curia

TunaCHO℠ platform for transient protein & antibody production

CHO expression systems at Curia

TunaCHO℠ Platform

7 – 14 day transient high yield

10 mL – 20 L

Can reach >1 g/L

CHO-GSN℠ Platform

High performance stable

Can reach up to 7 g/L

Multiple programs at clinical stage

- Support discovery, development, and manufacturing
- The same CHO-K1 parental is used for all platforms so products from the different platforms have similar activity & post-translational modification (PTM) profiles

Introducing TunaCHO platform

A high yield transient production system

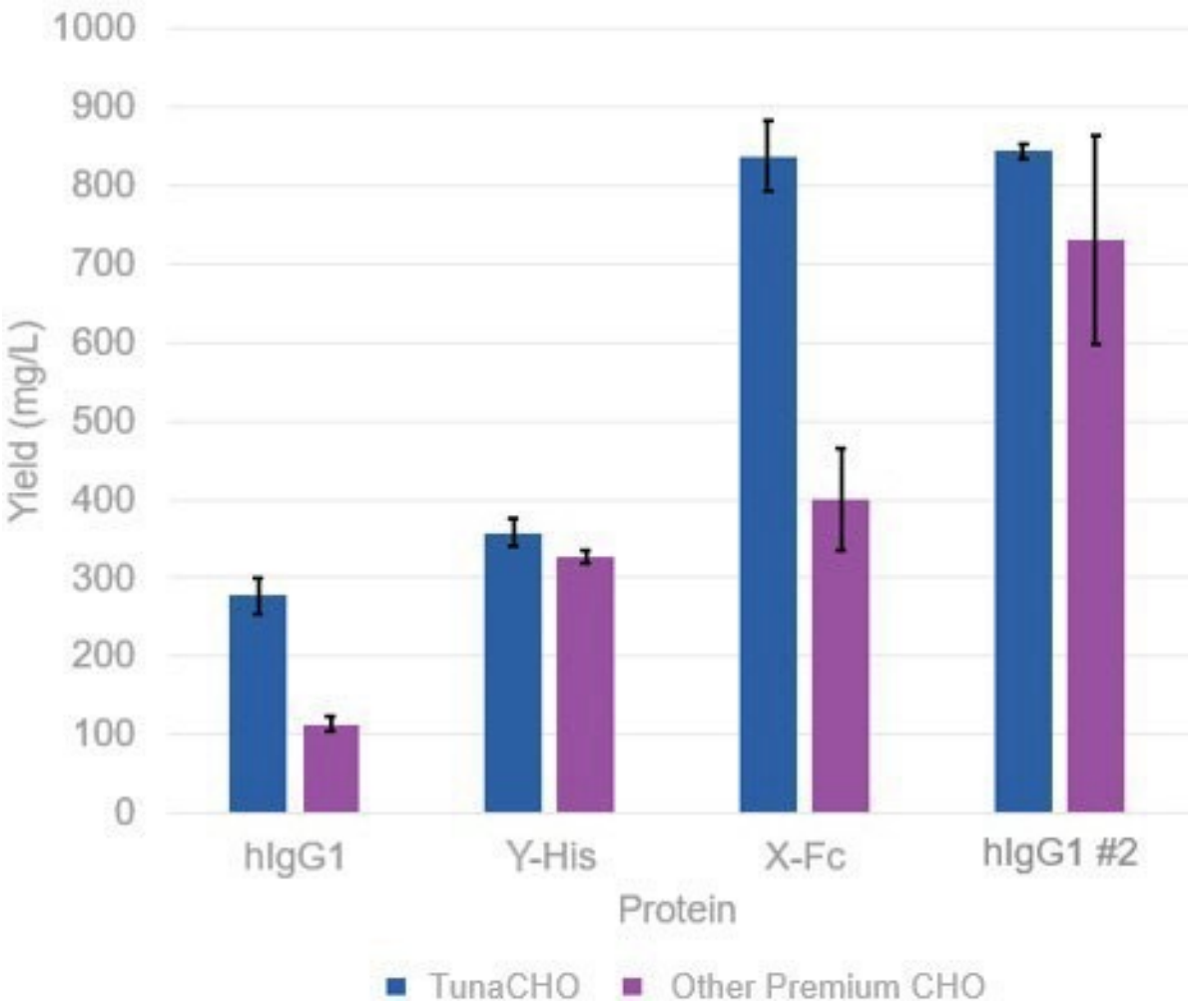
TunaCHO platform is a CHO transient protein production system

- Curia's proprietary CHO-SE™ cell line (same parental cell line as CHO-GSN platform)
- Curia's proprietary process

Compared to other CHO transient production systems, TunaCHO platform offers several distinctive advantages:

- Good productivity: can reach >1g/L
- Consistent and scalable: same results from 10 mL to 20L
- Cost effective compared to other premium CHO transient production systems

TunaCHO platform for high productivity & consistency



TunaCHO platform as an alternative to other premium CHO transient systems in production of:

