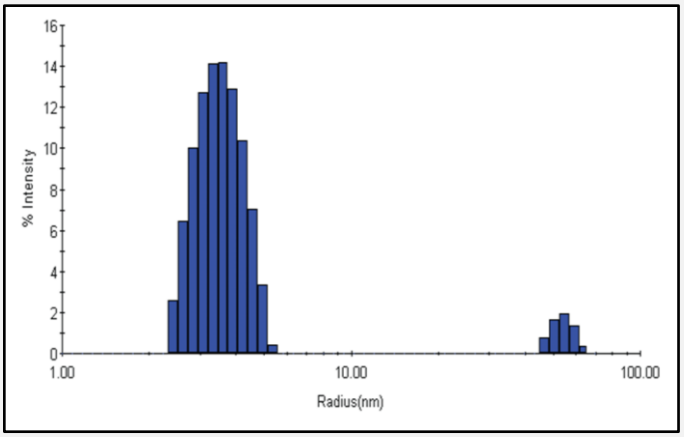
DelsaMAX Core

Dynamic and Static light scattering (DLS/SLS)

Light scattering is caused by the interaction of light with dispersed particles (typically in solution), while organized particles (typically in crystal) result in diffraction phenomenon. The intensity of the scattered light depends on the size and the shape of the interacting particles. The experiment using visible light may be performed in two different modes: dynamic and static light scattering. Dynamic light scattering (DLS) measurement analyses the time variance in the scattered light. Static light scattering (SLS) measurement depends on the analysis of light scattering at various angles with respect to the incident beam.

DLS/SLS can be used for:

- Determination of sample homogeneity and polydispersity (DLS)
- Observation of protein oligomerization or aggregation in time or as a result of buffer composition (DLS/SLS)
- Analyzing of thermal stability of biomacromolecules differentiating pure unfolding from aggregation (DLS/SLS)
- Protein oligomeric state determination (SLS; applicability may be limited).
- Estimation of particle size and molecular weight (0.5 – 5000 nm / 500 Da – 1 MDa) – applicable not only to biomacromolecules, but also viruses, colloids, liposomes, nanoparticles, quantum dots, etc.



CEITEC – Central European Institute of Technology
Masaryk University
Kamenice 753/5, 625 00 Brno, Czech Republic
www.ceitec.eu

Technical specifications

Instrument: **Delsa Max Core** (Beckman Coulter)

Features:

- Dynamic and/or static light scattering measurement at 90° (RALS)
- Laser wavelength of 658 nm
- Fast data acquisition – less than 2 minutes per sample for typical DLS set-up (minimal measurement time of 1 sec and data acquisition time in range 1 – 3 600 sec)
- Temperature range between 25°C and 80°C (lower temperature down to 4°C possible on special demand)
- Possibility to perform automatic time-dependent or temperature-dependent experiments
- Plastic cuvettes for DLS with 5 µl minimal sample volume. Quartz cuvettes for DLS/SLS with 45 µl minimal sample volume.

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Instrument operation

Assemblies:

- Plastic cuvettes for DLS with 4 µl minimal sample volume are disposable, however can be used repeatedly when washed properly.
- Quartz cuvettes for DLS/SLS with 45 µl minimal sample volume require rigorous cleaning after each measurement.

Data evaluation SW:

- DelsaMax SW is installed on the machine-operating PC

Operational mode:

- DLS/SLS measurement is performed by the users themselves after training.

Provided services:

- Instrument user training
- Basic DLS/SLS data evaluation training
- Consulting/assistance

Sample requirements

- For DLS measurement, at least 5 µL of the sample is required (10+ µL is recommended for easier handling).
- For SLS measurement, at least 45 µL of the sample is required. Extra volume of buffer is also necessary for cuvette calibration.
- Sample concentration of 0.1 mg/ml and higher are generally suitable. Large particles at lower concentrations give strong enough signal as well. There is no realistic upper concentration limit (even 100 mg/ml sample can be measured) for qualitative experiment.
- Detergents at higher concentration should be avoided. Above MIC, the micelle formation interferes with the measurement of biomacromolecule size.
- The sample should be filtered or centrifuged prior to measurement. Especially for SLS, high purity and homogeneity is essential for reliable results.

It is recommended to discuss the project and the details of the experiment (sample preparation, sample requirements) with the Core Facility members in advance.

Contacts

Biomolecular Interactions and Crystallography Core Facility

bic@ceitec.cz

Core Facility Leader: JOSEF HOUSER

josef.houser@ceitec.cz

Main Responsible Person: TOMÁŠ KLUMPLER

tomas.klumpler@ceitec.cz

Instrument Location:

CEITEC MU Campus Bohunice, pavilion C04/2.23 laboratory, Kamenice 5, 62500 Brno