

Burkholderiaceae abundance is associated with cognitive symptoms in women receiving chemotherapy for breast cancer: pilot results of the predict study

Courtney Subramaniam* ^{1,2}, Marc Gladman ¹, Joanne Bowen ¹, Hannah Wardill ^{1,2}

School of Biomedicine, Adelaide Medical School, University of Adelaide, South Australia, Australia

¹) Supportive Oncology Research Group, Precision Medicine (Cancer), South Australian Health and Medical Research Institute (SAHMRI), University of Adelaide, South Australia, Australia

Introduction

- Chemotherapy-induced cognitive impairment has been consistently identified as a priority concern by people living with and beyond cancer and is thought to develop due to neuroinflammatory processes¹
- The gut microbiota plays a pivotal role in shaping our immune system and neuroinflammation as well as cognitive symptom development in other diseases²
- Despite this, whether the microbiota plays a role in the development of chemotherapy-induced cognitive impairment remains unknown

?

Are there differences in microbiota composition in women with breast cancer, with and without cognitive impairment

- We aimed to characterise the gut microbiota composition during chemotherapy treatment and identify microbial features associated with cognitive symptoms

Methods

Diagnosis → Recruitment → Consent → 1st two cycles of chemotherapy

N=82 stool samples collected with time matched data on chemobrain (FACT-Cog) from newly diagnosed patients with breast cancer

Stool samples categorised as those from patients with chemobrain (FACT-Cog <106, N=21) and without chemobrain (FACT-Cog >106 N=51)

Stool samples analysed using 16S sequencing, comparisons performed between patient groups using PERMANOVA & LEfSe

Acknowledgements & References

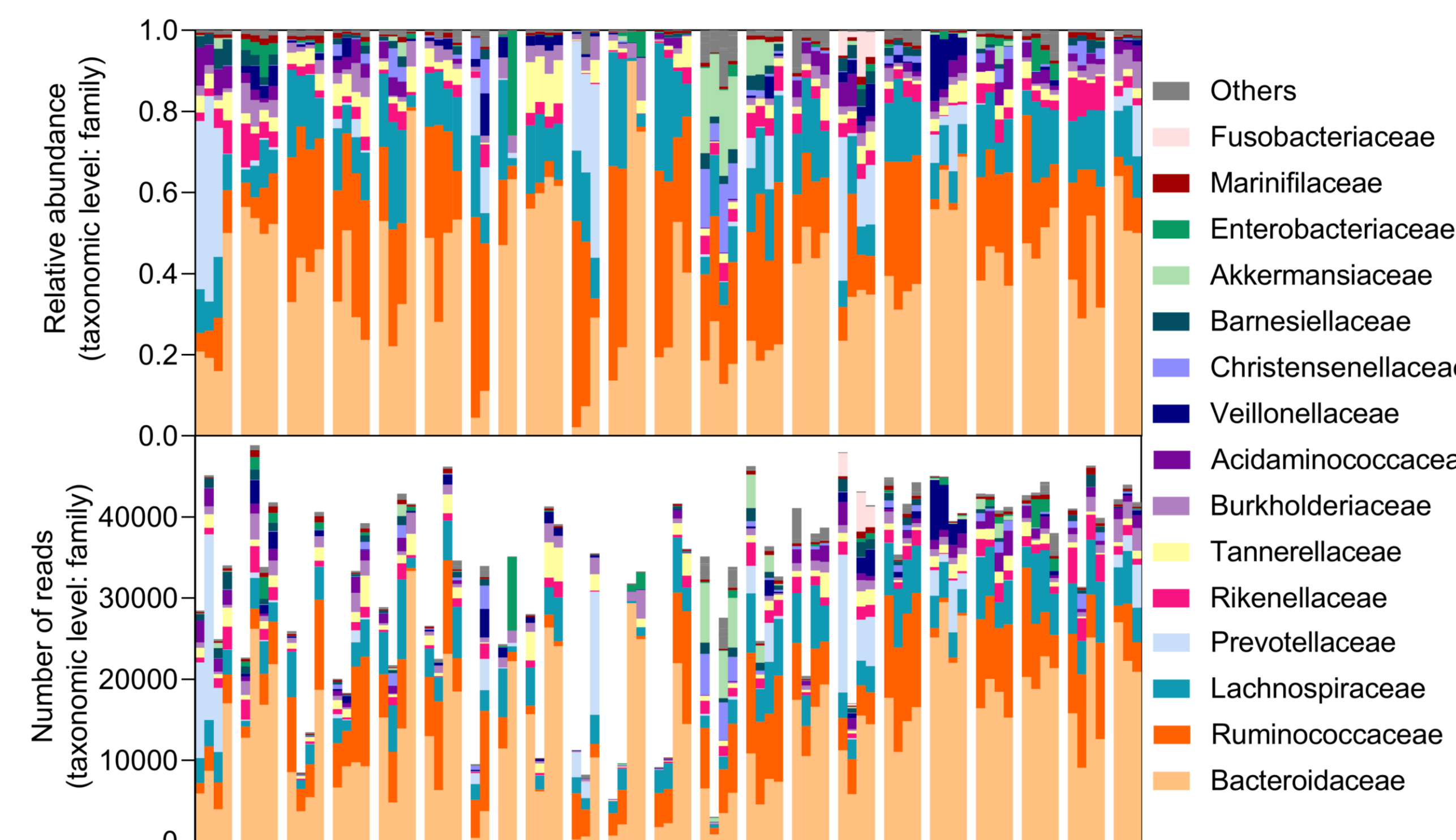
This research was funded by The Hospital Research Foundation Group and the National Health and Medical Research Council (NHMRC).

