Supporting the Oral, Nasal and Gut Microbiome

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Personalised Nutrition

Disclaimer

The information provided in this presentation is for information purposes only based on my own clinical experience, They are not designed to diagnose, treat or cure any condition, or replace the advice of your medical healthcare team.

Always be sure to talk with your licensed medical provider or suitably qualified health professional before undertaking any changes to your diet or supplement regime.

Supplements (and some foods) can interact with medication and you must check for drug / nutrient interactions before taking any kind of supplement or making any significant dietary changes.

Why are the microbiomes important

and why you need to focus on maintaining and protecting them

IMMUNITY

Participates in bolstering the immune system's resilience and functionality

BARRIER

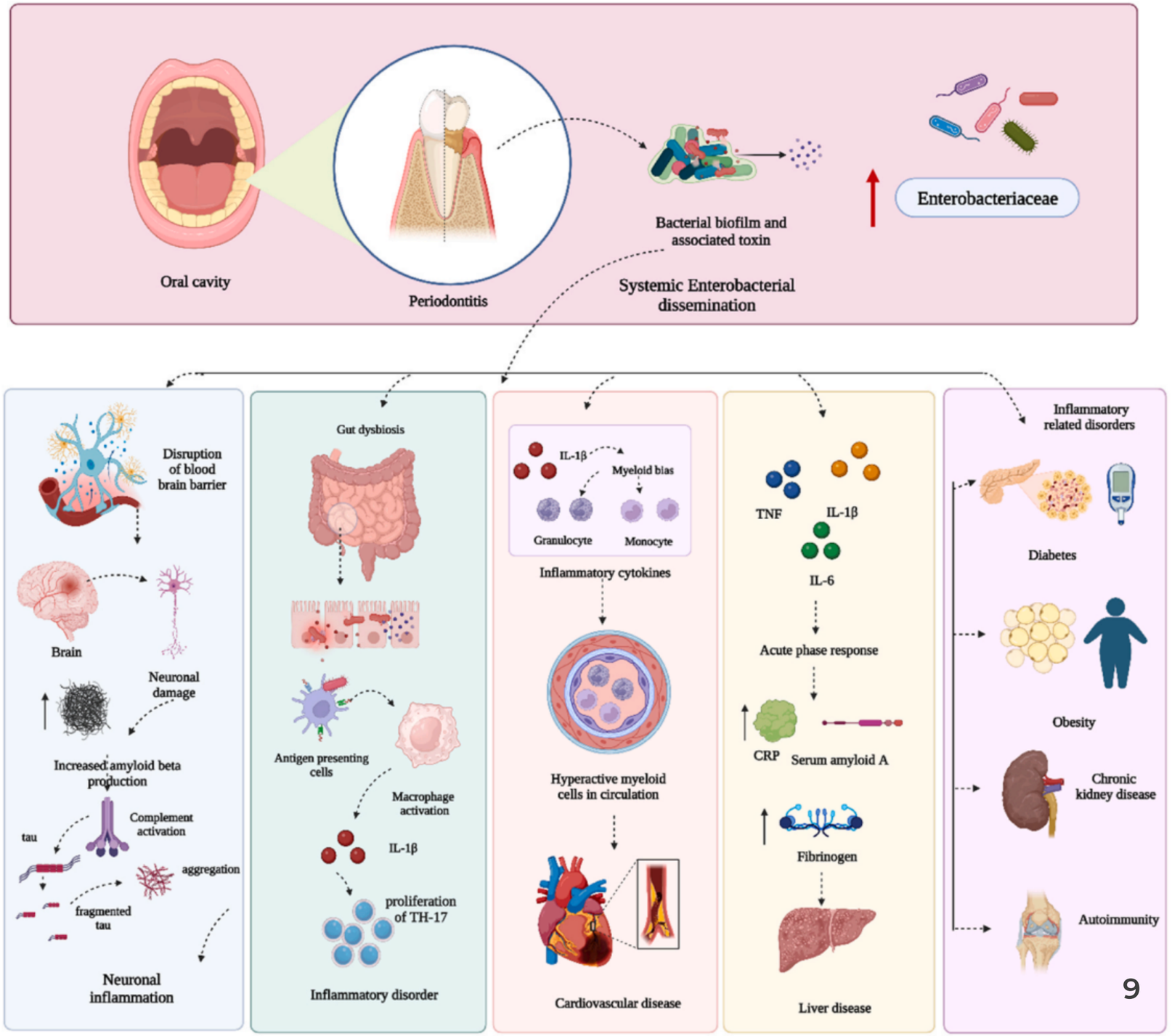
Helps protect the barrier membranes and defend against foreign invaders

