



Participating MMPC
centers: Michigan
UC Davis
Vanderbilt

Bariatric Surgery- Microbiome Working Group

Agenda Items

- Status of bariatric surgery working group
- Microbiota – antibiotic project

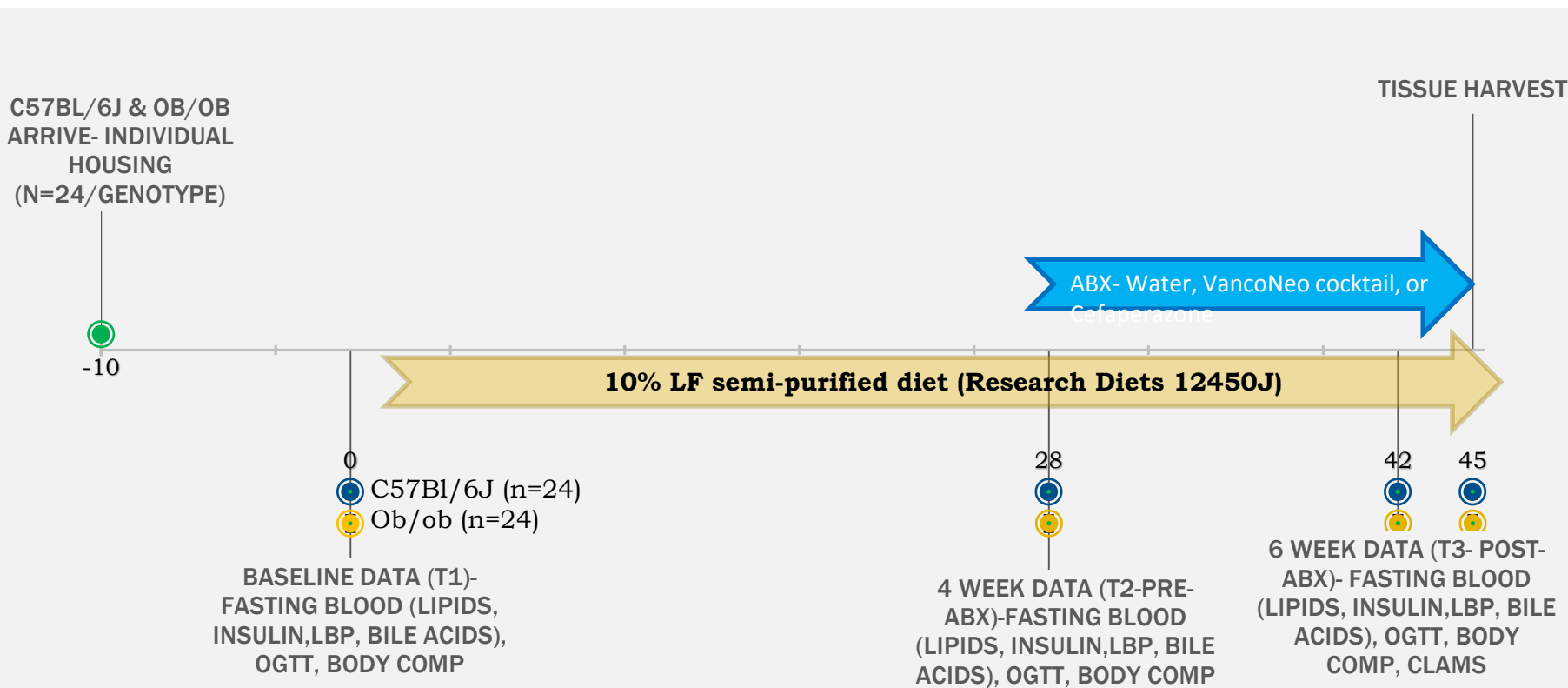
Aims

- Determine whether antibiotic treatment can provide a rapid, robust and relatively inexpensive way to identify the contribution of the gut microbiota to an observed metabolic phenotype of interest
- Use murine strains with clear metabolic phenotypes and test them using robust MMPC phenotyping protocols, with and without antibiotics.

