

Therapeutic Options for Low *Akkermansia muciniphila* Levels

Addressing Low Levels of *Akkermansia muciniphila*

Akkermansia muciniphila has appeared in over 2000 scientific publications, and abundance has been associated with maintaining intestinal integrity. The primary function of *Akkermansia muciniphila* is to support healthy mucin layer turnover in the intestines, and thus strengthen the intestinal lining. Furthermore, this process releases short-chain fatty acids such as acetate and propionate, that support the abundance and diversity of other health-promoting microorganisms in the gut.

Additionally, metabolic dysfunction stems in part from an increase in permeability of the gut barrier, which separates contents of the gut lumen from peripheral circulation. When the gut barrier becomes too permeable, levels of circulating lipopolysaccharide (LPS) from Gram-negative bacteria increase, activating pro-inflammatory cytokines and leading to chronic low-grade inflammation,¹ which is associated with both weight gain and higher fasting glucose levels.² A major protective factor against gut barrier permeability is the layer of mucus coating the inner wall of the digestive tract, which provides a home for certain mucin-loving bacteria such as *Akkermansia muciniphila*. When *Akkermansia muciniphila* consumes mucin, the host compensates by continuing to produce more mucins, helping replenish this protective layer and thus enhancing the integrity of the intestinal barrier.³

Supplement and Dietary Plan

- Supplement with a probiotic containing *Akkermansia muciniphila*
 - » For patients with undetectable levels of *Akkermansia*, a higher replenishment dose for 3–6 months may be necessary to repopulate the gut
- Encourage intake of polyphenols such as pomegranate, green tea, and grape seed⁴
 - » Supplement as necessary
- Encourage intake of prebiotic dietary fibers such as onion, chicory, garlic, asparagus, banana, and artichokes⁵
 - » Supplement as necessary
- Consider supplementation with DHA/EPA to promote *Akkermansia* abundance⁶
- Consider the possibility of intestinal permeability and/or damaged mucosa especially with other GI-MAP findings (low IgA, elevated zonulin)
- Consider a classic 5R protocol or 6R protocol

GI-MAP™
GI Microbial Assay Plus



1. Cani, Patrice D et al. "Changes in gut microbiota control metabolic endotoxemia-induced inflammation in high-fat diet-induced obesity and diabetes in mice." *Diabetes* vol. 57,6 (2008): 1470-81. doi:10.2337/db07-1403
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4. Anhê FF, Pilon G, Roy D, Desjardins Y, Levy E, Marette A. Triggering *Akkermansia* with dietary polyphenols: A new weapon to combat the metabolic syndrome? *Gut Microbes.* 2016;7(2):146-153. doi:10.1080/19490976.2016.1142036
5. Zhou K. Strategies to promote abundance of *Akkermansia muciniphila*, an emerging probiotics in the gut, evidence from dietary intervention studies. *Journal of Functional Foods.* 2017;33:194-201. doi:10.1016/j.jff.2017.03.045
6. Costantini L, Molinari R, Farinon B, Merendino N. Impact of omega-3 fatty acids on the gut microbiota. *International Journal of Molecular Sciences.* 2017;18(12):2645. doi:10.3390/ijms18122645

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