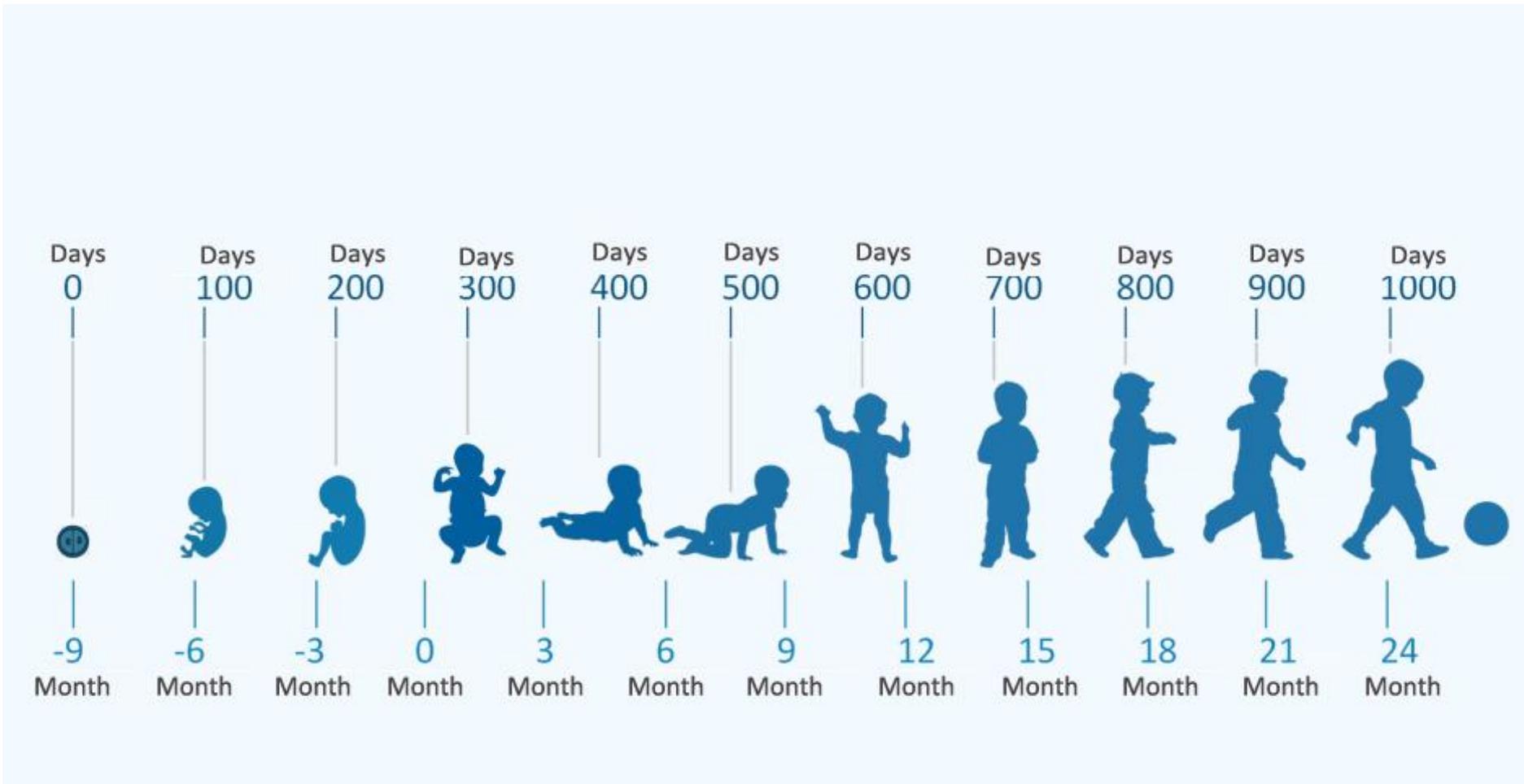




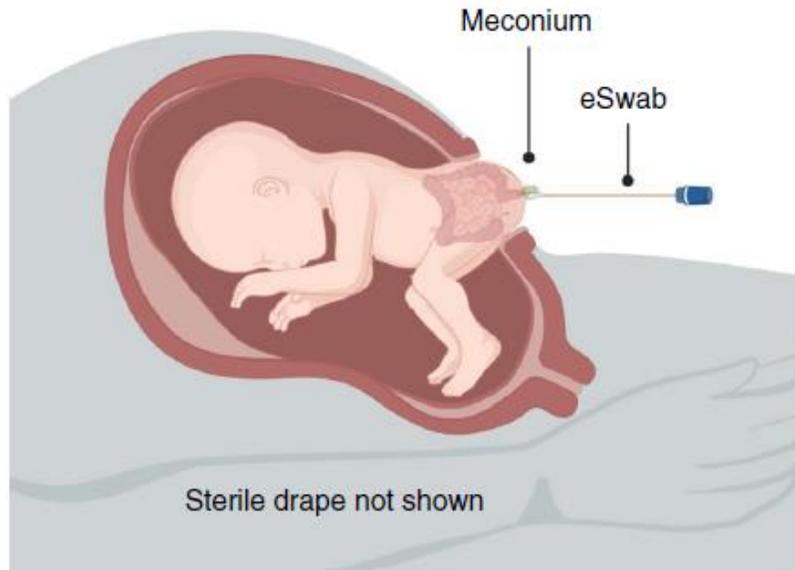
# O Microbioma ao longo do ciclo de vida – Uma Visão da Medicina Humana

PROFA. ASSOC. CARLA TADDEI – ICB/USP





# Fetal meconium does not have a detectable microbiota before birth



**Fig. 1 |** Diagram of the collection method for fetal meconium samples. After advanced physical disinfection of maternal skin from maternal armpits to knees, the surgical area was covered using a specialized sterile drape, with the film remaining intact until the incision. After caesarean section and exposure of the fetal buttocks before birth, meconium was rectally sampled using sterile eSwabs. Image created with BioRender.com.