METABOLITES

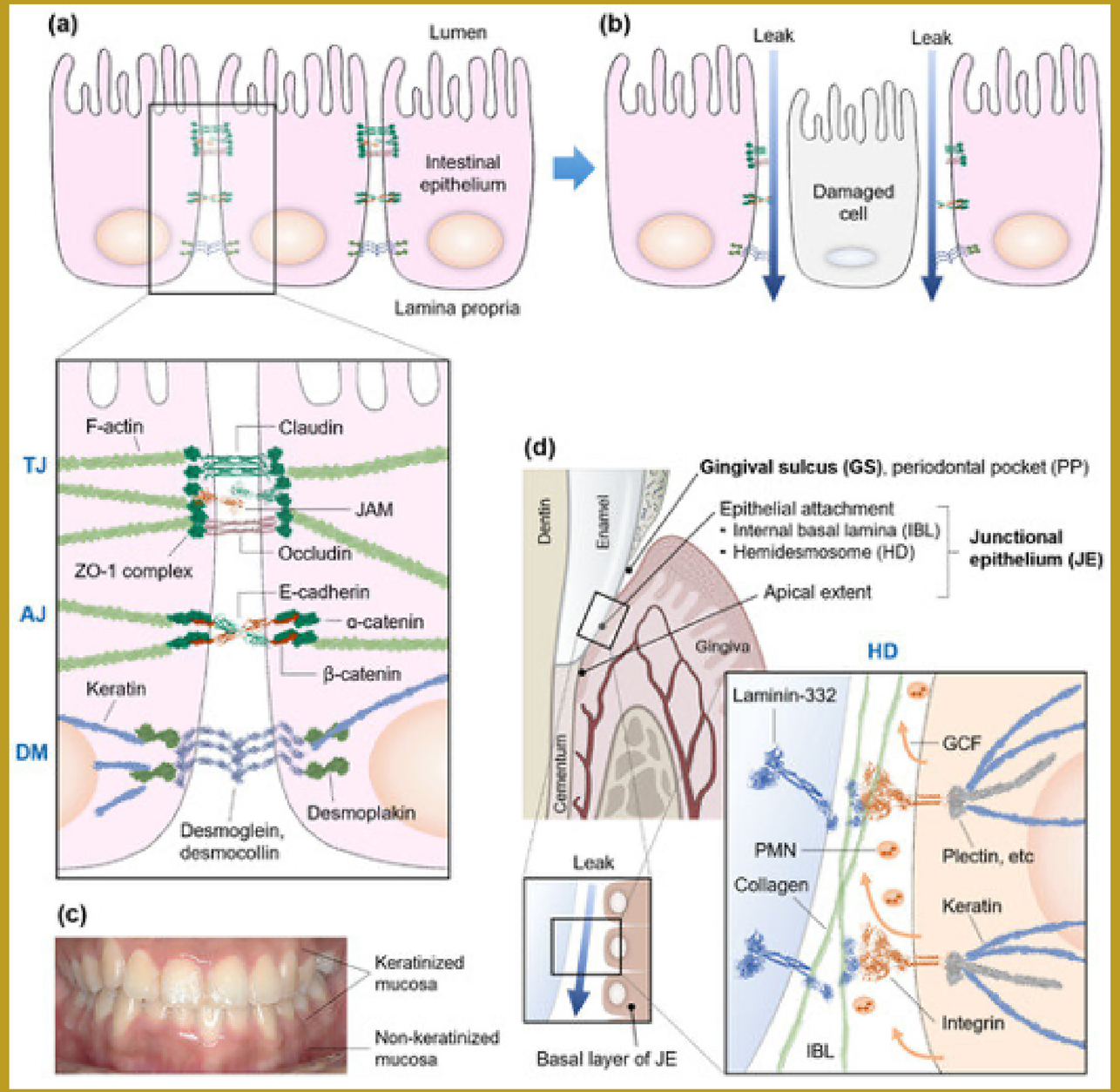
Produces molecules that communicate with the rest of the body

Lambring CB, Siraj S, Patel K, Sankpal UT, Mathew S, Basha R. Impact of the Microbiome on the Immune System. Crit Rev Immunol. 2019;39(5):313-328. doi: 10.1615/CritRevImmunol.2019033233. PMID: 32422014; PMCID: PMC7362776.

Oral Microbiome and Inflammation



The "Leaky" Oral Cavity



Park, D.Y., Park, J.Y., Lee, D., Hwang, I. and Kim, H., 2022. Leaky Gum: The Revisited Origin of Systemic Diseases. Cells 2022, Vol. 11, Page 1079, [online] 11(7), p.1079.

