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Device for quality control of biol. samples

Naprava za kontrolo kakovosti vzorcev biol. molekul

PROMETHEUS Panta (Nanotemper)

14.05.2024

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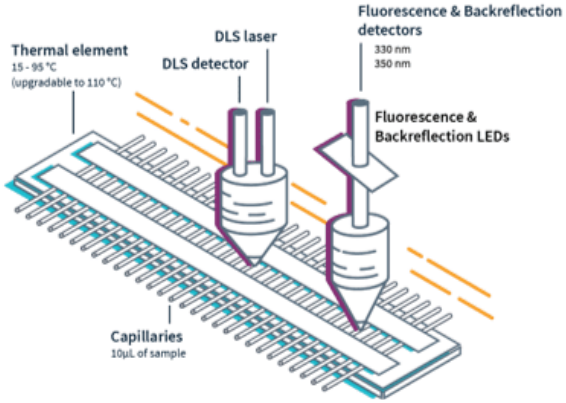
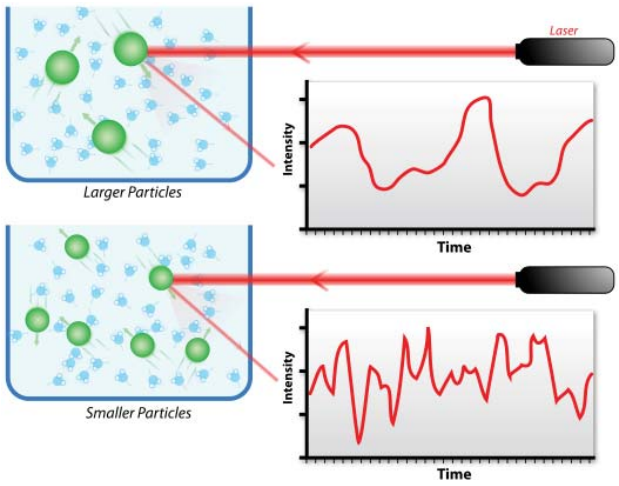
How does PROMETHEUS Work?





Brownian motion causes particles to undergo random motion in a fluid medium due to collisions with solvent molecules. This motion leads to the diffusion of particles, which can affect the accuracy of measurements. The rate of diffusion can be influenced by factors such as **temperature**, **viscosity of the medium**, and the **size of the particles**.

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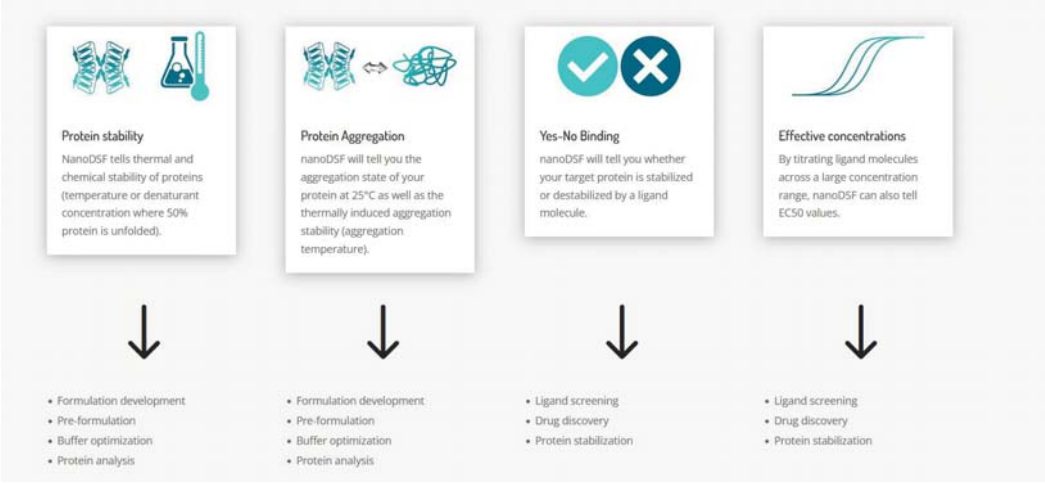
Why using PROMETHEUS PANTA?

- provides detailed information on various characteristics such as **thermal unfolding, particle sizing, and aggregation.**
- uses technologies like nanoDSF, backreflection, DLS, and SLS to give a comprehensive stability profile of the samples.
- It helps scientists understand how stable are the candidates for further development and manufacturing processes.
- Proteins hold up under different conditions, **like temperature changes**, is crucial for creating effective medicines.