- Recombinant human IgG1
- Fc-fusion protein
- His tagged non-antibody protein

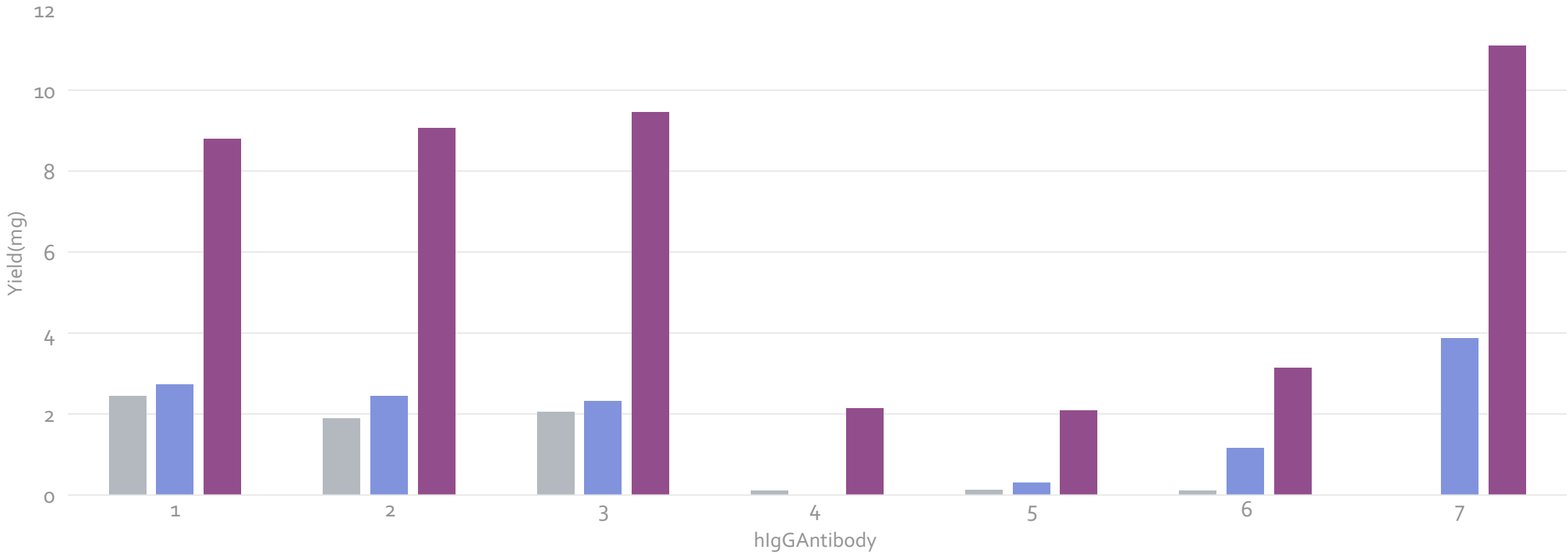
TunaCHO process is consistent in production yield

Data from extended 14-day production using TunaCHO platform is shown.

High productivity with TunaCHO platform

Production of 7 different human IgG antibodies in 3 transient expression systems demonstrates TunaCHO platform has **high productivity.**

The TunaCHO platform is able to increase expression level of low-expressing antibodies (samples 4–6) by 10- to 20-fold. Each sample is from a 10 mL production volume.

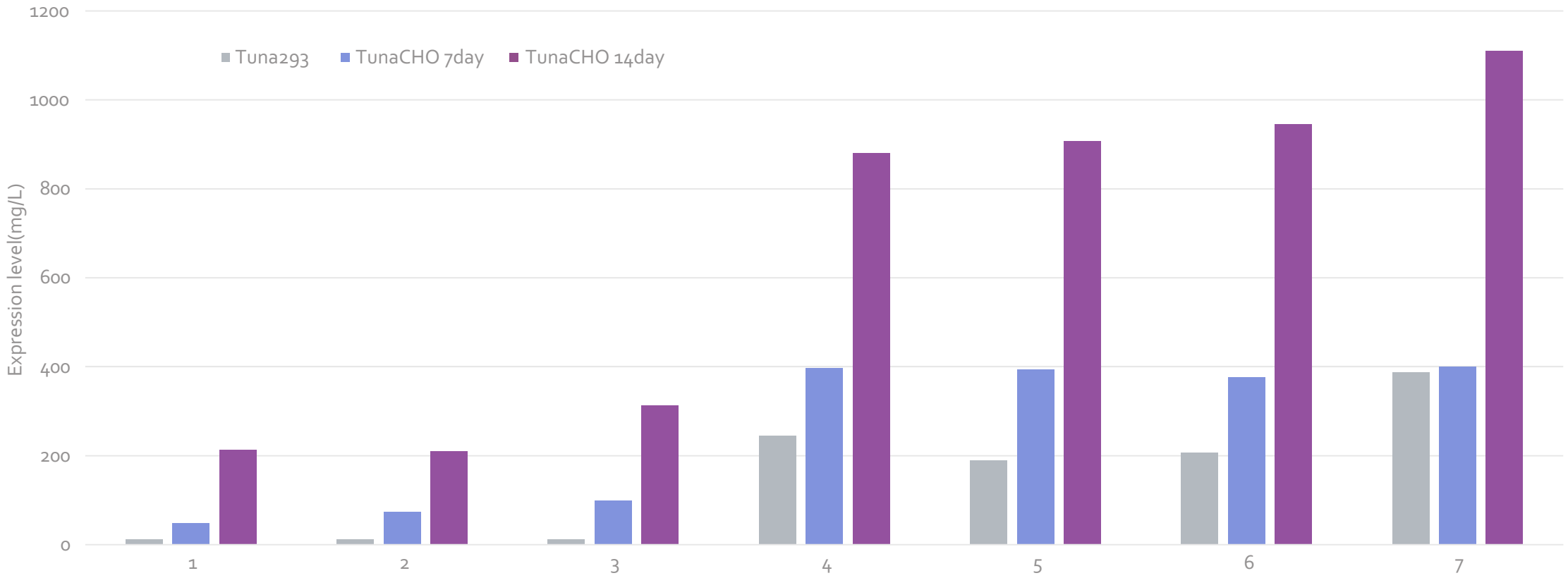


Data from extended 14-day production using TunaCHO platform is shown.

