

# EFFECTS OF 3-WEEK TRIBUTYRIN SUPPLEMENTATION ON THE GUT MICROBIOME: A PILOT STUDY

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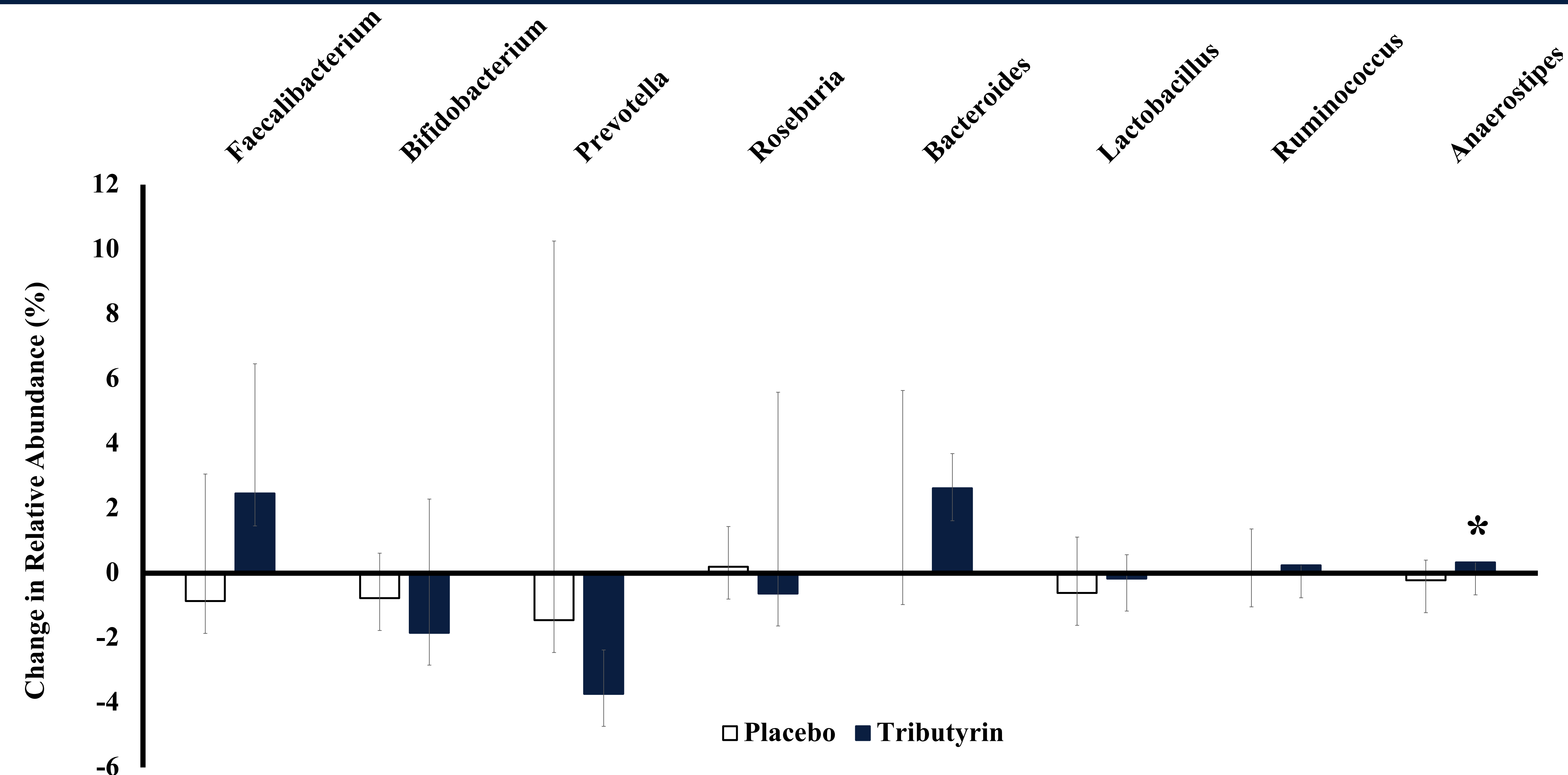
## ABSTRACT

