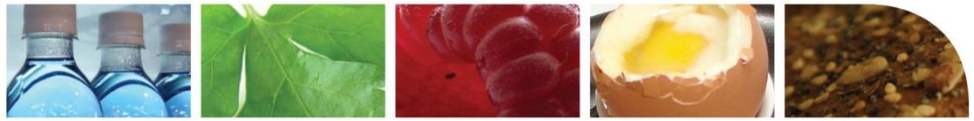
World class research into children's nutrition



Maternal Secretor Status and Child Microbiota Composition

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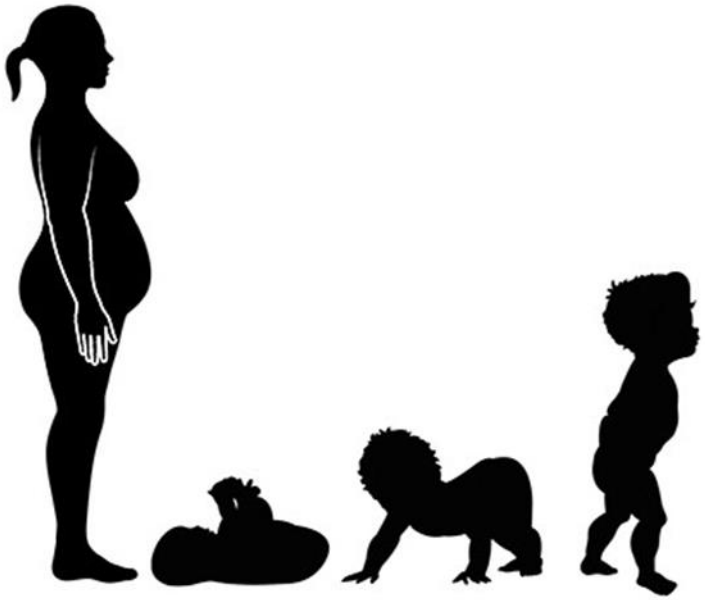
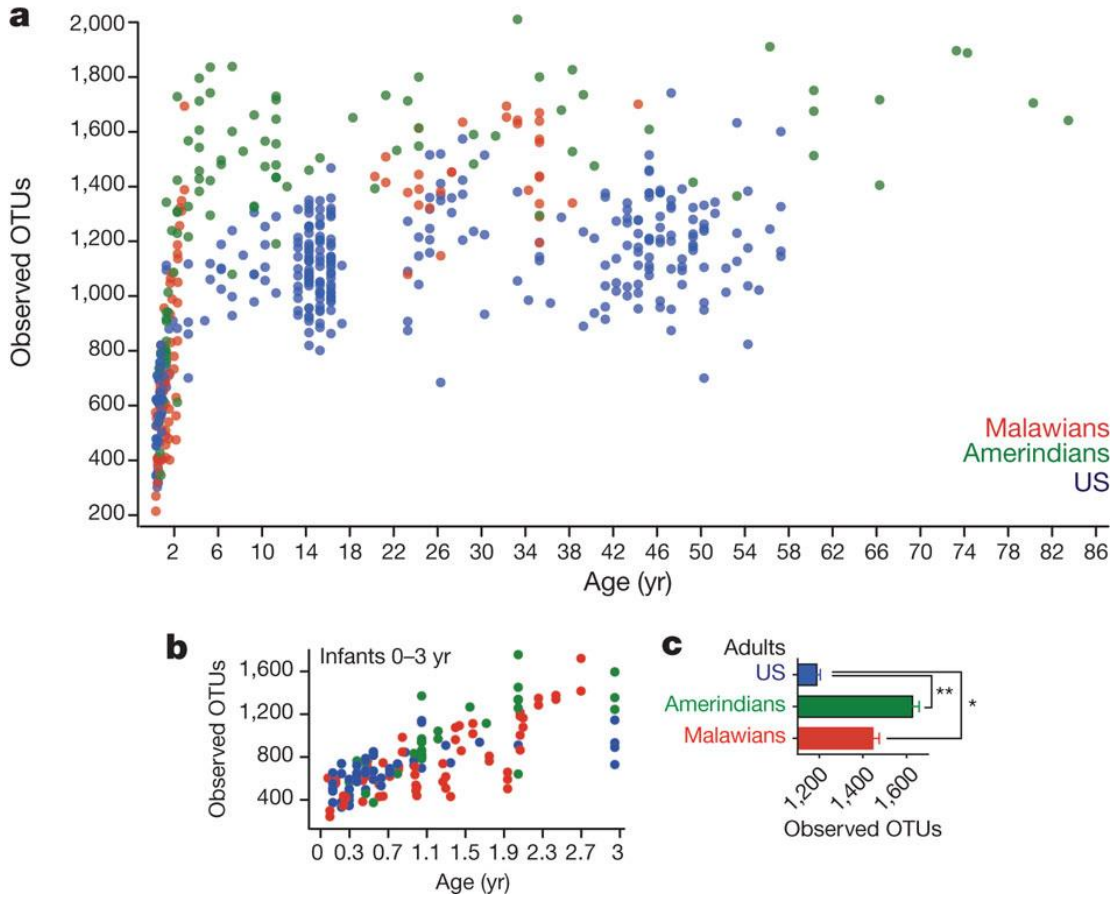
Brisbane, Australia