Specific Aim 1

- To determine the effect of antibiotic treatment on expression of the metabolic phenotype in mice maintained on standard laboratory chow diet.
- Ob/ob mouse model- robust phenotype demonstrated between institutions. Antibiotics have been shown to improve phenotype

AIM I - PROTOCOL



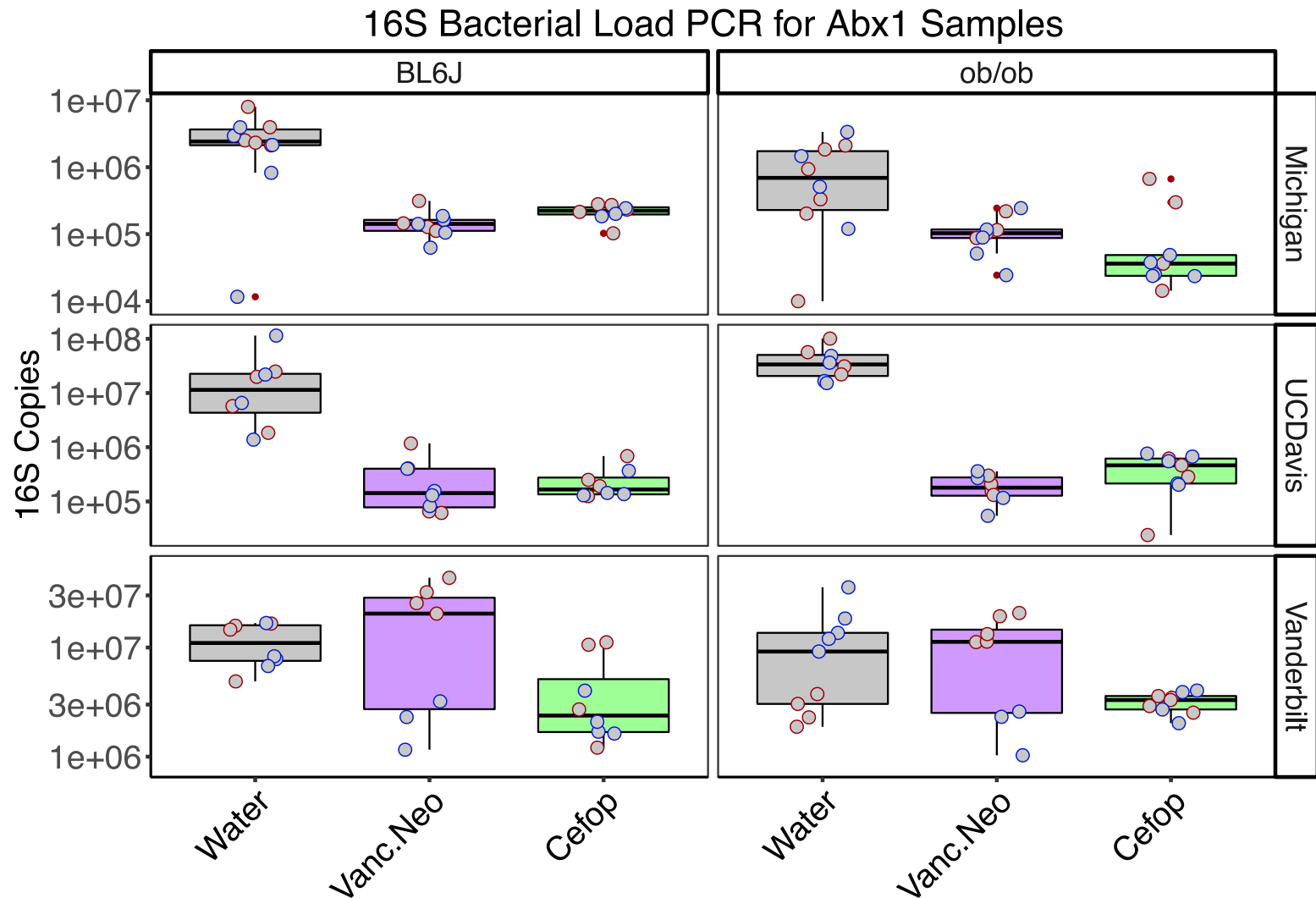
Longitudinal measures

- Body weight (2-3d)
- Food Intake (2-3d)
- Fresh fecal pellet collection

Tissue collection

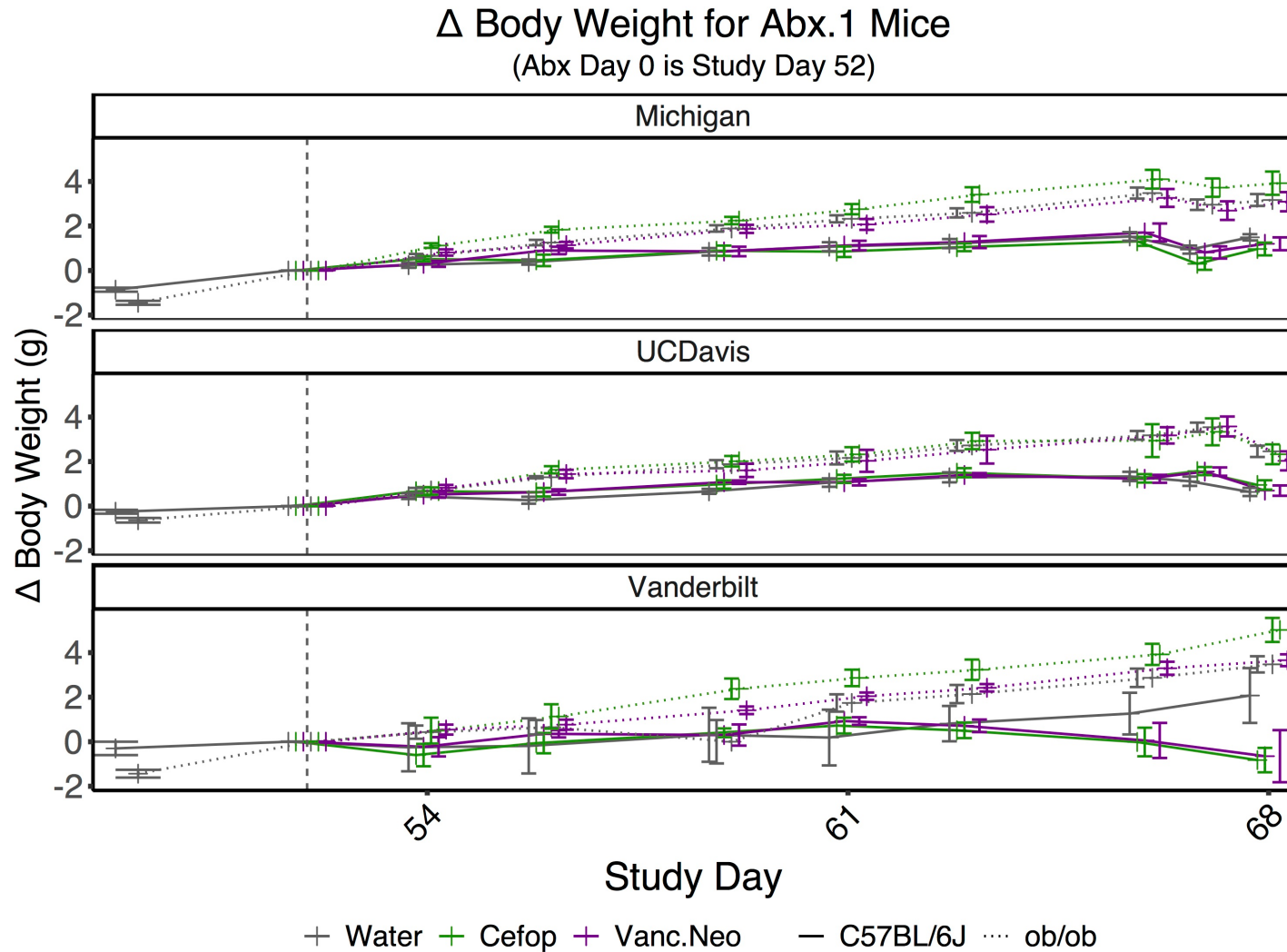
- Adipose Tissue
- Liver
- Muscle
- Intestinal regions (ileum/colon)
- Intestinal contents