RESEARCH

"Compared to control, patient saliva exhibited significantly reduced anti-candida efficacy. Although speculative, based on history and salivary analysis we hypothesise that salivary histatin-5 production may be compromised due to SARS-CoV-2 mediated salivary gland destruction"

Alfaifi A., Sultan AS., et al., Long-Term Post-COVID-19 Associated Oral Inflammatory Sequelae. Front Cell Infect Microbiol. 2022 Mar 2;12:831744

BRIEF RESEARCH REPORT article

Front. Cell. Infect. Microbiol., 02 March 2022
Sec. Microbes and Innate Immunity
Volume 12 - 2022 | https://doi.org/10.3389/fcimb.2022.831744

Long-Term Post-COVID-19 Associated Oral Inflammatory Sequelae

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Timothy F. Meiller[1,3] Mary Ann Jabra-Rizk[1,4*]

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[2] Department of Restorative and Prosthetic Dental Sciences, College of Dentistry King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia
[3] Greenebaum Cancer Center, University of Maryland, Baltimore, MD, United States
[4] Department of Microbiology and Immunology, School of Medicine, University of Maryland, Baltimore, MD, United States

RESEARCH

"The oral microbiome of patients with prolonged symptoms falling under the ongoing symptomatic COVID-19 or long COVID states demonstrated a dysbiotic pattern of increased pathobionts, an increase in inflammation-inducing and LPS-producing microbiota, and a reduction of metabolic pathways known to have anti-inflammatory properties"

Haran, J.P., Bradley, E., et al., 2021. Inflammation-type dysbiosis of the oral microbiome associates with the duration of COVID-19 symptoms and long COVID. JCI Insight, 6(20).

Inflammation-type dysbiosis of the oral microbiome associates with the duration of COVID-19 symptoms and long COVID

John P. Haran,[1,2,3] Evan Bradley,[1,3] Abigail L. Zeamer,[2,3] Lindsey Cincotta,[1] Marie-Claire Salive,[1] Protiva Dutta,[1] Shafik Mutaawe,[1] Otuwe Anya,[1] Mario Meza-Segura,[2] Ann M. Moormann,[4] Doyle V. Ward,[2,3] Beth A. McCormick,[2,3] and Vanni Bucci[2,3]

Authorship note: JPH and EB contributed equally to this work and are co–first authors. JPH and VB are co–senior authors.

Published August 17, 2021 - More info

View PDF

KEY CONCEPT

"Medical and holistic practitioners must consider the 'oral microbiome virus-host interaction' and understand systemic disorders are influenced by the oral microbiota"

Alghamdi Samar. The Relationship between Oral Microbiome and SARS-CoV-2. Journal of pharmaceutical research international. 2021 33(61A):73-87

The Relationship between Oral Microbiome and SARS-CoV-2

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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Applied interventions

