

Microbiome, Gut and Systemic Health: New Frontiers in Personalised Nutrition



Professor Glenn Gibson

Gut Microbiome Primer: An Alphabet of Gut Microbiology

11:15-12:00pm

An event by:  Nutritional Medicine Institute

Platinum sponsors:   

1



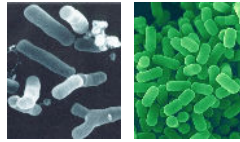
**Gut microbiome and health:
Friends in low places (A-Z)**

NMI Summit October 13th 2023

Glenn Gibson

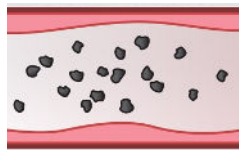
2

Probiotics, prebiotics and synbiotics



Probiotics

- Live microbes as bioactives (44,992)



Prebiotics

- Substrates that are selectively utilized by host microorganisms conferring a health benefit (14,606)



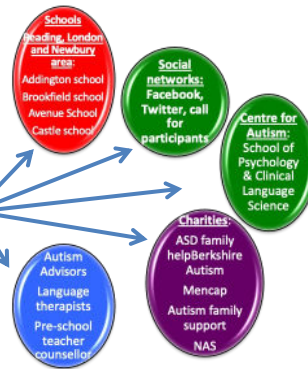
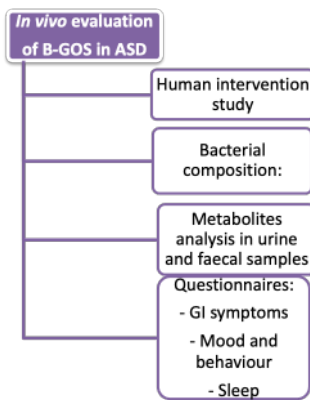
Synbiotics

- Combinations of the above (2,656)

