UAB Organismal Core, Drosophila Model Services
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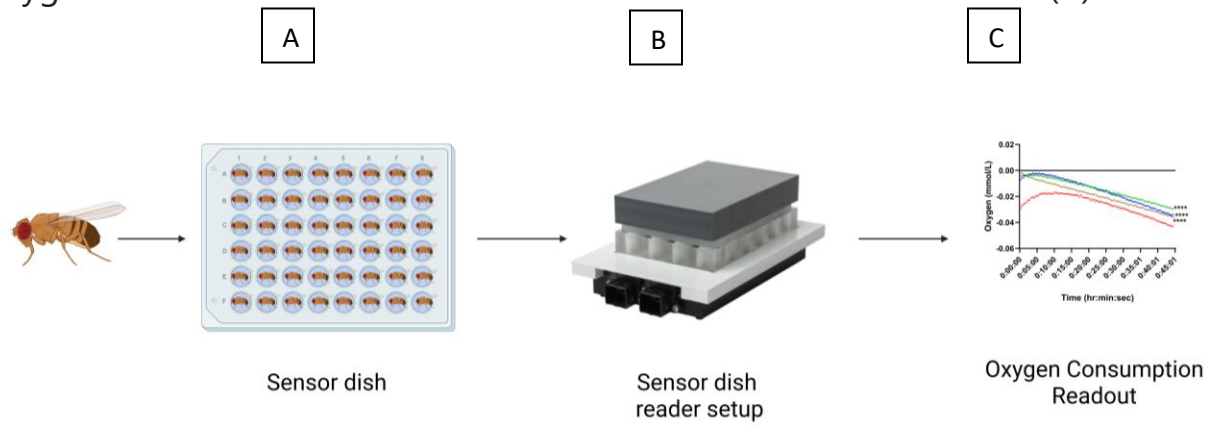
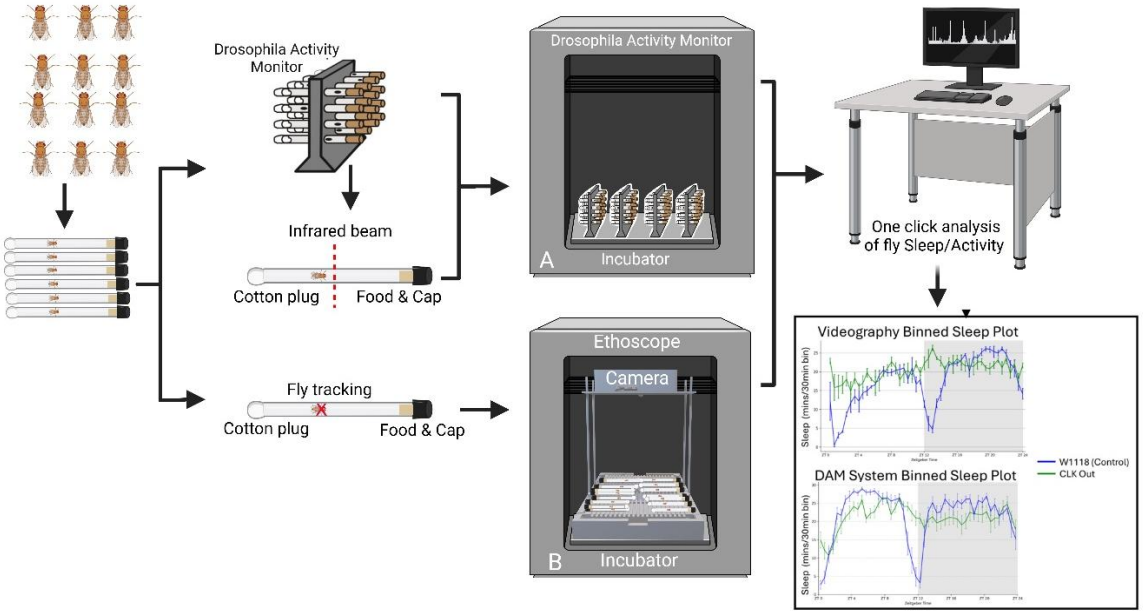
https://www.uab.edu/shockcenter/research/cores/organismal-core
https://sites.uab.edu/melkani-lab/

