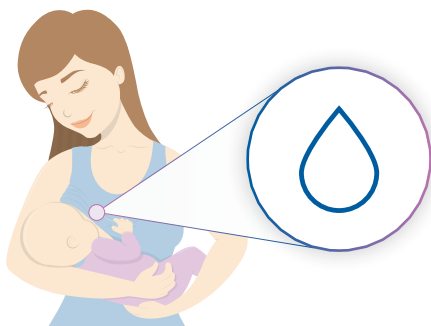


Role of Human Milk Oligosaccharides (HMOs) on Infant Immune Health and Association with Cognition

HMOs are unique, complex bioactive carbohydrates (oligosaccharides) naturally found in human milk¹

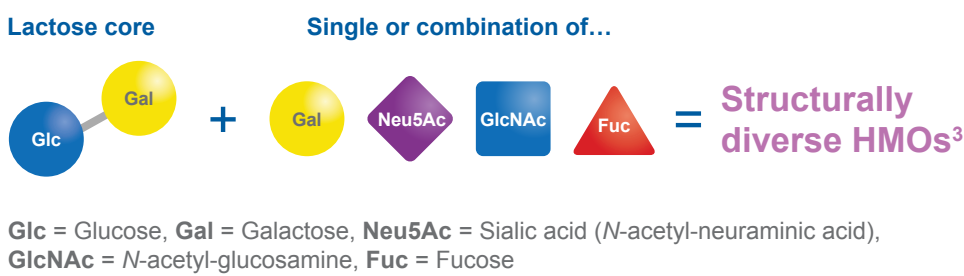
3rd largest solid component of human milk²



20–25 g/L
in colostrum²

5–15 g/L
in mature milk²

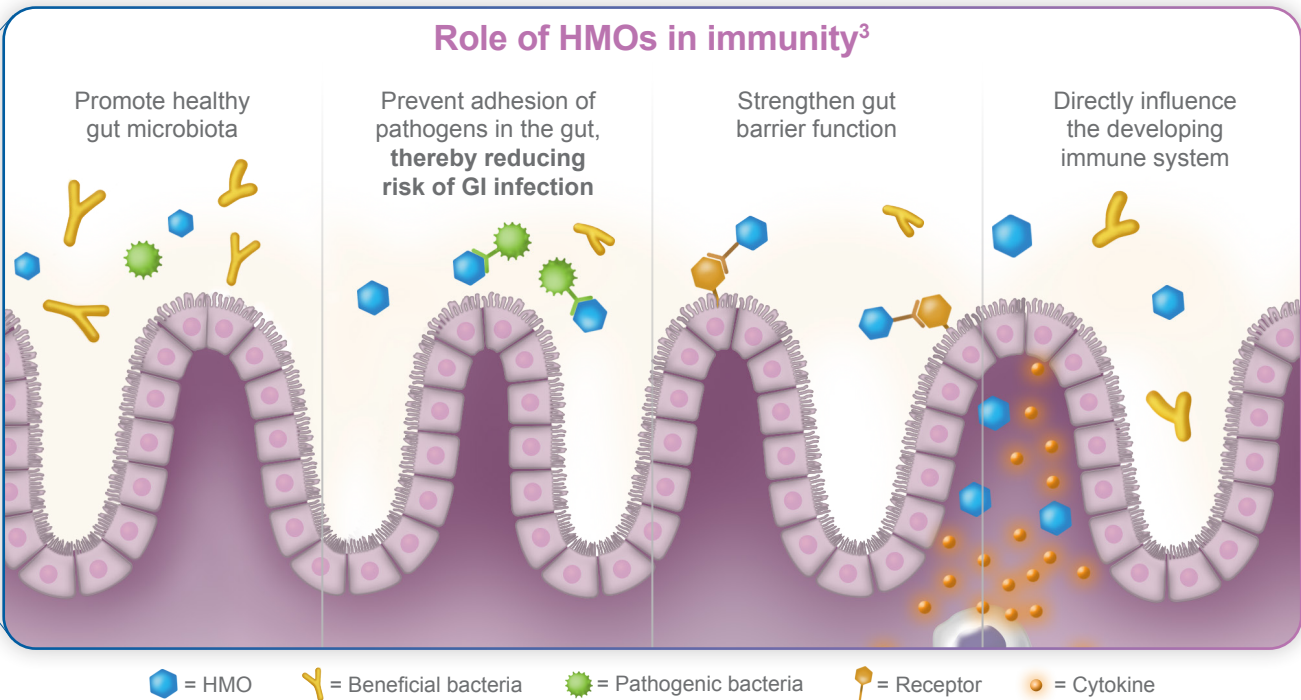
Composed of 5 monosaccharide building blocks³



