top ten in gastroenterologia

9ª EDIZIONE
2·3 MARZO 2018
BERGAMO Hotel Excelsior S. Marco
Piazza della Repubblica, 6

Disbiosi

Cosa c'è di nuovo?

Gianpiero Manes

UOC di Gastroenterologia ed Endoscopia Digestiva
ASST-Rhodense

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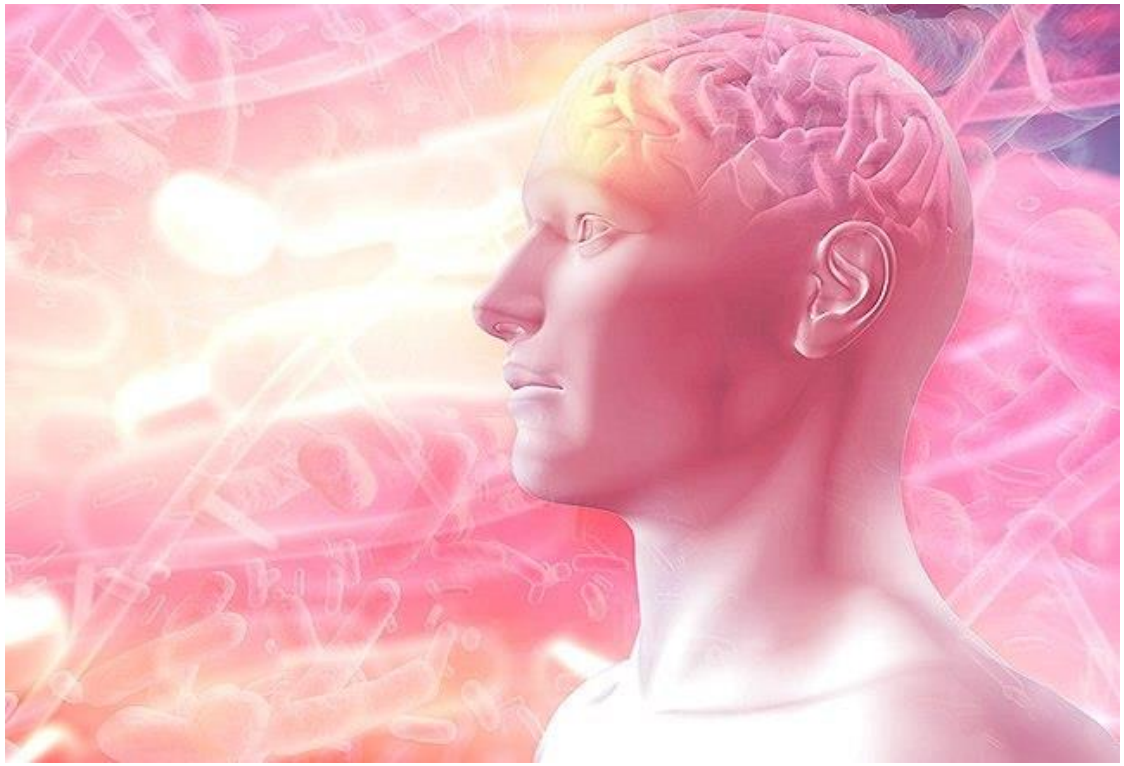
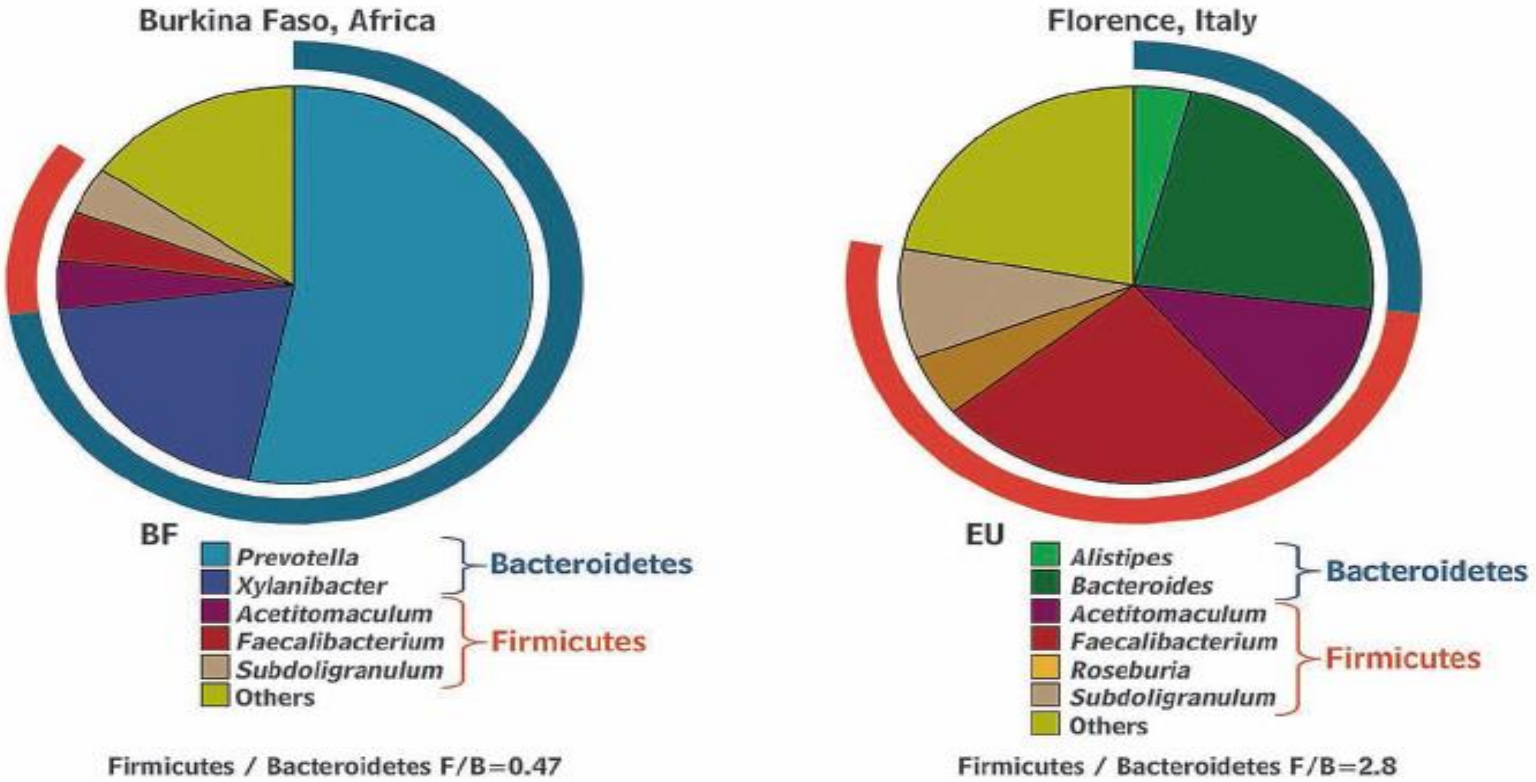
- **Dysbiosis** is a term for a microbial imbalance or maladaptation on or inside the body



Differente composizione del microbiota intestinale in bambini con diete diverse



	kcal	Prot. (g)	Grassi (g)	Totale Carb.	Fibre solubili
BF	996	40	31	149	14
EU	1512	67	74	290	8

De Filippo et al, *PNAS* 2010;107:14691

Papua New Guinea has extremely high biodiversity. The total number of different plants and animals in Papua New Guinea is not accurately known but almost certainly exceeds 200,000 species.

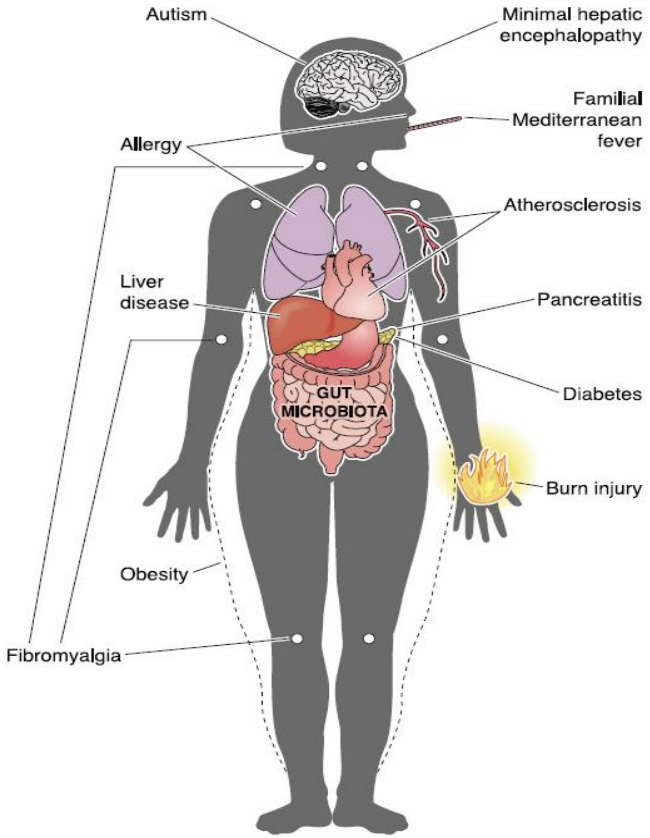
Scientists estimate that more than half the plants and animals found in Papua New Guinea have yet to be scientifically named.

PNG's forests provide habitat for around 250 species of mammals, 20,000 species of plants, 1,500 species of trees and 750 species of birds, half of which are unique to the island. The world's largest butterfly (10.4-inch wingspan) and the world's largest mangrove expanses can be found in PNG.

Saving Papua New Guinea's rainforest will protect its biodiversity for many generations to come.

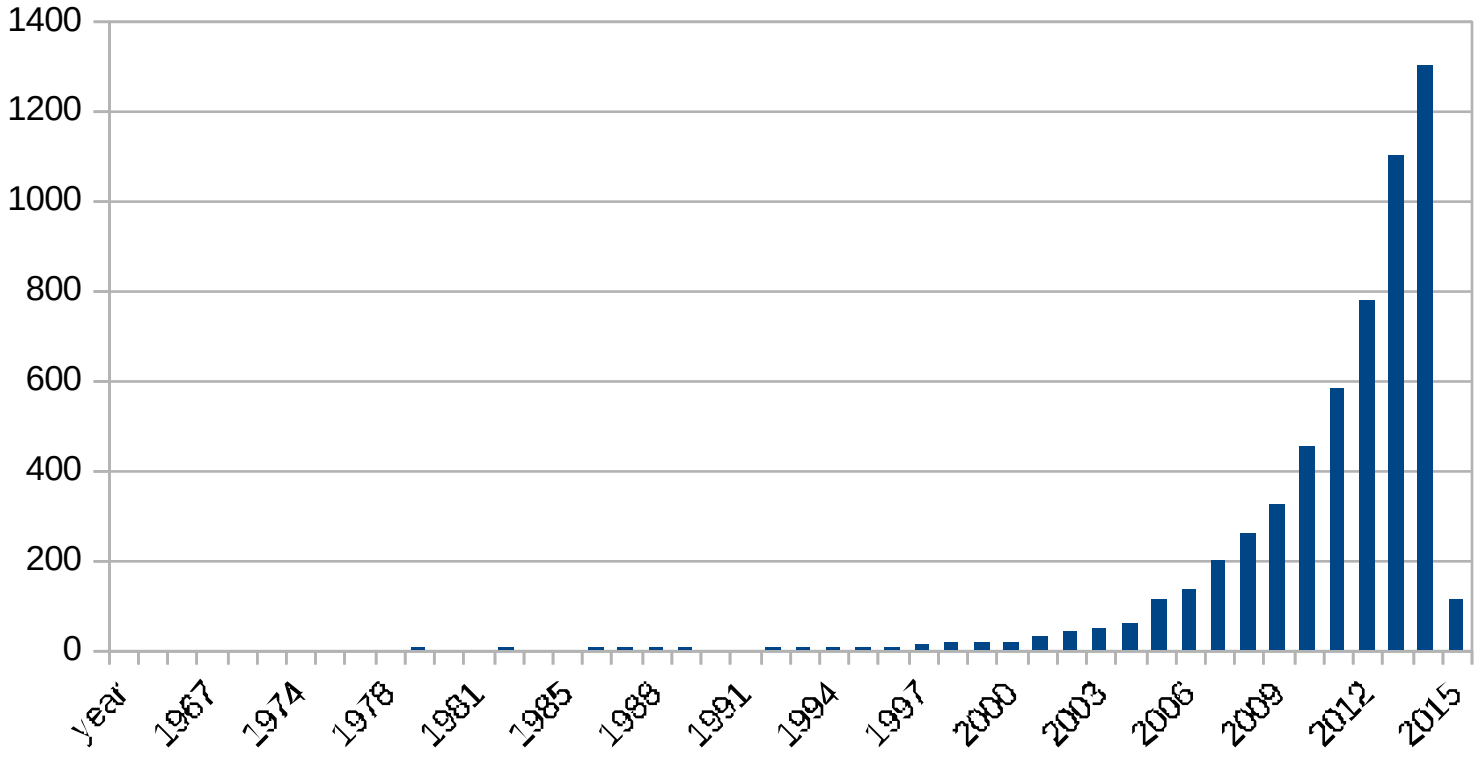
With only 350,000 people living in Port Moresby, this city still gets to enter the top 10 dangerous cities in the world. Theft, rape, murders and auto theft happen on a daily basis, and it is recommended not to use public transportation.

Cosa è “eubiosi” ?

