



Portfolio Overview





Better Biologics Tools



Analytics



Workflows

Stability Analytics



UNcle

Stability Screening



HUNK

Aggregation
Predictor



pUNk

Protein
Sizer

The UNcle

The All-in-One Stability Platform



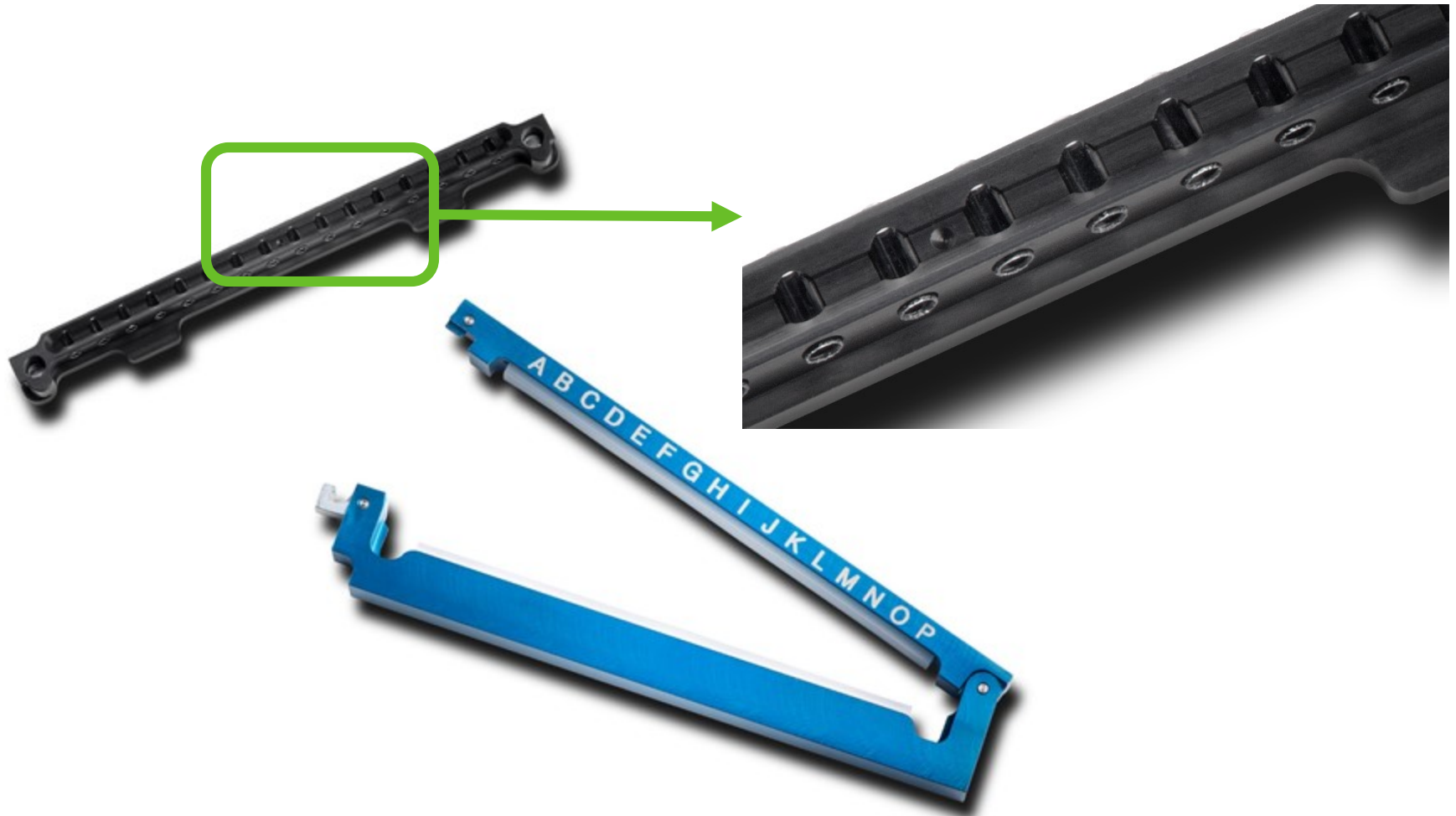
UNcle

The First All-in-One Biologics Stability Platform

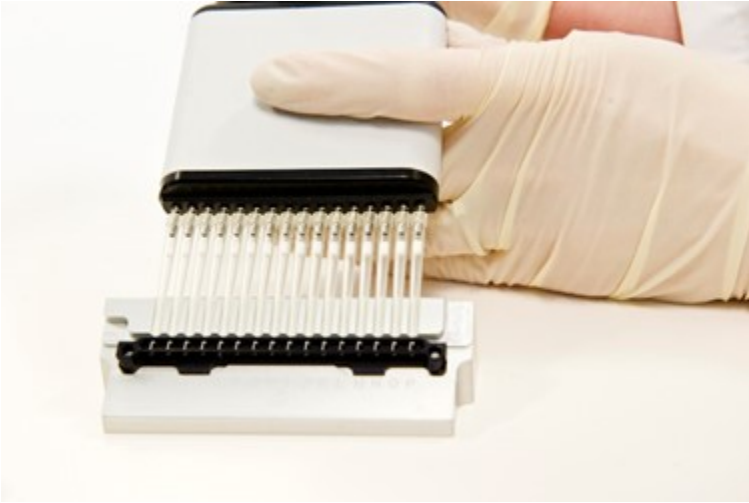


- Combines **3 detection methods:**
 - Full Spectrum Fluorescence
 - Static Light Scattering
 - Dynamic Light Scattering
- **Less sample** than other instruments
- **Label-Free** Measurements