3

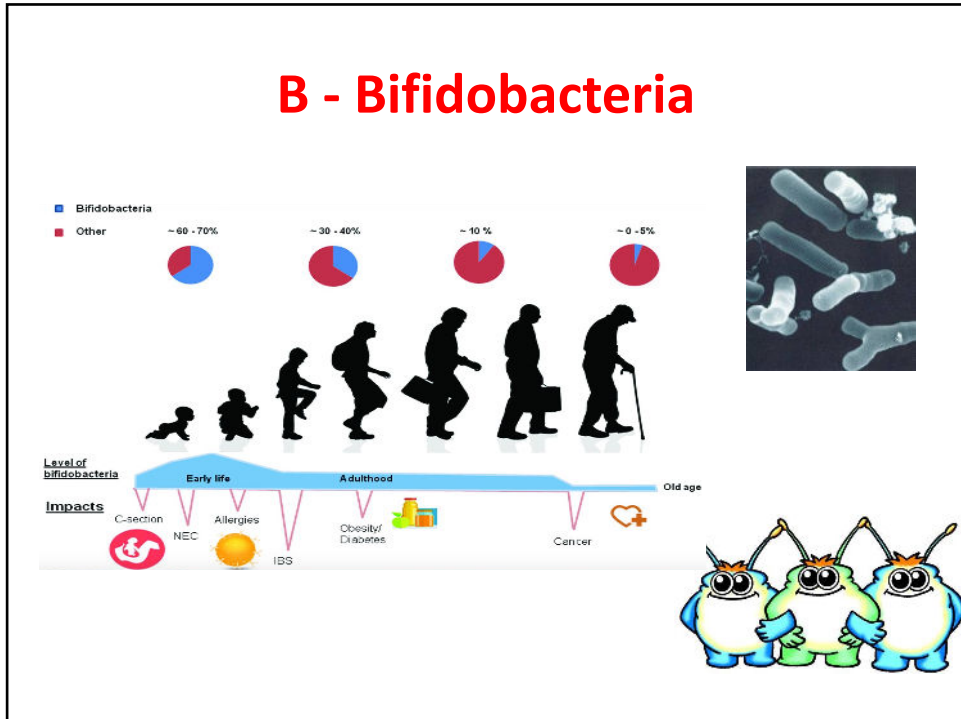
3

Autism

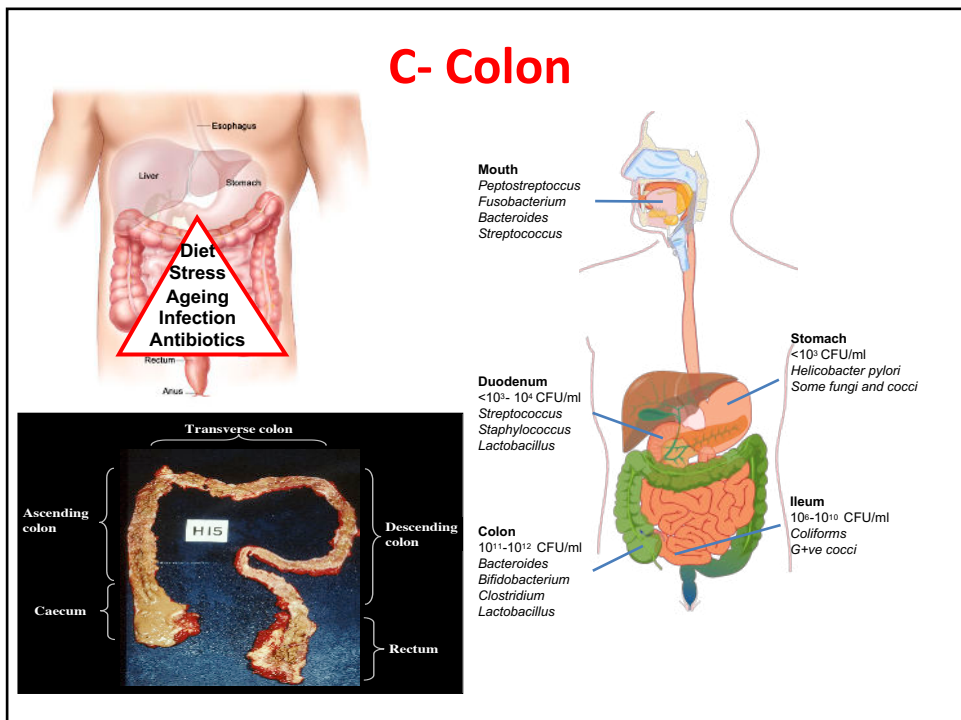


- Gut microbiome seems compromised, leading to GI difficulties
- ASDs costs the UK 32bn p.a. (treatment, loss of earnings, care, support)

4






5




6

D- Diarrhoea







7

E – EFSA

Nutraceutical health claims are hard to swallow



THE TIMES

MailOnline

Probiotic yogurt health claims can not be proven, say EU scientists



guardian.co.uk

Are probiotics really that good for your health?



Questions raised over probiotic benefits



Taking the pro out of probiotic

theguardian






Daily Mail

Revealed: The facts behind the great health drink illusion



8


F – Fast facts, gut bacteria

- Our body has 10x more gut microbes than human cells. 
- We excrete the same weight as 12 elephants in a typical lifetime 
- The gut microbiota represents the most metabolically active organ in the body. 
- In humans, 12 organs can be influenced by the gut microbiome
- Approximately 70% of our immune system resides in the gut 
- More than 1,000 different known bacterial species can be found in human gut microbiota. 

