

Protocol: Boost Metabolic Health

Developed by Christina O'Connor, RD and Jennifer McManus, RD

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 only and need to be adapted to meet individual patient needs. This may not be appropriate for every patient. This protocol is not a substitute for medical advice, and is not intended to diagnose or treat any medical condition. Please consult with your qualified medical professional to determine if this protocol is appropriate for you, as this may not be appropriate for every individual.

Description

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,⁴ which is associated with both weight gain and higher fasting glucose levels⁵. 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 barrier⁶.

Another mechanism by which the gut mediates metabolic health is through the production of certain metabolites, specifically butyrate. Targeted bacterial strains, such as *Clostridium butyricum*, increase butyrate production which triggers host secretion of GLP-1 and PYY, important gut-secreted hormones known to regulate metabolism, energy balance, and glucose homeostasis⁷. Restoring strains identified to deliver these key functions to the gut microbiome has the potential to naturally boost metabolic health.

Supplement Plan*

Weeks 1-4

- **Pendulum Akkermansia 500 Pro:** 1 capsule, once daily with food
- **Pendulum Polyphenol Booster:** add on to boost Akkermansia, which may further enhance the benefits

Ongoing from week 4:

- **Pendulum Metabolic Daily Pro:** 1 capsule, once daily with food
- **Pendulum Polyphenol Booster:** optional add on to boost *Akkermansia* which may further enhance the benefits

***Support your supplement plan with high-fiber, polyphenol-rich foods**

References

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