Bio-Analytical Redox Biology (BARB) Core

A **Diabetes Research Center** Metabolic and Redox Sub Core (NIDDK P30DK079626) and UAB **Institutional Research Pilot Core.**
Also supported by the **Heersink School of Medicine** and the **Nutrition Obesity Research Center** (NIDDK P30DK056336).
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Highlights

Lab Clean/Close Outs

State-of-the-Art Equipment, Materials & Facilities

- Psychological/Physiological Stress
- Mitochondrial Electron Transport Chain (ETC) Kinetics
- Mitochondrial Function & Oxidative Stress
- High Resolution Respirometry (Oroboros Oxygraph 2k)
- Extracellular Flux Analysis (Seahorse XFe96)
- Mitochondria Isolation

Service Request Form

Comprehensive Training

Consultations with Expert Staff

- Experimental Design, Troubleshooting & Data Interpretation.
- Grant Writing (strong letters of support, assay design, methods, budgeting, technical advice, collaboration).

All BARB Core Assays are of the highest quality, rigorously optimized, reproducible and standardized.

Lab Clean/Close Outs

We help reclaim valuable lab space quickly and safely. Whether you're closing out a lab, preparing for renovations, or transitioning to new research teams, our platinum-certified team handles:

- Biohazard & chemical waste removal
- Chemical manifesting & packing
- Equipment decontamination & surplus tagging
- Glassware cleaning & donation to UAB Green Labs
- EH&S coordination & compliance documentation

What UAB Colleagues Are Saying:

- "BARB Core saved me 30-35 hours of work." **- Kevin Speed, Dept. of Neurobiology**
- "They've flipped 10 labs for us since 2023. That's four weeks of work saved!" **- Julia Tolbert-Jackson, School of Health Professions**
- "I'm deeply appreciative of your incredible guidance and support." **- Faith Lang, Dept. of Medicine**

Affordable & Transparent Pricing

- Flat hourly rate per team member
- Flexible staffing: 1-3 team members work simultaneously to speed up cleanouts without increasing cost

Sustainable & Strategic

- Reuse and redistribute equipment and consumables
- Partner with UAB Green Labs for eco-friendly disposal
- Support UAB's Forging Ahead strategic goals

How to Get Started

- Fill out our quick request form (QR code in Highlights Section)
- Schedule a free 15-minute Zoom consultation
- We coordinate with EH&S and begin cleanout

Before

After

Cortisol – Chronic Stress

Cortisol is extracted from human nails (finger and/or toenail) and/or hair to measure cortisol levels as a biomarker of stress.

Samples: human hair (3 cm length from scalp, 0.65 cm in diameter), finger/toenails (25-50 mg)

Sample Preparation: Non-invasive, collected, stored and shipped to the BARB Core at room temperature, using regular mail, without any special biohazard requirements or costs.

Equipment: Qiagen TissueLyser III, Biotek Synergy 2 Multi-mode microplate reader.

Publications: References 1 - 6.



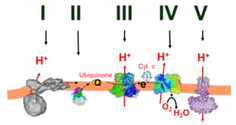
Mitochondrial ETC Kinetics

Homogenate/isolated mitochondria can be analyzed for differences in kinetics of each mitochondrial ETC complex in experimental samples compared to controls. Citrate synthase can also be measured as a surrogate for mitochondrial content.

Samples: fresh or frozen tissues or cells (human, rodent, fish, *Drosophila*)

Equipment: Beckman DU 800 Spectrophotometer, Custom-Built Mitochondrial Isolation Stations with Recirculating Chiller

Publications: References 7 - 13.



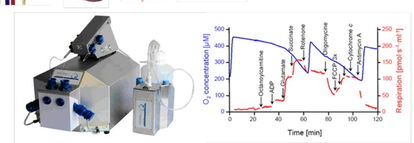
High Resolution Respirometry (HRR)

Mitochondrial function or dysfunction in freshly excised, permeabilized tissue or isolated mitochondria is measured in experimental versus control samples.

Samples: fresh, permeabilized, *ex vivo* tissues (human muscle, rodent renal cortex, medulla, and microvessels, embryonic and adult heart, gastroc and soleus muscle, hippocampus, bladder, liver) or isolated mitochondria (rodent, fish, Drosophila)

Equipment: 3 x Oroboros Oxygraph-2k Fluorometers (LED2-Module Amperometric Add-On)

Publications: References 8, 9, 11, 15 - 20.

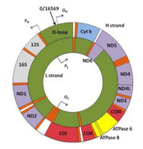
Mitochondrial DNA (mtDNA) DAMPs

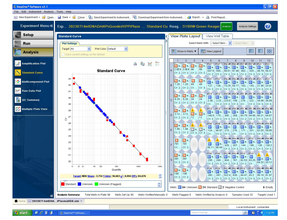
Cell-free mtDNAs are damage-associated molecular patterns (DAMPs) and biomarkers of inflammation, aging and many other diseases.

Samples: frozen serum/plasma (human, mouse)

Equipment: Applied Biosystems StepOnePlus Real-Time PCR System, Applied Biosystems DynaMag Magnet, Biotek Synergy 2 Multi-Mode Microplate Reader, LabNet Plate Spinner

Publications: References 21 & 22.



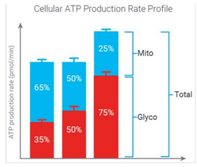
Seahorse Extracellular Flux

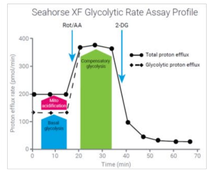
Mitochondrial respiration and glycolysis is measured simultaneously in a high throughput 96-well format in adherent cells.

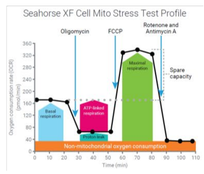
Samples: cultured cells or freshly isolated mitochondria (human, rodent), mycoplasmas.

Equipment: Agilent Seahorse XFe96, high throughput, 96-well format

Publications: References 10, 15, 20, 23 - 31.





Redox Assays

Catalase

Samples: plasma, serum, homogenate

Glutathione Tietze (GSSG and GSH)

Samples: plasma, whole blood

Glutathione Peroxidase (GPX)

Samples: plasma, homogenate

Total Antioxidant Capacity (TAC)

Samples: plasma, serum, urine, saliva

Ferric Reducing Antioxidant Power (FRAP)

Samples: plasma

Publications: Reference 32.

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