The effect of the gut microbiome in glaucoma risk from the causal perspective

Yaxuan Wu\textsuperscript{1,3}, Ronghua Shi\textsuperscript{1,3}, He Chen\textsuperscript{1,3}, Zicheng Zhang\textsuperscript{1,2,3}, Siqi Bao\textsuperscript{1,2,3}, Jia Qu\textsuperscript{1,2,3}, Meng Zhou\textsuperscript{2}

Supplementary Files

\textbf{Supplementary Table 1.} IVs related to 196 GM taxa and glaucoma in the primary stage (FinnGen consortium)

\textbf{Supplementary Table 2.} Causal effects of MR Analysis between GM taxa and glaucoma in the primary stage (FinnGen consortium)

\textbf{Supplementary Table 3.} Causal effects of reverse MR Analysis between glaucoma and GM taxa (FinnGen consortium)

\textbf{Supplementary Table 4.} IVs related to 196 GM taxa and glaucoma in the validation stage (MRC-IEU consortium)

\textbf{Supplementary Table 5.} Causal effects of MR Analysis between GM taxa and glaucoma in the validation stage (MRC-IEU consortium)
Supplementary Figures S1. Leave-one-out plots of significant MR results in the primary stage (FinnGen consortium). (A) MR leave-one-out sensitivity analysis for family *Oxalobacteraceae* on glaucoma. (B) MR leave-one-out sensitivity analysis for *genus* *Lachnospiraceae UCG010* on glaucoma. (C) MR leave-one-out sensitivity analysis for *genus* *Bilophila* on glaucoma. (D) MR leave-one-out sensitivity analysis for *genus* *Eggerthella* on glaucoma. (E) MR leave-one-out sensitivity analysis for *genus* *Ruminiclostridium* on glaucoma.
Supplementary Figures S2. Causal analyses of glaucoma and each gut microbial component taxon based on five MR analyses ($P < 1 \times 10^{-5}$) (FinnGen consortium).

From the outside to the inside are the genomic taxon name, the $P$-value of IVW (Inverse variance weighting), the $P$-value of MR-Egger, the $P$-value of the WM (weight median) result, the $P$-value of the SM (simple mode) result, the $P$-value of WMODE (weighted mode) and OR-value based on IVW results.
Supplementary Figures S3. Causality in the reverse MR (FinnGen consortium). Forest plot shows significant causal associations. Five two-sample MR methods (IVW, MR-Egger, weight median, simple mode, and weighted mode) were used to estimate causal effects. FDR-corrected P < 0.1 was considered significant. OR: odds ratio; CI: confidence interval.
Supplementary Figures S4. Leave-one-out plots of MR results that were repeated during the validation stage (MRC-IEU consortium). (A) MR leave-one-out sensitivity analysis for genus *Clostridium sensu stricto*1 on glaucoma. (B) MR leave-one-out sensitivity analysis for genus *Lachnospiraceae*UCG010 on glaucoma.