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Chronic exposure to antiseizure drugs impacts the gut microbiota community and function.

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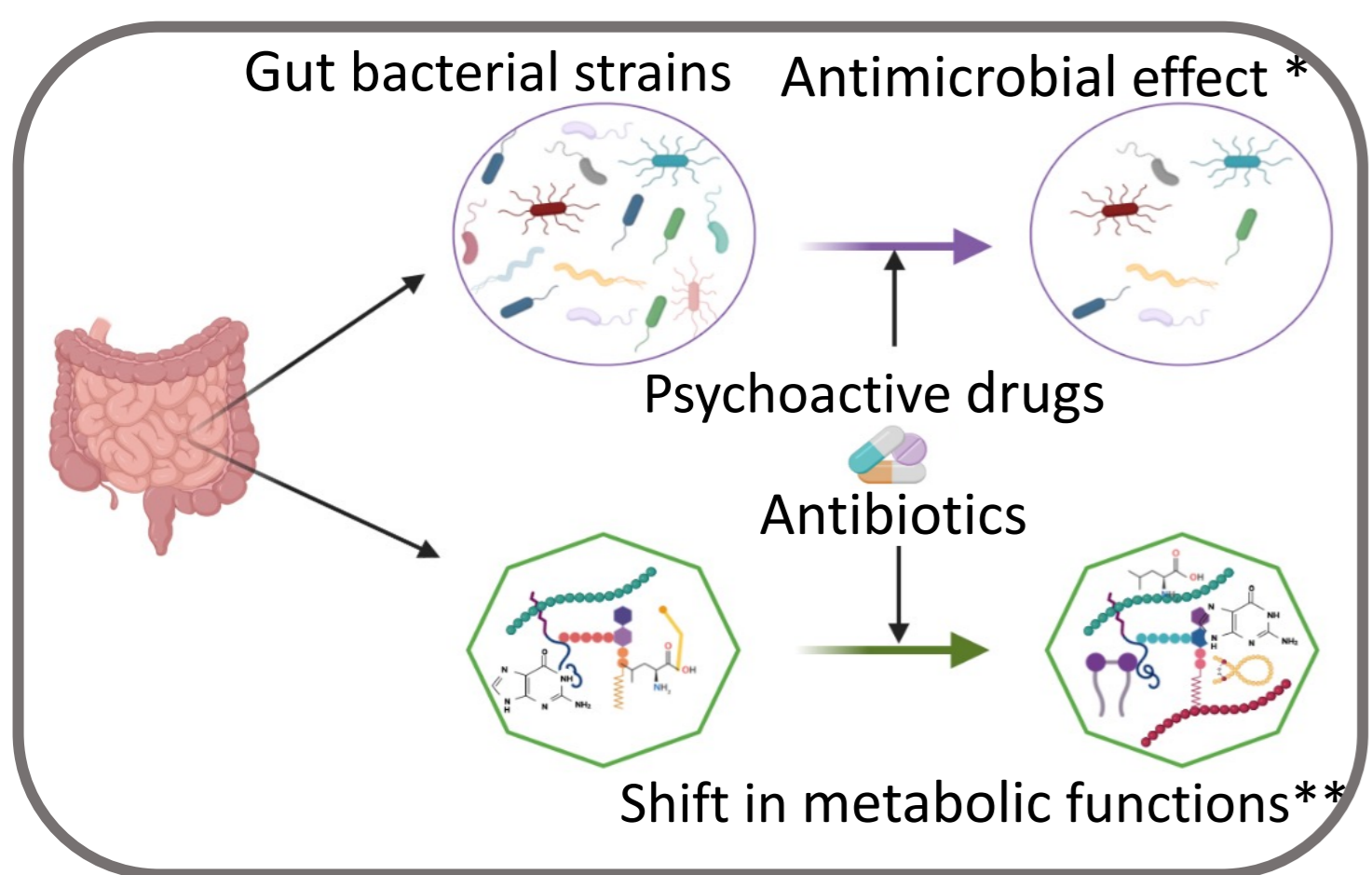
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Chronic exposure to antiseizure drugs impacts the gut microbiota community and function