The University Of Queensland
AUSTRALIA

The First 1000 Days



Development of Microbiota

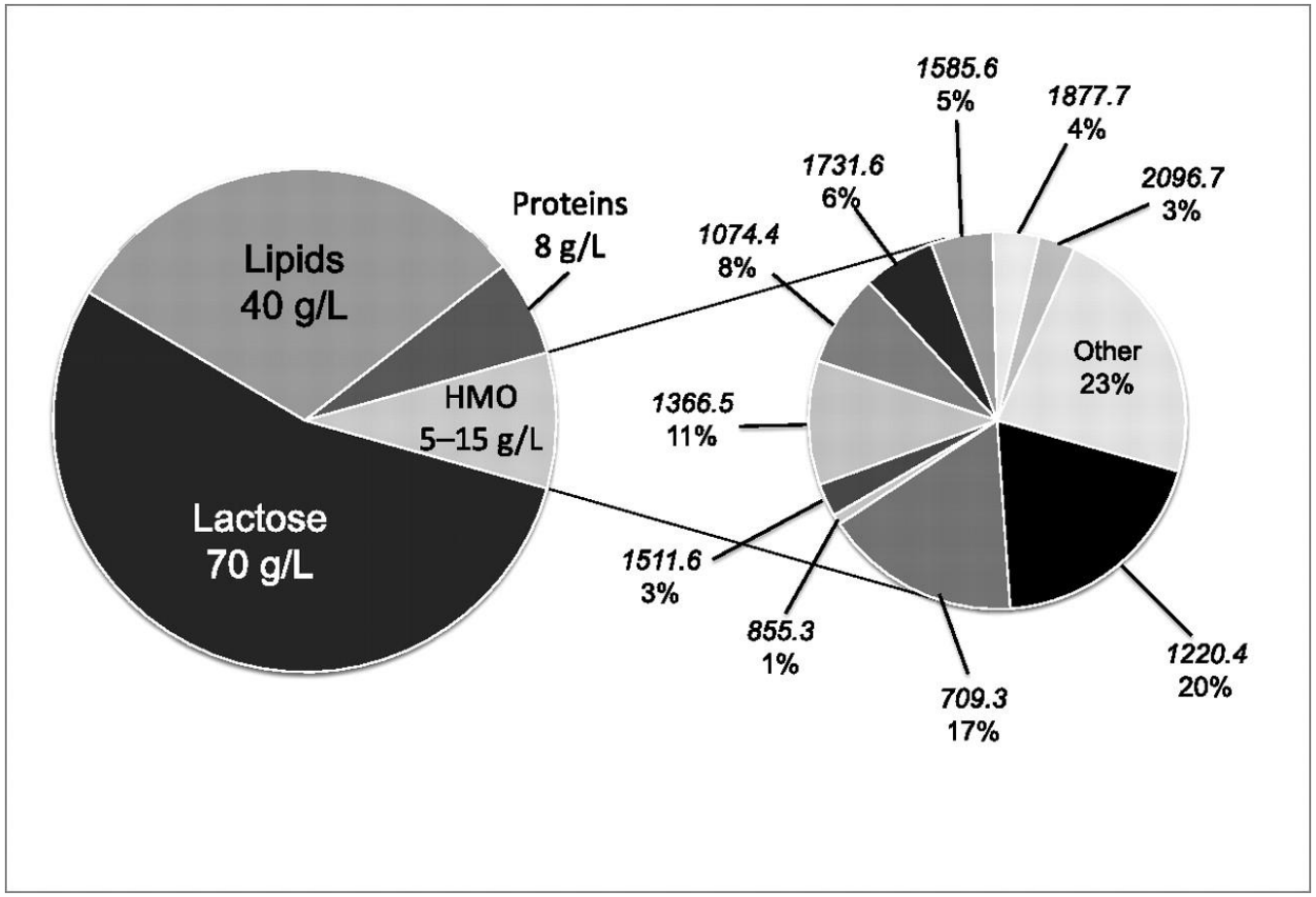


Yatsunenko *et al. Nature* **000**, 1-7 (2012)

WHO, Infant Feeding Recommendations, 2001

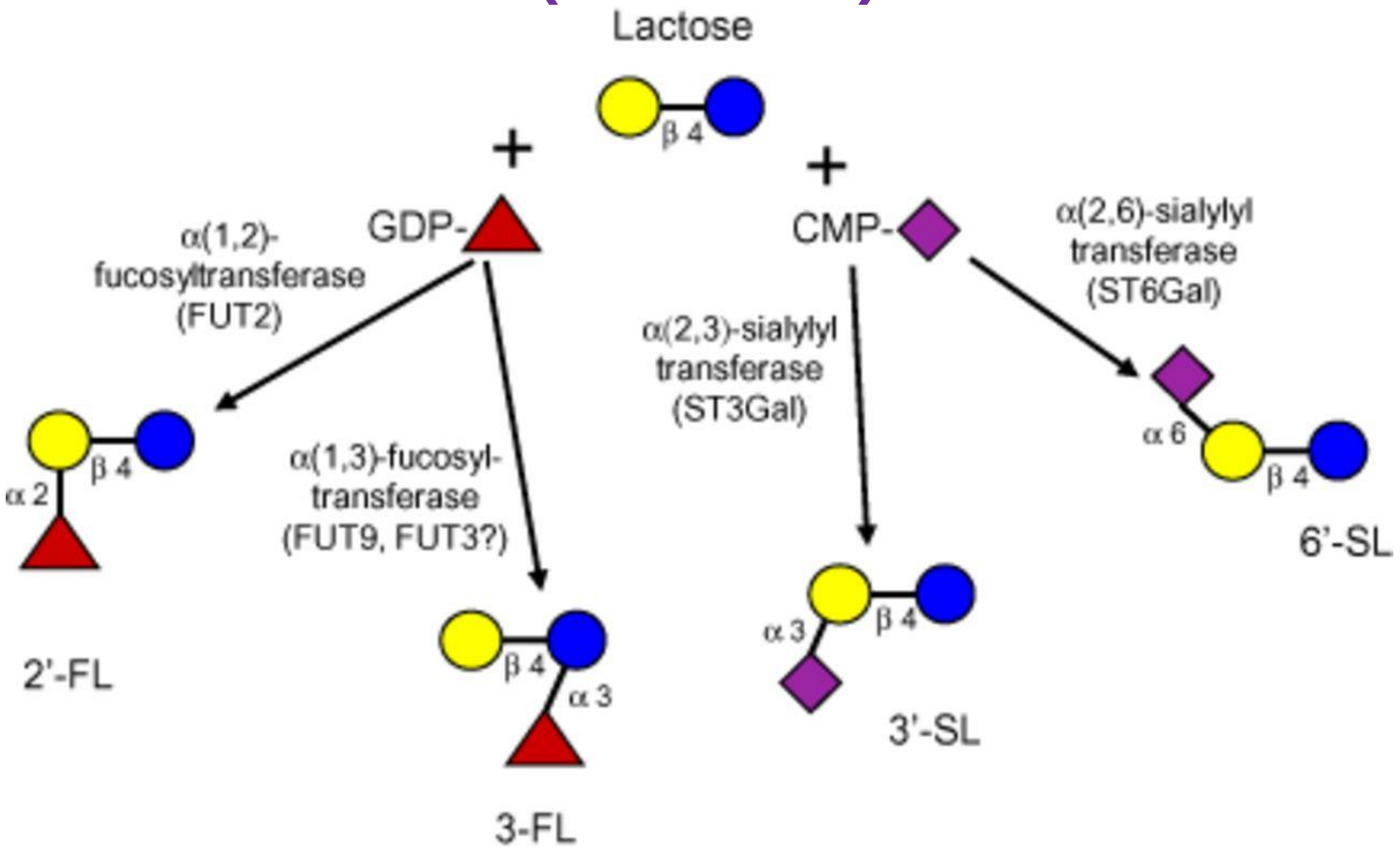
Infants should be exclusively breastfed for the first six months of life. Thereafter, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to 2 years of age or beyond.

