

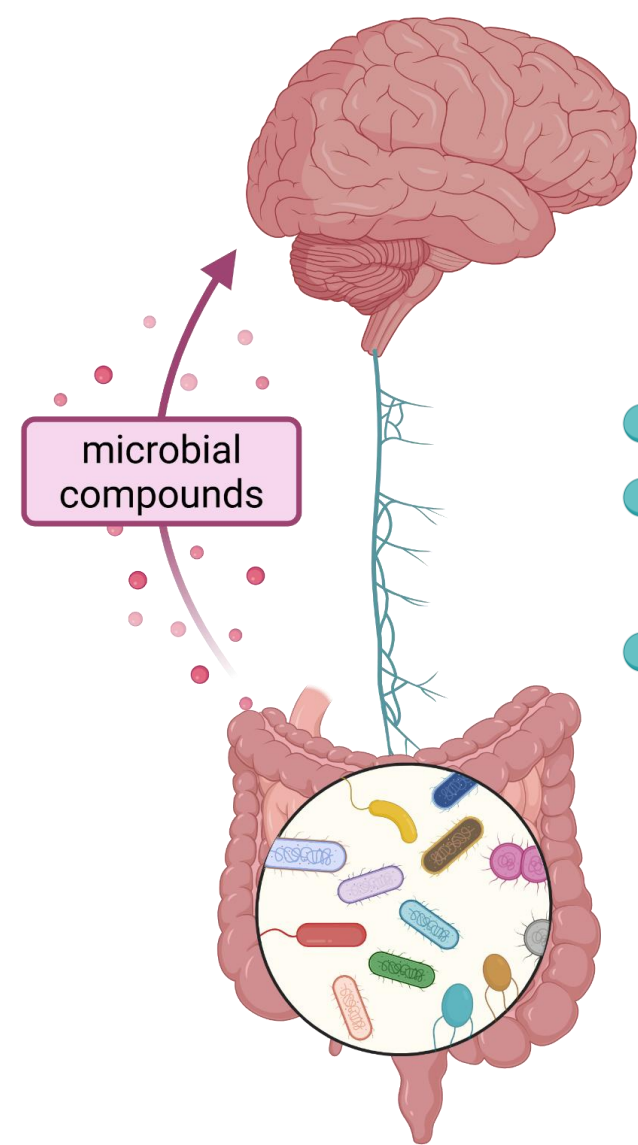
Psychotropic medications selectively reshape the composition and neuroactive metabolite landscape of the human gut microbiome

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Context



The gut microbiome and the brain

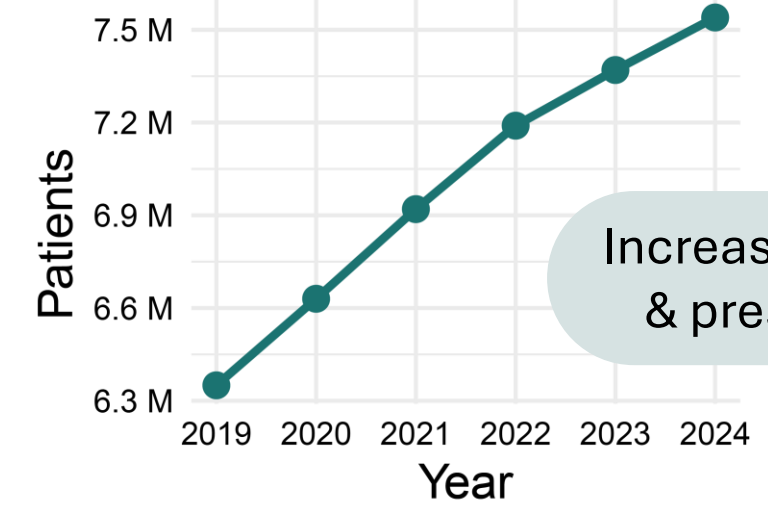
- ~ 40 trillion microbes
- ~ 500-1,000 unique bacterial species
- This diverse microbiome communicates with the brain via the microbiome-gut-brain-axis¹



Psychotropic medications and the gut microbiome

- Psychotropics target the brain
- Can reach the colon and target gut microbes²
- Drug-microbe interactions remain poorly understood

Why should we study these interactions?



