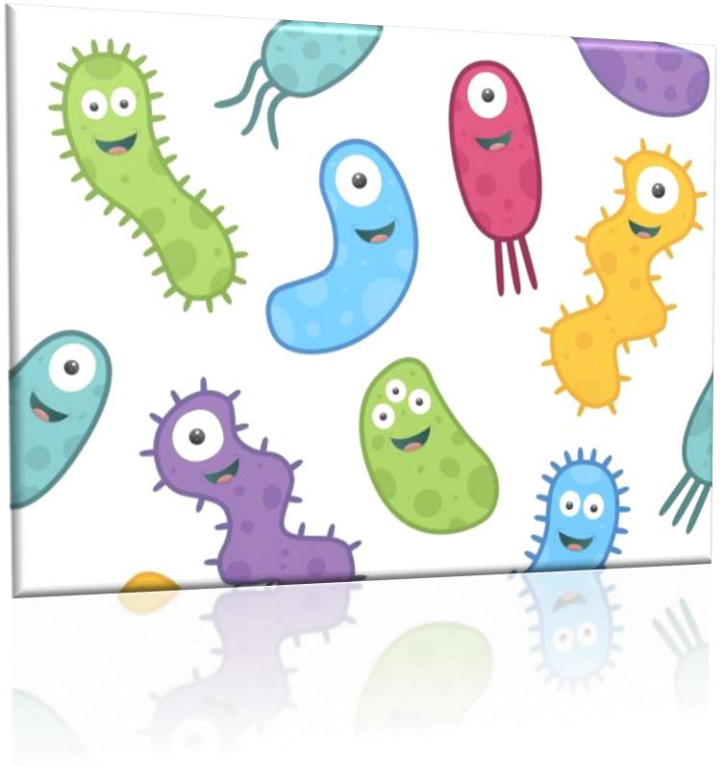
63° CONGRESSO NAZIONALE SIGG

GLI ANZIANI: LE RADICI DA PRESERVARE

ROMA 28 novembre 01 dicembre 2018 Auditorium della Tecnica, Roma



IL RUOLO DEL MICROBIOTA NELLA RISPOSTA ALLA TERAPIA NUTRIZIONALE

Aspetti Nutrizionali e Demenza

ROMA, 29 Novembre 2018

Alessandra Coin
Clinica Geriatrica – Azienda Ospedaliera, DIMED – Universita' di Padova

Giornata
Mondiale Alzheimer
21 settembre

Demenza

Possiamo ridurre il rischio?

www.alzheimer.it/iniziat2014

www.alz.co.uk/WAD

ALZHEIMER ITALIA

Mese

DIETA E DEMENZA

Tra individui cognitivamente normali, una più alta aderenza alla MeDi è stata associata ad un ridotto rischio di MCI

Singh B, J Alzheimer Dis, 2014;

La dieta mediterranea, da sola o in associazione alla DASH (Dietary Approach to Systolic Hypertension), può essere di beneficio nella prevenzione del declino cognitivo.

Rakesh G et al, Ther Adv Chronic Dis, 2017

Studi hanno riportato benefici per:

- Vitamina E
- Vitamine B e folati
- Polifenoli
- Vitamina D
- Carotenoidi
- Capsaicina
- PUFA

Solfrizzi V et al, Journal of Alzheimer's Disease 2017;

Nutrition and AD: a bi-directional relationship

AD influences nutritional status

- Provision and intake food
- Caloric, protein and micronutrient requirements
- Digestion and absorption of food
- Conversion and uptake of active compounds in the liver and at the blood brain barrier
- Cognitive and behavioural disturbances (eating habits, refusal to eat, dysphagia)

Nutritional habits influence AD

- Reduced immune function and increased risk of infection
- Reduce muscular mass and strength
- Disability and reduce performance
- Fall risk
- Risk of pressure sores
- **Risk of dementia and AD**
- **Progression from MCI to dementia**
- **Cognitive function, behaviour, functional status**

Volkert D et al, ESPEN guidelines, Clinical Nutrition, 2015

Terapia nutrizionale della demenza?

Pattern dietetici e non singoli alimenti (**Dieta Mediterranea**)

Evitare/trattare la malnutrizione: correggere introito proteico e calorico alterato

Integrare i deficit vitaminici e miconutrienti

Nutraceutici

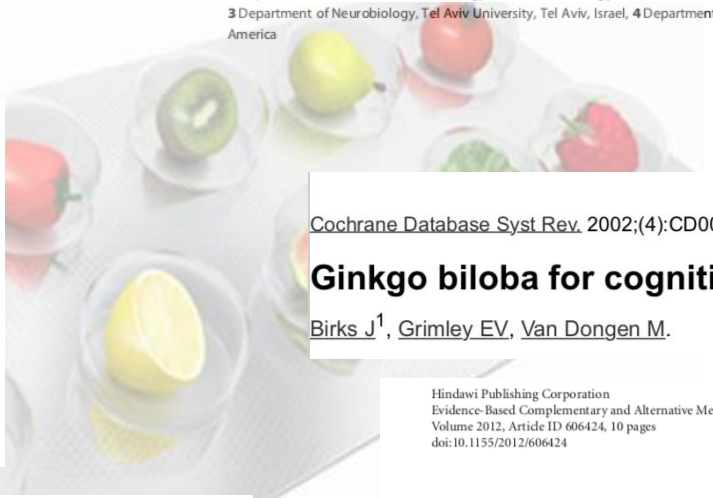
I NUTRACEUTICI…

OPEN ACCESS Freely available online PLoS one

Orally Administrated Cinnamon Extract Reduces β-Amyloid Oligomerization and Corrects Cognitive Impairment in Alzheimer's Disease Animal Models

Anat Frydman-Marom[1], Aviad Levin[2], Dorit Farfara[3], Tali Benromano[3], Roni Scherzer-Attali[1], Sivan Peled[1], Robert Vassar[4], Daniel Segal[1], Ehud Gazit[1]*, Dan Frenkel[3]*, Michael Ovadia[2]*

1 Department of Molecular Microbiology and Biotechnology, Tel Aviv University, Tel Aviv, Israel, 2 Department of Zoology, Tel Aviv University, Tel Aviv, Israel, 3 Department of Neurobiology, Tel Aviv University, Tel Aviv, Israel, 4 Department of Cell and Molecular Biology, Northwestern University, Chicago, Illinois, United States of America



British Journal of Nutrition (2010), **103**, 730–734 doi:10.1017/S0007114509992364

Concord grape juice supplementation improves memory function in older adults with mild cognitive impairment

Robert Krikorian[1]*, Tiffany A. Nash[1], Marcelle D. Shidler[1], Barbara Shukitt-Hale[2] and James A. Joseph[2]

[1]*Department of Psychiatry, University of Cincinnati Academic Health Center, Cincinnati, OH, USA*
[2]*USDA Human Nutrition Research Center on Aging and Tufts University, Boston, MA, USA*

(Received 1 May 2009 – Revised 3 September 2009 – Accepted 4 September 2009 – First published online 23 December 2009)

Cochrane Database Syst Rev. 2002;(4):CD003120.

Ginkgo biloba for cognitive impairment and dementia.

Birks J[1], Grimley EV, Van Dongen M.

Hindawi Publishing Corporation
Evidence-Based Complementary and Alternative Medicine
Volume 2012, Article ID 606424, 10 pages
doi:10.1155/2012/606424

Curcumin Structure-Function, Bioavailability, and Efficacy in Models of Neuroinflammation and Alzheimer's Disease

Aynun N. Begum, Mychica R. Jones, Giselle P. Lim, Takashi Morihara, Peter Kim, Dennis D. Heath, Cheryl L. Rock, Mila A. Pruitt, Fusheng Yang, Beverly Hudspeth, Shuxin Hu, Kym F. Faull, Bruce Teter, Greg M. Cole, and **Sally A. Frautschy**
Departments of Medicine (A.N.B., M.R.J., G.P.L., P.K., F.Y., B.H., S.H., B.T., G.M.C., S.A.F.) and Neurology (G.M.C., S.A.F.) and Psychiatry and Biobehavioral Sciences and The Semel Institute (K.F.F.), University of California, Los Angeles, California; Greater Los Angeles Healthcare System, Geriatric Research Education Clinical Center, Sepulveda, California (A.N.B., M.R.J., G.P.L., P.K., F.Y., B.H., S.H., B.T., G.M.C., S.A.F.); Cancer Prevention and Control Program, Moores UCSD Cancer Center, University of California San Diego, La Jolla, California (D.D.H., C.L.R., M.A.P.); and Department of Post-Genomics and Diseases, Division of Psychiatry and Behavioral Proteomics, Osaka University Graduate School of Medicine D3, Osaka, Japan (T.M.)