Antibiotic Treatment – Bacterial Load

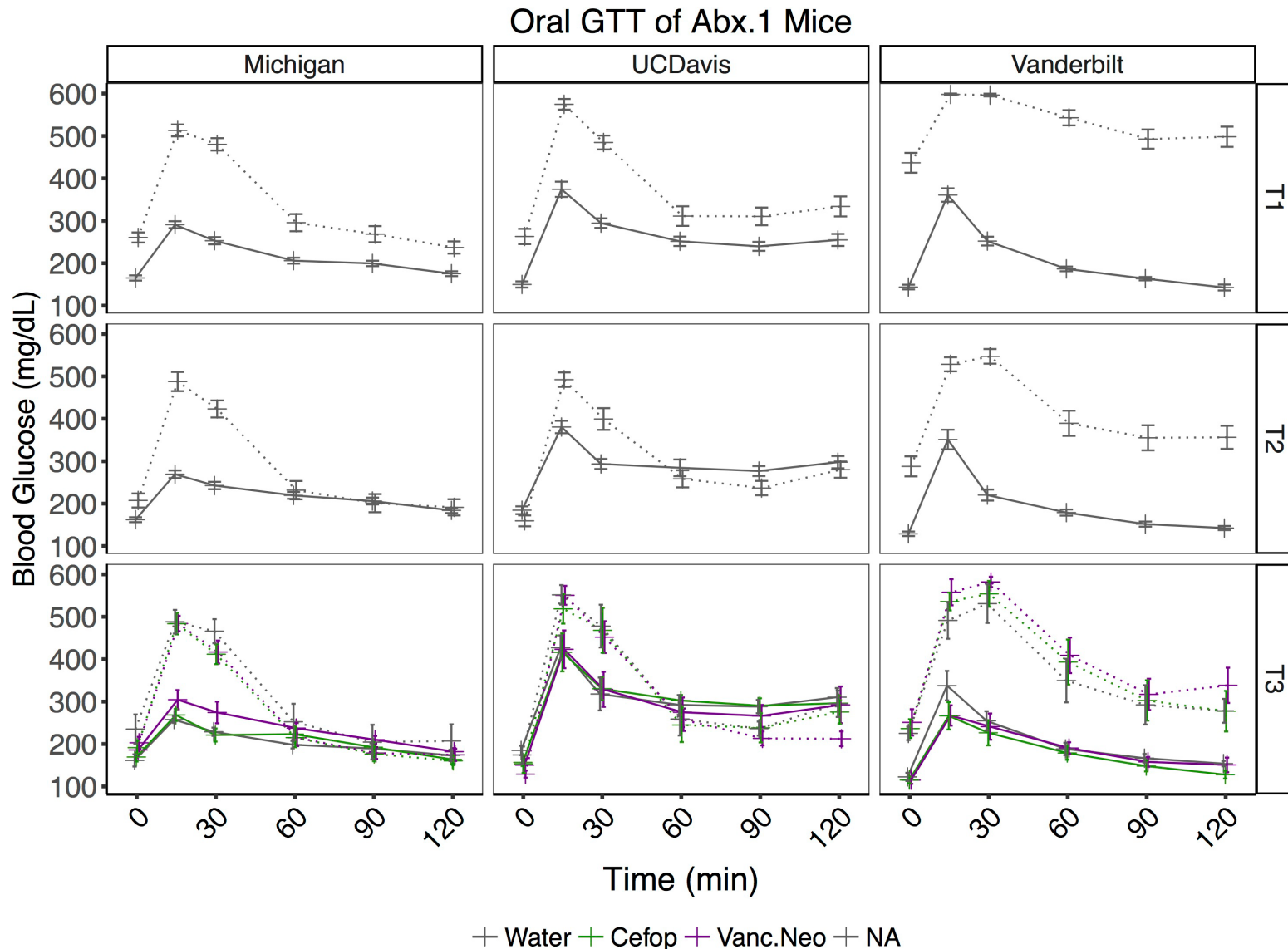


- 2 fold decrease in load
- Lactococcus in semi-purified diets may be a confounder

