Fly Project info:

Lipophorin (Lpp), the lipid transfer particle (LTP) and Crossveinless D (Cv-D)

Reporter for Lpp as this is involved in 95% of lipid droplets.

Lpp sequence: <https://www.uniprot.org/uniprot/L0MPS3>

Lpp is also most similar to ApoB in zebrafish

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3406001/>

Key Questions:

Where to insert tag: Carboxy terminus of whole protein, as ApoLpp I is most closelsy associated with lipid particles.

Is this an actual useful thing to tag? Is exchangeable

However: this paper found that the high fat diet altered levels of apoLpp gene expression in flies:

<https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1006555>

Overall apoLpp levels may not be affected so much by diet, this is something we have to test. However, this paper indicates that expression definitely changes in different tissue types.

Key Papers:

Jay’s LipoGlo System. This is key to see how we would engineer and calibrate this system: <https://www.nature.com/articles/s41467-019-11259-w#Sec1>

Paper on how Lipoproteins work in flies: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3406001/>

High-fat diet alters tissue specific expression of apoLpp:

<https://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1006555>

Laboratory flies are obesogenic:

<https://royalsocietypublishing.org/doi/10.1098/rsbl.2019.0803>

Diet doesn’t impact flies microbiome that much:

<https://www.nature.com/articles/s41598-018-24542-5>

Flies can be a model system for metabolism:

https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1008398

More details on how the system works for flies: Lipoprotein assembly and function from an evolutionary perspective

Microbiome and disease states in flies: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4833331/>

TALENS in flies:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4501208/>

Inhibit flies with lomitipide to test system