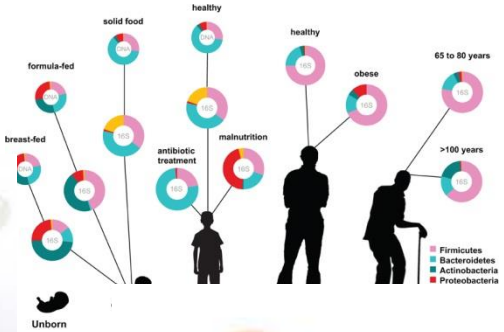
Research Article

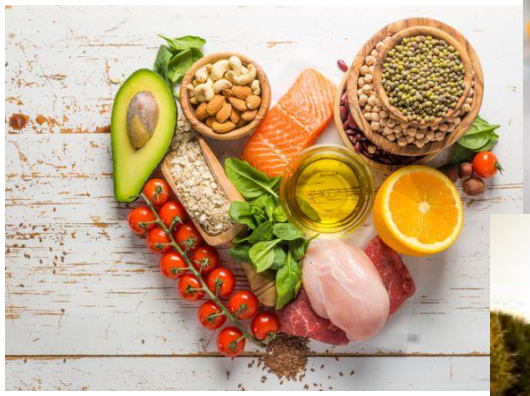
Effects of 12-Week *Bacopa monnieri* Consumption on Attention, Cognitive Processing, Working Memory, and Functions of Both Cholinergic and Monoaminergic Systems in Healthy Elderly Volunteers

Tatimah Peth-Nui,[1,2] Jintanaporn Wattanathorn,[2,3] Supaporn Muchimapura,[2,3] Terdthai Tong-Un,[2,3] Nawanant Piyavhatkul,[3,4] Poonsri Rangseekajee,[3,4] Kornkanok Ingkaninan,[5] and Sakchai Vittaya-areekul[5]

[1] *Neuroscience Program, Department of Physiology and Graduate School, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand*
[2] *Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand*
[3] *Integrative Complimentary Alternative Medicine Research and Development Group, Khon Kaen University, Khon Kaen 40002, Thailand*
[4] *Department of Psychiatry, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand*
[5] *Department of Pharmaceutical Chemistry and Pharmacognosy, Faculty of Pharmaceutical Sciences, Naresuan University, Phitsanulok 65000, Thailand*

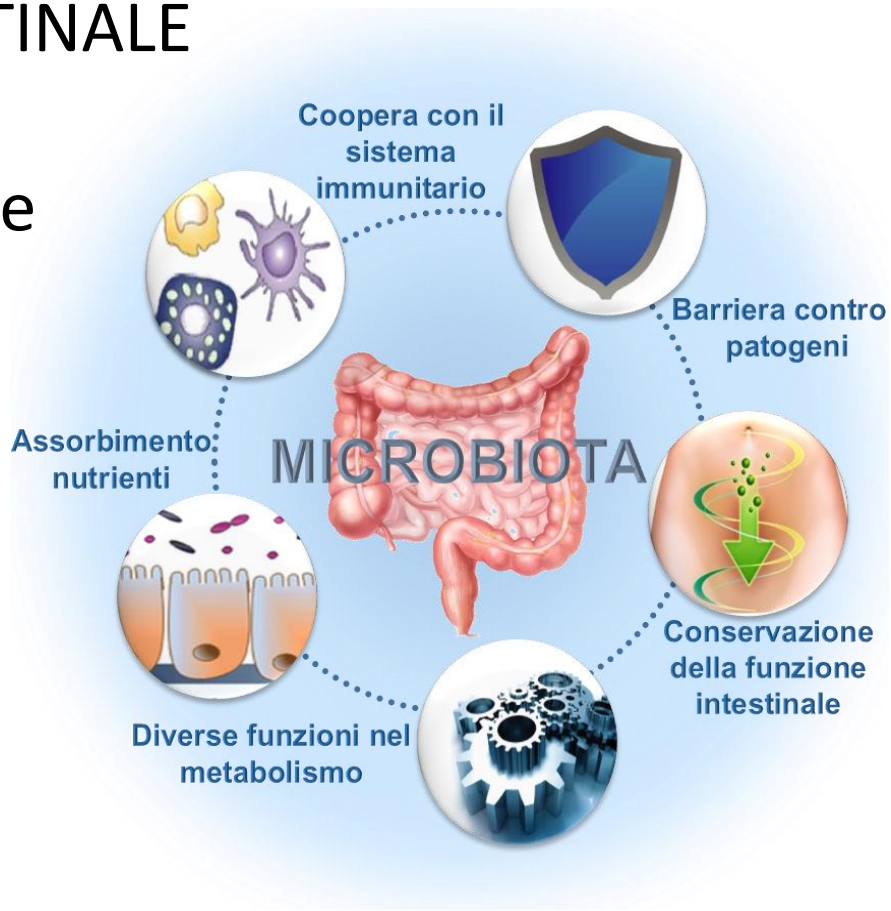
Dieta e microbiota





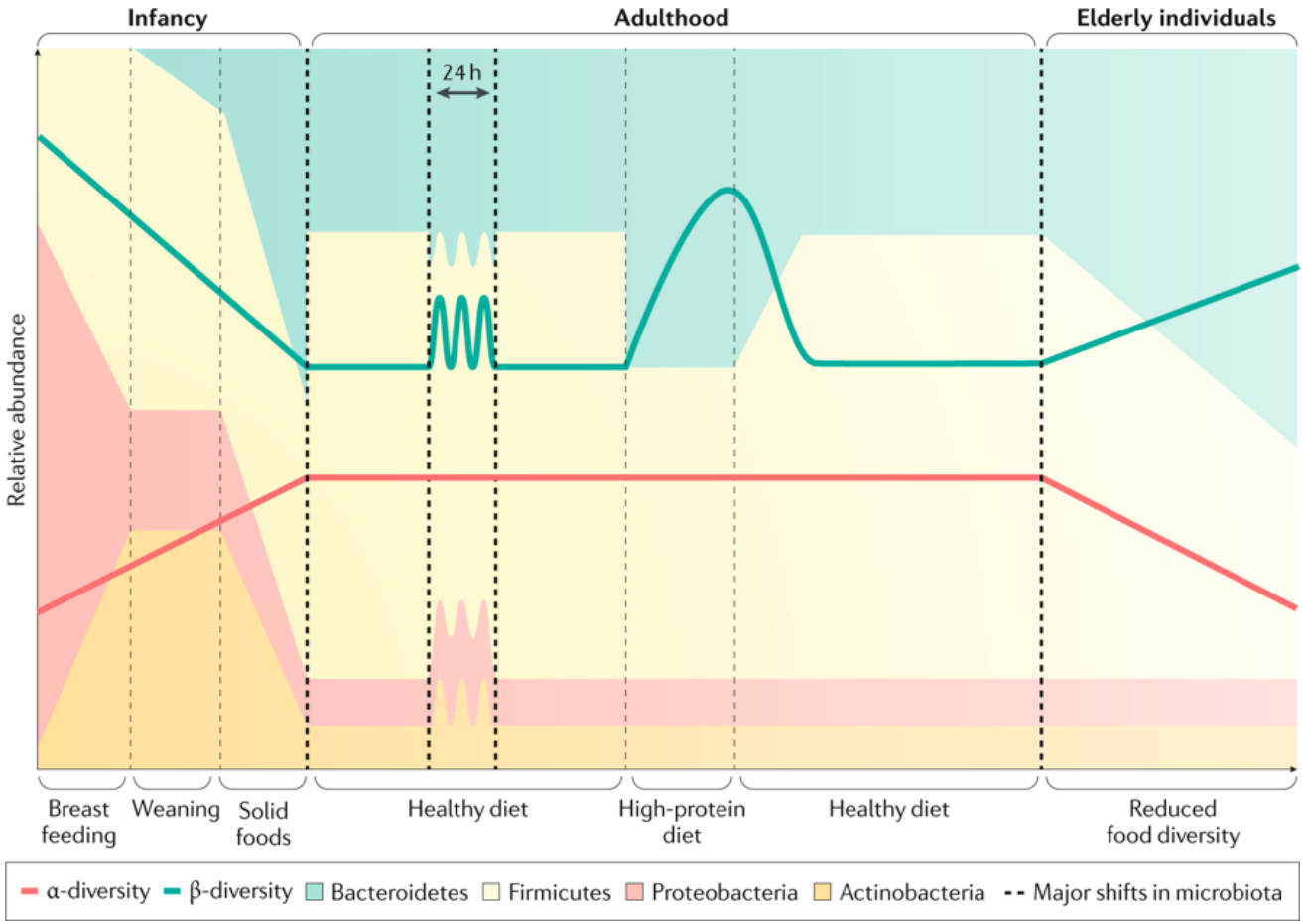
GUT MICROBIOTA: Principali funzioni

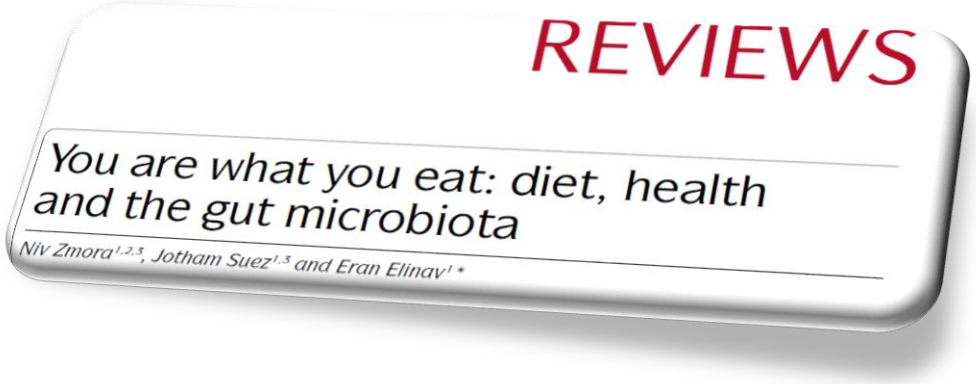
- Sviluppo e mantenimento della BARRIERA INTESTINALE
- Modulazione della flogosi ed effetto antiossidante
- Funzione metabolico-energetica
- Funzione di sintesi
  (Vitamine, acidi grassi a catena corta…)
- Immuno-modulazione