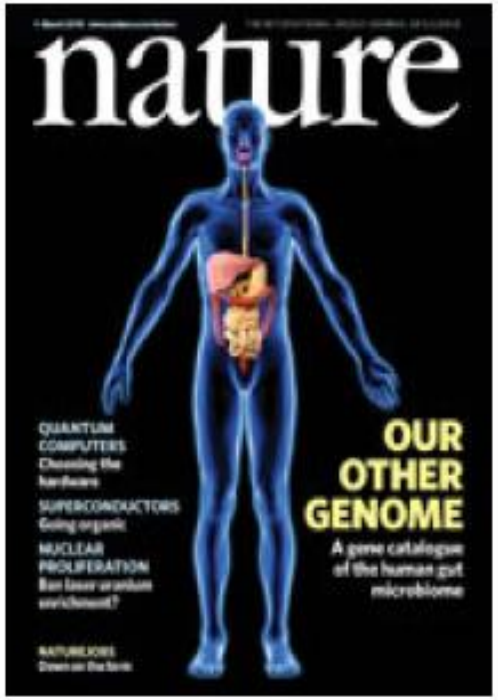


...the gut microbiome is a virtual Rosetta Stone of human health, playing a potentially meaningful role in the development of illnesses as seemingly disparate as autism and colorectal cancer, along with dozens of other conditions…

N° di pubblicazioni/anno su Microbiota intestinale, 1965→2015

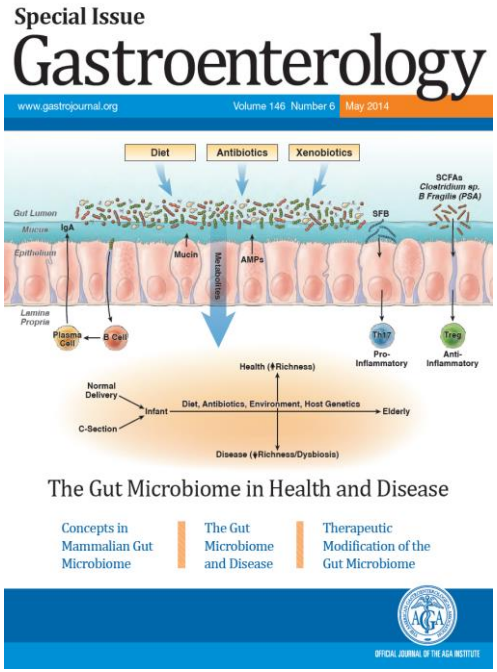


Il microbiota intestinale: *alcune recenti monografie*

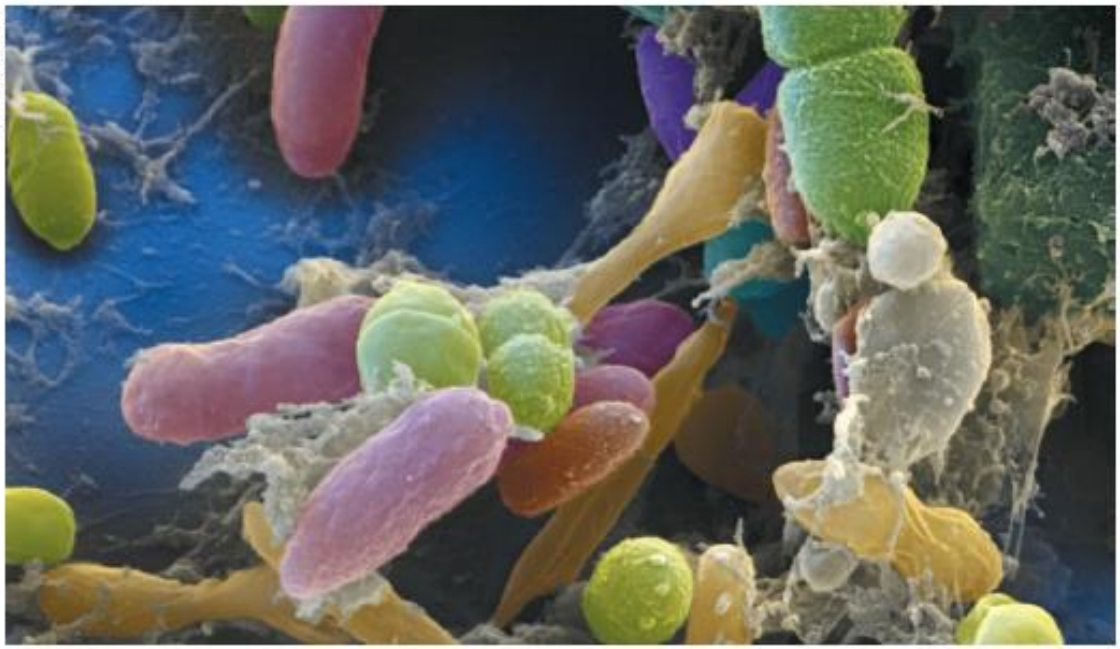


2010

2012



2014



EYE OF SCIENCE/SPL

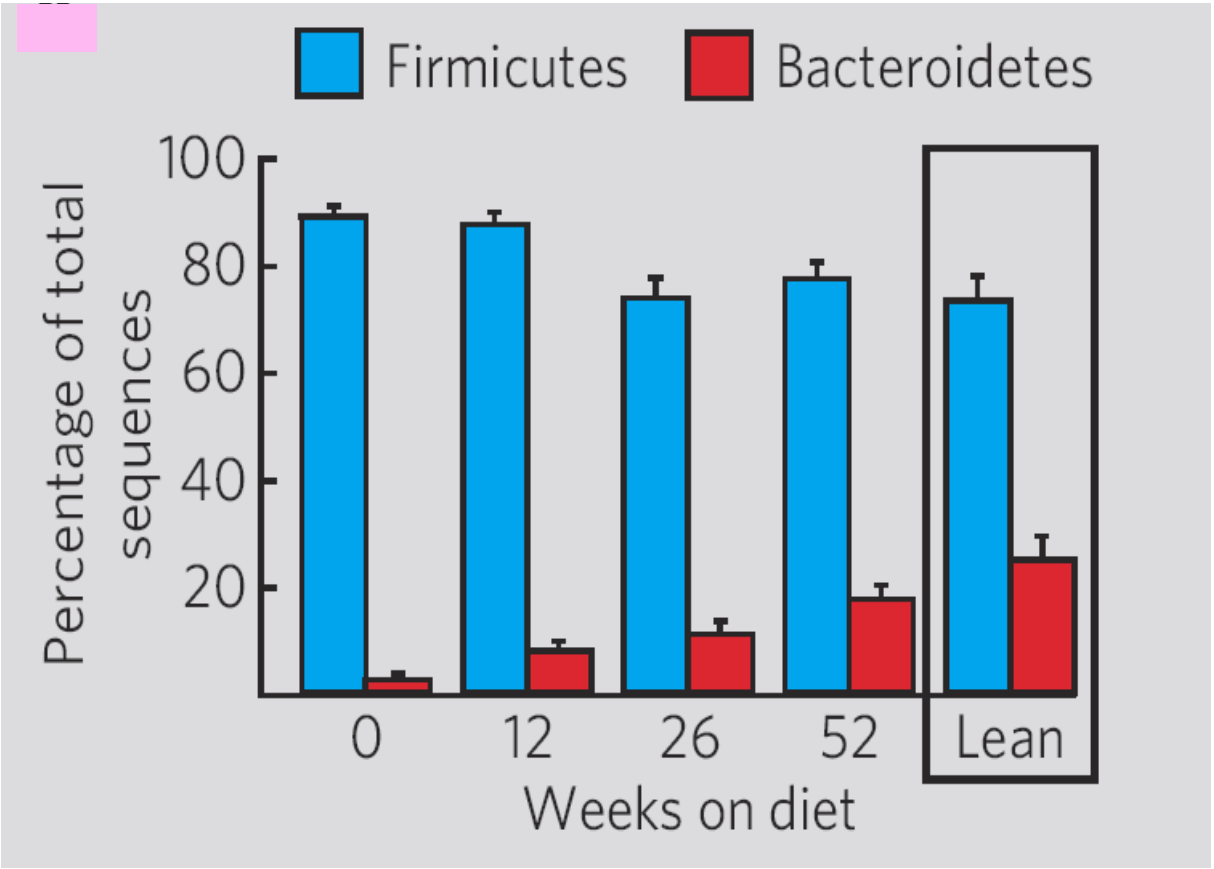
A scanning electron micrograph of bacteria in human faeces, in which 50% of species originate from the gut.

Microbiome science needs a healthy dose of scepticism

To guard against hype, those interpreting research on the body's microscopic communities should ask five questions, says **William P. Hanage**.

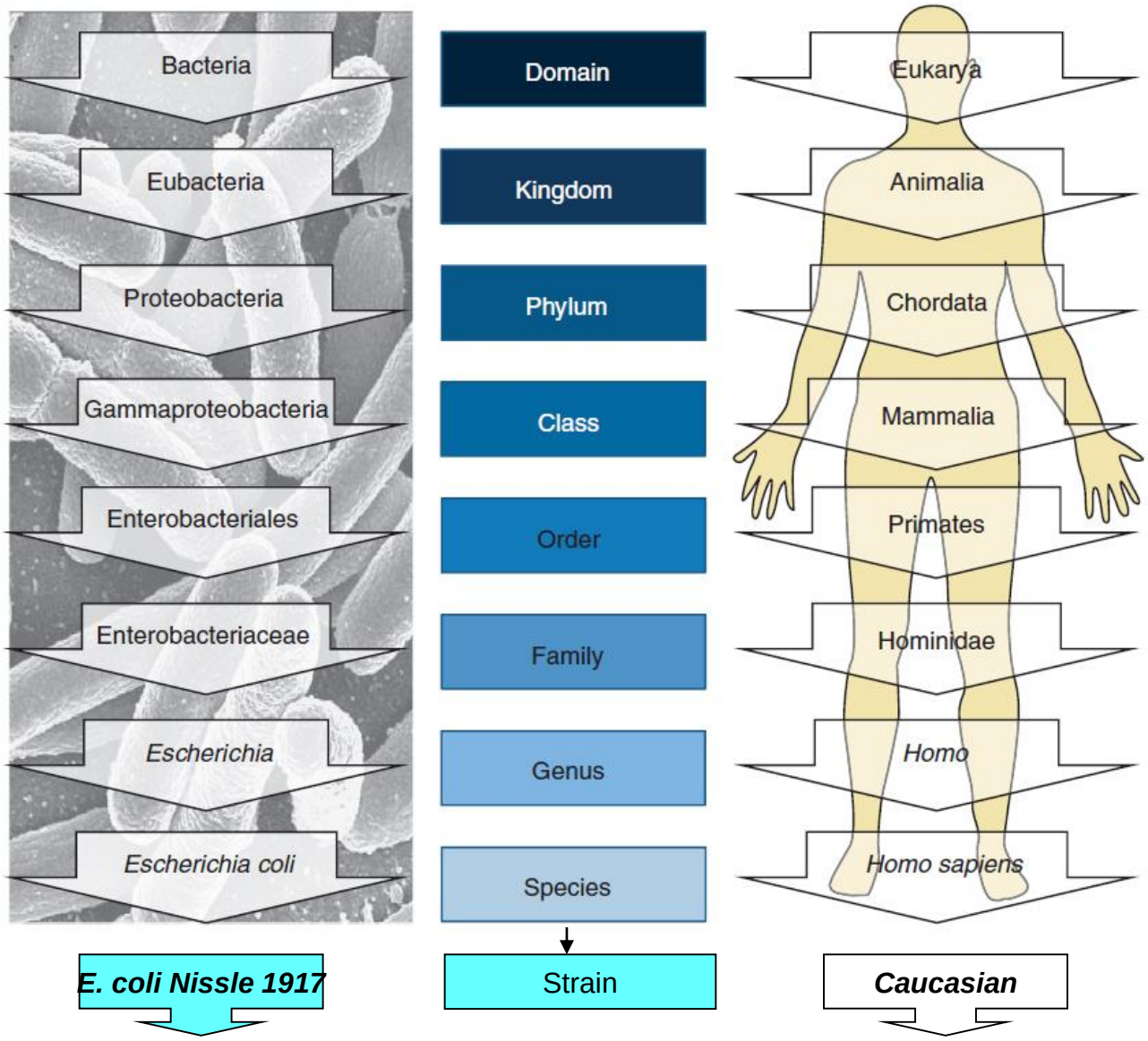
- Can experiments detect differences that matter?
- Does the study show causation or just correlation?
- What is the mechanism?
- How much do experiments reflect reality?
- Can anything else explain the results?

Effetti della dieta in soggetti obesi sul rapporto Firmicutes/Bacteroidetes



Ley RE et al, *Nature* 2006;444:1022

Tassonomia: *E. coli* vs *Homo sapiens*



Tyler et al *Am J Gastroenterol* 2014; 109:983

For example, microbiomes associated with obesity have been distinguished by different ratios of bacterial phyla, which encompass a staggering range of diversity. If this criterion were used to characterize animal communities, an aviary of 100 birds and 25 snails would be considered identical to an aquarium with 8 fish and 2 squid, because each has four times as many vertebrates as molluscs.

- "**The hype surrounding microbiome research is dangerous**, **for individuals who might make ill-informed decisions**, and for the **scientific enterprise**, which needs to develop better experimental methods to generate hypotheses and evaluate conclusions."

- As people's awareness of the pivotal role that their microbiomes play in their health and well-being increased, so too, understandably, did their desire to actively monitor and positively intervene in it.