9

9

G- Gut health



Immunity, pathogen inhibition

Atopic issues

Digestive cancers

Inflammatory bowel diseases

Cognitive interactions

Constipation, diarrhoea, bloating

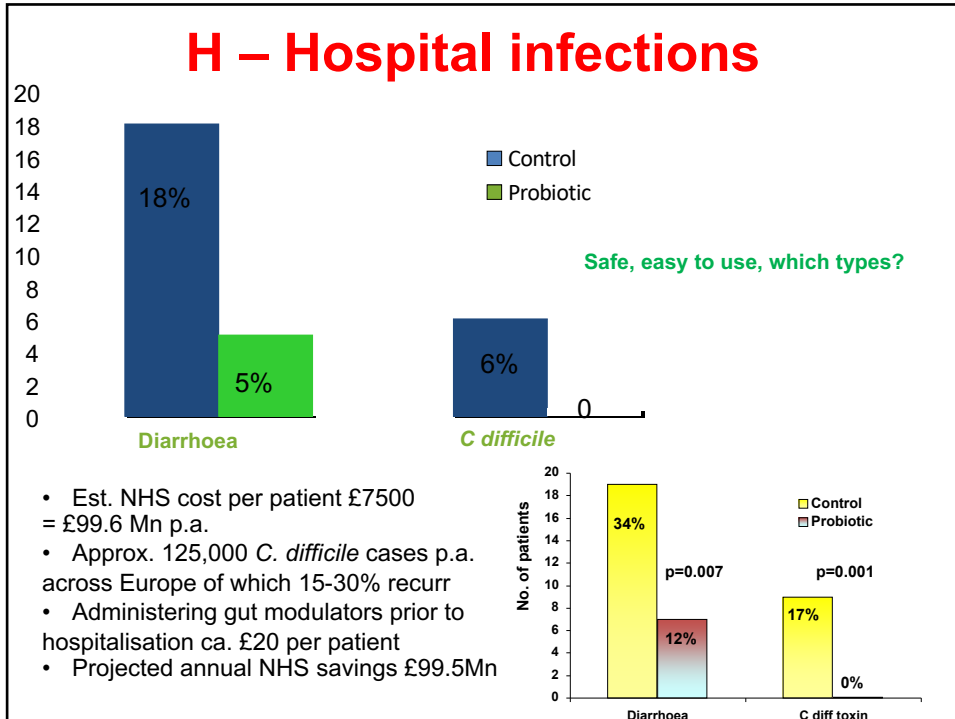
Obesity and metabolic syndrome

Irritable bowel syndrome

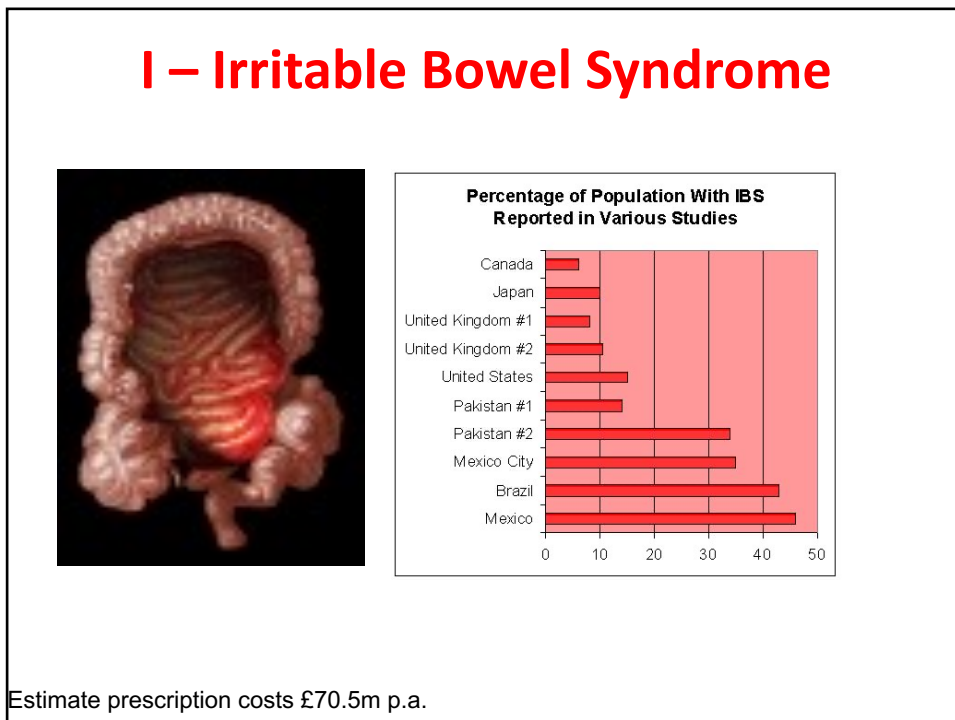
Antibiotic-associated diarrhoea

10

10





11



12


J – Julie Elliot





To highlight the role of the microbiome in physical and mental health and its capacity to prevent many disorders and improve or slow others; to inform debate about how this will save money for the Treasury and NHS; and to enable communications between interested parties and relevant parliamentarians’.

