

Stargazer-2

DSLS INSTRUMENT FOR THE THERMOSTABILITY ANALYSIS OF PROTEINS



LABEL-FREE TECHNOLOGY

Stargazer-2 measures protein aggregation through the scattering of visible light. No fluorescent probes are used, meaning samples which were previously difficult to screen using DSF are now readily accessible using Stargazer-2's label-free DSLS technique.

10 - 95°C OPERATION

384-well microplates, heating rates up to 5°C/minute, and a short cool-off time translates into high-throughput experiments and fast results.

SAMPLES AS LOW AS 2.5 µL

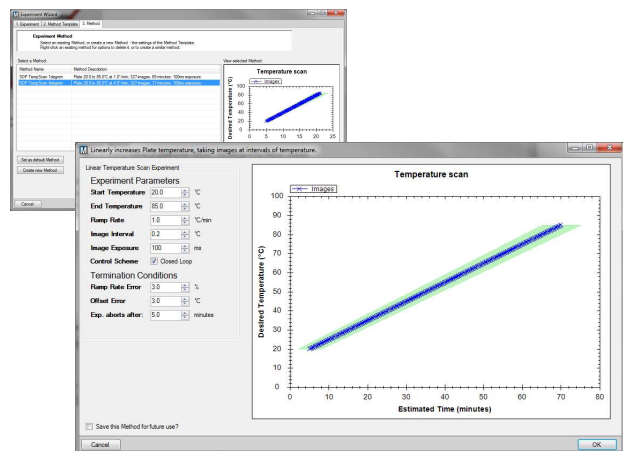
Using a standard low-volume 384-well optical bottom microplate, Stargazer-2 is capable of simultaneously collecting data from up to 383 samples per experiment. (Well A24 is reserved for use by the instrument.) To conserve valuable reagents, Stargazer-2 can detect aggregation in sample volumes as low as 2.5 µL/well. Typical protein concentrations used range from 0.05 mg/mL to 1 mg/mL.

ADVANCED SOFTWARE

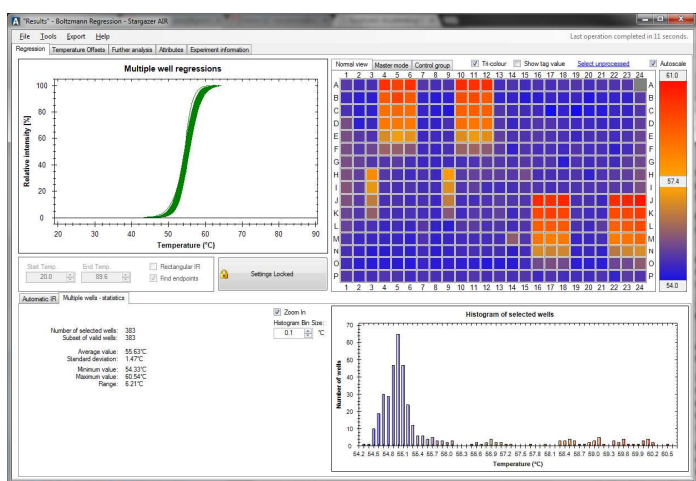
Method-based experiments in the Magellanic control software allow users to customize the operations of Stargazer-2 to their needs. Automated data processing using Stargazer-AIR lets users quickly analyze data. Export plugins provide Excel, BioActive, and LIMS compatibility. Optional online software updates ensure an up-to-date user experience.

STARGAZER-2 is Epiphyte3's second-generation DSLS instrument, designed to study the thermal stability of proteins. Using the label-free differential static light scattering technique pioneered by our scientists and engineers, Stargazer-2 measures the aggregation of protein in a 384-well microplate under controlled thermal conditions. This thermal aggregation assay can be used for many applications:

- Thermal stability analysis of proteins using temperature scanning & isothermal methods
- Formulation development of therapeutic monoclonal antibodies
- Characterization of membrane proteins
- Comparison of ligand specificity, including substrates, co-factors, inhibitors, etc.
- Validation of HTS hits
- Quality control of protein biologics
- Focused library screening for buffer optimization, protein crystallization, chemical biology
- Comparison of stability of SNP proteins



The Magellanic instrument control software allows users to create, share, and modify methods.



Stargazer-AIR automatically processes experiment data and provides users with powerful data analysis tools.

SELECTED PUBLICATIONS

- Vedadi M et al. Chemical screening methods to identify ligands that promote protein stability, protein crystallization, and structure determination. *Proc Natl Acad Sci U S A*. 2006 Oct 24;103(43):15835-40.
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- Adams M et al. Crystal structure of PhnH: an essential component of carbon-phosphorus lyase in *Escherichia coli*. *J Bacteriol*. 2008 Feb;190(3):1072-83.
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- Zhang et al. Conformational stabilization of ubiquitin yields potent and selective inhibitors of USP7. *Nat Chem Biol*. 2013 Mar;9(3):192.
- Goldberg, DS, Bishop, SM, Shah, AU and Sathish, HA (2011), Formulation development of therapeutic monoclonal antibodies using high-throughput fluorescence and static light scattering techniques: Role of conformational and colloidal stability. *J. Pharm. Sci.*, 100: 1306–1315. doi: 10.1002/jps.22371.
- Samra HS and He F, Advancements in High Throughput Biophysical Technologies: Applications for Characterization and Screening during Early Formulation Development of Monoclonal Antibodies, *Molecular Pharmaceutics* 2012 9 (4), 696-707.
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- El-Araby ME, Omar AM, Soror SH, Arold ST, Khayat MT, Asfour HZ, Bamame F, Elfaky MA. Synthetic bulky NS4A peptide variants bind to and inhibit HCV NS3 protease. *Journal of Advanced Research* 24 (2020) 251-259.
- Ferreira de Freitas R, Liu Y, Szewczyk MM, Mehta N, Li F, McLeod D, Zepeda-Velázquez C, Dilworth D, Hanley RP, Gibson E, Brown PJ, Al-Awar R, James LI, Arrowsmith CH, Baryste-Lovejoy D, Min J, Vedadi M, Schapira M, Allali-Hassani A. Discovery of Small-Molecule Antagonists of the PWWP Domain of NSD2. *J Med Chem*. 2021 February 11; 64(3): 1584-1592.

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TECHNICAL SUMMARY

Scattering wavelength: 620nm (other wavelengths, inquire)
 Sample temperature range: 10 - 95°C, 0.1 - 5.0°C/minute
 Number of samples: 1 - 383 samples (well A24 reserved)
 Sample volume: 2.5 - 50µL (average 0.1 mg/mL concentration)
 Protein consumption: 100µg / microplate (383 x 2.5µL @ 0.1 mg/mL)
 Approved microplates: Corning 3540, Nunc 242764
 Physical dimensions: 40 x 43 x 75cm (W x D x H), 50kg
 Power: 10A, 100-240VAC, 50-60Hz, 1Φ
 Included Software: Stargazer-Magellanic, Stargazer-AIR
 Computer: Two USB 2.0 ports available, 3 GB RAM minimum

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(+1) 647-479-9728
 www.epiphyte3.com
 info@epiphyte3.com