

X Congresso Nazionale IG-TBD



RICCIONE, 28-30 novembre 2019

Fecal Microbiota Transplantation Controls Murine Chronic Intestinal Inflammation by Modulating Immune Cell Functions and Gut Microbiota Composition

Burrello C, Giuffrè MR, Diaz-Basabe A, Macandog AD, Cribiù FM, Lopez G, Borgo F, Nezi L, Caprioli F, Vecchi M, Facciotti F

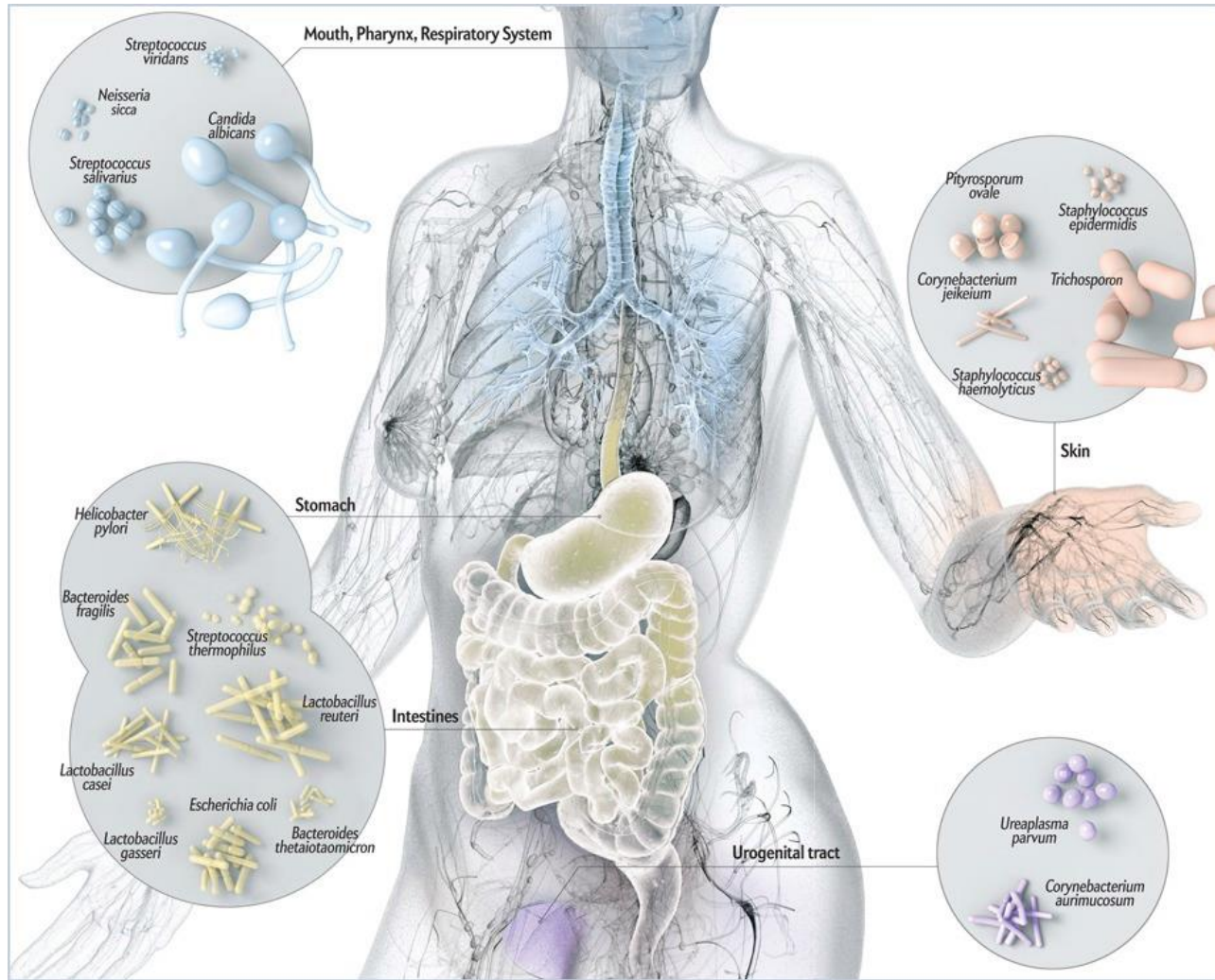


FONDAZIONE IRCCS CA' GRANDA
OSPEDALE MAGGIORE POLICLINICO

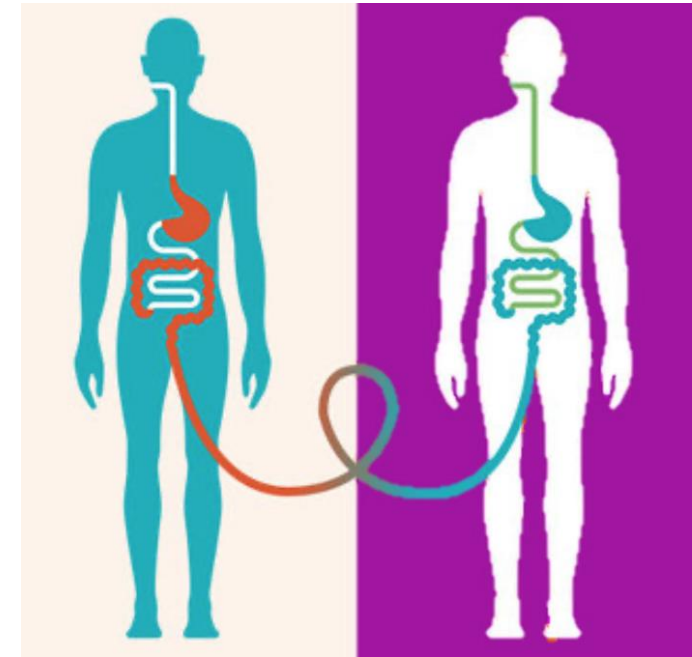
29.11.2019 - SESSION V



Microbiota and “The Germ Theory of Everything”



Bryan Christie Design, Scientific American 2012



Applications

Clostridium difficile infection (CDI)

