**Metabolomics Core**

**Mission:** Our facility measures metabolites in human and rodent tissues and body fluids (serum) and can also assist clinicians and basic science researchers in the design and interpretation of metabolomics results.

**Goals:** To provide a state-of-art facility metabolomics research.

**Capabilities:**

1. Targeted metabolomics – We perform targeted metabolomics, which refers to the analysis of defined subsets of molecules (molecular weight less than 1500 Daltons).
2. Fluxomics – This involves approaches that seek to determine the rates of metabolic reactions within a biological entity.  Specifically, we perform isotope-labeling studies to measure the flow of atoms through metabolic pathways, such as glycolysis, the tricarboxylic acid cycle, beta-oxidation and the urea cycle.
3. Assays for measuring mitochondrial oxygen consumption and glycolytic rates using Seahorse Bioanalyzer.

**Major Equipment:**

ACQUITY UPLC System with Xevo TQ-S Mass Spectrometer

Seahorse XFp Analyzer

**Workflow:**



**Detailed services**:

Metabolites measured:

|  |  |  |
| --- | --- | --- |
| **Glycolysis intermediates** | **Pentose pathway intermediates** | **TCA Cycle intermediates** |
| * Glucose
* Glucose 6-phosphate
* Fructose 6-phosphate
* Fructose 1,6-bisphosphate
* Dihydroxyacetone phosphate
* Glyceraldehyde 3-phosphate
* 1,3-Bisphosphoglycerate
* 3-Phosphoglycerate
* 2-Phosphoglycerate
* Phosphoenolpyruvate
* Pyruvate
* Lactate
 | * 6-phosphoglucono-δ-lactone
* 6-phosphogluconate
* ribulose 5-phosphate
* ribose 5-phosphate
* xylulose 5-phosphate
* sedoheptulose 7-phosphate
* erythrose 4-phosphate
 | * Acetyl CoA
* Oxaloacetate
* Citrate
* cis-Aconitate
* Isocitrate
* Oxalosuccinate
* α-Ketoglutarate
* Succinyl-CoA
* Succinate
* Fumarate
* Malate
 |
| **Amino acids (Amino compounds)** | **Urea Cycle intermediates** | **Nucleotide** |
| * alanine
* arginine
* asparagine
* aspartic acid
* cysteine
* glutamine
* glutamic acid
* glycine
* histidine
* isoleucine
* leucine
* lysine
* methionine
* phenylalanine
* proline
* serine
* threonine
* tryptophan
* tyrosine
* valine
 | * α-Aminoadipic acid
* Hydroxyproline
* Ethanolamine
* β-Aminoisobutyric acid
* 1-Methylhistidine
* 3-Methylhistidine
* Hydroxylysine
* Sarcosine
* Phosphoethanolamine
* Citrulline
* α-Amino-n-butyric acid
* allo-Isoleucine
* Ornithine
* Carnosine
* β-Alanine
* Taurine
* Cystathionine
* Anserine
* γ-Amino-n-butyric acid
 | * carbamoyl phosphate
* citrulline
* ornithine
* aspartate
* argininosuccinate.
* Arginine
* Fumarate
* urea
 | adenine cytosine guanine thymine uracil purinepyrimidine  |
| * **Fatty acyls (Fatty acids)**
* **glycerolipids**
* **glycerophospholipids**
* **sphingolipids**
* **sterols**
 | FADH2NAD+NADHNADP+NADPHadenine nucleotides (AMP, ADP, ATP)Guanosine triphosphate (GTP) |  |

Please contact us for more information on the types of isotope labeling studies performed and for information on consulting serves.

Note: We do not accept samples that were exposed to radioactive or infectious materials.

**Contact: Hoora Shaghaghi, PhD.** **Hoora.Shaghaghi@jefferson.edu** **Phone 215-503-0444**