9 μL Sample Size



Fast and Easy Prep

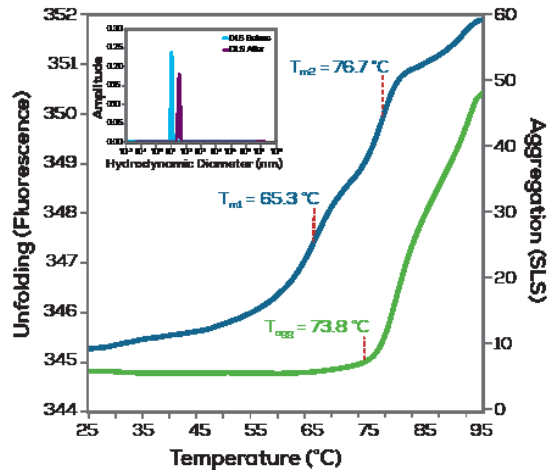


48 Samples Per Run

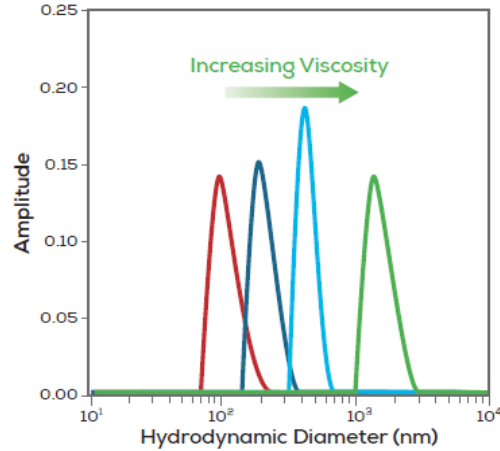


All-In-One Stability Platform

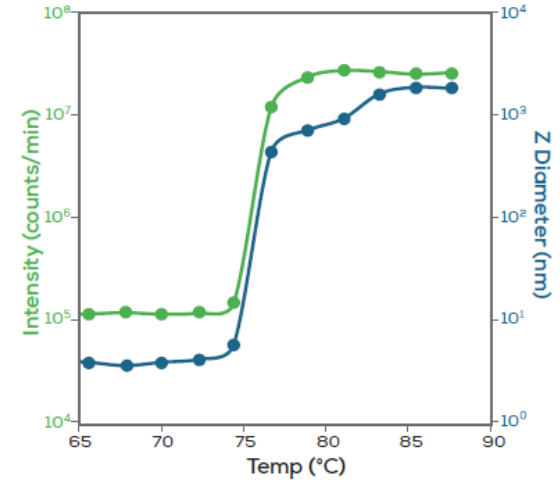
T_m , T_{agg} & DLS



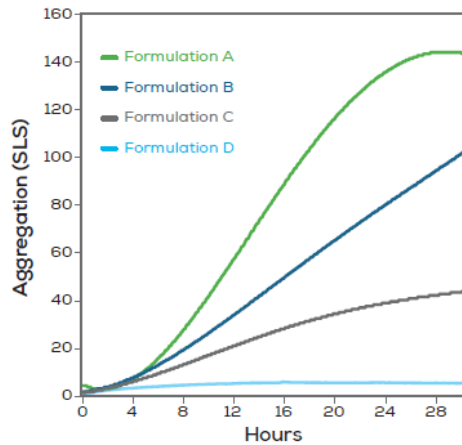
Viscosity



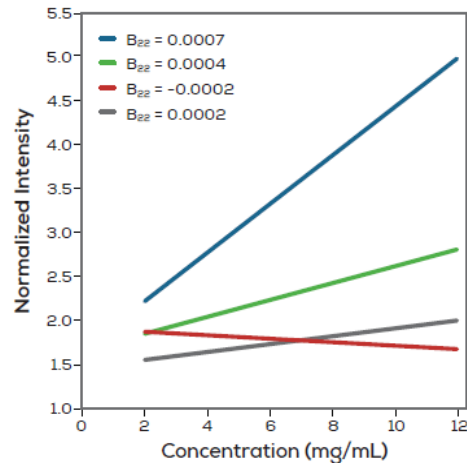
Thermal Ramp with Sizing



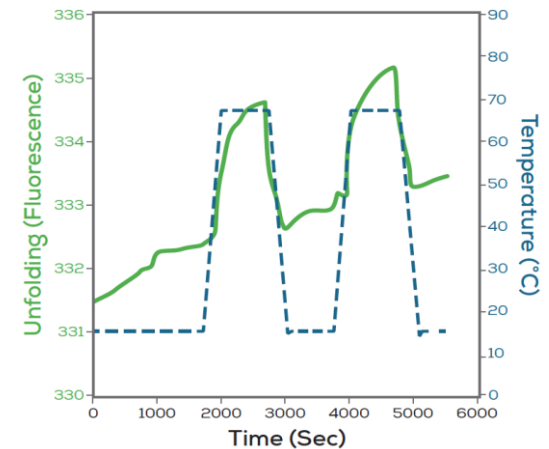
Isothermal Stability



B_{22} & k_D



Thermal Recovery



The HUNK

World's First Stability Predictor



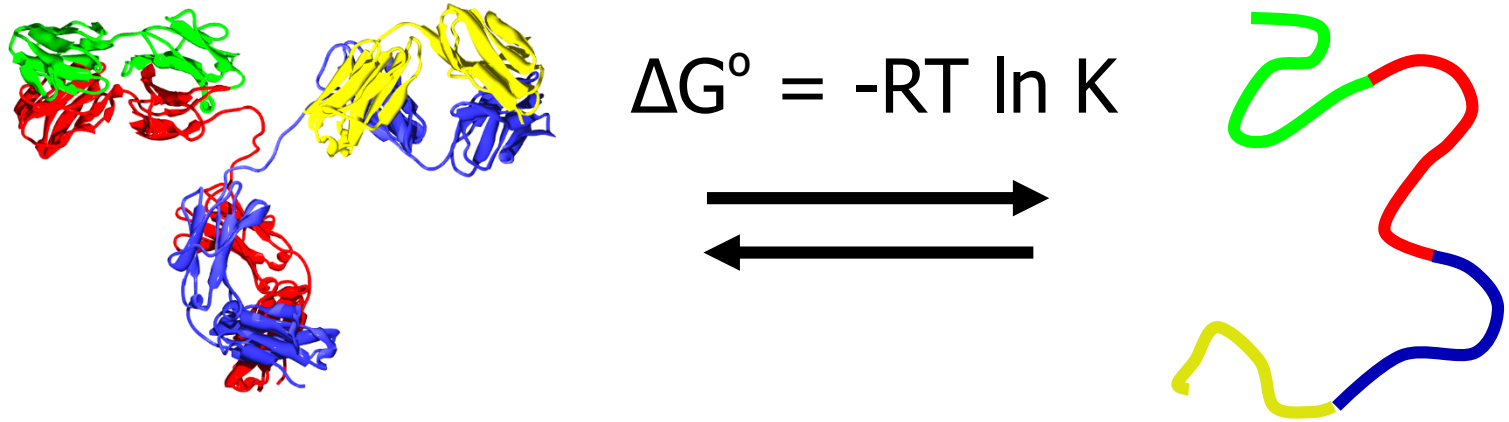
The HUNK

ΔG measure stability

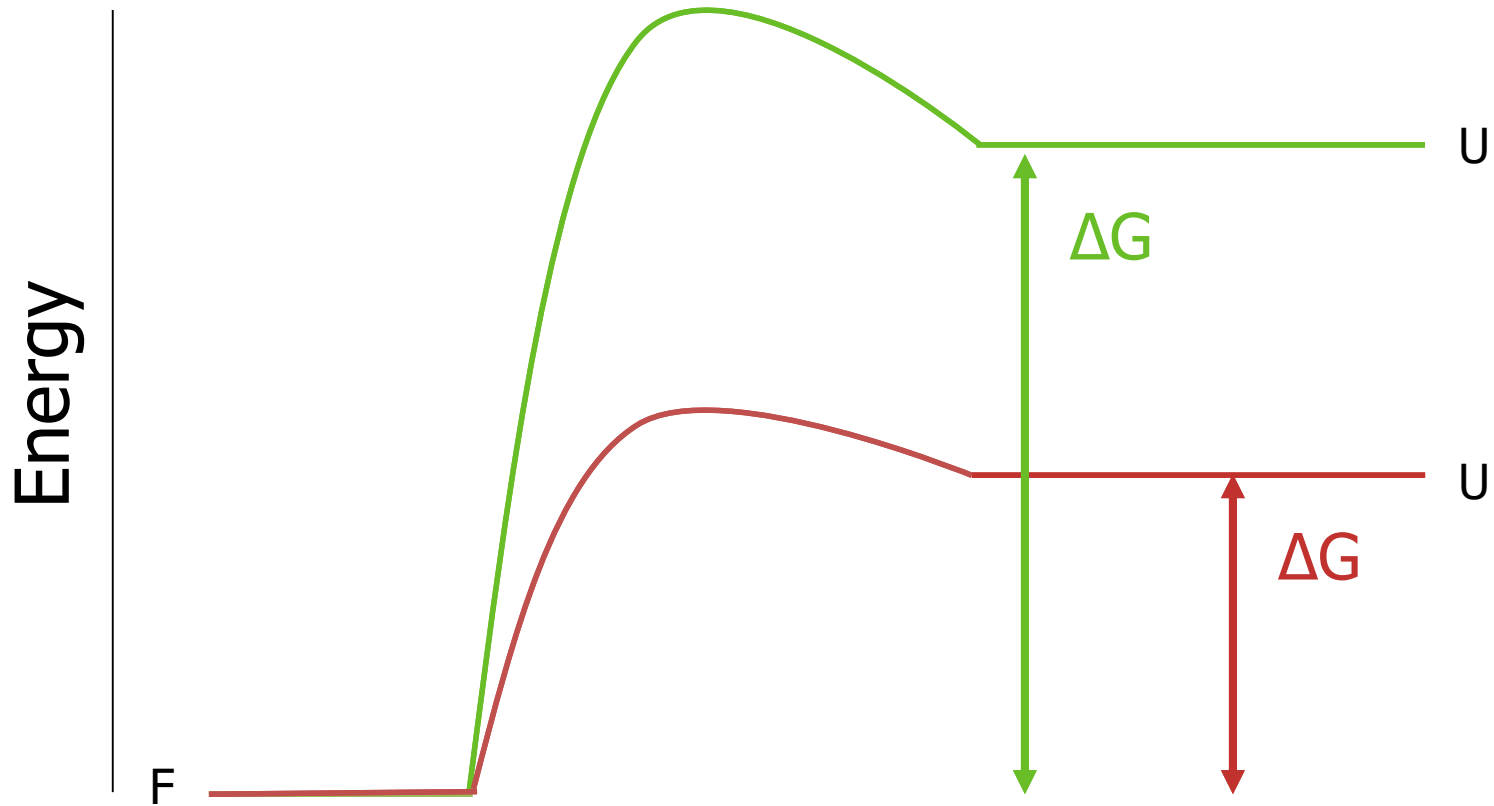
ΔG_{trend} predict aggregation



Thermodynamic Equilibrium



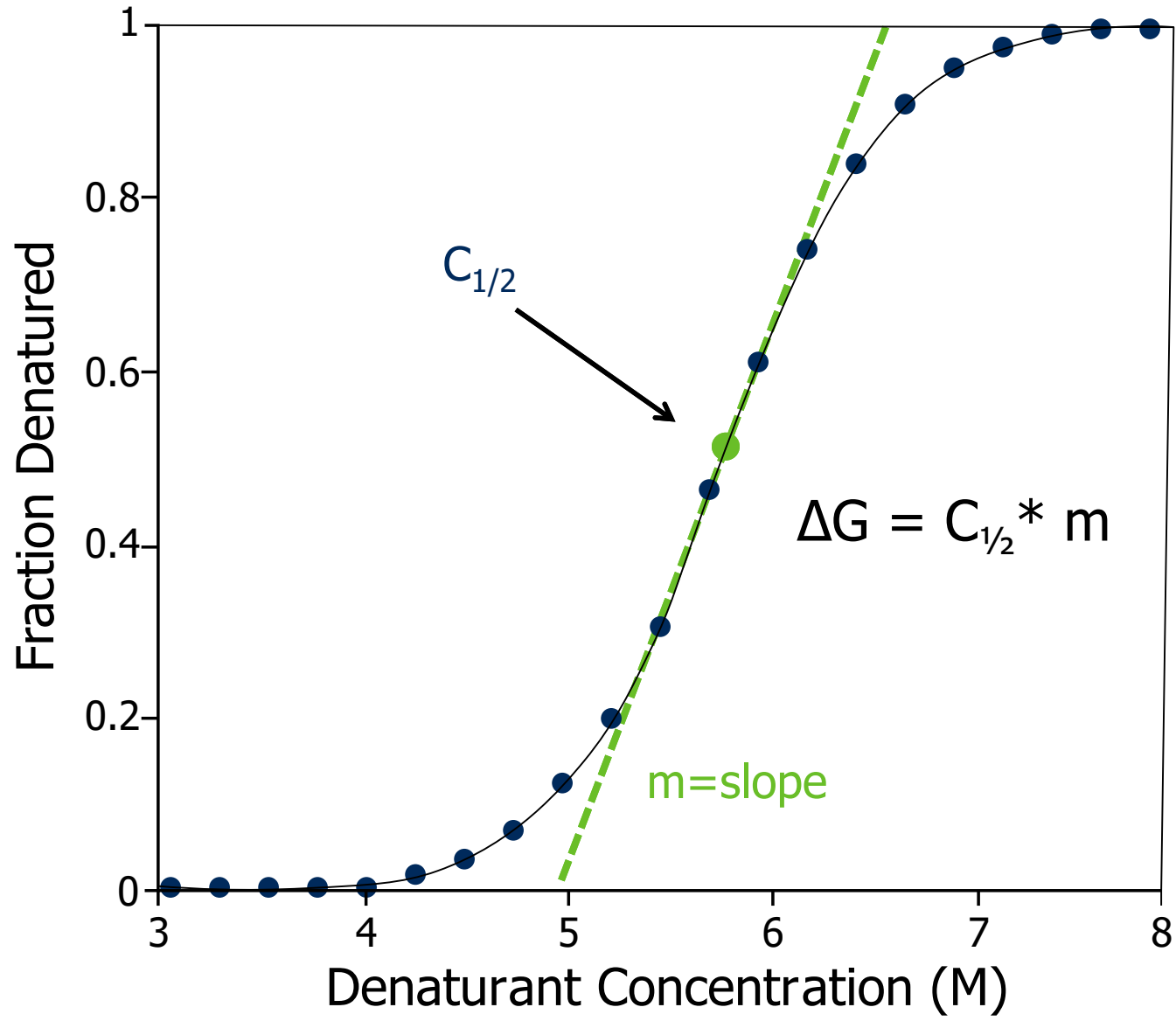
The Power of ΔG



Automated Chemical Denaturation

