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Summary

DIET AND DONOR-DEPENDENT EFFECTS OF FAECAL MICROBIOTA TRANSPLANTATION IN HUMANIZED IBD MOUSE MODELS OF COLITIS AND ILEITIS

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Mediterranean diet and faecal microbiota transplantation independently reduced disease activity in humanized mouse models of ulcerative colitis and Crohn's disease, though FMT efficacy was donor-dependent and showed contrasting site-specific effects in ileitis.

KEY POINTS

- Across both UC and CD mouse models, Mediterranean diet consistently reduced disease activity while Western diet worsened outcomes (all $P<0.05$).
- FMT improved disease activity independently of diet in both models, but effects were donor-dependent in UC, with Donor 1 outperforming other single donors and multi-donor preparations across all diets.
- In SAMP ileitis-prone mice, FMT showed divergent site-specific effects: it decreased microscopic colitis severity (trend, $P=0.073$) but unexpectedly worsened ileitis ($P=0.012$).
- Mediterranean diet significantly increased alpha diversity after DSS recovery in C57BL/6 mice ($P<0.01$) and enriched protective taxa such as Akkermansia, while no differences in alpha diversity were observed by FMT origin ($P=0.91$).
- The findings underscore the importance of donor selection for FMT and suggest dietary optimization may serve as a complementary strategy, though further mechanistic analyses are required to explain the divergent colonic versus ileal immune responses.

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