**Table 2 |** Fetal meconium culture results

Sample ID	Anaerobic culture		Aerobic culture	
	Result	Incubation time (h)	Result	Incubation time (h)
M201 <sup>a</sup>	<i>S. epidermidis</i>	18.64	<i>S. epidermidis</i>	23.2
M202	<i>S. epidermidis</i>	18.68	<i>S. lugdunensis</i>	20.67
M203 <sup>b</sup>	<i>S. epidermidis</i>	20.12	<i>S. epidermidis</i>	14.92
M204 <sup>a,b</sup>	<i>S. epidermidis</i>	18.59	<i>S. epidermidis</i>	17.09
M205 <sup>a</sup>	Negative	120.07	Negative	120.07
M206	<i>Staphylococcus saprophyticus</i>	26.09	<i>S. saprophyticus</i>	17.96
M207 <sup>a</sup>	<i>S. epidermidis</i>	19.06	<i>S. lugdunensis</i>	18.69
M208	<i>S. epidermidis</i>	22.05	Negative	120.08
M209	Negative	120.07	Negative	120.08
M210	<i>P. acnes</i>	79.21	Negative	120.08
M211	Negative	120.08	Negative	120.09
M212	<i>S. epidermidis</i>	19.94	<i>Staphylococcus hominis</i>	24.29
M213	<i>P. acnes</i>	102.77	<i>S. capitis</i>	36.68
Neg	Negative	120.02	Negative	120.03
M215	Negative	120.13	Negative	120.13
M216	Negative	120.16	Negative	120.15
M217	<i>P. acnes</i>	66.24	Negative	120.17
M219	Negative	120.08	<i>S. epidermidis</i>	17.41
M221	Negative	120.08	Negative	120.08
M222	Negative	120.08	Negative	120.09
M223	<i>P. avidum</i>	80.85	<i>P. avidum</i>	99.05

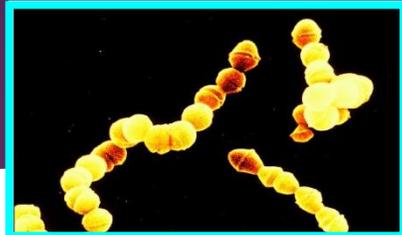
<sup>a</sup>Not breech presentation. <sup>b</sup>Monochorionic diamniotic twins. Bacterial species detected in fetal meconium by anaerobic and aerobic culture. Cultures were maintained until detection or for a maximum of 120 h.

# DISCUSSÃO- SUCESSÃO MICROBIANA DESCRITA

Anaeróbios facultativos



*E. coli*



*Streptococcus*

~~OXIGÊNIO~~



Anaeróbios

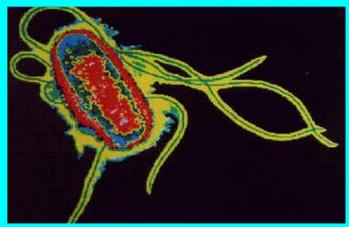
Produção de AGCC



*Bifidobacterium*



*Bifidobacterium*



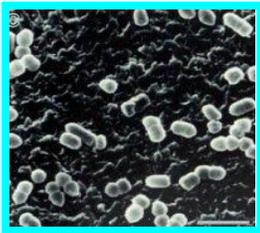
*E. coli*



*Lactobacillus*



*Bacteroides*



*Prevotella*

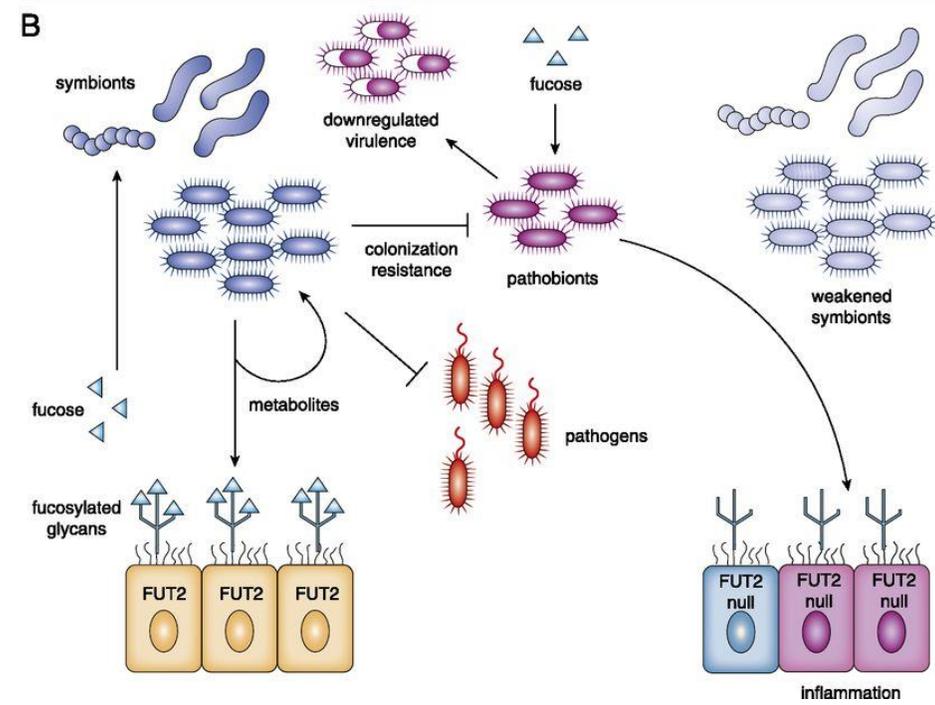
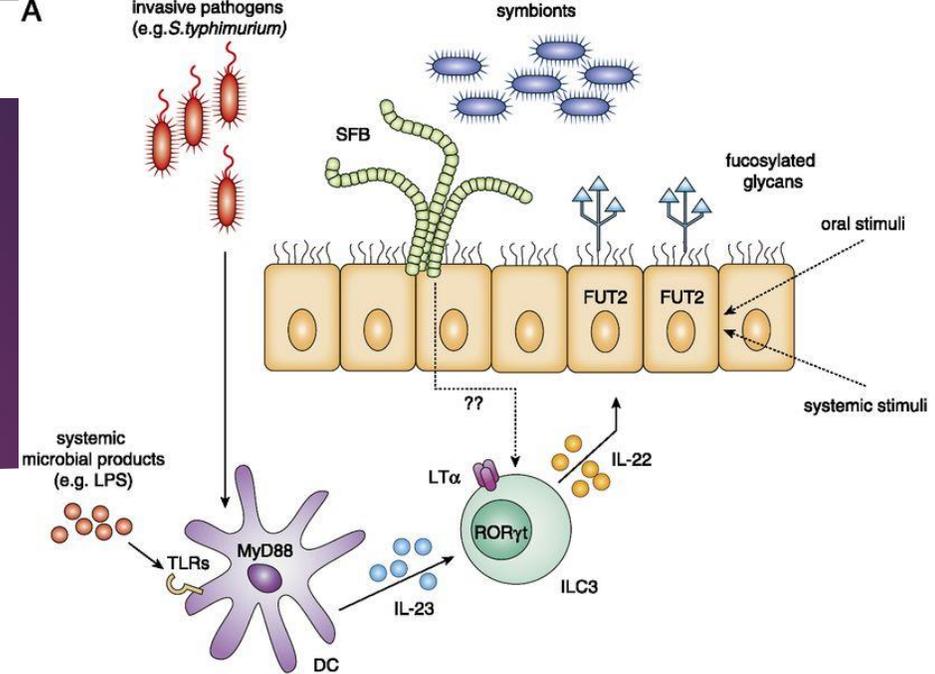
1º dia

