



Dear CORES users,

We have started this newsletter and announcement list to help keep you better informed on changes, additions, and announcements for the CORES Facilities. Please also keep an eye out for Tricks and Tips on using the instrumentation that will help you get better experimental results. All SCS (Chem and ChBE) Faculty, Staff, and graduate students have been included on this list, but if you know of others outside the department who wish to receive these announcements, Let us know – we can manually add people to the list. They can also sign up for the list by:

Sending a blank email to:

lists@lists.illinois.edu

With the subject:

“subscribe scs-cores-announce”

Best regards,

Danielle Gray

Associate CORES Director

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It's Clear! The Glass Shop is ready to serve you.

Now is a good time to submit your work orders to the Glass Shop because we now have shorter lead times since we caught up on open work orders over the summer with the assistance of an extra help staff.

Why wait until lab cleanup to bring in your broken glassware when you can get it repaired now? It is much easier to repair small orders of broken glassware than it is to complete large boxes of glassware that have piled up over time. Please also consider consulting Andy Gibbs before you make a major glassware purchase. It is often cheaper to have him make glassware to your specifications than it is to purchase things like Schlenk lines from a catalogue and then have them modified.

New Equipment = New Services in the Mass Spectrometry Center

The addition of Waters Synapt G2Si and the Bruker Autoflex Speed mass spectrometers the facility can offer new services.



Ion mobility (IM) – MS

Ion mobility can separate mixtures of ions by their size, shape and charge status. When it combines with Mass Spectrometry, it not only enables the analyte separation but also enables structural characterization of a wide range of sample types.

IM-MS can analyze small molecules, especially naturally occurring metabolites and metabolite molecules; it is also a powerful tool to determine the secondary structure of peptides, proteins and DNA/RNA in the gas phase.

IMS-MS enhances selectivity (separate isomers that are difficult to separate by chromatography), speed (faster than chromatography) and detection limits (lower the detection limit by lowering the background).

APGC

APGC - APCI is a “soft” ionization technique so that the fragmentation of the compounds is low when compared to Electron ionization (EI). It means the sensitivity and selectivity is increased and MRM precursor selection is simplified. In the meantime, other Waters enhanced unique MS technologies such as RADAR, MS(E) and HDMS (ion mobility separation) are now available for GCMS. APCI can identify, quantify and confirm the broadest range of small molecules.

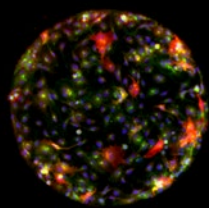


MALDI imaging

MALDI imaging (MALDI-IMS) involves the visualization of the spatial distribution of proteins, peptides, lipids, and other small molecules within thin slices of tissue, such as animal or plant. The application of this technique to biological studies has increased significantly since its introduction. MALDI-IMS is providing major contributions to the understanding of diseases, improving

diagnostics, and drug delivery. Significant studies are of the eye, cancer research, drug distribution, and neuroscience. It has been able to differentiate between drugs and metabolites and provide histological information in cancer research, which makes it a promising tool for finding new protein biomarkers.

Please contact the staff for inquiries at: massspec@scs.illinois.edu.



New Plate Readers in the High Throughput Screening Facility

The High Throughput Screening Facility has installed new BioTek Cytation 5 imaging plate readers.

Imaging Reader

- Bright field, phase contrast, fluorescence imaging
- Objectives: 4X, 10X, 20X, 40X
- Z-stacking, montage, time-lapse
- Filters: DAPI, CFP, GFP, YFP, RFP, Texas Red, CY5, CFP-YFP FRET, Acridine Orange, Propidium Iodide
- Laser autofocus (fast and less photo-bleaching), image-based autofocus
- Dual injectors for fast kinetics imaging such as calcium efflux
- 6-1536 well plates, slides, petri-dish, other vessels possible with adaptor
- Temperature and CO2 control for live imaging
- Automated long term imaging (ex. Image every hour for 3 days)
- User-friendly image processing and data analysis software

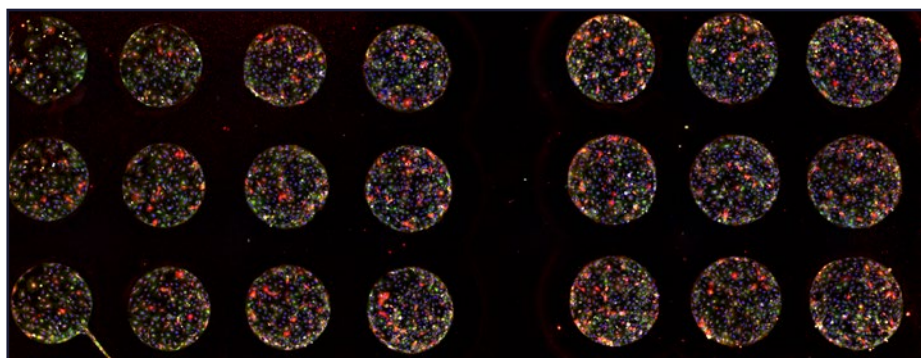


Plate Reader

- Monochromator and filter based
- Absorbance (230 - 999 nm, 1 nm increment)
- Fluorescence intensity (250 - 700 nm)
- Spectrum Scan
- Fluorescence polarization (anisotropy)
- Fluorescence resonance energy transfer (FRET)
- Time-resolved fluorescence assay (TR) and TR-FRET
- Luminescence
- Bioluminescence resonance energy transfer (BRET)
- Alpha Screen and AlphaLISA
- Convenient 16 sample direct protein/DNA/RNA measure (only 2 ul needed)
- Dual reagent injection (5-1000 µL) for fast kinetics
- Temperature and CO2 control
- Equipped with plate stacker for batch process

If your research can benefit from the readers, please do not hesitate to contact Chen Zhang (czhang8@illinois.edu, 217-244-4198) for discussion, training, and optimization.

Instrument TiPS

NMR Facility - CB500

Users of the CB500 automated NMR spectrometer have many options to monitor the instrument and their samples.

1 Queue

Using a link accessible from the main NMR web page, the queue can be monitored on-line [link here](#)

2 Data acquisition

Each user receives an email from the instrument after the completion of each NMR experiment for a given sample. The email signals completion of data acquisition, and only then can the data set be opened with Mnova.

3 Retrieval

Sample retrieval is best accomplished promptly by a user visit to the NMR Lab. The NMR Staff regularly removes samples and places them in a plastic container. Un-retrieved sample tubes are transferred just once daily by the Staff to the next container to the right.



It takes 4 days for a sample to work its way to the last container, whereby, after email notice and 4 days of neglect by the submitter, anyone is welcome to retrieve remaining tubes. Specialty NMR tubes go in a separate, labeled container indefinitely.

If you have a precious sample, retrieve it promptly, or tell the NMR staff, and we will set it safely aside for you to pick up when you can. Occasionally, a sample is lost because someone picked up the wrong tube. To prevent that possibility, label your tube distinctly and retrieve it quickly. Most samples are lost due to neglect.

4 Spectrometer Status

The status of any NMR spectrometer in the lab can always be checked via the main NMR web page by clicking on "[Spectrometer Status Now](#)".