Dieta-microbiota-ospite: un “crosstalk”

La dieta influenza la struttura e la funzione batterica del GUT nell’arco di vita.





Le alterazioni del microbiota rispecchiano gli adattamenti dei cambiamenti nutrizionali in diversi intervalli di tempo:

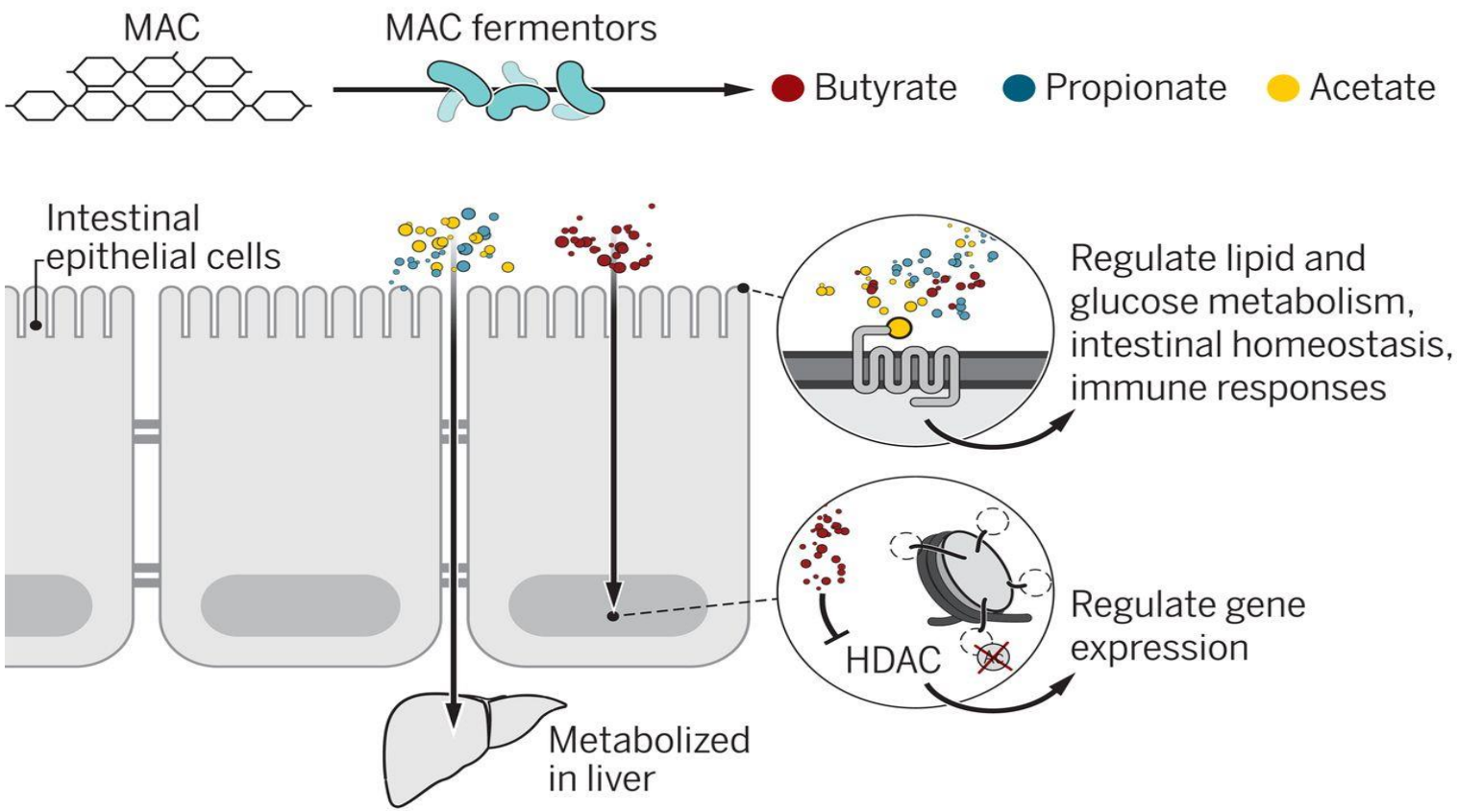
-le oscillazioni diurne corrispondono ai cicli sonno-veglia e digiuno-alimentazione;

-maggiori alterazioni nella composizione e quantità di cibo (una dieta con poche fibre, molti grassi e proteine) innescano cambiamenti transitori al microbiota, che persistono più della durata della perturbazione alimentare;

-le pratiche dietetiche di lunga data portano a cambiamenti indolenti al microbiota GUT.

Zmora N, Nture Reviews, 2018

Microbiota e metabolismo dei nutrienti: fermentazione dei “MAC”



MAC: frutto-galatto-oligosaccaridi, disaccaridi, monosaccaridi…polioli
→ PREBIOTICI? (anche PUFA, fenoli).

I CHO complessi sono per lo più indigesti per l‘uomo (fibre).

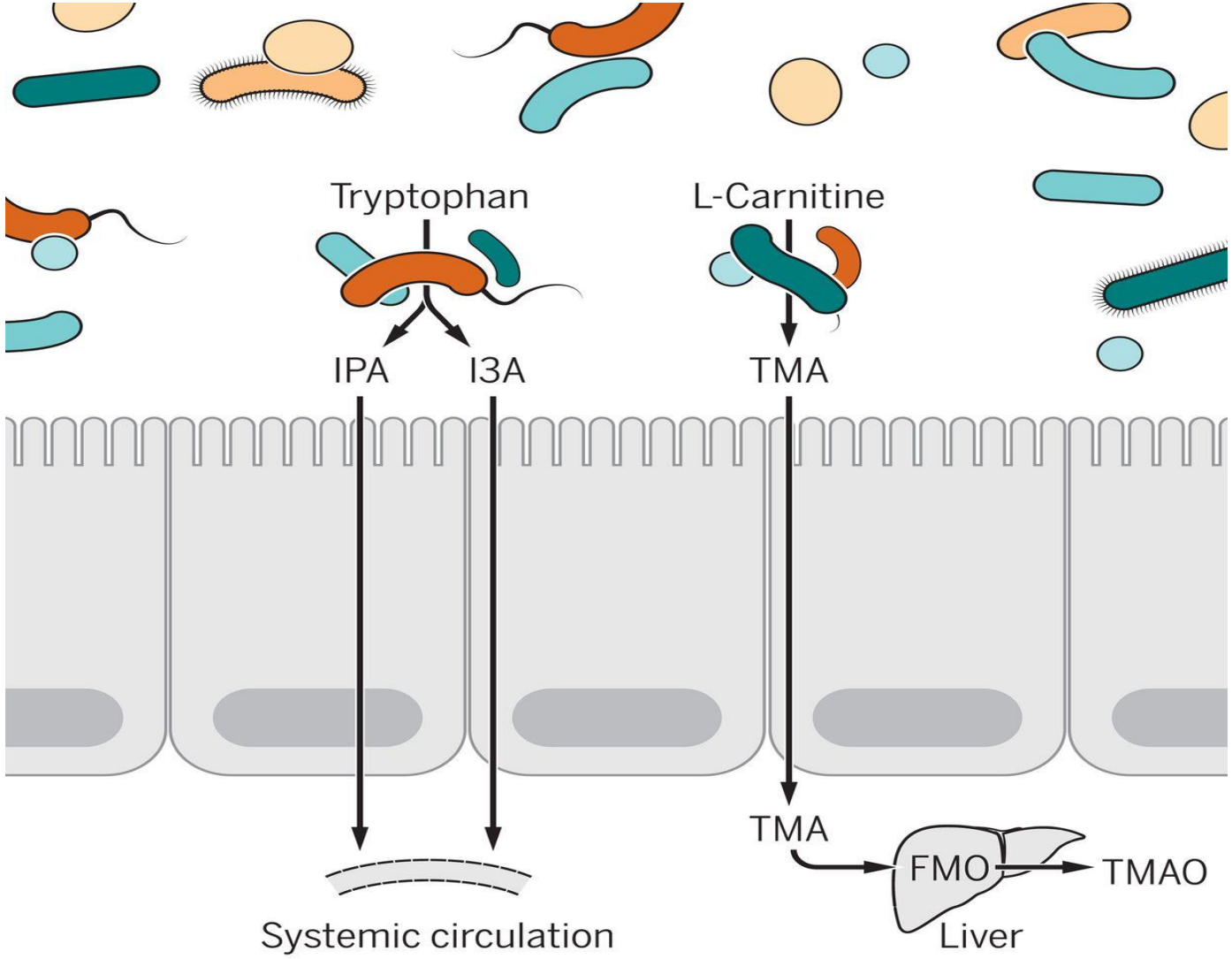
Alcuni di essi (MAC) sono digeribili dal GMB per produrre energia.