10 dias

1 mês

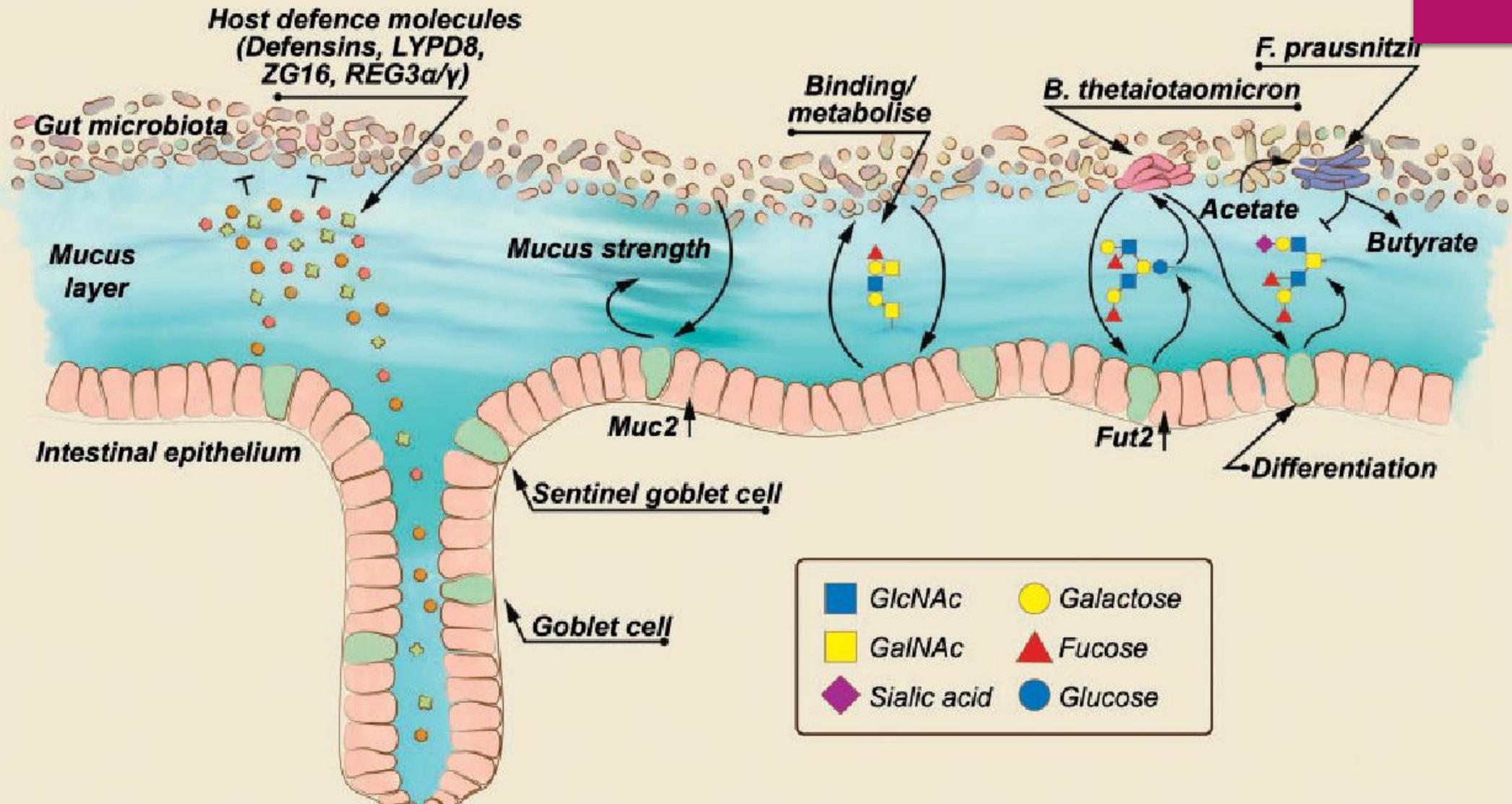
# Fucosiltransferase

- Fut 2: genes que expressam glicanos nas células endoteliais.
- Facilitação de alguns microrganismos específicos no intestino – ativação de sistema inume
- Fucose é liberada por fucosidades bacterianas
- Fucose livre inibe fatores de virulência bacterianos
- Deleções em Fut2 - inflamação



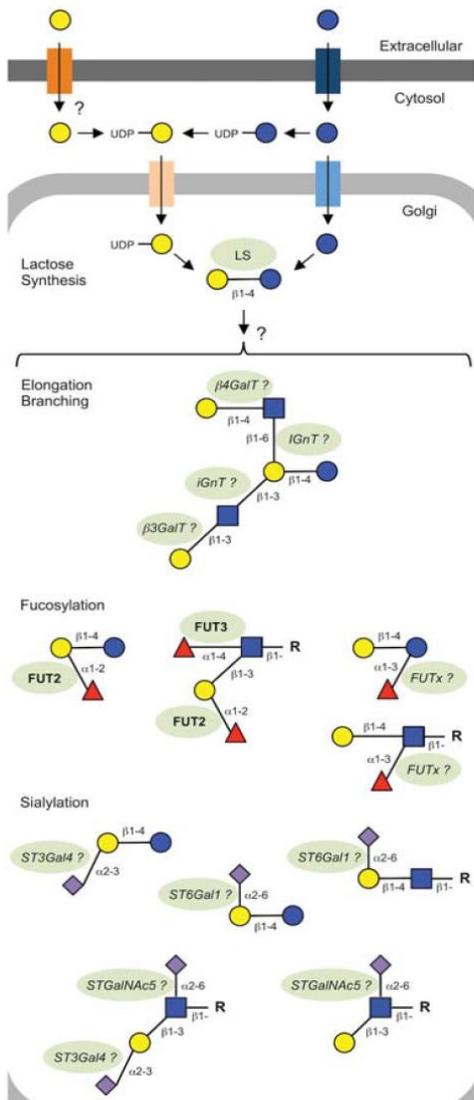
# Estágio primário de colonização

- Depende da quantidade de acúmulo de metabólitos bacterianos
- Succinato e lactato (anaeróbios facultativos)
- lactato e succinato estimulam expressão de fut2 e muc 4 – muco
- Mucosa intestinal rica em ácido siálico – e pobre em glicano fucosilado
- Perfil muda com desenvolvimento e maturação da mucosa – novos gêneros são favorecidos