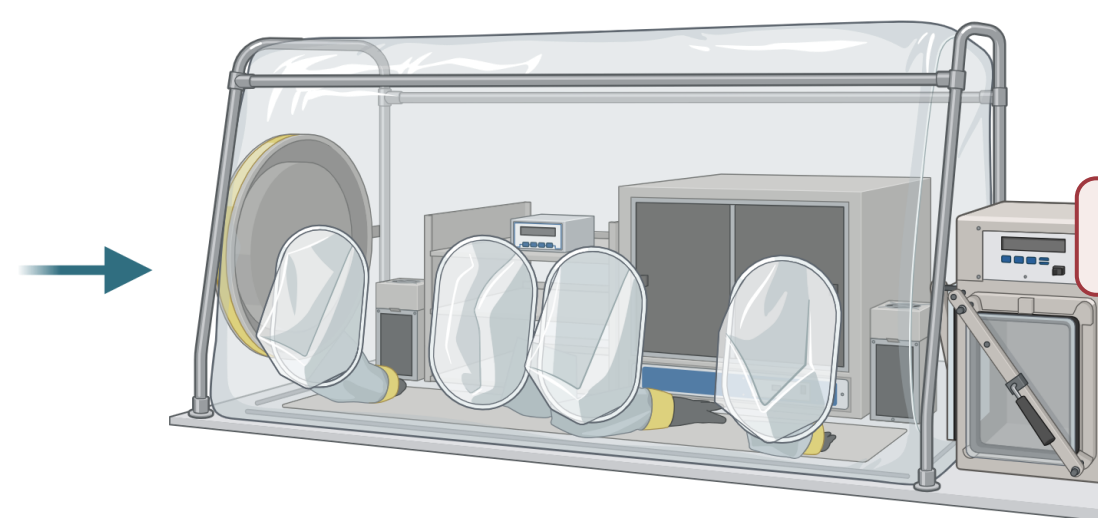
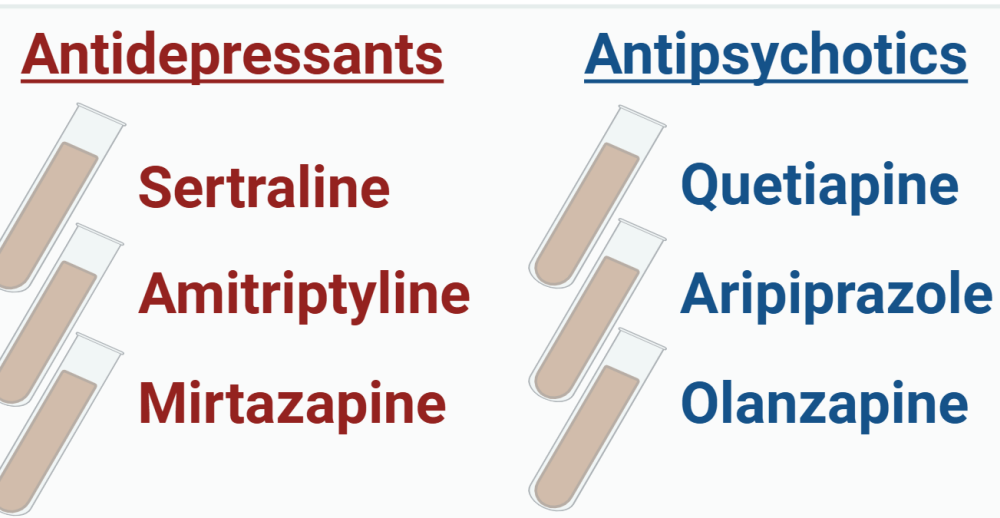
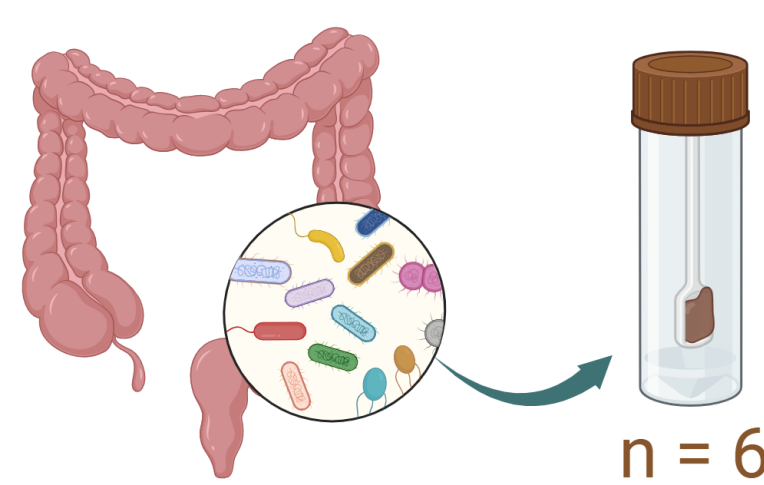
Increase in patients & prescriptions³