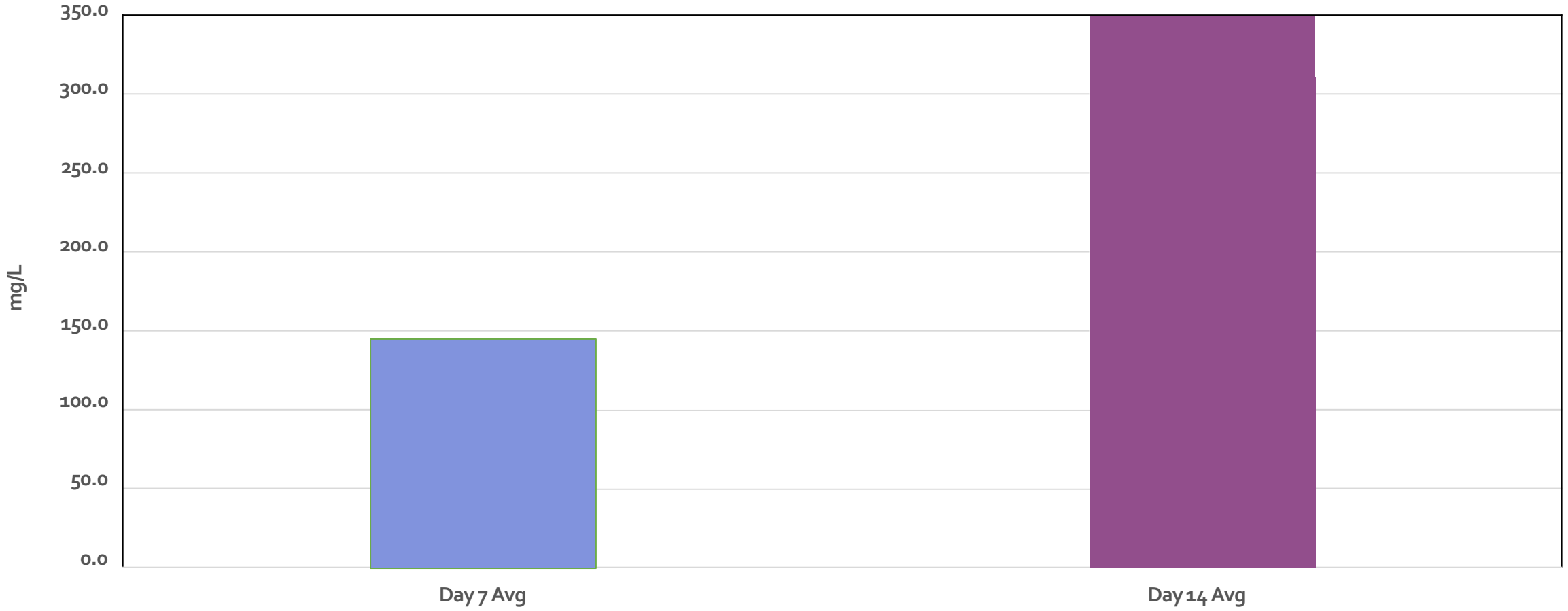
High productivity with TunaCHO platform

Production of 7 different human IgG antibodies in Tuna293^{SM}, TunaCHO (7 days), and TunaCHO (14 days extended run) transient expression systems is shown.

The TunaCHO 7-day platform is able to increase expression level of low-expressing antibodies (samples 1–3) by 10 to 20-fold while maintaining the expression level of a high-expressing antibody (sample 7).



Average TunaCHO platform yield 7 days vs 14 days*

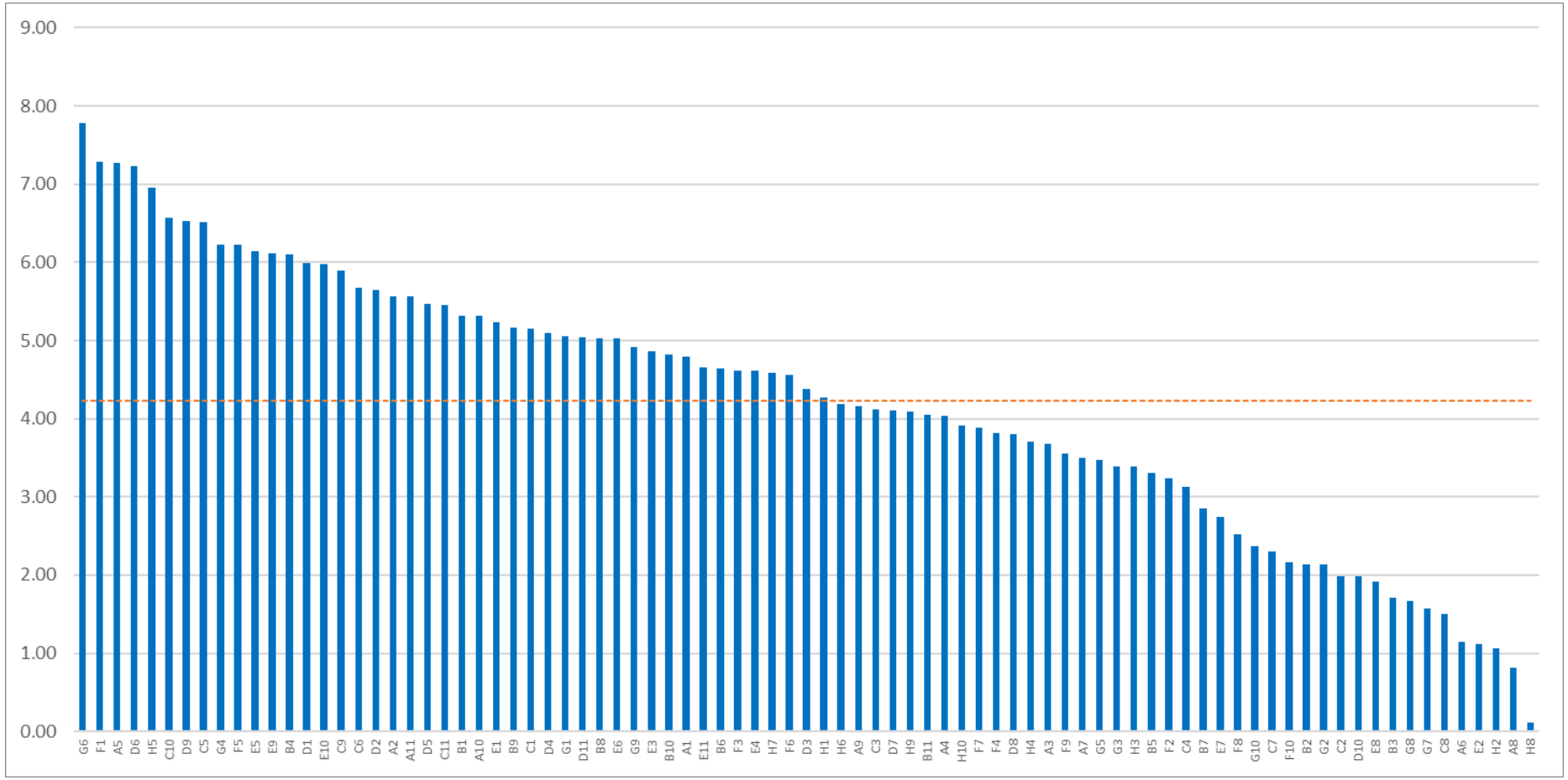


* Data from >30 production runs including human antibodies, mouse antibodies, and Fc-fusion proteins. Non-Fc proteins were not included.

TunaCHO platform for high-throughput antibody production

85 recombinant antibodies are produced in 10 mL TunaCHO process with Protein A purification.