Regular dental and hygienist checks

To address pathogenic microbes, plaque build up and gum disease

Watch traditional antiseptics

Long term antiseptic mouthwashes and toothpaste can destroy the beneficial flora

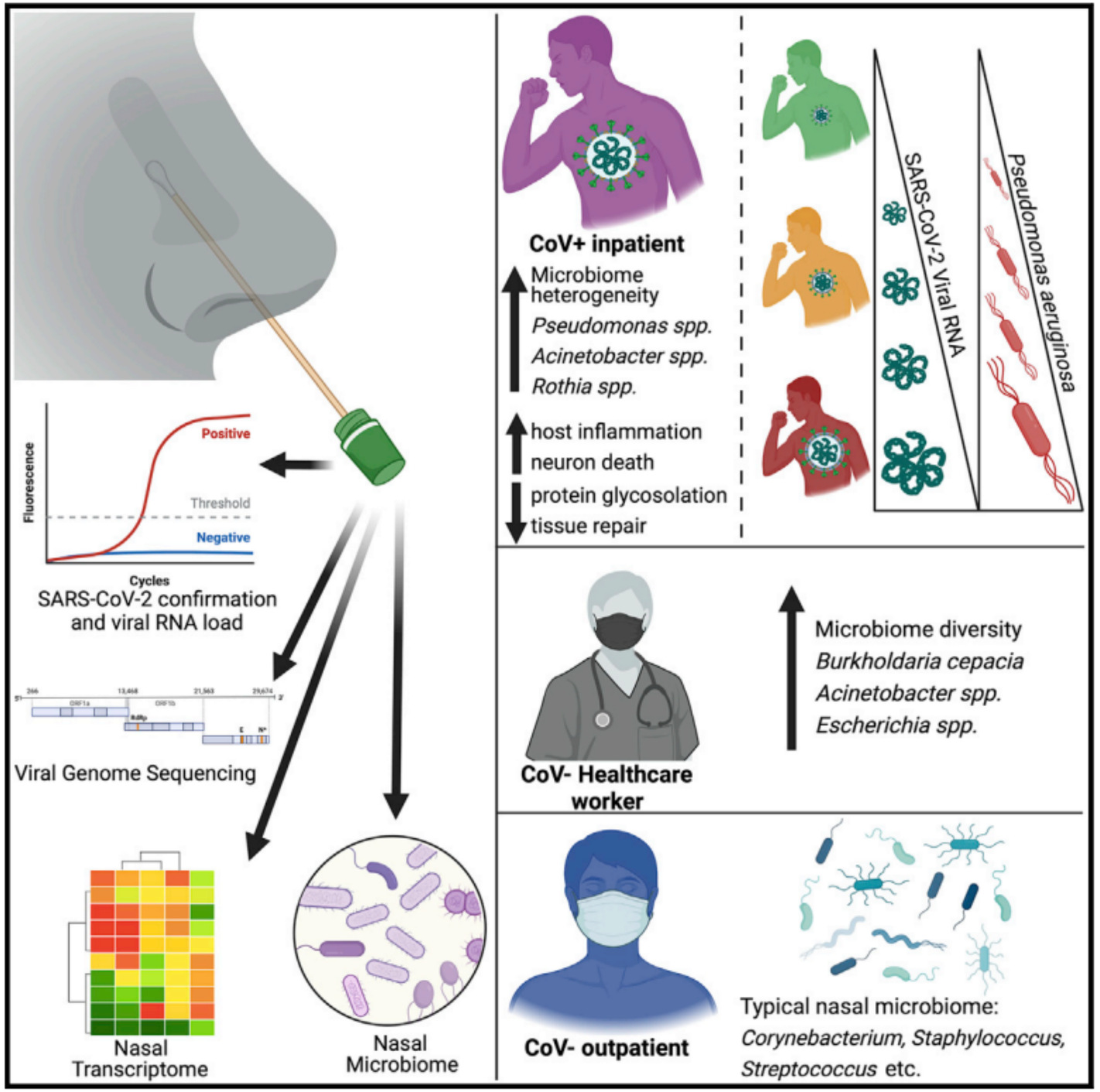
Address the oral microbiome

Use probiotic mouth rinses with gentle and targeted antimicrobials

Adopt simple oral hygine interventions

Follow our simple and effective natural oral health care routine

The Nasal Microbiome



Rhoades NS, Pinski AN, Monsibais AN, Jankeel A, Doratt BM, Cinco IR, Ibraim I, Messaoudi I. Acute SARS-CoV-2 infection is associated with an increased abundance of bacterial pathogens, including Pseudomonas aeruginosa in the nose. Cell Rep. 2021 Aug 31;36(9):109637. doi: 10.1016/j.celrep.2021.109637. Epub 2021 Aug 13

RESEARCH

"This data suggests that the inflammatory response caused by SARS-CoV-2 infection is associated with an increased abundance of bacterial pathogens in the nasal cavity that could contribute to increased incidence of secondary bacterial infections"

Cell Rep. 2021 Aug 31; 36(9): 109637.
Published online 2021 Aug 13. doi: 10.1016/j.celrep.2021.109637
PMCID: PMC8361213
PMID: 34433082

Acute SARS-CoV-2 infection is associated with an increased abundance of bacterial pathogens, including *Pseudomonas aeruginosa* in the nose

Nicholas S. Rhoades,[1] Amanda N. Pinski,[1] Alisha N. Monsibais,[1] Allen Jankeel,[1] Brianna M. Doratt,[1] Isaac R. Cinco,[1] Izabela Ibraim,[1] and Ilhem Messaoudi[1,2,*]

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Previous version available: This article is based on a previously available preprint posted on *bioRxiv* on May 20, 2021: " Acute SARS-CoV-2 infection is associated with an expansion of bacteria pathogens in the nose including *Pseudomonas Aeruginosa* ".

Rhoades NS, Pinski AN, Monsibais AN, Jankeel A, Doratt BM, Cinco IR, Ibraim I, Messaoudi I. Acute SARS-CoV-2 infection is associated with an increased abundance of bacterial pathogens, including Pseudomonas aeruginosa in the nose. Cell Rep. 2021 Aug 31;36(9):109637. doi: 10.1016/j.celrep.2021.109637. Epub 2021 Aug 13

RESEARCH

"The differentiated nasal organoids adequately recapitulated the higher infectivity and replicative fitness of SARS-CoV-2 emerging variants than the ancestral strain and revealed viral pathogenesis such as ciliary damage and tight junction disruption"

Man Chun Chiu, Cun Li, Et al., Human Nasal Organoids Model SARS-CoV-2 Upper Respiratory Infection and Recapitulate the Differential Infectivity of Emerging Variants
Volume 13 • Number 4 • 30 August 2022

RESEARCH ARTICLE
July/August 2022 Volume 13 Issue 4 e01944-22
https://doi.org/10.1128/mbio.01944-22