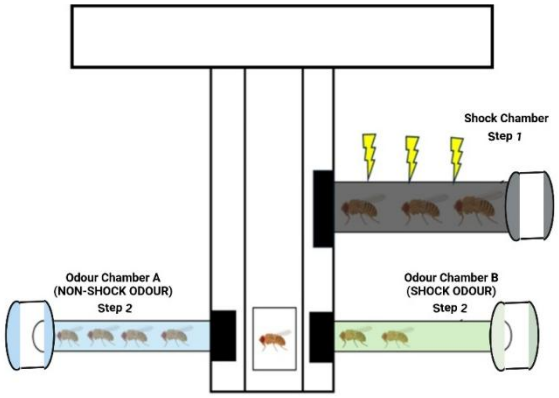
1. Loligo Respirometry: Real-time measurement of whole fly oxygen consumption using Loligo system, $50/plate. Oxygen consumption was measured using a fluorescence-based optical respirometry system. Adult flies were individually placed into glass chambers within a 24-well sensor dish (A), which was positioned on an optical fluorescence oxygen reader (B) maintained at 37 °C. Oxygen levels were recorded for up to 30 minutes, and wells without flies served as controls. Respiration rates were calculated based on the rate of oxygen decline after blank subtraction (C).[1]



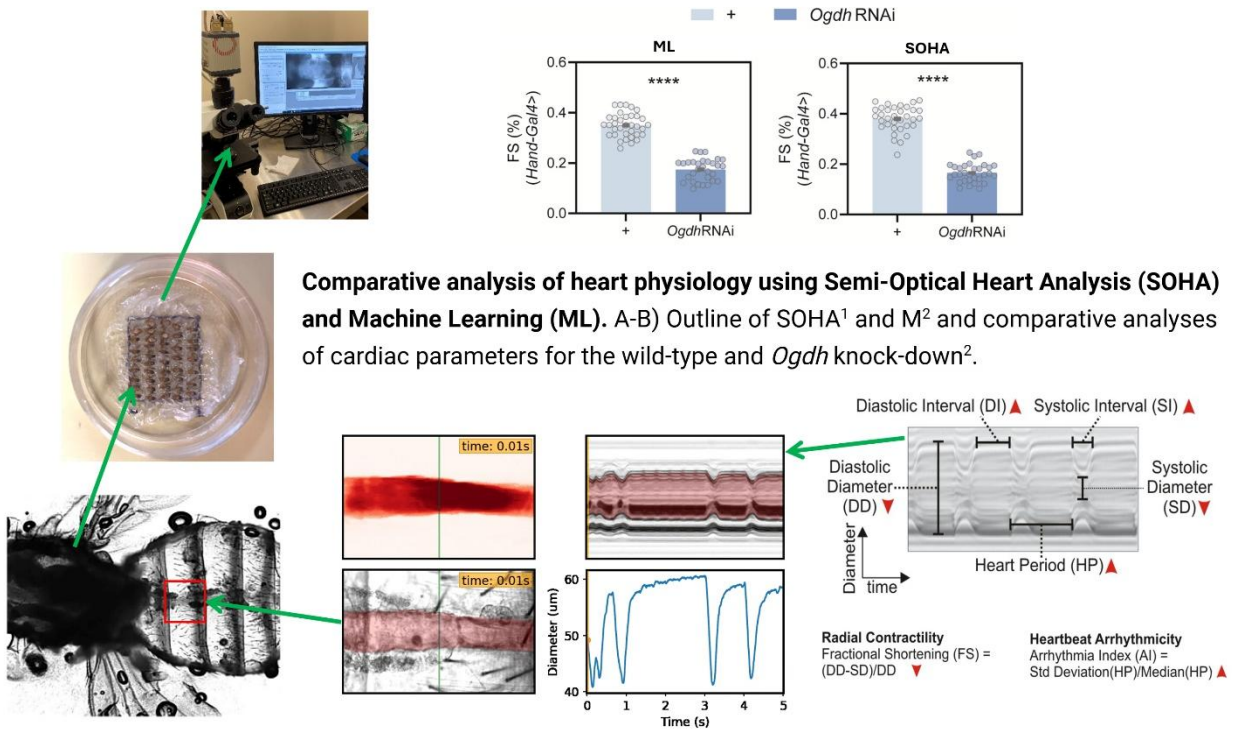
2. Sleep and Circadian Activities (Using DAM): Sleep and circadian analysis using DAM is available at $250 per 3-day data under 24-hour light-dark, constant light, or constant dark conditions (n = 32 flies per DAM), with charges applied per DAM unit. Data provided an Excel sheet containing 15 sleep/activity parameters, along with Prism analyses including one- or two-way ANOVA[2, 3]. Experiments can also be conducted simultaneously using DAM and videography with Ethoscopes (rates available upon request).



