EXOSOMES

LIPIDOMICS AND METABOLOMICS SERVICE

GAIN DEEPER INSIGHTS INTO EXOSOMES

SYSTEMBIO.COM/LIPIDOMICS

HIGHLIGHTS

- ***Discover novel circulating biomarkers***
- ***Learn more about exosome biology***
- ***Send us your sample and receive data in 4 - 6 weeks***

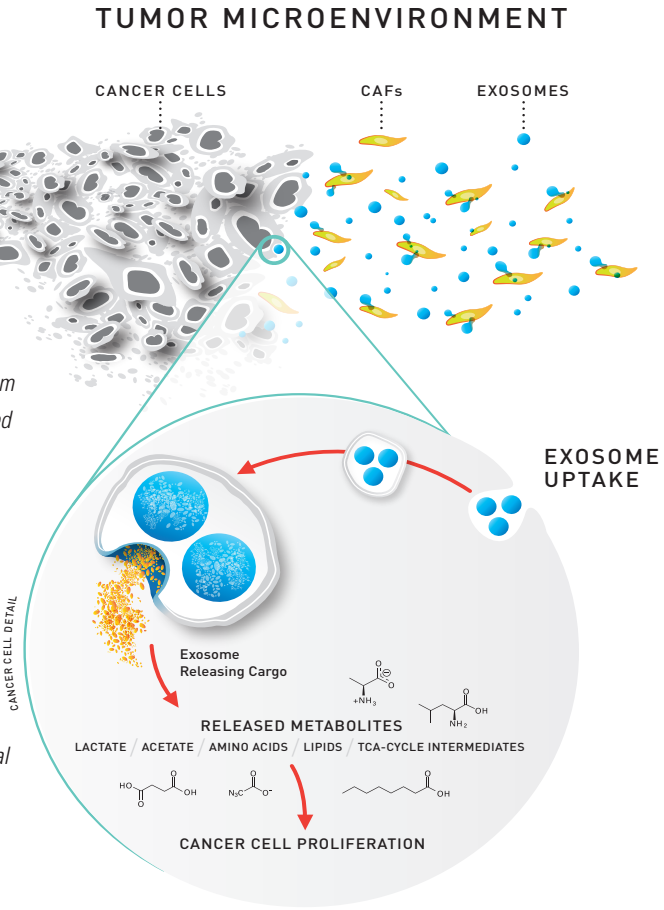
SERVICE OVERVIEW

Whether you're interested in circulating biomarker discovery, basic exosome research, or other exosome-related studies, SBI's Exosome Lipidomics & Metabolomics Service helps you quickly and efficiently get the most information from your exosomes. Simply send us your sample or purified exosomes and we'll send back a report with putative identifications, mass/charge ratios, and differential analysis (if requested).

What can lipidomics of exosomes tell you?

Lipids are an important part of cellular physiology, and are increasingly being recognized for their importance in exosome biology as well. Exosomes were recently shown to have the highest lipid-to-protein ratio of all classes of extracellular vesicles (1), with lipid content that both differs from the parent cell the vesicles are shed from (2) and also changes as exosomes undergo a variety of physiological processes (3). These unique lipid profiles can serve as novel circulating biomarkers, and recent evidence suggests that specific lipid species carried by exosomes can also modulate the function of recipient cells (4).

With so much information revealed by lipid content, lipidomics studies of exosomes are a great way to identify lipid-based biomarkers and for understanding vesicle biogenesis and function (5).



Exosomes affect metabolism of cancer cells

A recent study by Zhao, et al, (6) demonstrated that exosomes from patient-derived cancer-associated fibroblasts (CAFs) can reprogram the cellular machinery in cancer cells. They used a metabolomics approach to demonstrate that exosomes shed from CAFs contain intact metabolites that fuel tumor growth. In addition, they showed that uptake of CAF exosomes inhibited mitochondrial oxidative phosphorylation, increasing glycolysis and glutamine-dependent reductive carboxylation.

SBI
System Biosciences
Harnessing innovation to drive discoveries

What can metabolomics of exosomes tell you?