- Santos & Pyter (2018). *Front Immunol*, vol.9
- Cryan et al. (2019). *Physiol Rev*, vol.99(4)

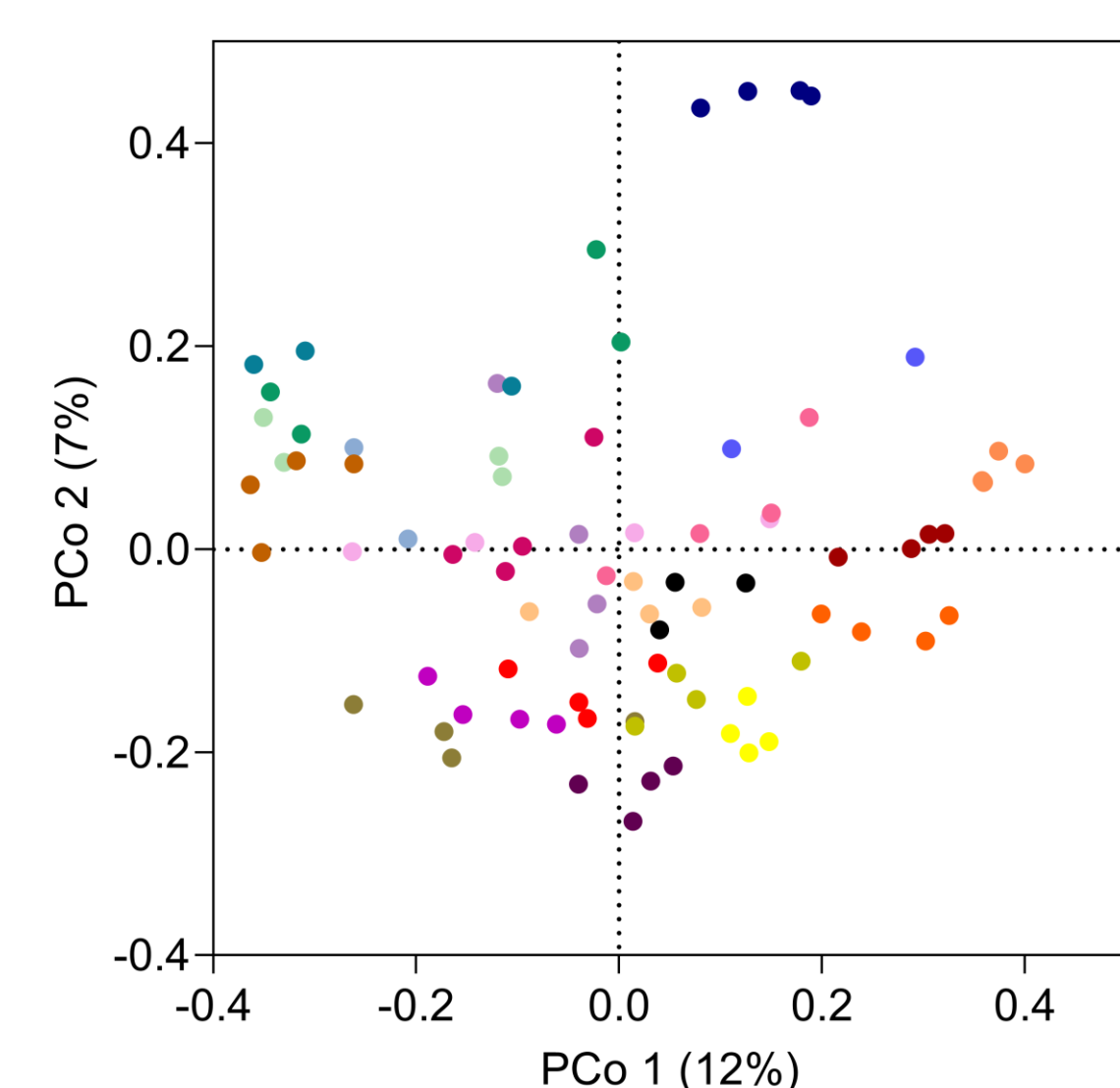
Results

There is a significant difference in