  - **Biohackers**
  - **Madri preoccupate per la salute dei loro bambini**
  - **Pazienti con patologie gastrointestinali**

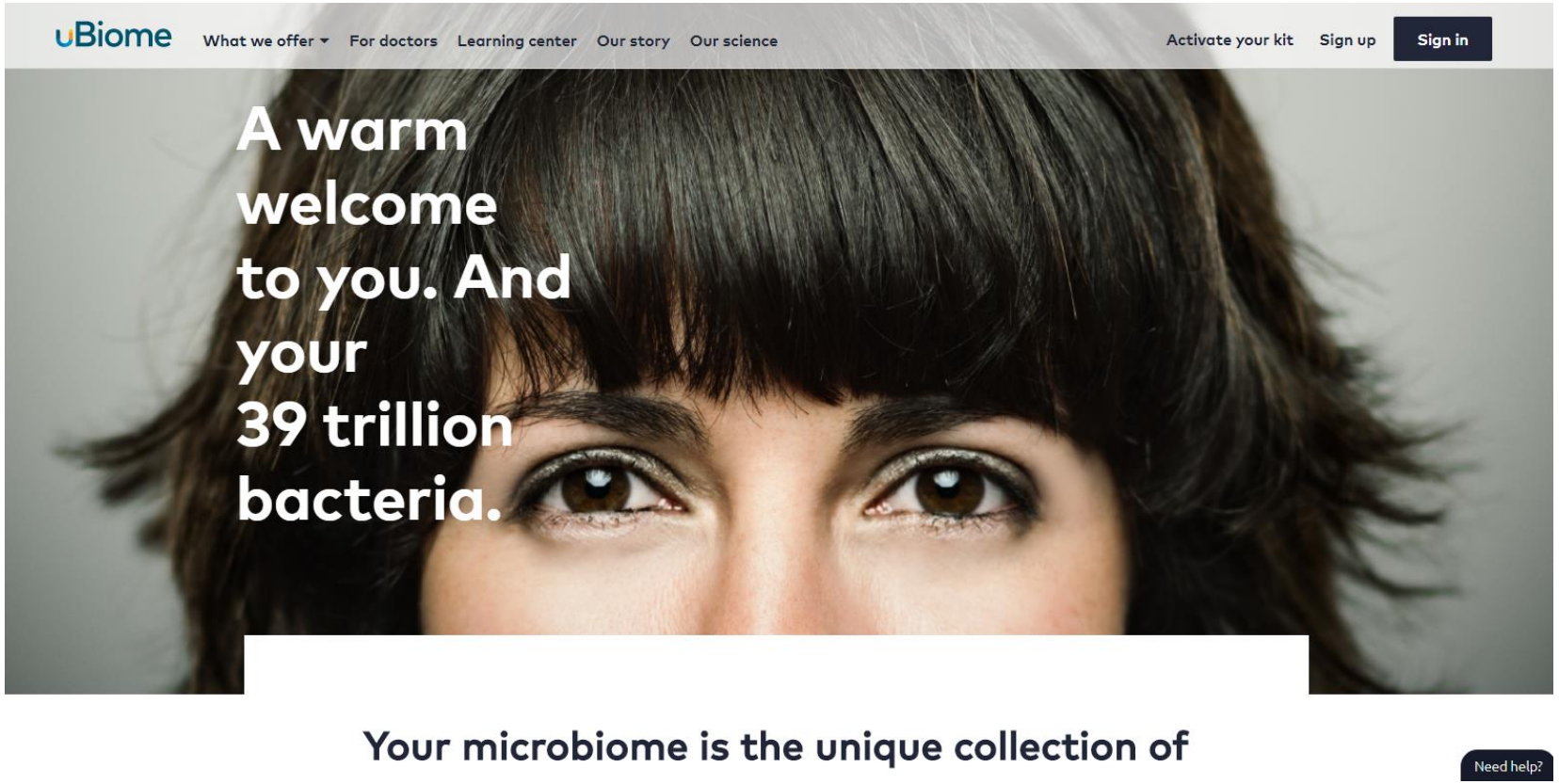
Microbiome Profiling: Big Business, but What About the Data?

- **The question is, has the science progressed enough to make these tests something more than high-end novelties?**

Microbiome Profiling: Big Business, but What About the Data?

- **Thryve** offers a monthly subscription service whereby its customers send in fecal samples obtained on pieces of toilet paper and in return receive reports summarizing the sequencing results. Thryve's user-friendly end product summarizes each subscriber's overall "Gut Wellness Score," and along with general lifestyle advice, the company offers its own line of probiotics.

- **uBiome** offers the similar Explorer™, a tool that tracks your gut microbiome over time and allows you to compare against averages.



DYSBIO CHECK

Cos'è e a cosa serve?

La **disbiosi intestinale** è un'alterazione degli equilibri e della composizione della **flora batterica intestinale**, che comporta un insieme di sintomi e disturbi dell'apparato gastrointestinale, in grado di avere conseguenze anche su organi ed apparati distanti dall'intestino.

A livello del tratto gastro intestinale è presente un

- "I'd give you a 100% guarantee that if you took one of these reports to a doctor, they'd say that they wouldn't know how to interpret it. And if the doctor did order it—and there are some out there who are doing this—I bet they have a diet or a probiotic that they want to sell you right behind it."
- Collection methods are carefully validated and replicated, we simply cannot rely on the diagnostic accuracy of at-home kits.
- Natural fluctuations within patients' microbiomes, which can occur during times of sickness, insomnia, or dietary changes, represent another challenge.
- Lack of substantive science backing up the utility of probiotics as an effective intervention for specific conditions.

According to experts, we're simply too early in our understanding of it to say what will or won't work when it comes to affecting, much less improving, our gut profile.

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Ipersensibilità viscerale

Disbiosi

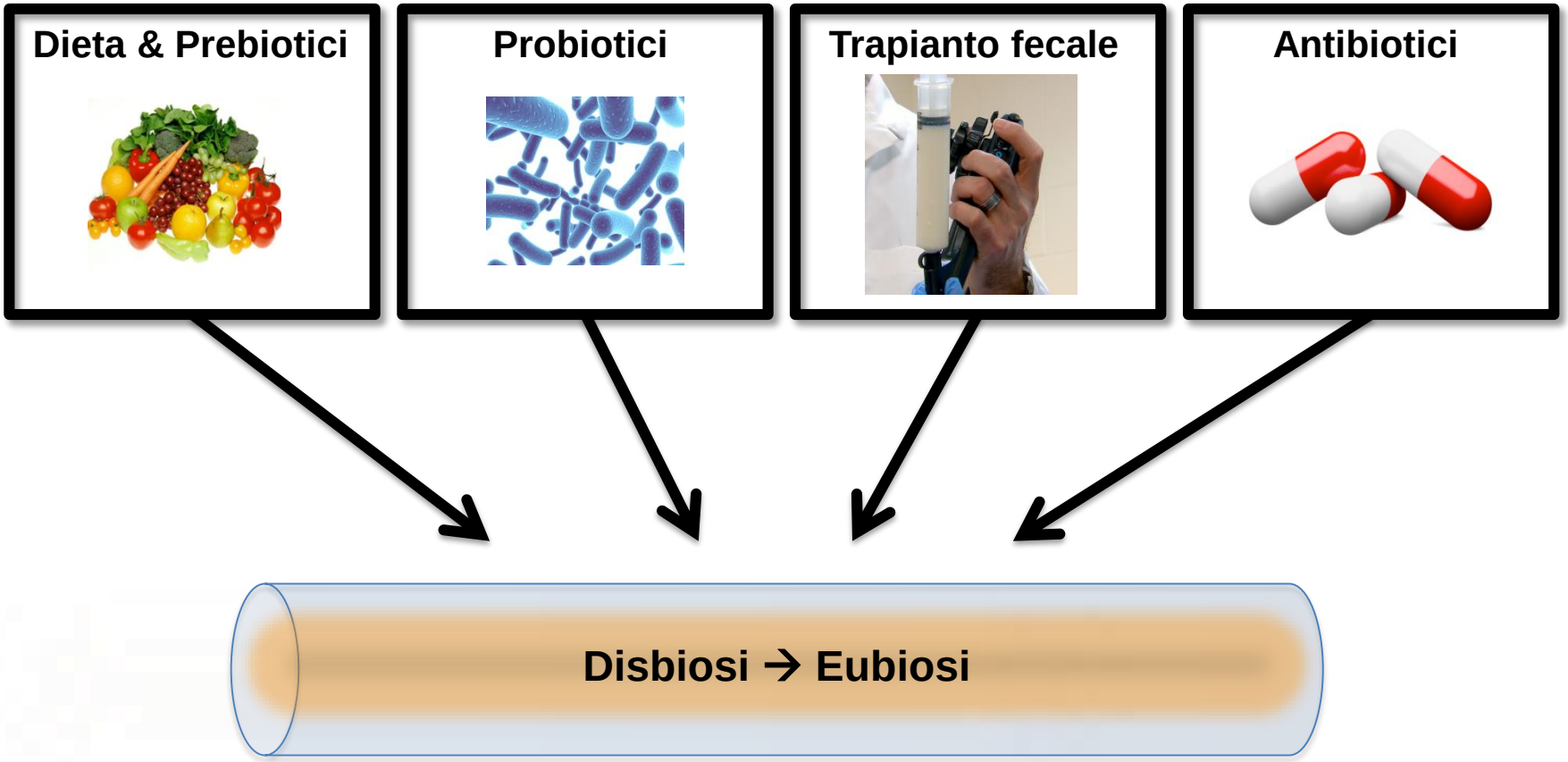
Infiammazione

Ansia

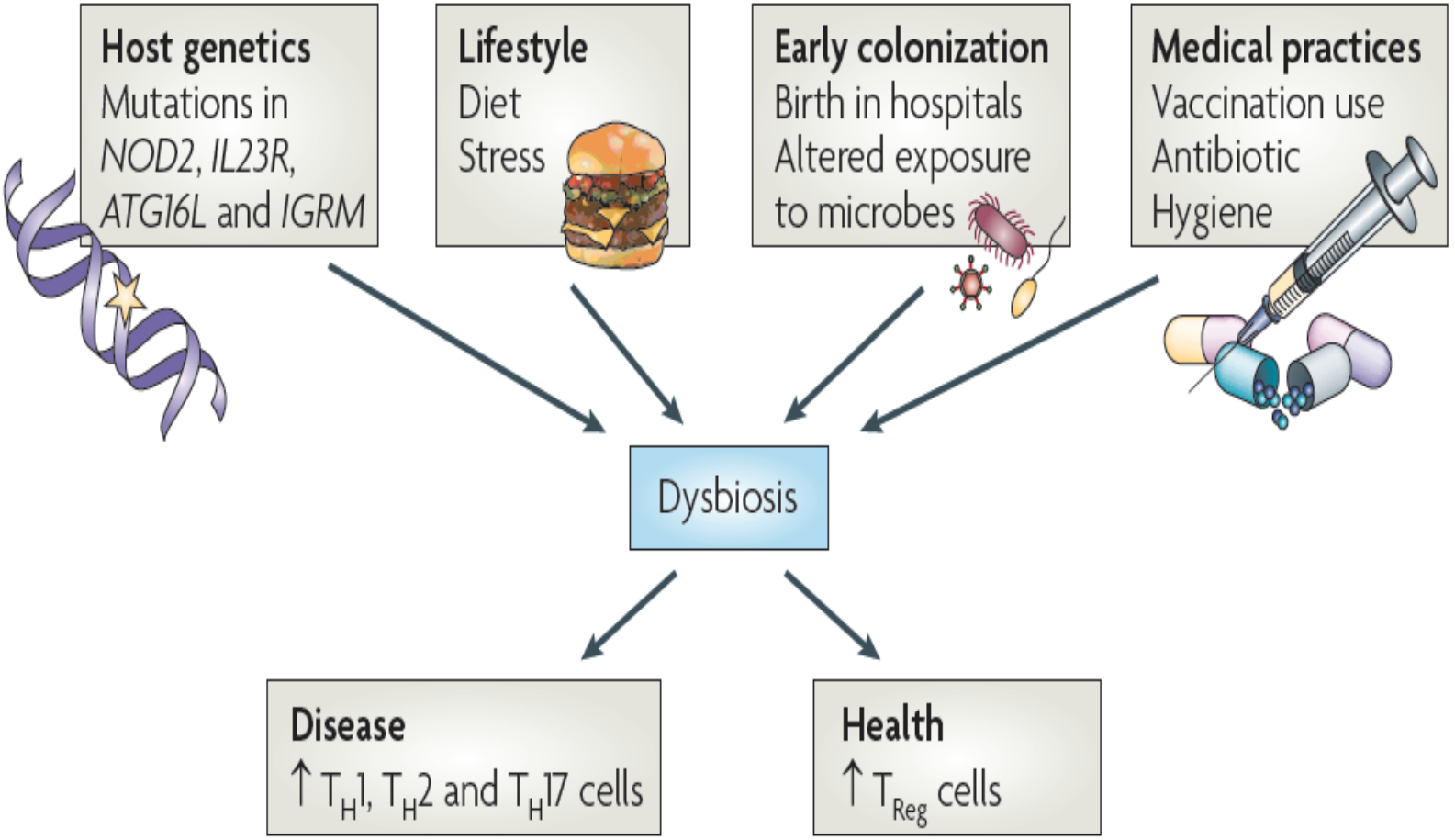
Stress

Disturbo neurovegetativo

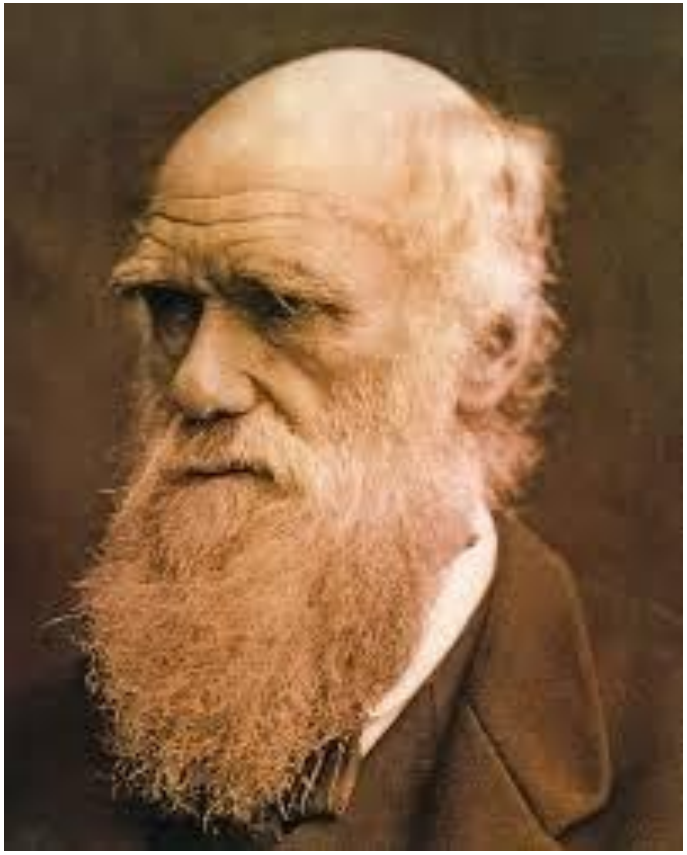
Come possiamo modificare il microbiota ?