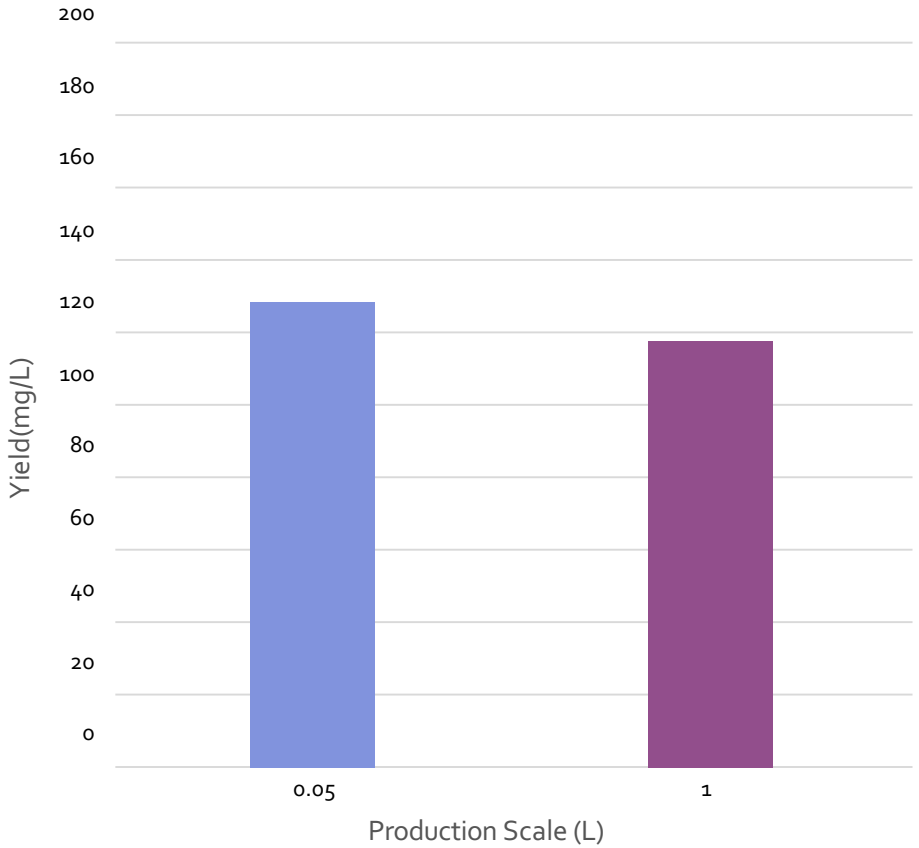
Average yield is 4.2 mg per 10 mL culture.

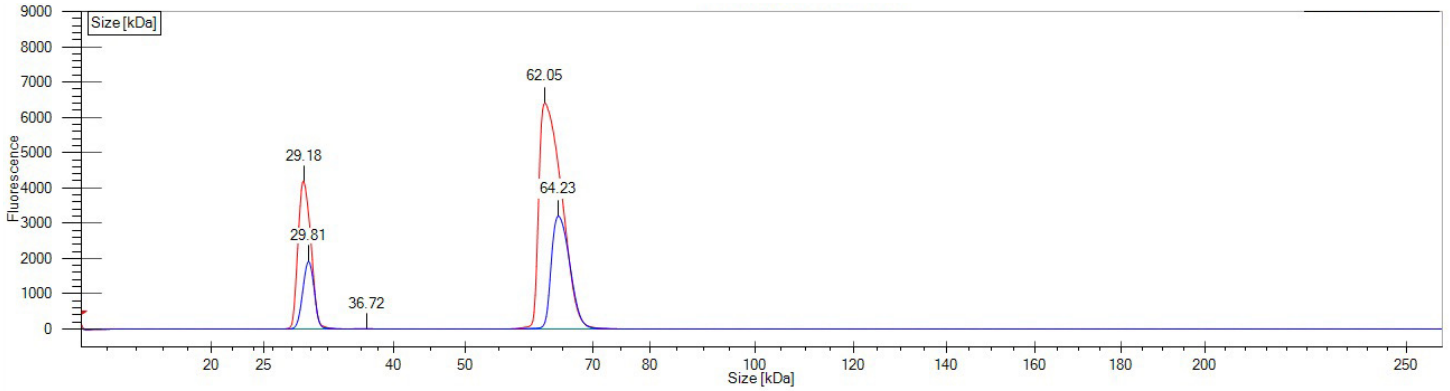


Data from extended 14-day production using TunaCHO platform is shown

TunaCHO platform for consistency and scalability

Consistent TunaCHO production levels, CE-SDS profile, and intact mass results between 0.05 L and 1 L production of hIgG1 demonstrate consistency and scalability.





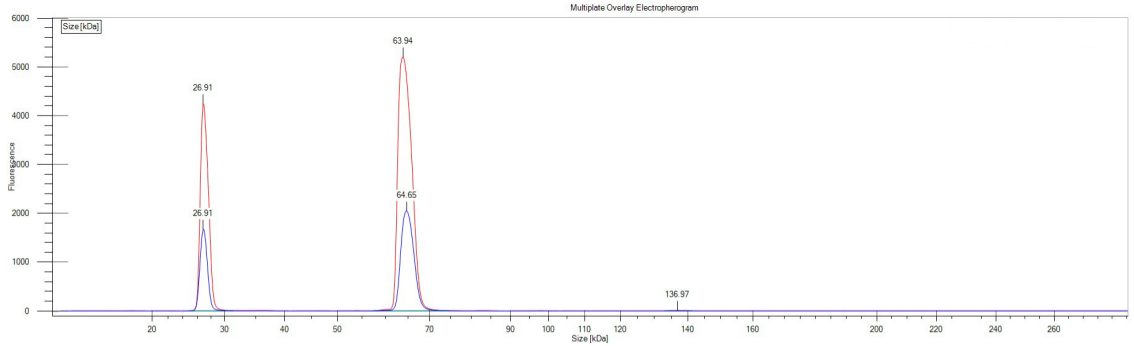
Protein Type	Production Volume	HC Measured	LC Measured	HC Calculated*	LC Calculated*	Δ HC
hIgG1	0.05L	48927	23947	48925	23947	2.0
	1L	48927	23947	48925	23947	2.0

