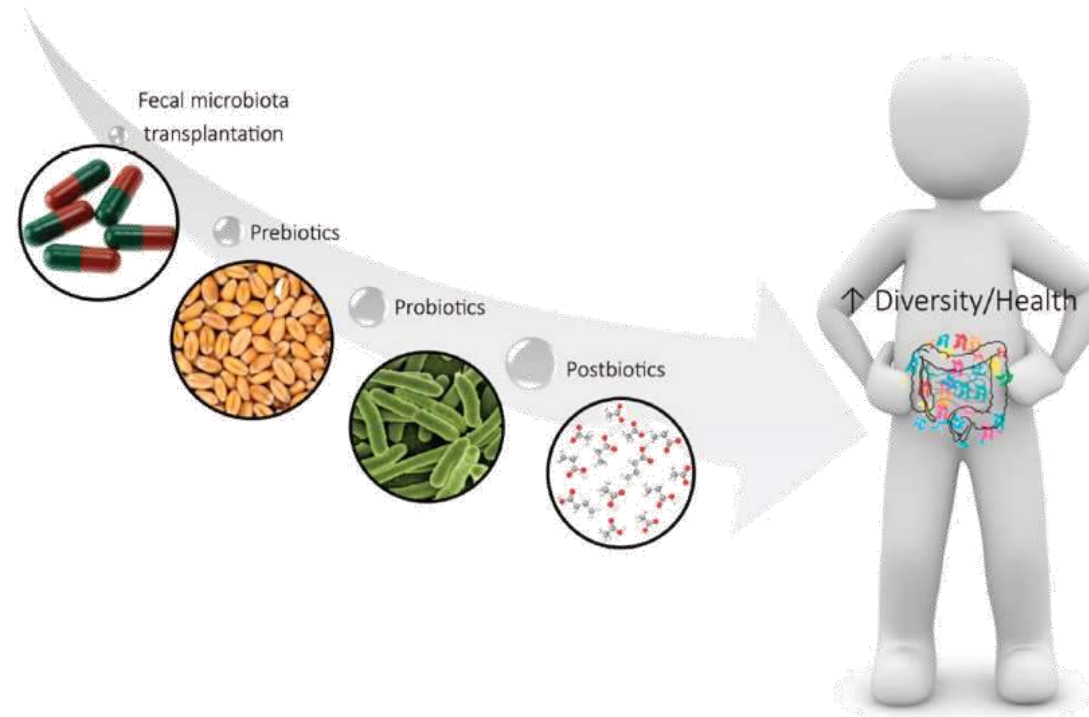


Strategie di modulazione del Microbiota Umano

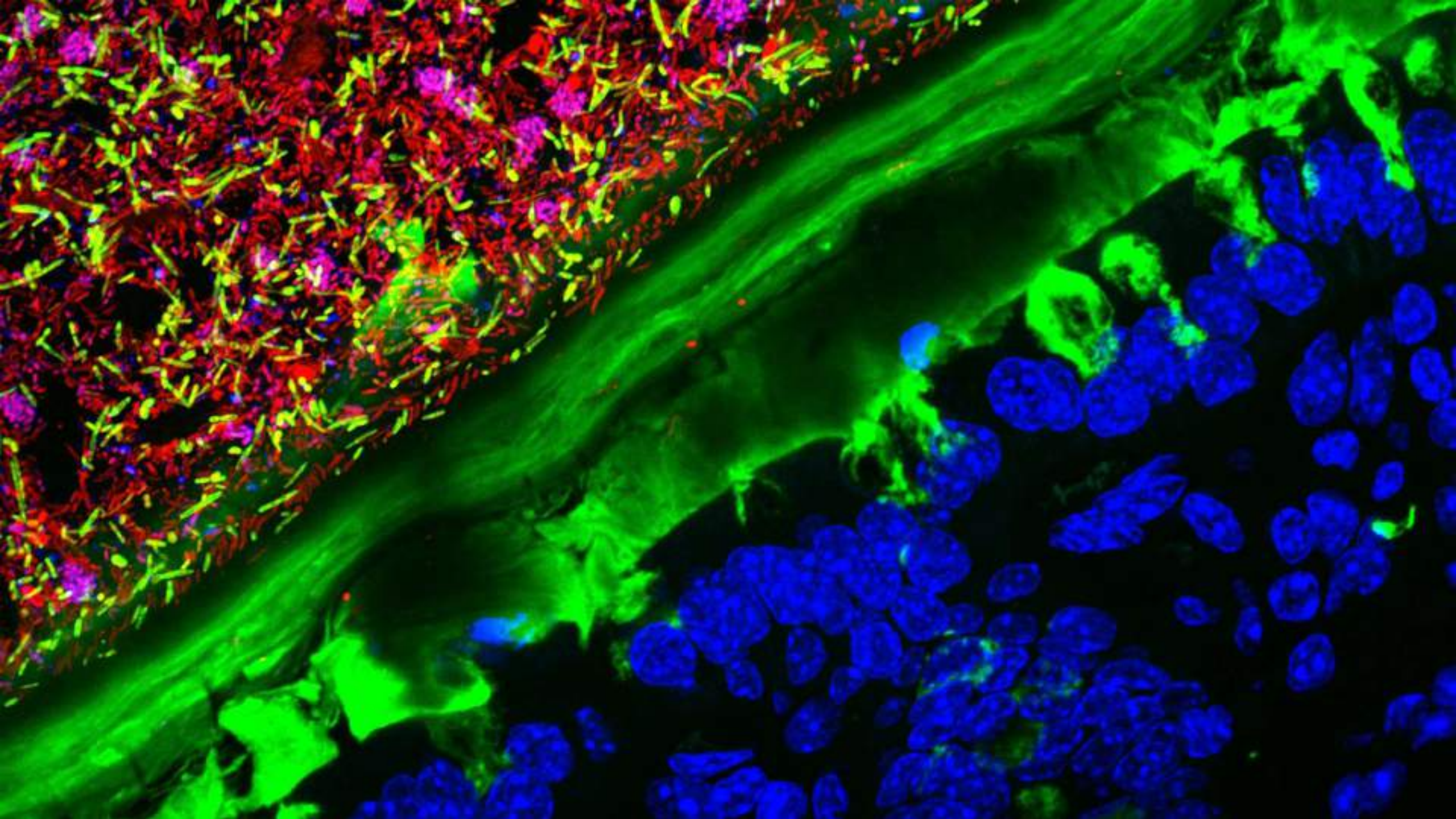
Agenti trofici intestinali, Prebiotici e Probiotici



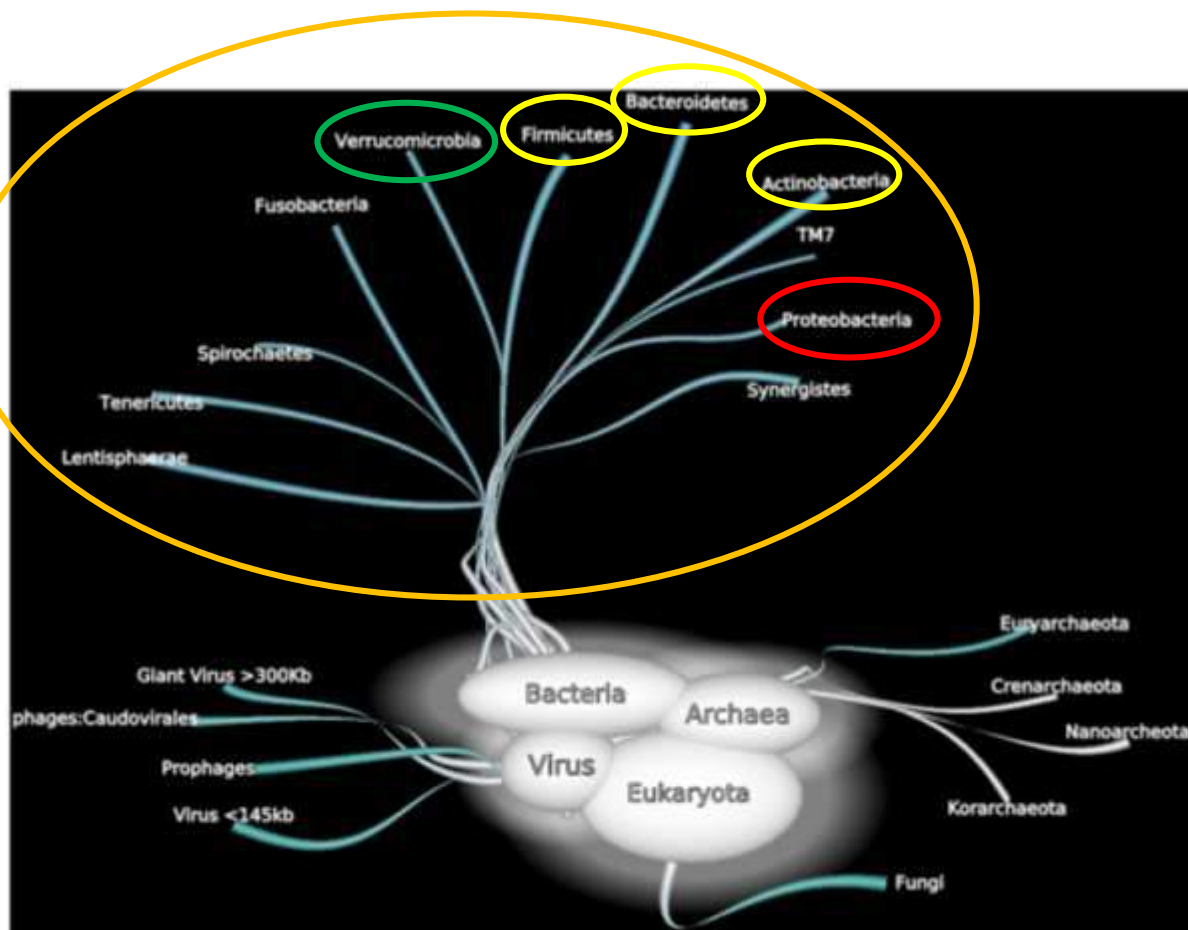
Vincenzo Sorrenti, PharmD, RDN, PhD

PENSATE AD UN ECOSISTEMA PROSPERO!





IL MICROBIOTA UMANO



500 - 10.000.000 specie differenti di microorganismi che realizzano una vera **simbiosi** con l'ospite stesso.