Breast Milk Composition



Angela M. Zivkovic et al. PNAS 2011;108:4653-4658

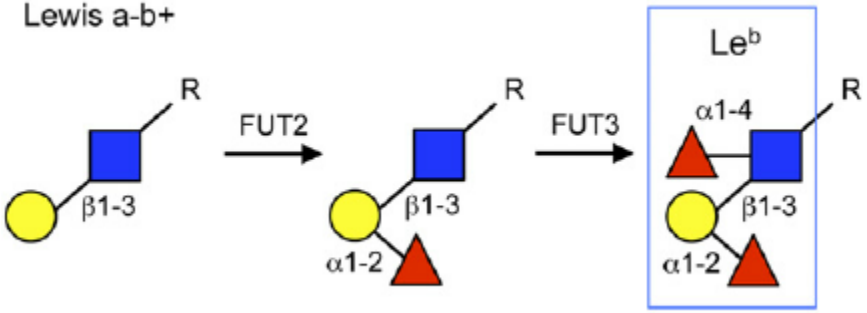
Human Milk Oligosaccharides (HMOs)



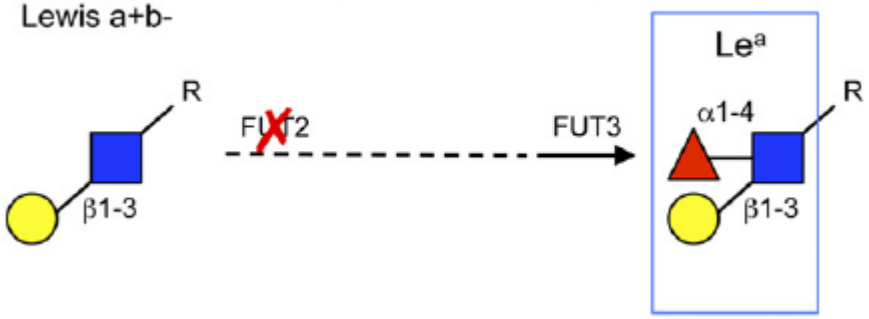
Castanys-Muňoz et al. Nutr Rev, 2013; 71(12):773 -89

Lewis Blood Group and HMOs

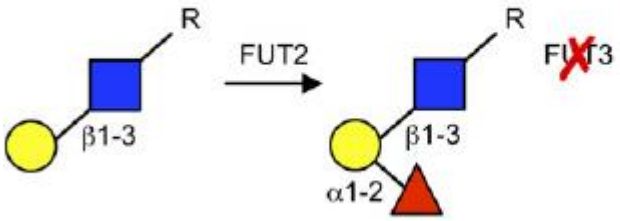
Group 1: Secretor, Lewis-positive (Se+Le+)
Lewis a-b+



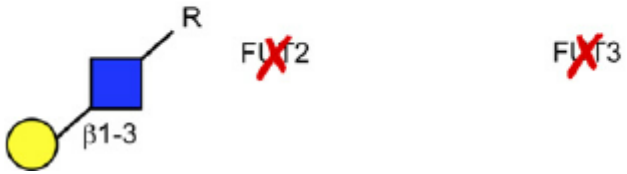
Group 2: Nonsecretor, Lewis-positive (Se-Le+)
Lewis a+b-



