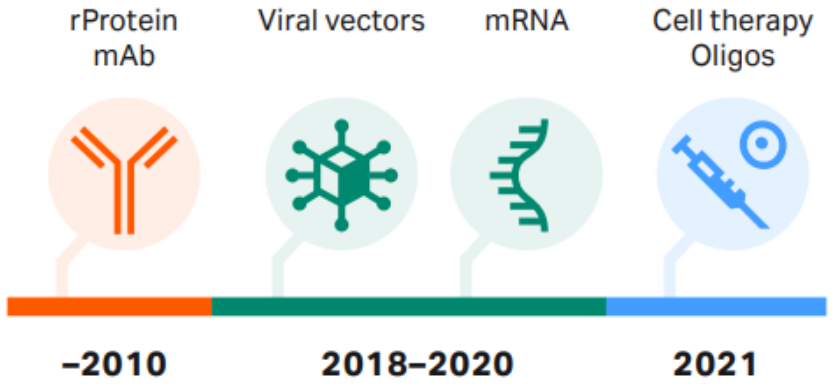
cytiva

生物性樣品的純化製程/優化/判讀
AKTA, DLS, Panta, Biacore

Andy
10/21/2026

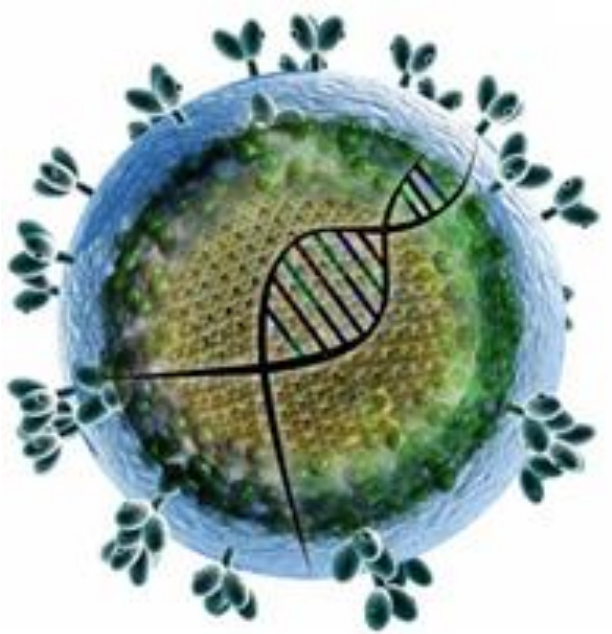
level
Discovering
new boundaries
進 階 生 物 科 技
Level Biotechnology Inc.

基因藥物/細胞治療

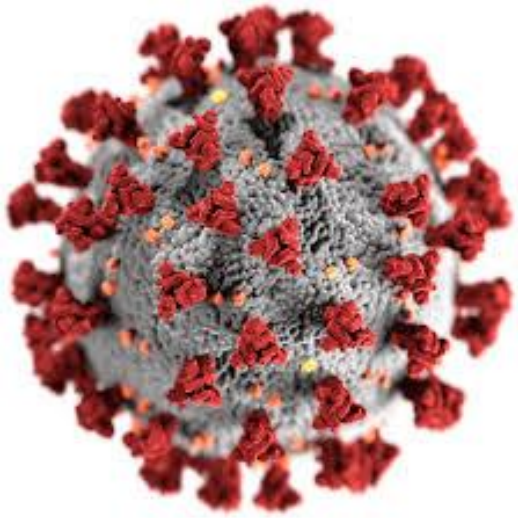


- 蛋白藥
  - 抗體/抗體藥物複合體 ADC
  - 重組蛋白
- 細胞療法
  - 基因修飾/Car-T、TCR-T
  - 細胞治療/IPSC、NK Cell、T Cell
- 病毒載體
  - AAV
  - LV
  - 溶瘤病毒
- 核酸藥物
  - Oligo/siRNA、ASO、miRNA
  - mRNA
- 非病毒載體
  - LNP
  - Exosome
- 奈米中草藥/天然物
  - 外泌體、外囊泡EV