Background

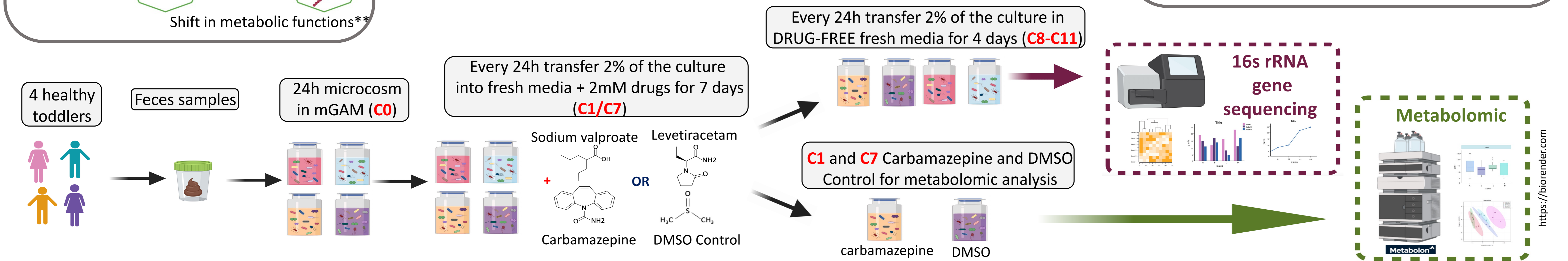


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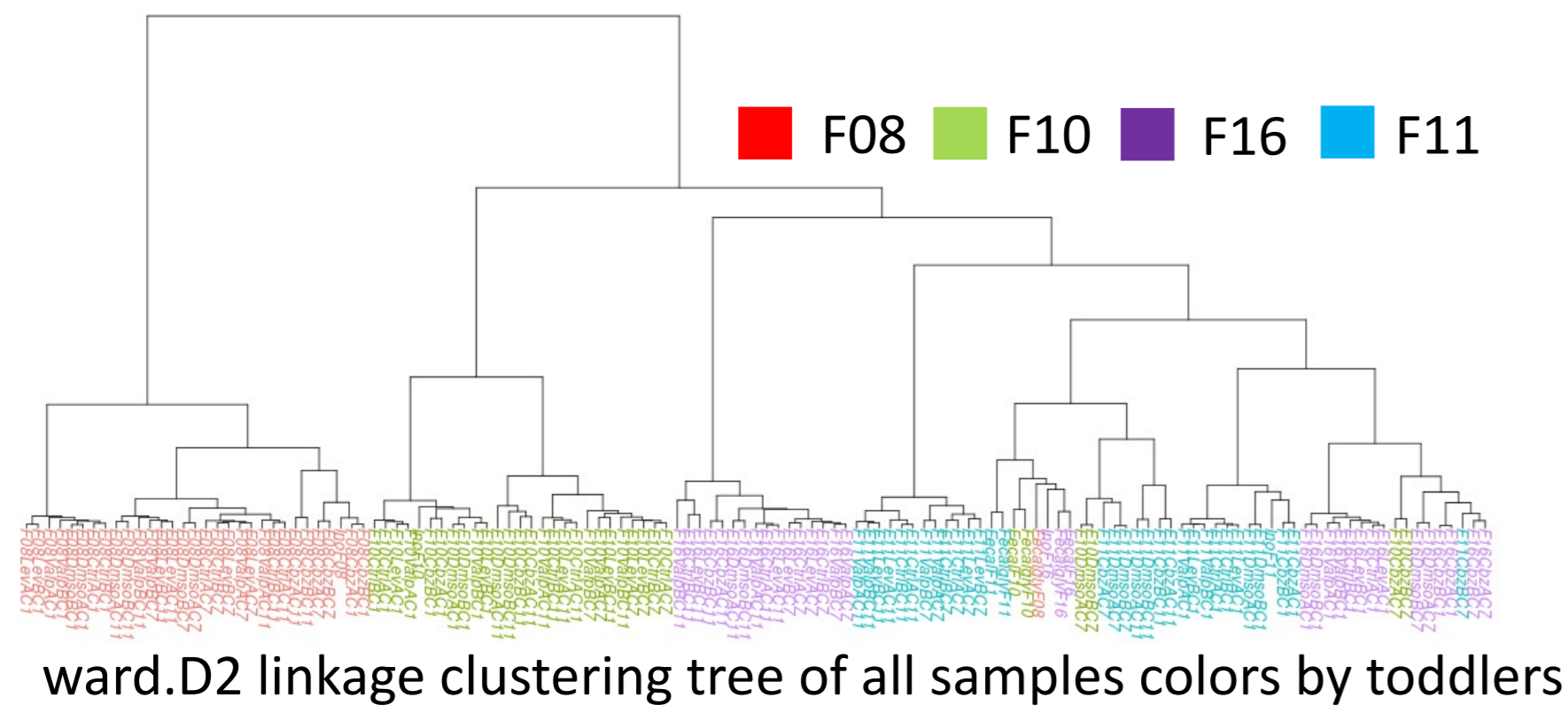
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➤ How does chronic exposure to antiseizure drugs (carbamazepine, sodium valproate, and levetiracetam) impact gut bacterial communities and their metabolic functions?