**BACKGROUND:** Butyrate is a short chain fatty acid synthesized via the fermentation of non-digestible fiber by bacteria in the colon that serves many important roles within the gut. Tributyrin, a butyrate prodrug, has been proven to overcome the pharmacokinetic drawbacks of butyrate with potential health benefits. To our knowledge, the present study was the first to explore the microbial implications of tributyrin supplementation in human subjects. **METHODS:** Thirty-two healthy individuals (29±10 yrs; 15 females) were randomized to receive either 300mg tributyrin or a placebo (cellulose) pill for 21 days. Gut microbiota composition was assessed via 16S rRNA sequencing in stool samples collected <24 hours before and after beginning and ending the assigned treatment, respectively. Changes in macro-level community structure and butyrate producing genera were comparatively explored based on the hypothesis of a tributyrin-mediated upregulation of butyrate-producing bacteria. **RESULTS:** Taxonomic richness, computed as Shannon’s H-Index, was comparable (P>0.05) between tributyrin (1.97±0.25) and placebo (1.85±0.33) groups at baseline, as was Firmicutes/Bacteroidetes ratio (tributyrin = 1.18±0.73 vs. placebo = 1.46±0.59; P>0.05). Following the treatment period, no between group differences were observed for changes in diversity (P=0.48) or F/B ratio (P=0.73). At the genus level, increases in Anaerostipes relative abundance were significantly greater (P<0.05) in tributyrin (+44%) vs. placebo (-24%). Faecalibacterium relative abundance increased in the tributyrin group (+20.1%; P<0.05), but this change was not statistically significant when compared to the placebo group (P=0.14). **CONCLUSION:** Short-term tributyrin supplementation appears to modify micro- but not macro-level microbial community structure with potential implications for increasing butyrate production.

## PURPOSE

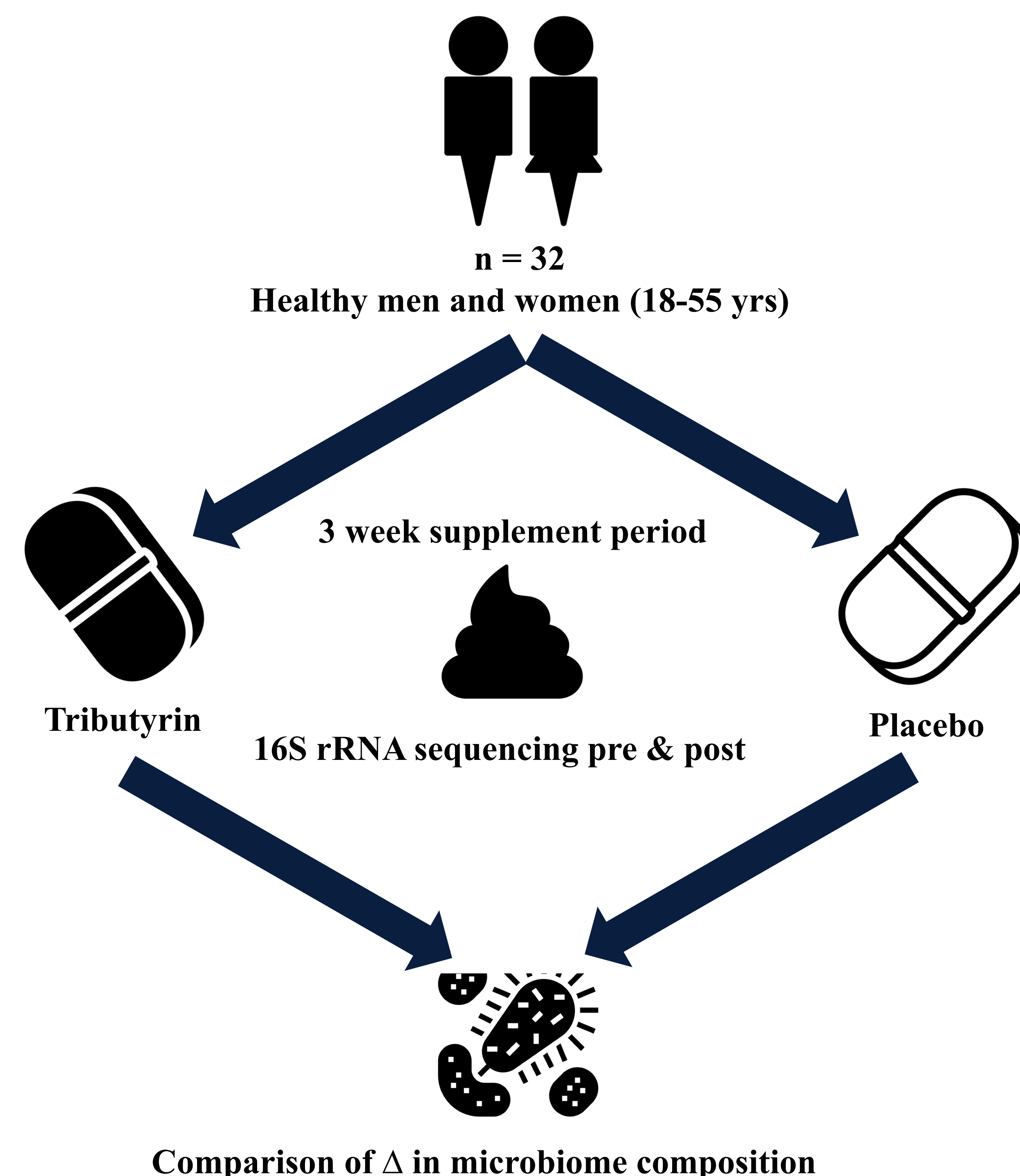
- Gut microbiota metabolites are emerging as a salient contributor to health and wellness
- The microbial metabolite butyrate is suggested to confer a variety of positive health benefits
- We explored the microbial implications of supplementing with the butyrate prodrug, tributyrin, which is proven to overcome the pharmacokinetic drawbacks of butyrate supplementation