Una dieta povera di MAC determina consumo del muco con perdita dell’integrità della barriera intestinale, minor produzione di SCFA, LPS in circolo (endotossinemia).

SCFAs (butirrato, propionato, acetato):
-riserva energetica supplementare
-regolatori del metabolismo, della risposta immune, dell’espressione genica (inibizione histone deacetylase).

Christopher L. Gentile, and Tiffany L. Weir Science 2018;362:776-780

Interazione tra amino acidi e gut microbiota



La proteolisi microbica produce metaboliti che interagiscono con la fisiologia umana. Ad esempio:

- indoli, fenoli, amine (in combinazione con NoX) favoriscono GIK

- Dal metabolismo di carnitina in trimetilamina (TMA) nel fegato viene viene prodotta TMAO. Livelli elevati di TMAO sono legati a malattie metaboliche.

- Dal metabolismo del triptofano → indolo3acetato con effetto antinfiammatorio, → acido indolpropionico con effetto omeostatico intestinale

Christopher L. Gentile, and Tiffany L. Weir Science 2018;362:776-780

Terapia nutrizionale, microbiota e salute

Dietary component	Bacteria	Metabolites or mediators	Disease risk
Red meat (l-carnitine)	*Prevotella* [a]	↑ TMAO	↑ CVD
Red meat (l-carnitine)	*Bacteroides* [b]	↓ TMAO	↓ CVD
Emulsifiers (lecithin)	?	↑ TMAO	↑ CVD
Emulsifiers (P80 and CMC)	↑ Proteobacteria[a]	↑ LPS and flagellin	↑ Colitis and metabolic syndrome
Emulsifiers (P80 and CMC)	↑ *Akkermansia*[a]	↑ LPS and flagellin	↑ Colitis and metabolic syndrome
Red meat (heterocyclic amines)	*Bacteroides* [a]	↑ 7-OHIQ	↑ Carcinogenesis
Red meat (heterocyclic amines)	*Clostridium* [a]	↑ 7-OHIQ	↑ Carcinogenesis
Red meat (heterocyclic amines)	*Eubacterium* [a]	↑ 7-OHIQ	↑ Carcinogenesis
Red meat (heterocyclic amines)	*Lactobacillus* [b]	↑ IQ and PhIP	↓ Carcinogenesis
Red meat (haem)	↑ *Bacteroides*[a]	↑ LPS? Diet influences the gut bacterial structure and function throughout the human lifespan. Microbiota alterations mirror adaptations to nutritional shifts at different time frames	↑ Colon cancer
Red meat (haem)	↑ Sulfate-reducing bacteria[a]	↑ Hydrogen sulfide	↑ Colon cancer
Red meat (haem)	↑ *Prevotella*[a]	↑ LPS?	↑ Colon cancer
Red meat (haem)	↑ *Akkermansia*[a]	↓ Mucus	↑ Colon cancer and IBD
Polyphenols (caffeic acid)	↑ *Akkermansia*[b]	?	↓ IBD
Polyphenols (resveratrol)	↓ *Prevotella*[a]	↓ TMAO	↓ CVD
Polyphenols (grape and/or cranberry extract)	↑ *Akkermansia*[b]	?	↓ Metabolic syndrome


REVIEWS

You are what you eat: diet, health and the gut microbiota

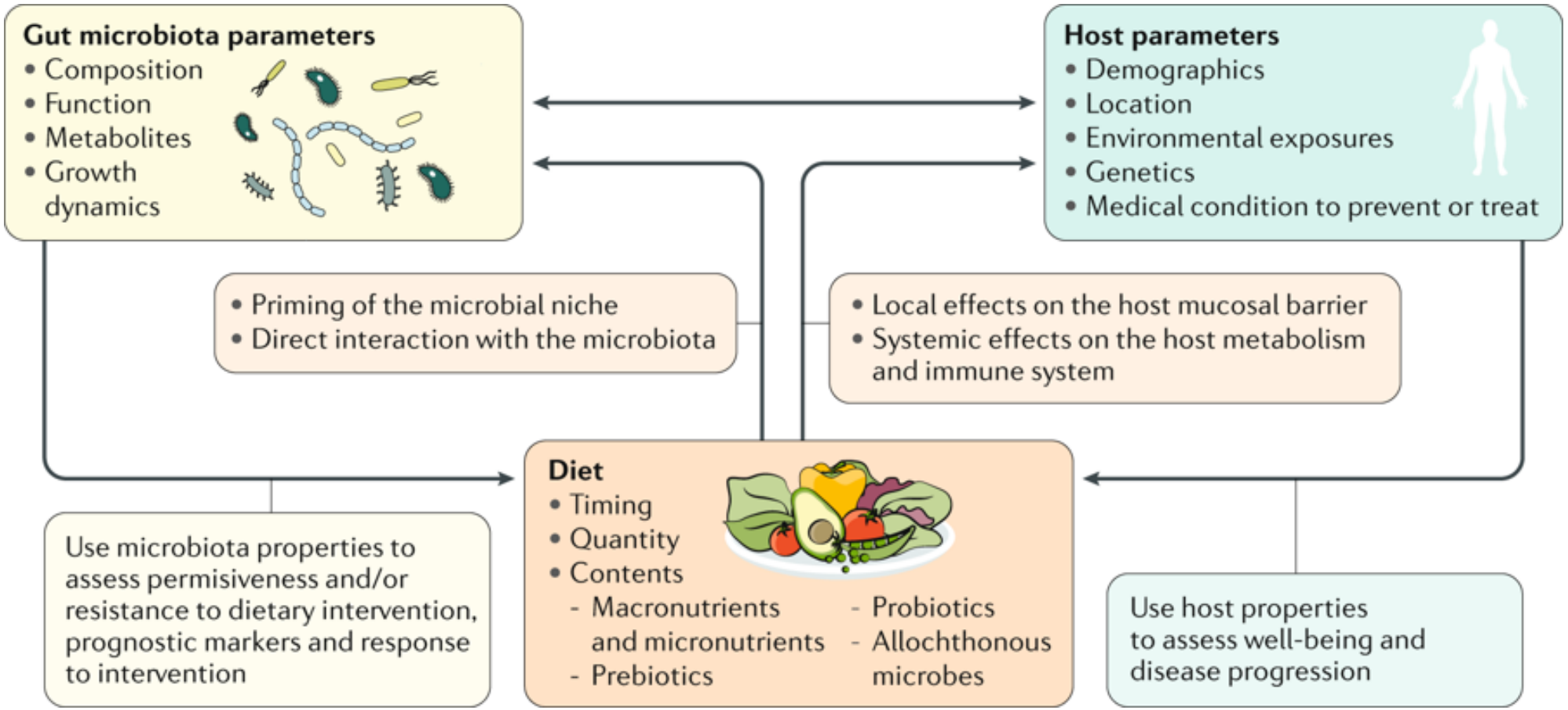
Niv Zmora[1,2,3], Jotham Suez[1,3] and Eran Elinav[1]*

La modulazione della composizione e delle funzioni del microbiota attraverso la dieta può avere sia un effetto benefico che dannoso sulla salute dell'ospite (uomo).