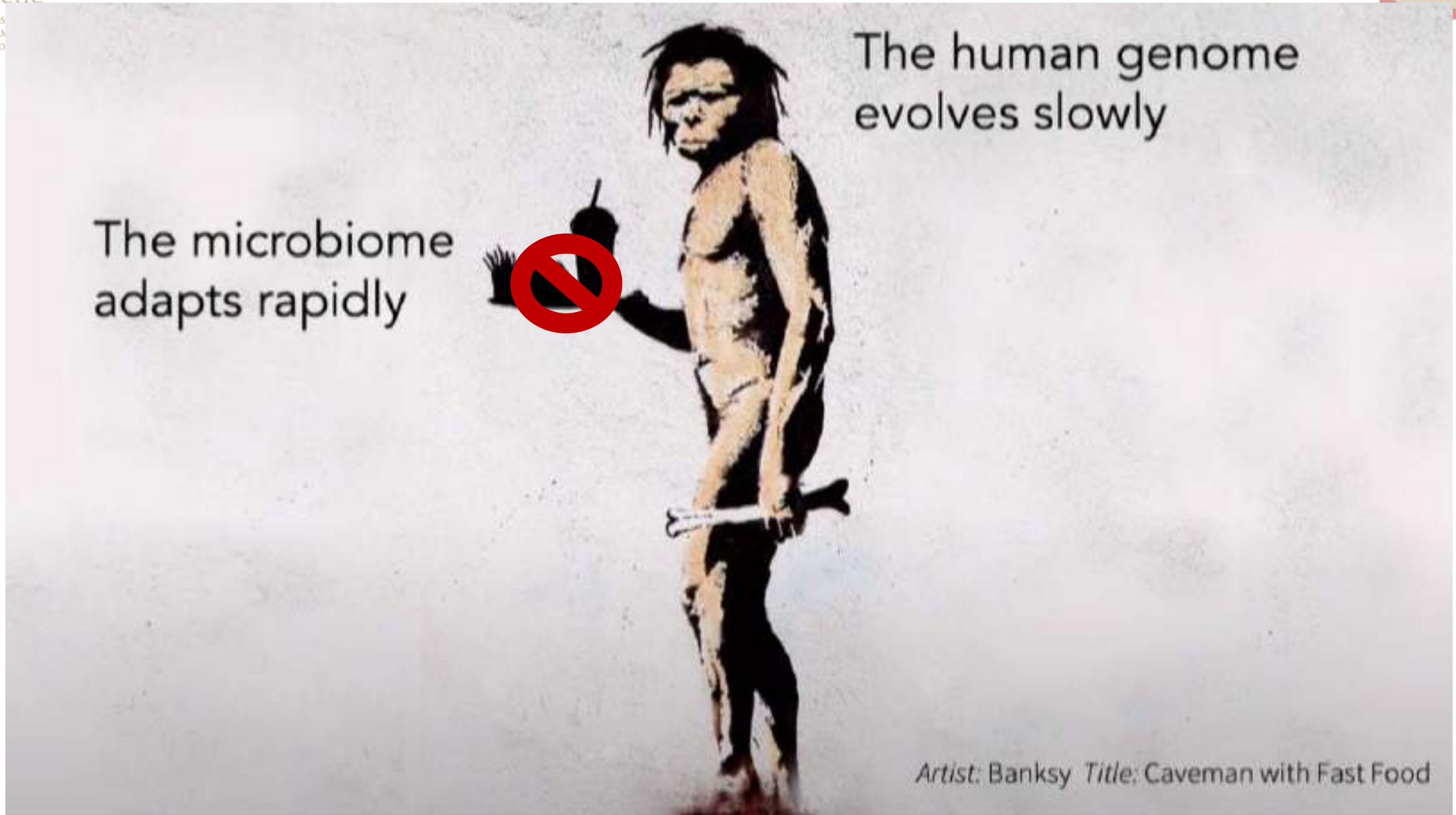
Il microbiota di ogni individuo ha una sua specifica **"impronta digitale batterica"**. Esiste tuttavia un **core di almeno 57 specie** batteriche che può essere considerato **comune a tutti**.

Nell'intestino umano sono riconosciuti cinque **filum** batterici prevalenti:

- I. **Bacteroidetes**: *Prevotella*, *Bacteroides*, *Alistipes*, *Porphyromonas*
- II. **Firmicutes**: *Blautia*, *Coprococcus*, *Dialister*, *Lachnospiraceae*, *Faecalibacterium*, *Roseburia*, *Ruminococcus*, *Clostridia*, ***Lactobacillus***, *Enterococcus*, ***Streptococcus***
- III. **Actinobacteria**: ***Bifidobacterium***, *Actinomyces*, *Slackia*,
- IV. **Verrucomicrobia**: *Akkermansia*,
- V. **Proteobacteria**: *Desulfovibrio*, *Enterobacter*, *Oxalobacter*, *Pseudomonas*, *Salmonella*, *Klebsiella*, *Escherichia-shigella*

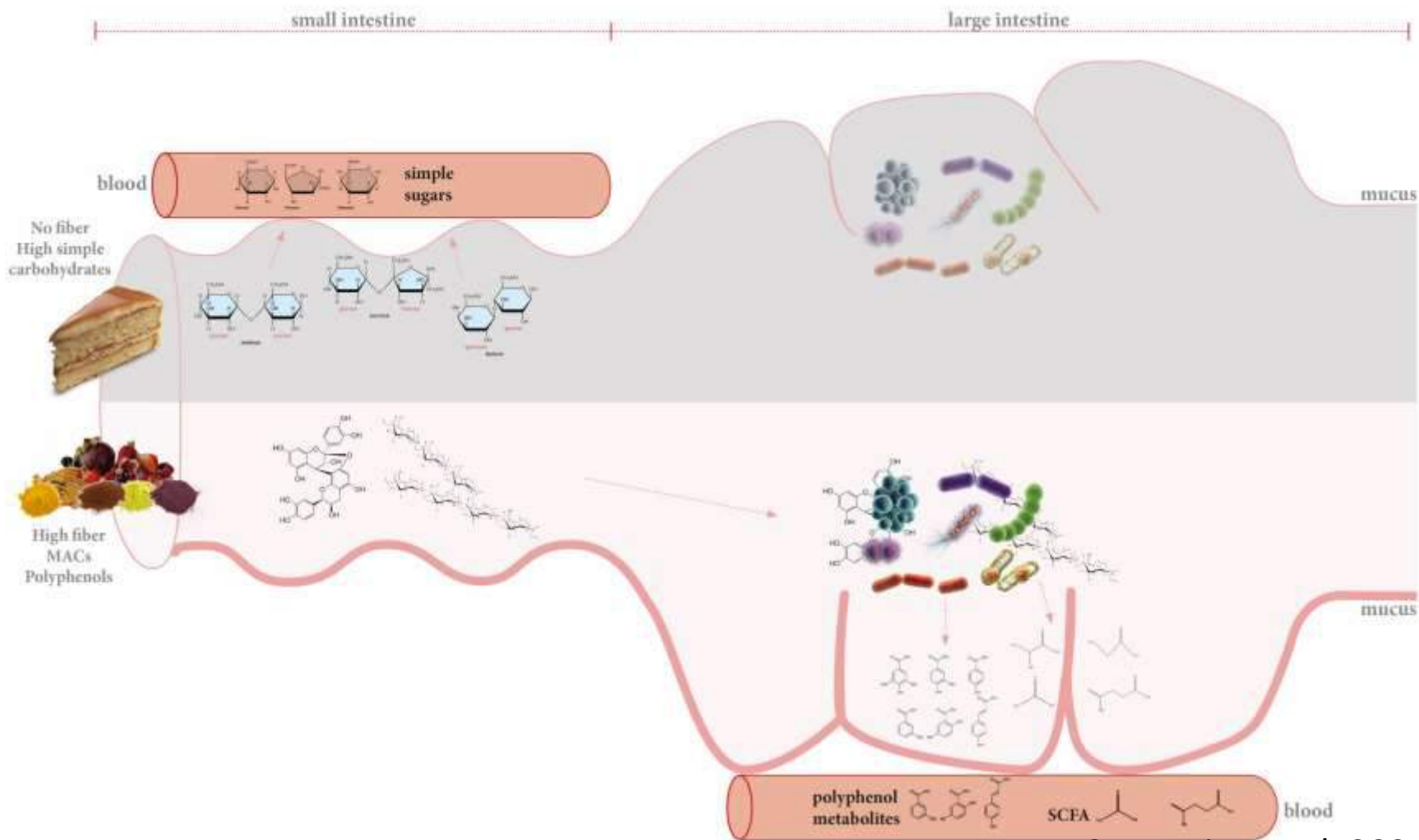
A non exhaustive overview of human gut microorganisms among bacterial, Archaea, viral, and Eukaryota domains.