- lectures, briefing documents, house questions, research days, specific inquiries





13

K - Kelly











Kelly Brook comments: "Having such a busy schedule means I'm constantly on the go and don't always have the time to look after my body in the way I'd like. Having a bed with pro-biotic qualities means it's doing my body good while I sleep – you can't ask for more than that from a bed!"

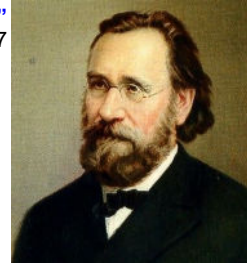
14

L – Live microbial therapeutics (probiotics)



“The prolongation of life”
– Metchnikoff, 1907

- Long use in humans
- Easy to use
- Need to survive in products and after use
- >40,000 research papers
- Diarrhoea, IBS, IBD, mental health, atopic issues, infections, CRC

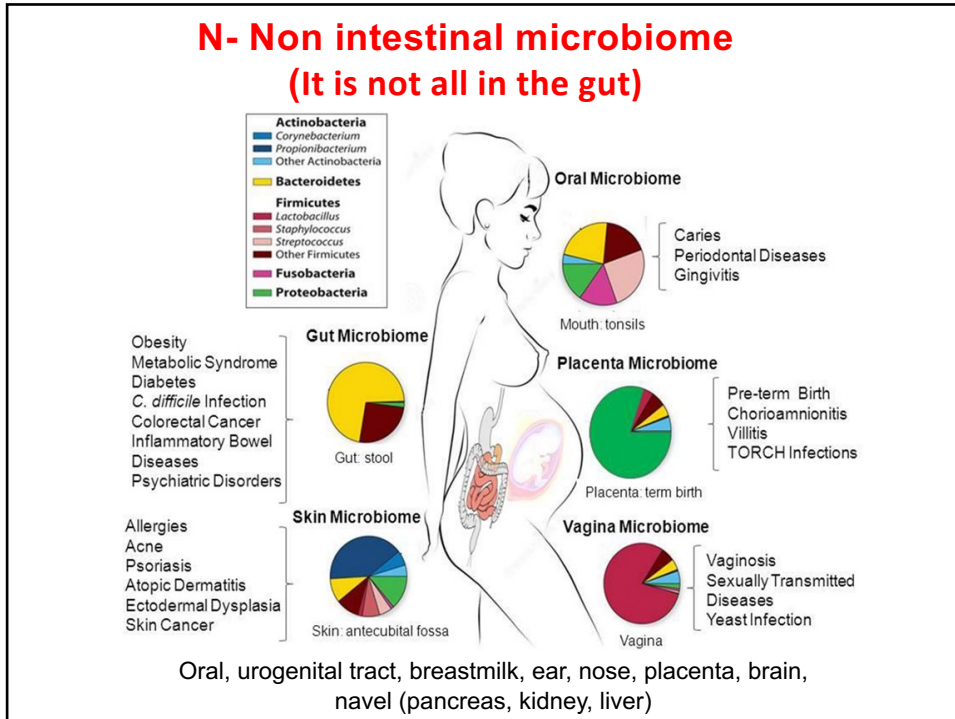


15

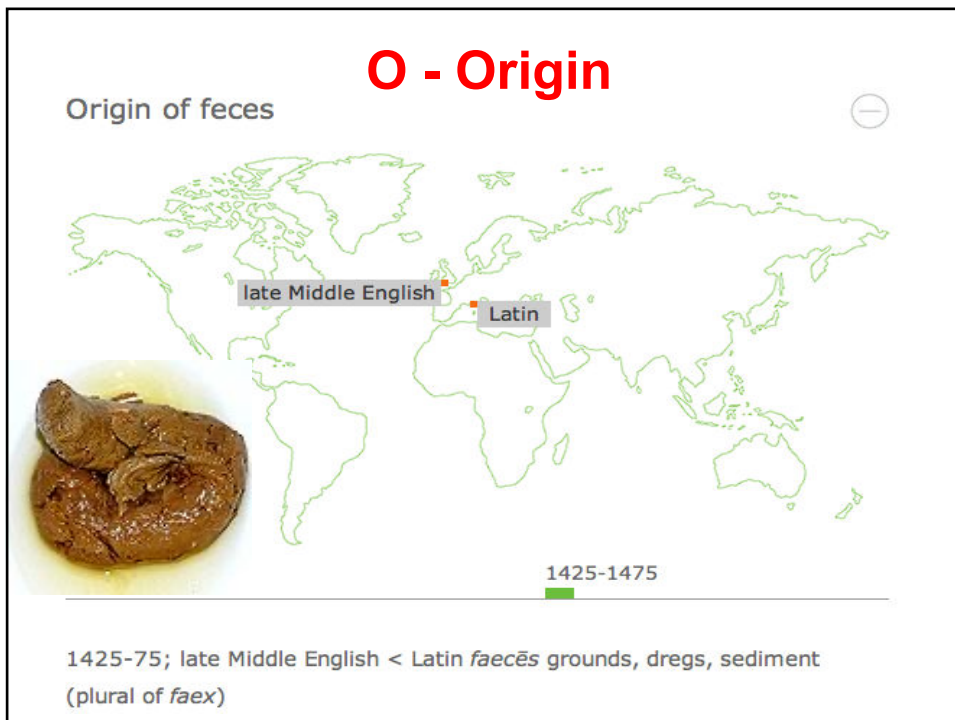
M- Museums



16



17



18

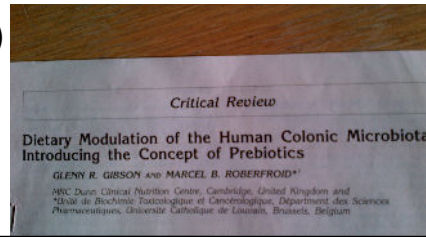
P - Prebiotics



“a substrate that is selectively utilized by host microorganisms conferring a health benefit”

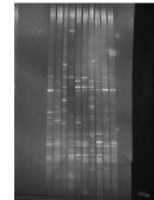
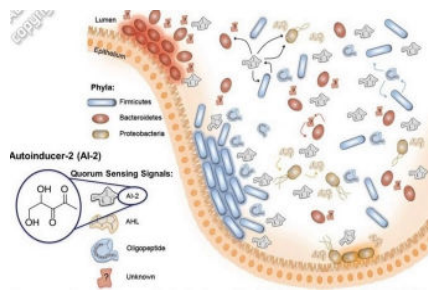
- 13000-15000(!!) peer reviewed research papers (depending where you look).
- Value of \$3-16b (!!) (depending where you look).

11-15% rise (depending where you look) predicted for the next 5 years.
 New companies; ongoing research; new products; health attention.
 Food and beverage (80%).



19

Q – Quorum sensing