Group 3: Secretor, Lewis-negative (Se+Le-)
Lewis a-b-

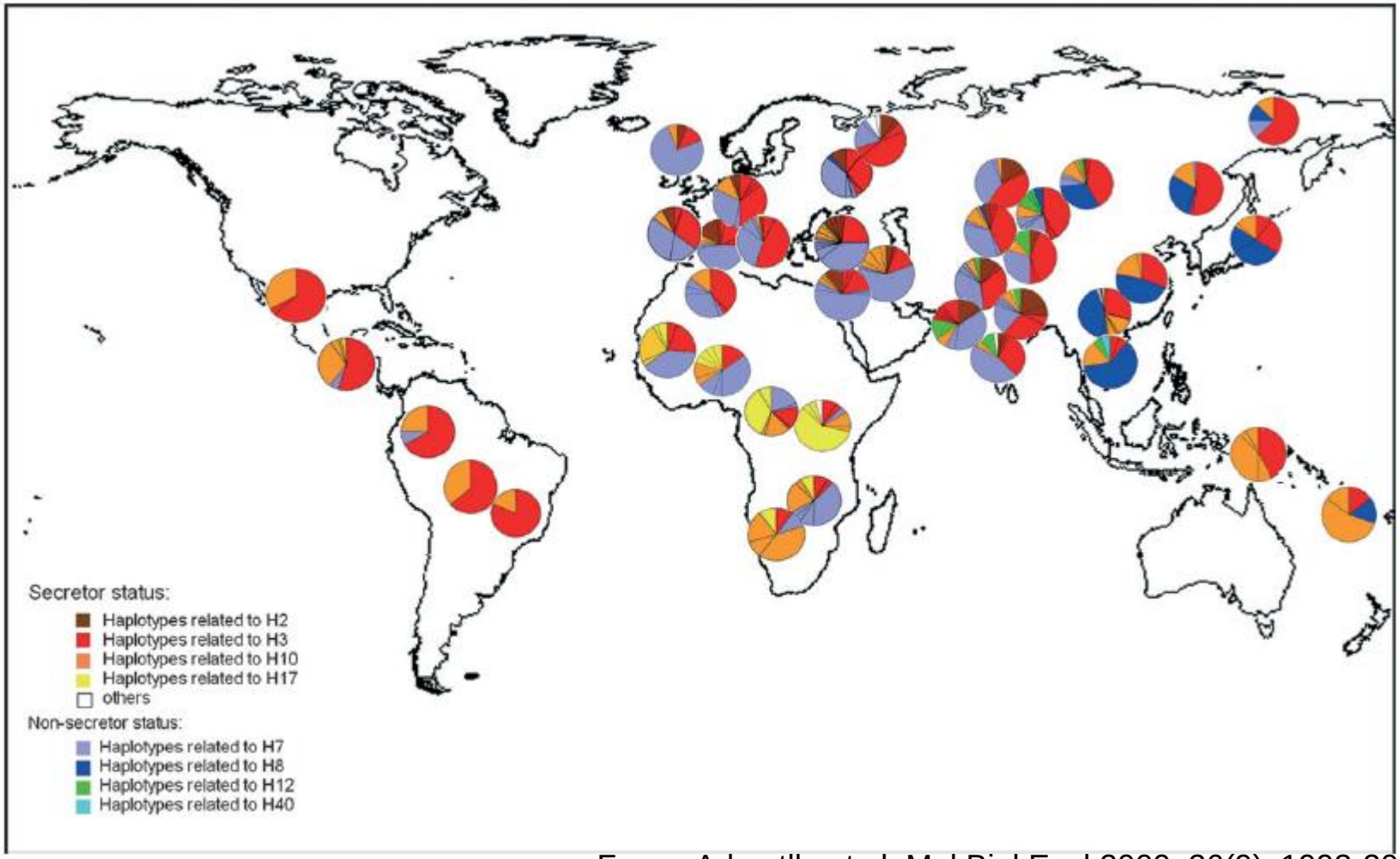


Group 4: Nonsecretor, Lewis-negative (Se-Le-)
Lewis a-b-



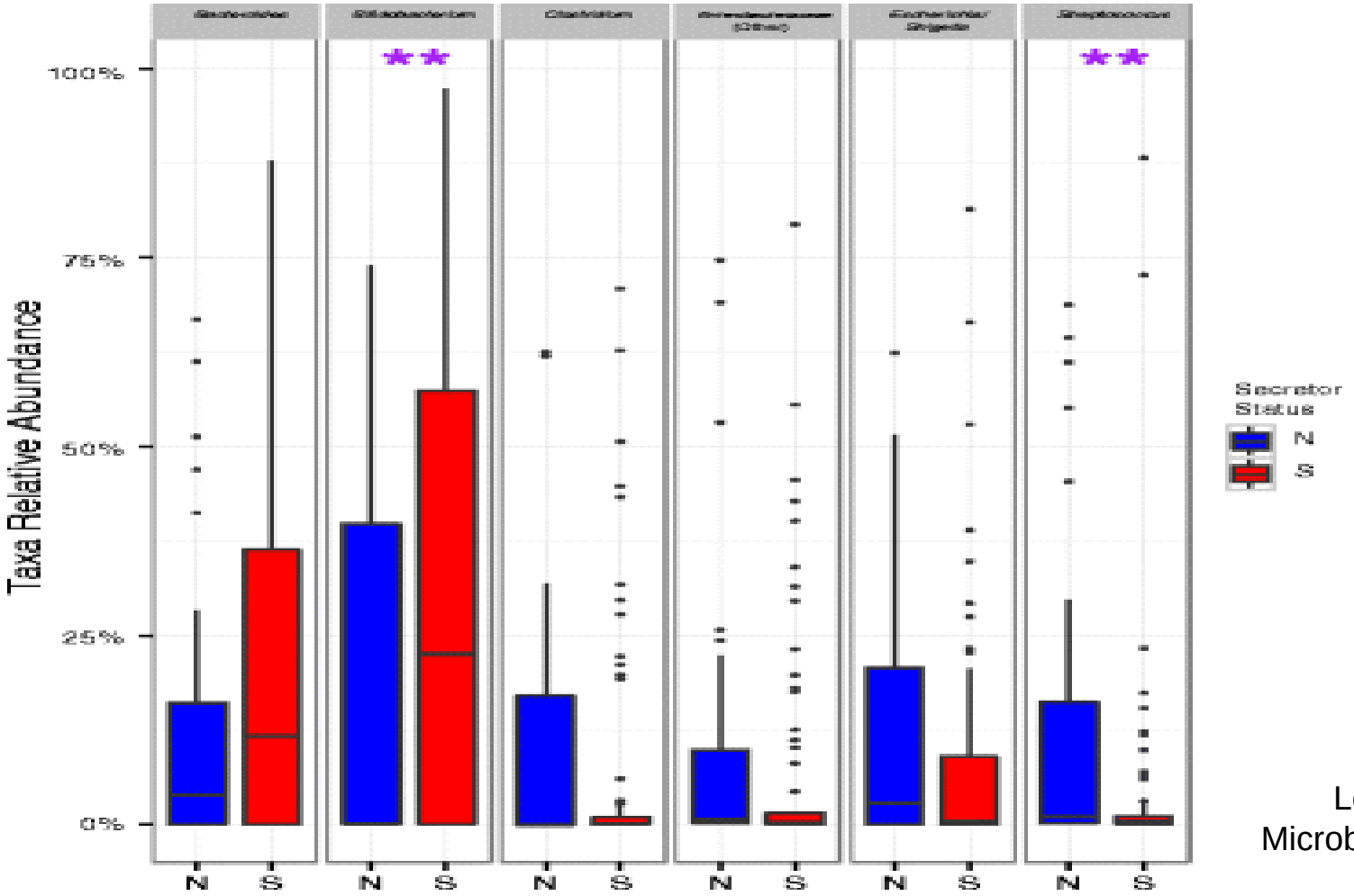
Bode & Jantscher-Krenn. Adv Nutr 2012; 3(3):383S-91S

Prevalence of Non-Secretor Status



Ferrer-Admetlla et al. Mol Biol Evol 2009; 26(9): 1993-2003

Microbiota of Breastfed Infants by Maternal Secretor Status.



