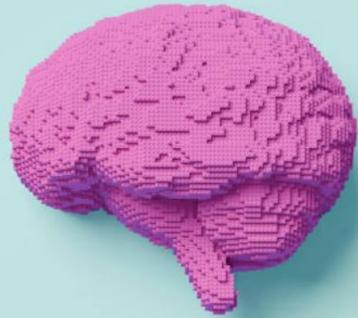


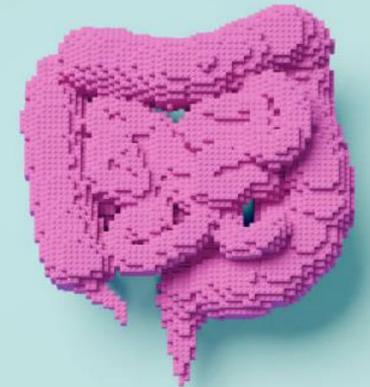
Fear and Starving in the Gut-Brain-Vagus: A Systematic Review of the Gut Microbiome and Metabolites in Anorexia Nervosa, PTSD, and Adversity Exposure

Rosiel Elwyn, Kita Williams, Bonnie Quigley, Christina Driver, Madeline West, Nikki Gunatilake, Taliah Prince, & Daniel Hermens, 2025



Introduction

Emerging evidence suggesting several shared neurobiological mechanisms between trauma and AN. Alterations in the gut microbiome and bacterial metabolites may be key neurobiological changes that confer AN risk. While gut microbiome dysregulation has been separately studied in AN, PTSD, and adversity, their distinct and overlapping profiles remain unclear. This systematic review consolidated research on gut microbiome and metabolite profiles in individuals with AN, PTSD, or exposure to adversity.



Methods

A systematic review was conducted, following PRISMA guidelines.

N=57 studies met criteria for inclusion

- AN = 33
- PTSD = 14
- Adversity = 10
- 1 study was both AN+adversity (childhood maltreatment)

Results

Unique and shared microbial and metabolite alterations were identified across groups.

AN & adversity exposure

- ↑ Proteobacteria
- ↓ Firmicutes (Bacillota)
- ↑ Clostridiales
- ↓ Ruminococcaceae

AN & PTSD

- ↔ Firmicutes (Bacillota), Bacteroidetes, Firmicutes (Bacillota)/Bacteroidetes ratio
- ↓ Actinobacteria
- ↓ Verrucomicrobia
- ↓ Lachnospiraceae

PTSD & adversity exposure

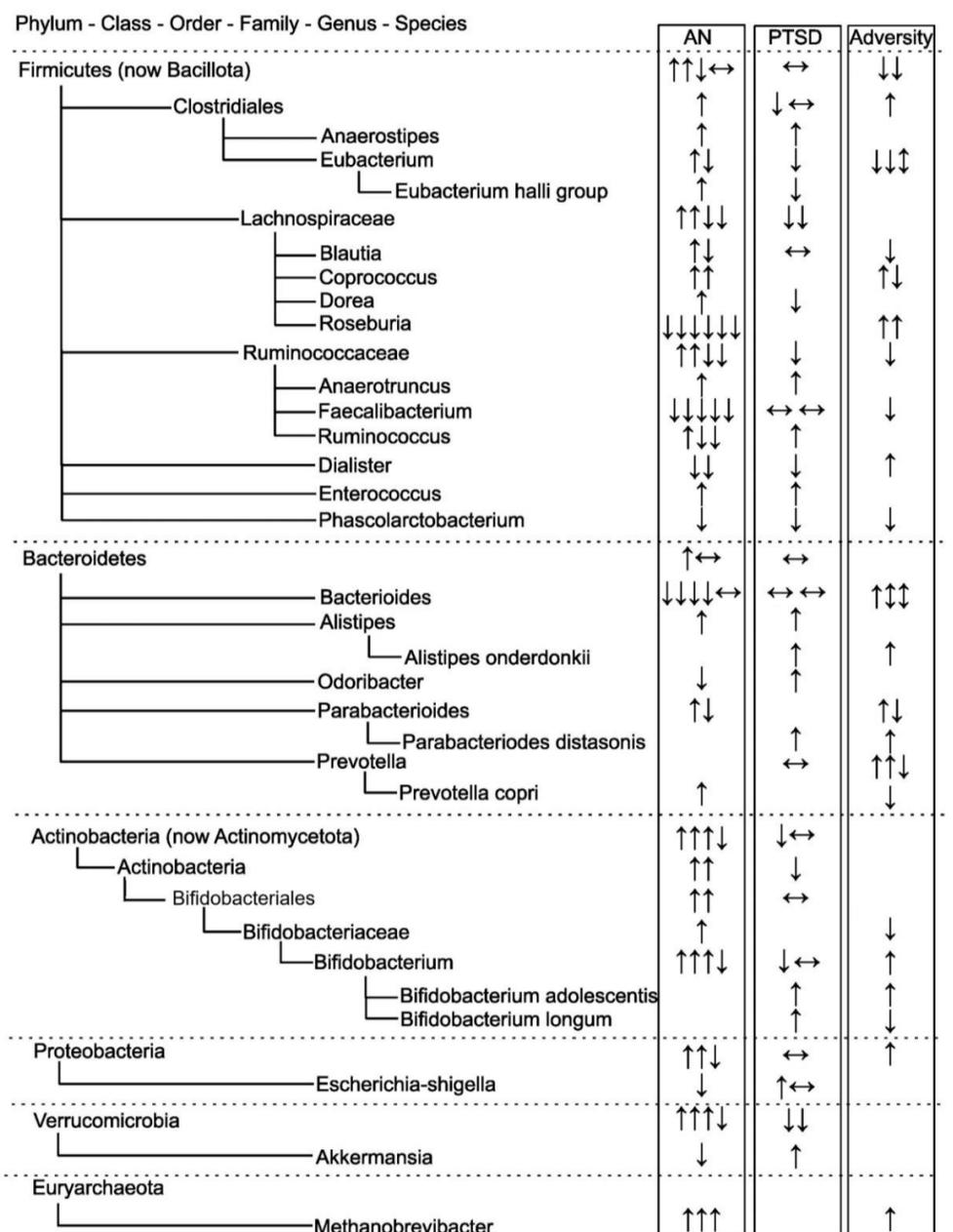
- ↑ *Alistipes onderdonkii*, *Bifidobacterium adolescentis*, *Parabacteroides distasonis*
- ↓ Bifidobacteriaceae

AN, PTSD, & adversity exposure

- ↓ *Phascolarctobacterium*
- Unique faecal metabolites
- Decreased butyric acid found in AN and adversity with childhood maltreatment

Contact

Email: Rosiel.Elwyn@research.usc.edu.au
 Research Gate: <https://www.researchgate.net/profile/Rosiel-Elwyn-2>



Conclusion

Gut microbiome composition varied according to taxonomic level and may depend on factors such as illness severity and type of trauma or adversity exposure. Similar alterations in key taxa between AN and PTSD, or AN and adversity suggest potential shared gut-brain pathways linking trauma-related biology and AN vulnerability. Identification of a distinct gut microbial profile in AN and PTSD aetiology may be important for future research and in the development of individualised treatment, such as informing future research into the physical health of people with PTSD and AN, given the role of the gut microbiome in neurotransmitter and cognitive function and metabolic health.