Silchester



Çatal Höyük




Arizona



20

How a GOAT cured my little boy's eczema... and saved my husband from a superbug!




Fecal transplant shows long-term safety for recurrent *C. difficile*

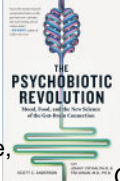
Exercise changes gut microbial composition independent of diet, team reports

R - Reporting

Prebiotic fiber supplement reduces body fat in overweight children by altering gut microbiome



Is a messed-up microbiome linked to obesity?



Can the bacteria in your gut explain your mood?

Gut microbiome therapies show promise for treating autism

A pregnant woman's diet could affect her baby's gut


Enhanced understanding of the microbiome is helping medicine

The microbiome goes viral

Is showering every day BAD for you?

Junk food-loving bacteria, not extra weight, cause arthritis and joint problems

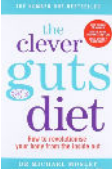
The microbiome, the gift that keeps on giving...



'Largest' microbiome study weighs in on our gut health

Microbiome integral to precision diagnosis, personalized treatment

Gut reaction: the surprising power of microbes



The kids are too clean! Landmark study finds germ-free environment in first year can CAUSE Leukaemia

21

S – SARS-CoV-2

Gastrointestinal Manifestations of SARS-CoV-2 Infection and Virus Load in Fecal Samples From the Hong Kong Cohort and Systematic Review and Meta-analysis