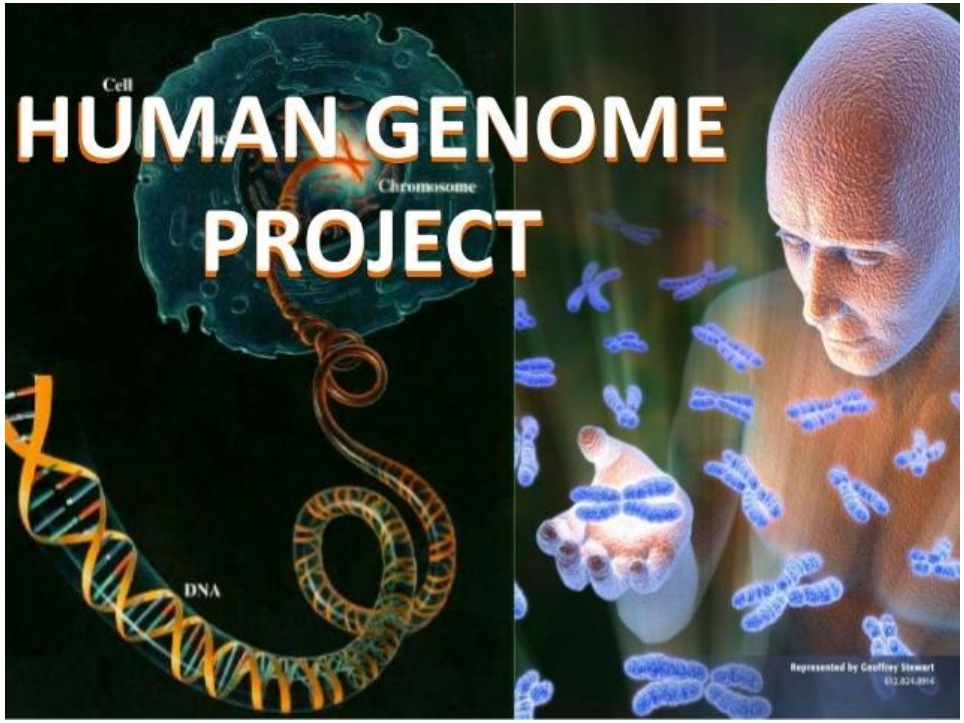


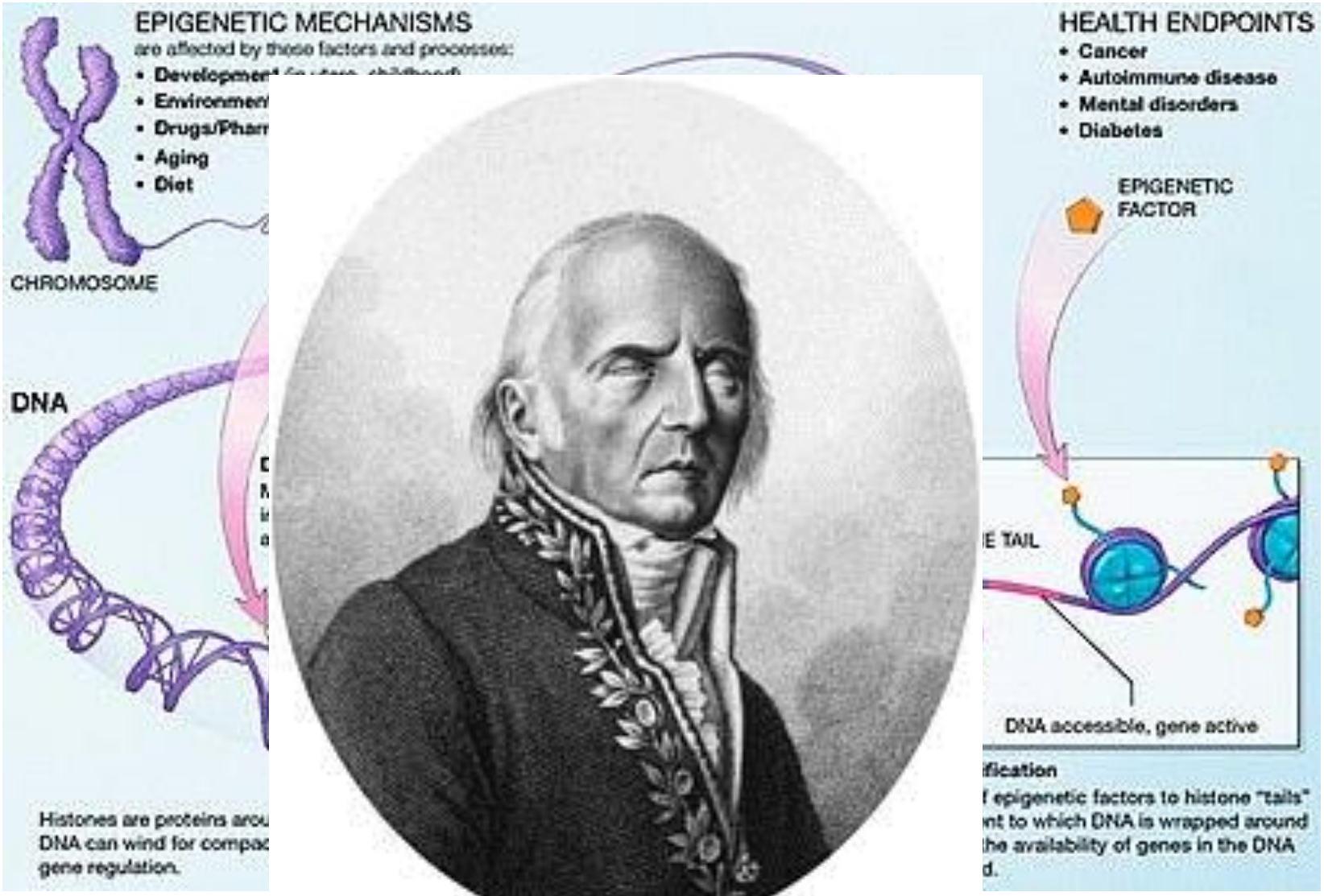
Cause di disbiosi intestinale e sue conseguenze



Round et al, *Nat Rev Immun* 2009;9:313




Cell
HUMAN GENOME
Chromosome
PROJECT
DNA
Represented by Geoffrey Stewart


EPIGENETIC MECHANISMS
are affected by these factors and processes:
• Aging
• Diet
CHROMOSOME
DNA
Histones are proteins arou
DNA can wind for compac
gene regulation.
HEALTH ENDPOINTS
• Cancer
• Autoimmune disease
• Mental disorders
• Diabetes
EPIGENETIC
FACTOR
E TAIL
DNA accessible, gene active
ification
f epigenetic factors to histone "tails"
nt to which DNA is wrapped around
he availability of genes in the DNA
d.

Improving adherence to healthy dietary patterns, genetic risk, and long term weight gain: gene-diet interaction analysis in two prospective cohort studies

Tiange Wang,[1,2] Yoriko Heianza,[1] Dianjianyi Sun,[1] Tao Huang,[3] Wenjie Ma,[4] Eric B Rimm,[4] JoAnn E Manson,[4,6,7] Frank B Hu,[5,6] Walter C Willett,[4,5,6] Lu Qi[1,5,6]

PARTICIPANTS

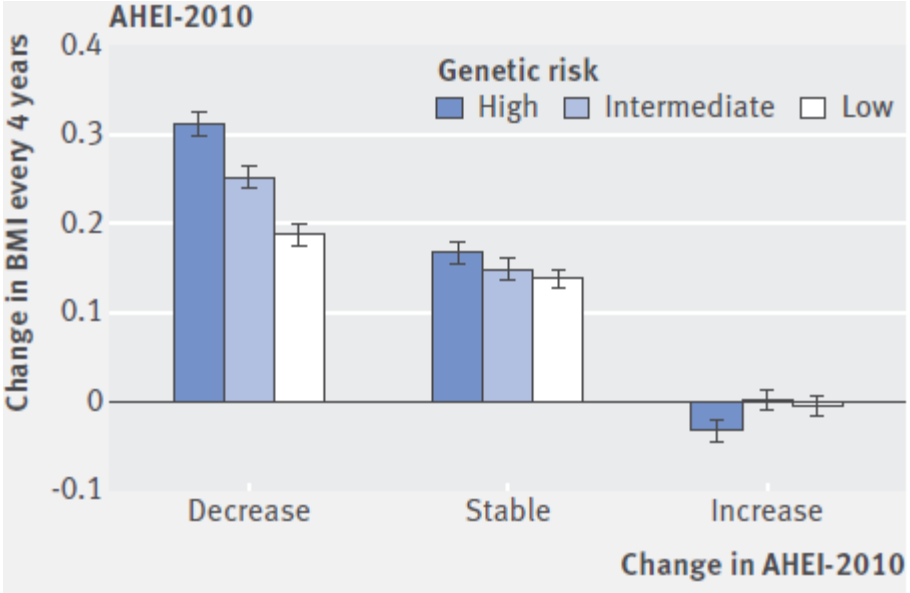
8828 women from the Nurses' Health Study and 5218 men from the Health Professionals Follow-up Study.

EXPOSURE

Genetic predisposition score was calculated on the basis of 77 variants associated with body mass index. Dietary patterns were assessed by the Alternate Healthy Eating Index 2010 (AHEI-2010), Dietary Approach to Stop Hypertension (DASH), and Alternate Mediterranean Diet (AMED).

CONCLUSIONS

These data indicate that improving adherence to healthy dietary patterns could attenuate the genetic association with weight gain. Moreover, the beneficial effect of improved diet quality on weight management was particularly pronounced in people at high genetic risk for obesity.



thebmj | *BMJ* 2018;360:j5644 | doi: 10.1136/bmj.j5644

Diet, genes, and obesity

Genetic predisposition to obesity is no barrier to successful weight management

Louisa J Ells *reader in public health and obesity*[1], Alessandro Demaio *medical officer*[2], Nathalie Farpour-Lambert *program director*[3]

[1]School of Health and Social Care, Teesside University, Middlesbrough, UK; [2]Department of Nutrition for Health and Development, World Health Organization, Geneva, Switzerland; [3]Obesity Prevention and Care Program Contrepoids, University Hospitals of Geneva, Geneva, Switzerland

However, the best opportunity to reduce risk in genetically susceptible people for the foreseeable future will not be to re-engineer their genes, but to modify their environment. We need to understand how genetic factors and environmental exposures interact in individuals to alter normal biological function and to affect the risk of disease development (464).

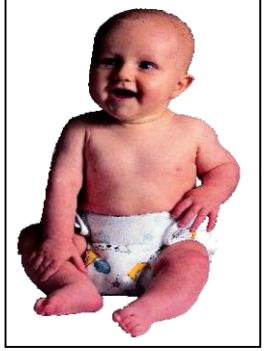
Schwartz D, Collins F. Medicine. Environmental biology and human disease. Science. 2007; 316:695–696. [PubMed: 17478705]

Alla nascita il corpo umano è sterile

Microbiota vaginale (madre)

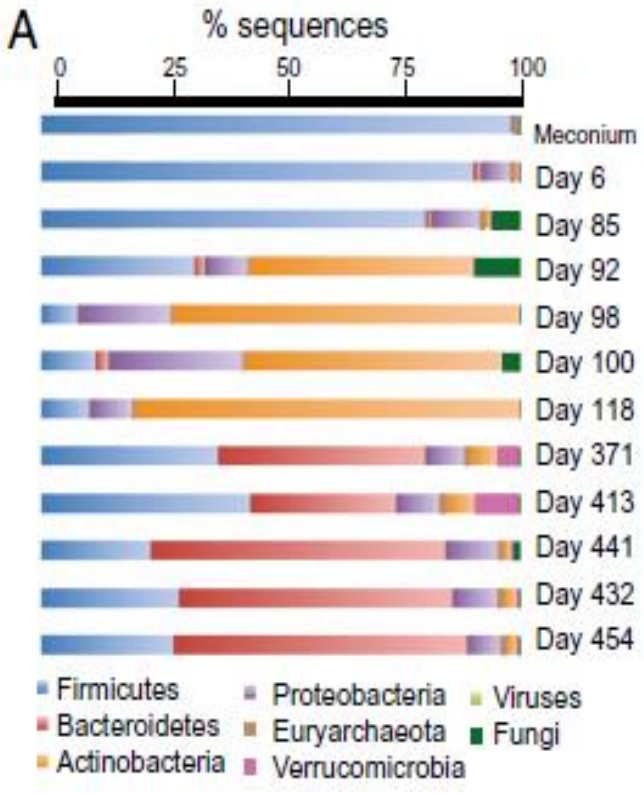
Microbiota fecale (madre)

Microbiota cutaneo (madre/padre/parenti/baby sitter)



Dieta

Ambiente



CORE microbiota (8-36 mesi)

Conseguenze sul microbiota del tipo di parto

Vaginal Delivery

Introduced to Vaginal Microbes: Lactobacillus

Normal Introduction of Gut Microbes

Normal Development of the Immune System
•Production of specific cytokines for proper immune system development

Le prime specie batteriche del neonato sono anaerobi facoltativi, come Staphilococcus, Streptococcus, Enterococcus e Enterobacter.
Queste specie creano un **ambiente anaerobico** che promuove la crescita di anaerobi obbligati, come Bifidobatteri, Bacteroides, Clostridium e Eubacterium

VS.

