

Promoting an immunomodulatory breastmilk profile with maternal prebiotic supplementation

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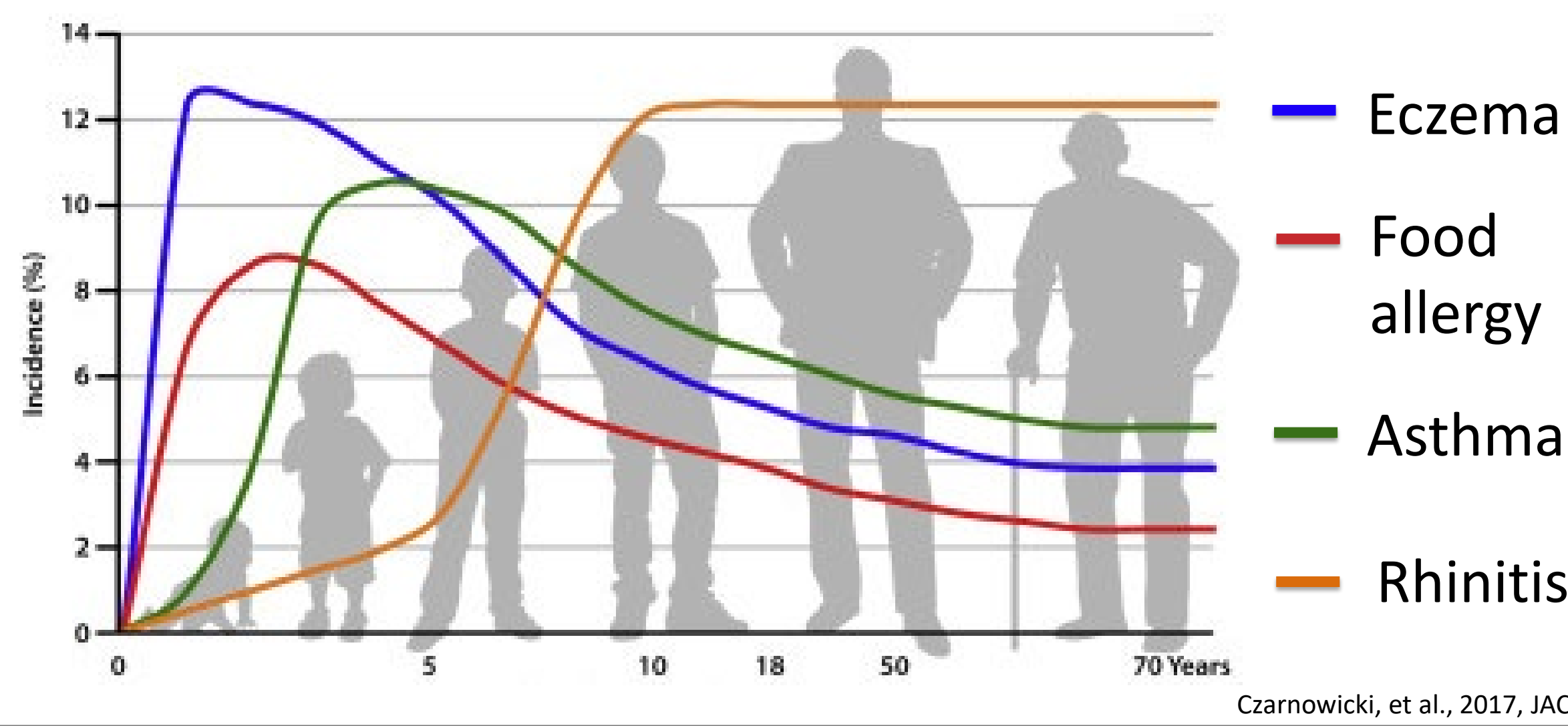
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Allergy is a public health issue

4.1 MILLION Australians have at least one allergic disease

10% of Australian infants have proven food allergy one of the highest incidences internationally