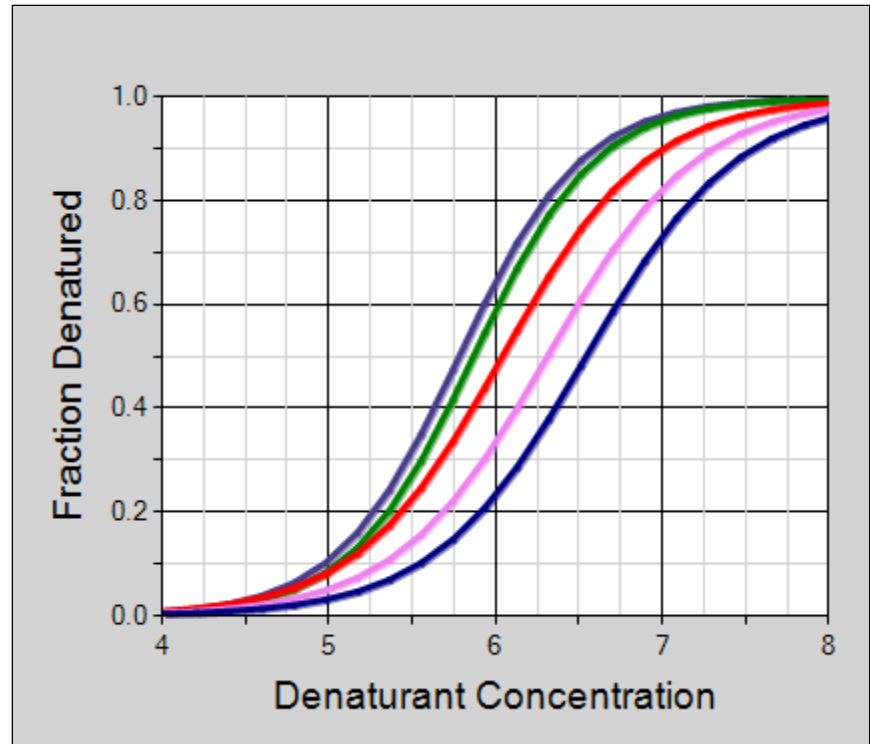


Read ΔG in One Hour



Quantify Formulation Stability

Formulation	ΔG (kcal/mol)
0 mM NaCl	8.19
250 mM NaCl	9.36
500 mM NaCl	8.88
750 mM NaCl	8.18
1 M NaCl	7.91



$\Delta G =$ Fraction Denatured

ΔG kcal/mol	Stability	Fraction Denatured
9.6	Low denaturation	1/10,000,000
8.2		1/1,000,000
6.8		1/100,000
5.5	Moderate denaturation	1/10,000
4.1		1/1000
2.7	High denaturation	1/100
1.3		1/10
0		1/2

10X decrease
in denatured
protein



Consequences of Aggregation

[Now UK Recalls Another Novartis Flu Vaccine – Agrippal – Recall Follows EU and Canadian Bans of Agriflu and Flud Flu Vaccines](#)

Posted on **October 31, 2012** by ChildHealthSafety

Following prior bans reported by CHS [[EU And Canada Flu Vaccine Ban – Not Reported By Press](#)] UK's drug regulator the MHRA yesterday issued an announcement which includes the following:

“ At the request of MHRA, Novartis Vaccines and Diagnostics S.r.l. is executing a precautionary recall of the above batches. This is due to the presence, in one of the components, of **visible protein aggregates** that were identified following additional testing during the course of an investigation. Such protein aggregation can occur in influenza vaccines. The aggregation consists mostly of viral proteins expected in the vaccine, and when observed, aggregation is transient and disappears upon shaking as recommended in product labelling. No visible protein aggregates were detected at the time of product release in any of these UK batches.