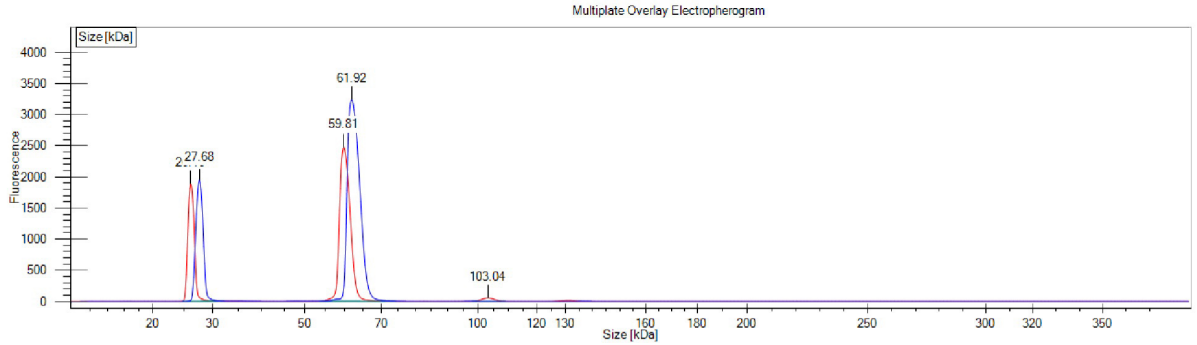
Data from extended 14-day production using TunaCHO platform is shown.

TunaCHO platform — Consistent CE-SDS profile

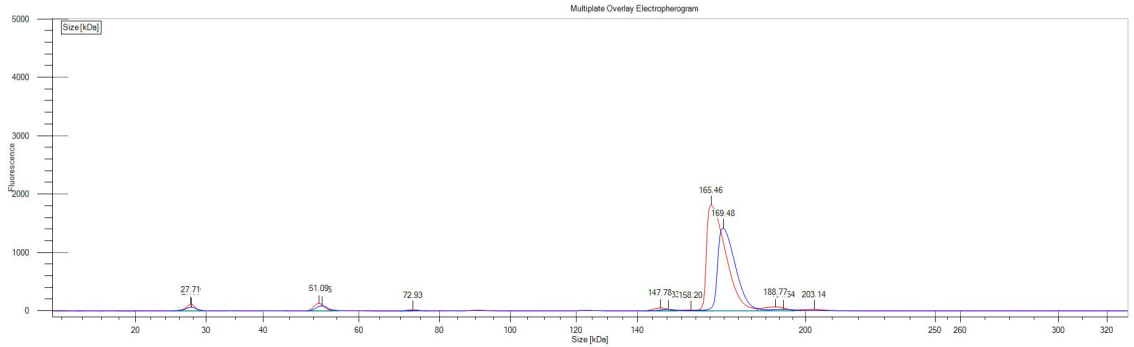
CE-SDS was performed on antibodies produced from TunaCHO platform and another premium transient CHO system under reducing & non-reducing conditions.