Lewis et al. Microbiome 2015; 13

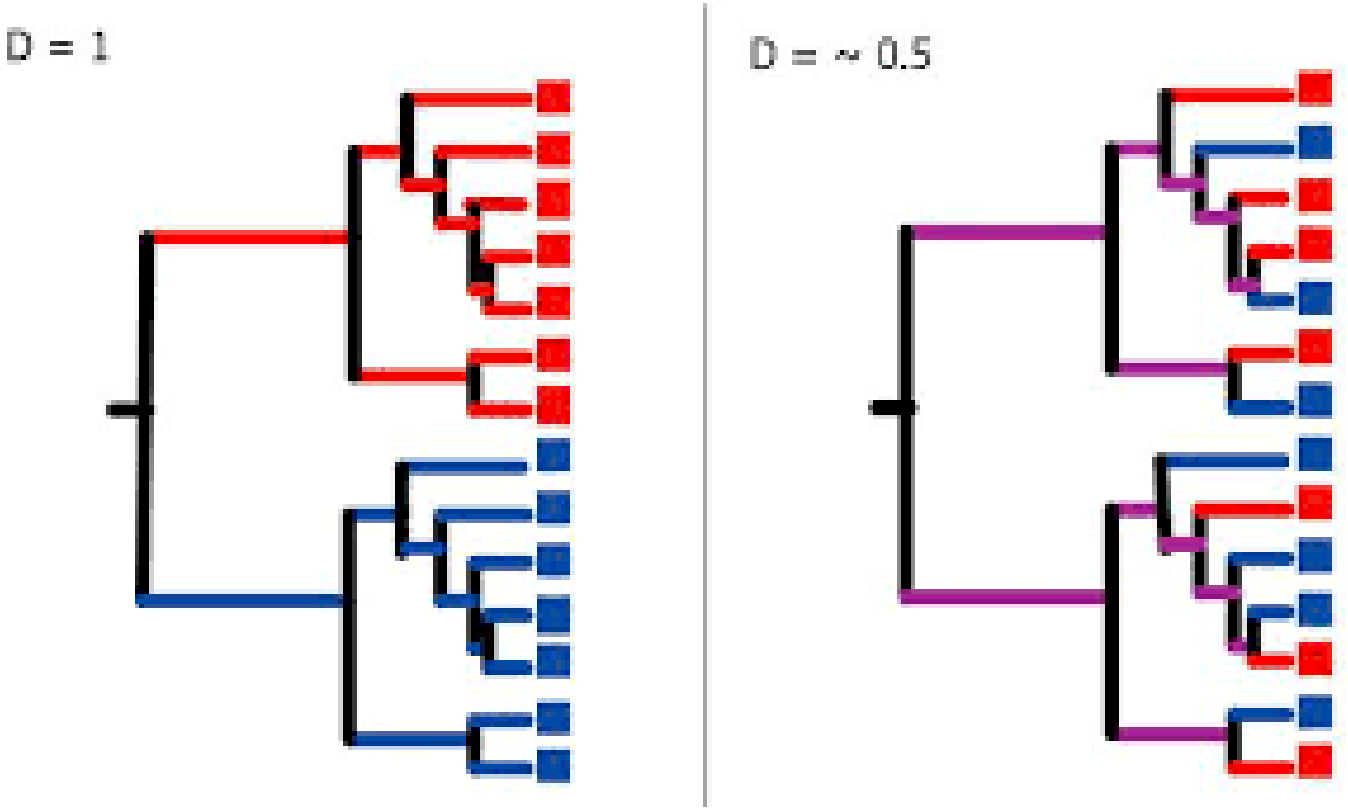
Study Design

Recruit
- Feeding Queensland Babies Study Cohort
- 37 children (2 -3 yrs) + 17 mothers

Secretor Status
- Blood and saliva samples
- Hemagglutination Inhibition Technique

Microbiota
- Faecal samples
- Illumina sequencing of rRNA gene (V6-8)

UniFrac Distance Metric



Microbiota Composition by Secretor Status

		Unweighted UniFrac		Weighted UniFrac	
	Sample size (secretor)	R^2	p	R^2	p
Child Secretor Status	28 (20 S)	0.069	0.030	0.023	0.699
Mother's Secretor Status	17 (11 S)	0.071	0.256	0.104	0.111
Mother's Secretor Status - ABF	14(10 S)	0.111	0.102	0.116	0.138
Mother's Secretor Status – EBF	11 (8 S)	0.167	0.028	0.159	0.081

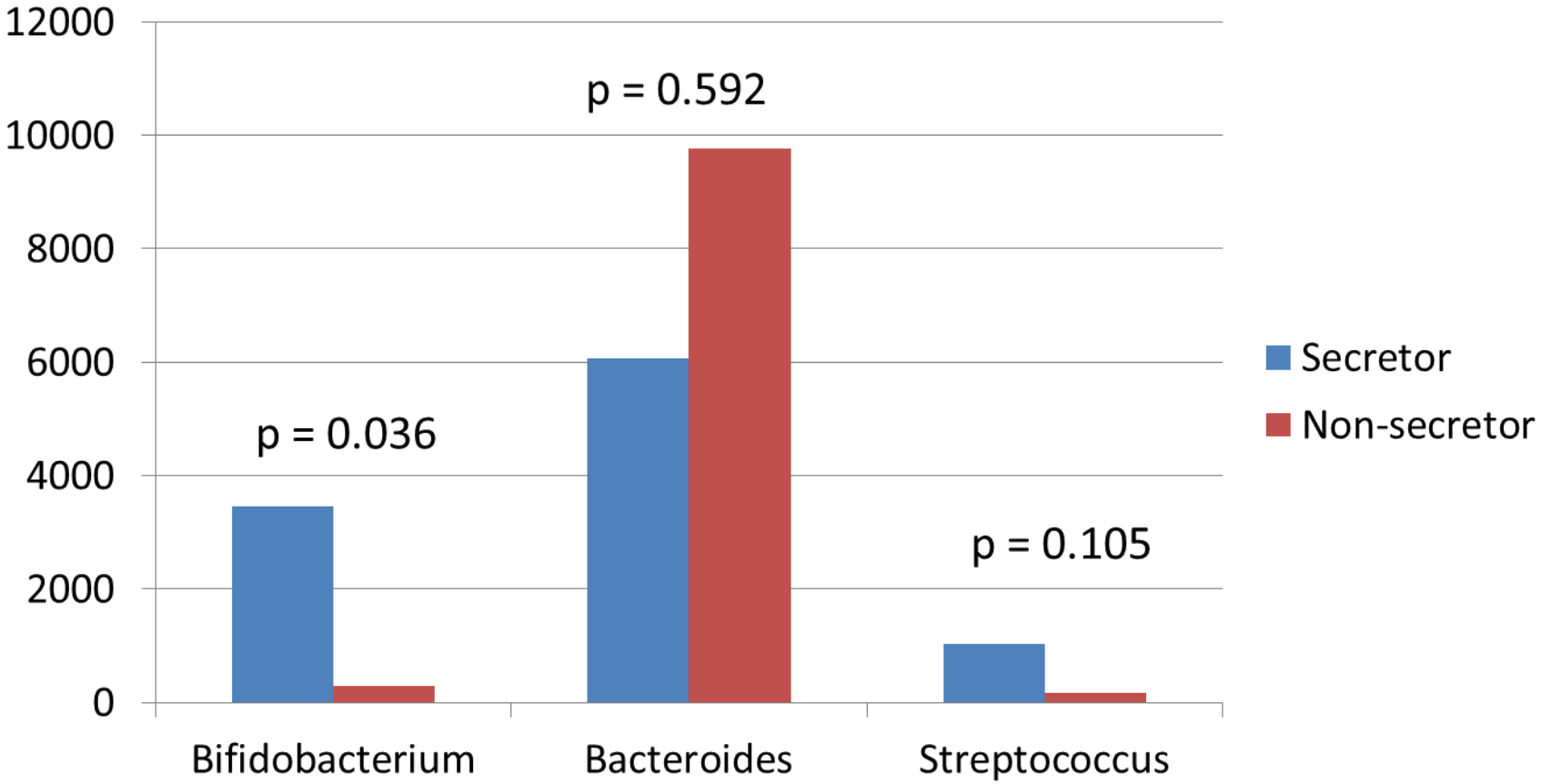
Smith-Brown et al, PLOS One, 19 Sept 2016