Kai Shing Cheung¹, Iren Fui Hung², Pierre Py Chen³, K.C. Leung⁴, Eugene Tao⁵, Raymond Liu⁶, Y. Y. Ng⁶, Man Y. Chau⁷, Tomi Wu Chung⁸, Anthony Raymond Tam⁹, Cyril Cy Yiu⁶, Kit-Hang Leung⁶, Agnes Yim-Fang Fung¹⁰, Ricky R. Zhang⁶, Yansheng Lin¹¹, Ho Ming Cheng⁶, Anna Jx Zhang¹², Kelvin Kw To¹³, Kwok-H Chan¹⁴, Kwok-Y Yuen¹⁵, Wei K Leung¹⁶

THE LANCET
Gastroenterology & Hepatology

Correspondence: Eric Giamouri, David Baud, Varvara Stimpouliou, Agi, Glenn R Gibson, Gregor Raft

Probiotics and COVID-19

Published: August, 2020 • DOI: [https://doi.org/10.1016/S2468-2652\(20\)30126-3](https://doi.org/10.1016/S2468-2652(20)30126-3)

Clinical Characteristics of COVID-19 Patients With Digestive Symptoms in Hubei, China: A Descriptive, Cross-Sectional, Multicenter Study

Lei Pan¹, Mi Mu², Pengcheng Yang³, Yu Sun⁴, Runsheng Wang⁵, Junhong Yan⁶, Ribao Li⁶, Baoguang Hu⁶, Jing Wang⁷, Chao Hu⁷, Yuan Jin⁶, Xun Niu⁶, Rongyu Ping⁷, Yingzhen Du⁷, Tianzhi Li⁸, Guogang Xu⁸, Qinyong Hu⁹, Lei Tu¹⁰

Using Probiotics to Flatten the Curve of Coronavirus Disease COVID-2019 Pandemic

David Baud¹, Varvara Stimpouliou Agi¹, Glenn R. Gibson¹, Gregor Raft^{1} and Eric Giamouri^{2*}*

Review Article: Gastrointestinal Features in COVID-19 and the Possibility of Faecal Transmission

Yuan Tien¹, Long Kong¹, Weidong Nian¹, Yan He²

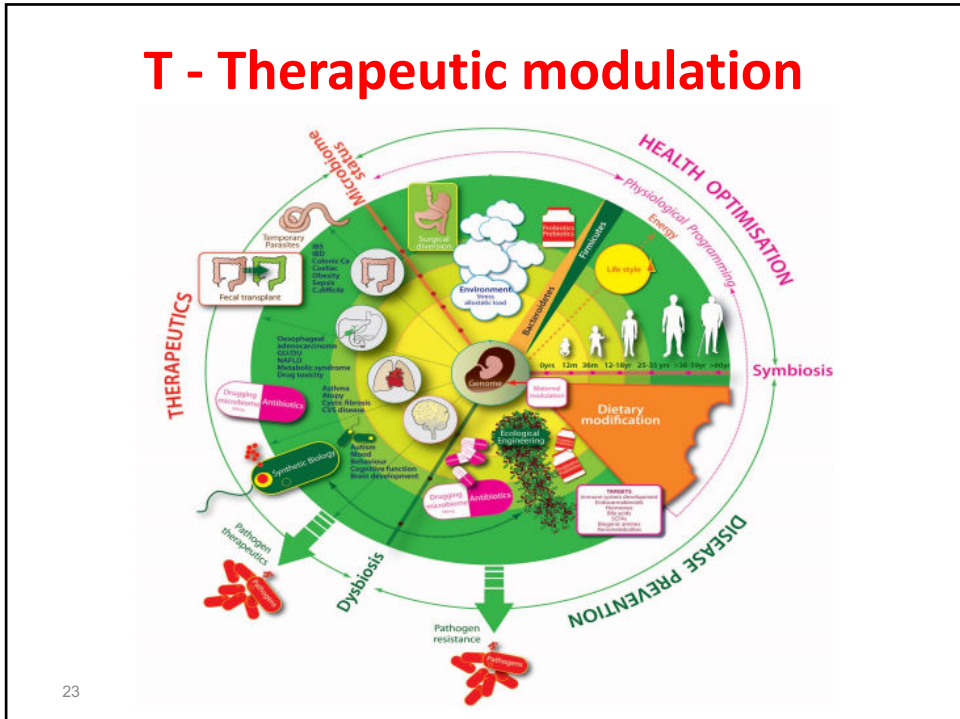
Mechanisms linking the human gut microbiome to prophylactic and treatment strategies for COVID-19