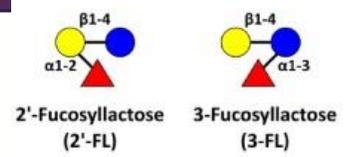


•DOI:10.1093/gastro/goy052

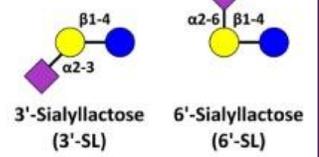
Fight them or feed them: how the intestinal mucus layer manages the gut microbiota



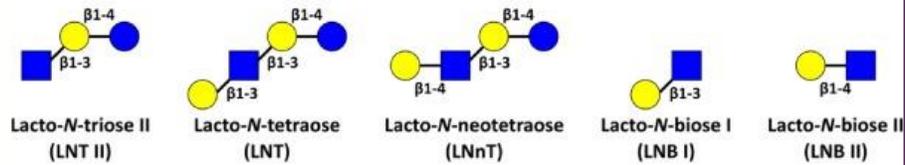
**Fucosylated lactose:**



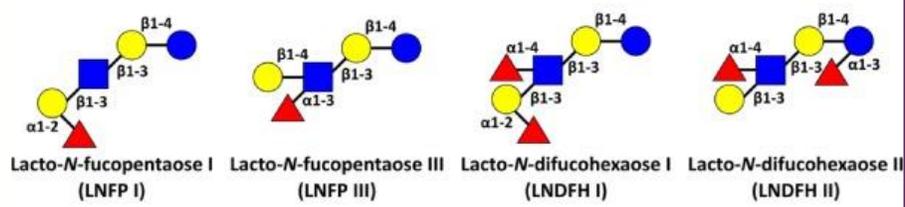
**Sialylated lactose:**



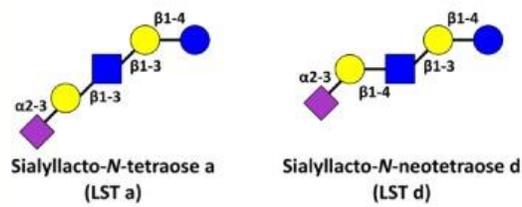
**Core structures:**



**Fucosylated core structures:**



**Sialylated core structures:**

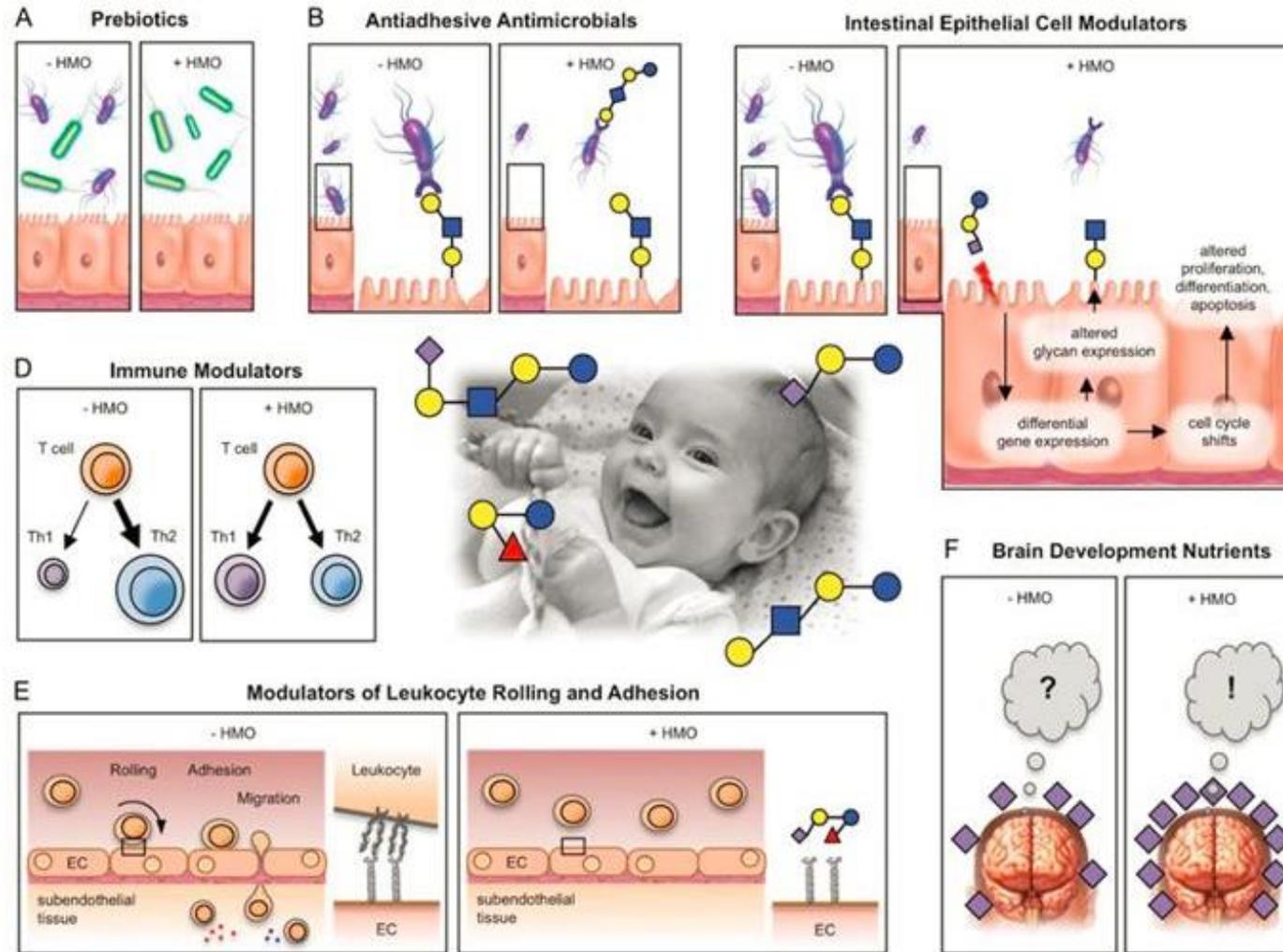


Oligossacarídeos do leite materno (HMO)

