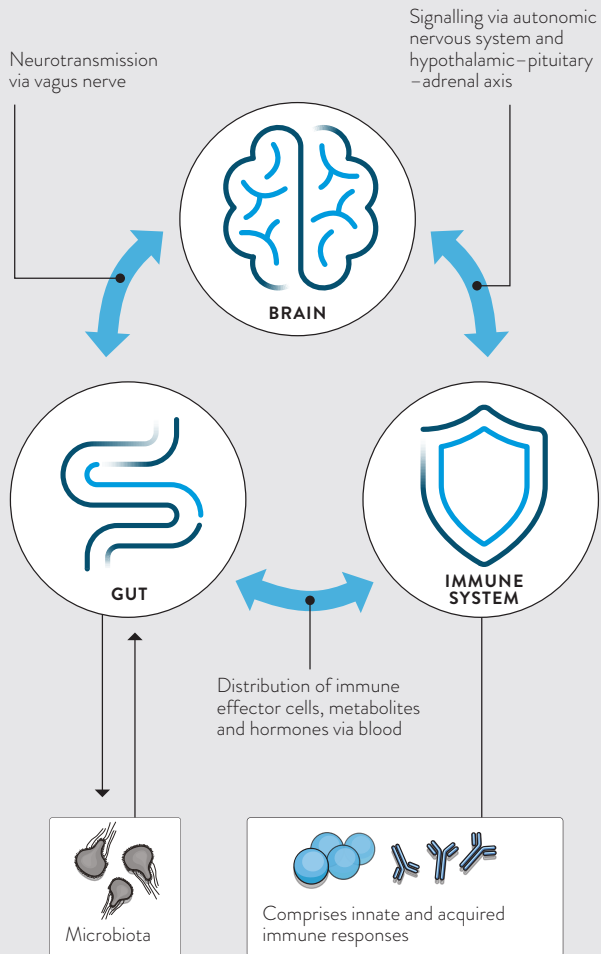


HUMAN MILK OLIGOSACCHARIDES (HMOs)

UNDERSTANDING THE POTENTIAL

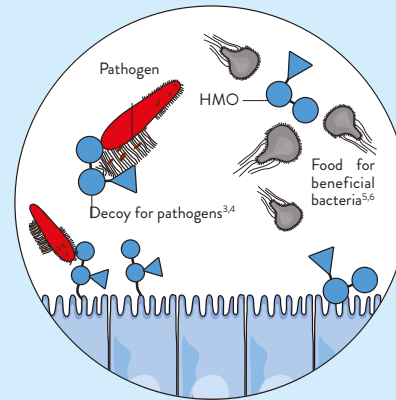
GUT-BRAIN-IMMUNE AXIS

70% of the immune system is in the gut and there are millions of neurons.

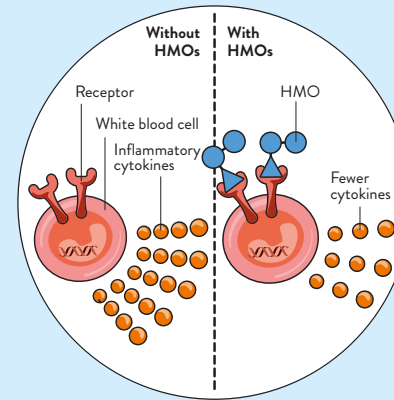


SYSTEM-WIDE EFFECTS OF HMOs

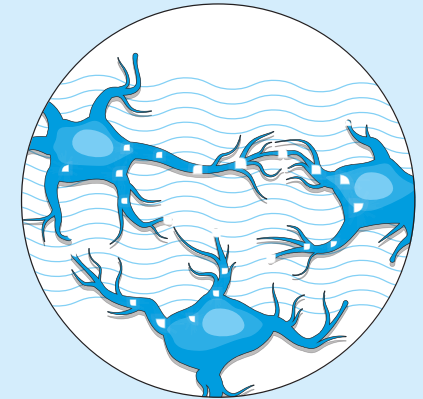
Human milk oligosaccharides (HMOs) have many postulated benefits.^{1,2}



In cell culture, certain HMOs act as receptor decoys to block specific pathogen attachment to epithelial cells.^{4,7,8*}



Preclinical research suggests that HMOs act as immune cell modulators to help balance immune response.^{2,9*}



Studies suggest fucose metabolites, sialic acid, and microbiota-derived metabolites are absorbed into the blood stream where they can travel to the brain to support cognitive development.^{2*,10-15*}

*Preclinical results

IMPORTANT OUTCOMES OF 2'-FL HMO

Clinical and preclinical research is revealing potential benefits of supplementation with 2'-fucosyllactose (2'-FL), which is the most abundant HMO in 75–85% of mothers breastmilk.^{16,17}

GUT HEALTH

- ➔ Supports growth of populations of *Bifidobacterium*^{5,6*}
- ⬇ Higher levels of 2'-FL HMO in breastmilk was associated with lower incidence of bacterial diarrhea.¹⁸
- ⬇ Decreased intensity of colonic motor contractions^{19*}

IMMUNE SYSTEM

- ⬇ In a clinical study, compared to a control formula, 2'-FL HMO was shown to:
 - lower levels of multiple inflammatory cytokines to be more like levels in breastfed infants²⁰
 - associate with lower incidence of eczema^{21†}
 - associate with fewer respiratory infections^{21,22†}
- ⬇ Attenuation of food allergy symptoms in mouse model of allergic response.^{23*}

BRAIN HEALTH

- ⬆ Higher 2'-FL breastmilk concentrations were associated with:
 - higher motor scores in breastfed infants at 6 months of age²⁴
 - improved cognitive development outcomes through 24 months of age²⁵

*Preclinical results only. †In comparison to control formula without HMOs, based on parent-reported adverse events from a post-hoc analysis of a clinical study.

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