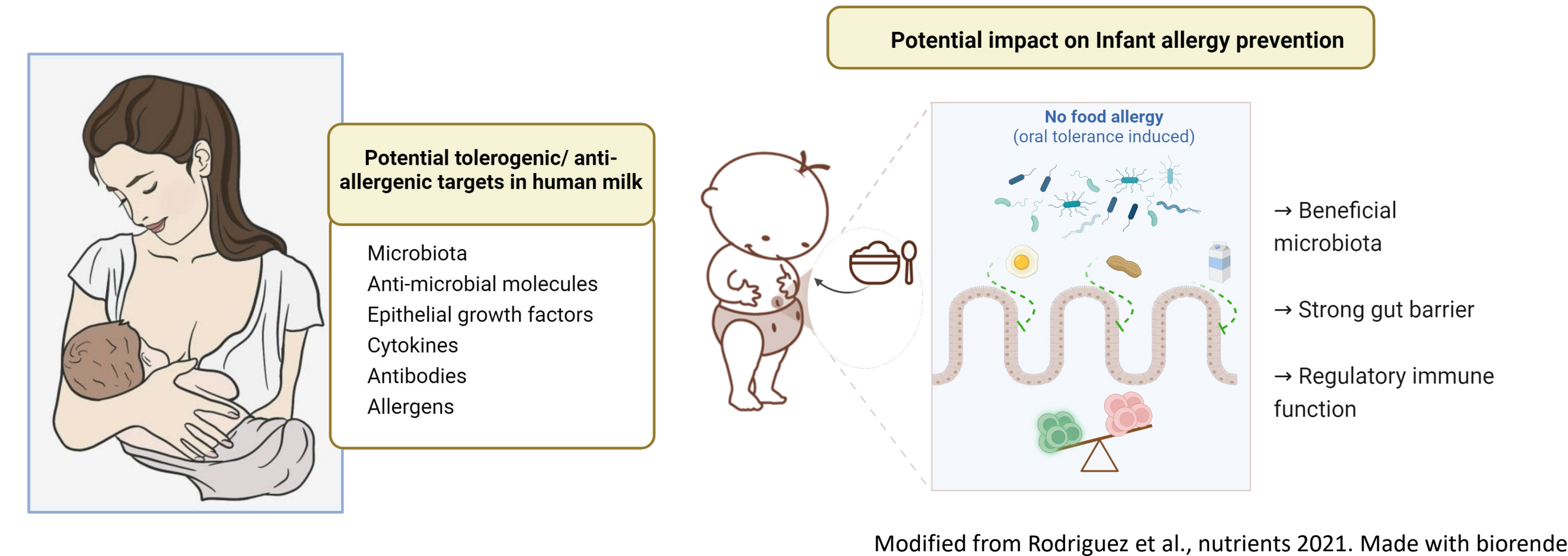
Allergic march: allergic diseases usually onset in infancy and progress over time