Shift in the gut microbiome due to chronic antiseizure drugs

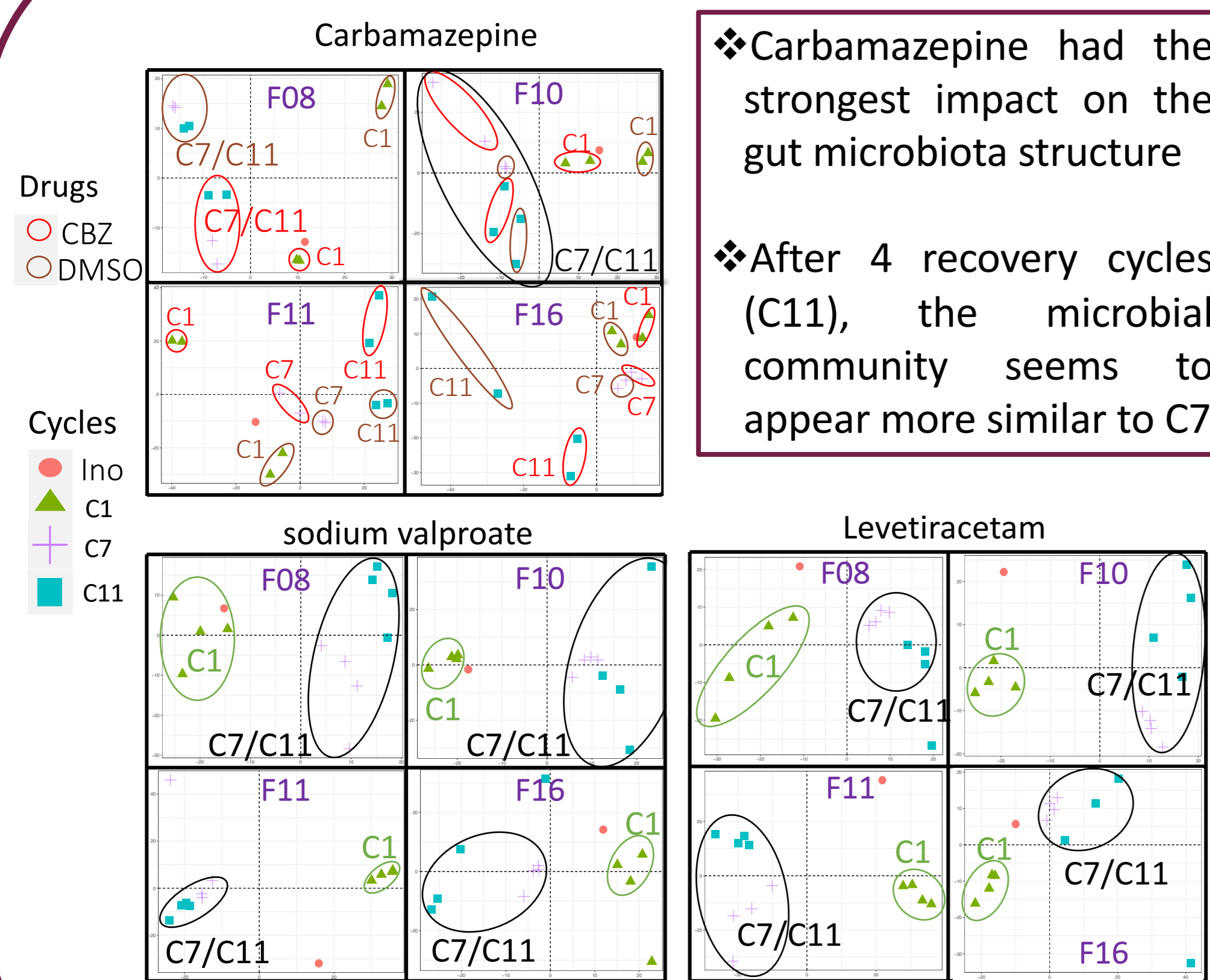
Inoculum composition is the main driver of developing microcosms composition



