

2nd Edition of International Summit on **Diabetes, Endocrinology and Metabolic Disorders** July 21-22, 2026 | Vienna, Austria



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An Introduction to “Alleviative effect of probiotics and prebiotics on dry eye in type 2 diabetic mice through the gut-eye axis”

Diabetes Mellitus (DM) is a metabolic disease that manifests as a state of “chronic low-grade inflammation”. Patients with DM have a disorder of intestinal flora. There is a discernible correlation between this disorder of intestinal flora and the onset and progression of eye diseases, which offers novel insights into treating eye diseases through the modulation of intestinal flora. Here, we demonstrated that a high-fat diet and streptozotocin injection-induced intestinal microbiota dysbiosis can lead to dry eye-like manifestations in T2DM mice. Probiotic and prebiotic treatments not only alleviated intestinal inflammation and barrier disruption, but also mitigated damage to the lacrimal barrier and suppressed immune cell infiltration and inflammatory responses. Additional mechanism investigation found that probiotics and prebiotics inhibited the TLR4/NF- κ B signaling pathway and its downstream pro-inflammatory products both in the lacrimal gland and colon. 16S RNA sequencing identified a reduction in the bacterial genera Akkermansia and Lactobacillus in the fecal samples of DM mice. By contrast, treatment with probiotics and prebiotics led to a reshaping of the intestinal microbial community and a reduction in bile acid metabolites, such as taurocholic acid and deoxycholic acid. Our current study demonstrates that probiotic and prebiotic treatments can ameliorate dry eye-like symptoms and associated pathological changes in T2DM mice. Moreover, we proved that a high-fat diet and STZ-induced microbiota dysbiosis were involved in diabetic dry eye through the gut-eye axis.

Keywords: Diabetic dry eye, Gut-eye axis, Gut flora, Probiotics, Prebiotics



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Biography

Jianfeng Long is a Clinical Dietitian at Department of Clinical Nutrition, in the Second Xiangya Hospital of Central South University, Changsha, China. With over 13 years of experience in clinical nutrition practice, I have amassed extensive hands-on expertise, particularly in the prevention and management of chronic diseases as well as weight management. From 2017 to 2018, I completed a nearly 18-month visiting scholar program at the Center for Human Nutrition, University of California, Los Angeles (UCLA). With expertise in Research on the Role of Dietary Fiber and Gut Microbiota in the Prevention and Management of Chronic Diseases and weight management, they have contributed significantly to publish academic papers in a number of high-impact journals, including The Ocular Surface, Journal of Functional Foods and Food & Function. Their research interests include the Prevention and Management of Diabetes, Its Complications, and Obesity. I aspire to achieve further advances in research, translate these findings into clinical practice for patients, and ultimately contribute to patient care.