Genima E Wallon¹, Glenn R Gibson¹, Kirsty A Hunter²

<https://www.dailymail.co.uk/news/article-8315017/Scientists-ask-Health-Secretary-evaluate-role-gut-microbiome-coronavirus.html#comments>

22

T - Therapeutic modulation



23

23

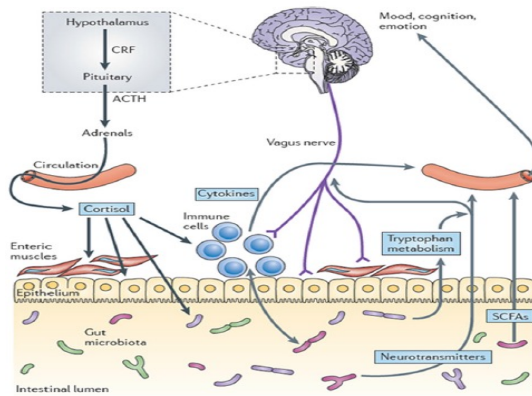
U – US army



“Dysentery has been more fatal to armies than powder and shot” (Osler 1892)

24

V – Vagus nerve



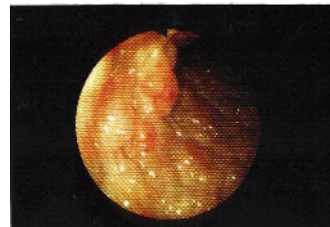
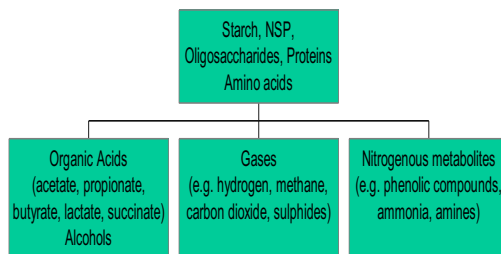
- ca. 20% of the UK population aged over 16 show symptoms of anxiety
- Depression has the highest mortality rate of any cognitive issue
- Mental health costs the UK Government £102bn p.a. of which 7.2bn is on depression
- Gut microbiome produces +ve and -ve neurotransmitters
- EU research (E2m) at UoR to MRI the gut and brain in response to pro/prebiotics