Shreiner A et al. 2015

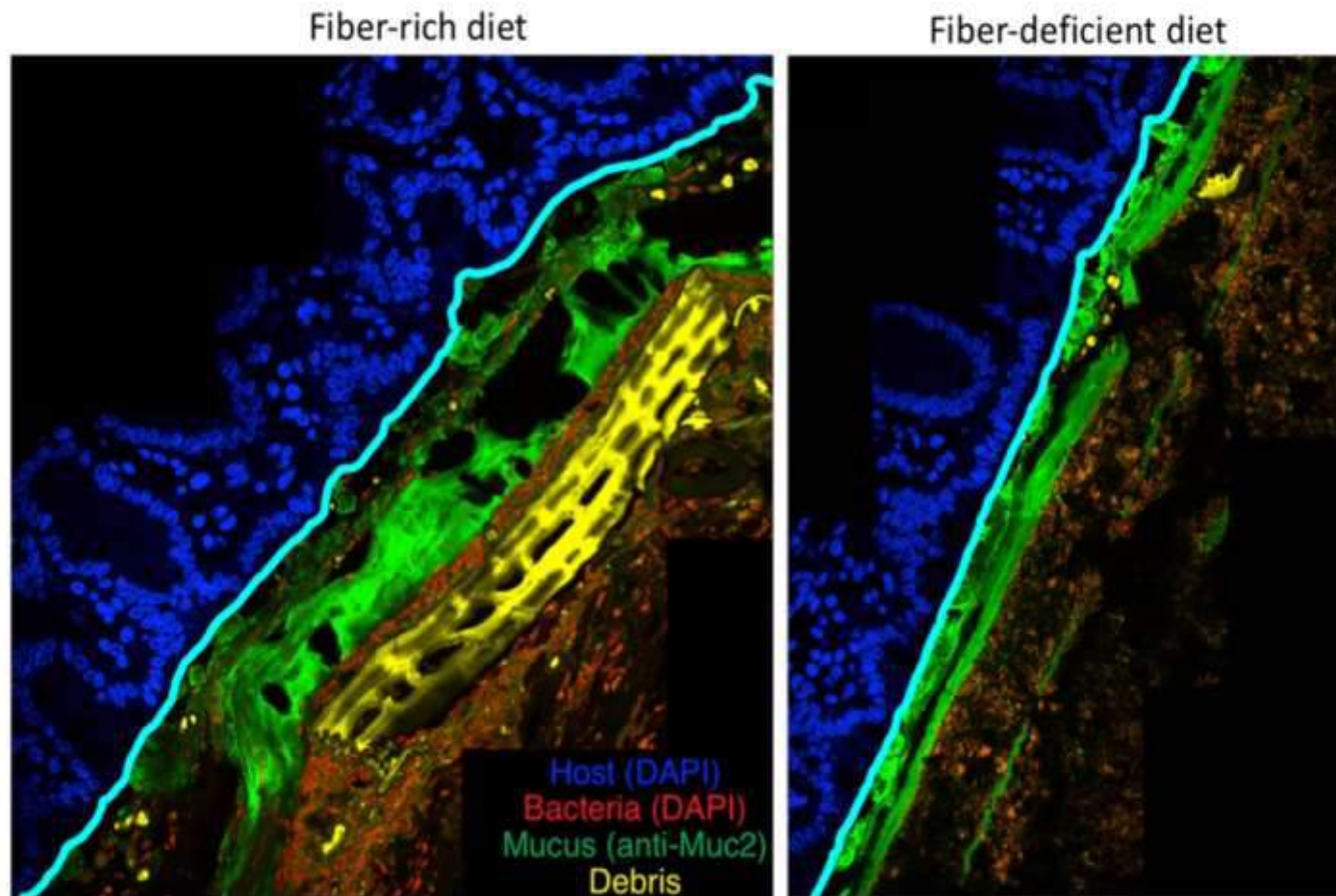


Diet rapidly and reproducibly alters the human gut microbiome

Lawrence A. David^{1,2*}, Corinne F. Maurice¹, Rachel N. Carmody², David B. Grootenberg², Julie E. Burton², Benjamin E. White², Alissa V. Ling³, A. Ross Devlin⁴, Yag Vazara⁴, Michael A. Fischbach⁴, Sadha R. Nibbeling⁵, Rachel J. Dutton¹ & Peter J. Turnbaugh²

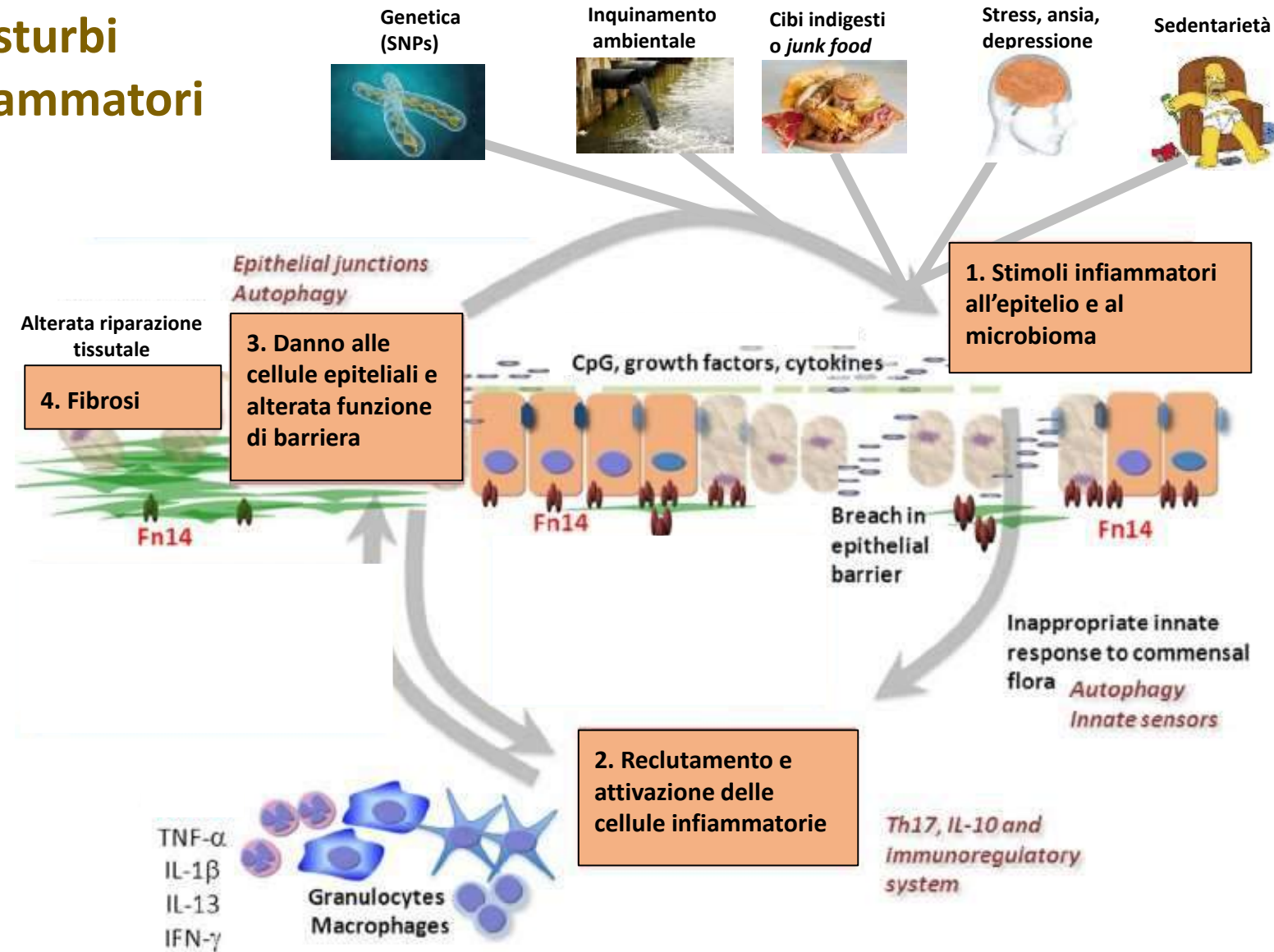


A starving microbiota eats you



(Earle et al., *Cell Host Microbe*, 2015)

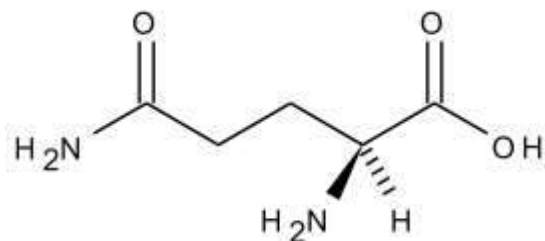
Patofisiologia dei disturbi cronici immuno-infiammatori



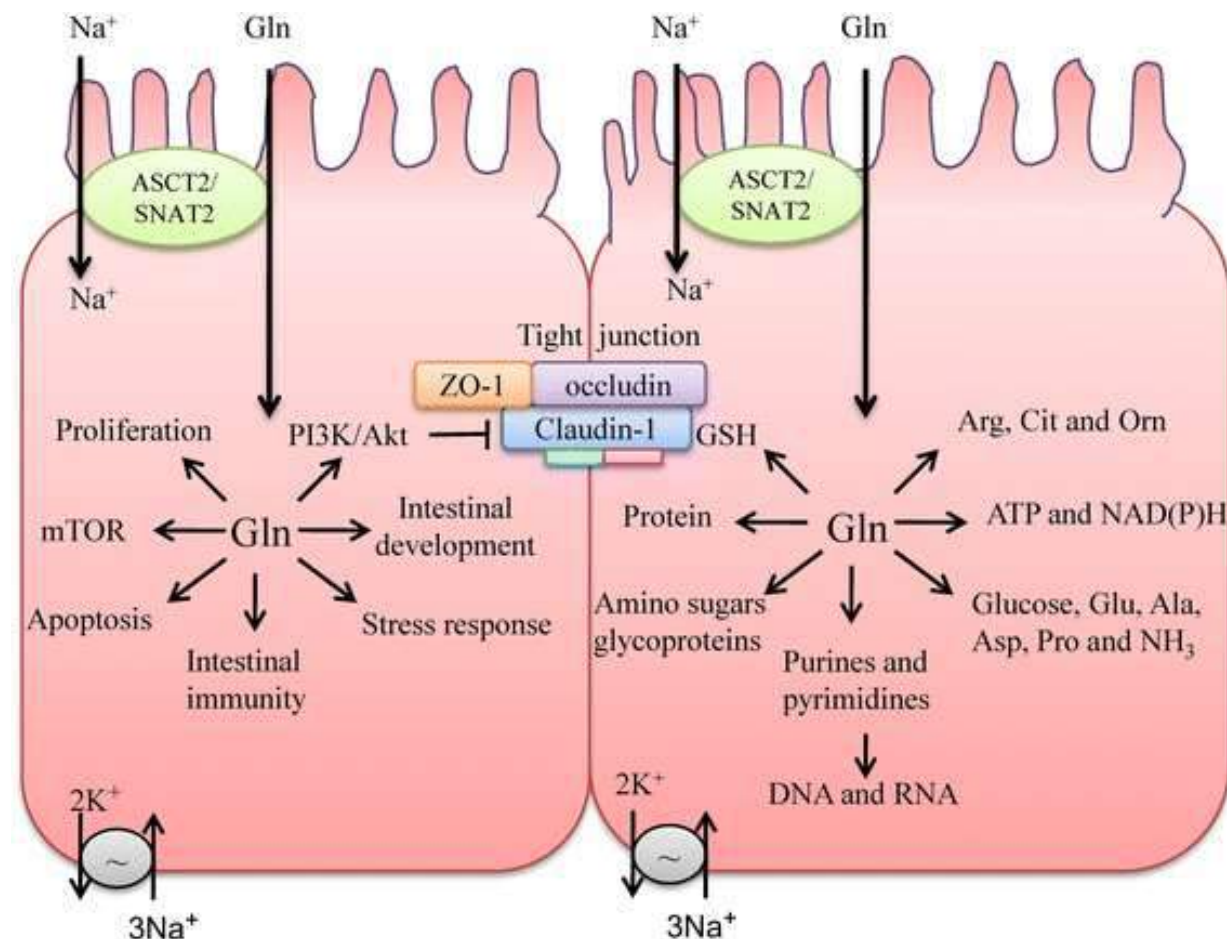


The Roles of Glutamine in the Intestine and Its Implication in Intestinal Diseases