3. Learning and Memory (Olfaction Aversion Training): $250 per run (n=50 per genotype). Analyses in an Excel sheet followed by Prism quantification[2].

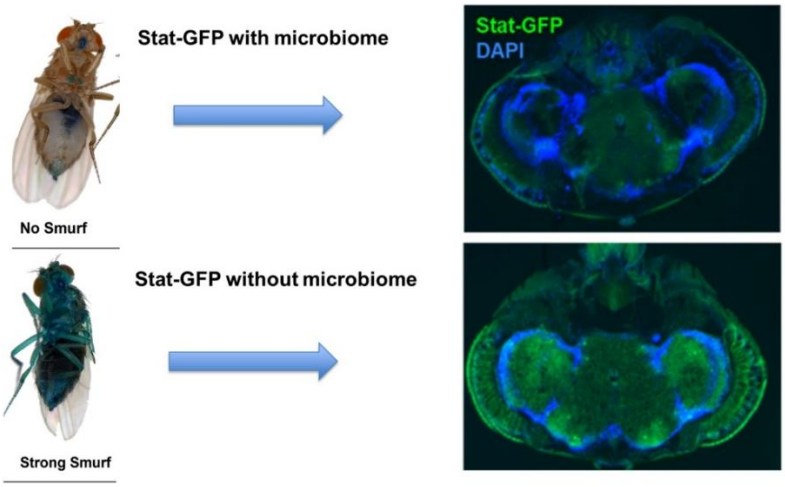


4. Cardiac Physiology: $250 per run (n = 30 per genotype), with data provided as an Excel sheet containing eight cardiac parameters. Statistical analysis is performed using Prism, including one- or two-way ANOVA at $100 per run up to 4 genotypes per condition (male & female separately).[4]

