SpectroLight 600

Dynamic light scattering (DLS)

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 and determines the size-based composition of the studied sample.

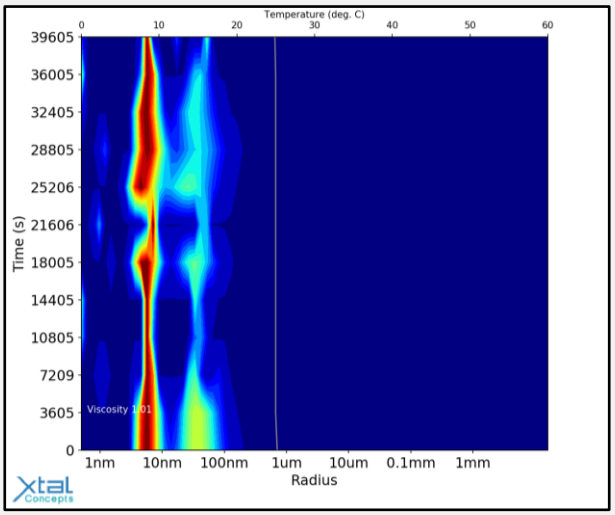
DLS can be used for:

- Determination of sample homogeneity and polydispersity.
- Observation of protein oligomerization or aggregation in time or as a result of buffer composition
- Analyzing of thermal stability of biomacromolecules differentiating pure unfolding from aggregation
- Estimation of particle size (0.5 – 5000 nm) – applicable not only to biomacromolecules, but also viruses, colloids, liposomes, nanoparticles, quantum dots
- Optimization of protein storage buffer
- Observation of the crystallization process *in situ*

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

Technical specifications

Instrument: **SpectroLight 600** (Xtal Concepts)



Features:

- Examination of each well via built-in microscopic color camera with up to 2.5 µm resolution – check for presence of macroscopic precipitation, air-bubbles, dust, etc.
- Dynamic light scattering measurement at 148°
- 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)
- Accessible particle size from 1 nm to app. 5 µm
- Temperature range between 5°C and 45°C
- Possibility to perform automatic time-dependent or temperature-dependent experiments
- Measurement in 96-well plates – high-throughput
- Ultra-low sample consumption (<0.1 - 1 ul of sample needed)

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Instrument operation

Assemblies:

- Machine is equipped with sample holder for SBS plates and Douglas Instrument small-footprint plates.

Data evaluation SW:

- SpectroLight 600 SW is Linux-based and is installed on the machine-operating PC only.

Operational mode:

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

Provided services:

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

Sample requirements

- For DLS measurement, at least 0.5 µL of the sample is typically required (smaller volume might be used but requires manual adjustment of the measurement).
- Sample concentration of 0.1 mg/ml and higher are generally suitable. Large particles at lower concentrations give strong enough signal as well, while higher concentration might be needed for small proteins (<30 kDa). 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.

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

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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

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