Based on the information available, there is no evidence of any new safety concerns or of any impact on efficacy. No adverse reactions which may be associated with this issue have been reported to Novartis in connection with these batches. Those who have had a flu vaccine from these batches should have no cause for concern and there is no need for revaccination.

[Class 2 Drug Alert \(Action Within 48 hours\): Novartis Vaccines and Diagnostics S.r.l. – Agrippal suspension for injection in pre-filled syringe – Influenza Vaccine – EL \(12\)A/34](#)

Another Soliris recall as Alexion evaluates its manufacturing network

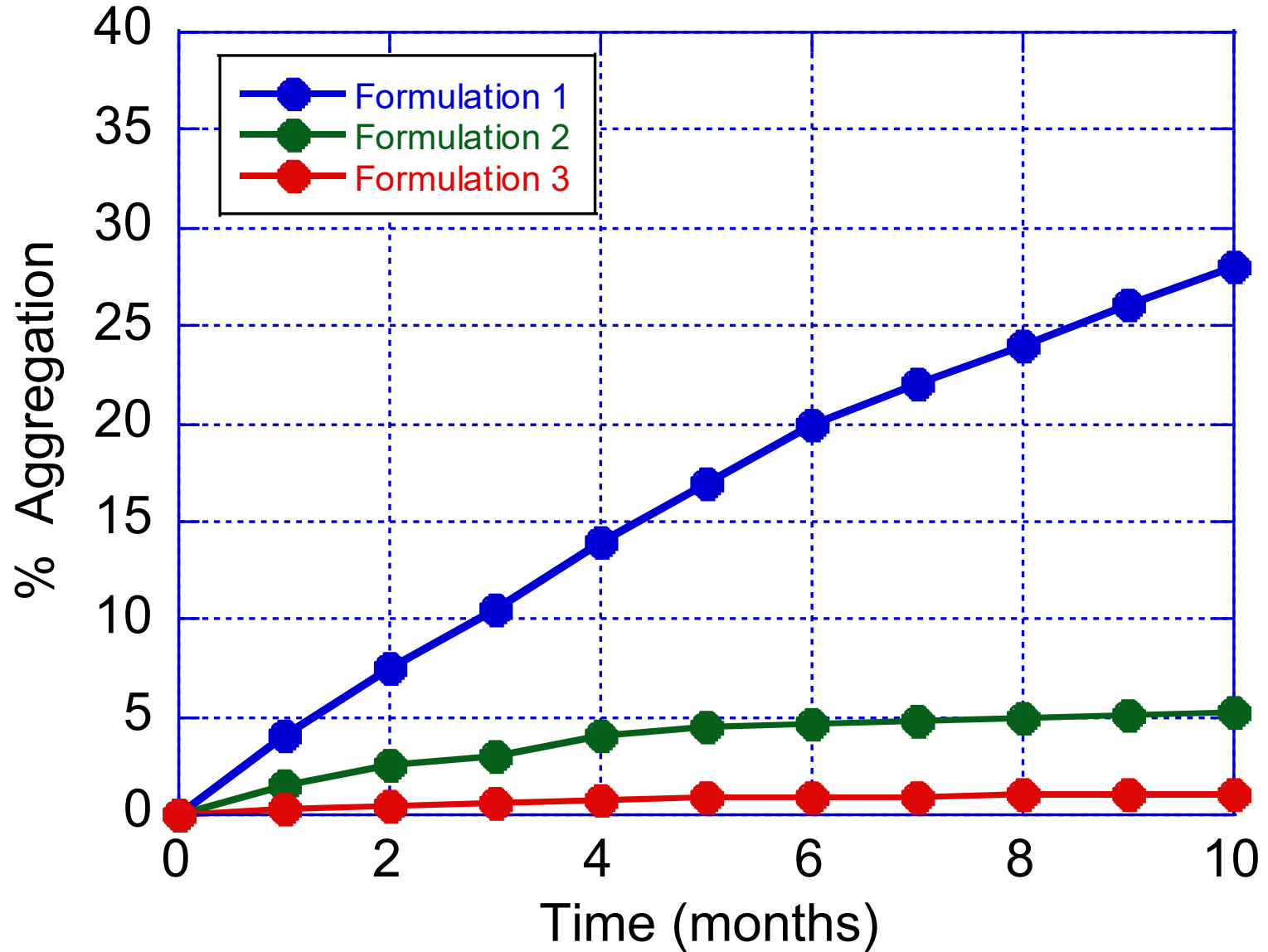


Related tags: Alexion, Soliris, Lonza, FDA

Alexion has recalled another nine lots of Soliris after finding "visible particles" in vials of the \$600,000-a-year drug for the third time in 10 months.

The voluntary recall covers nine lots of the drug distributed in the US last October in which **visible proteinaceous particles** were detected during stability testing.