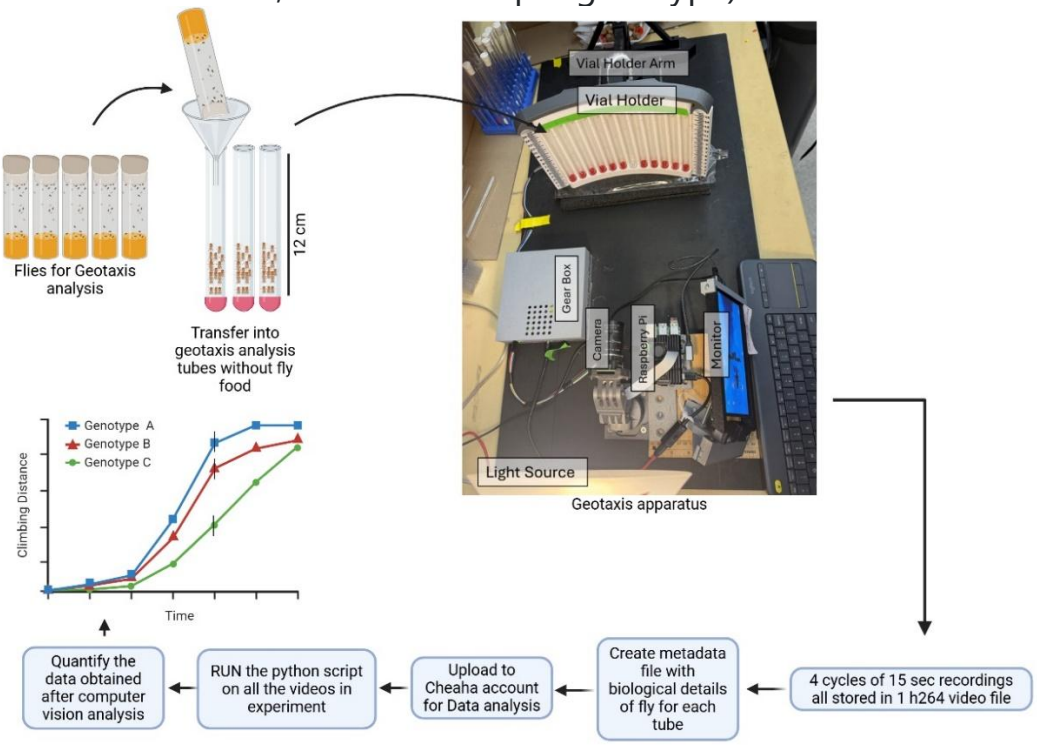


Comparative analysis of heart physiology using Semi-Optical Heart Analysis (SOHA) and Machine Learning (ML). A-B) Outline of SOHA[1] and M[2] and comparative analyses of cardiac parameters for the wild-type and *Ogdh* knock-down[2].

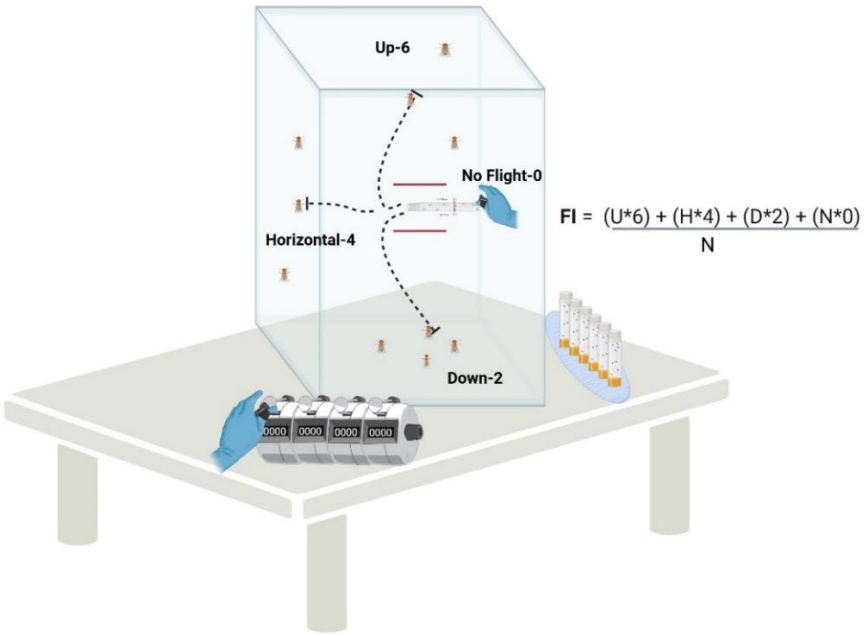
<u>5. Intestinal Barrier Dysfunction/Gut integrity (Smurf assay):</u> $50 per run (n=10 flies/genotype (without Stat-GFP). Data on Excel sheet along with images.[5]



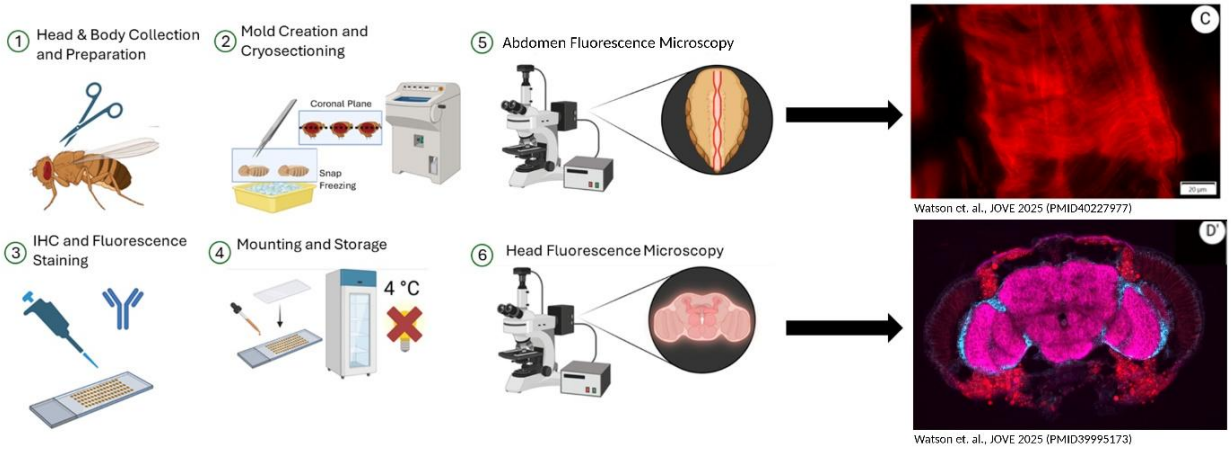
6. Locomotor Function (Geotaxis Performance): $200 per run (max 100 flies, n=40-50 flies per genotype)[1-3, 5-6].