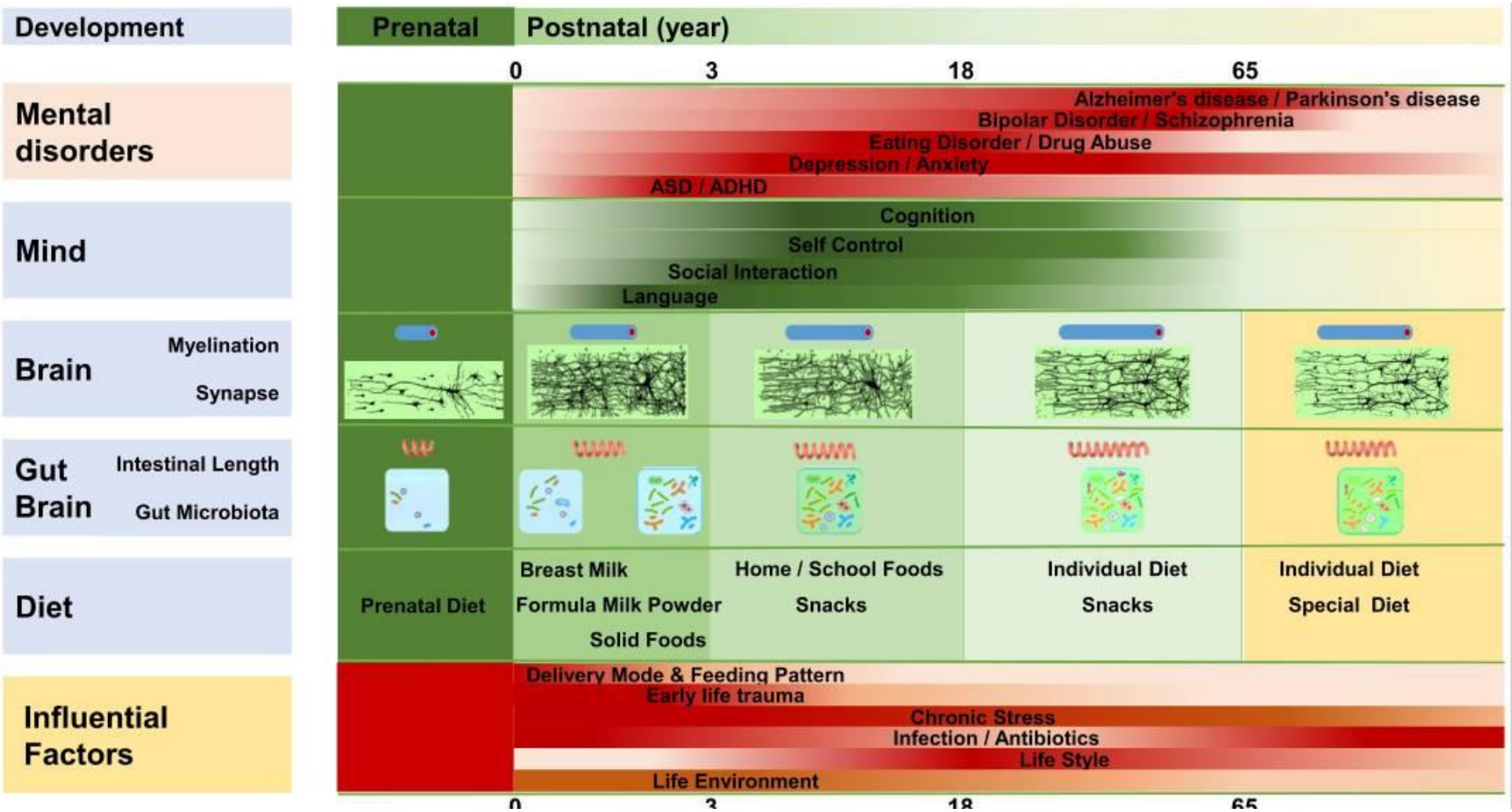
NAS (saccharin)	↑ *Bacteroides*[a]	↑ Acetate, propionate and LPS[a]	↑ Metabolic syndrome
NAS (saccharin)	↓ *Akkermansia*[b]	↑ Acetate and propionate[a]	↑ Metabolic syndrome
NAS (saccharin)	↑ *Turicibacter*[a]	↑ LPS?	↑ Metabolic syndrome
NAS (aspartame)	↑ *Clostridium leptum*[a]	↑ Acetate, propionate and butyrate[a]	↑ Metabolic syndrome
NAS (acesulfame-potassium)	↑ *Bacteroides*[a]	↑ LPS, pyruvate and cholate	↑ Metabolic syndrome
High-fat and high-sugar diet	↑ Firmicutes, Mollicutes and *Eubacterium*[a]	↑ Lactate, acetate and butyrate[a]	↑ Metabolic syndrome
High-fat and high-sugar diet	↓ Bacteroidetes[b]	?	↑ Metabolic syndrome
Saturated fat	↑ *Bacteroides* and *Turicibacter*[a]	↑ LPS	↑ Metabolic syndrome
Saturated fat	Supplemented *Bacteroides uniformis*[b]	?	↓ Metabolic syndrome
Saturated fat	↑ *Bilophila*[a]	↑ LPS	↑ IBD
Saturated fat	↓ S24-7 (Bacteroidetes) and Lachnospiraceae[b]	↓ Butyrate and retinoic acid[b]	↑ IBD
Saturated fat	↑ *Bacteroides*, Mollicutes and *Lactobacillus*[a]	↓ Flavonoids and UCP1	↑ Metabolic syndrome
Saturated fat (palmitate)	↓ S24-7 (Bacteroidetes) and Prevotellaceae[b]	↓ Propionate?[b]	↑ Multiple sclerosis
Unsaturated fat	↑ *Akkermansia*, Mollicutes and *Lactobacillus*[b]	↓ LPS?	↓ Metabolic syndrome
High-fat (saturated and unsaturated)	↓ *Prevotella*, *Bacteroides* and *Turicibacter*[a]	↓ Pro-IL-1β	↓ Osteomyelitis

Fibre	Clostridiales[a]	↑ Butyrate[a]	↑ Colon cancer
Fibre	?	↑ Butyrate, IL-10 and IL-18[b]	↓ Colon cancer
Fibre	↑ Actinobacteria and Bacteroidetes[b]	↑ Propionate, butyrate and IGN[b]	↓ Metabolic syndrome
Fibre	*Prevotella* [b]	↑ Glycogen storage	↓ Metabolic syndrome
Fermentable fibre (inulin)	↑ *Bifidobacterium* and *Akkermansia*[b]	↑ IL-22	↓ Metabolic syndrome
Fermentable fibre (inulin)	*Bifidobacterium* [b]	↑ Mucus growth	↓ IBD
Fermentable fibre (inulin)	?	↑ Acetate[b] ↓ Appetite	↓ Metabolic syndrome
High-fat	?	↑ Acetate[a], GSIS and hyperphagia	↑ Metabolic syndrome
Low-fibre diet	↑ *Akkermansia* and *Bacteroides caccae*[a]	↓ Mucus	↑ *Citrobacter* susceptibility

Principi terapeutici utilizzandi l'asse "cibo-micriobiota"