Antibiotic Treatment had **no effect** on body weight gain

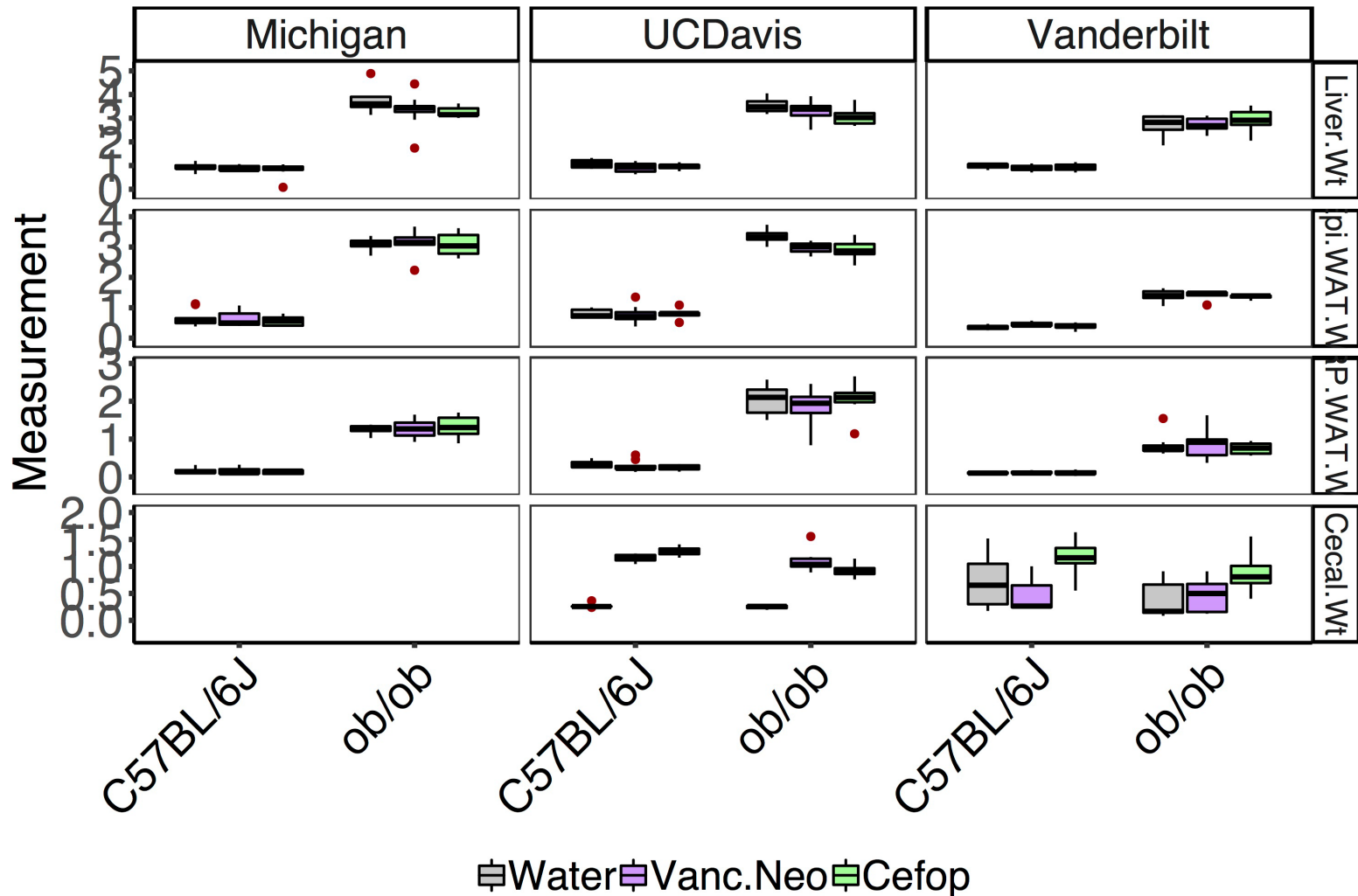


Antibiotic Treatment had **no effect** on oral glucose tolerance



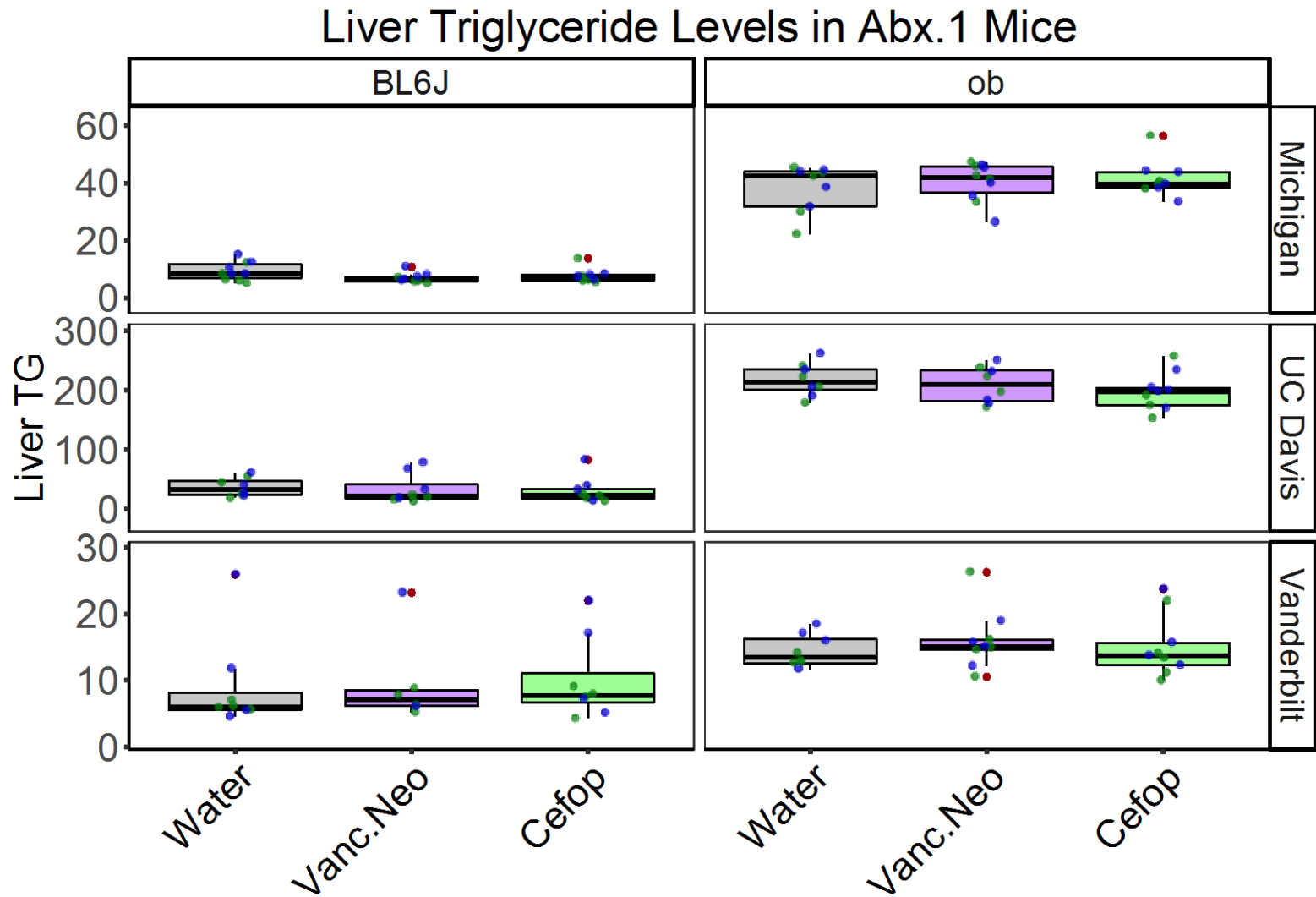
Antibiotic Treatment - organ weights

Abx. Organ Measurements at Sac of Both Cohorts
Combined Data from All Centers



Decrease in liver weight??

Antibiotic Treatment had **no effect** on Liver triglycerides



Other Parameters

No change in:

- Lean body mass
- AUC for OGTT
- Fasting glucose
- Liver TGs