Cesarean Delivery

Introduced to Skin Flora: Staphylococcus

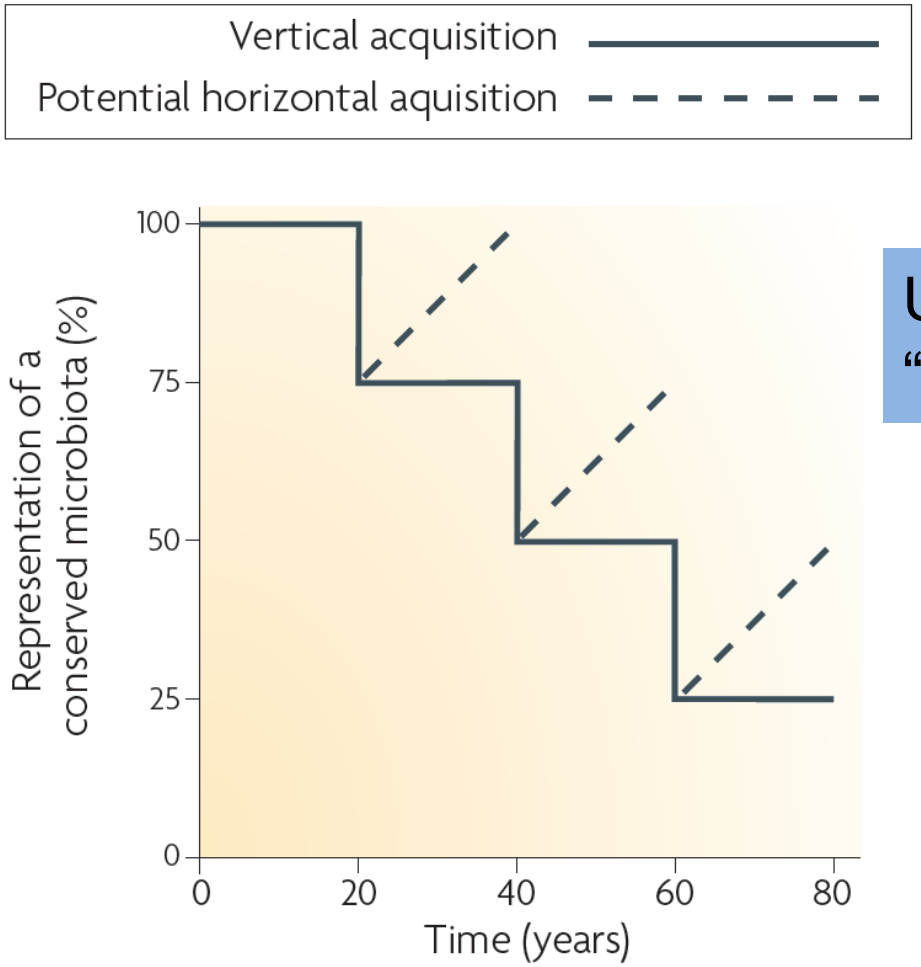
Abnormal Microbial Introduction

Disrupted Intestinal Microbial Colonization
•Increase risk for Atopic Diseases, Asthma, Allergic Rhinitis, and Celiac Disease
•Association: Delayed Onset of Lactation
•Lack Breast Milk Support for Gut Flora

Ridotta diversità e ritardata colonizzazione da parte dei Bifidobatteri

Richardson, 2013

Effetto dello stato materno sul microbiota residente nella generazione successiva



Un esempio di "EPIGENETICA"

Blaser. Nat Rev Microbiol 2009;7:887

JAMA Pediatrics | Original Investigation

Association Between Cesarean Birth and Risk of Obesity in Offspring in Childhood, Adolescence, and Early Adulthood

Changzheng Yuan, ScD; Audrey J. Gaskins, ScD; Arianna I. Blaine, ScM; Cuilin Zhang, MD, PhD; Matthew W. Gillman, MD, SM; Stacey A. Missmer, ScD; Alison E. Field, ScD; Jorge E. Chavarro, MD, ScD

Table 4. Within-Family Odds Ratios for Obesity in Offspring Associated With Cesarean vs Vaginal Delivery

Variable	Obese Offspring/ Total Offspring, No./No. (%)	Odds Ratio (95% CI)	*P* Value
Overall			
Vaginal delivery	1091/10 155 (10.7)	1 [Reference]	
Cesarean delivery, model 1[a]	417/2748 (15.2)	1.64 (1.08-2.48)	.02
9-18 y			
Vaginal delivery	719/10 113 (7.1)	1 [Reference]	
Cesarean delivery, model 1[a]	301/2739 (11.0)	1.67 (1.01-2.76)	.04
19-28 y			
Vaginal delivery	677/6714 (10.1)	1 [Reference]	
Cesarean delivery, model 1[a]	233/1772 (13.1)	1.72 (0.89-3.32)	.11

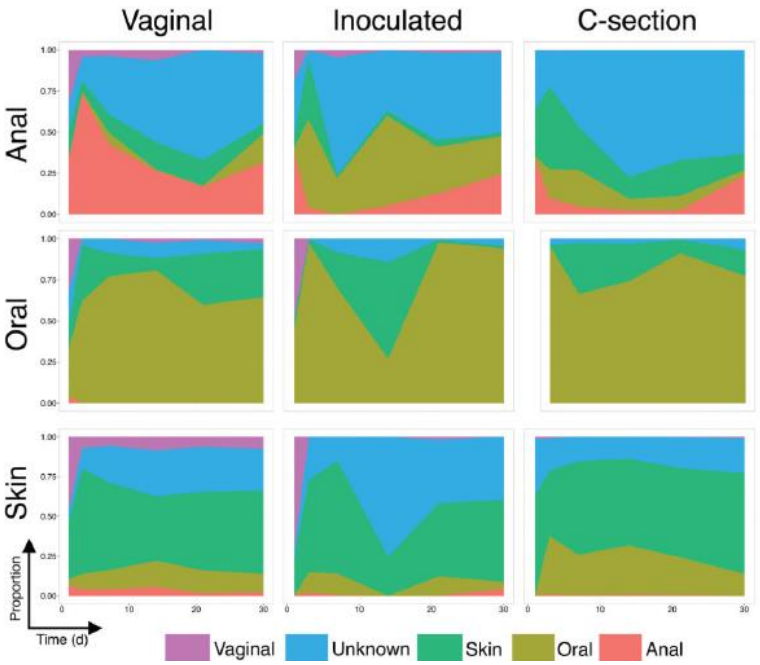
CONCLUSIONS AND RELEVANCE Cesarean birth was associated with offspring obesity after accounting for major confounding factors. Although additional research is needed to clarify the mechanisms underlying this association, clinicians and patients should weigh this risk when considering cesarean delivery in the absence of a clear indication.

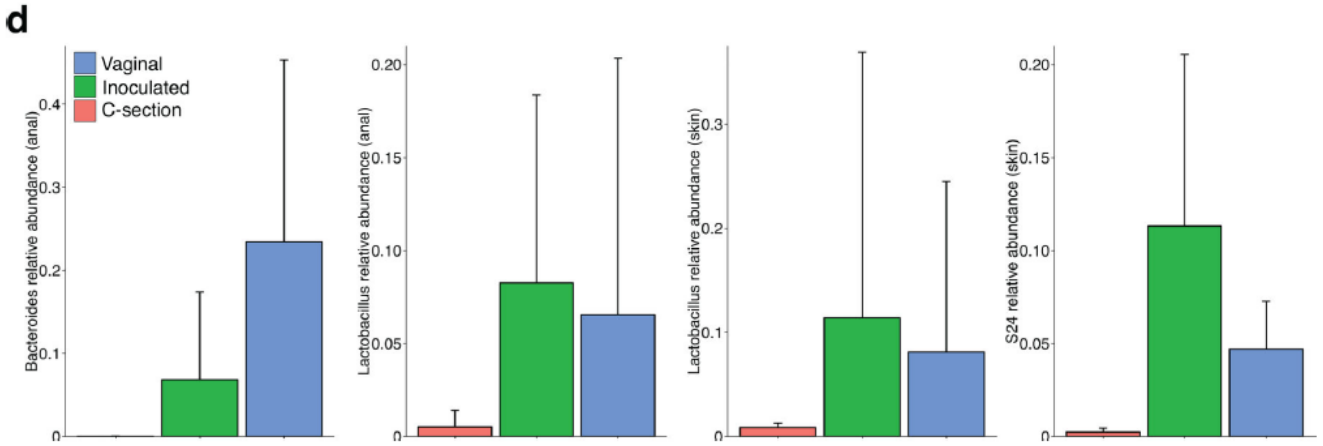
JAMA Pediatr. 2016;170(11):e162385. doi:10.1001/jamapediatrics.2016.2385
Published online September 6, 2016.

Partial restoration of the microbiota of cesarean-born infants via vaginal microbial transfer

Nat Med. Author manuscript; available in PMC 2016 October 13.

Maria G. Dominguez-Bello[1,2,*], Kassandra M. De Jesus-Laboy[2], Nan Shen[8], Laura M. Cox[1], Amnon Amir[3,7], Antonio Gonzalez[3,7], Nicholas A. Bokulich[1], Se Jin Song[3,4], Marina Hoashi[5], Juana I. Rivera-Vina[6], Keimari Mendez[6], Rob Knight[3,7], and Jose C. Clemente[8,9,*]





Vaginal seeding or vaginal microbial transfer from the mother to the caesarean-born neonate: a commentary regarding clinical management

T Haahr,[a] J Glavind,[a] P Axelsson,[b] M Bistrup Fischer,[c] J Bjurström,[d] G Andrésdóttir,[c] D Teilmann-Jørgensen,[e] U Bonde,[e] N Olsén Sørensen,[d] M Møller,[f] J Fuglsang,[a] PG Ovesen,[a] JP Petersen,[g] J Stokholm,[h,i] TD Clausen[b]

Table 1. National recommendations for the clinical management of couples who are considering VS (agreed to by the vast majority of obstetrician members of the Danish Society of Obstetrics and Gynaecology at the national meeting on 19 January 2017)

We do not recommend vaginal seeding in relation to cesarean delivery

We recommend that maternity wards NOT participate

- in guidance on how to perform vaginal seeding
- in screening of the women prior to vaginal seeding
- actively in the procedure for vaginal seeding

We are strongly against vaginal seeding in the following situations:

- Mothers who meet national criteria for GBS prophylaxis during delivery
- Gestational age $<37^{+0}$ weeks at delivery
- Clinical situations where we recommend caesarean delivery to prevent infection of the child during vaginal delivery—primary vaginal herpes infection, HIV infection with HIV-RNA >50 copies/ml
- Other clinical situations where vaginal seeding is considered to be potentially harmful to the neonate, i.e. certain fetal malformations

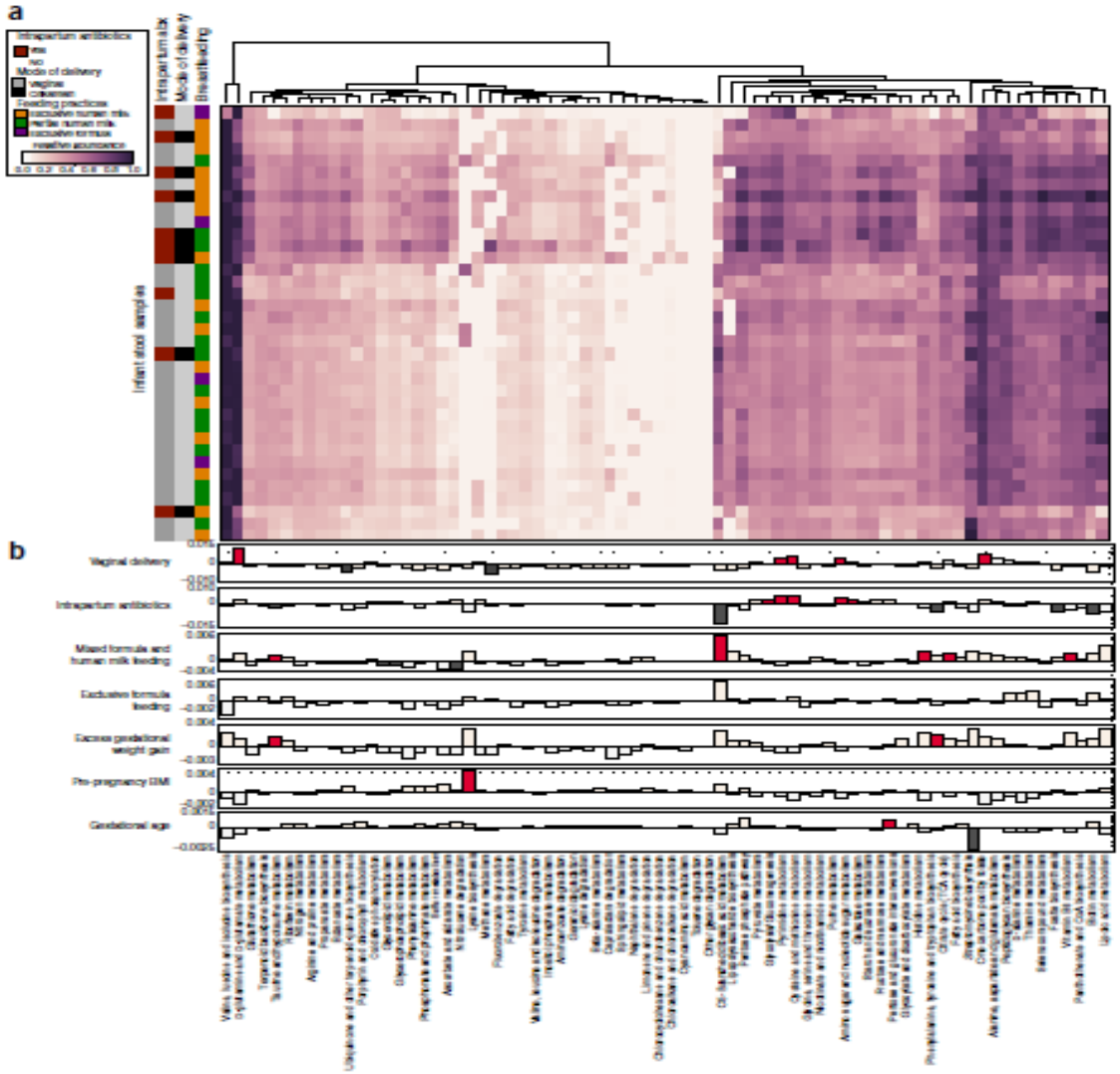
Parents who personally wish to undertake vaginal seeding

- Can perform the procedure provided it does not interfere with or delay other procedures
- Should be informed about the lack of evidence and the potential risk by a/their physician. Moreover, they could be provided with the patient information provided in Appendix S1
- Must be advised to be aware of signs of disease in their neonate and to indicate that they have performed vaginal seeding if the neonate requires medical assistance

The following recommendations are for clinical management and do not exclude the performance of vaginal seeding as part of a clinical trial with proper research board supervision.

