



Manipulating the gut microbiota to maintain health and treat disease

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W I N C L O V E
P R O B I O T I C S

Diseases associated with microbiota

IBD

IBS

Clostridium difficile infection

Colorectal cancer

Allergy/Atopy

Celiac disease

Type 1 & 2 diabetes

Obesity

Alzheimer's disease

Atherosclerosis

Autism

Chronic fatigue syndrome

Colic babies

Depression and anxiety

Frailty

Graft-vs. host disease

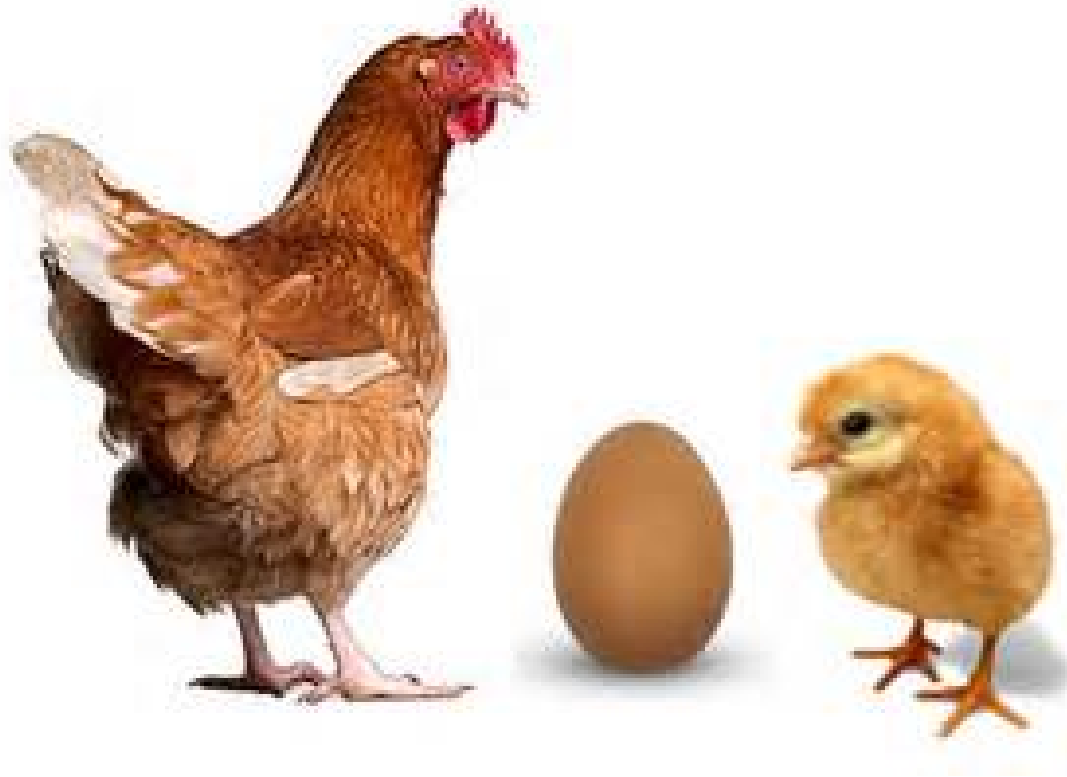
Multiple sclerosis

Nonalcoholic fatty liver disease

Parkinson's disease

Rheumatoid arthritis

Diseases associated with microbiota



Manipulating the gut microbiota

- Diet
- Exercise
- Medicines
- Probiotics
- Prebiotics
- Fecal transplants

ENGiHR review

MICROBIAL
ECOLOGY
in Health and Disease



COACTION
PUBLISHING

ENGiHR SUPPLEMENT