## RESULTS

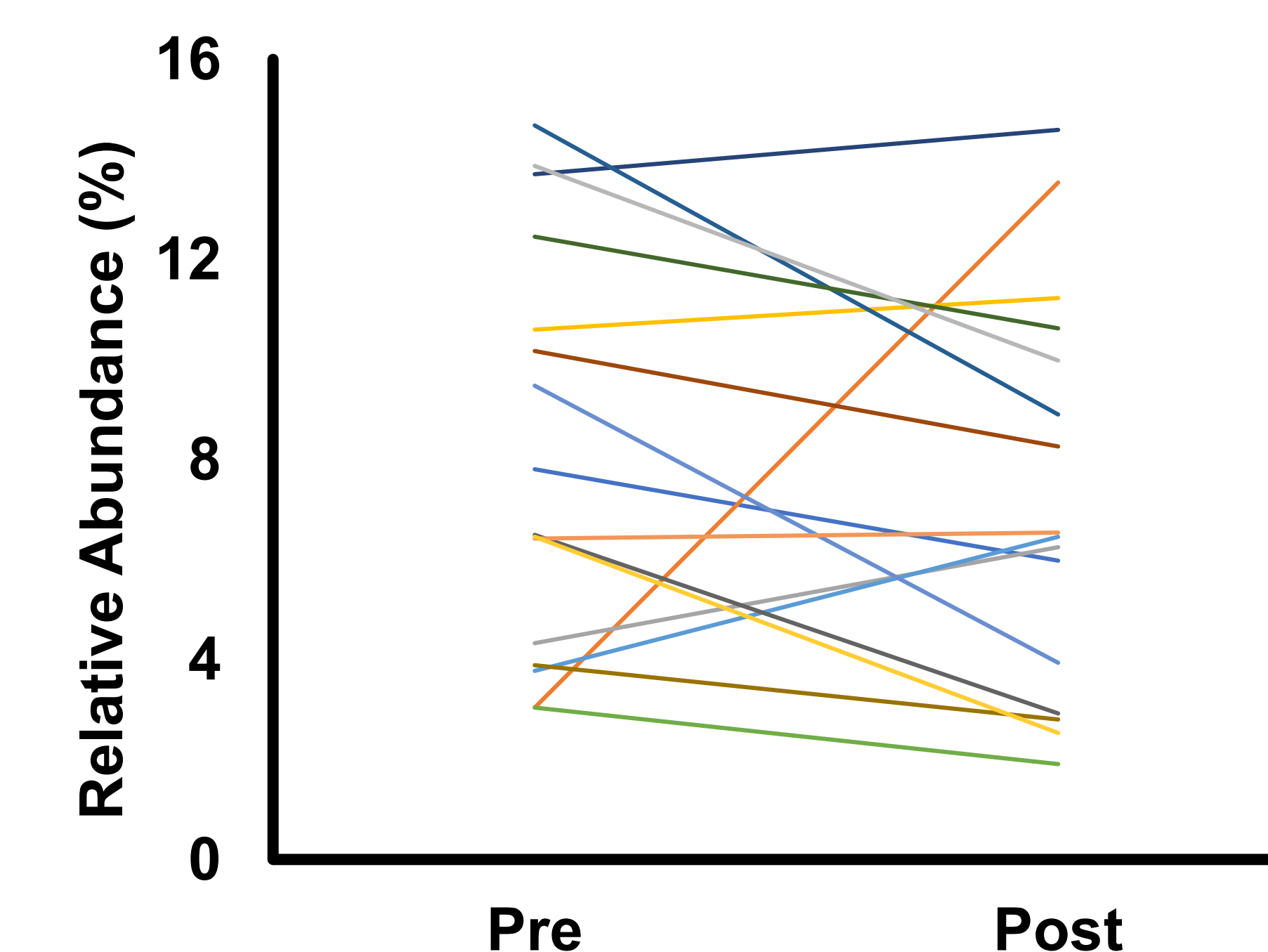


Change in relative abundance of butyrate-associated genera in placebo and tributyrin groups