- 1/3 patients do not respond to drug!⁴
- Gastrointestinal side effects⁵
- Is microbiome involved?
- Understanding these interactions could benefit patients in the future

Hypothesis: The efficacy and/or side effects of psychotropics can be partially attributed to interactions with the gut microbiome

How did we test it?

Human faecal samples (gut microbiome proxy) were incubated with psychotropic drugs

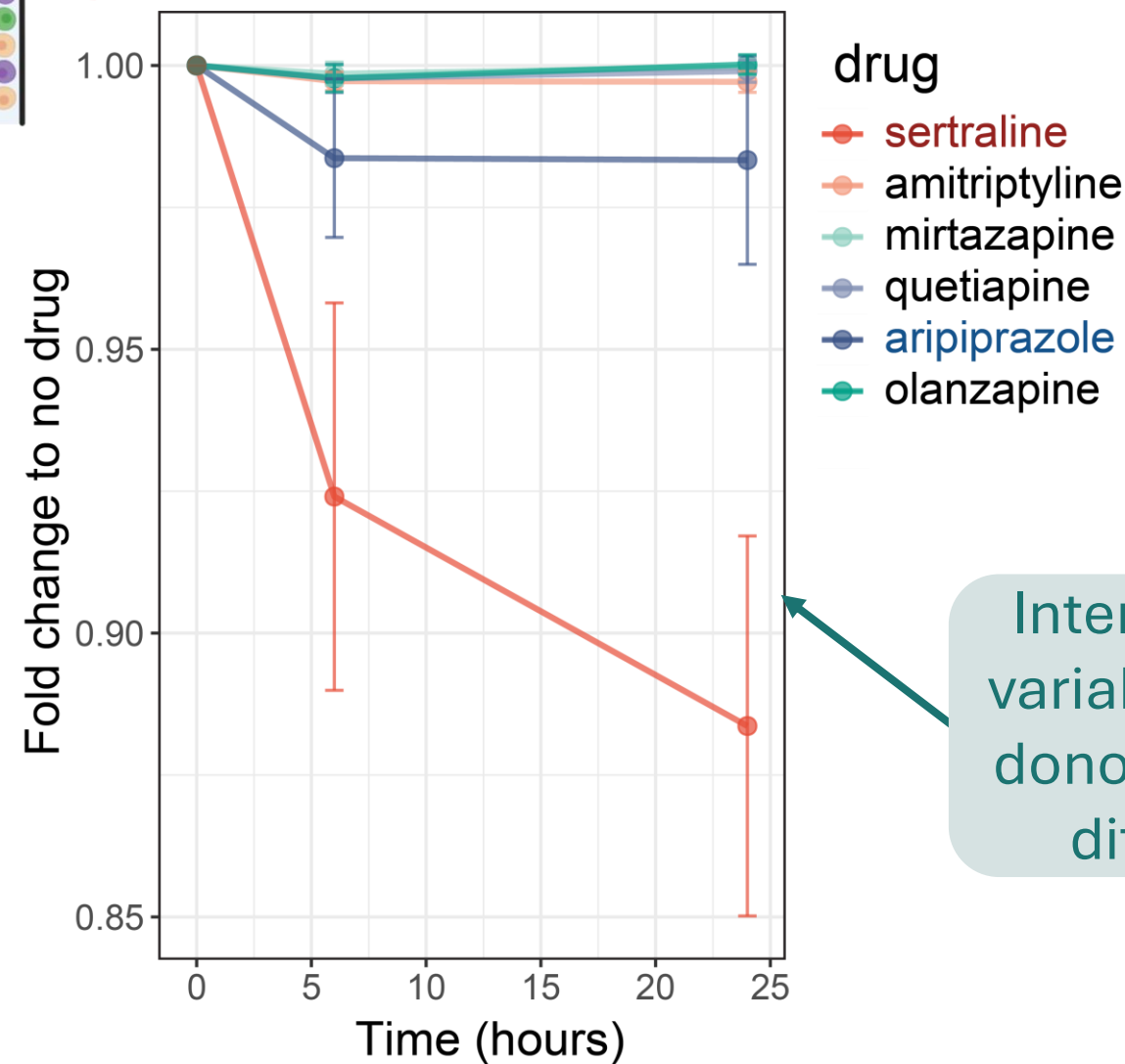


Key Questions:

- Are the drugs antimicrobial?
- Do they change microbiome structure?
- Is production of neuroprotective compounds affected?

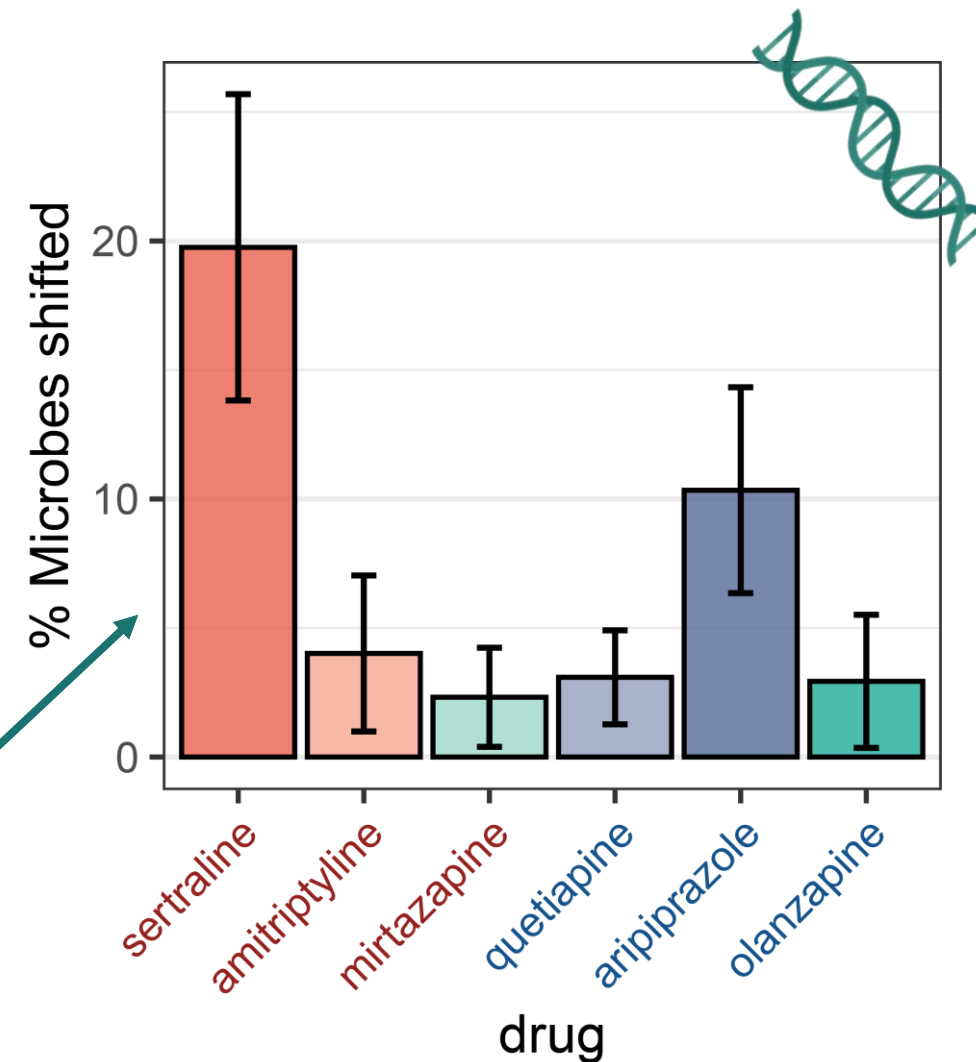
What did we find?