Parkinson disease

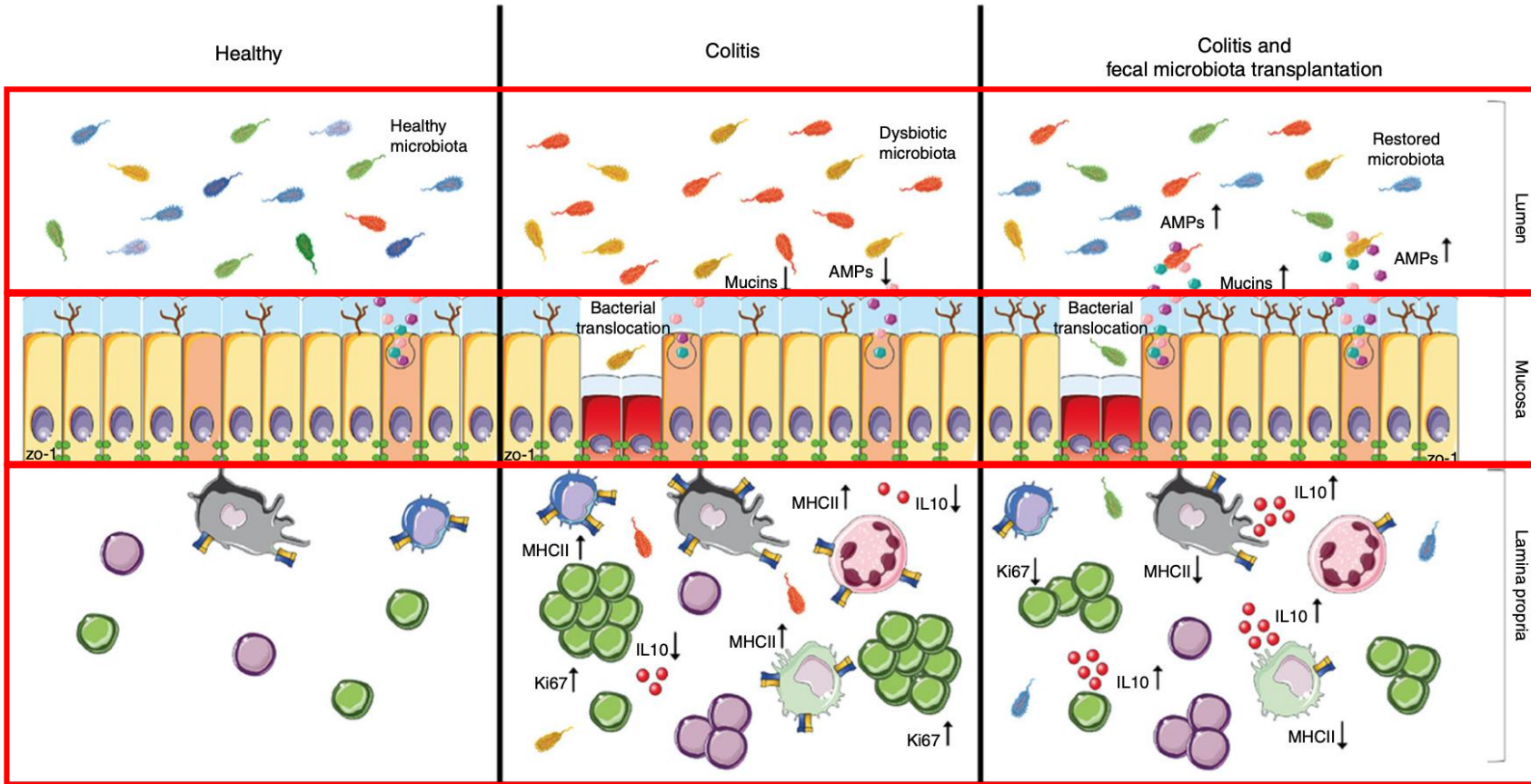
Obesity

Metabolic syndrome

Atherosclerosis

IBD

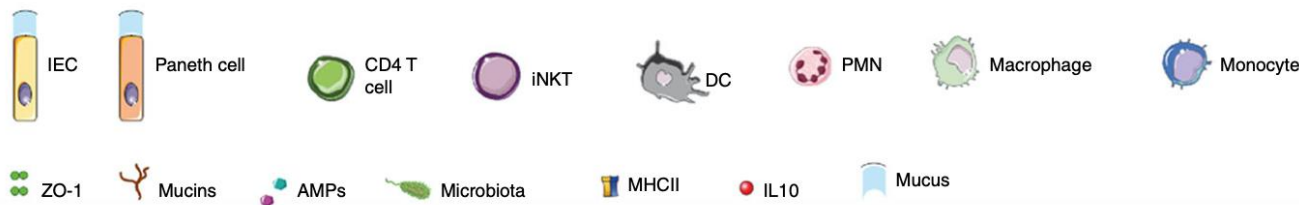
Therapeutic FMT reduces colonic inflammation and initiates the restoration of intestinal homeostasis.



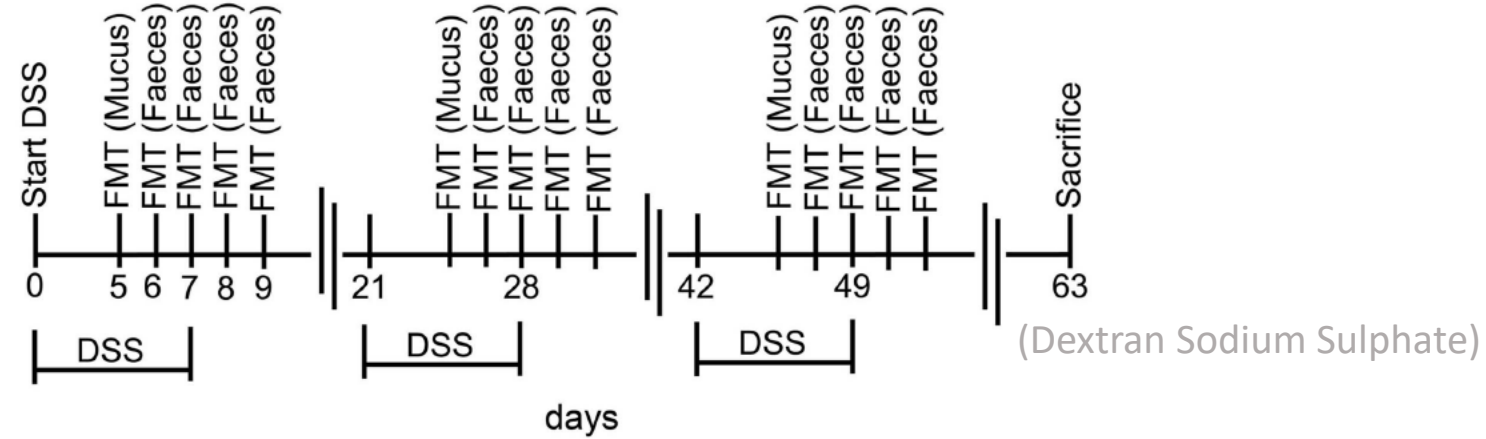
- Restoration of intestinal microbial ecology
- Restoration of the intestinal barrier properties
- Modulation of immune responses (production of tolerogenic IL10)