microbiota composition between women with breast cancer, with and without cognitive impairment

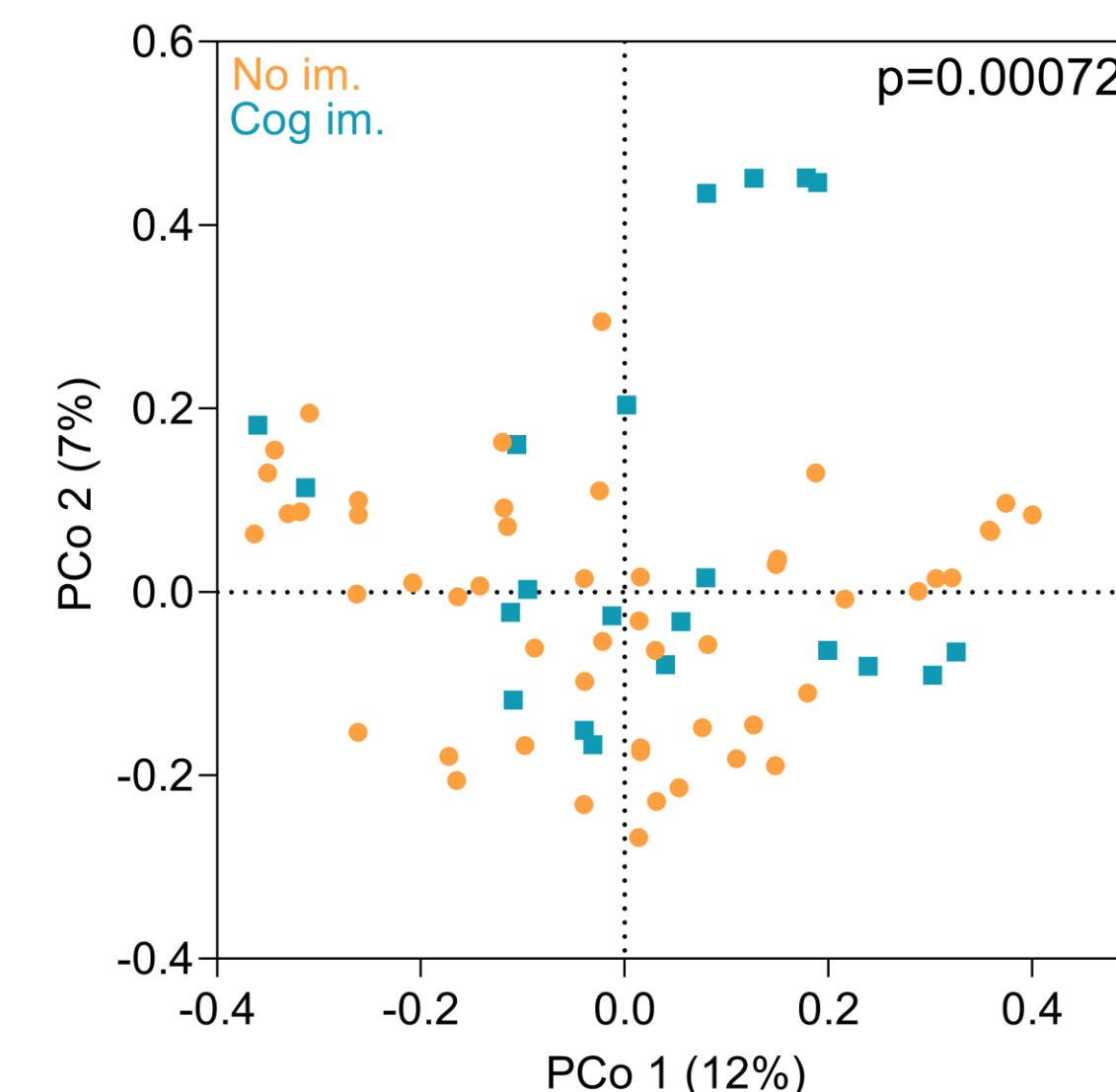
a) Relative & raw abundance of individual samples



