

Technology Summary

This document gives a quick overview on the Microscale Thermophoresis (MST) technology and available instruments:

Microscale Thermophoresis (MST)



Microscale Thermophoresis is based on a physical principle, used for the first time for biomolecular interaction studies. It measures changes of the mobility of molecules in microscopic temperature gradients. The technology is exceptional sensitive since it detects changes in size, charge and hydration shell of molecules. NanoTemper provides two Monolith series instruments based on MST:

- **Monolith NT.115**, which measures thermophoresis of fluorescently labeled molecules.
- **Monolith NT.LabelFree**, which measures thermophoresis by intrinsic tryptophan fluorescence.

NanoTemper's MST technology has the following key benefits:

- **fast:** measurement of a dissociation constant in 10 minutes
- **high sensitivity range:** ion and fragment binding up to interactions of large complexes (e.g. liposomes and ribosomes)
- **assay diversity and robustness:** measurements possible in any buffer as well as complex detergent mixtures (membrane receptors)
- **close to native assay conditions:** measurements possible in serum or cell lysate (only NT.115)
- **high information content:** straightforward detection of aggregation and other sample related artifacts
- **access to physical parameters:** affinity, stoichiometry, binding energetics
- **low sample consumption:** < 4 µl sample at nM concentration
- **free solution measurement:** no surface immobilization necessary
- **dynamic range:** sub-nM to mM (NT.115) and 10nM to mM (NT.LabelFree) dissociation constants
- **maintenance-free instrument**
- **straightforward handling:** simple sample preparation and intuitive software user interface

Monolith Series Instruments

The Monolith NT.115 and the Monolith NT.LabelFree complement each other well. Each system has its specific advantages and a decision has to take into account your applications. If you are interested in measuring a wide variety of different samples, we recommend considering the use of both systems.

Monolith NT.115



NT.115: Measuring with fluorescence label:

- Measurements in any buffer and also in complex bioliquids like cell lysis possible.
- MST with dye fluorescence is sensitive to measure a wide range of binding events, from ion binding to ribosome or histone binding.
- You avoid auto-fluorescence of the titrated binding partner and can measure any interaction of (bio)molecules independent of their spectroscopic properties.
- Accessible affinity range from sub-nM to mM

Monolith NT.LabelFree



NT.LabelFree: Measuring with intrinsic fluorescence:

- Since no label is needed, also samples that might be sensitive to a labeling procedure (e.g. some membrane receptors) can be measured.
- The system is very sensitive, even for slightest modification of your molecule of interest.
- The system works perfectly for all systems where the titrated binding partner shows no or only a weak intrinsic fluorescence. That includes Nucleic acids, Peptides, Sugars most Small Molecules and many Proteins.
- Accessible affinity range from 10nM to mM.

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