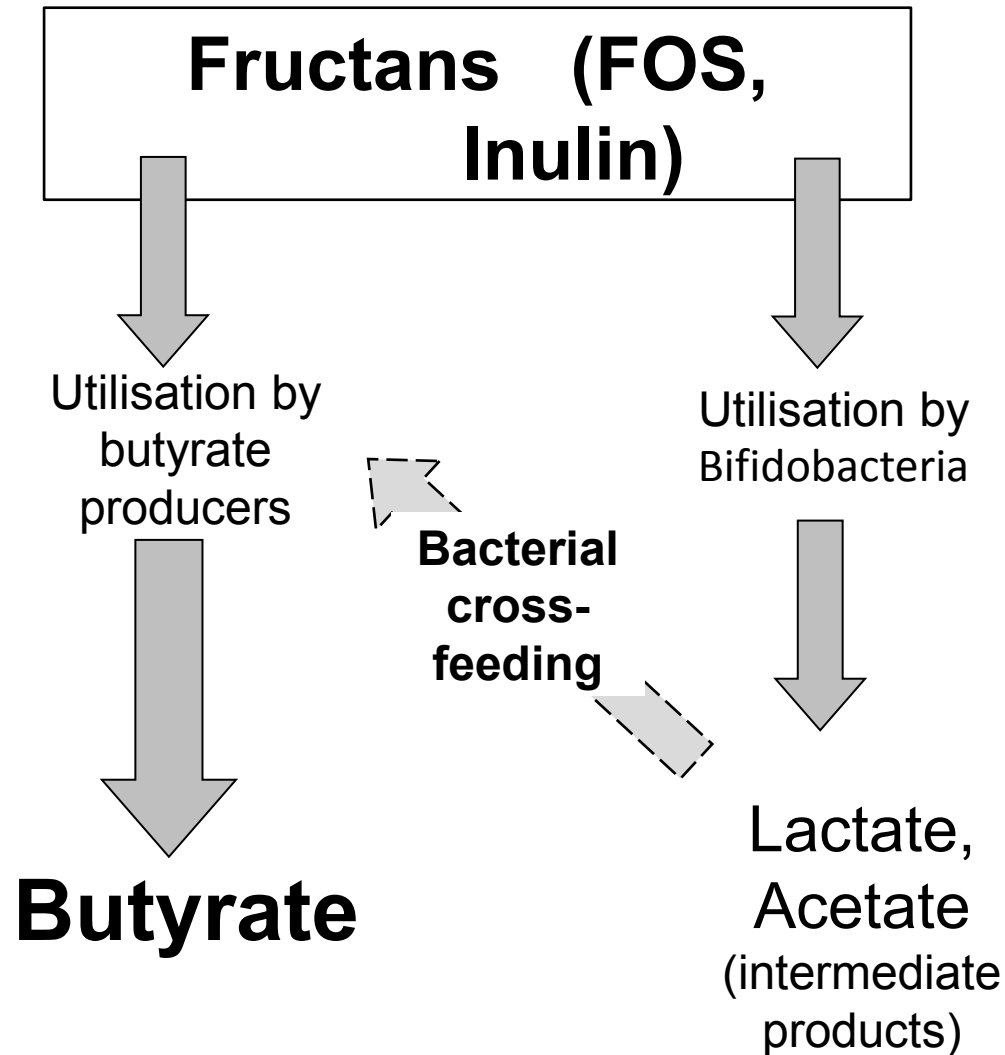
Manipulating the gut microbiota to maintain health and treat disease

Karen P. Scott¹, Jean-Michel Antoine², Tore Midtvedt³ and
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Prebiotics

- Enhance the growth and/or activity of bacteria that are resident in the colon
- Most known: inulin, FOS, GOS, lactulose
- Increase number of bifidobacteria
- Effects on keystone species
- Increase butyrate

Crossfeeding



Probiotics manipulating gut microbiota

- direct and indirect effects
- effects on gut microbiota: composition and/or activity
- adding enzymes (lactose intolerance)
- secrete anti-microbial factors (AAD, infectious diarrhea)
- quicker restoration of microbiota after distortion
- modify function of the microbiota

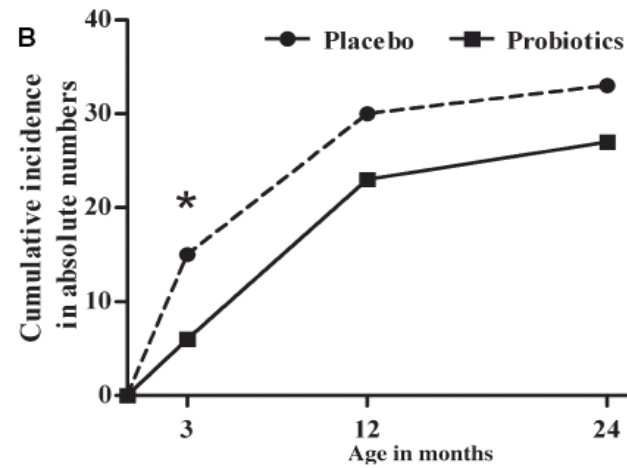
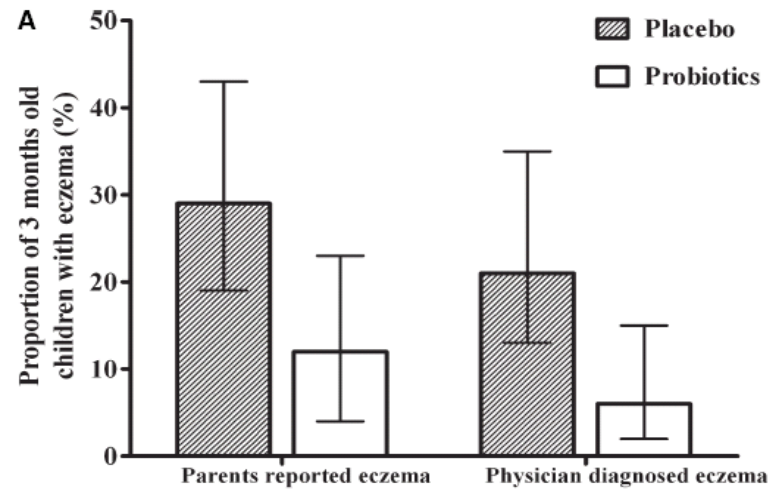
Fecal transplants