Drug-free cycles do not lead to microbial community resilience

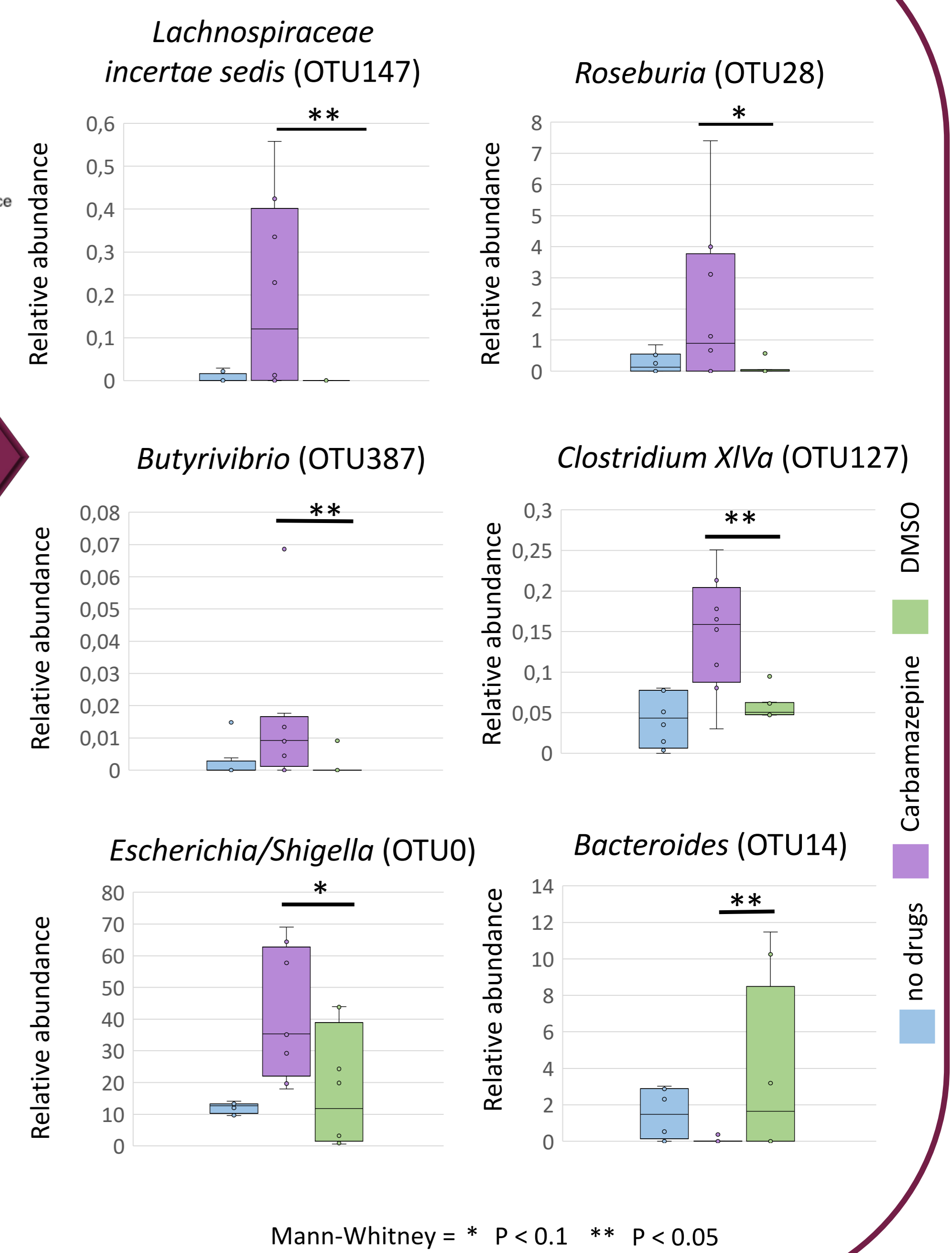
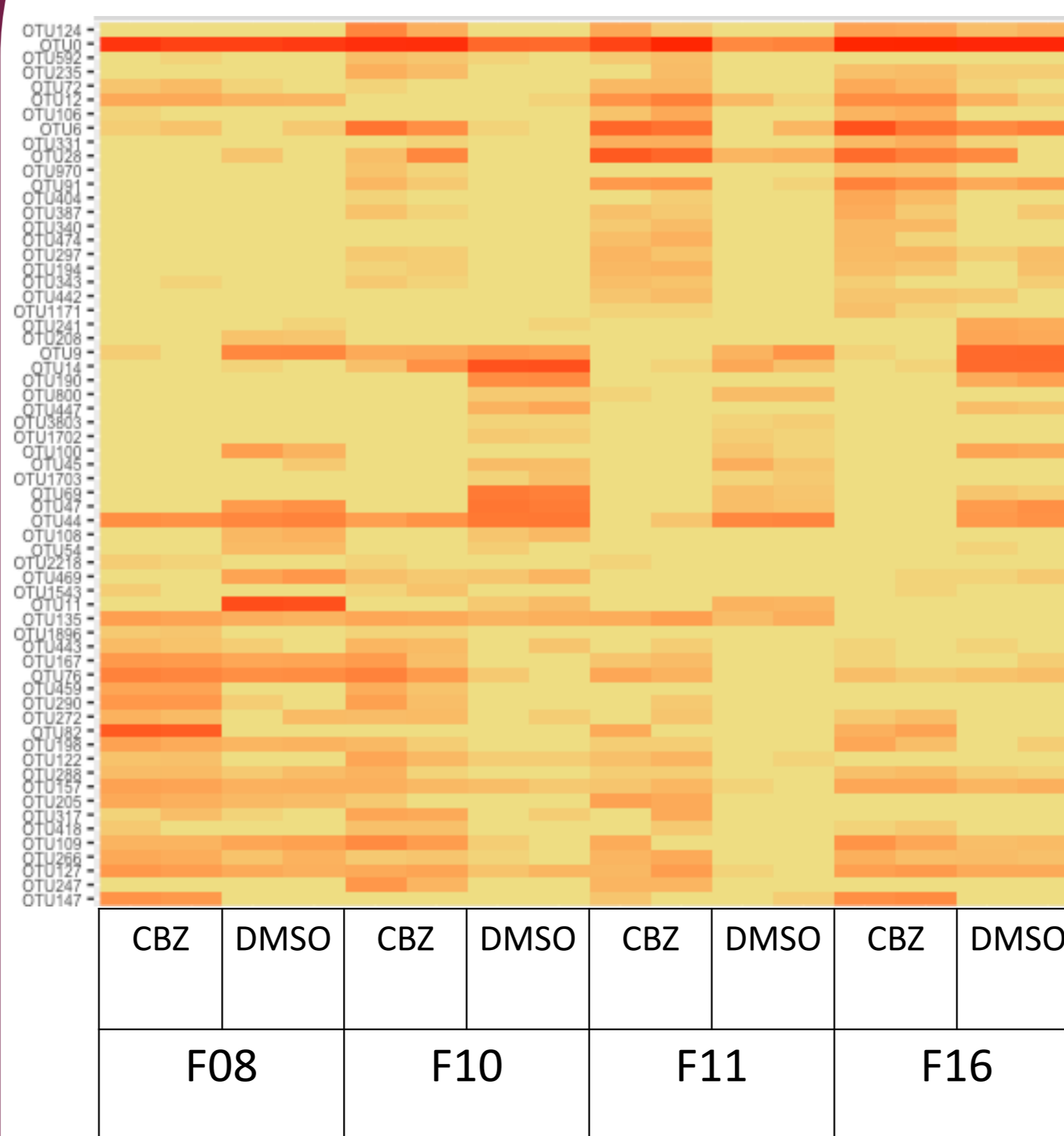
❖ Carbamazepine had the strongest impact on the gut microbiota structure

❖ After 4 recovery cycles (C11), the microbial community seems to appear more similar to C7



Chronic exposure to carbamazepine influenced the relative abundance of 6 different taxa after 7 days of exposure