Min-Hyun Kim¹ and Hyeoung Kim^{2,*}



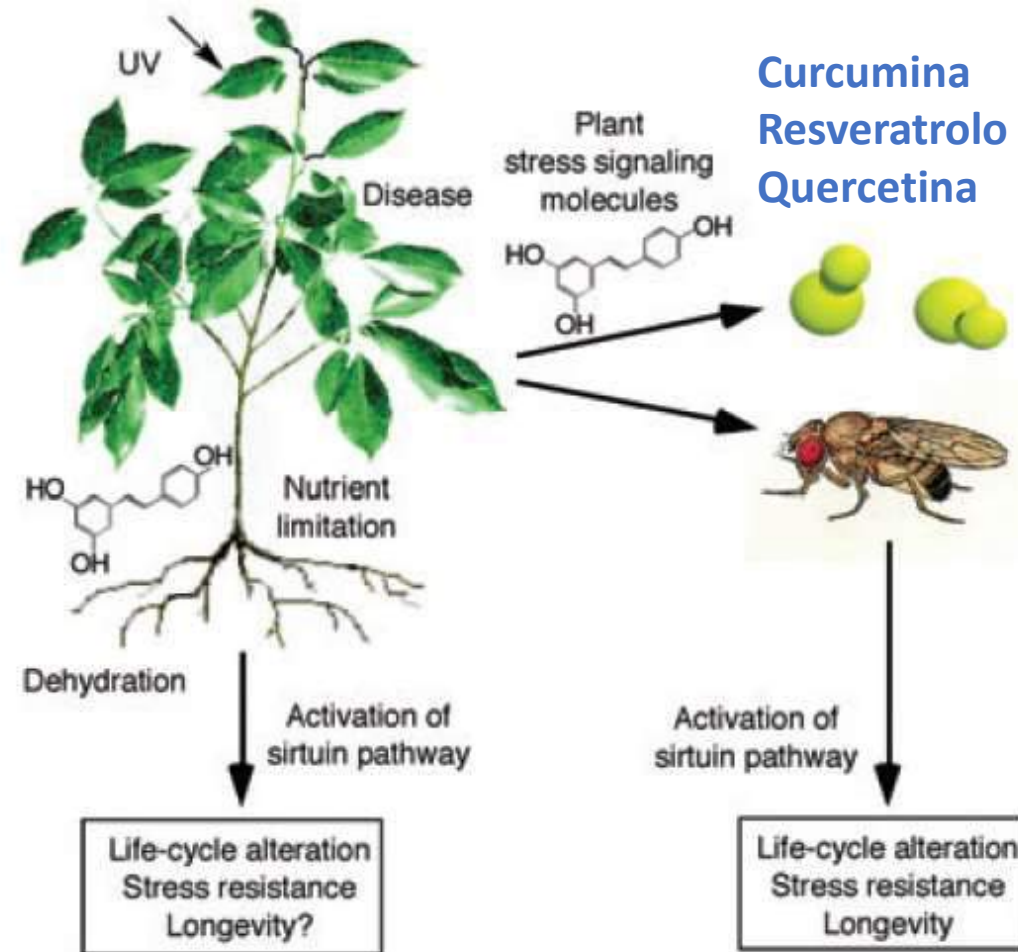
Glutamine has been reported to enhance intestinal and whole-body growth, to promote enterocyte proliferation and survival, and to regulate intestinal barrier function in injury, infection, weaning stress, and other catabolic conditions.



Wang, B., Wu, G., Zhou, Z. *et al.* Glutamine and intestinal barrier function. *Amino Acids* **47**, 2143–2154 (2015). <https://doi.org/10.1007/s00726-014-1773-4>



“ The xenohormesis hypothesis”: organisms have evolved to respond to stress signaling molecules produced by other species in their environment.



Lamming DW, Wood JG, Sinclair DA. Small molecules that regulate lifespan: evidence for xenohormesis. *Molecular Microbiology* (2004)

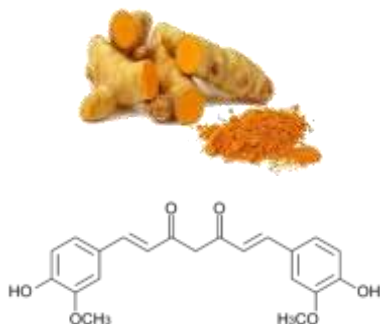
Review

Cell Survival, Death, and Proliferation in Senescent and Cancer Cells: the Role of (Poly)phenols



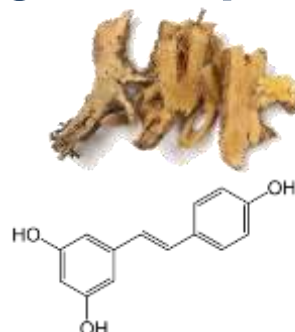
Vincenzo Sorrenti^{1,2,*}, Alessandro Buriani^{2,†}, Stefano Fortinguerra^{3,†}, Sergio Davinelli⁴,
Giovanni Scapagnini⁴, Aedin Cassidy⁵, Immacolata De Vivo⁶

Curcuma longa



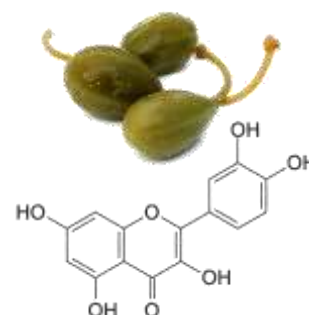
Curcumin

Polygonum cuspidatum



Resveratrol

Capparis spinosa



Quercetin

Camellia sinensis

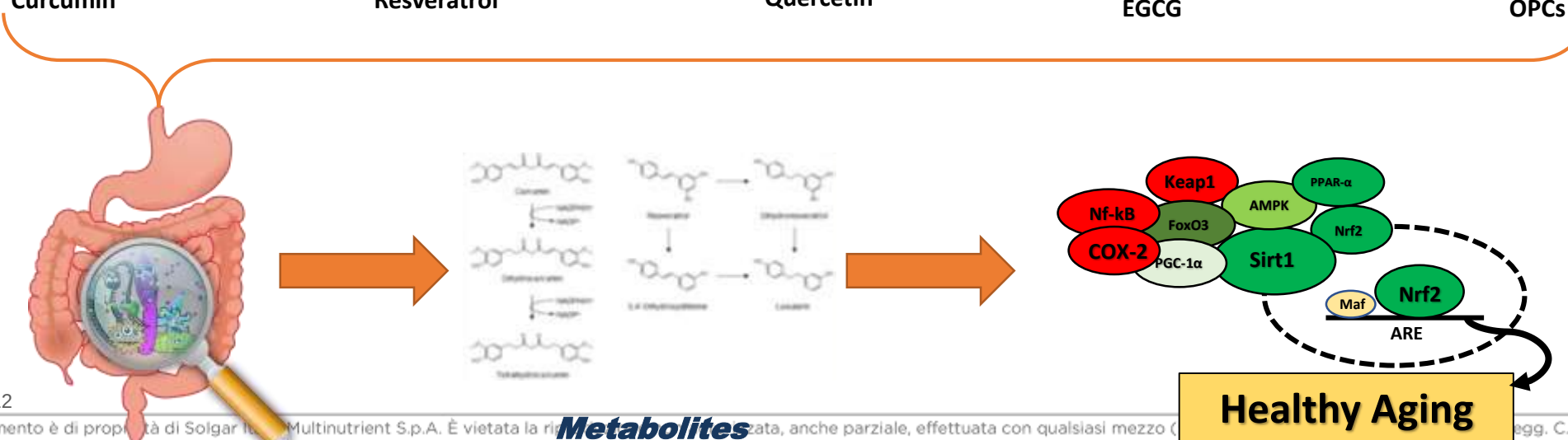


EGCG

Vaccinium myrtillus



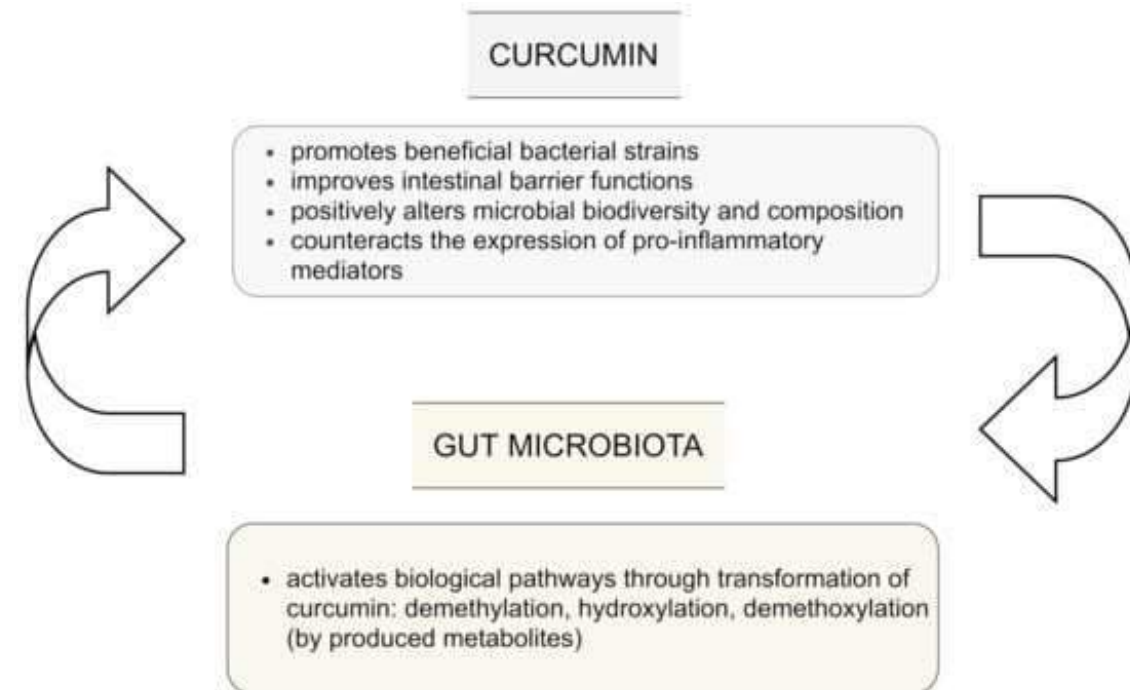
OPCs



Curcumin Prevents Acute Neuroinflammation and Long-Term Memory Impairment Induced by Systemic Lipopolysaccharide in Mice

Vincenzo Sorrenti¹, Gabriella Contarini¹, Stefania Sut², Stefano Dall'Acqua¹, Francesca Confortin¹, Andrea Pagetta¹, Pietro Giusti^{1*} and Morena Zusso¹