- Liver cholesterol

Conclusions (INTERIM)

- Both antibiotic protocols gave a 2 log decrease in bacterial load
- Maybe underestimating due to Lactococcus in the semi-synthetic diet
- No major effect on ob/ob phenotype
- Majority of measures were reproducible between centers

Next Phase

- Determine the bacterial load WITHOUT Lactococcus to measure the true extent of decrease in load (reasonable assumption)
- *Determine SCFA and/or secondary bile acids as a measure of decrease in bacterial function*
- *Measure of gut inflammation*
- Forge ahead with Aim 2 – HF-diet in obesity-prone (C57/Bl6) and obesity-resistant (A/J mice) (*which antibiotic, duration of treatment*)



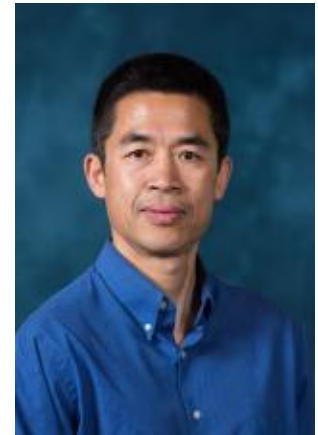
Michigan



Christine Bassis Vincent Young



Malcolm Low



Melanie Schmitt Nathan Qi



Michelle Long



Regina Wang



Zeyu Zhou



Jon Ramsey



Riley Swift



Michael Goodson



Trina Knotts



Jenny Rutkowski



Helen Raybould



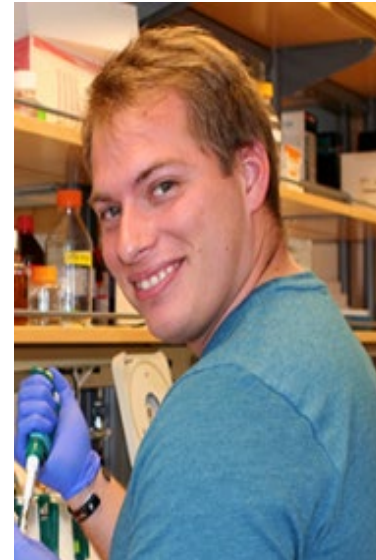
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