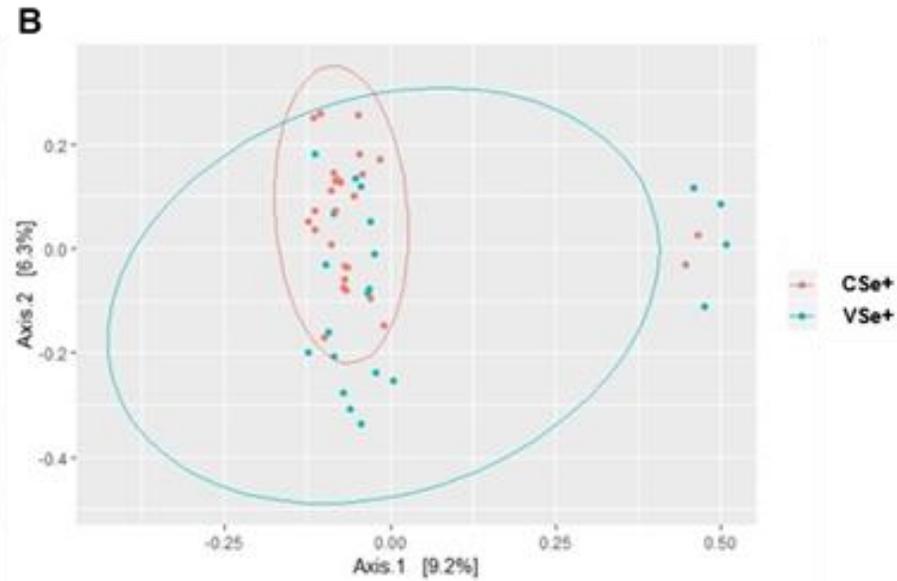
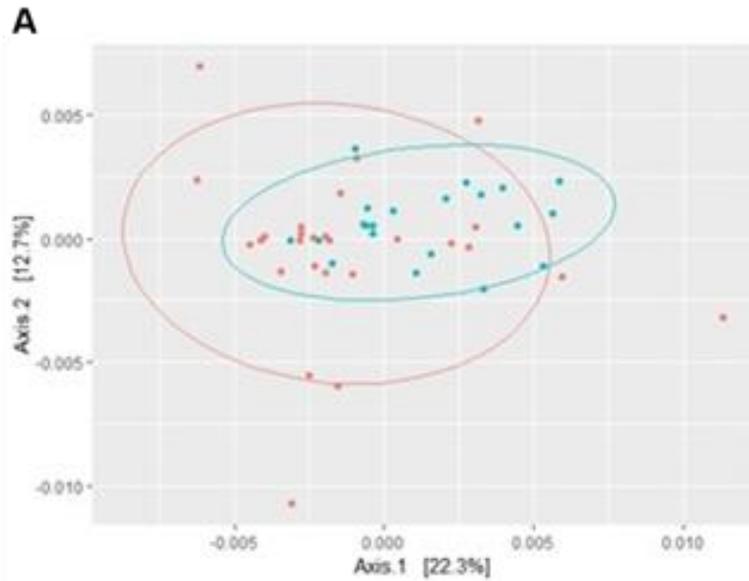
diversidade dependente do gene *Fut*

- Se + : expressa FUT2
- Se - : não expressa FUT2
- Le + : expressa FUT3
- Le - : não expressa FUT3

# Enzyme-catalysed synthetic HMO production setup



Bode L Glycobiology 2012;22:1147-1162

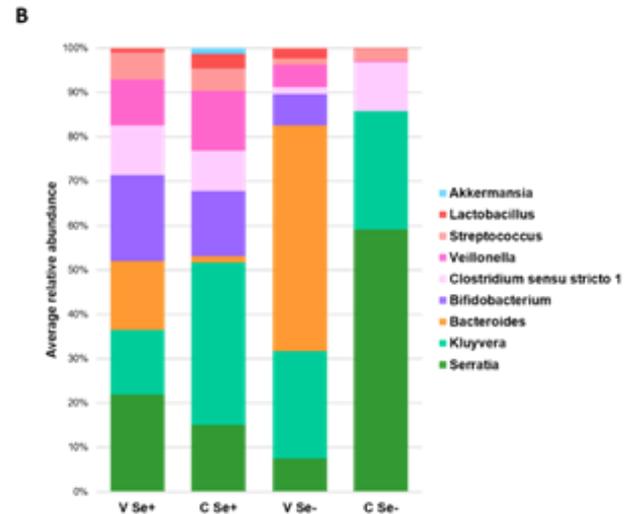
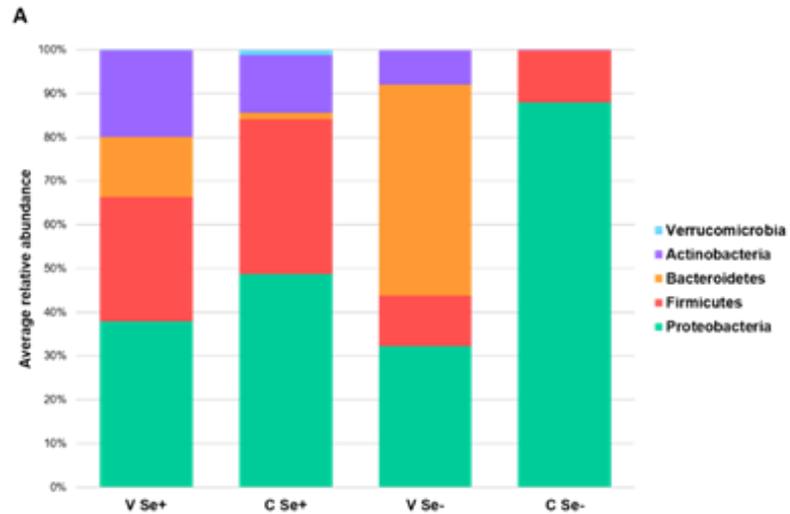