Dieta, microbiota, encefalo e sviluppo mentale

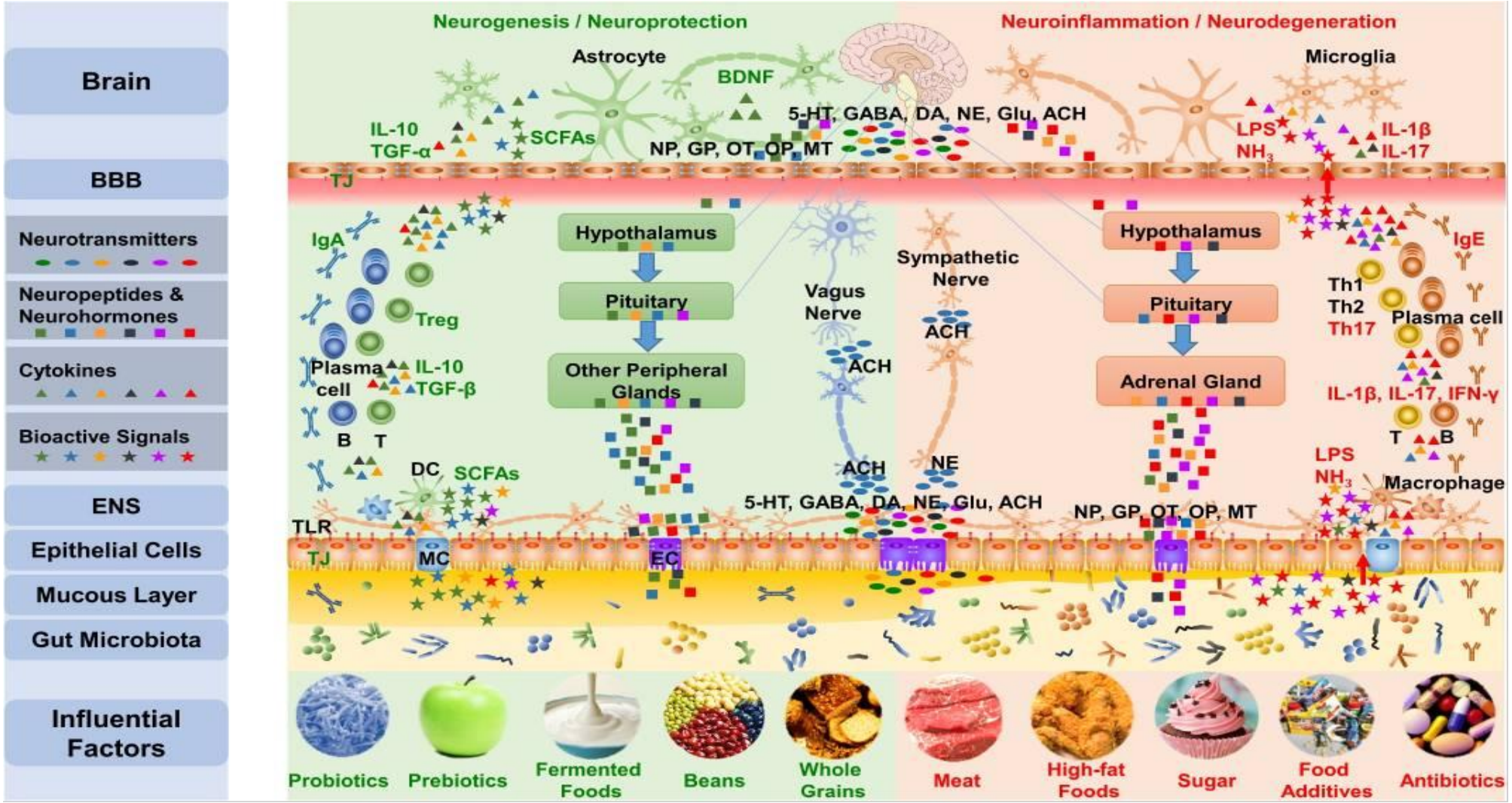


Il microbiota, l'encefalo e le funzioni mentali mostrano pattern di sviluppo simili: tutti e tre sono sensibili a diversi fattori. La dieta ha un ruolo preminente nella loro maturazione. Alterazioni della dieta e conseguentemente del microbiota possono favorire l'incidenza di disturbi mentali e malattie psichiche.

Liang S. Front Integr Neurosci 2018

Dieta, microbiota, encefalo

Liang S.
Front Integr Neurosci
2018

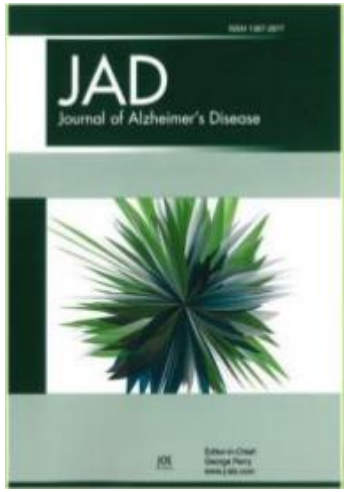


I diversi alimenti che compongono pattern dietetici caratteristici come la dieta meditarranea o la dieta occidentale possano svolgere azioni protettive sul microbiota o alterare l'asse intestino-cervello.
A sinistra: la protezione del microbiota, il mantenimento del muco e della barriera intestinale, la produzione di SCFA inducono un ambiente neuroprotettivo. A destra: l'asse benefico intestino-cervello si interrompe e vengono prodotti LPS e altre sostanze tossiche e ossidanti con neuroinfiammazione e degenerazione

Il gut microbiota puo' essere fondamentale per la trasformazione dei nutrienti della dieta in composti attivi che esercitano un effetto benefico

Ticinesi A et al, Clinical Interventions in Aging, 2018

Published in final edited form as:
J Alzheimers Dis. 2018 ; 63(2): 409–421. doi:10.3233/JAD-171151.



The Role of the Gut Microbiota in the Metabolism of Polyphenols as Characterized by Gnotobiotic Mice

Giulio Maria Pasinetti[a,d,*], **Risham Singh**[a], **Susan Westfall**[c], **Francis Herman**[a], **Jeremiah Faith**[b], and **Lap Ho**[a]

[a]Department of Neurology, Icahn School of Medicine at Mount Sinai, New York, NY, USA

[b]Department of Genomic Sciences, Icahn School of Medicine at Mount Sinai, New York, NY, USA

[c]Department of Biomedical Engineering, McGill University, Montreal, QC, Canada

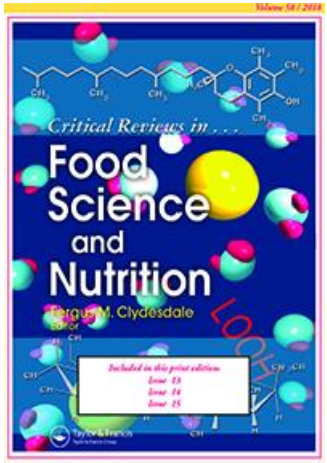
[d]Geriatric Research, Education and Clinical Center, James J. Peters Veterans Affairs Medical Center, Bronx, NY, USA

Gli autori ipotizzano che sfruttare l'ecosistema microbico intestinale per generare metaboliti bioattivi a livello cerebrale derivanti dai polifenoli introdotti con la dieta, possa essere in grado di attenuare i fattori di rischio legati allo stile di vita e di promuovere la resilienza contro il declino cognitivo legato all'età

Crit Rev Food Sci Nutr. 2018 May 21:1-28. doi: 10.1080/10408398.2018.1478388.

Bidirectional interactions between dietary curcumin and gut microbiota.

Shen L[1,2,3], Ji HF[1,2,3].



Abstract

Curcumin is a
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between the a
curcumin show
aspects, we re
curcumin and
curcumin biot
pharmacologic
parent curcum
pharmacological effects and iii) development of gut microbiota regulation-based disease prevention/treatment strategy for curcumin in view of its clinical safety.
This review is important to deepen our understanding of the mechanisms of action of curcumin and to provide future directions about how to use this natural compound to combat human diseases.

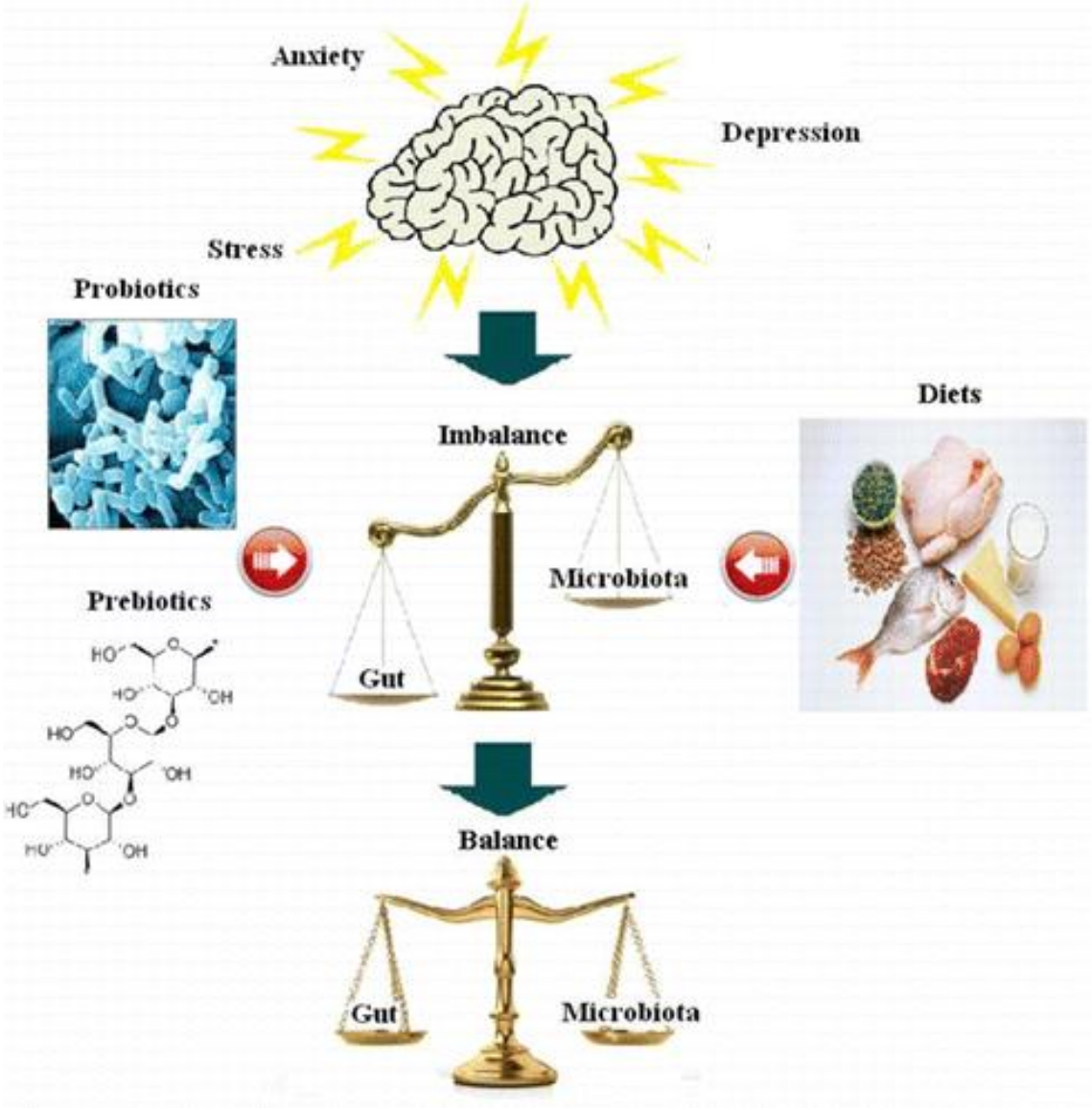
La curcumina e' recentemente emersa come un promettente modulatore del microbiota intestinale, mostrando effetti neuroprotettivi.

