

# EPA and DHA ameliorate diabetes in mice through the microbiome-gut-organ axis

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## Video Byte

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# Abstract

The omega-3 fatty acids EPA and DHA may help prevent metabolic diseases and alleviate microbiome disruption, but how these fatty acids affect the gut microbiome and metabolome in diabetes remains unclear. To learn more, a new study examined the gut health of diabetic (db/db) mice fed EPA-/DHA-supplemented diets. Both EPA and DHA improved blood sugar-related indices in diabetic mice without affecting body weight and distinctly altered mouse gut microbiomes and fecal metabolomic profiles. In addition, both fatty acids accelerated gut glutamate degradation, which was strongly correlated with Coriobacteriaceae bacterial abundance. EPA and DHA increased the levels of beneficial short-chain fatty acids, while EPA decreased the levels of the bacterial endotoxin LPS. Notably, all of the effects were more evident for EPA than for DHA. In transplantation experiments, the microbiotas of EPA- and DHA-supplemented diabetic mice improved glucose homeostasis and gut metabolites in diabetic recipient mice, and in vitro experiments confirmed that EPA/DHA directly inhibited the growth of endotoxin-producing *E. coli* and promoted the growth of a Coriobacteriaceae species. Although further functional and clinical research is needed, the results suggest that targeting the microbiome-gut-organ axis with EPA and DHA, particularly EPA, is a promising strategy for diabetes treatment.