A Waiting Game



Lots of SEC

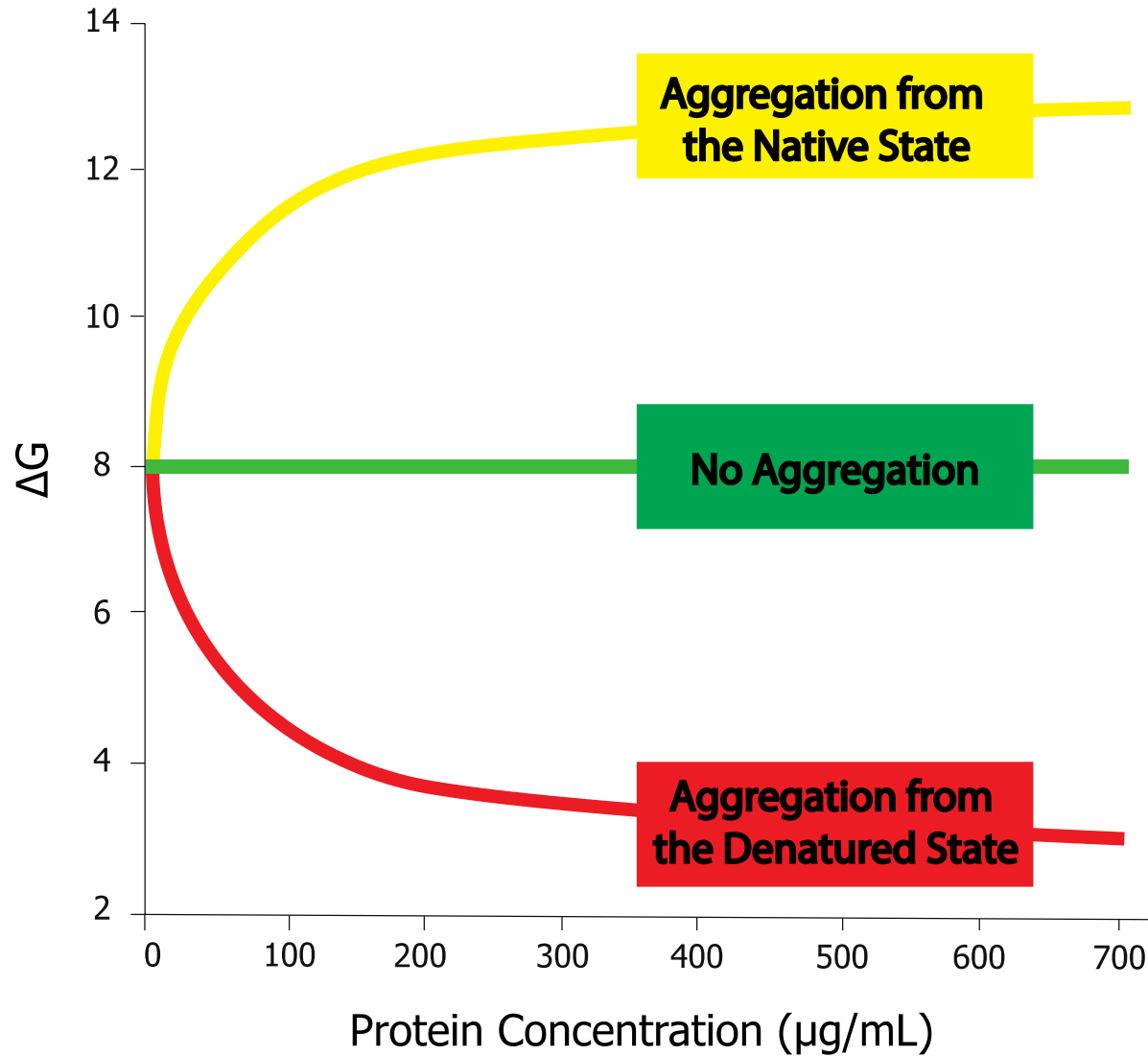




Your protein will aggregate



The HUNK Measures ΔG_{trend}

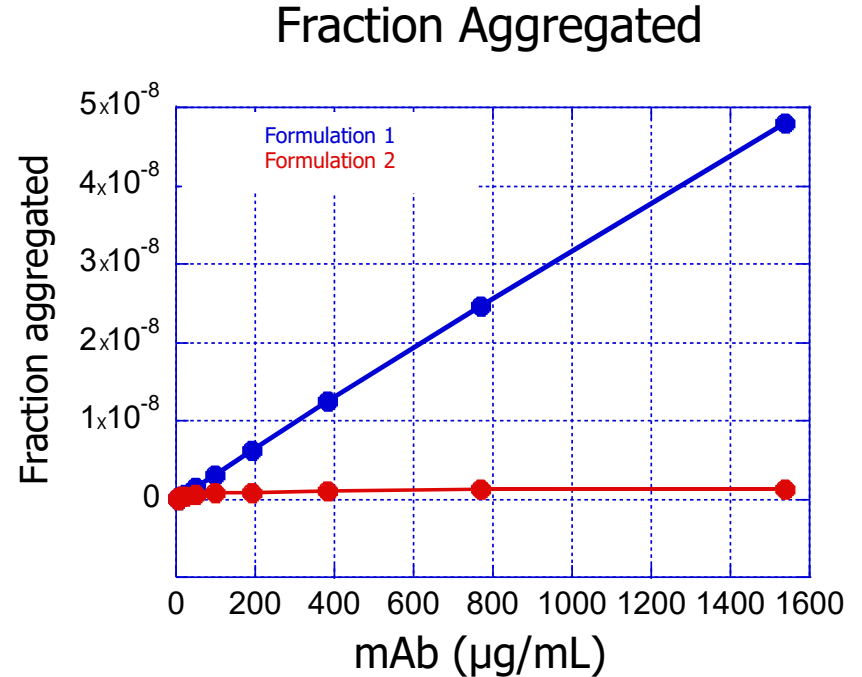
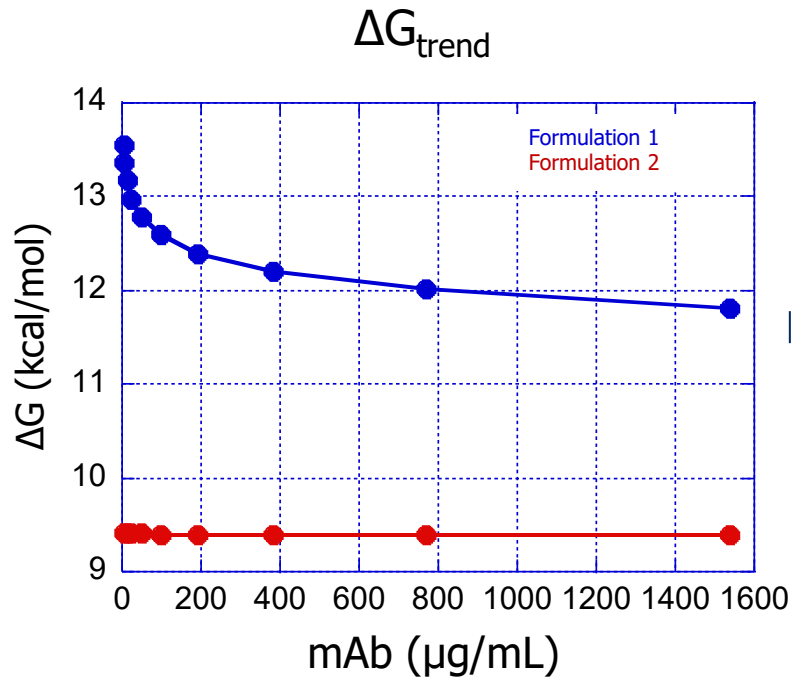


Importance of ΔG_{trend}

Formulation #	ΔG (kcal/mol)
1	13.5
2	9.5

- Same mAb in two formulations
- Both are very good
- Formulation 1 is better... right?