7. Muscle Function (Flight Performance): $200 per run (max 200 flies, n=40-50 flies per genotype[1-3, 5-6]



8. Brain, Muscle, or Abdomen Cryosectioning and Staining: $250/genotype. Sucrose saturation, putting them OCT block, and collection on Slides after cryosectioning (section size 20-30 microns thick section on a positively charged slide. $250/genotype, 5 males or females.[7,8] If you want us to stain, image, and quantify. Check with me.



9. Potential Drug/Known Drug Screening: charges will vary by the number of conditions (Check).

10. Genetics & Lifespan: Costs vary by experiment design, please discuss. This includes ordering the flies, maintaining the stocks, tissue-specific knockdown or overexpression, aging, life span, and interventions (Exercise and time-restricted feeding).

Representative Lab Publications for These Assays/Services:

1. Modeling Late-Onset Multiple Acyl-CoA Dehydrogenase Deficiency in Drosophila Identifies Exercise-Driven Rescue of Lipid Storage Myopathy
   Budhathoki S, Guo Y, Doamekpor M, Melkani GC. (Under Review)
2. Regulation of Lipid Dysmetabolism and Neuroinflammation Progression Linked with Alzheimer's Disease Through Modulation of Dgat2.
   Yadav A, Ouyang X, Barkley M, Watson JC, Madamanchi K, Kramer J, Zhang J, Melkani GC. ***Aging Cell.*** 2026 Mar;25(3):e70439. doi: 10.1111/acel.70439. PMID: 41832772
3. Dissecting metabolic regulation of behaviors and physiology during aging in Drosophila.
   Pasam ES, Madamanchi K, Melkani GC. ***Biogerontology.*** 2025 Aug 19;26(5):165. doi: 10.1007/s10522-025-10306-y. PMID: 40828329
4. Automated assessment of cardiac dynamics in aging and dilated cardiomyopathy Drosophila models using machine learning.

Melkani Y, Pant A, Guo Y, Melkani GC. ***Communication Biology***. 2024 Jun 7;7(1):702. doi: 10.1038/s42003-024-06371-7. PMID: 38849449

5. Time-restricted feeding mediated modulation of microbiota leads to changes in muscle physiology in Drosophila obesity models.
   Livelo C, Guo Y, Madhanagopal J, Morrow C, Melkani GC. ***Aging Cell***. 2025 Feb;24(2): e14382. doi: 10.1111/acel.14382. Epub 2024 Oct 24. PMID: 39446089
6. Time-restricted feeding promotes muscle function through purine cycle and AMPK signaling in Drosophila obesity models.
   Livelo C, Guo Y, Abou Daya F, Rajasekaran V, Varshney S, Le HD, Barnes S, Panda S, Melkani GC**.** ***Nature Communications*** 2023 Feb 21;14(1):949. doi: 10.1038/s41467-023-36474-4. PMID: 36810287
7. Novel And Efficient Method for Drosophila Heart Fluorescence Staining with Cryosectioning.
   Watson J, Budhathoki S, Melkani GC. ***J Vis Exp***. 2025 Mar 28;(217). doi: 10.3791/67827. PMID: 40227977
8. Direct Cryosectioning of Drosophila Heads for Enhanced Brain Fluorescence Staining and Immunostaining.
   Watson J, Roth JR, Melkani GC. ***J Vis Exp.*** 2025 Feb 7;(216). doi: 10.3791/67791. PMID: 39995173