- Single donor
- Multiple donors
- Autologous feces transplantation
- Anaerobically cultivated bacteria

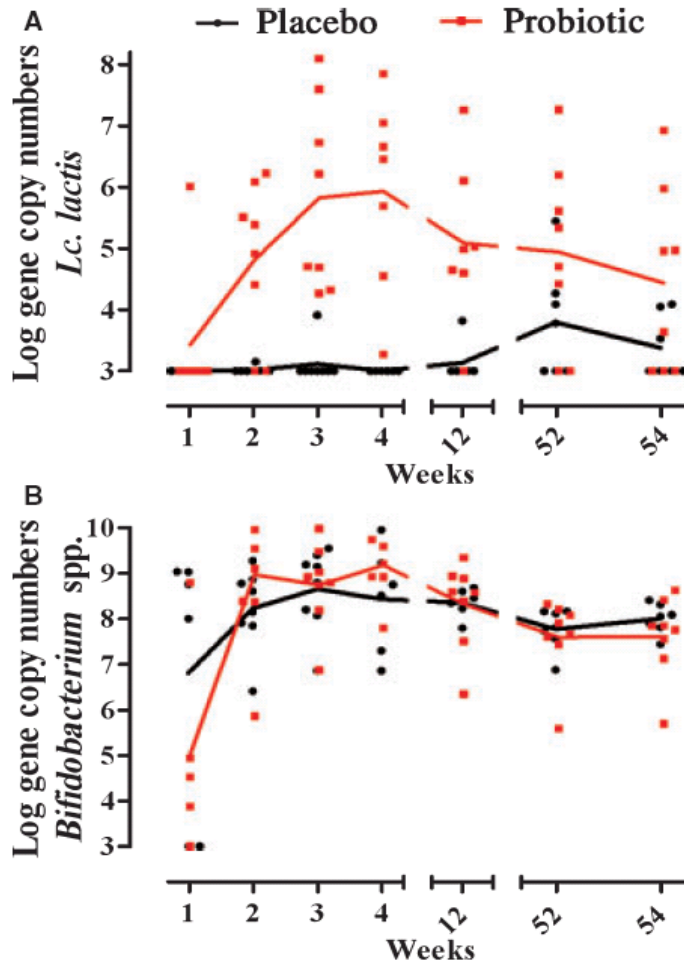
Applications of fecal transplants

- *Clostridium difficile* associated diarrhea
- IBD
- IBS
- Metabolic syndrome
- autoimmune disorders, allergies, neurological disorders, chronic fatigue syndrome, ..