ORIGINAL RESEARCH
published: 06 March 2018
doi: 10.3389/fphar.2018.00183

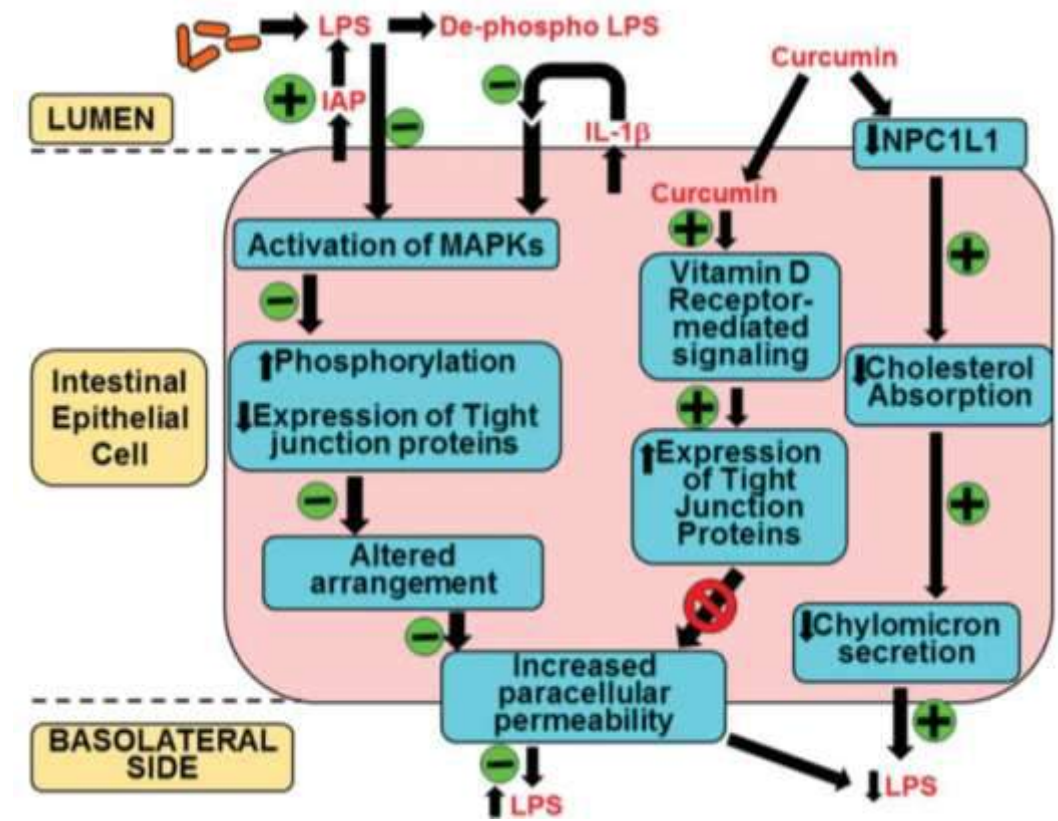


TISSUE BARRIERS
2018, VOL. 6, NO. 1, e1425085 (13 pages)
<https://doi.org/10.1080/21688370.2018.1425085>

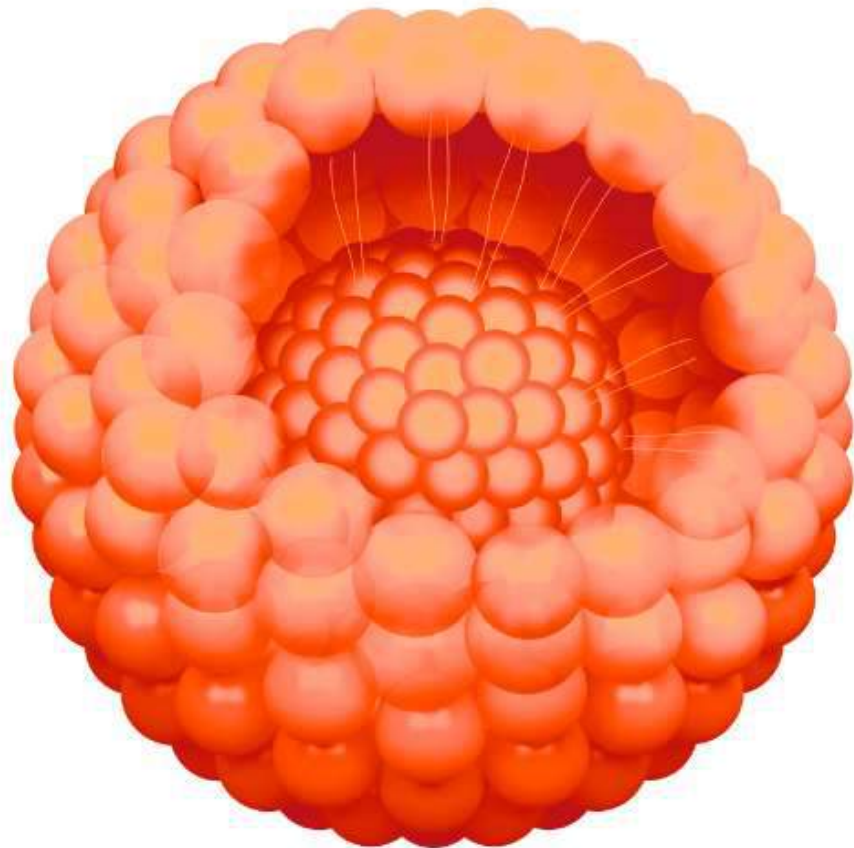
REVIEW

Curcumin-mediated regulation of intestinal barrier function: The mechanism underlying its beneficial effects

Siddhartha S. Ghosh, Hongliang He, Jing Wang, Todd W. Gehr, and Shobha Ghosh



Curcumina Nanomicellare



NovaSOL® is the leading bioavailable, clinically-proven Curcumin

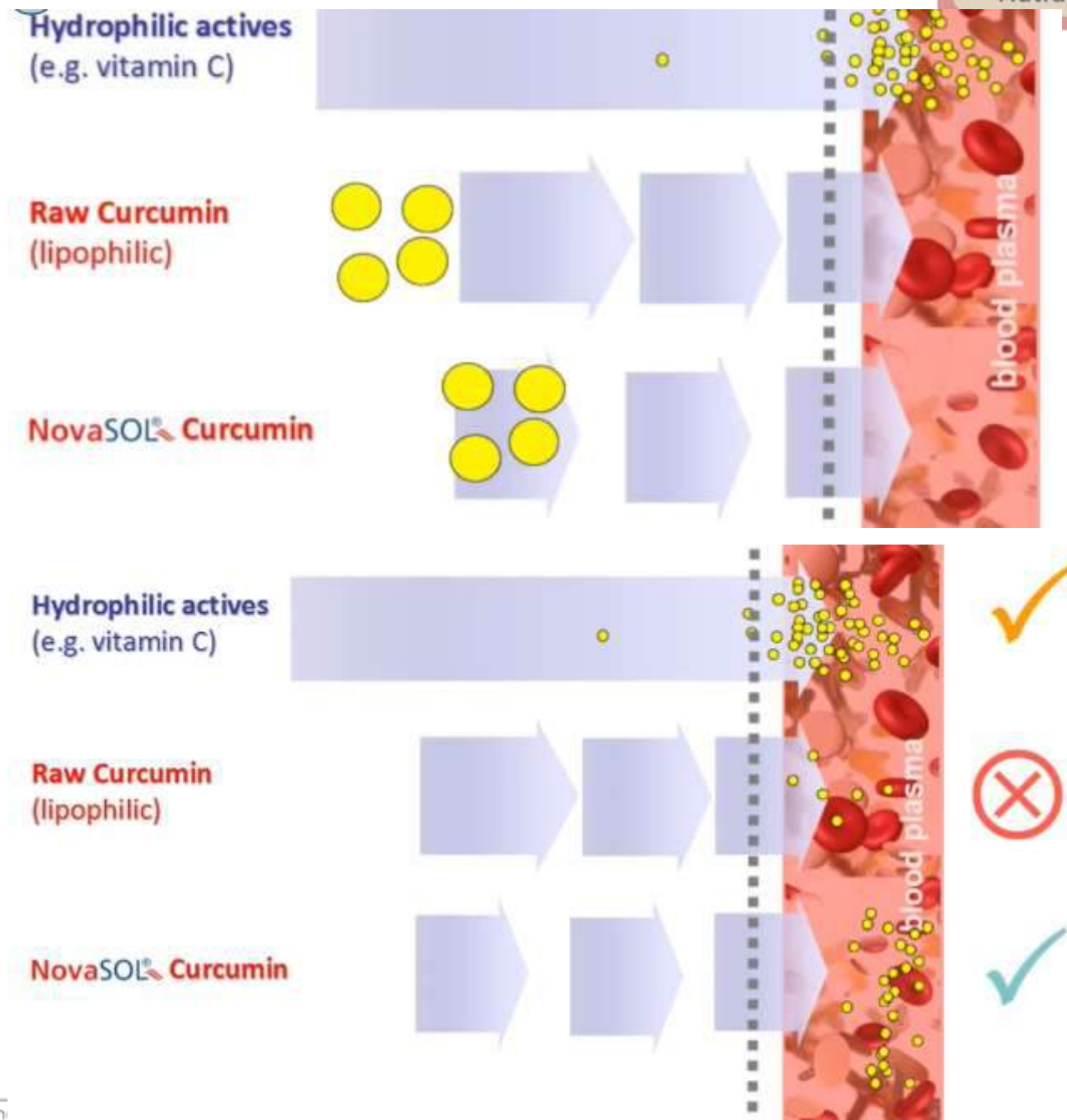
In order to make curcumin an effective health ingredient, it has to be processed in a way that still allows delivery to the blood plasma. Here NovaSOL® offer its strengths, converting curcuma into a fully water soluble and pH stable form, thus promoting optimum oral bioavailability.

