ongoing care.

72% of patients with long COVID who received HRA reported clinical improvement. All symptoms improved except dysautonomia.

expression on central memory (CM) cells, whereas the asymptomatic participants had reduced CD8+ EM cells only and increased CD28 expression on CM

analysis of T cells from patients with long COVID may provide further insights into the pathogenesis of this and perhaps other

Antihistamines

- H1 receptor blockade:
- Loratadine (Claritin): Start with 10 mg before bed for three days. If no improvement, 10 mg in the AM and 10 mg before bed.
- Fexofenadine (Allegra): Same protocol as above with 180 mg tablets.
- Cetirizine (Zyrtec): Same protocol as above with 10 mg tablets.
- Diphenhyrdramine (Benadryl): High probability of drowsiness. 25-50 mg before bed.
- Ketotifen 0.5-1 mg qd or bid. Hypnotic effect so take before bed.
- H2 receptor blockade:
- Famotidine (Pepcid): 20-40 mg before bed or 20-40 mg twice a day on emtpy stomach.

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Low-dose naltrexone and NAD+ for the treatment of patients with persistent fatigue symptoms after COVID-19

Anar Isman [a], Andy Nyquist [a,*], Bailey Strecker [a], Girish Harinath [a], Virginia Lee [a], Xingyu Zhang [b], Sajad Zalzala [a]

In this pilot study, we assessed whether treatment with low-dose naltrexone (LDN, 4.5 mg/day) and supplementation with NAD + through iontophoresis patches could improve fatigue symptoms and quality of life in 36 patients with persistent moderate/severe fatigue after COVID-19. We detected a significant increase from baseline in SF-36 survey scores after 12 weeks of treatment, suggestive of improvement of quality of life. Furthermore, participants scored significantly lower on the Chalder fatigue scale after 12 weeks of treatment

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Stem Cell Research & Therapy

RESEARCH Open Access

Adipose-derived, autologous mesenchymal stem cell therapy for patients with post-COVID-19 syndrome: an intermediate-size expanded access program

Ridhima Vij[1*], Hosu Kim[2], Hyeonggeun Park[2], Thanh Cheng[1], Djamchid Lotfi[1] and Donna Chang[1,2]

Ten eligible subjects with post-COVID-19 syndrome were enrolled in the program for a duration of 40 weeks who received 5 intravenous infusions of 200 million autologous HB-adMSCs each at week 0, 2, 6, 10 and 14 with a follow-up at week 18 and end of the study at week 40.

The results of the expanded access program indicated that treatment with autologous HB-adMSCs resulted in significant improvements in the signs and symptoms associated with post-COVID-19 syndrome as assessed by VAS and FAS scores. Additionally, improvements in the patients' quality-of-life as demonstrated using SF-36 scores that also showed significant improvements in individual scaled scores.

Long COVID Core Protocol

- PEA + Luteolin: PEA 600 mg + Luteolin 100 mg bid
- **Microcirculation Trio:**
- **Gingko Biloba 120 mg bid**
- **Mango extract 100 mg bid**
- **Grape Seed Extract 100 mg bid**
- Cordyceps 1,000 mg tid
- Reginator Amino Acid Blend + HMB for sarcopenia.
- Black Cumin Seed Oil Softgels 1,000-3,000 mg/day in 2-3 divided doses.
- Probiotics and prebiotics
- Magnesium-l-threonate 144 mg/day
- Cod Liver Oil 1-2 tsp or 3-6 softgels/day
- Vitamin D+K 5-10,000 IU/day
- Melatonin 3 mg
- CoQ10 (Ubiquinol) 100 mg bid
- Alpha Lipoic Acid 300 mg bid
- NAC 700 mg tid
- Nattokinase (NSK-SD) 100-200 mg bid

Viral Persistence

- Herbal antibiotic blend (wormwood, olive leaf, berberine, thyme, neem, clove, black walnut, oregon grape, myrrh)
- **2 tid days 1-4**.
- Anti-viral/Immune support herbal blend (echinacea, andrographis, olive leaf, astragalus, goldenseal, oregon grape, shisandra, amla, lysine)
- **2 tid days 5-14**.
- or
- Ivermectin

Long COVID Protocol

- Low-Histamine, anti-inflammatory diet
- Intermittent fasting - autophagy
- Microcirculation strategies
- NIBS
- Limbic System Retraining – Gupta Program
- LDN 3-4.5 mg/day
- Methylene blue, 25 to 50 mg two or three times daily
- Ozone autohemotherapy followed by 25-100 grams of vitamin C
- Tai Chi, Yoga, mental and physical pacing
- Mindfulness meditation
- Whole body vibration therapy
- Hyperbaric Oxygen Therapy
- Forest bathing
- Acceptance and commitment therapy
- Photobiomodulation
- Stem cells/Exosomes
- H1 and H2 histamine receptor blockade

Questions?

Email me for full Long COVID protocol:
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