Example: Preventing eczema in children



Example: Preventing eczema in children

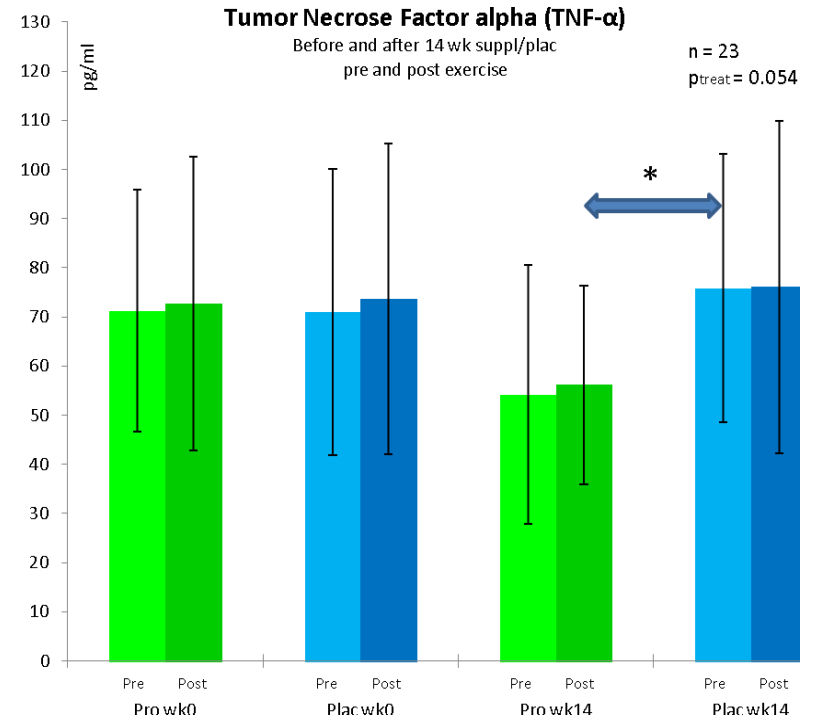
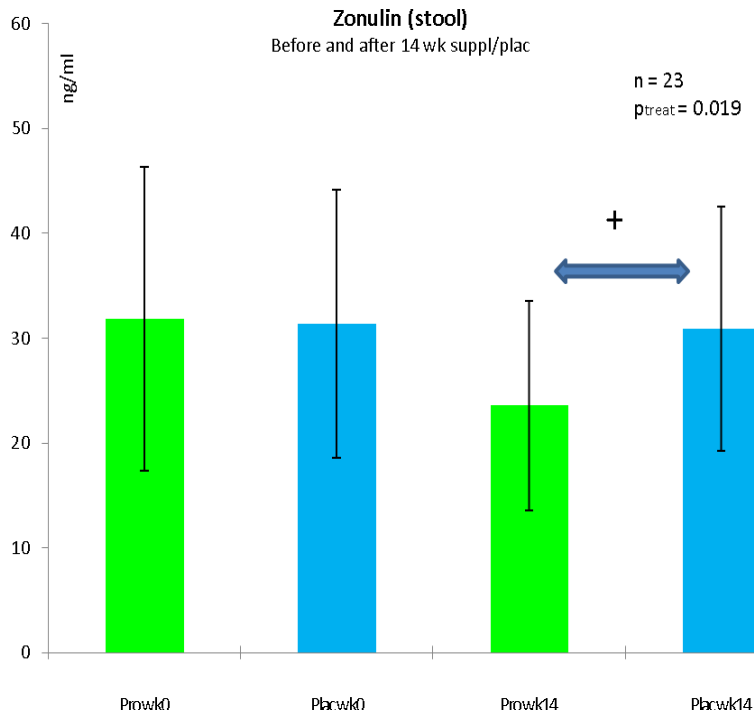


Example: Barrier function in sportmen

Variable	Probiotics (n = 11)	Placebo (n = 12)
Age, yr	37.6 ± 4.7	38.2 ± 4.4
BMI, kg · m ⁻²	23.7 ± 2.2	23.9 ± 3.1
Weight, kg	80.2 ± 7.9	81.6 ± 6.3
Total body fat, %	14.2 ± 3.1	14.4 ± 3.5
VO _{2max} , mL	4118 ± 172	4087 ± 169
VO _{2max} , mL · kg ⁻¹ · min ⁻¹	51.2 ± 4.1	50.3 ± 3.6
P _{max} , W	367 ± 28	357 ± 32
P _{rel} , W · kg ⁻¹	4.53 ± 0.55	4.38 ± 0.62

- No difference in baseline characteristics
- Ecologic[®] Performance for 14 weeks

Example: Barrier function in sportmen



Example: *C. dif.* in elderly

Age	survived	died	cause (a)	contribute(b)	inconclusive	% a+b
<70	479	42	6	15	21	4.0
70-74	103	16	2	6	8	6.7
75-80	88	13	1	6	6	6.9
>80	209	23	3	11	9	6.0

- Case serie of ten patients
- 125 mg Vancomycin 4x daily
- Use of Ecologic[®]AAD twice daily (10^{10} cfu/day)

Example: *C. dif.* in elderly

Age	sex	Corticosteroids/PPI	Type	resolution
88	m	PPI	023	complete
89	f	None	014	complete
72	m	Cortison	413	complete
85	f	PPI	433	complete
85	m	PPI	014	complete
80	m	PPI	nd	complete
76	m	Cortison, PPI	nd	complete
79	m	Cortison, PPI	053	complete
81	m	None	nd	complete
85	f	PPI	053	complete

Conclusions

- Cross-talk between the intestinal microbiota and the host leads to life-long epigenetic programming
- Many diseases are associated with gut microbiota composition
- Manipulation of the gut microbiota seems rational for the prevention and treatment of disease

**but studies linking gut microbiota manipulation
1:1 to health effects are still scarce**

Acknowledgements

- My co-authors:
 - Karen Scott
 - Jean-Michel Antoine
 - Tore Midtvedt
- My colleagues of Winclove
- Collaborators of Winclove
 - UMC
 - Titia Niers, Ger Rijkers & team
 - Medical University of Graz
 - Manfred Lamprecht & team
 - Salzburg University Hospital
 - Marcus Hell & team



Thank you for your attention