But even, if bioavailability was not the top priority part of your product design, NovaSOL® Curcumin offers vital material and processing characteristics, which make it the first choice for your product design:

- Liquid colloidal & easy to process 6% formula
- Fully water and fat soluble (amphiphilic)
- Crystal clear dissolution
- Nature like (biomimetic) micelle structure
- Ready to use in capsules and soft gels without additional excipients or processing aids
- High pH stability range from approx. 1.1 – 8.0
- Kosher / Halal on request



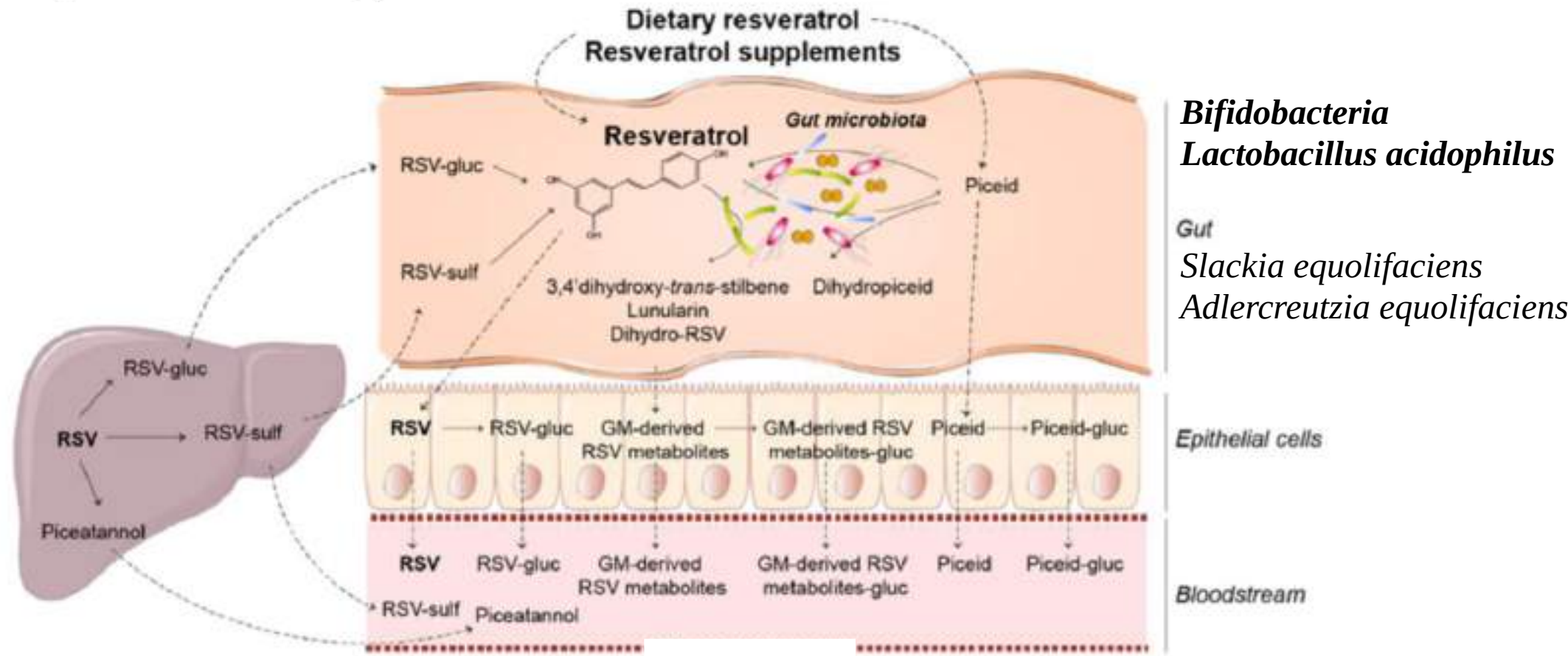
Solubilità in acqua



Review

Immunomodulatory and Antiaging Mechanisms of Resveratrol, Rapamycin, and Metformin: Focus on mTOR and AMPK Signaling Networks

Vincenzo Sorrenti ^{1,2,3,*}, Francesca Benedetti ^{4,†}, Alessandro Buriani ⁴, Stefano Fortinguerra ⁵, Giada Caudullo ², Sergio Davinelli ⁶, Davide Zella ^{4,*} and Giovanni Scapagnini ^{6,*}



Flavonoid intake is associated with lower mortality in the Danish Diet Cancer and Health Cohort

Nicola P. Bondonno^{1,2,12}, Frederik Dalgaard^{3,12}, Cecilie Kyre⁴, Kevin Murray⁵, Catherine P. Bondonno^{1,2}, Joshua R. Lewis^{1,2}, Kevin D. Croft¹, Gunnar Gislason^{3,6,7}, Augustin Scalbert⁸, Aedin Cassidy⁹, Anne Tjønneland⁴, Kim Overvad^{10,11} & Jonathan M. Hodgson¹²

500 mg flavonoidi/die → soggetti sani

1000 mg flavonoidi/die → soggetti a rischio

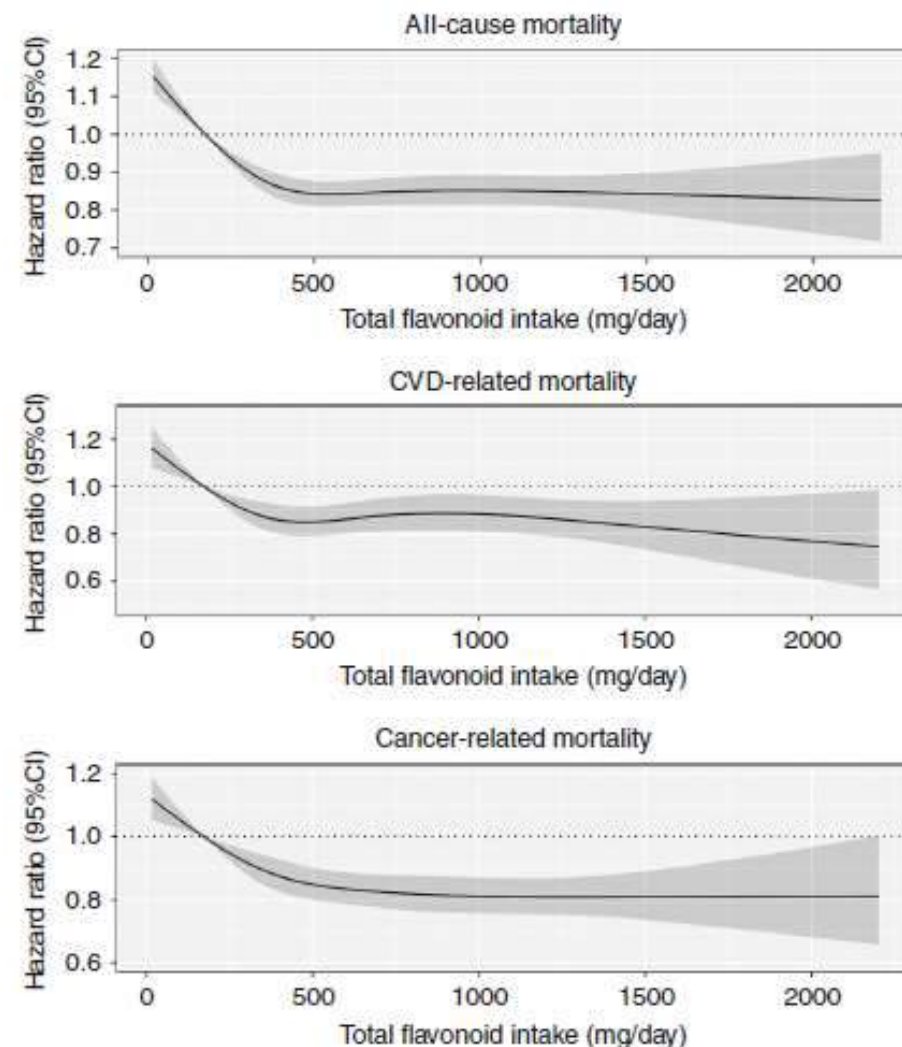


Fig. 1 The association of total flavonoid intake with all-cause and cause-specific mortality. Hazard ratios are based on Cox proportional hazards models adjusted for age, sex, BMI, smoking status, physical activity, alcohol intake, hypertension, hypercholesterolemia, social economic status (income), and prevalent disease and are comparing the specific level of flavonoid intake (horizontal axis) to the median intake for participants in the lowest intake quintile

PROBIOTICS

An October 2001 report by the [World Health Organization](#) (WHO) defines probiotics as **live microorganisms that, when administered in adequate amounts, confer a health benefit on the host.**



Nomenclatura dei Batteri Probiotici

Probiotic bacteria

genus species strain
| | |
Lactobacillus rhamnosus (LGG®)

GASTRORESISTENZA

- I probiotici per poter svolgere la loro funzione devono arrivare vivi e vitali a livello intestinale: il passaggio attraverso l'ambiente acido dello stomaco è cruciale.
- Come molte caratteristiche, anche la resistenza al pH acido è CEPPO-SPECIFICA: mediamente però solo il 10-25% della carica assunta è in grado di sopravvivere, raggiungendo l'intestino.
- La sopravvivenza dei probiotici può essere aumentata in fase di produzione con la tecnica della microincapsulazione: un coating protettivo, spesso con **matrici polisaccaridiche, gastroresistente a pH acidi in grado di dissolversi solo a pH >6.5-7.0, tipico dell'ambiente intestinale**
- In questo modo si riesce a aumentare il tasso di sopravvivenza (fino al 90%) e la stabilità, incrementando la performance d'utilizzo del probiotico.