Maturation of the infant microbiome community structure and function across multiple body sites and in relation to mode of delivery

Derrick M Chu[1–3], Jun Ma[1], Amanda L Prince[1], Kathleen M Antony[1], Maxim D Seferovic[1] & Kjersti M Aagaard[1–5]



Administration of Antibiotics to Children Before Age 2 Years Increases Risk for Childhood Obesity

6

Exposure	Exposed, n	Obese, n (% of exposed)	Univariable analysis, OR (95% CI)	Adjusted model assessing no. of prescriptions, OR (95% CI)	Adjusted model assessing age at first prescribed antibiotic, OR (95% CI)
No. of antibiotic prescriptions					
0 (ref)	6844	355 (5.2)	1.00	1.00	—
1–2	8761	492 (5.6)	1.09 (0.95–1.25)	1.07 (0.93–1.23)	—
3–5	4481	332 (7.4)	1.46 (1.25–1.71)	1.41 (1.20–1.65)	—
>5	1628	127 (7.8)	1.55 (1.25–1.91)	1.47 (1.19–1.82)	—
Age at first prescription					
None (ref)	6489	355 (5.2)	1.00	—	1.00
0–6 mo	3837	267 (7.0)	1.37 (1.16–1.61)	—	1.33 (1.13–1.57)
6–12 mo	5851	390 (6.7)	1.31 (1.13–1.51)	—	1.27 (1.09–1.47)
12–24 mo	5182	294 (5.7)	1.10 (0.94–1.29)	—	1.07 (0.91–1.26)

Table 4. Multivariable Model Assessing Interaction Variable of Time of First Antibiotic and Number of Antibiotic Prescriptions With Obesity

Exposure	Multivariable analysis	
	n/N (%)	OR (95% CI)
No antibiotic exposures	345/6590 (5.2)	1.00
1–2 prescriptions with first exposure between 0–12 mo	259/4279 (6.1)	1.18 (0.995–1.39)
3 or more prescriptions with first exposure between 0–12 mo	377/4989 (7.6)	1.48 (1.27–1.72)
1–2 prescriptions with first exposure between 12–24 mo	210/4141 (5.1)	0.96 (0.81–1.15)
3 or more prescriptions with first exposure between 12–24 mo	67/828 (8.1)	1.60 (1.22–2.10)

Gastroenterology 2016;151:120–129

Is It Useful to Administer Probiotics Together With Proton Pump Inhibitors in Children With Gastroesophageal Reflux?

JNM
J Neurogastroenterol Motil, Vol. 24 No. 1 January, 2018
pISSN: 2093-0879 eISSN: 2093-0887
https://doi.org/10.5056/jnm17059
Journal of Neurogastroenterology and Motility

Table. The Characteristics of the Study Groups

Parameters	Control group (n = 120)	Placebo group (n = 64)	Probiotics group (n = 64)
Mean age ± SD (yr)	8.3 ± 2.7	8.5 ± 2.4	7.6 ± 2.1
Gender (girls/boys)	41/79	29/35	21/43
BMI (kg/m^2)	16.1 ± 2.1	15.7 ± 3.0	14.3 ± 3.1
Comorbidities (%)	0	0	0
Other drugs intake besides those from study protocol (yes/no)	no	no	no

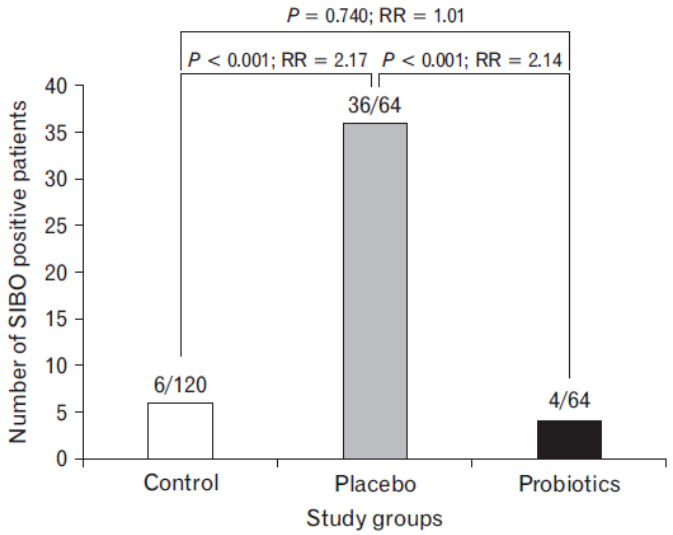


Figure 2. Comparison of small intestinal bacterial overgrowth (SIBO) prevalence as assessed by glucose hydrogen breath test among the study groups. RR, risk ratio.

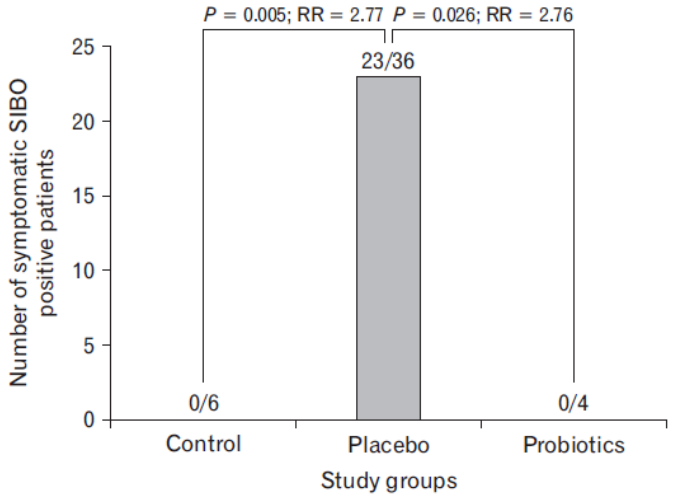


Figure 3. The presence of intestinal symptoms among different groups of children with positive glucose hydrogen breath test. SIBO, small intestinal bacterial overgrowth. RR, risk ratio.

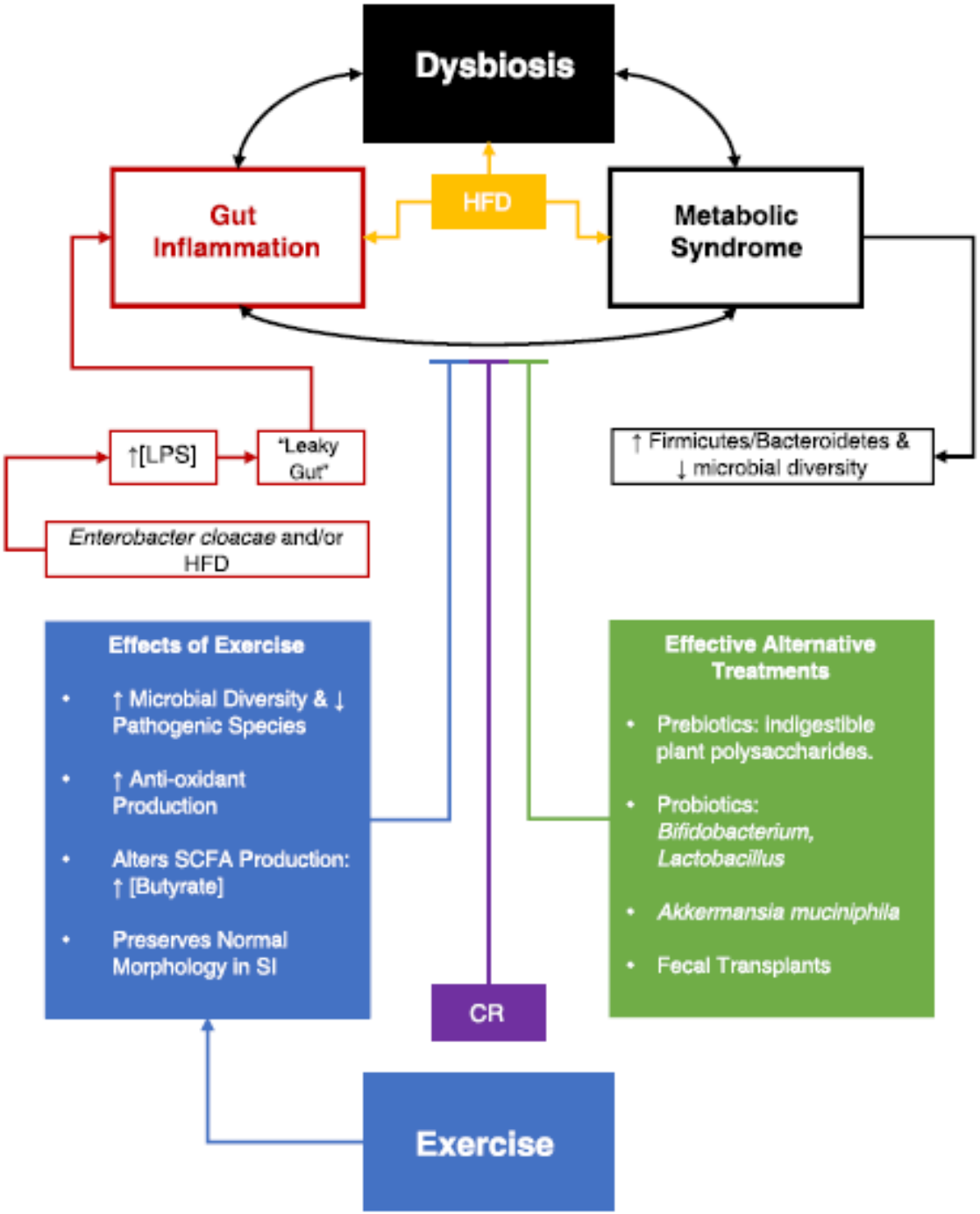
Exercise is a Novel Promoter of Intestinal Health and Microbial Diversity

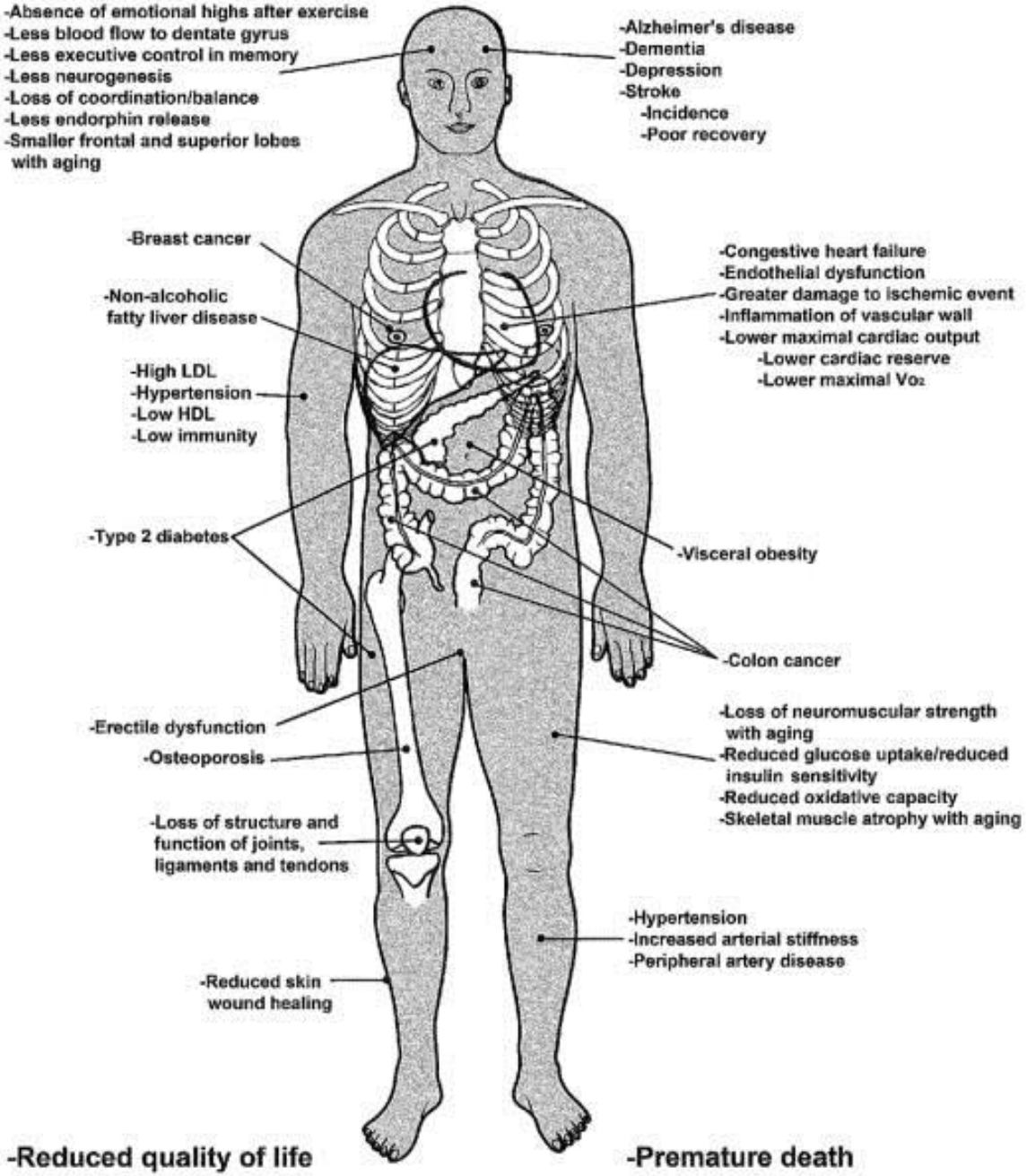
Sara C. Campbell and Paul J. Wisniewski, II

Exerc. Sport Sci. Volume 45 • Number 1 • January 2017

Key Points

- Exercise increases microbial diversity independent of diet; the microbiota of athletes may be related to dietary protein content.
- Microbiota alterations as a result of exercise are more substantial in earlier life compared with later life.
- Exercise capacity may be influenced by the presence of a diverse microbiota.
- High-fat diets increase intestinal inflammation; exercise reduces this inflammation and may improve gut epithelial integrity.