La sua somministrazione e' in grado di indurre un aumento dell'espressione di gruppi di batteri con proprieta' antinfiammatorie attenuando l'assorbimento sistemico dell'LPS associato con la dieta occidentale.

Tale rapprto e' bidirezionale in quanto i metaboliti della curcumina prodotti dal microbiota stesso, possono esercitare attivita' antiossidante indipendente, in particolare nei confronti del SNC inibendo l'aggregazione della proteina tau.

Probiotici, microbiota e demenza

In questo contesto l'impiego di probiotici potrebbe essere utile per aumentare l'efficacia della terapia nutrizionale della demenza?



Mod. da Xiaofei L. et al, J. Agric. Food Chem. 2015

Clinical Interventions in Aging

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REVIEW

Gut microbiota, cognitive frailty and dementia in older individuals: a systematic review

Andrea Ticinesi[1–3]
Claudio Tana[2]
Antonio Nouvenne[2,3]
Beatrice Prati[2]
Fulvio Lauretani[2]
Tiziana Meschi[1–3]

[1]Department of Medicine and Surgery, University of Parma, Parma, Italy; [2]Geriatric-Rehabilitation Department, Parma University Hospital, Parma, Italy; [3]Microbiome Research Hub, University of Parma, Parma, Italy

We identified 47 papers with original data (31 from animal studies and 16 from human studies) suitab and inter- venti e) support the co ctivity and bacte d amyloid depos sely, there is a su preventing to for f cognitive function represents, however, a promising area of research for identifying novel preventive and treatment strategies against dementia.

Modelli animali: La modulazione dell'attività vagale e la sintesi batterica di sostanze attive sul metabolismo neuronale dell'ospite, l'infiammazione e il deposito di amiloide, sembrano i principali meccanismi coinvolti nella relazione intestino-cervello.
Vi è invece una mancanza di evidenze sull'uomo anche se la modulazione del microbiota, potenziata da probiotici, sulle funzioni cognitive sembra una promettente area di ricerca per individuare strategie di prevenzione e cura della demenza

Gut microbiota, cognitive frailty and dementia in older individuals: a systematic review

This article was published in the following Dove Press journal:
Clinical Interventions in Aging

EJCN

European Journal of Clinical Nutrition (2007) 61, 355–361
© 2007 Nature Publishing Group All rights reserved 0954-3007/$30.00
www.nature.com/ejcn

ORIGINAL ARTICLE

Impact of consuming a milk drink containing a probiotic on mood and cognition

D Benton, C Williams and A Brown

Department of Psychology, University of Wales S

[1]Department of Me
University of Parma
[2]Geriatric-Rehabilit
Parma University H

doi.org/10.1016/j.bbi.2016.11.018

Lost in translation? The p
fails to modulate stress or cognitive performance in healthy male subjects

[1]John R.Kelly[ab]Andrew P.Allen[ab]AndriyTemko[c]WilliamHutch[d]Paul J.Kennedy[e]NiloufarFarid[b]EileenMurphy[e]GeraldineBoylan[d]JohnBienenstock[f]John F.Cryan[ab]GerardClarke[ab]Timothy G.Dinan[ab]

Citation: Transl Psychiatry (2016) **6**, e939; doi:10.1038/tp.2016.191
www.nature.com/tp

ORIGINAL ARTICLE

Bifidobacterium longum 1714 as a translational psychobiotic: modulation of stress, electrophysiology and neurocognition

n[1,7,8], TG Dinan[1,2] and G Clarke[1,2]

Sull'uomo studi osservazionali e d'intervento (4).
Risultati iniziali sull'umore, sulla memoria visuo-spaziale (contrastanti)
Vi è una mancanza di evidenze sull'uomo anche se la modulazione del microbiota, potenziata da probiotici, sulle funzioni cognitive sembra una promettente area di ricerca per individuare strategie di prevenzione e cura della demenza

ted with probiotic
bacteria, Lactobacillus rhamnosus LB 21, and Lactococcus lactis L1A--a pilot study among old people with dementia in a residential care facility.

Carlsson M[1], Gustafson Y, Haglin L, Eriksson S.

Bifidobacterium Animalis (lactis BS05)

Appl Microbiol Biotechnol (2013) 97:809–817
DOI 10.1007/s00253-012-4241-7

APPLIED MICROBIAL AND CELL PHYSIOLOGY

Antioxidant properties of potentially probiotic bacteria: in vitro and in vivo activities

Alberto Amare
Stefano Raimo
Alessandra Bo

Received: 7 May 2

Abstract Thirty
Bifidobacterium
Streptococcus th
oxidant activity
tion (TAA_{AA} a
capacity (TEAC
peroxide dismu
TAA_{AA}, TAA_{LA}
bacterial groups
strain specific. The strains *Bifidobacterium animalis* subsp. *lactis* DSMZ 23032, *Lactobacillus acidophilus* DSMZ 23033, and *Lactobacillus brevis* DSMZ 23034 exhibited among the highest TAA_{AA}, TAA_{LA}, TEAC, and TGSH values within the lactobacilli and bifidobacteria.

- Su modelli animali, in vitro e in vivo, esercita attivita' antiossidante per aumento di GSH (glutatione ridotto) e SOD (superossidodismutasi)
- La produzione di GSH e' piu elevata rispetto altri ceppi testati (bifidobatteri, lattobacilli, lattocochhi, streptococchi)

Lactobacillus Plantarum LP01

Siezen and van Hylckama Vlieg *Microbial Cell Factories* 2011, **10**(Suppl 1):S3
http://www.microbialcellfactories.com/content/10/S1/S3

MICROBIAL CELL FACTORIES

PROCEEDINGS

Genomic diversity
plantarum, a natu

Roland J Siezen[1,2,3,4*], Johan ET van Hylck

From 10th Symposium on Lactic Acid
Egmond aan Zee, the Netherlands. 28

- **Manifesta attivita' anti-infiammatoria mediata prevalentemente da IL-10**
- **Modula il Sistema immunitario aumentando I linfociti helper e B**
- **Migliora l'integrita dell'epitelio intestinale**

Abstract

In the past decade it has become clear that the lactic acid bacterium *Lactobacillus plantarum* occupies a diverse range of environmental niches and has an enormous diversity in phenotypic properties, metabolic capacity and industrial applications. In this review, we describe how genome sequencing, comparative genome hybridization and comparative genomics has provided insight into the underlying genomic diversity and versatility of *L. plantarum*. One of the main features appears to be genomic life-style islands consisting of numerous functional gene cassettes, in particular for carbohydrates utilization, which can be acquired, shuffled, substituted or deleted in response to niche requirements. In this sense, *L. plantarum* can be considered a "natural metabolic engineer".

Lactobacillus Buchneri LB26

Selenium and Zinc Internalized by *Lactobacillus buchneri* Lb26 (DSM 16341) and *Bifidobacterium lactis* Bb1 (DSM 17850)

Improved Bioavailability Using a New Biological Approach

Luca Mogna,

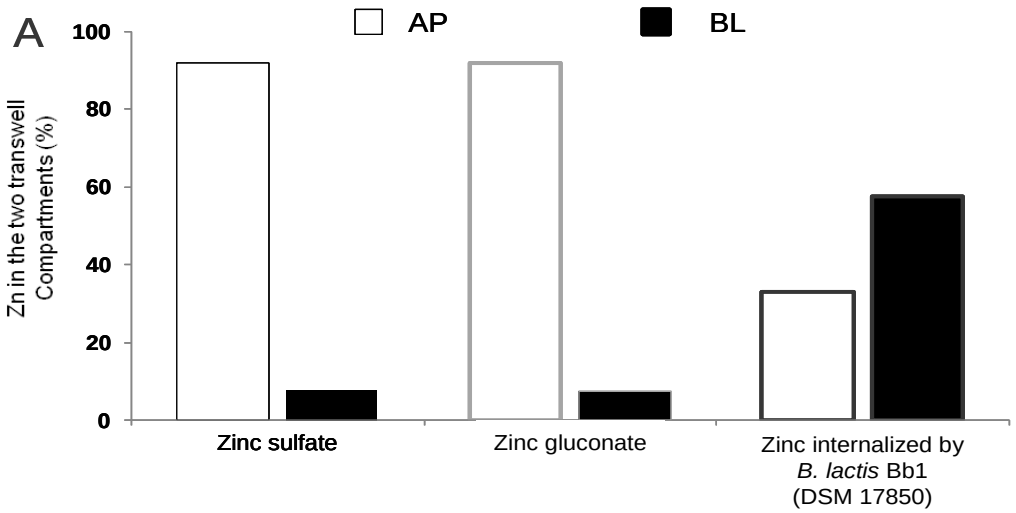
Background: Minerals, often re
of the 5 fundamental groups
Micronutrient malnutrition aff
ulation. In particular, zinc
emerging public health problem
countries. Selenium (Se) is a
humans and animals. Dietary S
nine and selenocysteine. In a
inorganic form (selenite) in son
intake of these minerals, nume
different inorganic and organic
available. At any rate, it is qu
have a very low bioavailability.
gluconate, orotate, citrate, or
by a higher systemic effect. Th
certain species of probiotics e
represent an interesting alternative to these preparations. Diet integration with bacteria able to internalize Zn and Se may embody a new application of probiotics.