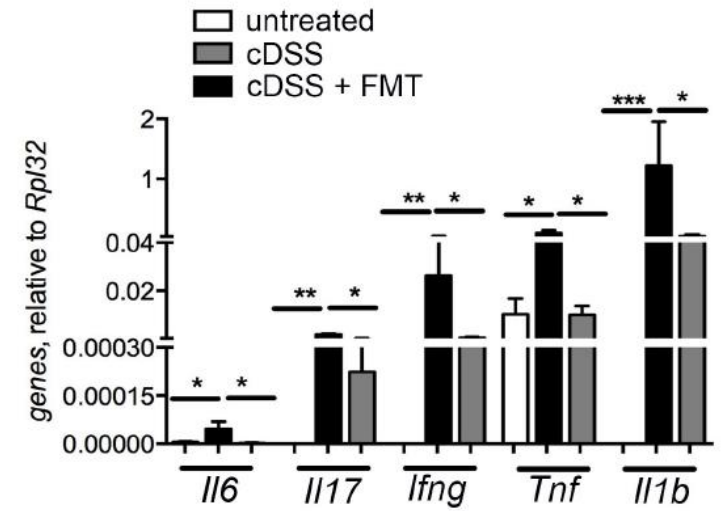
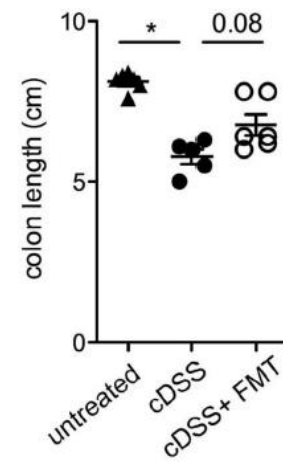
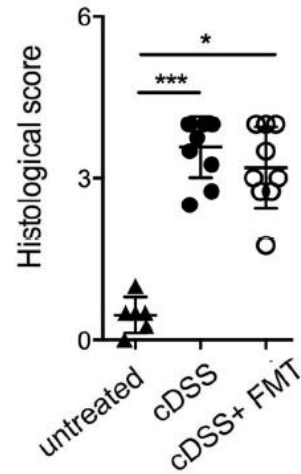
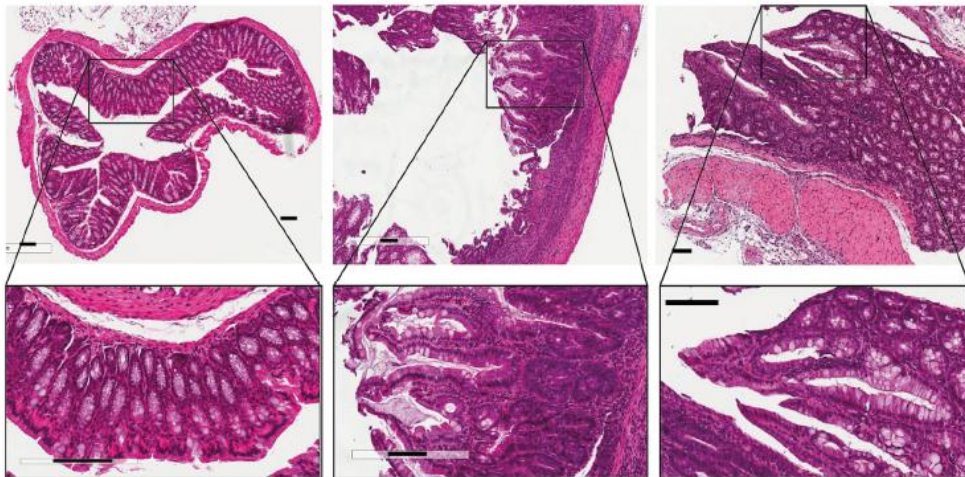
Resolution of inflammation



Therapeutic FMT reduces signs of inflammation in DSS-induced chronic inflammation.