Dysbiosis
Gut Inflammation
HFD
Metabolic Syndrome
↑[LPS]
"Leaky Gut"
Enterobacter cloacae and/or HFD
↑ Firmicutes/Bacteroidetes & ↓ microbial diversity
Effects of Exercise
↑ Microbial Diversity & ↓ Pathogenic Species
↑ Anti-oxidant Production
Alters SCFA Production: ↑ [Butyrate]
Preserves Normal Morphology in SI
Effective Alternative Treatments
Prebiotics: Indigestible plant polysaccharides.
Probiotics: Bifidobacterium, Lactobacillus
Akkermansia muciniphila
Fecal Transplants
CR
Exercise


-Absence of emotional highs after exercise
-Less blood flow to dentate gyrus
-Less executive control in memory
-Less neurogenesis
-Loss of coordination/balance
-Less endorphin release
-Smaller frontal and superior lobes with aging
-Alzheimer's disease
-Dementia
-Depression
-Stroke
-Incidence
-Poor recovery
-Breast cancer
-Non-alcoholic fatty liver disease
-High LDL
-Hypertension
-Low HDL
-Low immunity
-Type 2 diabetes
-Congestive heart failure
-Endothelial dysfunction
-Greater damage to ischemic event
-Inflammation of vascular wall
-Lower maximal cardiac output
-Lower cardiac reserve
-Lower maximal Vo2
-Visceral obesity
-Colon cancer
-Erectile dysfunction
-Osteoporosis
-Loss of structure and function of joints, ligaments and tendons
-Loss of neuromuscular strength with aging
-Reduced glucose uptake/reduced insulin sensitivity
-Reduced oxidative capacity
-Skeletal muscle atrophy with aging
-Hypertension
-Increased arterial stiffness
-Peripheral artery disease
-Reduced skin wound healing
-Reduced quality of life
-Premature death

Estimated historical reductions in daily steps by humans.

Population	Year	Steps per day		References
Paleolithic	(~20,000 BC)	~13,200–21,120 (men)	~10,560 (women)	(385)
Amish	(2002)	18,425 (men)	14,196 (women)	(27)
Mean of 26 studies	(1966–2007)		7,473 (mainly women)	(63)
Colorado	(2002)	6,733 (men)	6,384 (women)	(573)
US adults	(2010)	5,340 (men)	4,912 (women)	(26)

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Diet rapidly and reproducibly alters the human gut microbiome

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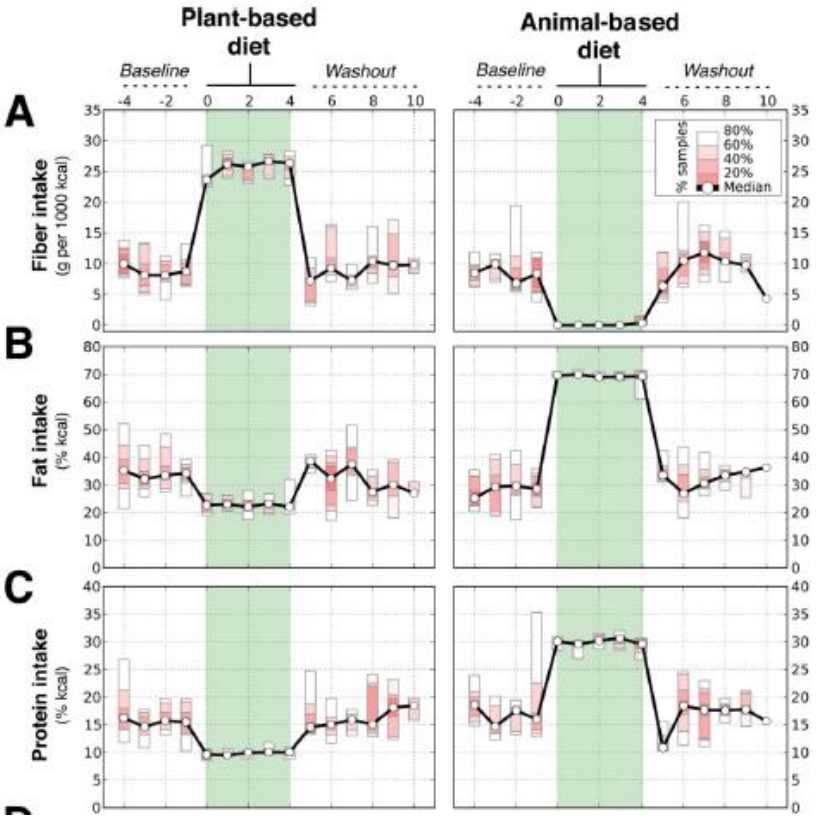
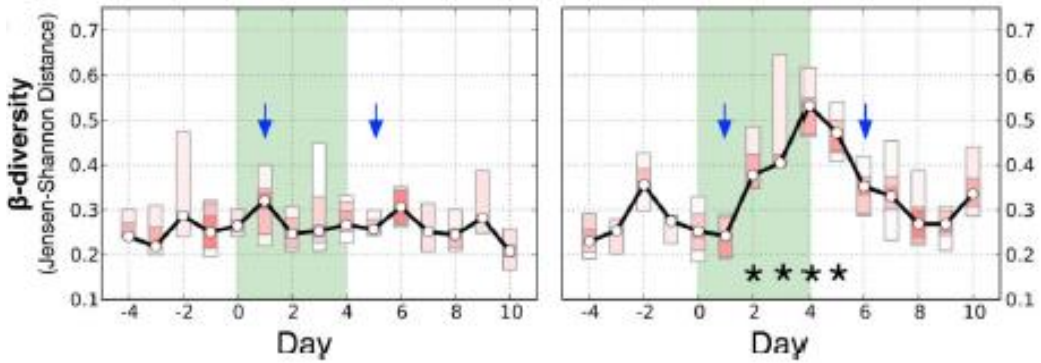


Animal-based diet

↑ -Bile-tolerant (bilophila, bacteroidetes)

↓ --Firmicutes



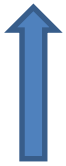
Nature. 2014 January 23; 505(7484): 559–563. doi:10.1038/nature12820.

Prebiotics and synbiotics: Dietary strategies for improving gut health

Janina A. Krumbeck,[1, 2] Maria X. Maldonado-Gomez,[1]
Amanda E. Ramer-Tait,[1] and Robert W. Hutkins[1]

Table 1. Simple and complex prebiotics

Simple	Complex
Inulin	Pectins
Fructooligosaccharide	Human milk oligosaccharide
Galactooligosaccharide	Resistant starch
Isomaltooligosaccharide	Arabinoxylan
Mannan oligosaccharide	

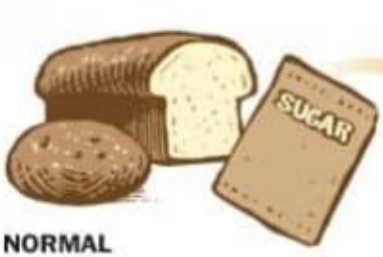


-Bifidobacteria, lattobacilli
-Produzione di Butirrato
-Tolleranza glucidica

Current Opinion in Gastroenterology 32 (2016), pp. 110–119.

Artificial sweeteners induce glucose intolerance by altering the gut microbiota

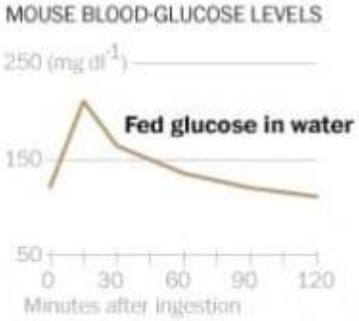
Jotham Suez[1], Tal Korem[2]*, David Zeevi[2]*, Gili Zilberman-Schapira[1]*, Christoph A. Thaiss[1], Ori Maza[1], David Israeli[3], Niv Zmora[4,5,6], Shlomit Gilad[7], Adina Weinberger[2], Yael Kuperman[8], Alon Harmelin[8], Ilana Kolodkin-Gal[9], Hagit Shapiro[1], Zamir Halpern[5,6], Eran Segal[2] & Eran Elinav[1]



NORMAL

Digested from starch or even table sugar, glucose is a simple sugar used as fuel by cells. Glucose concentrations in the bloodstream are regulated by insulin.

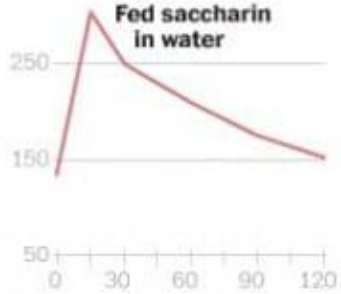
Moderate amounts of starch and sugars can support a healthy population of gut microorganisms, which affect the body in myriad ways.



ARTIFICIAL

Sugar substitutes are designed to satisfy the sweet tooth while avoiding tooth decay, obesity and other problems, including high blood-sugar levels.

However, some artificial sweeteners can alter the composition of gut organisms, leading to imbalances that induce high levels of glucose in the bloodstream, according to the study.



TESTING THE FINDINGS

- Mice fed normal diets suffered high blood-glucose levels after receiving fecal transplants from mice fed artificial sweeteners.
- Antibiotics were used to eliminate gut flora in mice fed artificial sweeteners. Blood- glucose levels returned to normal.
- Artificial sweeteners may affect people in the same way. Blood-glucose levels rose in four of seven people whose normal diets were supple- mented with commercial saccharin.

Probiotics for Gastrointestinal Conditions: A Summary of the Evidence

Thad Wilkins, MD, MBA; Jacqueline Sequoia, MD, MPH

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Probiotic use is ineffective for acute pancreatitis and Crohn disease.	B

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to http://www.aafp.org/afpsort.

Am Fam Physician. 2017;96(3):170-178.

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Homemade Yogurt Resolves Irritable Bowel Symptoms

We were surprised by the response. We had 189 patients in the study, and 169 had remission within 6 months," said Manju Girish Chandran, MBBS, from the Mary Breckinridge ARH Hospital in Hyden, Kentucky.

And some of the participants had lived with symptoms of irritable bowel syndrome for 9 or 10 years, she reported here at the World Congress of Gastroenterology.

Conclusione

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- La disbiosi è una condizione che, coinvolta nella genesi di molteplici patologie, il “medico normale” può solo supporre ma non ancora diagnosticare
- Nella attesa di nuove opzioni diagnostiche e terapeutiche che siano dimostrate essere efficaci il “medico normale” può fare tante “piccole” cose in grado di influenzare positivamente il microbioma dei propri pazienti e che riguardano gli stili alimentari e di vita

“the dependence of the intestinal microbes on the food makes it possible to adopt measures to modify the flora in our bodies and to replace the harmful microbes by useful microbes”

(Ilya Metchnikoff, The prolongation of life: Optimistic studies. 1908)

Dove dobbiamo andare da qui in poi?

- Cercare di capire ciò che è “normale” attraverso la comprensione degli effetti del cambiamento del microbiota sulla fisiologia umana

- Capire come manipolare il microbiota del singolo individuo in modo da portarlo ad una nuova condizione di equilibrio con gli altri sitemi dell’individuo stesso e dell’ambiente. Ciò è strettamente collegato con la comprensione degli effetti della dieta, dei probiotici e degli antibiotici sul microbiota.