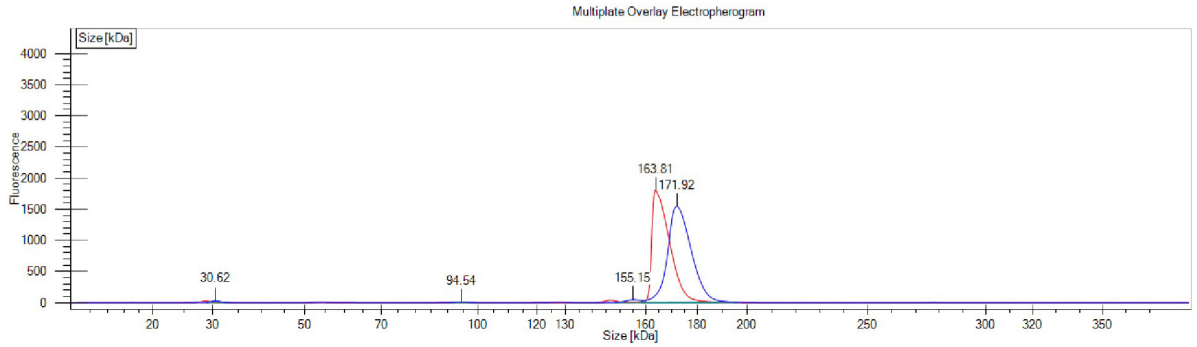
Reducing





Non-Reducing



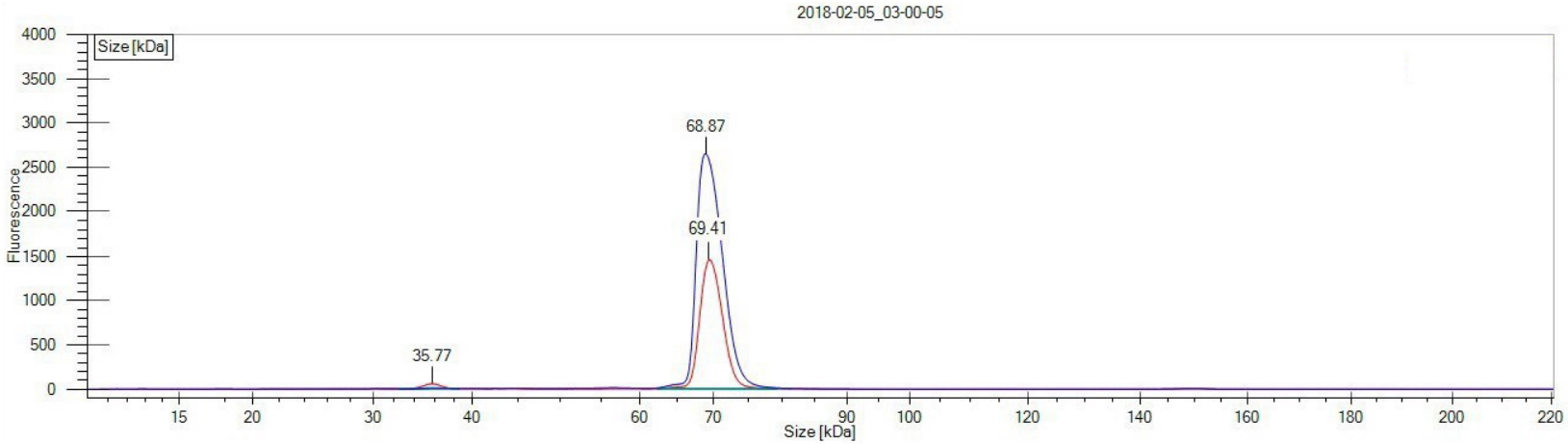


TunaCHO Platform Other Premium Transient CHO System

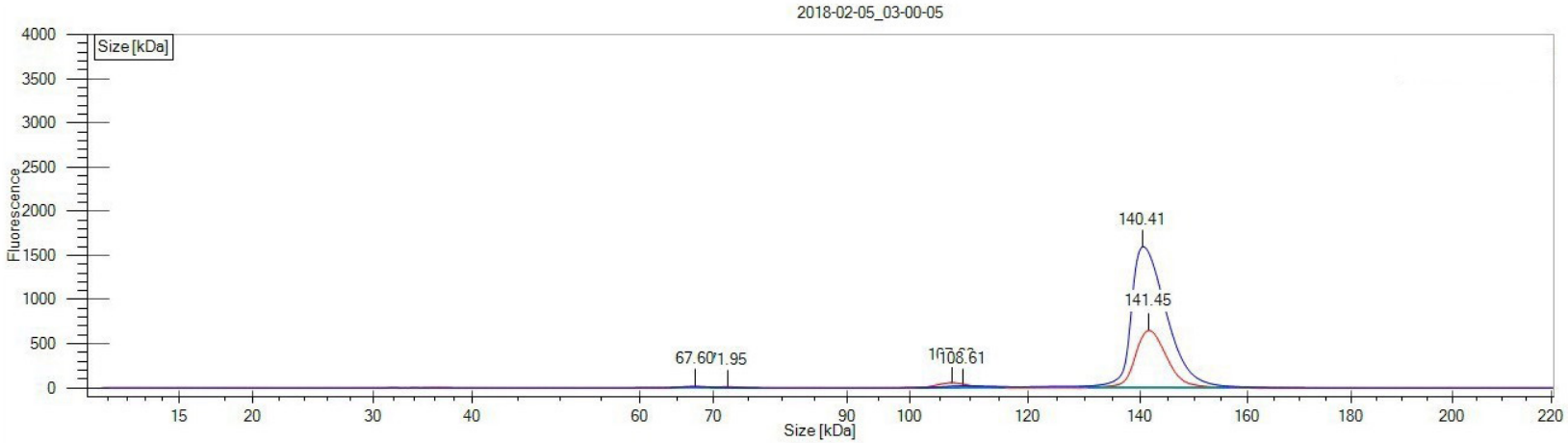
TunaCHO platform — Consistent CE-SDS profile

CE-SDS was performed for Fc-fusion proteins from TunaCHO platform and another premium transient CHO system under reducing & non-reducing conditions.

Reducing



Non-Reducing



TunaCHO Platform

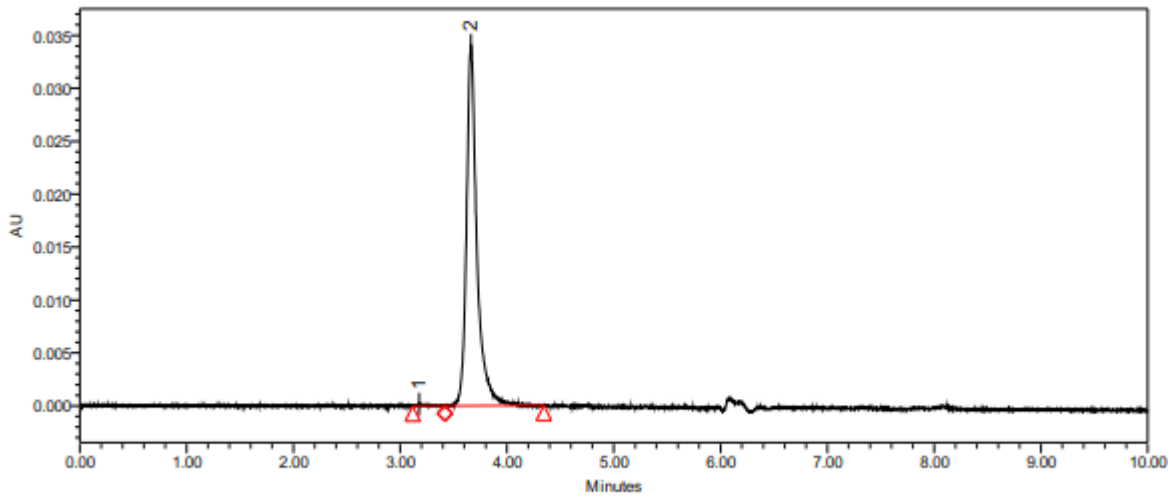
Other Premium Transient CHO System

High purity from TunaCHO production

Two different antibodies were produced in TunaCHO platform at the 0.05 L production scale and purified via Protein A. SE-UPLC analysis demonstrates **production level does not impact purity.**

hIgG1 #1: >600mg/L

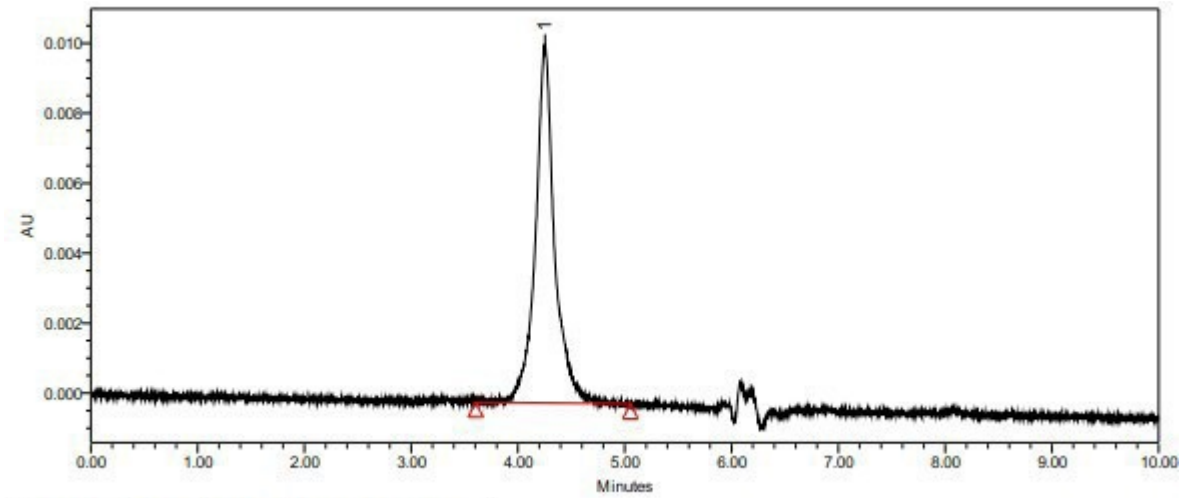
Results



	Peak Label	RT (min)	% Area	Peak Size (kD a)	Name
1	1	3.180	0.38	...	Aggregate
2	2	3.662	99.62	...	Monomer