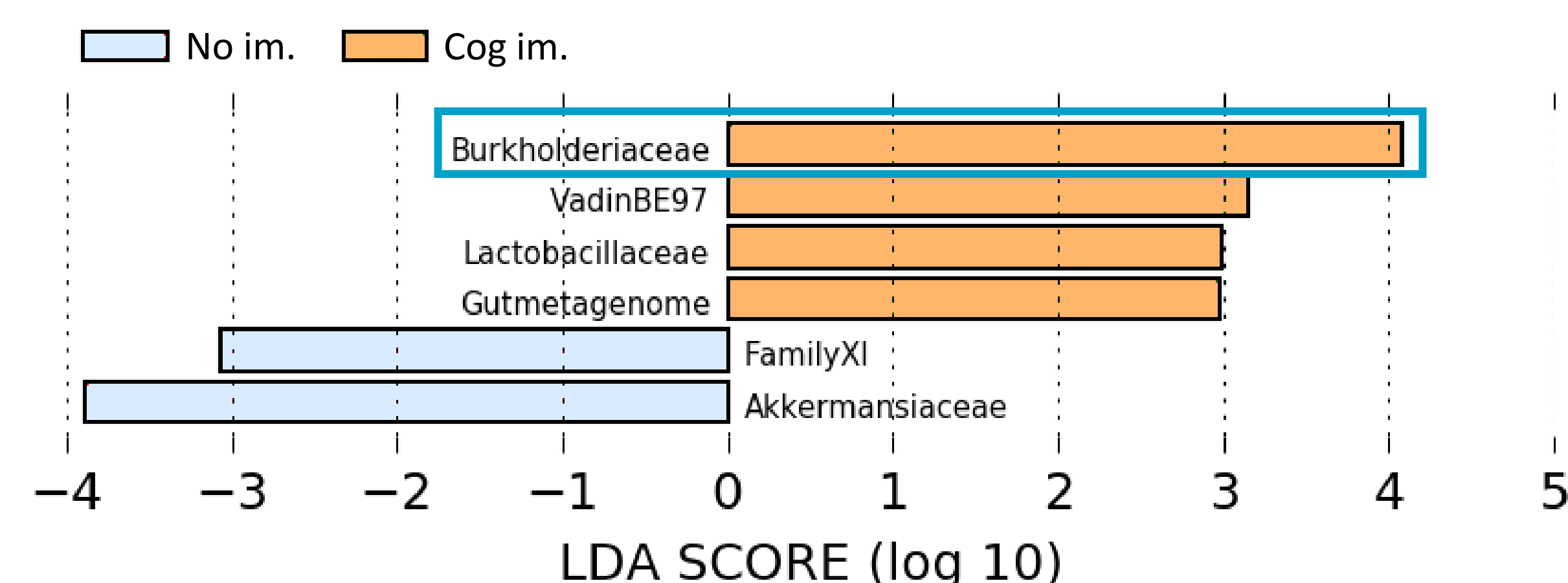
b) Individual Principal component analysis



