

Mass Spectrometry Shared Resource (MS)

Felix Grün, PhD
Director, MSF, Chemistry

Mission and Leadership



MISSION

Support researchers with expertise and services in mass spectrometric analysis of proteins, oligo nucleotides, metabolites and drugs

To fulfill this mission, **MS**:

- Consists of three facilities/labs that provide specialized expertise and high-end instrumentation
- Provides consultation on project goals, choice of analytical pipelines, instrument selection, method development
- Provides access to instruments (walk-up open access or staff operated)
- Provides staff services and user training as appropriate
- Provides data analysis and interpretation from self-guided to intensive collaborative projects
- Assists with publications and grant submissions

LEADERSHIP



Felix Grün, PhD

Director, MSF
Chemistry



Lan Huang, PhD

Director, HMSF
Physiology & Biophysics



Cholsoon Jang, PhD

Nutrient Metabolism &
Disease Lab

High-end Mass Spectrometry Facility (HMSF)

<https://sites.uci.edu/hmsf>

High-end Orbitrap instruments

- ThermoSci Orbitrap Fusion Lumos Tribrid
- ThermoSci Orbitrap XL
- **Qualitative and quantitative profiling of whole proteomes**
- **Multiplexed, targeted, and label-free quantitative proteomics**
- **Characterization of post-translational modifications (PTMs)**
- **Protein interaction and structural analysis using cross-linking (XL-MS)**

Staff services:

- Staff operated (Clinton Yu, PhD)
- Per sample, project or longer term collaborative support
- Project seed funding

Nutrient Metabolism & Disease Lab (NMDL)

Project Services

- Orbitrap and triplequad LC-MS/MS instruments
- **Untargeted and targeted metabolomics/lipidomic analyses**
- **Stable isotope tracing experiments**
- **Focused on metabolic changes in health and disease**

Services:

- Data acquisition
- Bioinformatic analysis

Mass Spec Facility (MSF, Chemistry)

<https://ucimsf.ps.uci.edu>

Walk-up Open Access for 20 instruments

- LC-MS and GC-MS for **polar and non-polar small molecule analysis** (low resolution)
- LC-MS/MS for **peptide/protein characterization**; sequencing; PTMs; (high resolution ± 3 ppm)
- LC-MS/MS for **untargeted metabolomics/lipidomics**
- LC-MS/MS for **quantitative targeted metabolomics** (e.g. custom assays, PK/PD studies)
- MALDI for **proteomics and polymers**
- MALDI IMS for **spatial metabolomics/lipidomics**

Staff services (B. Katz, C. Dickson, F. Grün):

- **User/instrument training** (weekly)
- Molecular formulae (MF) validations
- Protein characterization (exact mass; sequencing; PTMs; conjugates)
- Oligonucleotide (exact mass; conjugate validation)
- Imaging Mass Spectrometry
- Data processing and software packages: onsite or via Server & Remote Desktop

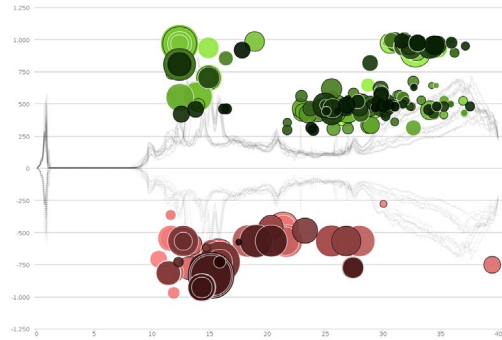
Pricing/Service time

- Low cost (\$3-20 per sample)
- High-throughput: results from 5 mins to 2-3 day
- **Open 24/7**

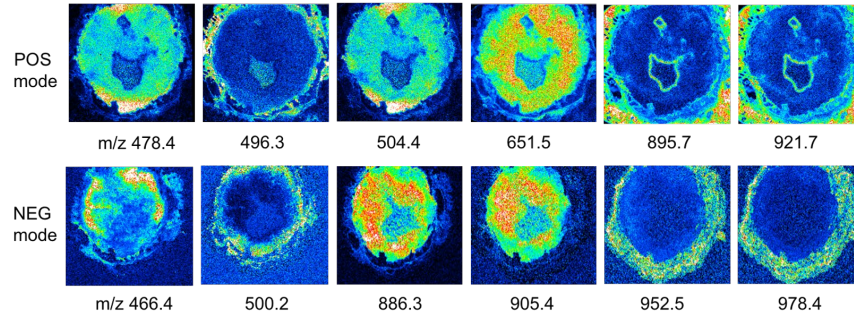
Example Service



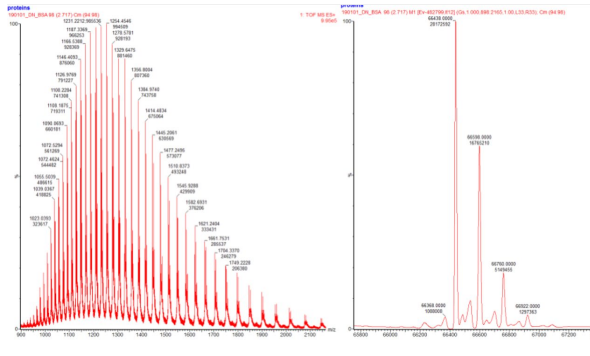
Untargeted Metabolomics: Biomarkers



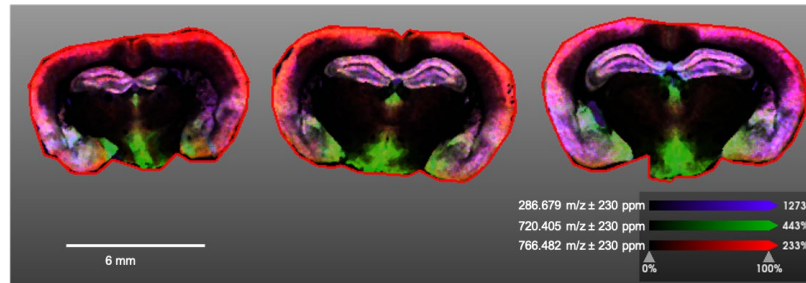
Tumor Imaging: Spatial Metabolite Profiling



Protein Characterization



AD Brain Lipid Imaging



**NIH S10 award:
Shimadzu iMScope**

Thank You