Prevotella Abundance by Secretor Status

				Median Prevotella Abundance by Secretor Status	
	Sample size (secretor)	p	pFDR	S	N-S
Child Secretor Status	28 (20 S)	< 0.001	<0.001	0	3
Mother's Secretor Status	17 (11 S)	< 0.001	<0.001	0	4
Mother's Secretor Status – ABF	14(10 S)	< 0.001	<0.001	0	4055.5
Mother's Secretor Status – EBF	11 (8 S)	< 0.001	<0.001	0	8106

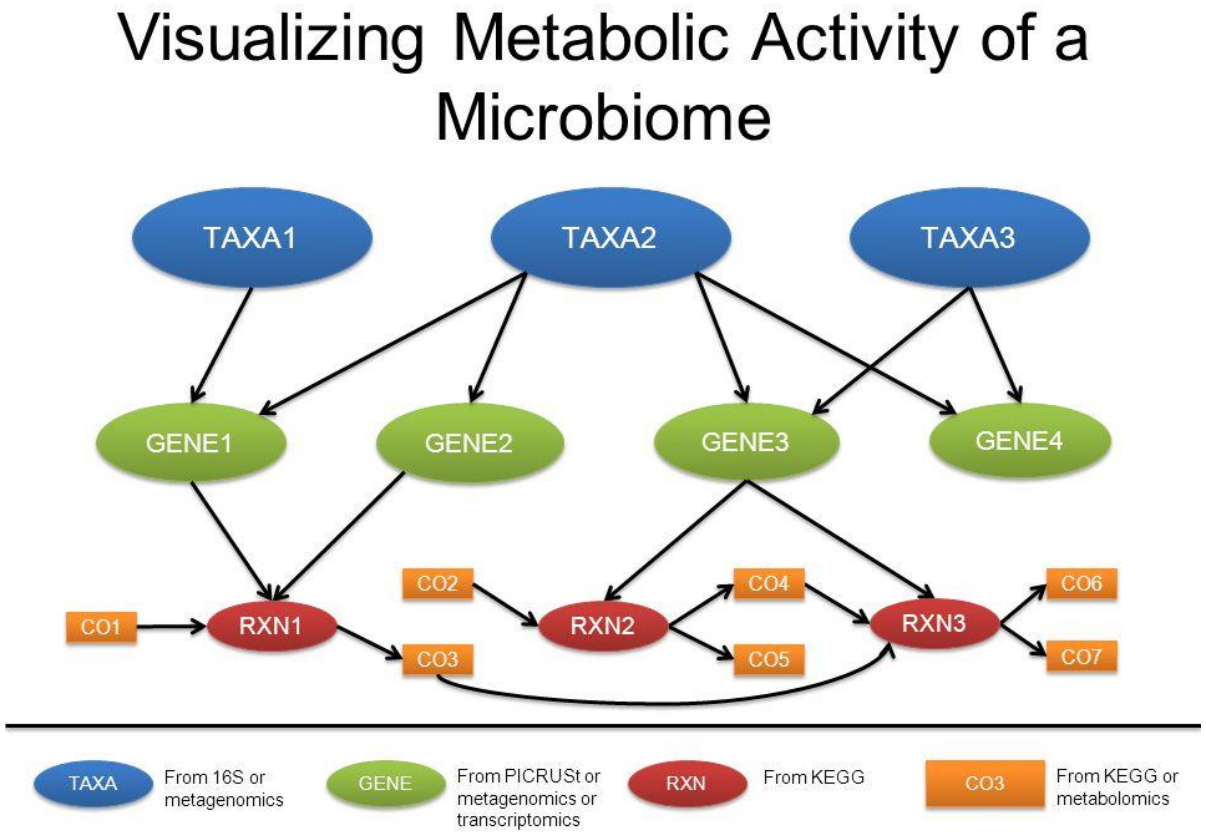
Smith-Brown et al, PLOS One, 19 Sept 2016