Strategies to prevent allergy need to start early in life

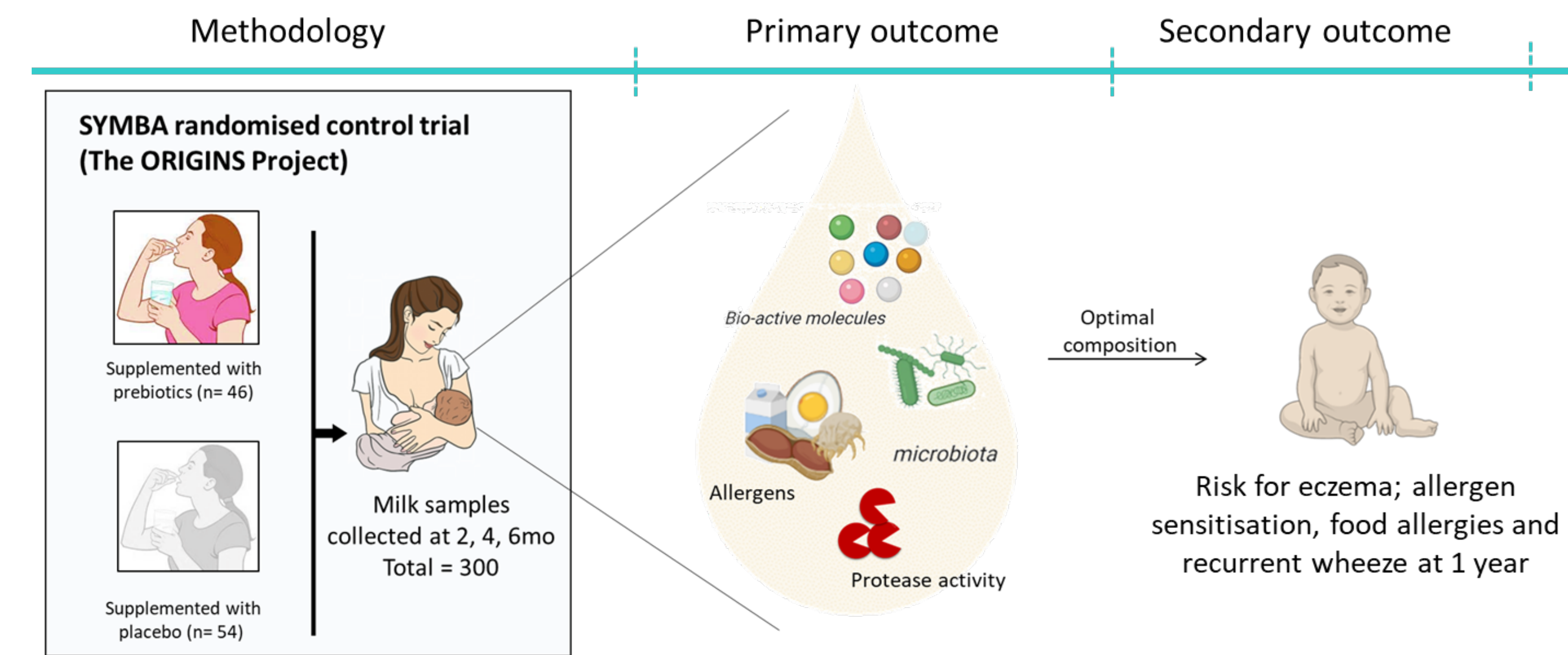
Human milk has the potential to influence child allergy risk

Maternal gut plays an important role to shape a personalized human milk composition



Can we modulate human milk composition for a more “protective” profile and improve allergy prevention?

Methodology



Investigate if maternal prebiotic fibre supplementation changes human milk profile and reduce food allergy in children

- This study is nested within the SYMBIA RCT (ACTRN12615001075572), where mothers are supplemented with FOS and GOS from 20 weeks of gestation until 6months of lactation. 100 mother-infant pairs were selected from the SYMBIA RCT based on the availability of human milk samples.
- Breast milk samples were analysed for 24 analytes (cytokines, growth factors, antimicrobials, antibodies) that can influence allergy. They were quantified using ELISA and multiplex.

Results: (primary outcome)

