Fasting blood sampling is widely used in diabetic studies. However, fasting is stressful particularly in the young and fasting animals at multiple timepoints confounds the progression of diabetes. Therefore non-fasted random-fed sampling would be preferred. It is often assumed that the increased variability in non-fasted samples negates the usability of non-fasted samples for diabetic studies. Given the low sensitivity of using fasted blood glucose for the initial diagnosis of diabetes compared to post-prandial blood glucose, we hypothesize that early biomarkers of diabetes can be discovered in non-fasted plasma, despite larger metabolite variance. To test this hypothesis, we performed LC-MS/MS metabolomics and lipidomics on weekly plasma samples in Nile rats from 8 to 10 weeks old, and diabetes is assessed by OGTT at 12 weeks old. The Nile rat develops diet-induced diabetes rapidly on a standard rodent chow and progresses to advanced diabetic complications, mimicking the etiology and natural history of type 2 diabetes. This study aims to assess the plasma metabolite and lipid variability in fasted versus random-fed conditions. Additionally, we analyzed the fasted and non-fasted metabolome/lipidome in association with blood glucose levels to find early markers for diabetes.

Huishi’s points:

-Fasting is commonly used

- Fasting is stressful

Fasting confounds progression of diabetes

Therefore non-fasted random-fed is preferred

People assume that increased variability in non-fasted samples negates its usefulness

Fasted blood glucose levels are not sensitive to initial diagnosis of diabetes

Therefore we hypothesize that diabetes biomarkers will appear in non-fasted plasma

Nile rat develops diabetes rapidly mimicking type 2 diabetes etiology

Study aims to assess plasma and metabolite variability in fasted vs random-fed samples

Hi Ben,

I wrote a short paragraph to make it more interesting (Intro part):

**Fasted blood sampling has been widely used for early detection of diabetic biomarkers. However, the performance of non-fasted sampling is largely unknown. Given the low sensitivity of early diabetic diagnosis in general, we hypotheses that the early diabetic metabolomic/lipidomic markers are more likely existing during diet processing period (non-fasted) than during fasted period. To test this hypothesis, we combined LC-MS/MS metabolomics and lipidomics approaches with an unique rodent diabetic model (Nile grass rat) to compare diabetic biomarkers in fasted and non-fasted blooding sampling. Comparing with other rodent diabetic model, Nile grass rat does not require high-fat feeding and can fully develop diabetic symptoms which can mimic human diabetic patients. In this study, [Ben: please add the major conclusion here].**

One minor suggestion: Nile rat 🡪 Nile grass rat