Pendulum

Protocol: Support Intestinal Barrier Function

Developed in collaboration with Britta Nevitt, ND

Disclaimer: The Pendulum team has created these protocols in collaboration with practitioners to help healthcare partners make decisions when building treatment plans. When using this protocol, you understand and accept that the recommendations in the protocol are for educational guidance and need to be adapted to meet individual patient needs. This may not be appropriate for every patient.

Description

Akkermansia muciniphila has appeared in over 800 scientific publications, and abundance has been associated with maintaining intestinal integrity[1]. 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, including the butyrate-producing strain *Clostridium butyricum*. *Clostridium butyricum* is shown to improve gut barrier function by increasing mucosal layer thickness and increasing expression of tight junction proteins, making it another beneficial strain for supporting intestinal barrier function[2].

To optimize the presence of *Akkermansia muciniphila*, polyphenol-rich prebiotic foods are not only beneficial antioxidants, but have also been shown to increase *Akkermansia* population in the gut[3].

Support your supplement plan with this polyphenol-rich prebiotic food list.

Top Polyphenol-containing Foods

Seasonings	Fruit	Vegetables	Nuts + seeds	Extras
Cloves	Blueberries	Black olives	Flaxseeds	Dark chocolate
Peppermint	Pomegranate	Green olives	Hazelnuts	Red wine
Oregano	Cranberries	Artichokes	Pecans	Coffee
Sage	Cherries	Red onions	Almonds	Black tea
Rosemary	Blackberries	Spinach	Walnuts	Green tea

Supplement Plan

Pendulum Akkermansia: 1 capsule, once daily with food

Pendulum Butyricum: 1 capsule, once daily with food

Pendulum Polyphenol Booster: *optional add on to boost *Akkermansia* which may further enhance the benefits

References

1. Geerlings SY, Kostopoulos I, De Vos WM, Belzer C. *Akkermansia muciniphila* in the Human Gastrointestinal Tract: When, Where, and How? *Microorganisms*. 2018; 6(3):75. https://doi.org/10.3390/microorganisms6030075
2. Stoeva MK, *et al*. Butyrate-producing human gut symbiont, *Clostridium butyricum*, and its role in health and disease. Gut Microbes. 2021;13(1): e1907272. https://doi.org/10.1080/19490976.2021.1907272
3. Pérez-Jiménez, J., Neveu, V., Vos, F. *et al.* Identification of the 100 richest dietary sources of polyphenols: an application of the Phenol-Explorer database. *Eur J Clin Nutr* 64, S112–S120 (2010). https://doi.org/10.1038/ejcn.2010.221