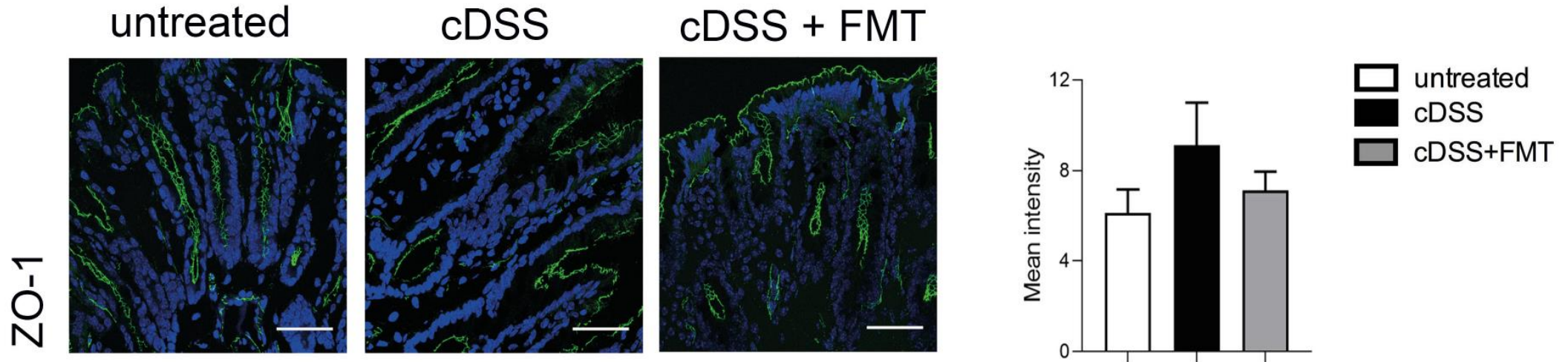


untreated cDSS cDSS + FMT

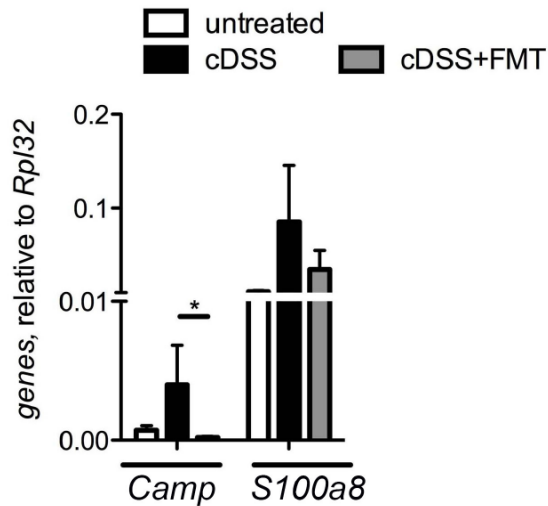


$P < 0.05$ (*), $P < 0.01$ (**), $P < 0.001$ (***)

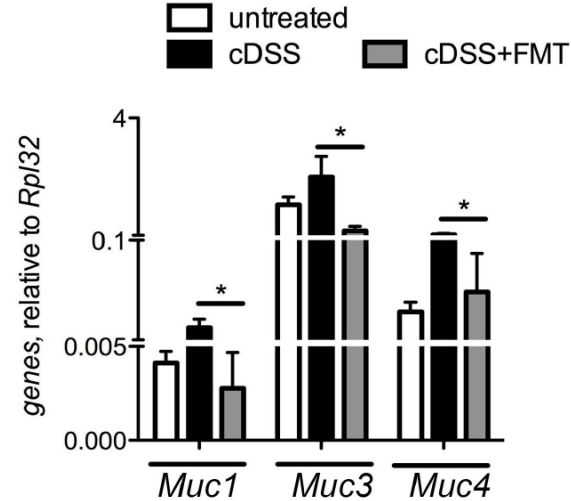
The architecture of the gut intestinal barrier confirms the therapeutic role of FMT.



Expression of antimicrobial peptide genes

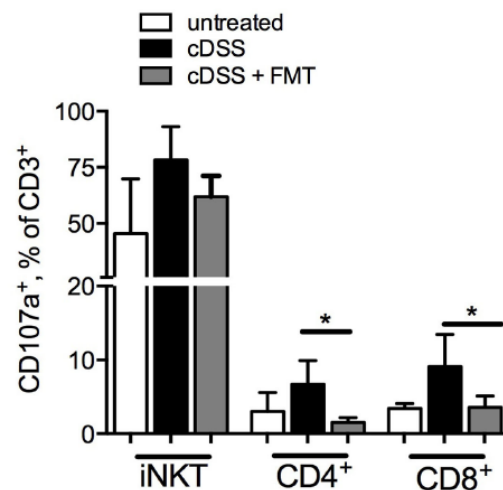
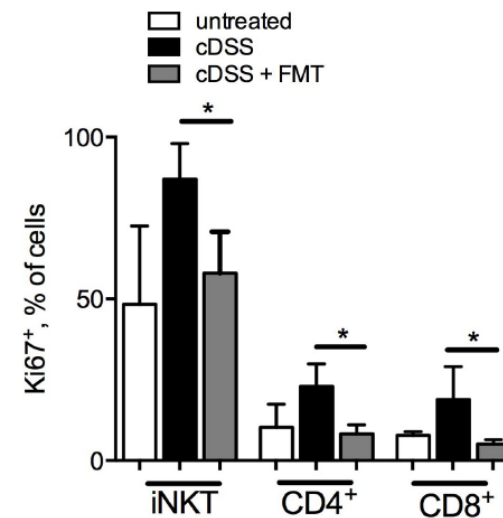
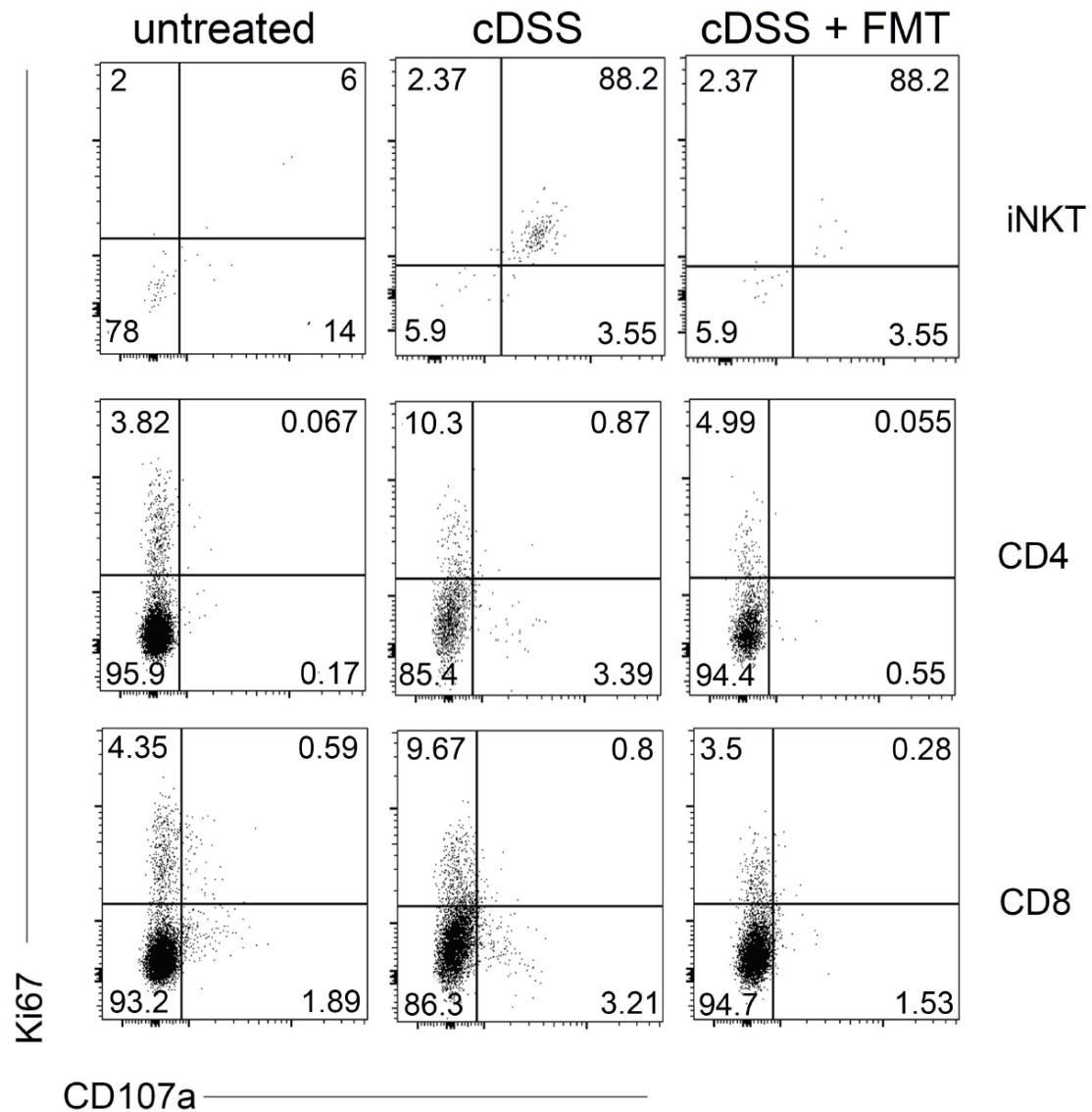