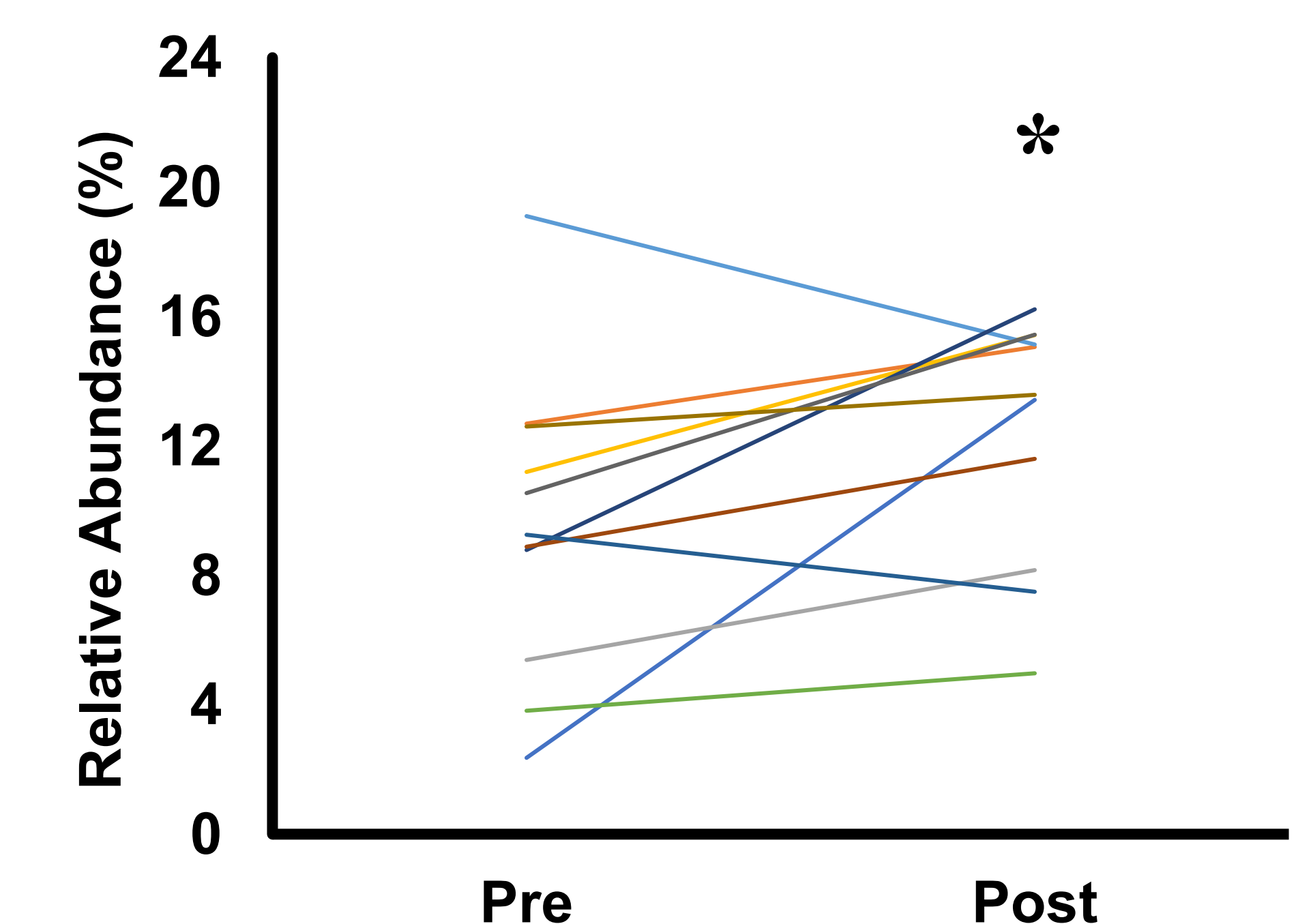
## METHODS



### Placebo



### Tributyrin



Change in Faecalibacterium  
\*P<0.05 vs. Pre

## CONCLUSIONS

- Relatively short-term tributyrin supplementation appears to modify micro-level gut microbial community structure with potential implications for increasing butyrate production