hIgG1 #2: >260mg/L

Results



	Peak Label	RT (min)	% Area	Peak Size (kD a)	Name
1	1	4.254	100.00	...	Monomer

TunaCHO platform — Consistent intact mass results

TunaCHO productions (in duplicates) were compared to another premium transient CHO system to demonstrate **comparable intact mass profiles.**

Expression system	Protein Type & Label	HC Measured	LC Measured	HC Calculated*	LC Calculated*	Δ HC	Δ LC
Other premium transient CHO system	hIgG1 #1	49126	23444	49124	23443	2.0	1.2
		49126	23444	49124	23443	2.0	1.2
	hIgG1 #2	49280	23661	49279	23660	1.5	0.6
		49280	23661	49279	23660	1.5	0.6
	Fc fusion	51677	-	51676	-	1.3	0.0
		51677	-	51676	-	1.3	0.0
TunaCHO	hIgG1 #1	49126	23444	49124	23443	2.0	1.2
		49126	23444	49124	23443	2.0	1.2
	hIgG1 #2	49280	23661	49279	23660	1.5	0.6
		49280	23661	49279	23660	1.5	0.6
	Fc fusion	51678	-	51676	-	2.3	0.0
		51678	-	51676	-	2.3	0.0

All samples were run under deglycosylated & non-reduced conditions.

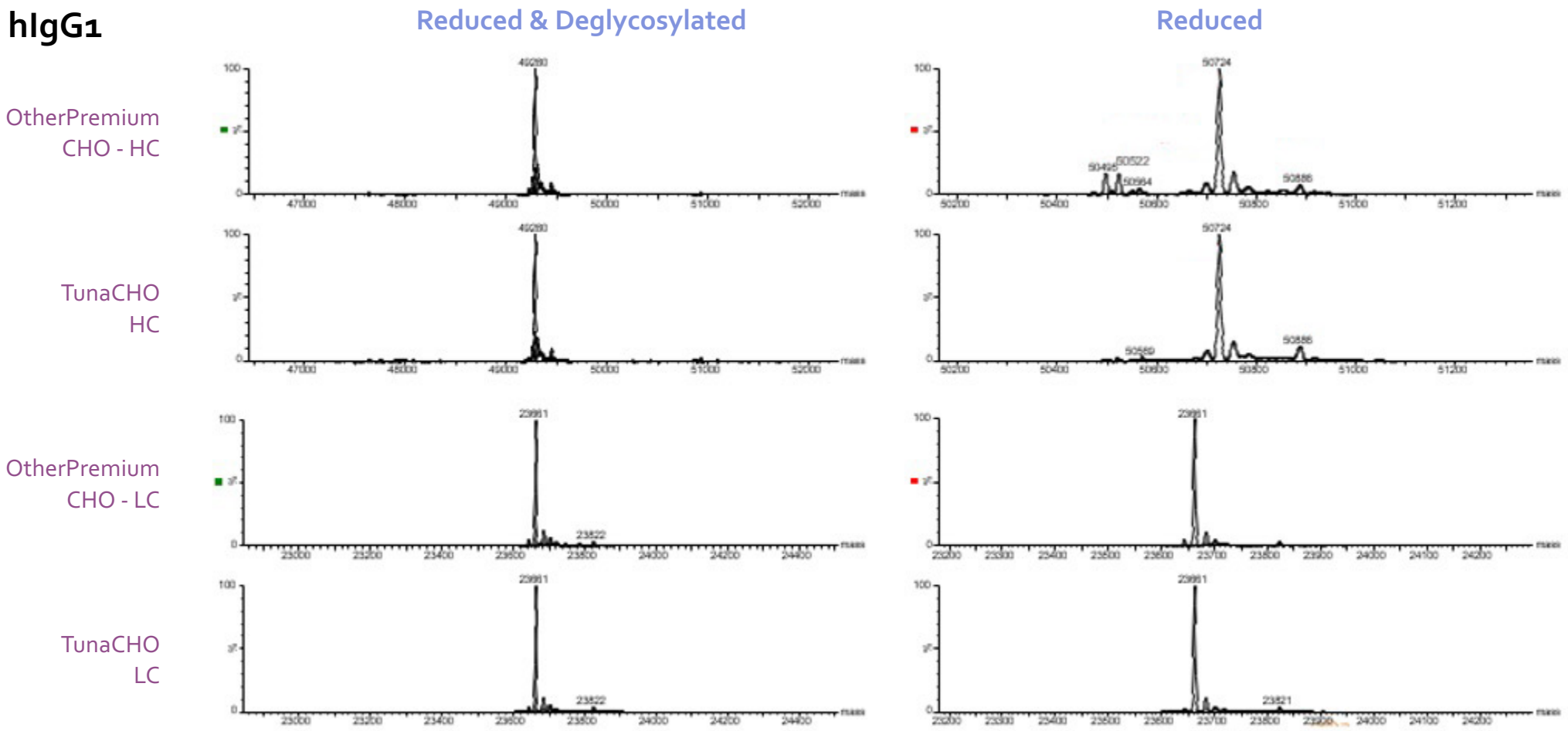
* The calculated M.W. includes mass shift of the pyroglutamate N-terminal Q and C-terminal lysine clipped based on the M.W. from DS.

Intact mass measurement of reduced and deglycosylated protein confirmed the sequence of each purified protein prep with delta M.W. less than 3 Da.

TunaCHO platform — Consistent intact mass results

CE-SDS was performed for Fc-fusion proteins from TunaCHO platform and another premium transient CHO system under reducing & non-reducing conditions.