Expression of mucin genes



$P < 0.05$ (*)

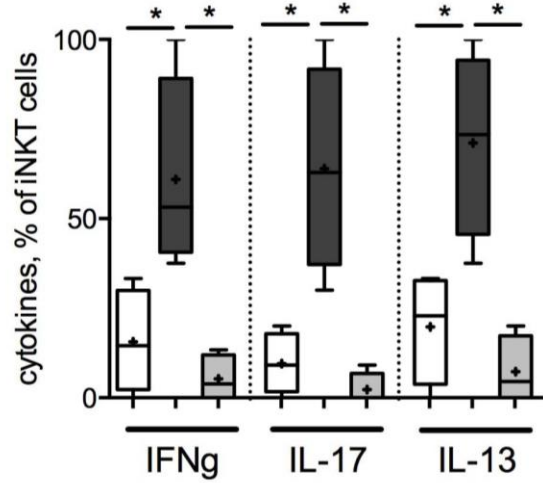
Therapeutic FMT modulates T cell phenotypes but not APC functions in cDSS-treated mice.



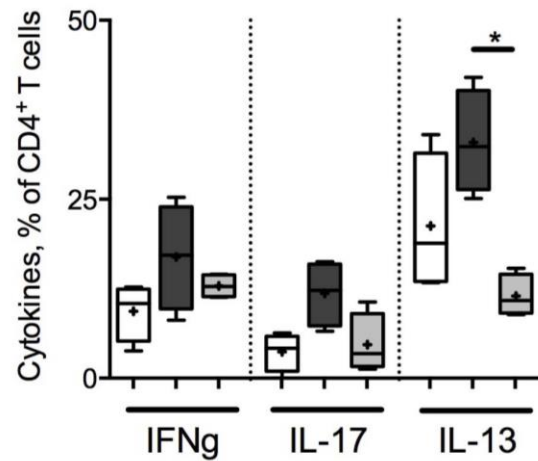
P < 0.05 (*)

FMT reduces immune cell pro-inflammatory cytokine profile.