- Come portare tutte queste informazioni nella pratica clinica

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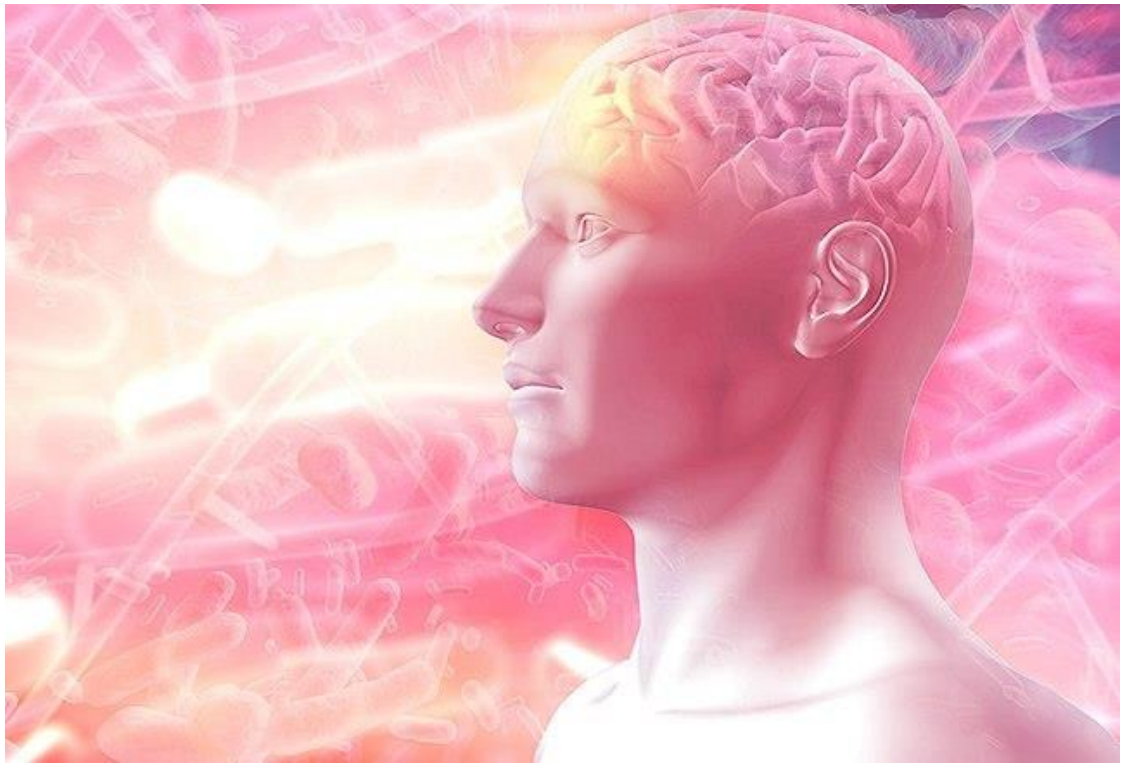
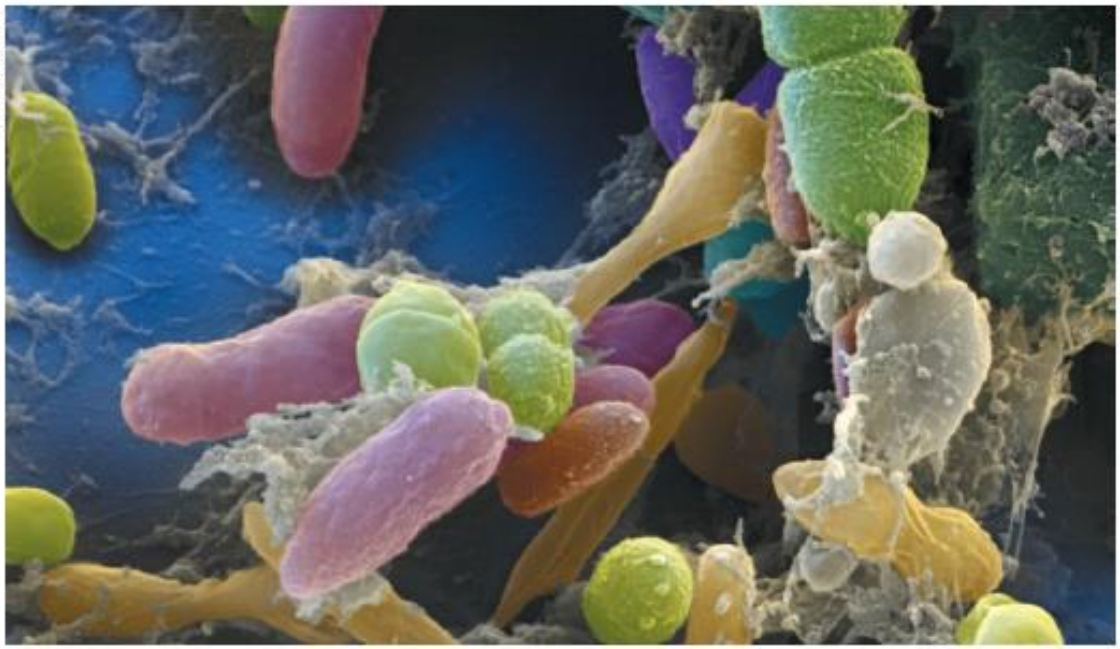
- **Dysbiosis** is a term for a microbial imbalance or maladaptation on or inside the body





EYE OF SCIENCE/SPL

A scanning electron micrograph of bacteria in human faeces, in which 50% of species originate from the gut.

Microbiome science needs a healthy dose of scepticism

To guard against hype, those interpreting research on the body's microscopic communities should ask five questions, says **William P. Hanage**.

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Ipersensibilità viscerale

Disbiosi

Infiammazione

Ansia

Stress

Disturbo neurovegetativo

Improving adherence to healthy dietary patterns, genetic risk, and long term weight gain: gene-diet interaction analysis in two prospective cohort studies

Tiange Wang,[1,2] Yoriko Heianza,[1] Dianjianyi Sun,[1] Tao Huang,[3] Wenjie Ma,[4] Eric B Rimm,[4] JoAnn E Manson,[4,6,7] Frank B Hu,[5,6] Walter C Willett,[4,5,6] Lu Qi[1,5,6]

PARTICIPANTS

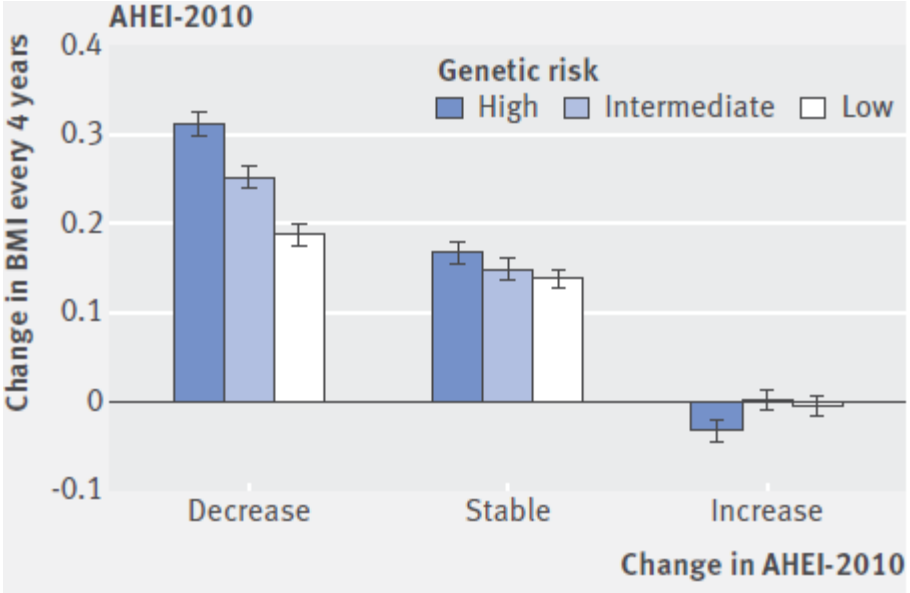
8828 women from the Nurses' Health Study and 5218 men from the Health Professionals Follow-up Study.

EXPOSURE

Genetic predisposition score was calculated on the basis of 77 variants associated with body mass index. Dietary patterns were assessed by the Alternate Healthy Eating Index 2010 (AHEI-2010), Dietary Approach to Stop Hypertension (DASH), and Alternate Mediterranean Diet (AMED).

CONCLUSIONS

These data indicate that improving adherence to healthy dietary patterns could attenuate the genetic association with weight gain. Moreover, the beneficial effect of improved diet quality on weight management was particularly pronounced in people at high genetic risk for obesity.



thebmj | *BMJ* 2018;360:j5644 | doi: 10.1136/bmj.j5644

JAMA Pediatrics | Original Investigation

Association Between Cesarean Birth and Risk of Obesity in Offspring in Childhood, Adolescence, and Early Adulthood

Changzheng Yuan, ScD; Audrey J. Gaskins, ScD; Arianna I. Blaine, ScM; Cuilin Zhang, MD, PhD; Matthew W. Gillman, MD, SM; Stacey A. Missmer, ScD; Alison E. Field, ScD; Jorge E. Chavarro, MD, ScD

Table 4. Within-Family Odds Ratios for Obesity in Offspring Associated With Cesarean vs Vaginal Delivery

Variable	Obese Offspring/ Total Offspring, No./No. (%)	Odds Ratio (95% CI)	*P* Value
Overall			
Vaginal delivery	1091/10 155 (10.7)	1 [Reference]	
Cesarean delivery, model 1[a]	417/2748 (15.2)	1.64 (1.08-2.48)	.02
9-18 y			
Vaginal delivery	719/10 113 (7.1)	1 [Reference]	
Cesarean delivery, model 1[a]	301/2739 (11.0)	1.67 (1.01-2.76)	.04
19-28 y			
Vaginal delivery	677/6714 (10.1)	1 [Reference]	
Cesarean delivery, model 1[a]	233/1772 (13.1)	1.72 (0.89-3.32)	.11

CONCLUSIONS AND RELEVANCE Cesarean birth was associated with offspring obesity after accounting for major confounding factors. Although additional research is needed to clarify the mechanisms underlying this association, clinicians and patients should weigh this risk when considering cesarean delivery in the absence of a clear indication.

JAMA Pediatr. 2016;170(11):e162385. doi:10.1001/jamapediatrics.2016.2385
Published online September 6, 2016.

Administration of Antibiotics to Children Before Age 2 Years Increases Risk for Childhood Obesity

6

Exposure	Exposed, n	Obese, n (% of exposed)	Univariable analysis, OR (95% CI)	Adjusted model assessing no. of prescriptions, OR (95% CI)	Adjusted model assessing age at first prescribed antibiotic, OR (95% CI)
No. of antibiotic prescriptions					
0 (ref)	6844	355 (5.2)	1.00	1.00	—
1–2	8761	492 (5.6)	1.09 (0.95–1.25)	1.07 (0.93–1.23)	—
3–5	4481	332 (7.4)	1.46 (1.25–1.71)	1.41 (1.20–1.65)	—
>5	1628	127 (7.8)	1.55 (1.25–1.91)	1.47 (1.19–1.82)	—
Age at first prescription					
None (ref)	6489	355 (5.2)	1.00	—	1.00
0–6 mo	3837	267 (7.0)	1.37 (1.16–1.61)	—	1.33 (1.13–1.57)
6–12 mo	5851	390 (6.7)	1.31 (1.13–1.51)	—	1.27 (1.09–1.47)
12–24 mo	5182	294 (5.7)	1.10 (0.94–1.29)	—	1.07 (0.91–1.26)

Table 4. Multivariable Model Assessing Interaction Variable of Time of First Antibiotic and Number of Antibiotic Prescriptions With Obesity

Exposure	Multivariable analysis	
	n/N (%)	OR (95% CI)
No antibiotic exposures	345/6590 (5.2)	1.00
1–2 prescriptions with first exposure between 0–12 mo	259/4279 (6.1)	1.18 (0.995–1.39)
3 or more prescriptions with first exposure between 0–12 mo	377/4989 (7.6)	1.48 (1.27–1.72)
1–2 prescriptions with first exposure between 12–24 mo	210/4141 (5.1)	0.96 (0.81–1.15)
3 or more prescriptions with first exposure between 12–24 mo	67/828 (8.1)	1.60 (1.22–2.10)

Gastroenterology 2016;151:120–129

Exercise is a Novel Promoter of Intestinal Health and Microbial Diversity

Sara C. Campbell and Paul J. Wisniewski, II

Exerc. Sport Sci. Volume 45 • Number 1 • January 2017

Key Points

- Exercise increases microbial diversity independent of diet; the microbiota of athletes may be related to dietary protein content.
- Microbiota alterations as a result of exercise are more substantial in earlier life compared with later life.
- Exercise capacity may be influenced by the presence of a diverse microbiota.
- High-fat diets increase intestinal inflammation; exercise reduces this inflammation and may improve gut epithelial integrity.

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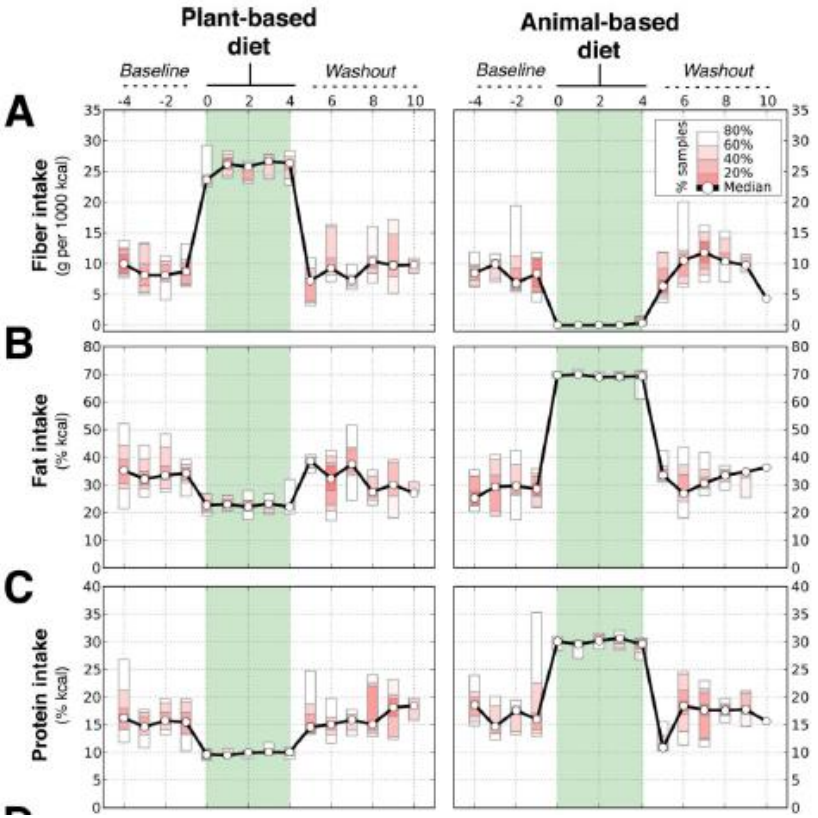

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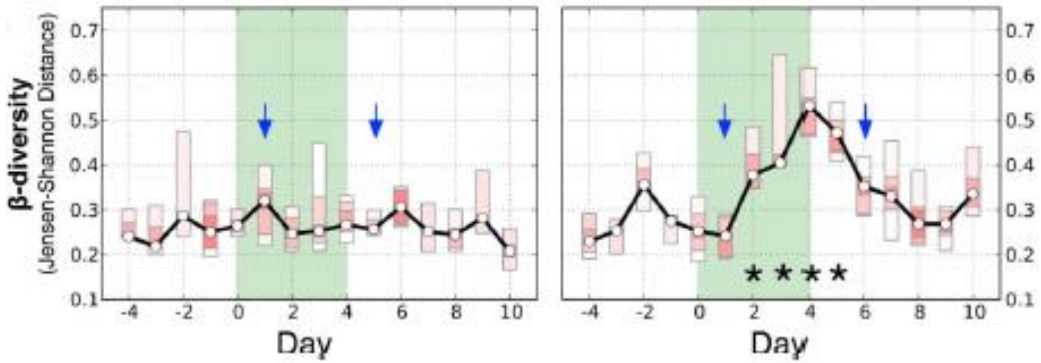
↑ -Bile-tolerant (bilophila, bacteroidetes)

↓ --Firmicutes



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