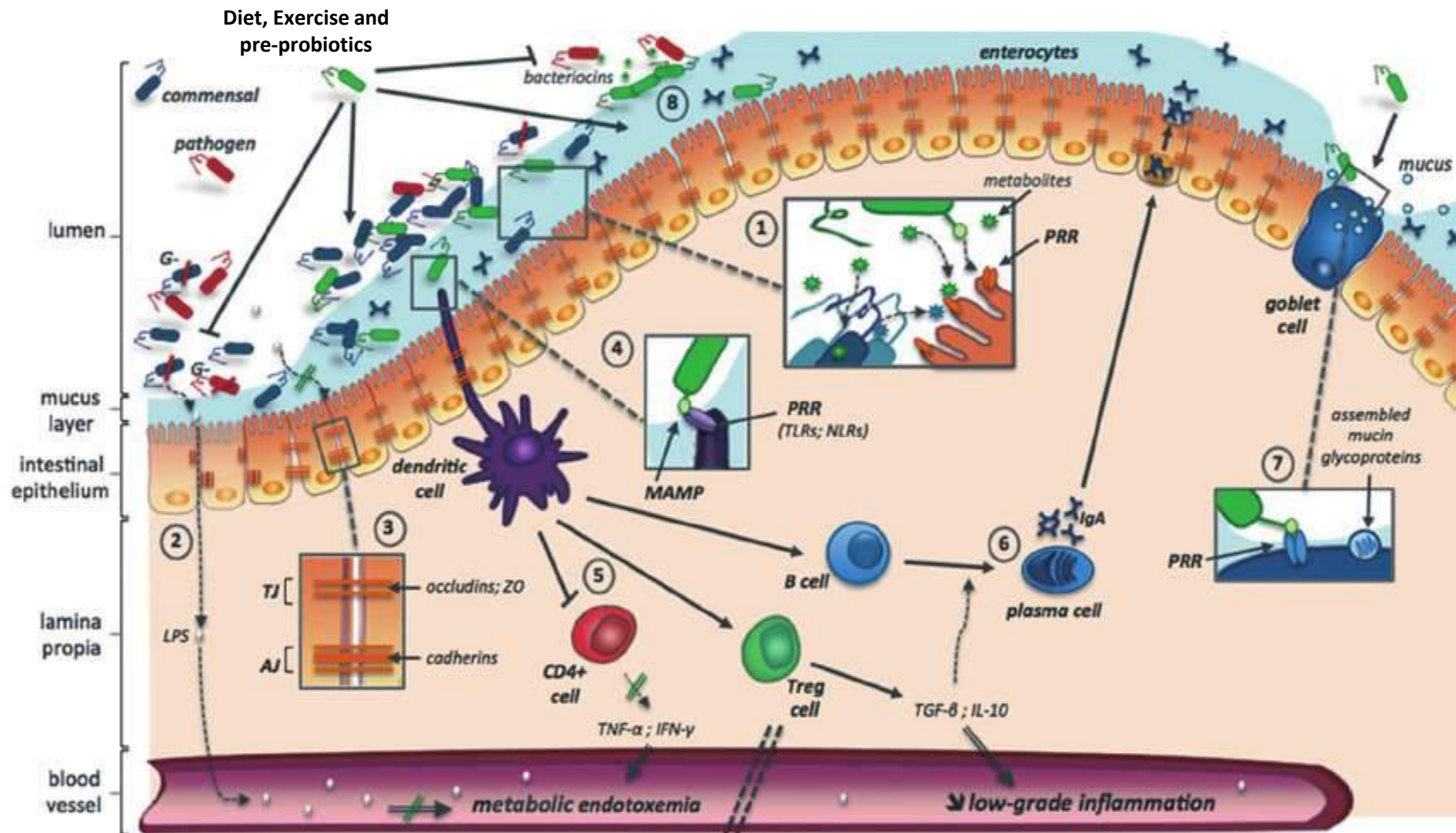


Improving food & health



Meccanismi d'azione dei probiotici

L'insieme di meccanismi che permettono al sistema immunitario di non reagire a stimoli di quest'ultimo tipo va sotto il nome di **tolleranza immunitaria**.

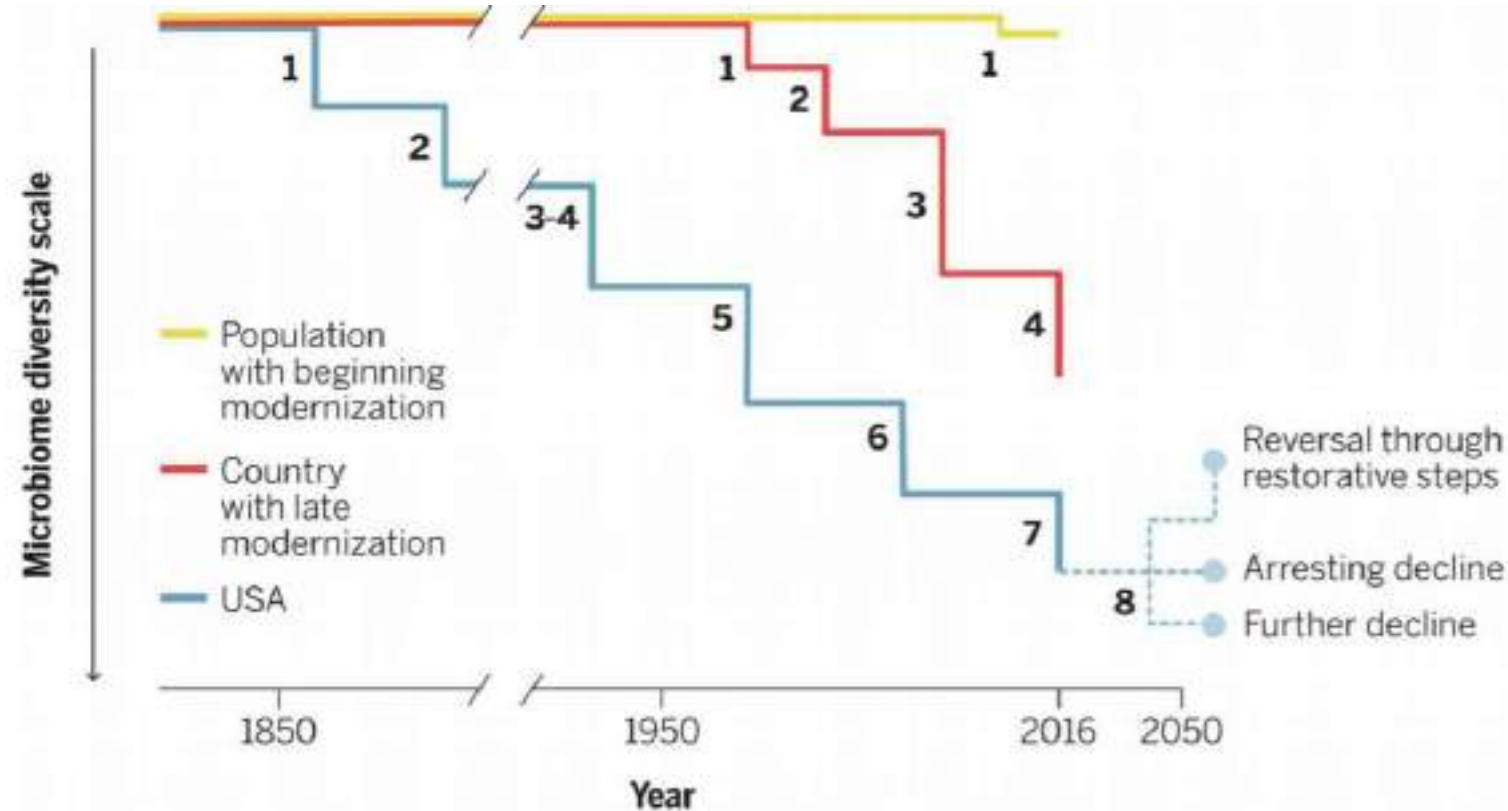
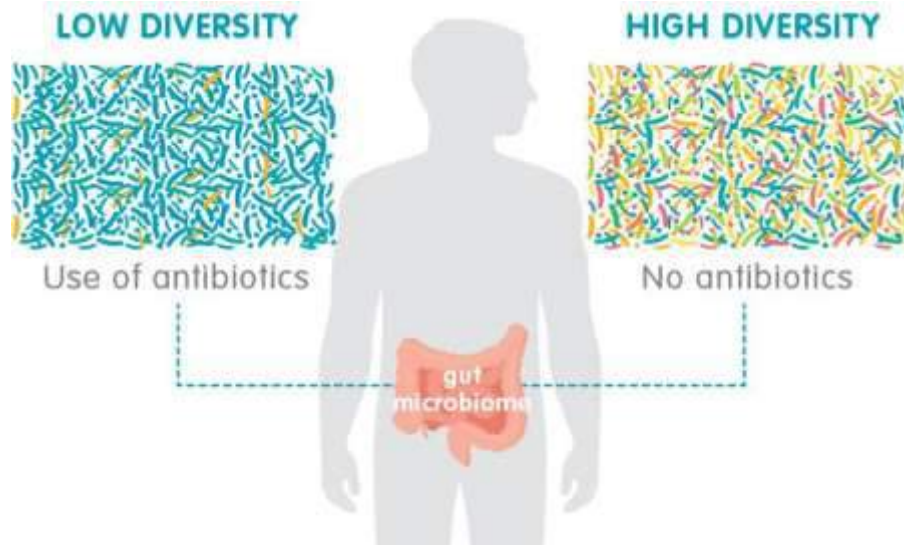


Antibiotic use and its consequences for the normal microbiome

Martin J. Blaser^{1,2,3}

+ See all authors and affiliations

Science, 29 Apr 2016;
Vol. 352, Issue 6285, pp. 544-545
DOI: 10.1126/science.aad9358



Probiotics for Prevention and Treatment of Diarrhea

Guarino, Alfredo MD^{*}; Guandalini, Stefano MD[†]; Lo Vecchio, Andrea MD^{*} **Author Information** 

Journal of Clinical Gastroenterology: November/December 2015 - Volume 49 - Issue - p S37-S45
doi: 10.1097/MCG.0000000000000349

***Lactobacillus rhamnosus* GG (LGG)** and *Saccharomyces boulardii* had the most compelling evidence of efficacy as they reduced the duration of the disease by 1 day. For AAD 4 meta-analyses were found, reporting variable efficacy of probiotics in preventing diarrhea, based on the setting, patient's age, and antibiotics. The most effective strains were LGG and *S. boulardii*. For NEC, we found 3 randomized controlled trials, 5 meta-analyses, and 4 position papers. Probiotics reduced the risk of NEC enterocolitis and mortality in preterm babies. Guidelines did not support a routine use of probiotics and asked for further data for such sensitive implications. In conclusion, there is strong and solid proof of efficacy of probiotics as active treatment of gastroenteritis in addition to rehydration. There is solid evidence that probiotics have some efficacy in prevention of AAD, but the number needed to treat is an issue. For both etiologies LGG and *S. boulardii* have the strongest evidence. In NEC the indications are more debated, yet on the basis of available data and their implications, probiotics should be carefully considered.

A practical guide for probiotics applied to the case of antibiotic-associated diarrhea in The Netherlands

[Valeria Agamennone](#), [Cyrille A. M. Krul](#), [Ger Rijkers](#) & [Remco Kort](#) 

[BMC Gastroenterology](#) 18, Article number: 103 (2018) | [Cite this article](#)

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[Digestive Disorders](#) > [Reference](#) >

Using Probiotics for Diarrhea

Some research shows that the bacteria strains most likely to help are *Lactobacillus rhamnosus* GG LGG®, *Lactobacillus reuteri*, and the probiotic yeast *Saccharomyces boulardii*, although other strains might be useful. A mix of a few different probiotics may also treat this type of diarrhea.