1. Some psychotropics had strong antimicrobial effect



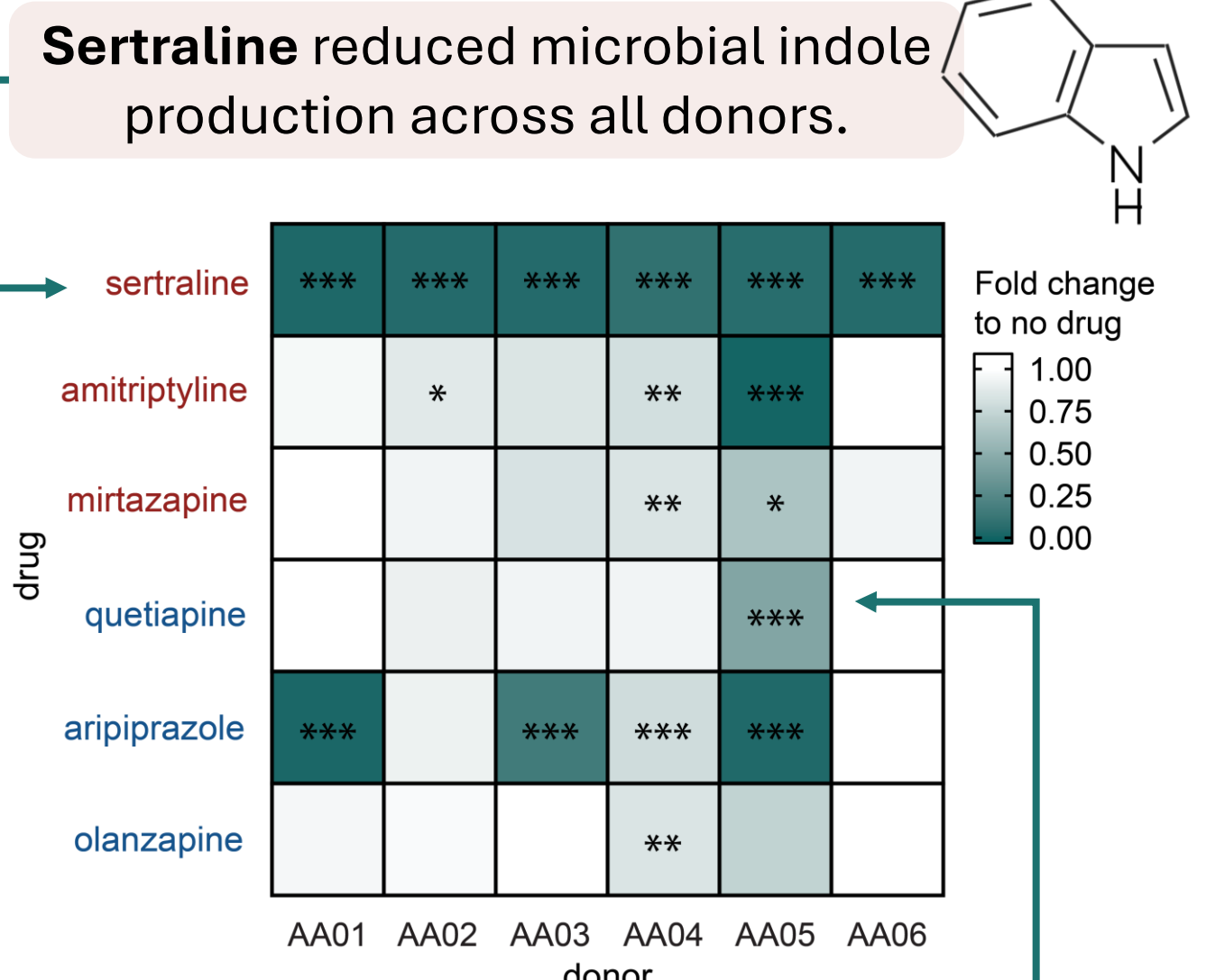
Interindividual variability: every donor responds differently

2. Psychotropics altered microbiome structure



Of all the drugs tested, **sertraline** drove the largest shift in the gut microbiome, followed by **aripiprazole**.

