

Equipment in the BMB Physical Biochemistry Facility:

The Department of Biochemistry and Molecular Biology (BMB) at the University of Oklahoma Health Sciences Center (OUHSC) has the biophysical instruments listed below available for use by investigators at OUHSC, OU, and at the Oklahoma Medical Research Foundation. Staff in the Physical Biochemistry Facility will assist investigators in experimental design, data collection, and data analysis, as well as provide training as needed.

Multi-angle laser light scattering (MALS) instrument:

Wyatt WH2 DAWN HELEOS II light scattering detector and Wyatt WTREX Optilab refractive index detector. Multi-angle Laser Light Scattering (MALS), a molecular size and shape measuring technique, is a very important capability in the structural biochemical tool set. Besides doing the 'normal' well known macromolecules, samples with different conformations than molecular standards or exhibit challenging or unexpected behavior can still be successfully analyzed. As an *absolute* technique, MALS overcomes the limitations of other methods such as chromatography, electrophoresis, ultracentrifugation, etc. Also, the samples can be studied in water-based solutions, as in the body, unlike crystallographic methods that often use rather foreign conditions.

Contact information: BMB Faculty (Drs. P. DeAngelis paul-deangelis@ouhsc.edu & F. Hays Franklin-Hays@ouhsc.edu) and Personnel (D. Green & J. Johnson) will assist in using the MALS system as requested by end-users. Please note that an initial consultation is required for multiple practical & logistical reasons. The MALS detector is so sensitive that any dust or debris will interfere with measurements, and depending on the sample(s), the user may need to supply their own HPLC column and/or buffers.

Circular Dichroism Spectropolarimeter:

Jasco J-715 CD spectropolarimeter with an accessory Peltier temperature controller. The optical system includes a 150W air-cooled Xenon lamp source and a wavelength range from 160-900 nm. Analysis of protein CD spectra for determination of secondary structure fractions is performed using the software package, CDPro.

Contact Information: Contact Drs. [Karla Rodgers](mailto:Karla_Rodgers) or [Jennifer Byrum](mailto:Jennifer_Byrum) for information regarding training, scheduling for instrument time, and data analysis.

Microscale Thermophoresis:

NT.115 Microscale Thermophoresis (MST) Instrument. Applications for this instrument include measuring interactions of fluorescently labeled molecules with dissociation constants over the nM to mM range. A distinct advantage of the MST technology is the ability to use a wide range of buffer composition, as well as serum or lysate mixtures, for binding studies.

Contact Information: Contact Dr. [Frank Hays](mailto:Frank_Hays) for information regarding training, scheduling for instrument time, and data analysis.

Calorimeters:

Contact Information: For the calorimeters listed below, contact Drs. [Karla Rodgers](#) or [Jennifer Byrum](#) for information regarding training, scheduling for instrument time, and data analysis.

Isothermal Titration Calorimeter (ITC):

Microcal VP-ITC (Malvern Instruments). This ultrasensitive instrument uses a cell feedback network to differentially measure heat produced or absorbed between sample and reference cells. The cells are constructed from Hastelloy, and are shielded in an adiabatic chamber. Titration is achieved through a linear drive delivery system with the option of variable mixing speeds. Experiments can be performed within a temperature range from 20°C to 80°C controlled by an internal Peltier mechanism.

Differential Scanning Calorimeter (DSC):

Microcal VP-DSC (Malvern Instruments). This instrument has an operating temperature range from -10°C to +130°C with an internal Peltier mechanism, along with a self-contained pressurizing system (for scanning solutions at the high temperatures). Both the MicroCal VP-ITC and VP-DSC instruments incorporate integrated, user-friendly software, including Origin for post-run analysis.

Fluorometers:

Contact Information: For the fluorometers listed below, contact Dr. [Jialing Lin](#) for information regarding training, scheduling for instrument time, and data analysis.

SLM 8100 fluorometer:

Photon-counting spectrofluorimeter for steady-state fluorescence measurements.

ChronosFD:

Frequency-domain fluorometer, described at:

<http://www.oumedicine.com/department-of-biochemistry-molecular-biology/department-facilities/iss-chronos-lifetime-spectrometer>

PC1, photon counting spectrofluorimeter for steady state fluorescence measurements.

Described at web site: <http://www.iss.com/fluorescence/instruments/pc1.html>