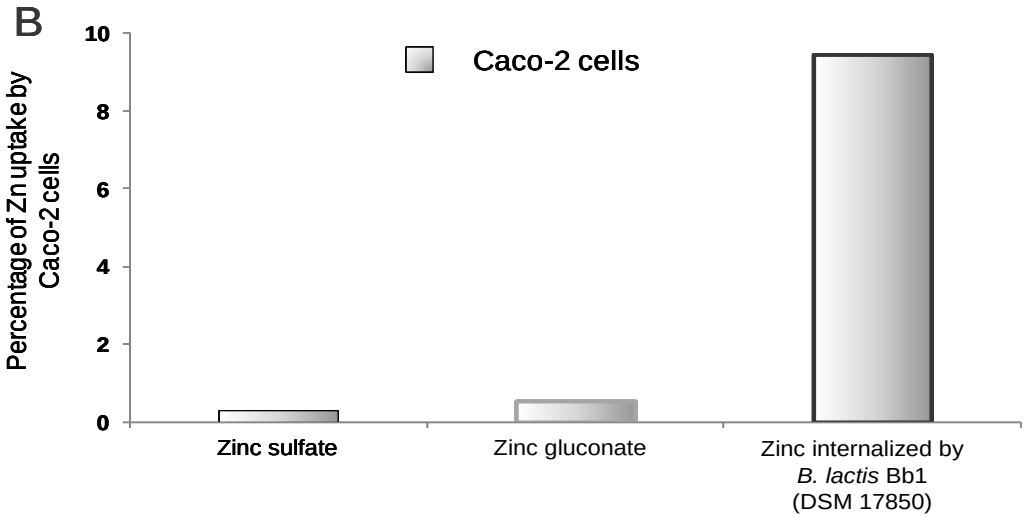
- **Lb26, grazie ad un particolare processo biologico, internalizza il Selenio in forma altamente biodisponibile per il mantenimento della funzione immunitaria intestinale e la protezione delle cellule dello stress ossidativo**

- **Il selenio internalizzato in lb26 evidenza una maggiore biodisponibilita'**

Un caso particolare: l'internalizzazione di Zinco

Lo zinco internalizzato da *B. lactis* Bb1 (DSM 17850) ha mostrato una biodisponibilità più elevata rispetto alle forme sia inorganiche che organiche testate.





LEGENDA
AP = comparto apicale;
BL = comparto basolaterale.

Mogna L. et al. Selenium and zinc internalized by *Lactobacillus buchneri* Lb26 (DSM 16341) and *Bifidobacterium lactis* Bb1 (DSM 17850): improved bioavailability using a new biological approach. J Clin Gastroenterol. 2012;46 Suppl:S41-5.

POLICY FORUM

SCIENCE AND REGULATION

Food and microbiota in the FDA regulatory framework

How should microbiota-directed foods be regulated?

By Jonathan M. Green,[1,2*] Michael J. Barratt,[3,4*] Michael Kinch,[5] Jeffrey I. Gordon[3,4]

approaches to regulation vary among coun-
tries (9), we focus on the U.S. Food and
because of its

"Classification schemes that are ultimately adopted will likely have broad societal implications for...products that target the microbiota."

Si attesta un sempre più crescente numero di prodotti che sostengono di avere effetti benefici sul GUT microbiota e sullo stato di salute

Cibo convenzionale (non pensato per alterare specificatamente il microbiota)

VS

Cibo "orientato al microbiota" (formulato intenzionalmente allo scopo di alterare il microbiota MDF)

Importanza di concepire i MDF come **"integratori alimentari"**

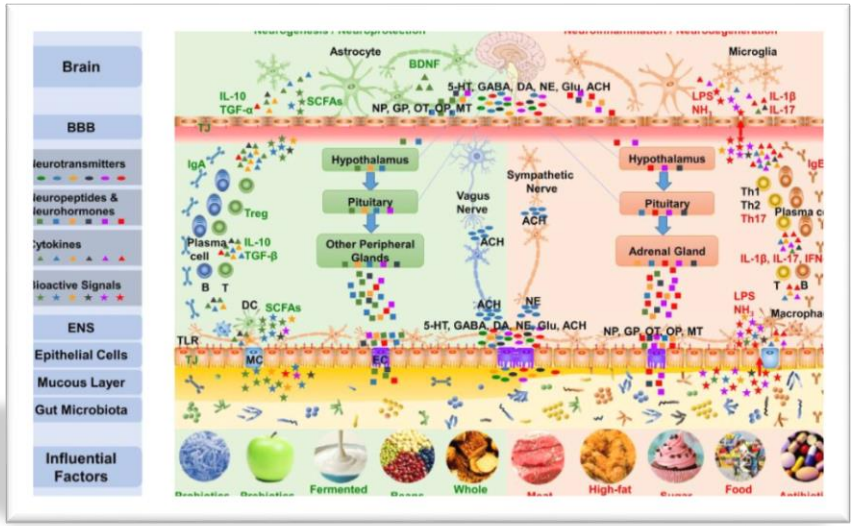
Published by AAAS

CONCLUSIONI

La dieta è un fattore potenzialmente modificabile/reversibile per demenza e deficit cognitivi

La dieta influenza il microbiota durante tutto il corso della vita sia con effetto benefico che dannoso

I pattern dietetici “sani” possono non essere sufficienti nell’invecchiamento per la prevenzione di neuro-infiammazione e degenerazione.

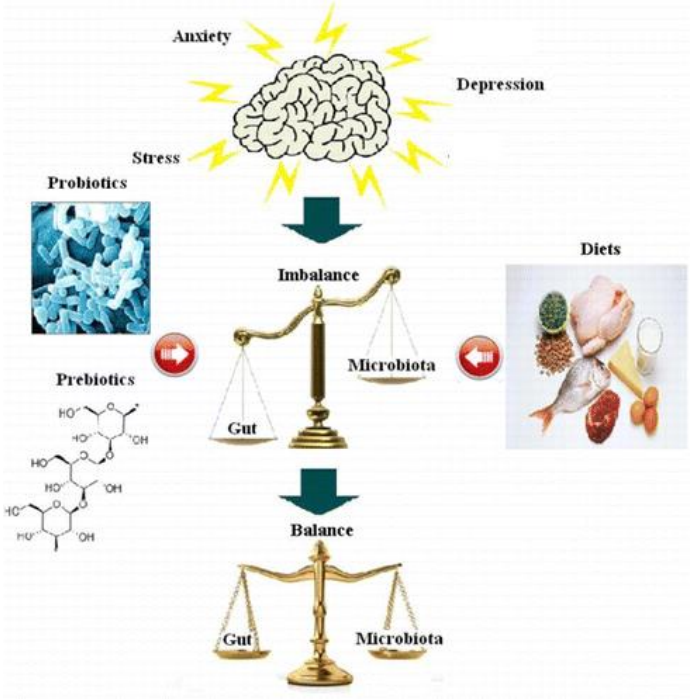


E’ necessario introdurre nella dieta prebiotici e probiotici.

CONCLUSIONI

Il gut microbiota puo' essere fondamentale per la trasformazione dei nutrienti della dieta in composti attivi che esercitano un effetto benefico.

L'impiego di probiotici potrebbe essere utile per aumentare l'efficacia della terapia nutrizionale della demenza



63° CONGRESSO NAZIONALE SIGG

GLI ANZIANI: LE RADICI DA PRESERVARE

ROMA 28 novembre 01 dicembre 2018 Auditorium della Tecnica, Roma

GRAZIE PER L'ATTENZIONE!!!

ROMA, 29 Novembre 2018

Dr.ssa Alessandra Coin
Clinica Geriatrica – Azienda Ospedaliera di Padova