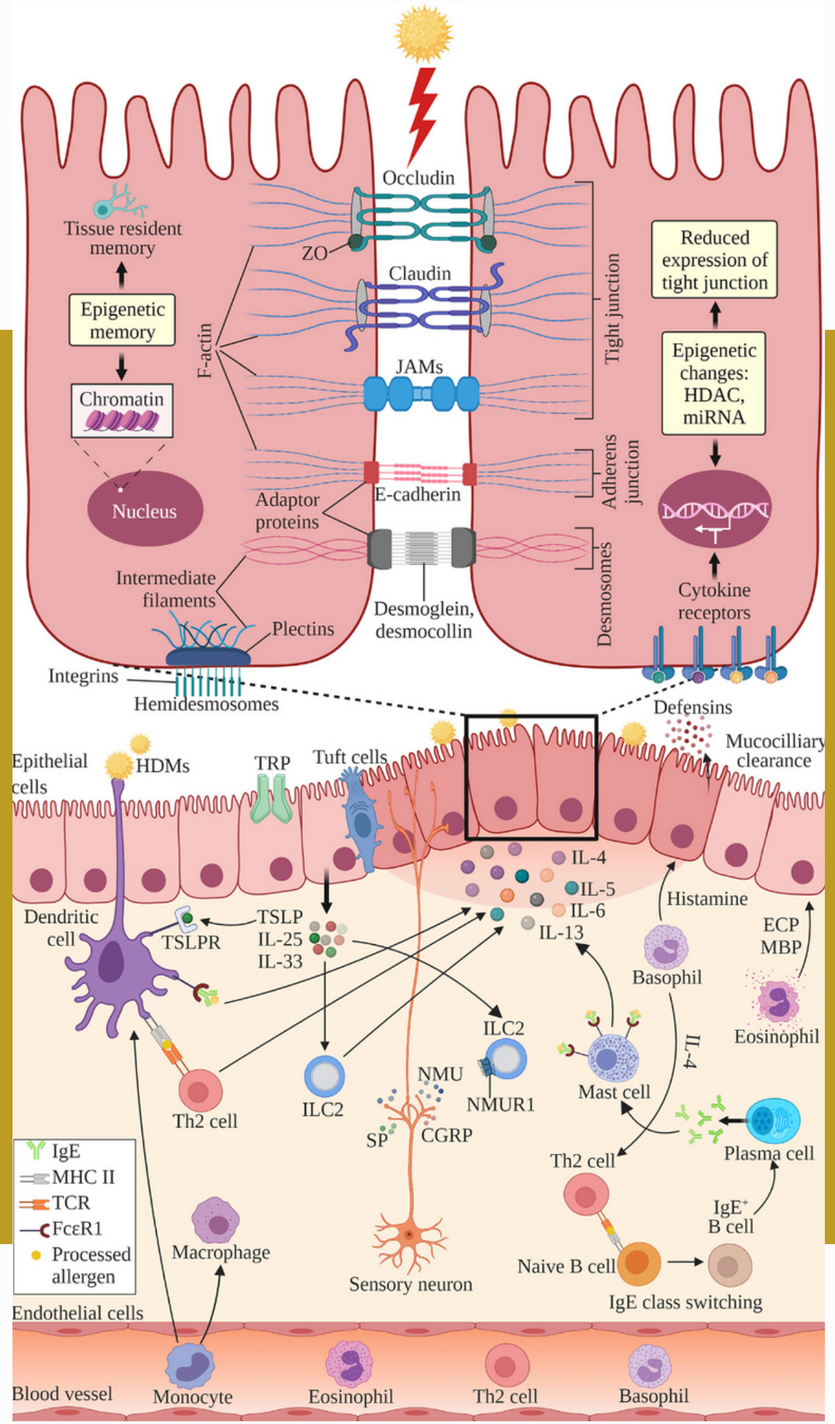
Human Nasal Organoids Model SARS-CoV-2 Upper Respiratory Infection and Recapitulate the Differential Infectivity of Emerging Variants

Man Chun Chiu[a], Cun Li[a], Xiaojuan Liu[a], Wenjun Song[b], Zhixin Wan[a], Yifei Yu[a], Jingjing Huang[a], Ding Xiao[a], Hin Chu[a,c,d], Jian-Piao Cai[a], Kelvin Kai-Wang To[a,c,d,e], Kwok Yung Yuen[a,c,d,e], Jie Zhou[a,c,d]

RESEARCH

"This paper discusses how disruption of tight junction proteins in nasal epithelial cells contributes to increased permeability and allergen exposure in allergic rhinitis patients. It reviews the mechanisms causing this disruption, including cytokines, epithelial interactions with immune cells, and environmental factors"

Citation: Nur Husna SM, Tan H-TT, Md Shukri N, Mohd Ashari NS and Wong KK (2021) Nasal Epithelial Barrier Integrity and Tight Junctions Disruption in Allergic Rhinitis: Overview and Pathogenic Insights. Front. Immunol. 12:663626. doi: 10.3389/fimmu.2021.663626



RESEARCH

"The data suggest that nasal bacterial diversity could be influenced by both health status and living environment. Our results therefore highlight the importance of the indoor environment for Health Care Institute residents"

Chen, CH., Liou, ML., Lee, CY. et al. Diversity of nasal microbiota and its interaction with surface microbiota among residents in healthcare institutes. Sci Rep 9, 6175 (2019). https://doi.org/10.1038/s41598-019-42548-5

Article | Open Access | Published: 16 April 2019

Diversity of nasal microbiota and its interaction with surface microbiota among residents in healthcare institutes

Chang-Hua Chen, Ming-Li Liou, Cheng-Yang Lee, Ming-Chuan Chang, Han-Yueh Kuo & Tzu-Hao Chang

Scientific Reports **9**, Article number: 6175 (2019) | Cite this article

RESEARCH

Lazarini, F., Roze, E., et al., 2022. The microbiome–nose–brain axis in health and disease. Trends in Neurosciences, 45(10), pp.718–721