25

W - Wind



Fermentation by Colonic Bacteria



26

X – X syndrome

NEWS & VIEWS

Vol 444 | 21/28 December 2006 nature

PHYSIOLOGY

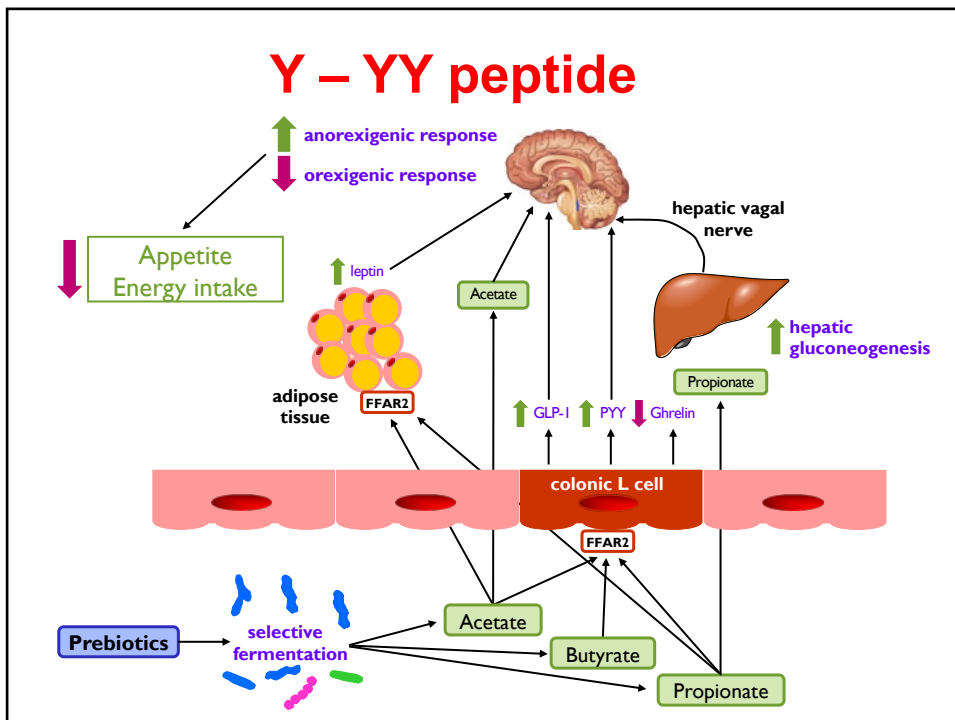
Obesity and gut flora

Matej Bajzer and Randy J. Seeley

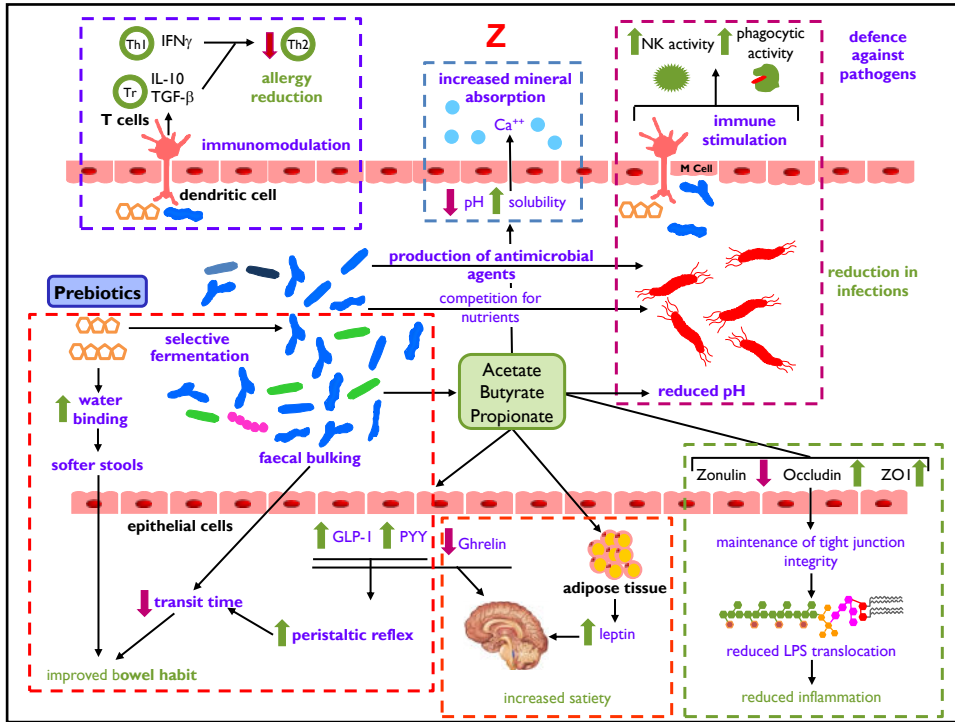
The intestinal bacteria in obese humans and mice differ from those in lean individuals. Are these bacteria involved in how we regulate body weight, and are they a factor in the obesity epidemic?

BOSTON FISH+SCFA obese.M1 (PLS-DA)
[Comp. 1] [Comp. 2]
Colored according to classes in M1

27



28



29

- | | |
|------------------------------------|----------------------------------|
| Autism | Non intestinal microbiota |
| Bifidobacteria | Origin of faeces |
| Colon | Prebiotics |
| Diarrhoea | Quorum sensing |
| EFSA | Reporting |
| Fast facts on the gut | SARS-CoV-2 |
| Gut health | Therapeutic modulation |
| Hospital infections | US Army |
| Irritable Bowel Syndrome | Vagus nerve |
| Julie Elliot | Wind |
| Kelly Brook | X syndrome |
| Live microbial therapeutics | YY peptide |
| Museums | Zonulin |

30

Microbiome, Gut & Systemic Health:
New Frontiers in Personalised Nutrition

NMI SUMMIT 2023
Friday 13th October

Featuring Dr. Gerard Mullin, Professor Glenn Gibson, Dr. Amrita Vijay,
Justine Bold, Dr. Indra Barathan and Dr. Miguel Toribio-Mateas

An event by:  Nutritional Medicine Institute

Platinum sponsors:   