Effect of carbamazepine (CBZ) and DMSO control on microcosms composition at C7

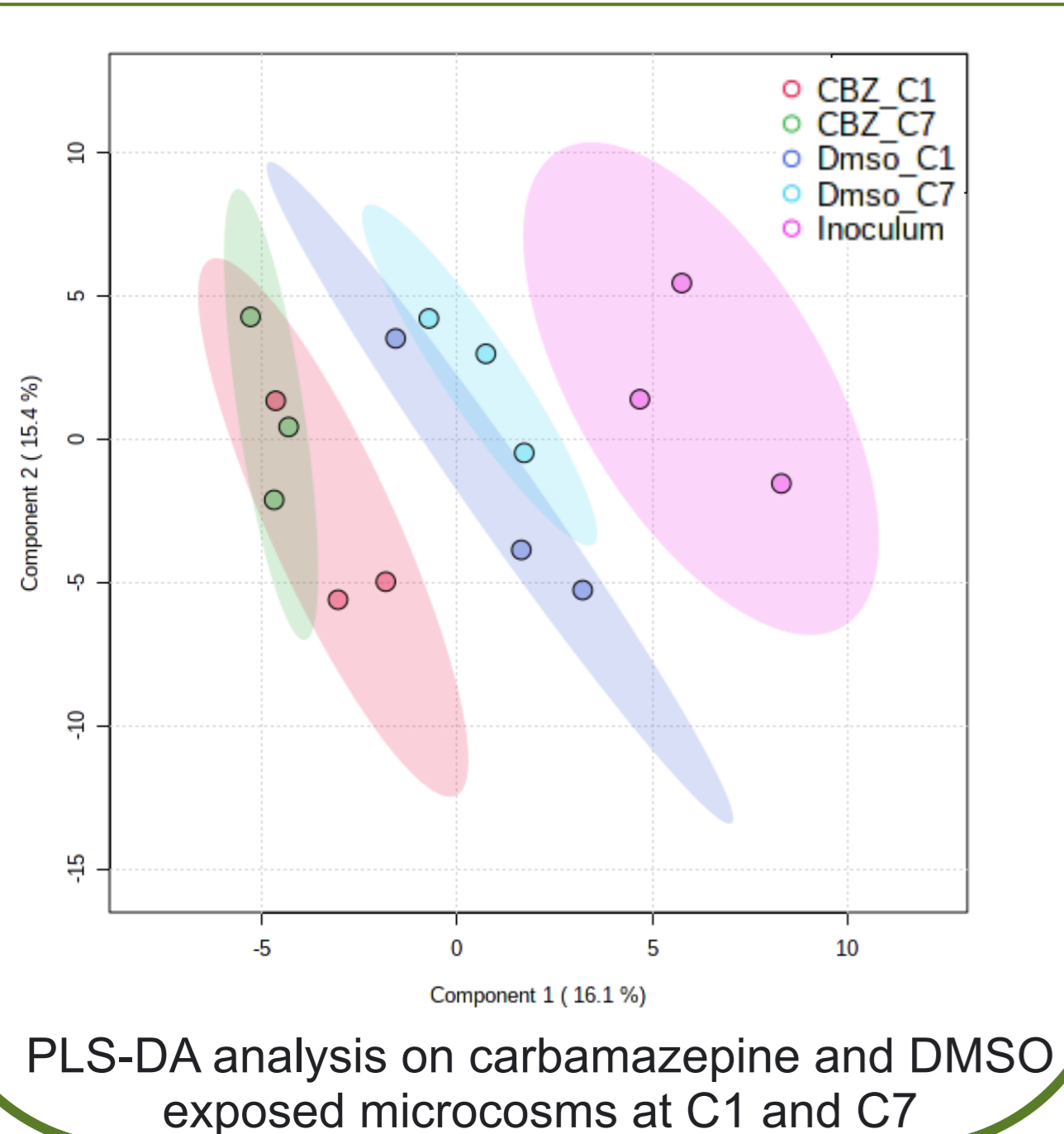


Phylotypes abundance changed after chronic exposure to DMSO or Carbamazepine

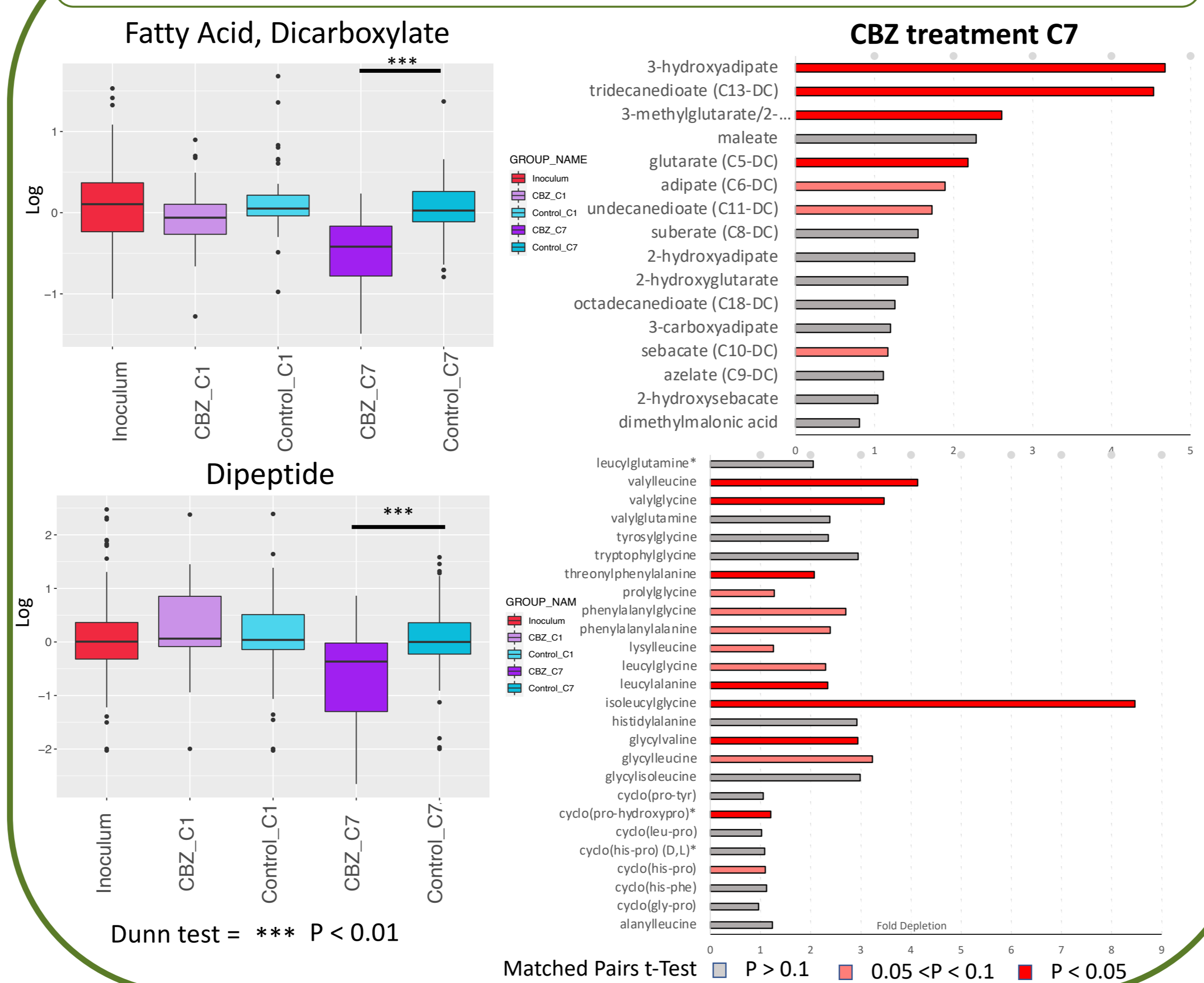
Some taxa are significantly increased or decreased by chronic exposure to carbamazepine

Shift in the microbiome metabolic function due to chronic exposure to Carbamazepine

Impact of carbamazepine on the gut-like microcosms metabolism



Chronic exposure to carbamazepine leads to a decrease in dicarboxylic acid and dipeptides metabolites in the microcosms



Conclusion

- ❖ Inoculum composition is the main driver in gut-like microcosm composition
- ❖ Among the tested drugs, exposure to carbamazepine for 7 days impacted the relative abundance of 6 genus levels OTUs.
- ❖ Microbiome communities did not recover from chronic exposure after 4 drug-free cycles.
- ❖ Chronic exposure to carbamazepine altered the metabolic function of gut bacteria communities

Background reference :

* Maier et al., PMID: 29555994, 2018

** Cox & Blaser, PMID: 25488483, 2015

Where to join us!

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