Fut2 secretory and non secretory women

HMO

C section and vaginal delivery

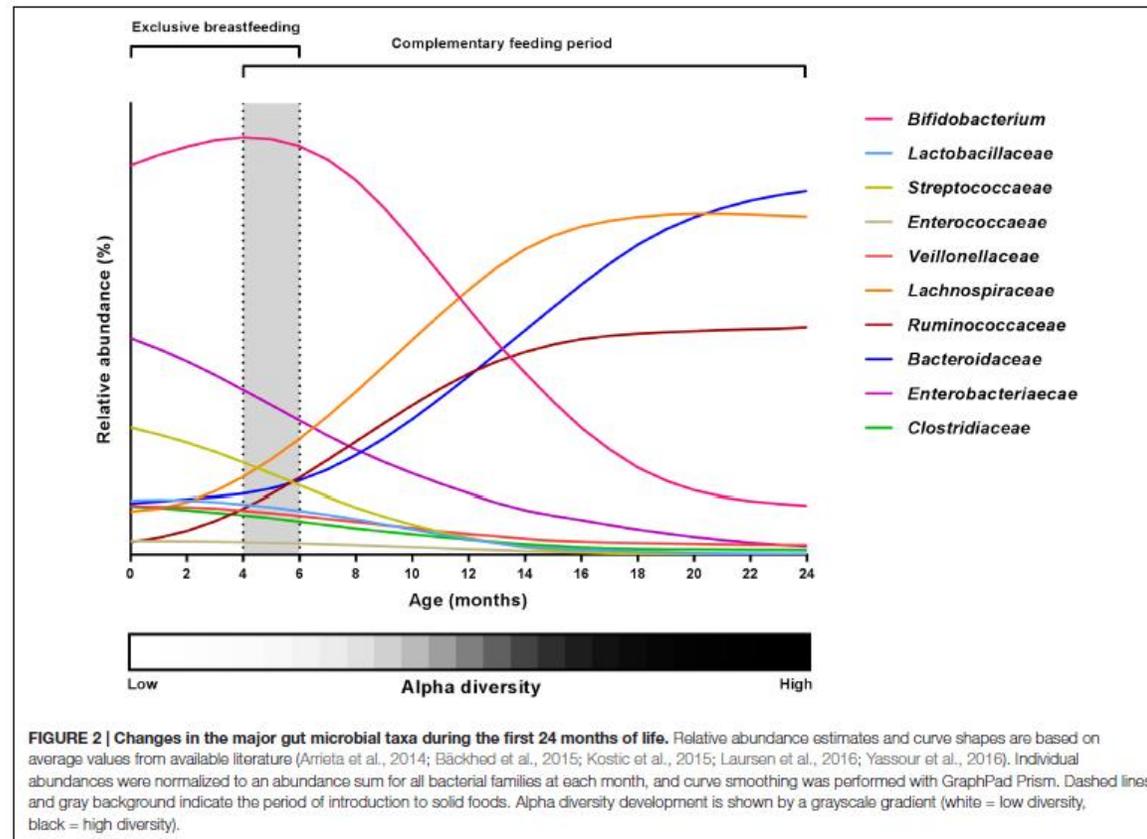
Babies intestinal microbiome



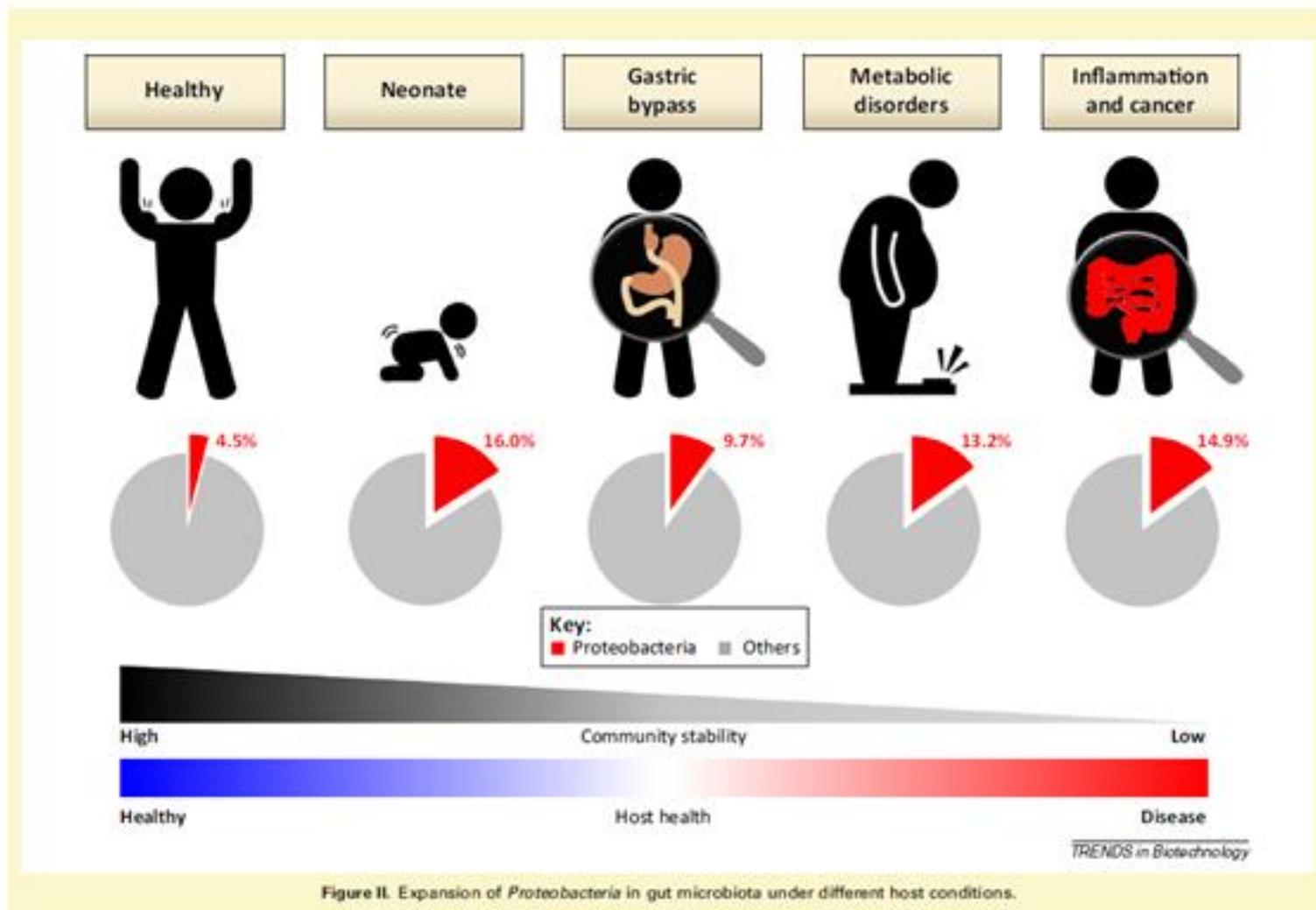
# Desmame e introdução de alimentos sólidos

Laurson et al.