Candel, S., Tyrkalska, et al., 2023. The nasopharyngeal microbiome in COVID-19. Emerging Microbes & Infections. 2165970

Thangaleela, S., Sivamaruthi, B.S., et al., 2022. Nasal Microbiota, Olfactory Health, Neurological Disorders and Aging;A Review. Microorganisms. Vol. 10, Page 1405, 10(7), p.1405

Guauthia N., et al. Alterations in the nasopharyngeal microbiome associated with SARS-CoV-2 infection status and disease severity. PLOS ONE. Oct 2023. 17(10):10

Giugliano, R., Sellitto, A., et al., 2022. NGS analysis of nasopharyngeal microbiota in SARS-CoV-2 positive patients during the first year of the pandemic in the Campania Region of Italy. Microbial Pathogenesis, 165, p.105506

KEY CONCEPT

"Emerging evidence suggests SARS-CoV-2 may effect the nasal microbiome, impair tight junctions, and provoke inflammatory pathways implicated in neurodegeneration. Environmental allergens could potentially exacerbate these effects by further disrupting nasal epithelial barrier integrity"

http://anatomy.kmu.edu.tw/BlockHis/Block4/slides/block9_07.html

PCE: pseudostratified columnar ciliated epithelium
V: venules
LP: lamina propria
G: glands

Fig 2. Nasal mucosa (93W4847)

Applied interventions

Saline solution rinsing

Especially if one is sensitive to pollen, dust and mold, this will help clear out irritants without disrupting the microbial balance

Avoid harsh antiseptics

Some nasal sprays used long term may further contribute to the disruption of the nasal biome

Reduce allergen exposure

Think dust mites, mold, pollen and pollution

Nasal Resilience

Vedicinals Neuro and Enovid

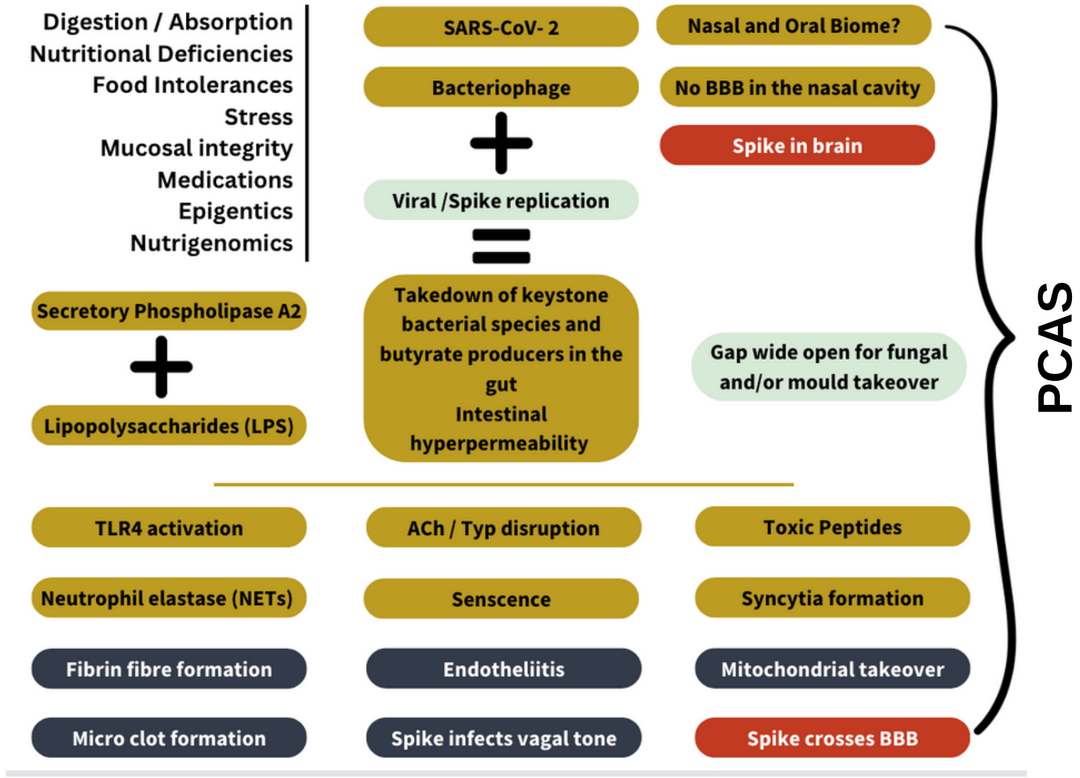
Farrell, N.F., Klatt-Cromwell, C. and Schneider, J.S., 2020. Benefits and Safety of Nasal Saline Irrigations in a Pandemic—Washing COVID-19 Away. JAMA Otolaryngology–Head & Neck Surgery,146(9), pp.787–788.

Lazarini, F., Roze, E., Lannuzel, A. and Lledo, P.M., 2022. The microbiome–nose–brain axis in health and disease. Trends in Neurosciences,45(10), pp.718–721.