ΔG_{trend} Provides New Information

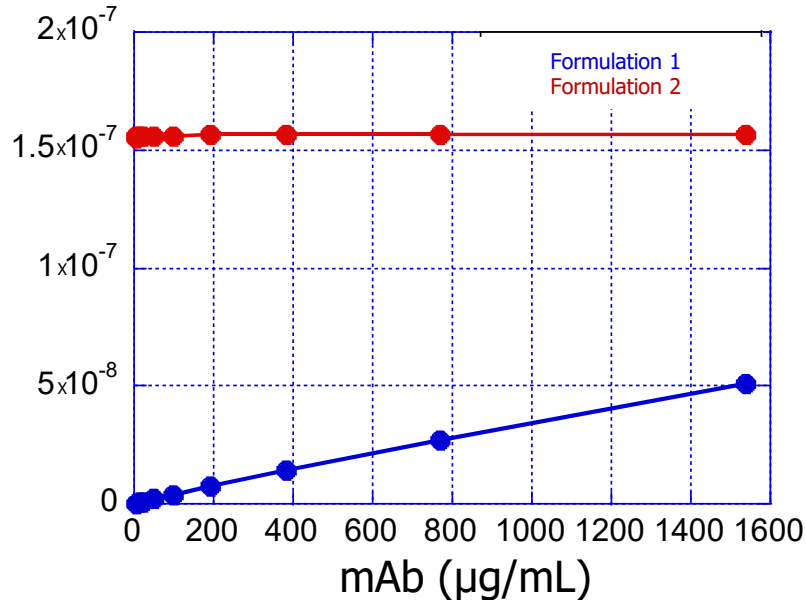


- **Formulation 1:** ΔG decreases
- **Formulation 2:** No change

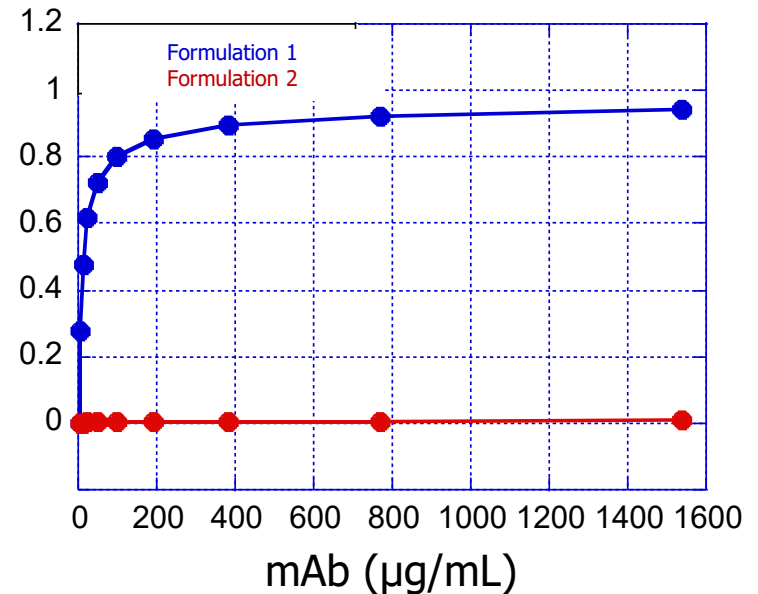
- **Formulation 1:** Increased aggregation
- **Formulation 2:** No change

Denaturation Profile from ΔG_{trend}

Fraction Denatured



Fraction Aggregated of Fraction Denatured



- **Formulation 1:** Denatured protein increases
- **Formulation 2:** No change
- **Formulation 1:** Denatured protein aggregates
- **Formulation 2:** No change
- HUNK prediction: **Formulation 2** is more stable
- SEC data at one month agrees

The pUNK

Smallest, fastest, easiest protein sizing



Size It Up Quick

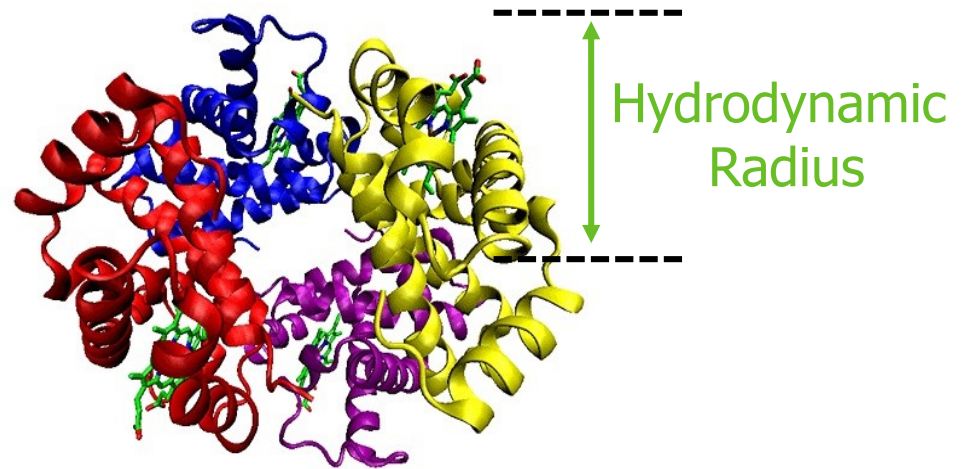
5 μ L of sample

8x faster



pUNK Measures...