Microbiota pre-antibiotico

↓ Diversità Microbica

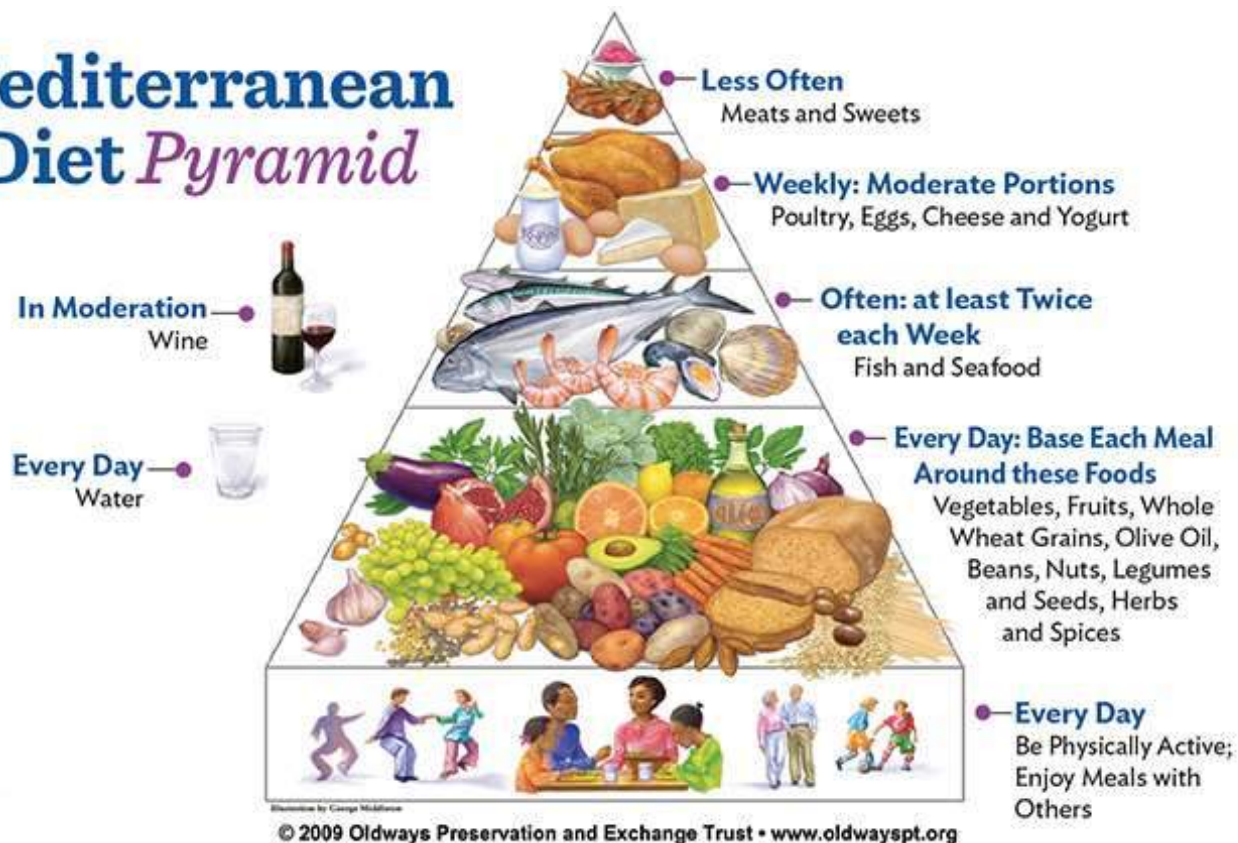
4-8 settimane

ANTIBIOTICO

FASE CRITICA

Strategies to Boost our Gut and Systemic Health

Mediterranean Diet Pyramid



Microbiota analysis

Vitamins and Minerals, Omega 3

Plant-based Nutraceuticals
(*Curcuma longa*, *Polygonum cuspidatum*, *Camelia sinensis*...)

Probiotics: High scientific literatures and a personalized approach

Genetic background (STAT6, HLA family, FoxP3, CD14, filaggrin, LCT, MCM6, MTHFR, ABCB1, etc...)

PROTOCOLLI INTEGRATIVI MANTENIMENTO DELLA SALUTE INTESTINALE

SUPPORTO ALLA TERAPIA ANTIBIOTICA:

- **L. rhamnosus, L.paracasei** (durante l'antibiotico e 30-60 giorni dopo)
- **Quercetina** 250-500 mg (colazione per 1 mese durante e post antibiotico)
- **Omega 3** 600 mg - 1g (azione anti-infiammatoria durante e prebiotica post antibiotico)

SUPPORTO A PROBLEMATICHE AUTOIMMUNI INTESTINALI:

- **L. acidophilus, L. rhamnosus, L.paracasei, B.lactis** (integrazione basale)
- **Curcumina nanomicelle** 80 mg (cicli di 3 mesi o secondo necessità)
- **Omega 3 fosfolipidi** 1g (la sera a cena ogni giorno)
- **Spirulina** 2g (a colazione almeno 3 mesi consecutivi)

SUPPORTO IN CASO DI LEAKY GUT SYNDROME O IBS:

- **L. acidophilus, L. rhamnosus, L.paracasei, B.lactis** (integrazione basale)
- **Curcumina nanomicelle** 40 mg (nei periodi di acutizzazione della patologia)
- **Omega 3 fosfolipidi** 1g (la sera a cena ogni giorno)
- **Glutamina** 1g (lontano dai pasti la sera)

PROTOCOLLI INTEGRATIVI MANTENIMENTO DELLA SALUTE INTESTINALE

BENESSERE EPATO-INTESTINALE:

- **L. acidophilus, L. rhamnosus, L.paracasei, B.lactis** (1-2 mesi fino a 3 volte l'anno)
- **Enzimi digestivi** (15 gg/1 mese o al bisogno; > 60 anni anche periodi lunghi)
- **Complesso B attivo** (uso giornaliero al mattino a colazione)
- **Chlorella pyrenoidosa** 1g (cicli di 3 mesi 2/3 volte l'anno)

BENESSERE METABOLICO E PREBIOTICO:

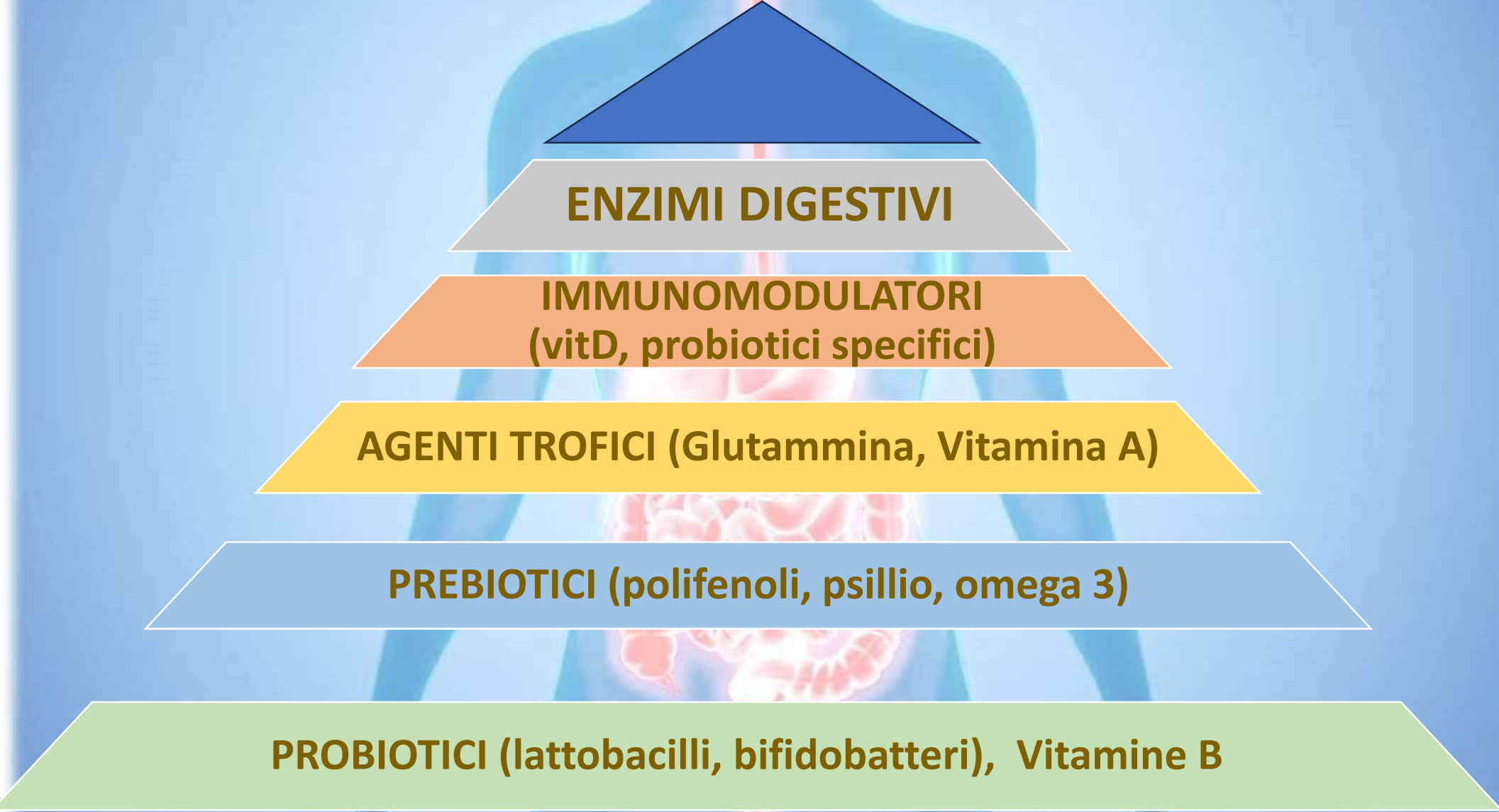
- **L. acidophilus, L. rhamnosus, L.paracasei, B.lactis** (1-2 mesi fino a 3 volte l'anno)
- **Resveratrolo** 100-200 mg (3 mesi fino a 2 volte l'anno)
- **Omega 3 fosfolipidi** 500 – 1g (3-4 mesi fino a 2 volte l'anno)
- **Quercetina** 250 -500 mg (2-3 mesi fino a 3 volte l'anno)

FISIOLOGICA FUNZIONE DEL SISTEMA IMMUNITARIO INTESTINALE:

- **Glutammina** 500 mg (4-6 mesi fino a 2 volte l'anno)
- **Curcumina nanomicellare** 40 mg (2-3 mesi fino a 3 volte l'anno)
- **L.plantarum, L.paracasei** (3-4 mesi fino a 3 volte l'anno)

FOUNDATIONAL HEALTH

Nutraceutici chiave per la salute GI



ENZIMI DIGESTIVI

**IMMUNOMODULATORI
(vitD, probiotici specifici)**

AGENTI TROFICI (Glutamina, Vitamina A)

PREBIOTICI (polifenoli, psillio, omega 3)

PROBIOTICI (lattobacilli, bifidobatteri), Vitamine B