3. Psychotropics reduced neuroprotective indole production

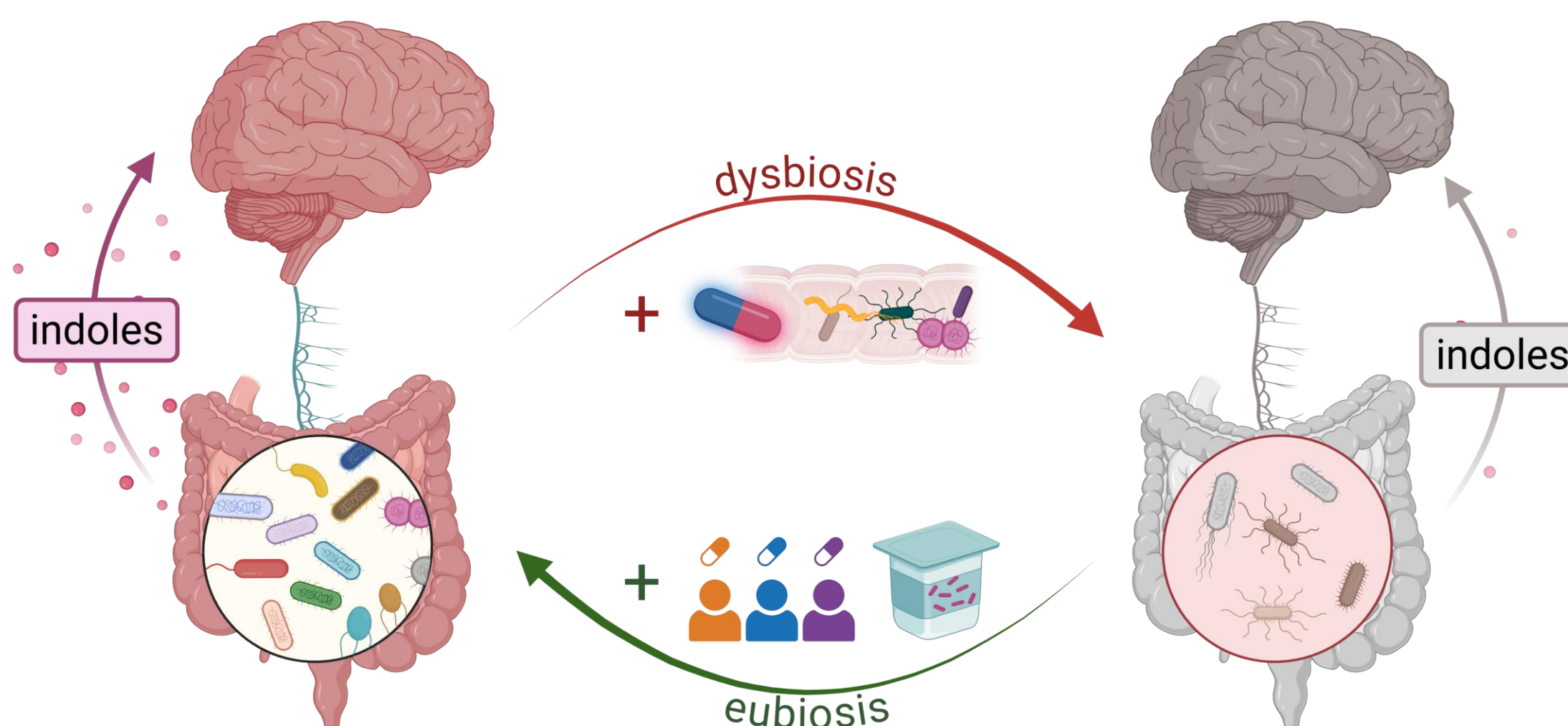


Other drugs also reduced indoles! This was more donor dependent.

Sertraline and **aripiprazole** decreased total microbial counts potentially causing an imbalance in the gut microbiome (dysbiosis).

Conclusions and Implications

Interactions between sertraline/aripiprazole and the gut microbiome may **counteract** their efficacy and **contribute to side effects**



Microbiome targeted interventions (e.g. probiotics) or **personalised prescriptions** may improve treatment outcomes and mitigate drug-associated side effects.