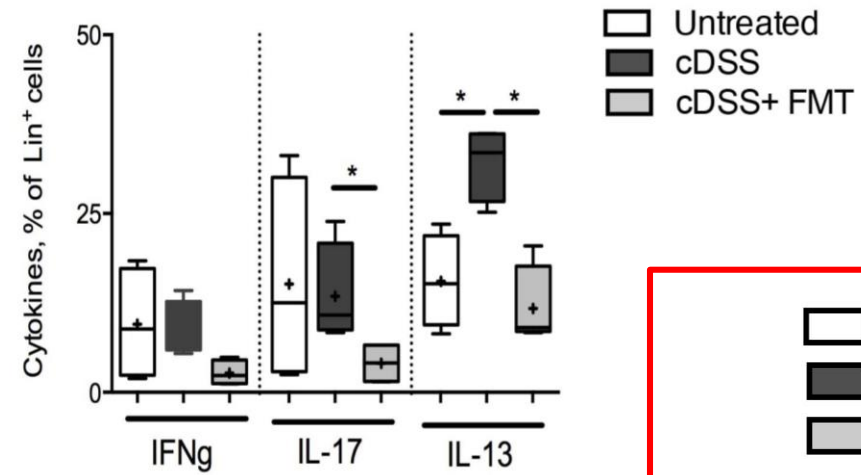
iNKT



CD4+ T

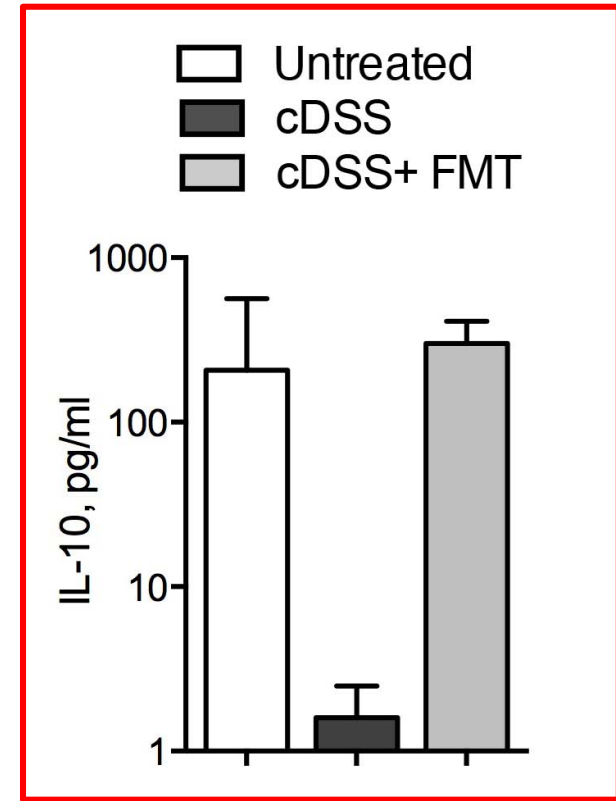


APCs

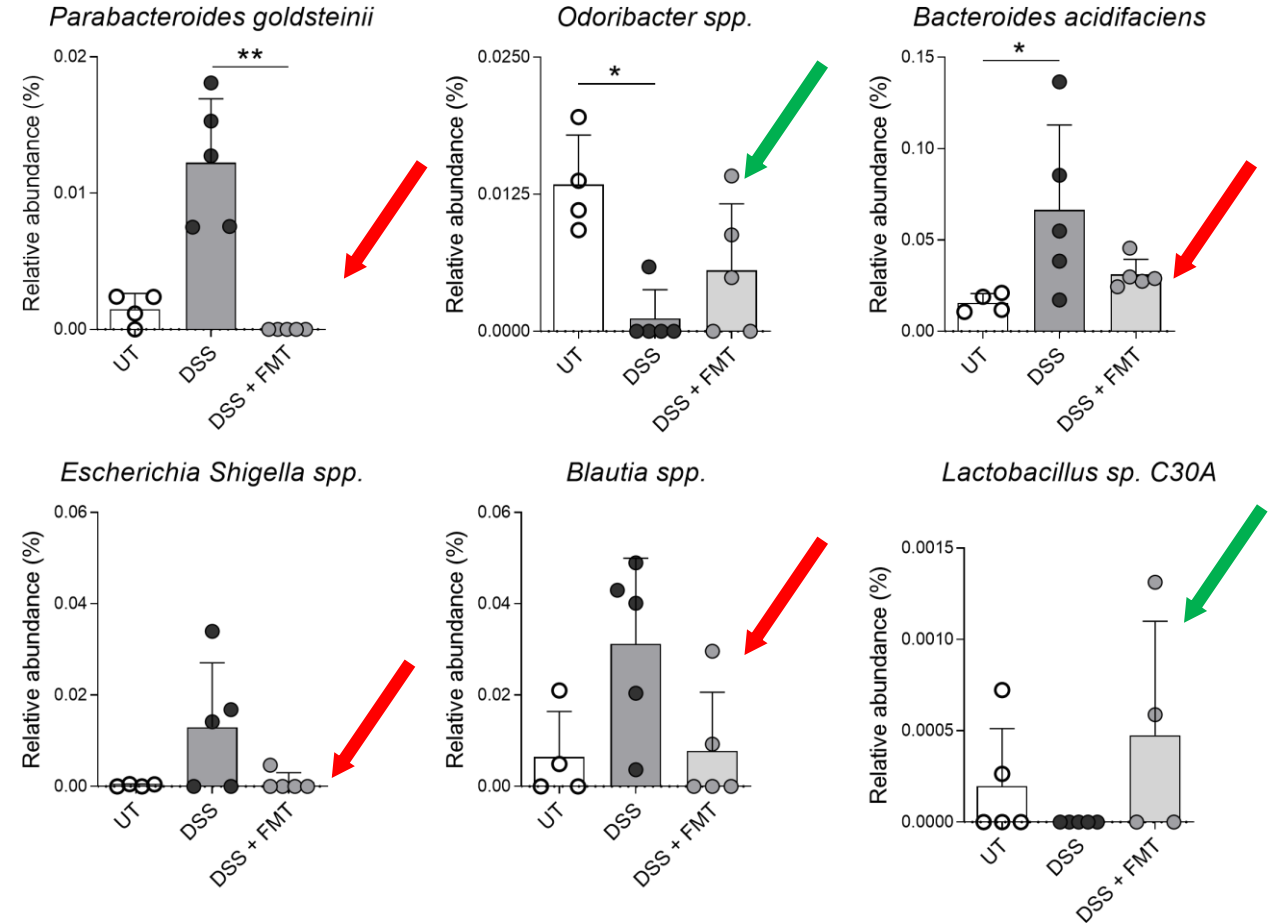
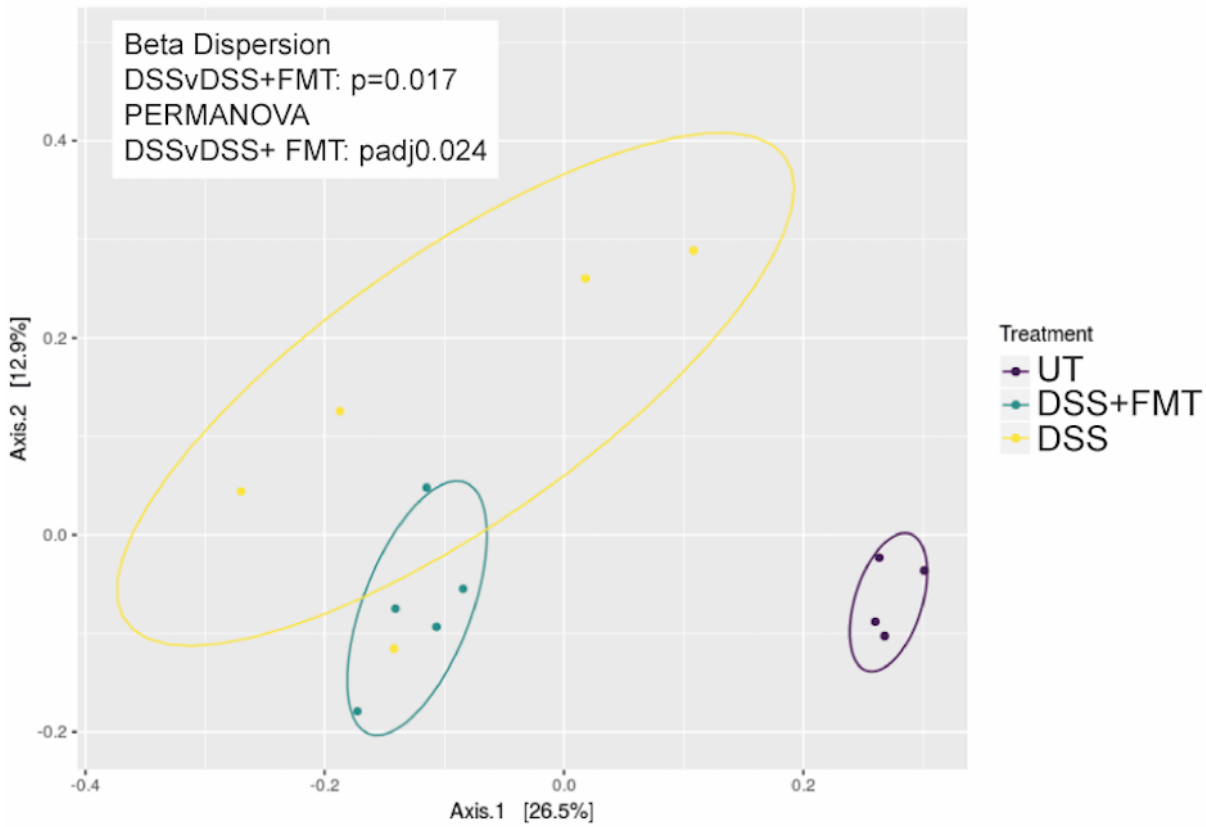