First Food and Gut Microbes







Baixa prevalência de atopia e doenças auto-imunes

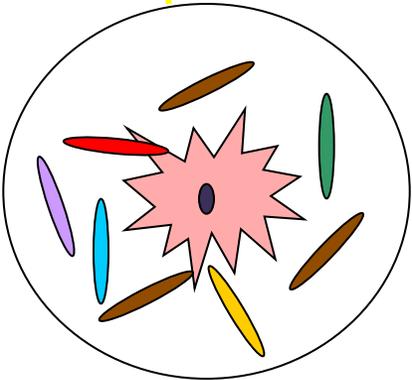
Regulação TH

Desequilíbrio TH

Elevada prevalência de atopia e doenças auto-imunes

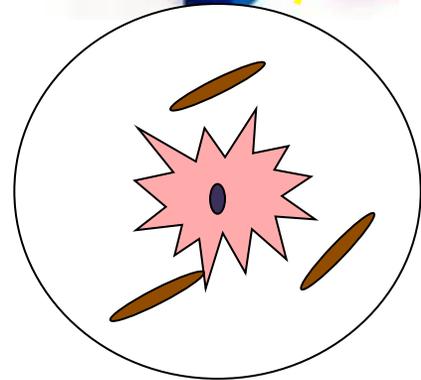


# Teoria da higiene

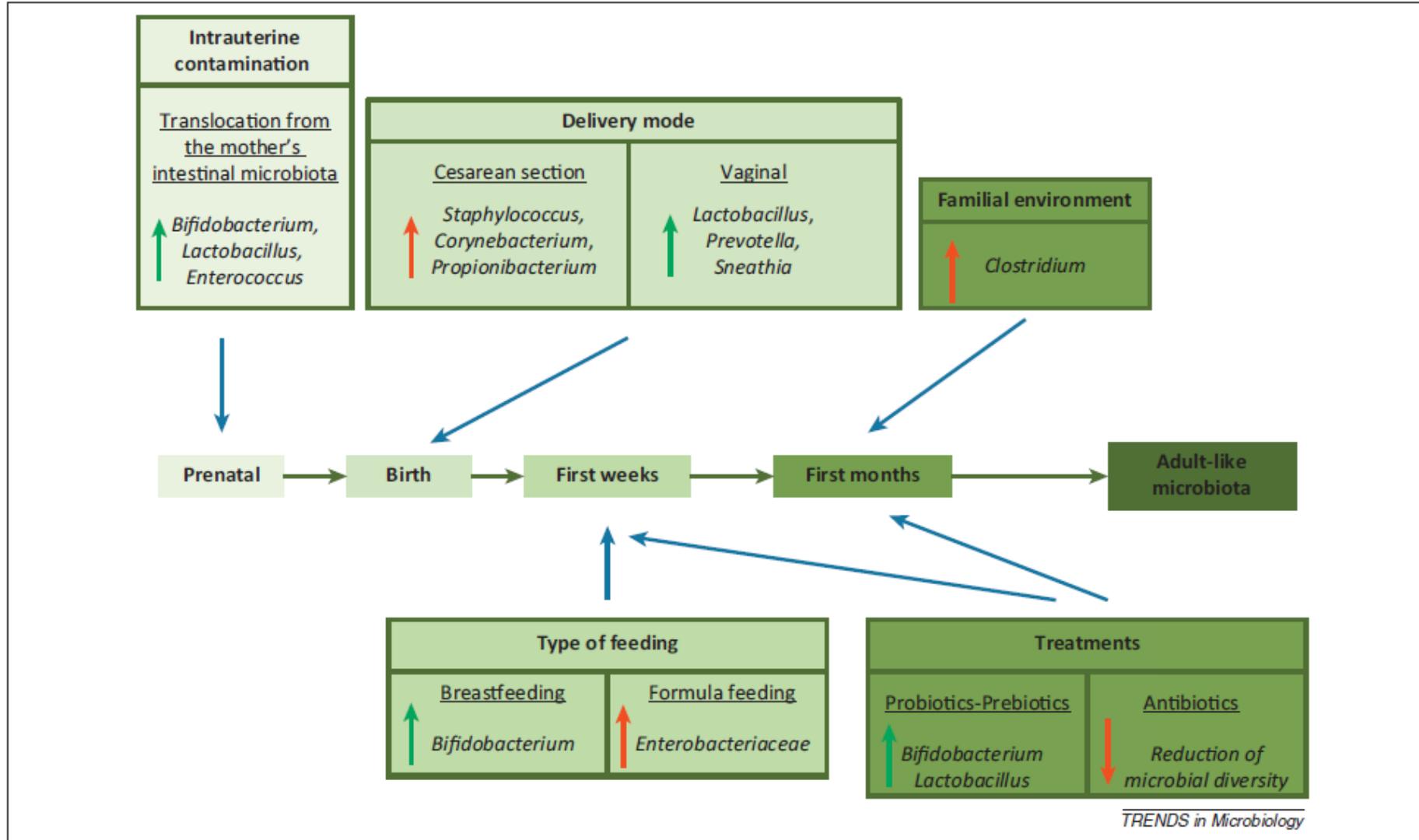


Ambiente contaminado

SI reage a antígenos ambientais



Elevada higiene ambiental



**Figure 1.** Impact of external factors on the intestinal microbiota of the infant. Green arrows show beneficial modification; red arrows show modification considered negative for healthy development.