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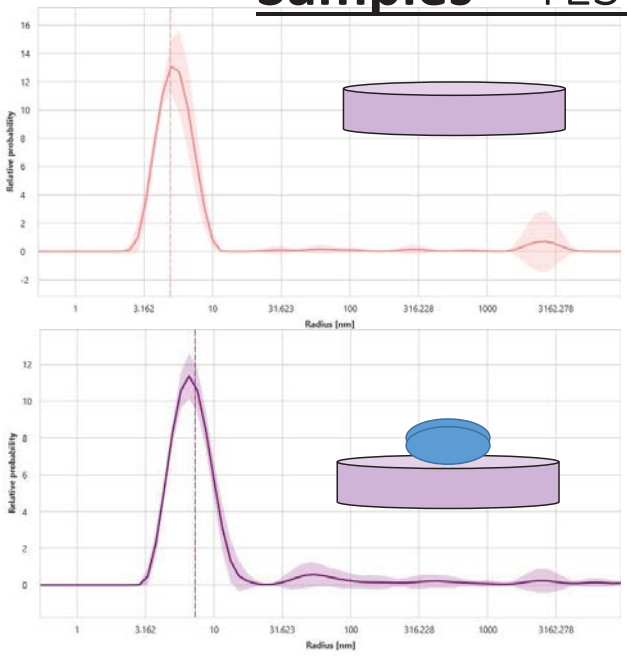
Samples • YES or NO binding•



Nanodisc

DOPC:SM:CH composition

SIZE: 5,23 ± 0,40 nm
PDI: 0,08 ±0,01
nanodisc only

SIZE: 6,78 ± 0,29 nm
PDI: 0,18 ±0,05
nanodisc + toxin

The polydispersity index (PDI) is an indicator of the heterogeneity of particle sizes in the sample and is derived from fitting the autocorrelation function.

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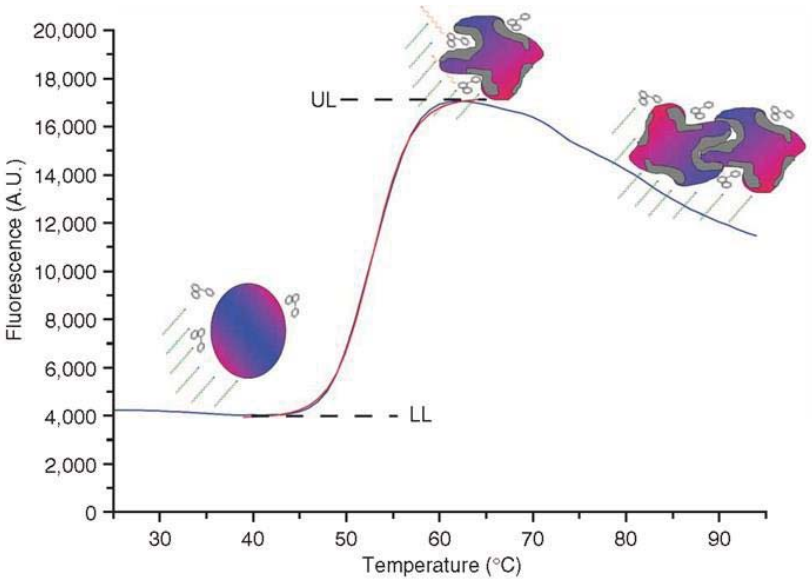
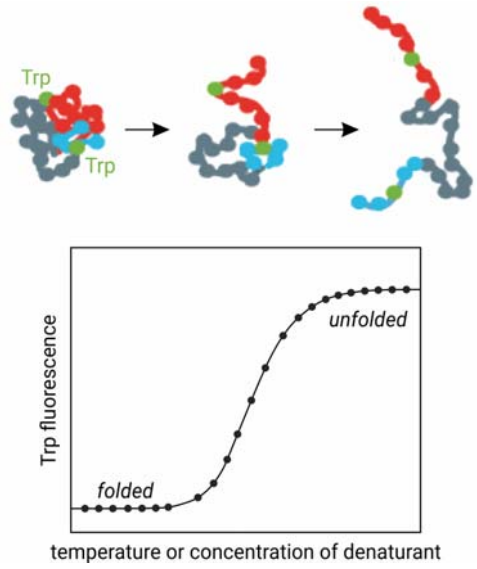
Samples • Protein Stability and Unfolding •

nanoDSF





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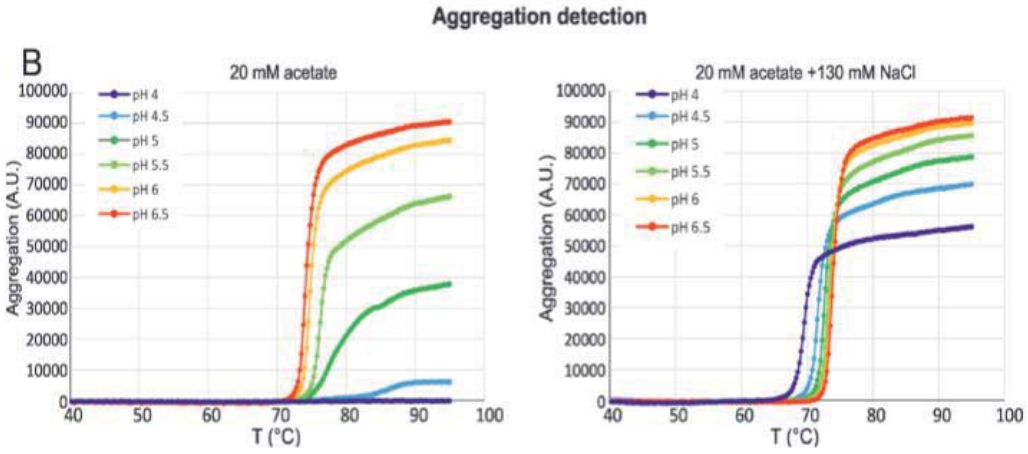
Samples • Aggregation•