The Gut Microbiome

Key facts (Research and in-clinic findings):

- A decline in Bifidobacteria and or Lactobacillus Spp.
- A decline of Akkermanisa Muciniphila
- Increased fungal colonisation Candida / Aspergillus Spp.
- Increased acetate and decreased butyrate
- Bacteriophage activity



Yamamoto, S., Saito, M., et al., 2021. The human microbiome and COVID-19: A systematic review. PLOS ONE,16(6), p.e0253293.

Meringer, H. and Mehandru, S., 2022. Gastrointestinal post-acute COVID-19 syndrome. Nature Reviews Gastroenterology and Hepatology, 19(6), pp.345–346.

Clerbaux, L.A., Mayasich, et al., 2022. Gut as an Alternative Entry Route for SARS-CoV-2: Current Evidence and Uncertainties of Productive Enteric Infection in COVID-19. Journal of Clinical Medicine 2022, Vol. 11, Page 5691, 11(19), p.5691.

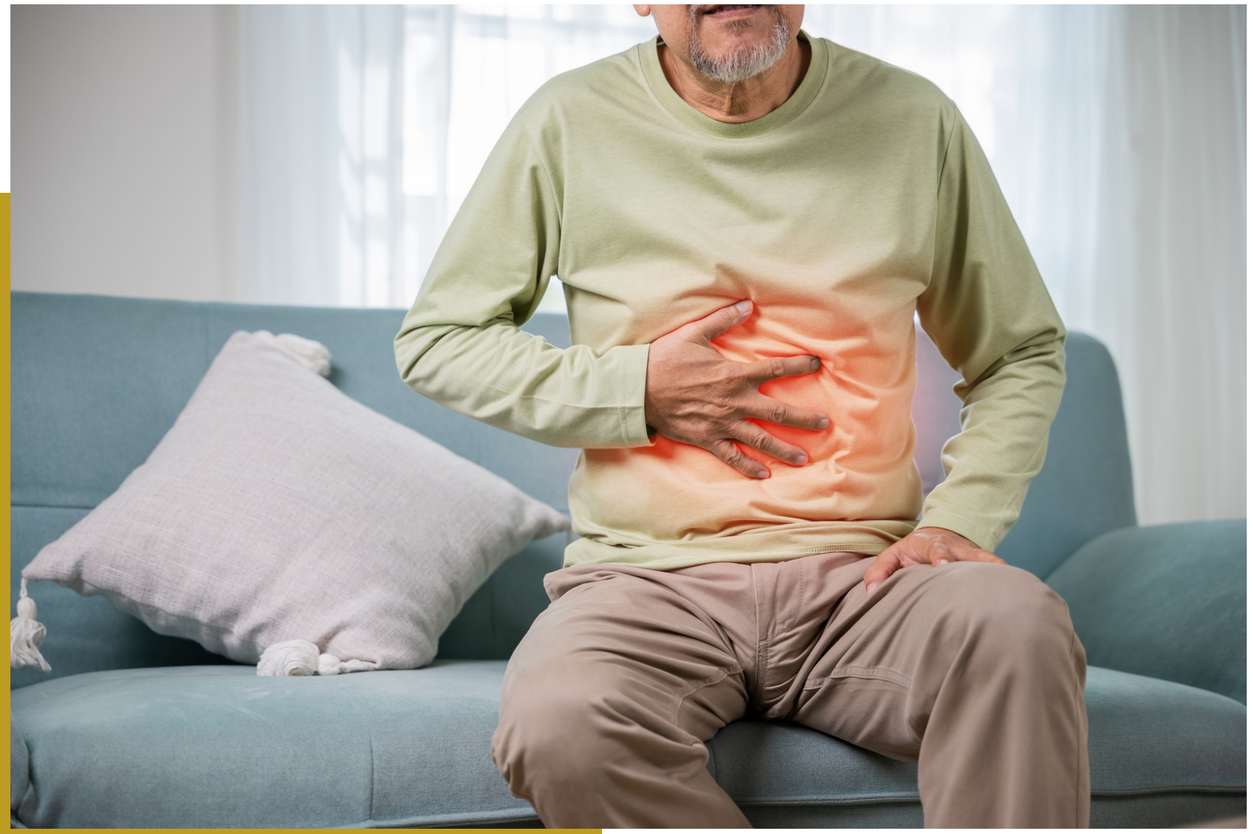
Brogna, C., Brogna, B.,et al., 2022. Could SARS-CoV-2 Have Bacteriophage Behavior or Induce the Activity of Other Bacteriophages? Vaccines, 10(5)..

Hoenigl, M., Seidel, D., et al., 2022. COVID-19-associated fungal infections. Nat. Microbiol., 7(8), pp.1127–1140.

Lionakis, M.S., Drummond, R.A. and Hohl, T.M., 2023. Immune responses to human fungal pathogens and therapeutic prospects. Nature Reviews Immunology 2023, pp.1–20.