- Molecular Size
- Aggregation
- Polydispersity
- Molecular weight estimate

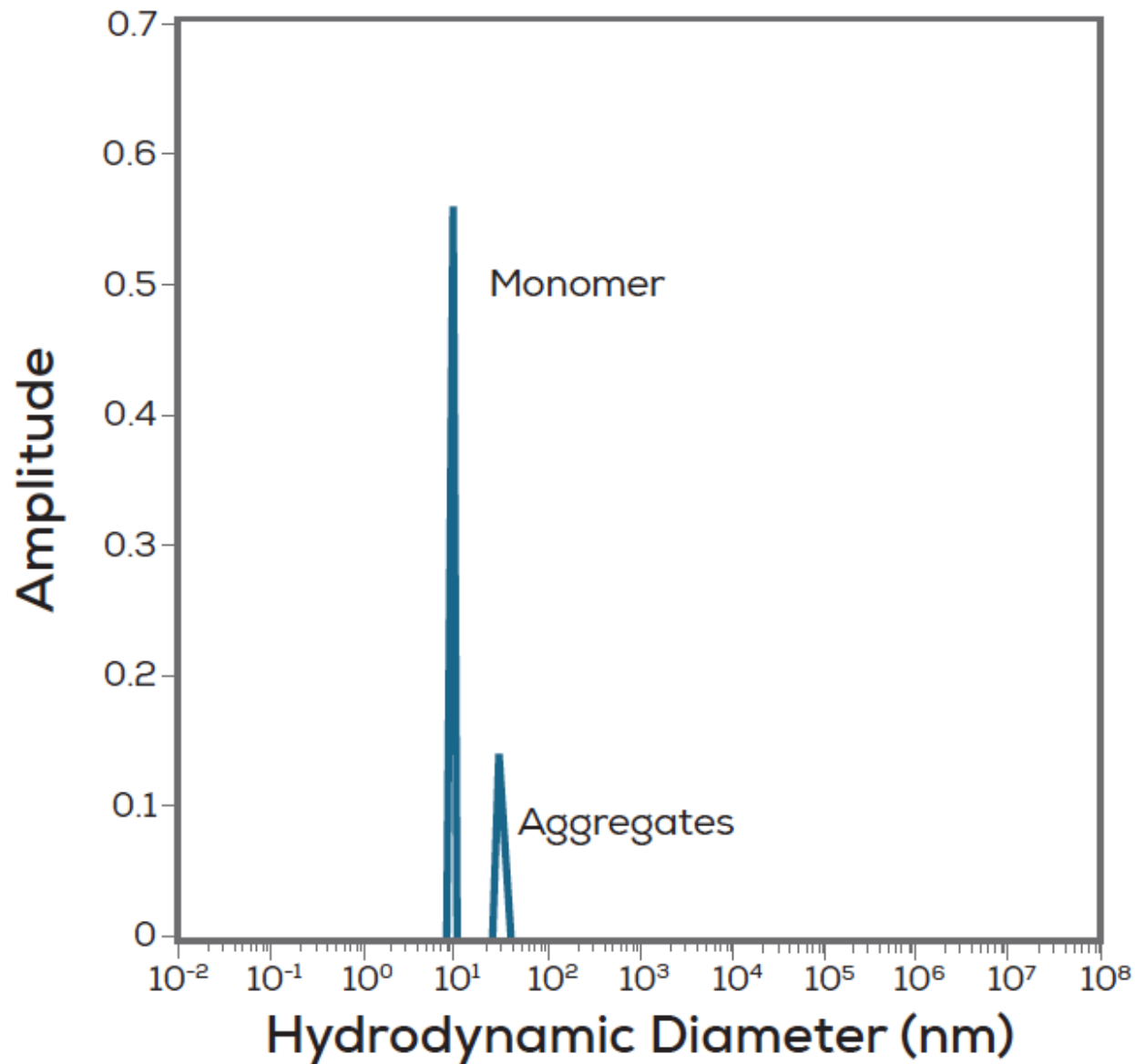


The rUNT

- Only 5 μL of sample
- No reference needed
- No cross-contamination
- No cleaning
- Full sample recovery

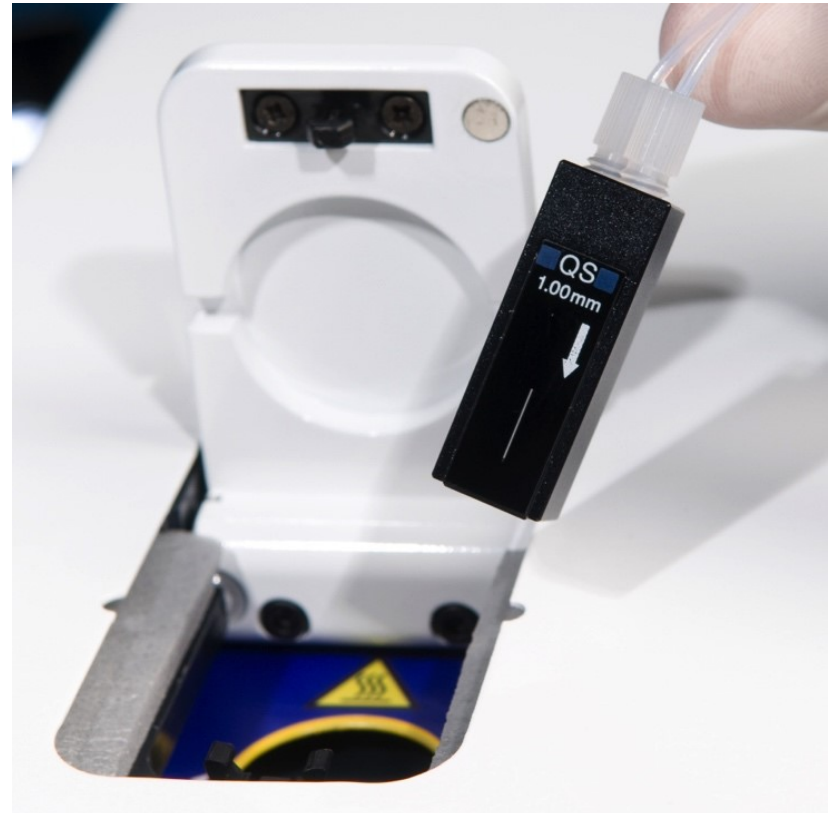


pUNk Detects Aggregates



Get Your Flow On With SEC-DLS

- Absolute size across peaks
- Aggregates separate first
- Accurate MW
- Peak widths based on size
- Size distributions





The Stability Experts



Screening



Prediction



Sizing



Break free.