Aggregation detected by changes in backreflection.

ADVANTAGES OF NANODSF

Modification-free
- in-solution
- no immobilization
- no labeling

Highly efficient
- fast analysis
- high-throughput
- multiple parameters

Quality-controlled
Detection of sample aggregation and fluorescence effects

Highly variable
- Free choice of buffers
- Use bioliquids
- Serum, cell lysate

Very frugal
Complete stability profile with just microliters of sample

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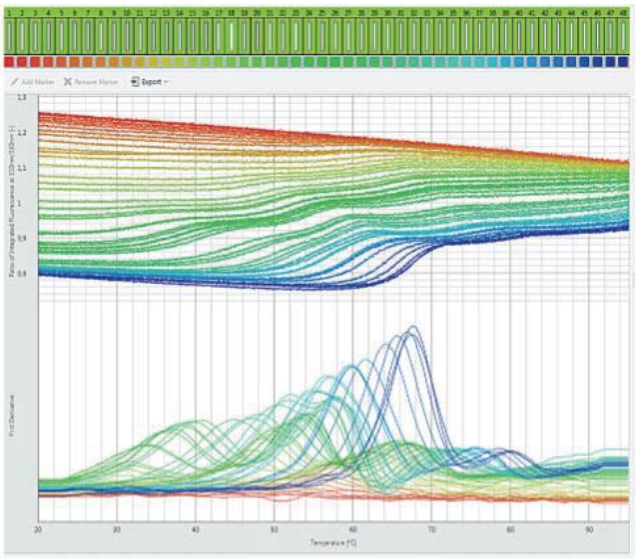
High resolution data for your optimization

- Antibody engineering
- Formulation development
- Biological in biosimilar candidate selection
- Thermal shift assay for hit screening
- Protein stability optimisation for structural biology



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PLUSES and MINUSES

Data Backup: can create a backup or snapshot of Prometheus data at a specific point in time.
Debugging and Troubleshooting: to facilitate without affecting the live system.
Experimentation: small amount of the sample, 10 µl
Offline Analysis: offline analysis of metrics data without requiring a live Prometheus instance
Short measurement time - 48 samples in 20min. Isothermal DLS in 2h thermal ramp range 15-110°C
Versatile sample types - peptides, proteins, nucleic acids, lipids, polymers, viruses, and more
Label-free detection - no sample labelling or immobilization is required
Wide molecular weight range - can measure particles from 1 kDa to 1 MDa
Provides multi-parameter information on conformational and colloidal stability, unveiling hidden behaviours that other technologies may miss
Combines thermal stability detection and aggregation information-rich analysis
Can be integrated with robotic platforms for high-throughput, automated operation

Storage Space: consumes storage space, which can be a concern for large frequent snapshots.
Manual Operation: operations may require manual intervention
Limited to Prometheus Data: Panta is specific to Prometheus, meaning it doesn't cover other data sources or tools that might integrate with Prometheus.
Buffer viscosity problems: parameters are important in Brownian motion

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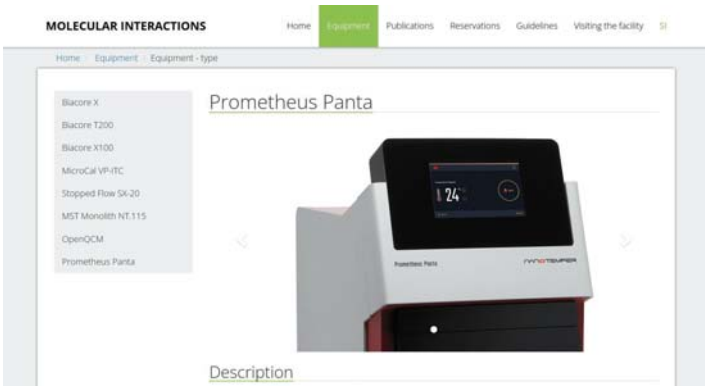
Molecular interactions

- Reservations on our page:

http://www.molekulske-interakcije.si/en/equipment/11/prometheus-panta

- Training on PROMETHEUS PANTA



Tuesday, 21st of May, @10:00