Genus Mean Abundance by Maternal Secretor Status

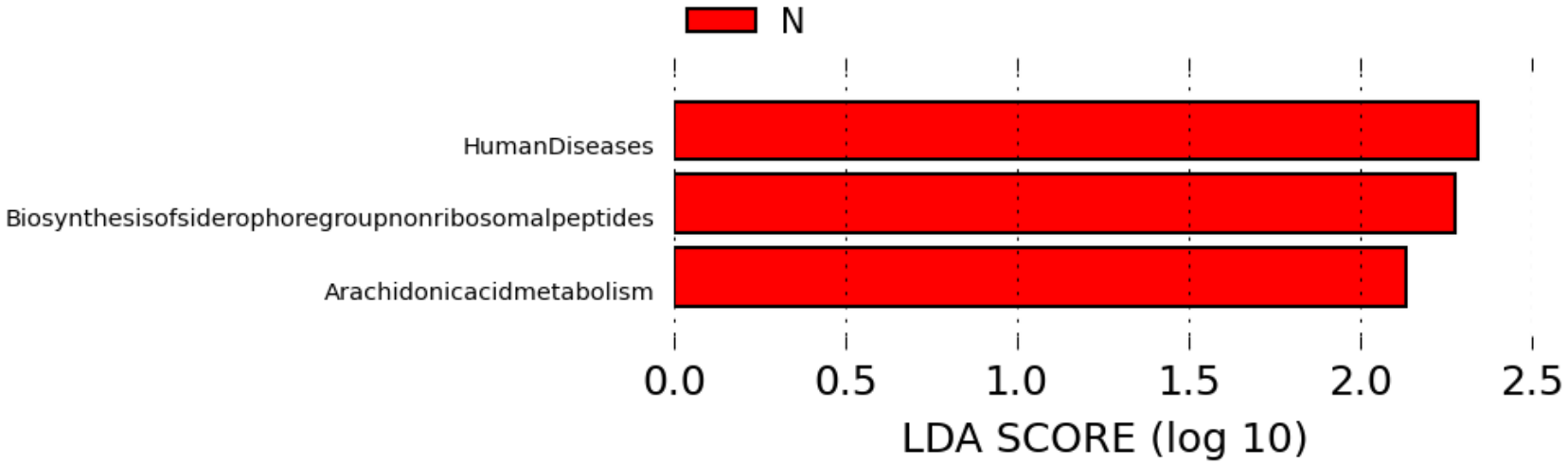


Smith-Brown et al, PLOS One, 19 Sept 2016

PICRUSt PREDICTED METAGENOME

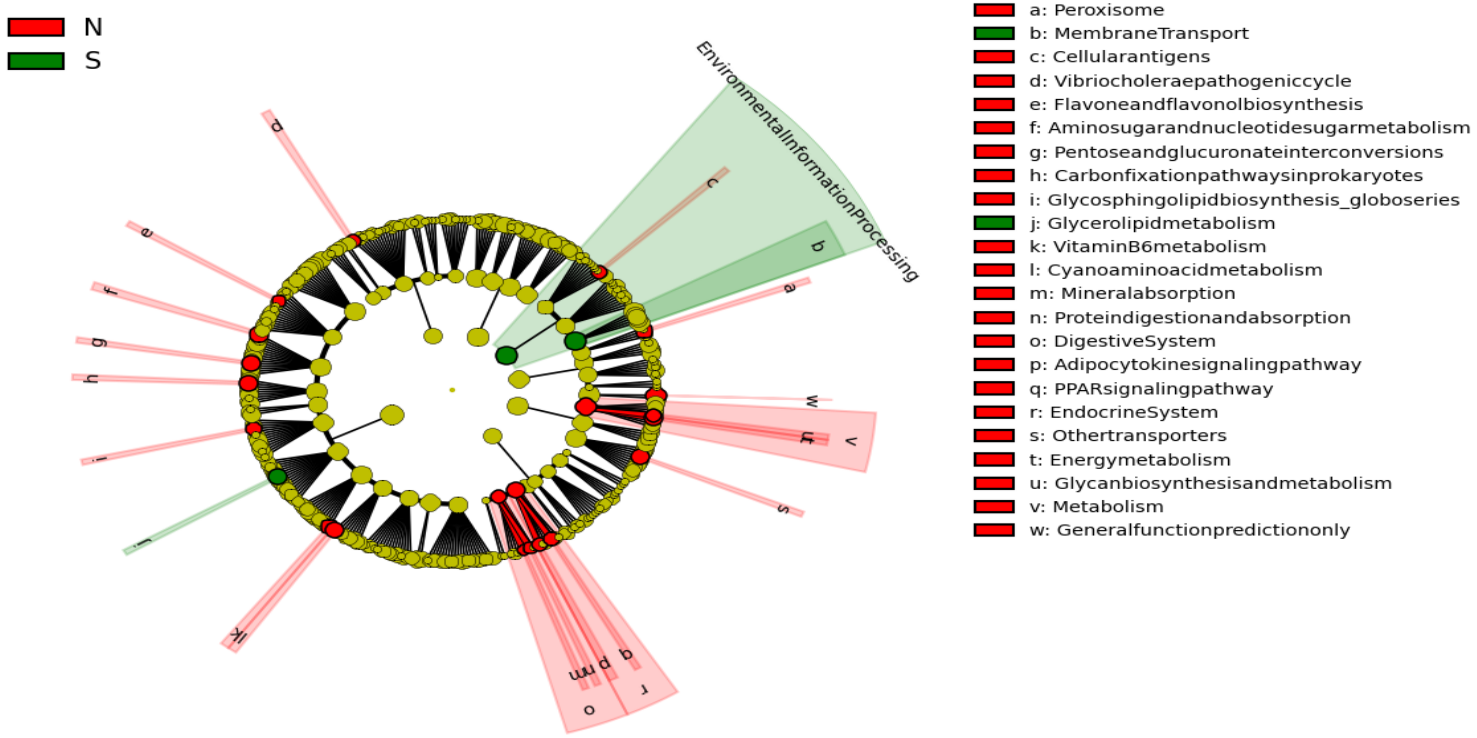


KEGG Functional Pathway Abundance Child Secretor Status



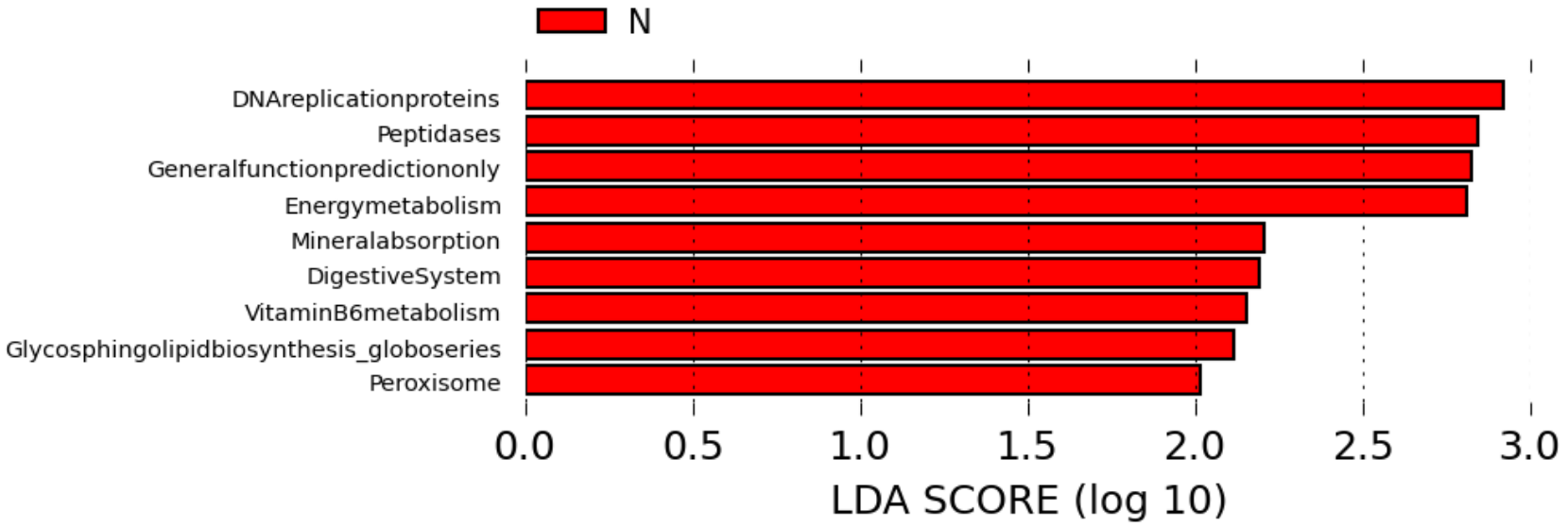
Smith-Brown et al, PLOS One, 19 Sept 2016

KEGG Functional Pathway Abundance Mother Secretor Status



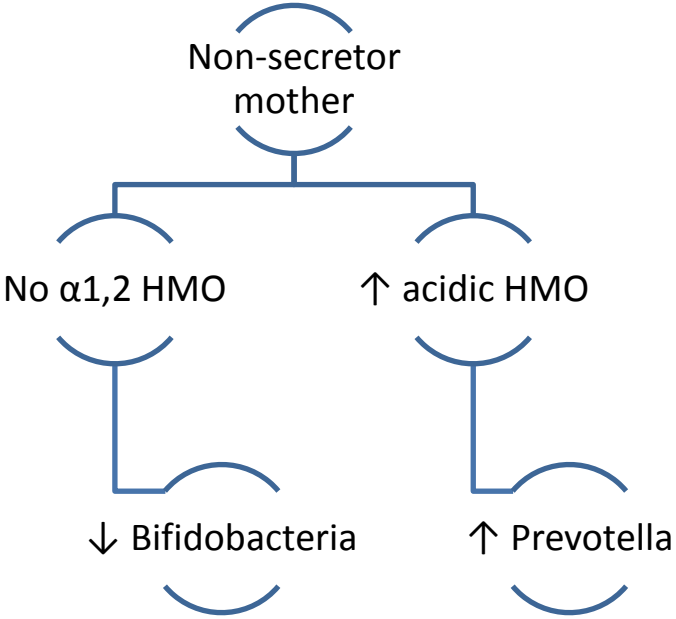
Smith-Brown et al, PLOS One, 19 Sept 2016

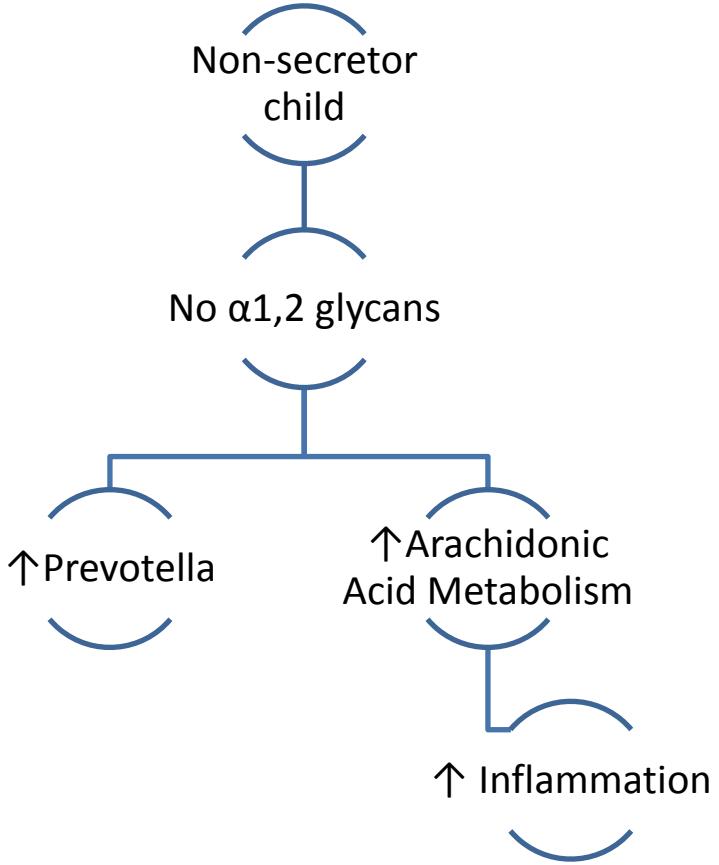
KEGG Functional Pathway Abundance Mother Secretor Status - EBF



Smith-Brown et al, PLOS One, 19 Sept 2016

Conclusion





Acknowledgements

- Supervisors:
  - Professor Peter Davies – Children's Nutrition Research Centre, University of Queensland
  - Professor Mark Morrison and Associate Professor Lutz Krause, The University of Queensland Translational Research Institute.
- Feeding Queensland Babies Study:
  - Dr Ruth Newby, University of Sunshine Coast
- Funding: Danone Nutricia Australia

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