Legend:
□ Untreated
■ cDSS
■ cDSS+ FMT

P < 0.05 (*)

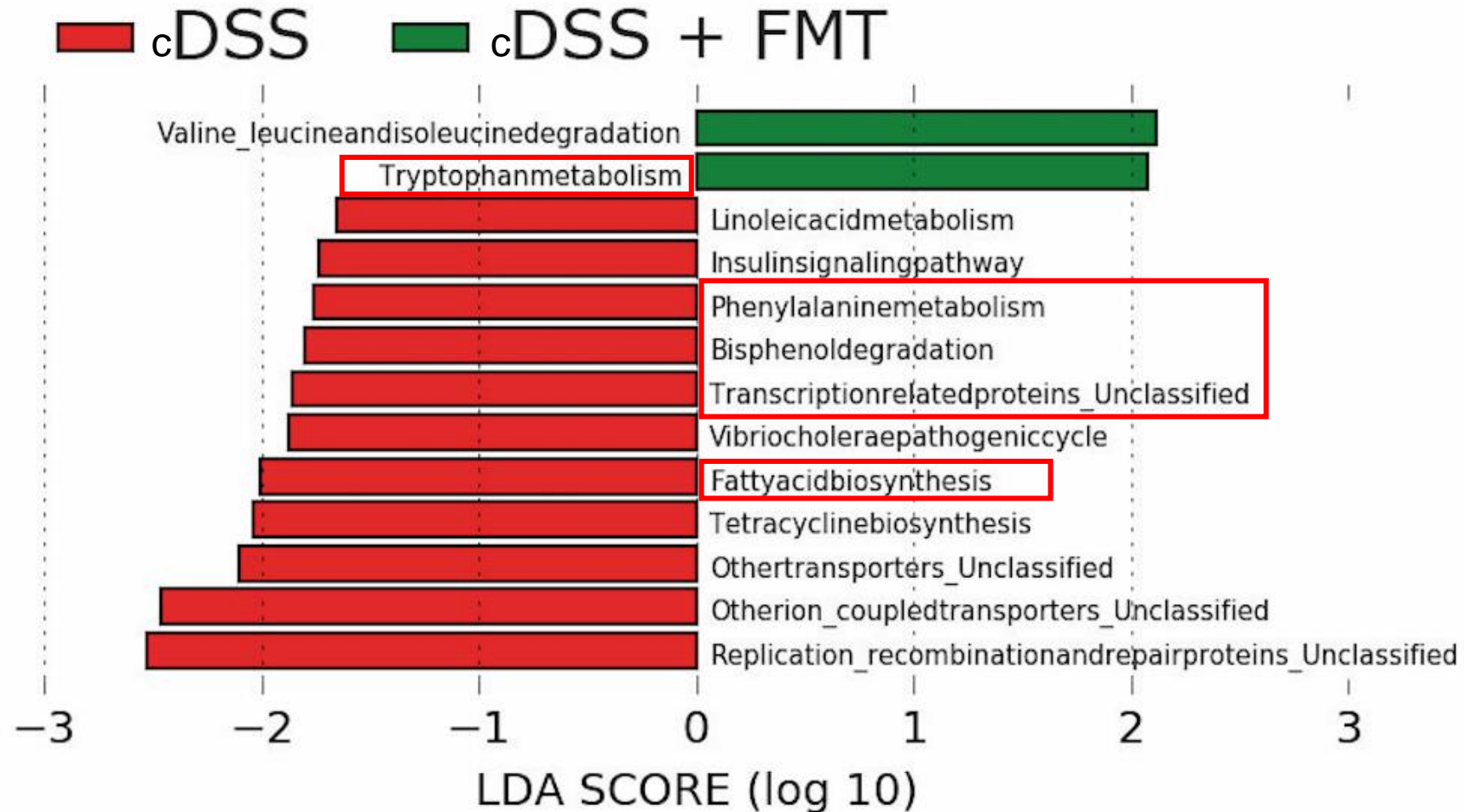


FMT restores normobiotic microbial ecologies.