In addition to lipids, exosomes carry a wide range of metabolites that can also be used for biomarker discovery. Like exosomal lipids, exosomal metabolites can also take an active role in the target cell, and have been shown to reprogram metabolic machinery upon uptake by cancer cells, fueling growth (6). A recent study found distinctly different populations of metabolites in PANC1 cells treated with TGF-β, a known driver of cancer progression, versus a control group, suggesting that metabolite profiling can be used for differentiating cellular states (7).

How the service works

Sample Requirements

Biofluid	Volume (ml)
Serum	0.5 - 1
Plasma	0.5 - 1
Cell Media	5 - 10
Urine	5 - 10
Spinal Fluid	5 - 10
Ascites Fluid	0.5 - 1
Other	Inquire

Timeline

4 -6 weeks

Data Deliverables

- *MS data will be delivered as Excel files with putative identification based on the m/z ratio of the analytes*
- *Differential analysis of lipids and metabolites between treatment groups will be included in the Excel files*

Our standard service (Cat# CSEQ850A-1) offers UPLC-FTMS analysis of both very polar metabolites in the aqueous phase and lipids and other non-polar metabolites in the organic phase. Individual polar or non-polar analysis also available upon request.

Note that all IDs are based only on retention time, accurate mass measurement, and preliminary MS/MS data, and cannot be guaranteed. Not all peaks will be identified, and we recommend that any peaks of interest—either due to the identity of the compound reported and/or change in intensity between samples—MUST be verified by additional targeted analysis at additional cost.

What else can you learn about exosomes?

Maximize the amount of information you get from your exosomes with SBI's full range of exosome services.

- *Simultaneously obtain microvesicle particle size and concentration with our NanoSight Characterization service*
- *Get the sequence of all exosomal nucleic acids such as miRNAs with our Exo-NGS service*
- *Discover exosomal surface and/or internal proteins with our exosome mass spectrometry service*

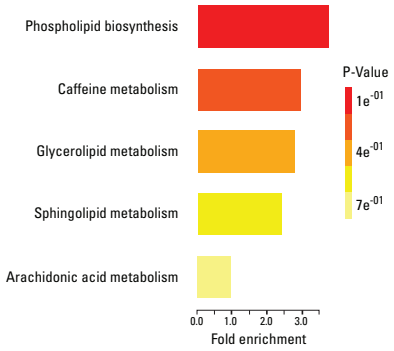
References

1. Osteikoetxea X, *et al. PLoS One.* 2015;**10**(3):e0121184. PMID: 25798862; PMCID: PMC4370721.
2. Llorente A, *et al. Biochim Biophys Acta.* 2013;**1831**(7):1302-9. PMID: 24046871.
3. Carayon K, *et al. J Biol Chem.* 2011;**286**(39):34426-39. PMID: 21828046; PMCID: PMC3190795.
4. Subra C, *et al. J Lipid Res.* 2010;51(8):2105-20. PMID: 20424270; PMCID: PMC2903822.
5. Subra C, *et al. Biochimie.* 2007;**89**(2):205-12. PMID: 17157973.
6. Zhao H, *et al. Elife.* 2016 Feb 27;**5**. pii: e10250. PMID: 26920219.
7. Altadill T, *et al. PLoS One.* 2016 Mar 14;**11**(3):e0151339. PMID: 26974972.

Building the tools that speed your research

With an eye on the latest advances, SBI finds promising technology and converts it into easy-to-use tools accessible to any researcher. Our growing exosome services are just one example. Visit our website to see what else SBI can help you accomplish.

Sample data—Pathways represented by metabolites that are enriched in exosomes from the AML subject



Exosomes were harvested from 300 µL of serum of a healthy human subject and a subject with Acute Myeloid Leukemia (AML). Discovery-based lipidomic/ metabolomics profiling was performed on the serum vesicles from the two subjects.

Find more sample data including excel files for a differential expression study at systembio.com/lipidomics

SBI System Biosciences
Harnessing innovation to drive discoveries

2438 Embarcadero Way, Palo Alto, CA 94303
Toll Free: 888-266-5066 www.systembio.com