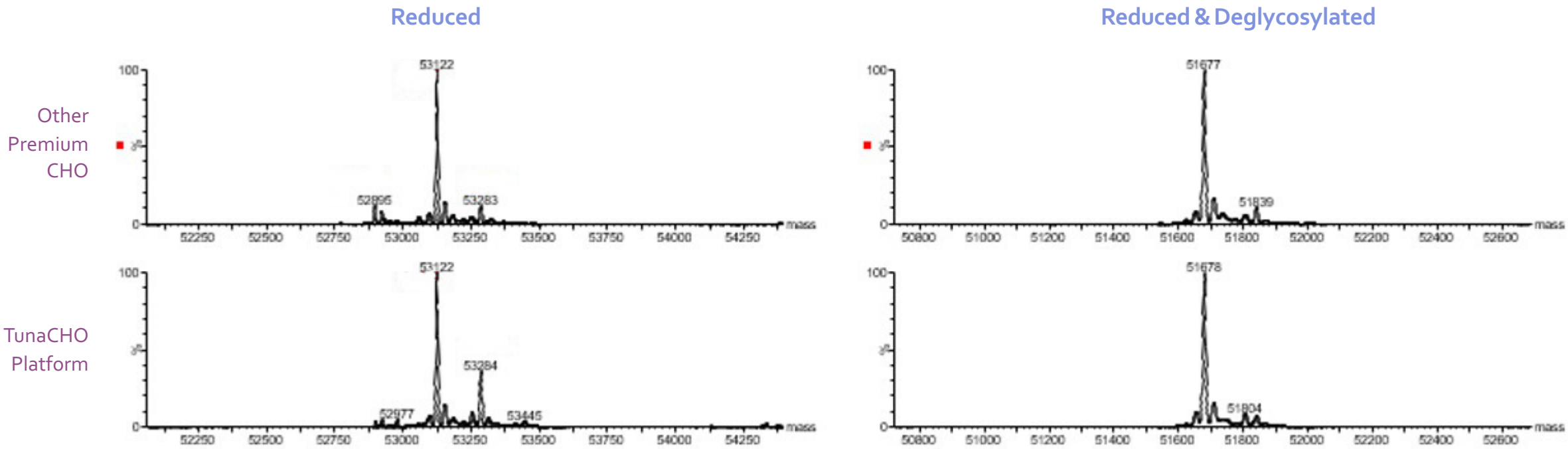
hIgG1



TunaCHO platform — Consistent intact mass results

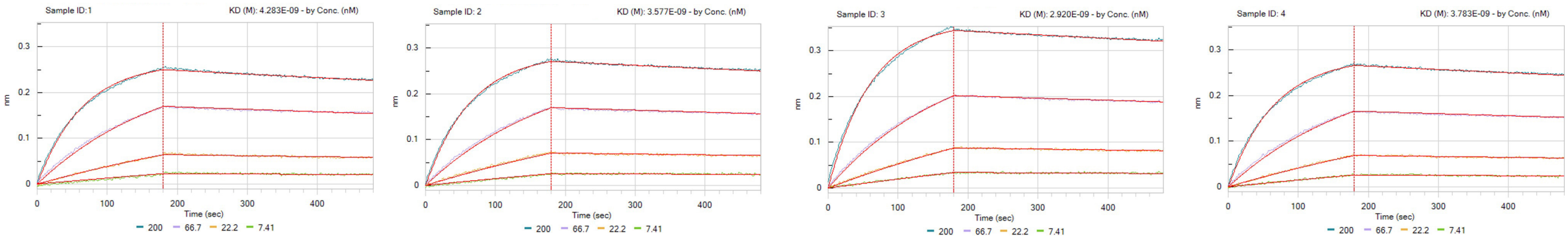
CE-SDS was performed for Fc-fusion proteins from TunaCHO platform and another premium transient CHO system under reducing & non-reducing conditions.

Fc-fusion protein



TunaCHO platform — Comparable binding affinity

TunaCHO productions (in duplicates) were compared to another premium transient CHO system to demonstrate **comparable affinity measurement results.** hIgG1 binds the antigen.



Loading Sample ID	TunaCHO		Other Premium CHO	
Sample ID	1	2	3	4
KD (M)	4.3E-09	3.6E-09	2.9E-09	3.8E-09
Kon (1/Ms)	7.6E+04	7.6E+04	8.1E+04	7.5E+04
Kdis (1/s)	3.3E-04	2.7E-04	2.4E-04	2.8E-04
Full X^2	0.0111	0.0096	0.0121	0.0086
Full R^2	0.9992	0.9994	0.9995	0.9994

Methods:

Binding experiments were performed on Octet® RED96 system at 25°C. Purified antibodies (0.5 µg/mL) were loaded onto Anti-Human IgG Fc (AHC) biosensors. Loaded sensors were dipped into a three-fold dilution series of antigen "1" (starting at 200 nM). Kinetic constants were calculated using a monovalent (1:1) binding model.

GMP manufacturing for ASR using TunaCHO platform

Curia can manufacture components of *in vitro* diagnostic kits for ASR or companion diagnostic applications under GMP conditions.

Key highlights

ISO 9001:2015 certified

Various customization options available:

- Quantity
- Concentrations
- Release criteria
- One-time delivery or reoccurring delivery

Two royalty-free CHO platforms are available to accommodate different timelines and needs:

TunaCHO Transient Platform

- Quick turnaround since RCB step is not needed
- 1 L – 100 L production tailored for specific needs

CHO-GSN Stable Platform

- Robust, high performance
- Flexible production scale from small to large quantities

Available TunaCHO transient production services

14-day extended production

- Ideal for obtaining higher yields of proteins (2x higher than 7-day standard production)
- Over 2 to 10-fold higher than HEK293

For antibody using TunaCHO platform

- Gene synthesis and pilot production Learn More >
- HTP production for candidate screening Learn More >
- Large scale production of control or surrogate antibodies Learn More >

Non-antibody proteins using TunaCHO platform

- Gene synthesis, pilot & large-scale production Learn More >

Working with Curia

- Comprehensive technology platform
- Technical consultation with experts in antibody discovery, protein production, and GMP manufacturing
- Online data system for 24-hour access to project information (timelines, data, team communications)
- Strong project management with regular project updates (email and teleconferences)
- "Reserved Capacity Agreement (RCA)" offers accurate and reliable project schedule and timeline

For more information, please contact
bio_inquiries@curiaglobal.com