# The cost of not breastfeeding: global results from a new tool

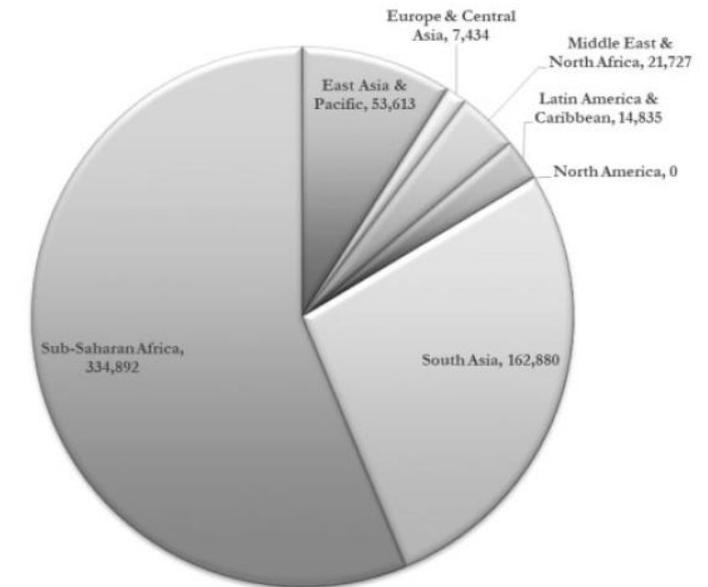
Dylan D. Walters<sup>1,\*</sup>, Linh T. H. Phan<sup>2</sup> and Roger Mathisen<sup>2</sup>

<sup>1</sup>Nutrition International, 180 Elgin St, Ottawa, ON, K2P 2K3, Canada and <sup>2</sup>Alive & Thrive, 60 Ly Thai To Street, Hoan Kiem, Ha Noi, Viet Nam

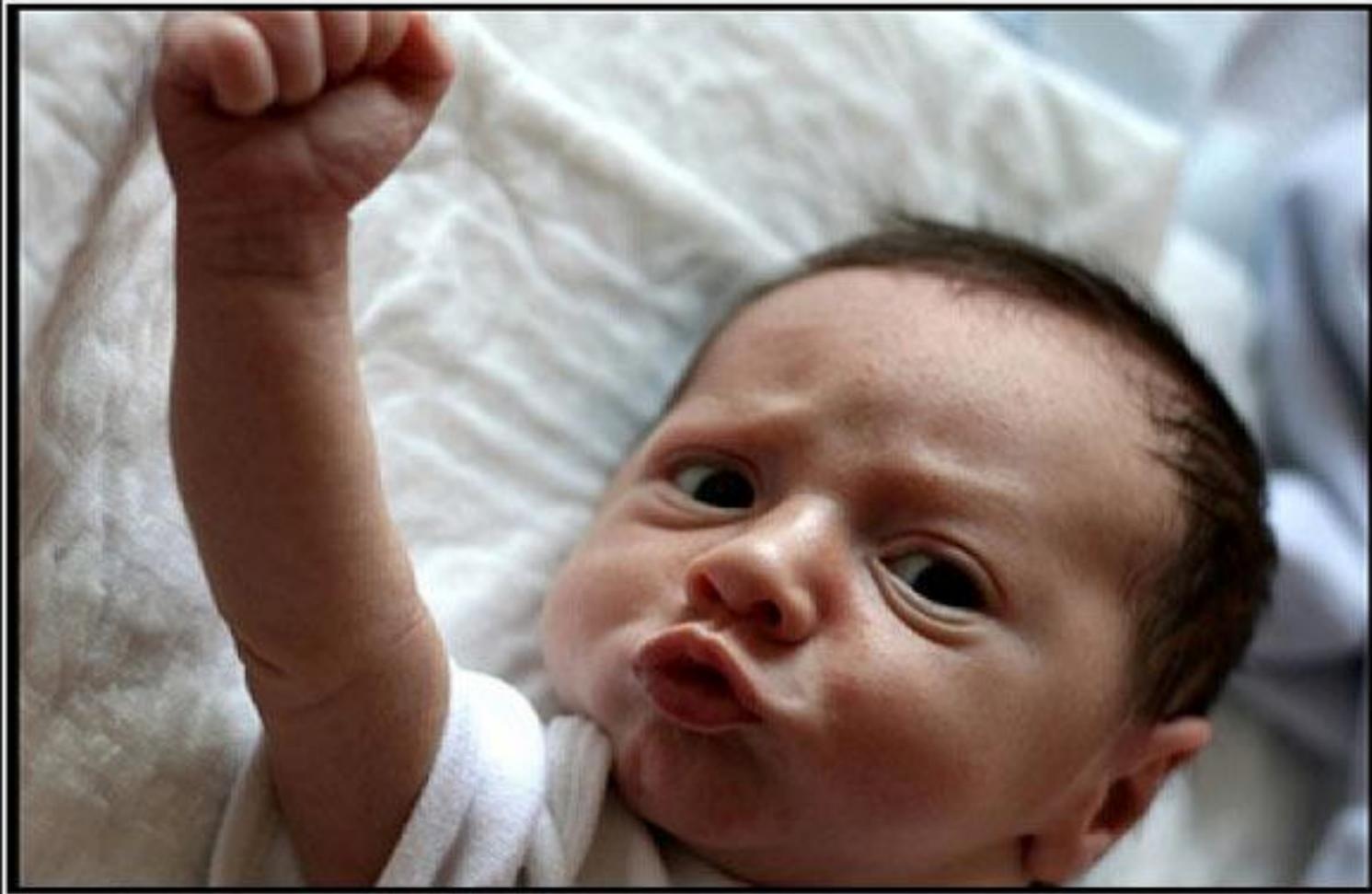
**Table 1** Number of annual cases of morbidity in women and children attributable to not breastfeeding by region and country income group

Number of cases of morbidity attributable to not breastfeeding

Regions	Child diarrhoea (0–23 months)	Child ARI/ pneumonia (0–23)	Childhood obesity	Breast cancer in mothers	Ovarian Cancer in mothers	Type II diabetes
East Asia and Pacific	19 533 482	1 058 553	374 405	54 393	9 905	389 006
Europe and Central Asia	3 514 920	357 835	69 231	11 016	3 214	52 077
Middle East and North Africa	12 704 537	716 047	168 568	8379	902	101 441
Latin America and Caribbean	13 160 409	778 792	134 192	18 254	3 355	118 363
North America	33 571	64 739	0	0	0	0
South Asia	56 056 468	3 346 020	74 249	14 051	2435	121 620
Sub-Saharan Africa	60 843 179	2 317 553	154 311	11 711	1745	75 009
High income	335 534	86 075	9362	3249	728	15 719
Upper-middle-income	24 816 631	1 706 300	528 011	68 921	12 696	494 165
Lower-middle-income	99 358 380	5 375 448	356 162	39 297	7230	313 822
Low income	41 336 021	1 471 716	81 421	6337	902	33 809
Total	165 846 566	8 639 539	974 956	117 804	21 556	857 515



**Figure 2** Number of child deaths attributed to not breastfeeding by region.



# BREASTFEEDING

It Rocks!

Obrigada!!



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