$P < 0.05$ (*), $P < 0.01$ (**)

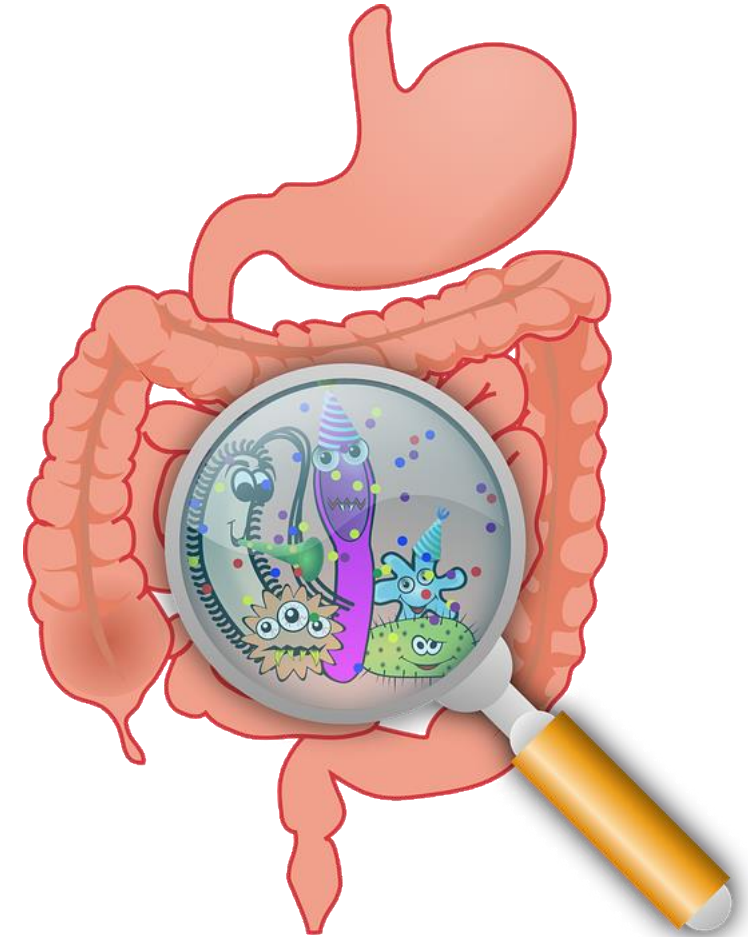
Several pathways associated with inflammatory responses and bacterial hyperproliferation were reduced in FMT-treated mice.



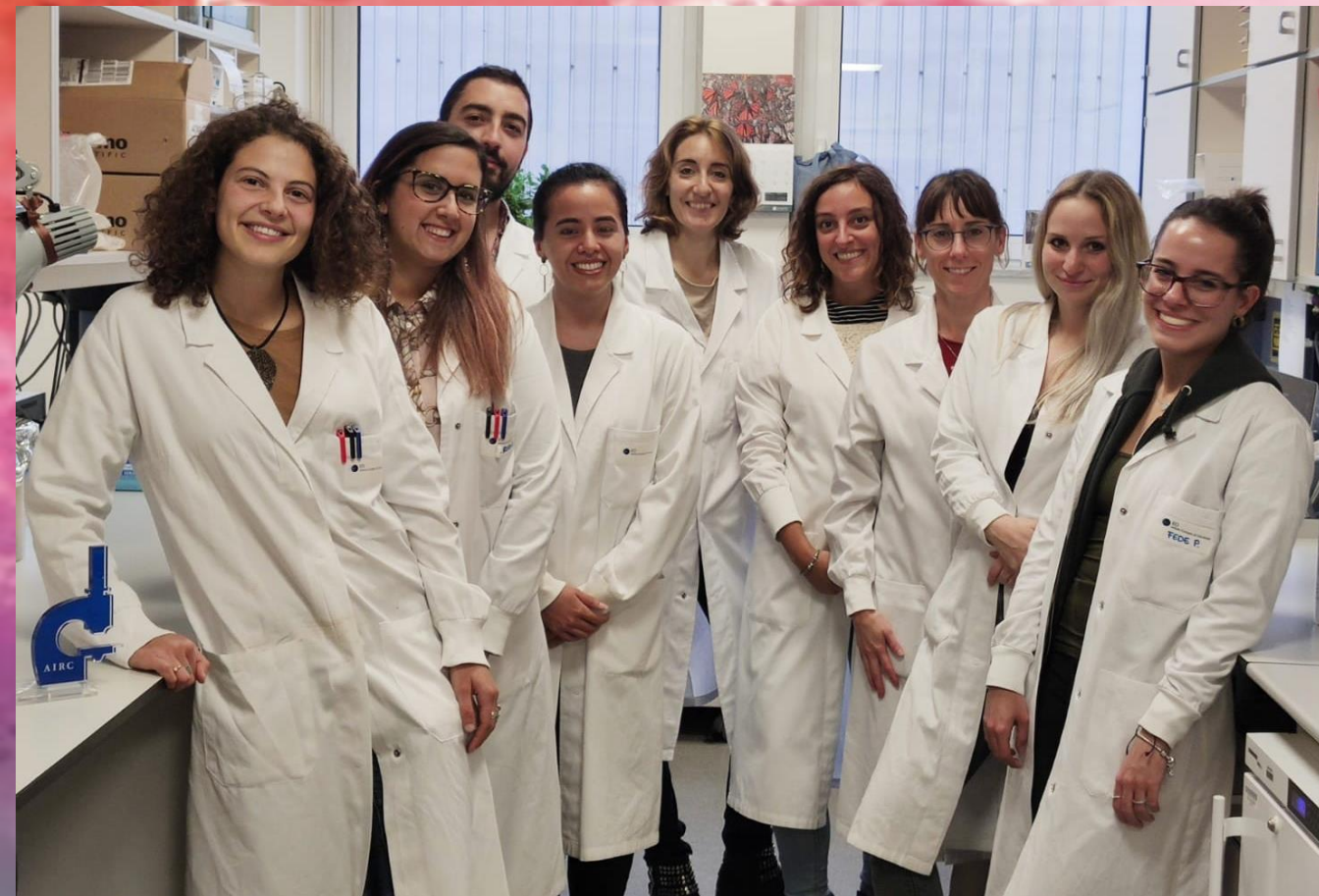
Conclusion

FMT modulates multiple immune pathways all aimed at the resolution of the inflammation.

- Proliferative capability of mucosal pathogenic T cell populations is decreased.
- Colonic T cell proinflammatory activity is regulated.
- Colonic protein level of homeostatic cytokine IL-10 is restored.
- Several pathways associated with bacterial hyperproliferation and inflammatory responses are reduced.



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Thanks for your attention