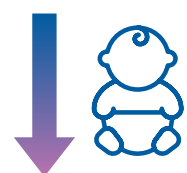
HMOs are considered innate defense factors of human milk^{2,4}



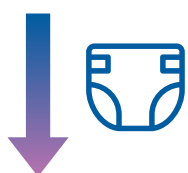
70–80%
of the immune system
resides in the gut^{5,6}



In breastfed infants, high levels of 2'-fucosyllactose (2'FL), a predominant HMO found in human milk,⁷ have been linked to immune benefits^{8,9}



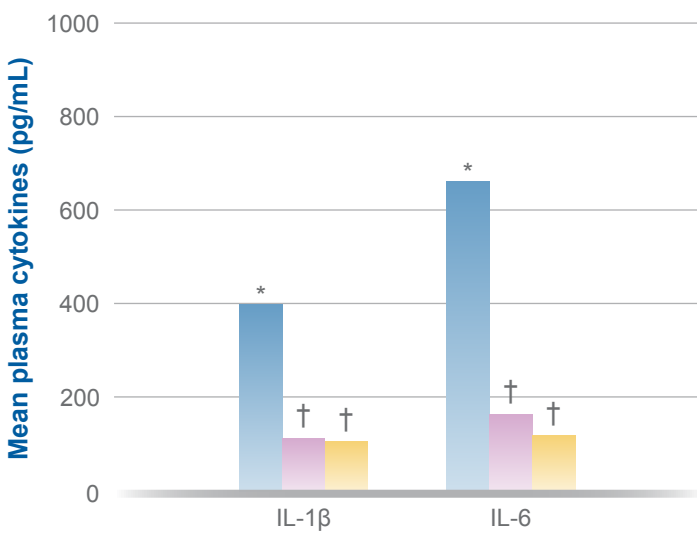
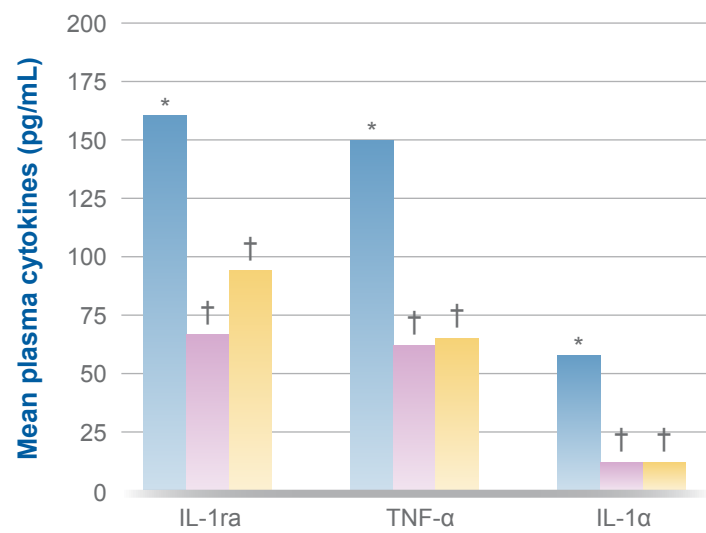
Lower incidence of IgE-associated eczema in C-section-born infants with family history of allergies⁸



Reduced risk of diarrheal infection⁹

2'FL, an oligosaccharide structurally identical to those predominantly found in human milk,^{7,10-12} has been clinically shown to support the developing immune system¹³