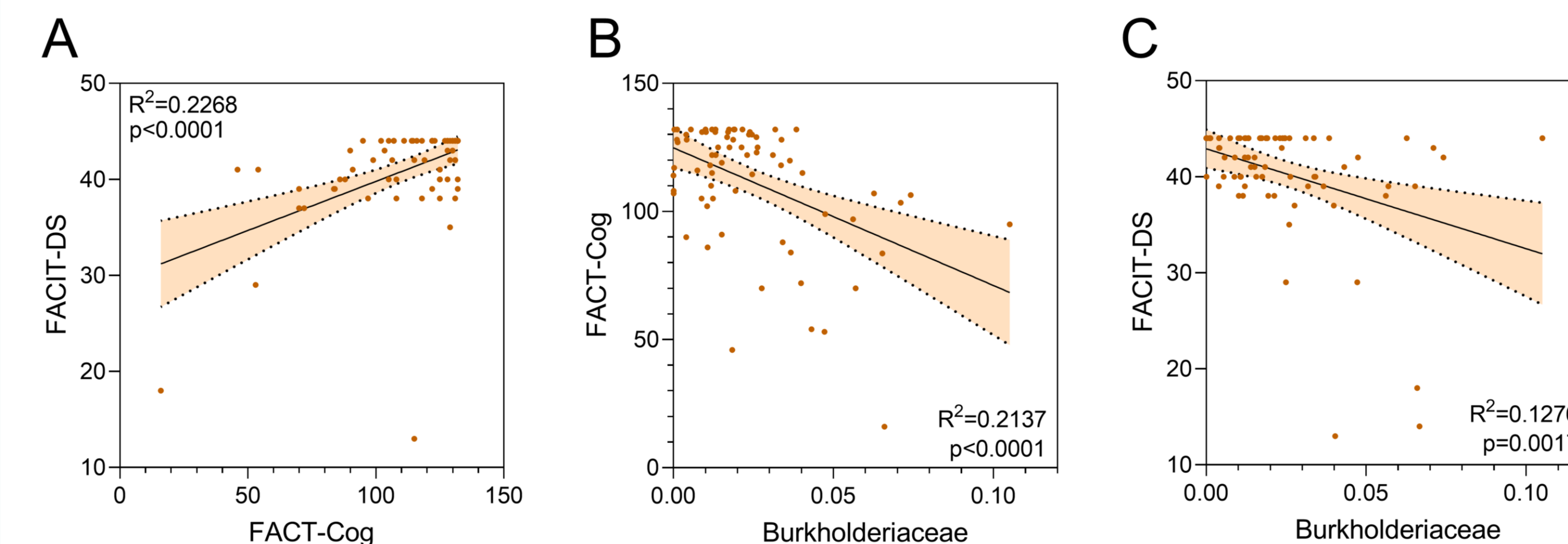
c) Grouped Principal component analysis



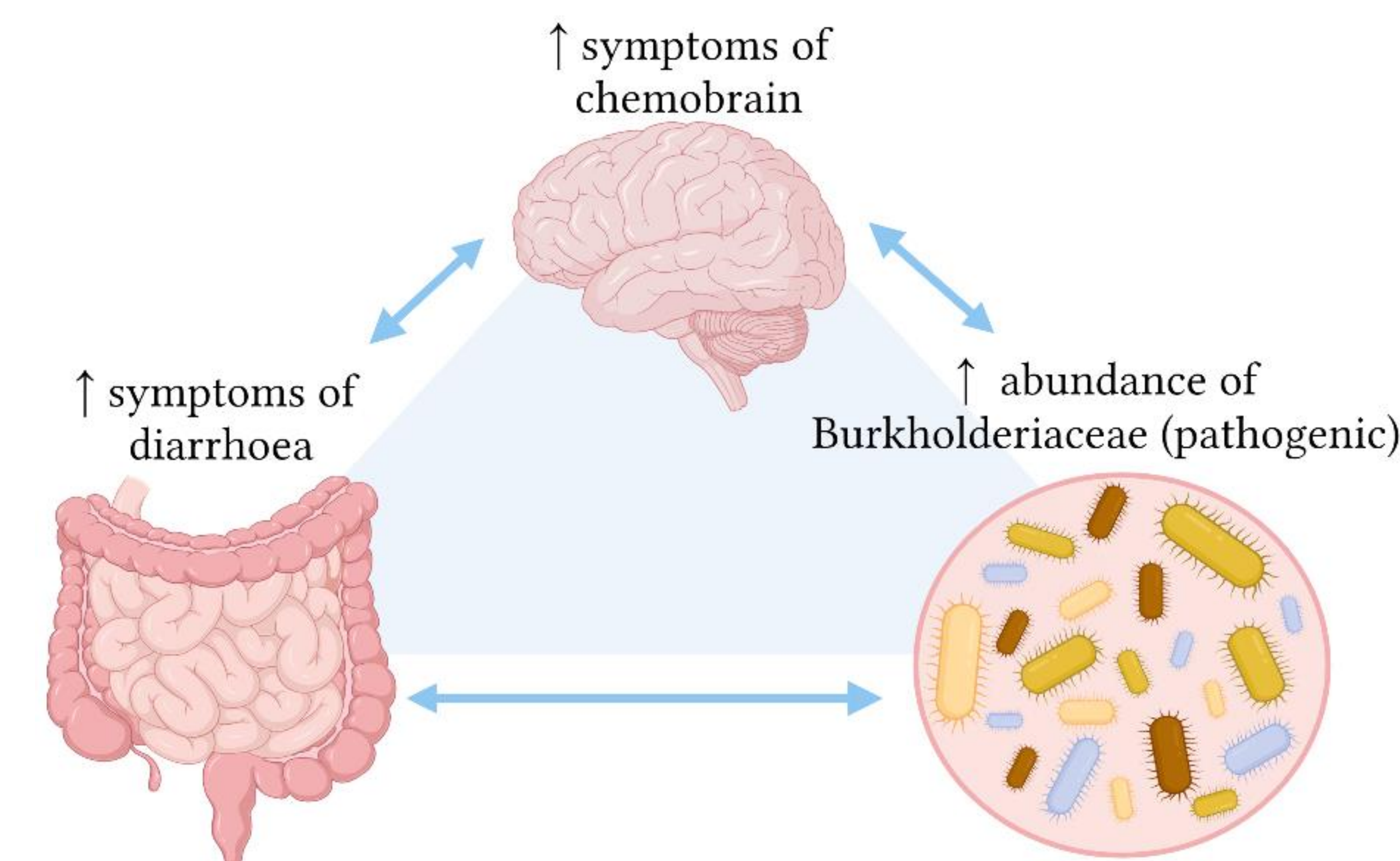
Burkholderiaceae abundance is increased 4-fold in women with breast cancer, with cognitive impairment



Burkholderiaceae abundance correlates with cognitive impairment (FACT-Cog score) and diarrhoea burden (FACIT-DS score)

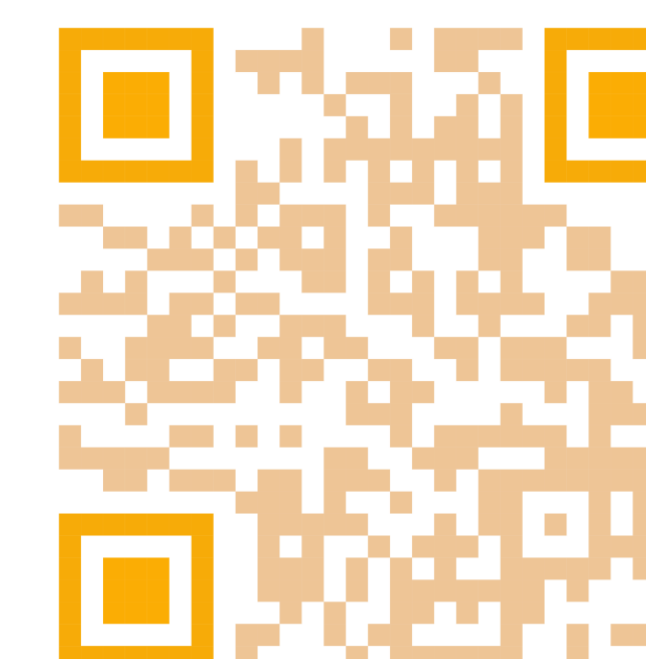


Triad of events co-occur following chemotherapy that highlight the microbiota as a potential therapeutic target for gut and neurotoxicity



Conclusions

Want to connect?
@CourtneyCross_1



- Burkholderiaceae abundance is significantly associated with the severity of cognitive symptoms and diarrhoea burden, positioning this microbial family as a therapeutic target for both chemotherapy-induced gastrointestinal toxicity and cognitive impairment.