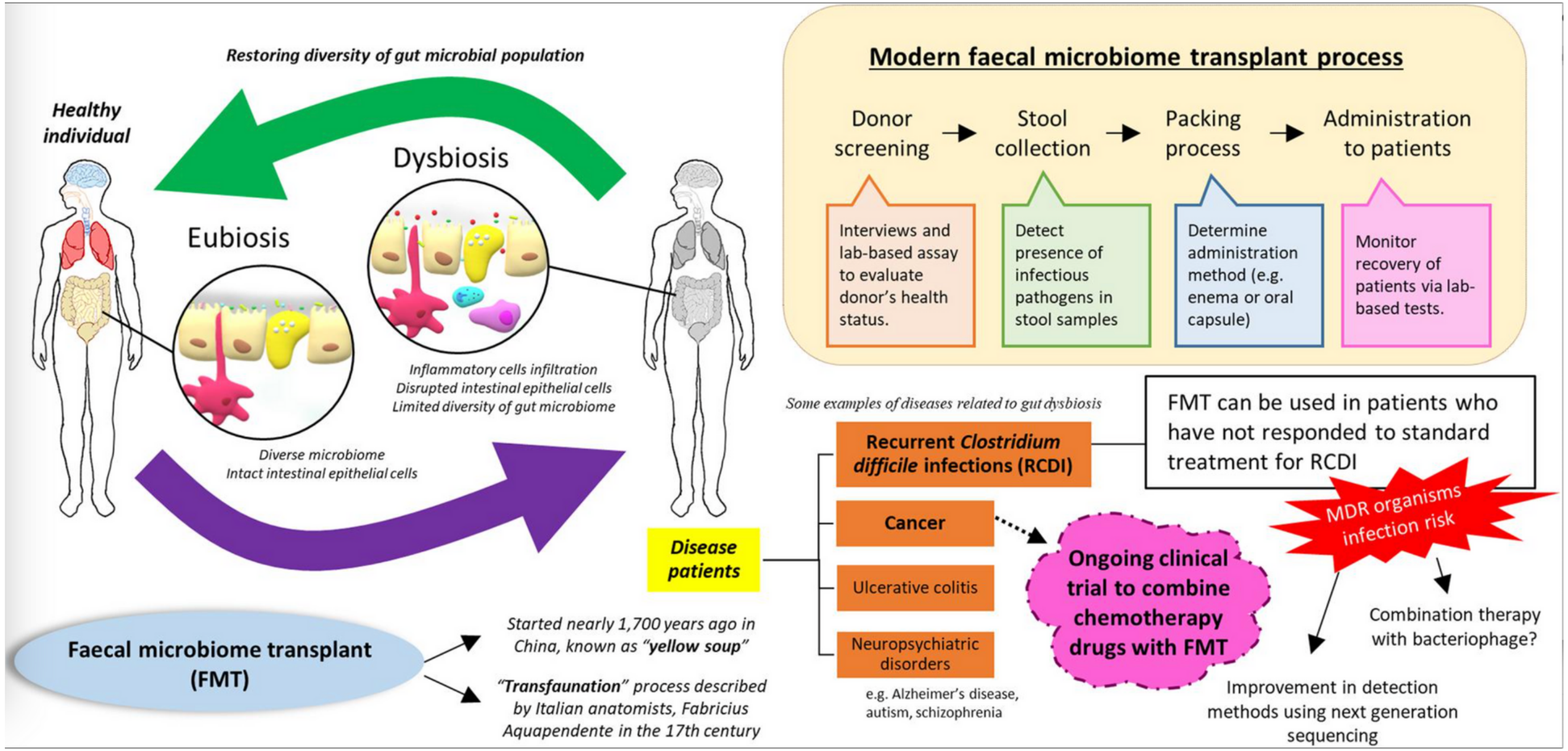
KEY CONCEPT

"The unfolding interplay of epigenetic and immune forces placed upon the gut microbiome may provide the perfect environment for the emergence of novel intestinal flora to take over with unknown consequences"



WE KNOW NOTHING - THE RESEARCH HAS ONLY JUST STARTED

Questions on efficacy and longevity of FMT



Applied interventions

MICROBIOME ROADMAP

INITIAL INTERVENTIONS

1

Address oral health

May include:

- Implementing simple oral hygiene practices
- Avoiding harsh mouthwashes and toothpastes
- Keeping up to date with your dental and hygienist appointments
- Supplementing if necessary

2

Address nasal health

May Include:

- Implementing simple nasal hygiene practices
- Addressing your environment and in particular get rid of any mold that is in your home, car or office space
- Supplementation if necessary

3

Address gut health

May Include:

- Addressing the diet
- Addressing oral and nasal health
- Addressing stress
- Including supplements if necessary

4

Polyphenol rich diet with cyclical carbs & fats IF

May Include:

- Eating polyphenol rich foods daily
- Consuming resistant starches regularly
- Cycling higher carb days with higher fat days that include intermittent fasting

Connect with me

Thank you

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