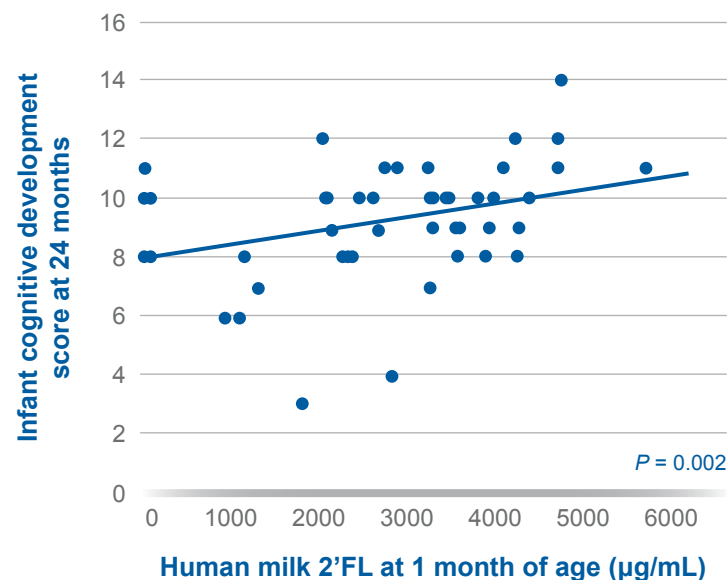
Infants fed formula with 2'FL had levels of 5 inflammatory cytokines (immune biomarkers) closer to breastfed infants at age 6 weeks¹³



Preclinical evidence suggests that HMOs play a role in brain developmental processes that influence both structure and function¹⁴⁻¹⁶

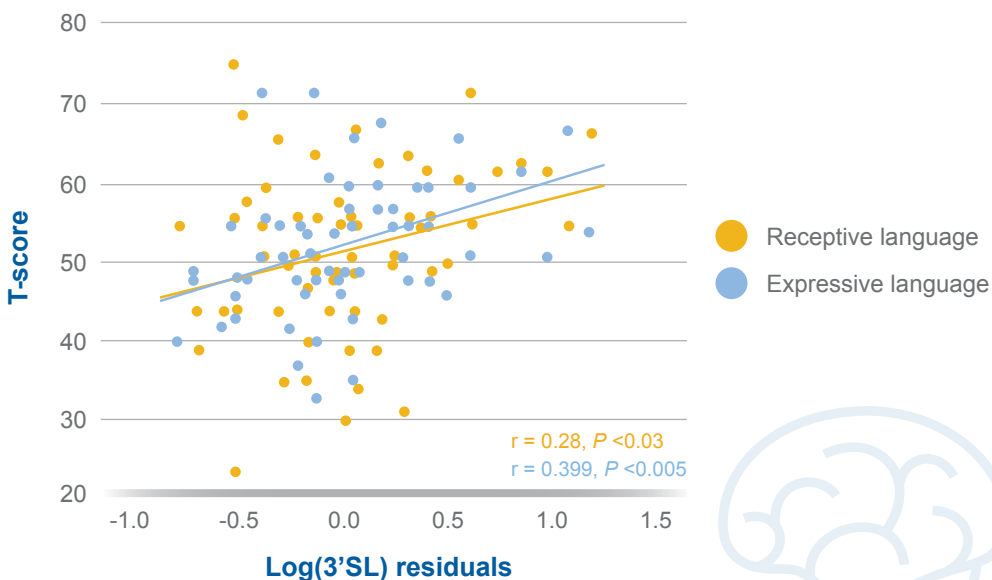
Observational studies have shown associations between HMO composition in human milk and cognitive development in breastfed infants^{17,18}

Higher exposure to 2'FL at 1 month resulted in a higher cognitive development score at 24 months of age^{*17}



*While the assessment was done at both 1 and 6 months, the link was only observed at 1 month, but not at 6 months¹⁷

Levels of 3'sialyllactose (3'SL), another HMO in human milk, is positively associated with receptive and expressive language scores^{†18}



†This association between human milk 3'SL and language was observed in the subset of infants whose mothers' milk contained detectable A-Tetra HMO¹⁸



HMOs may benefit infants in multiple ways, including helping support gut, immune, and cognitive development³