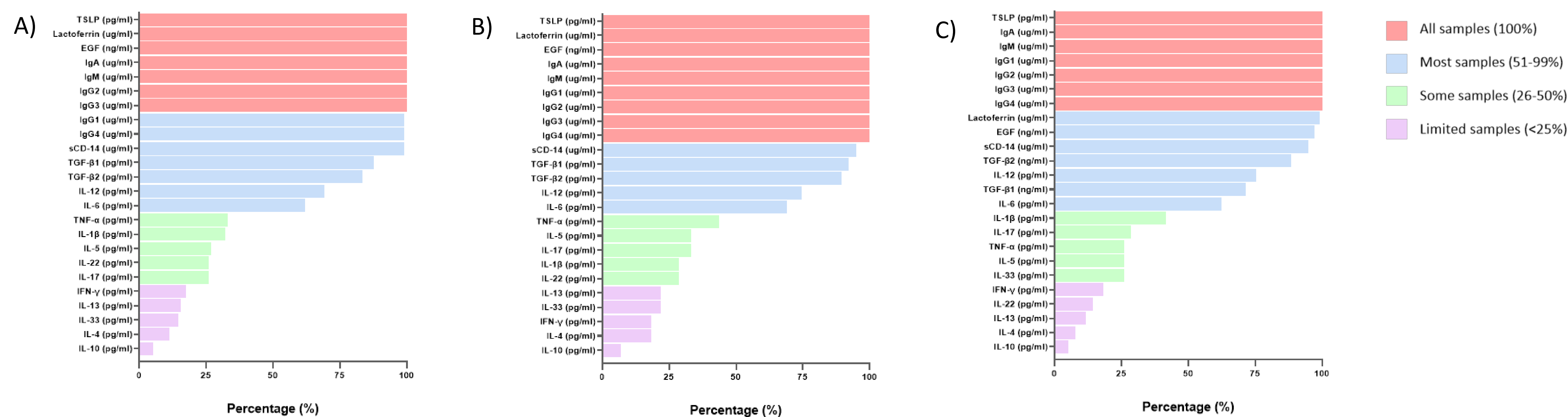


Figure 1: Frequency of detection of 24 bioactive compounds quantified in human milk collected at 2 (A) 4 (B) and 6 (C) months.

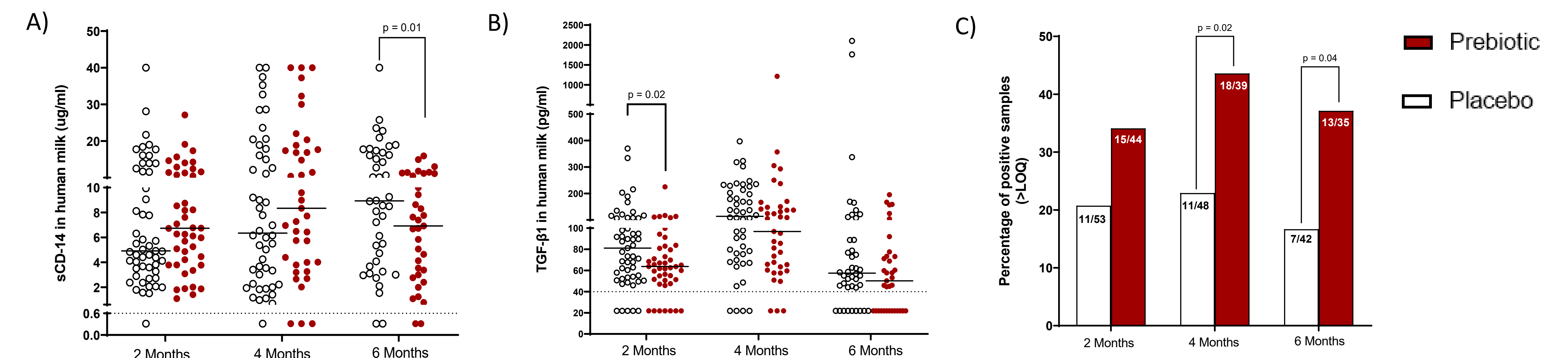


Figure 2: Human milk TGF-β1, sCD-14 and IL-5. Levels of TGF-β1(A), sCD-14 (B) and percentage of detectable IL-5 (C) at 2, 4 and 6 months of lactation. Solid lines and bars indicate the median values, and the dotted line indicates the LOQ (limit of quantification). Data between placebo and prebiotic group were compared using Mann-Whitney U test. P values <.05 were considered significant.

Conclusion

- The frequency of detection and the levels of cytokines, growth factors, and allergens were highly variable among mothers. Only immunoglobulins (IgA, IgM, IgG2 and IgG3) and TSLP were detected in the whole population at all time points
- Maternal prebiotic supplementation decreases levels of sCD-14 at 6 months and TGF-β1 at 2 months while increasing the levels of IL-5 in human milk at 4 and 6 months.
- This study supports the fact that human milk composition can be modified via diet (prebiotics)
- Further analysis and secondary outcomes will provide evidence for better establishment of maternal dietary guidelines for allergy prevention

Acknowledgements:

To our funding partners and sponsors: Larsson Rosenquist foundation, WACRF 2018 and NHMRC ID1099480
Collaborators: Prof Donna Geddes and Dr Ching Tat Lai

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