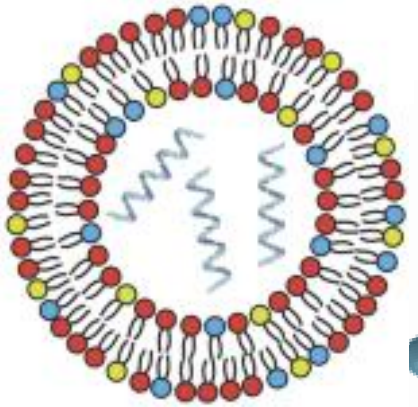
The sizes of viral vectors



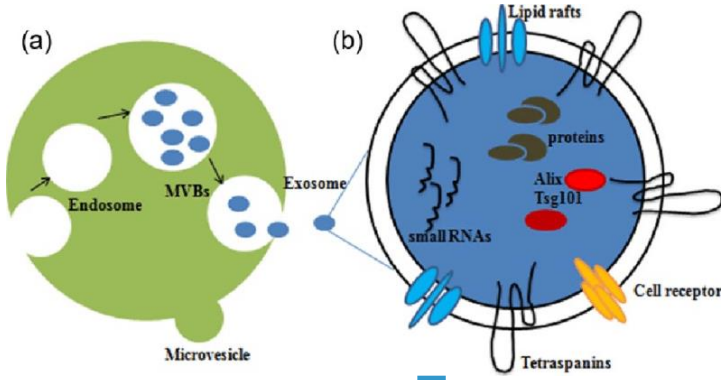
Lentivirus
~ 80–120 nm



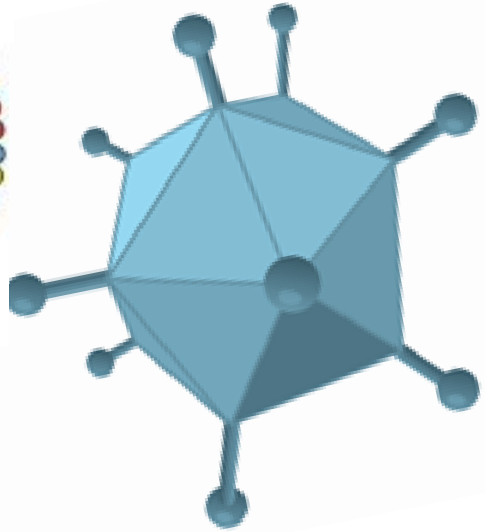
SARS-CoV-2 (COVID-19)
~ 60-140 nm



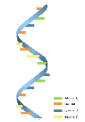
LNPs Vector for mRNA
~ 80-100 nm



Exosome
~ 60-120 nm



Adenovirus (AdV)
~ 90 nm



mRNA
~ 1-25 nm



AAV
~ 25 nm



Antibody Spike
~ 5 nm

Adenovirus vector platform

Upstream	Harvest	Clarification	Buffer exchange	Capture	Polishing	Formulation	Sterile filtration	Final product
HEK293 sus AdV5-GFP CDM4HEK293	Cell lysis, DNA degradation Tween™ 20 Benzonase	NFF ULTA™ 2 µm + 0.6 µm GF	TFF Hollow fiber 300 MWCO	AIEX Capto Q ImpRes	Capto Core 700	TFF Hollow fiber 300 MWCO	NFF ULTA 0.2 µm SG	AdV5 bulk



Scale-X™ carbo Bioreactor


ReadyCircuit™


ÄKTA™ flux 6


ÄKTA pure 150


ÄKTA flux s

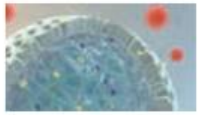

ULTA SG Filters


Biacore™ T200

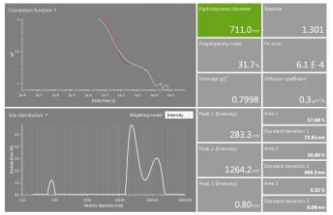

ReadyToProcess WAVE™ 25

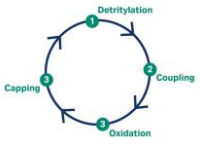

ReadyMate™
Aseptic Connector


ReadyToProcess™
hollow fibers


Capto™ Core 700


ReadyToProcess
hollow fibers






ÄKTA oligosynt™

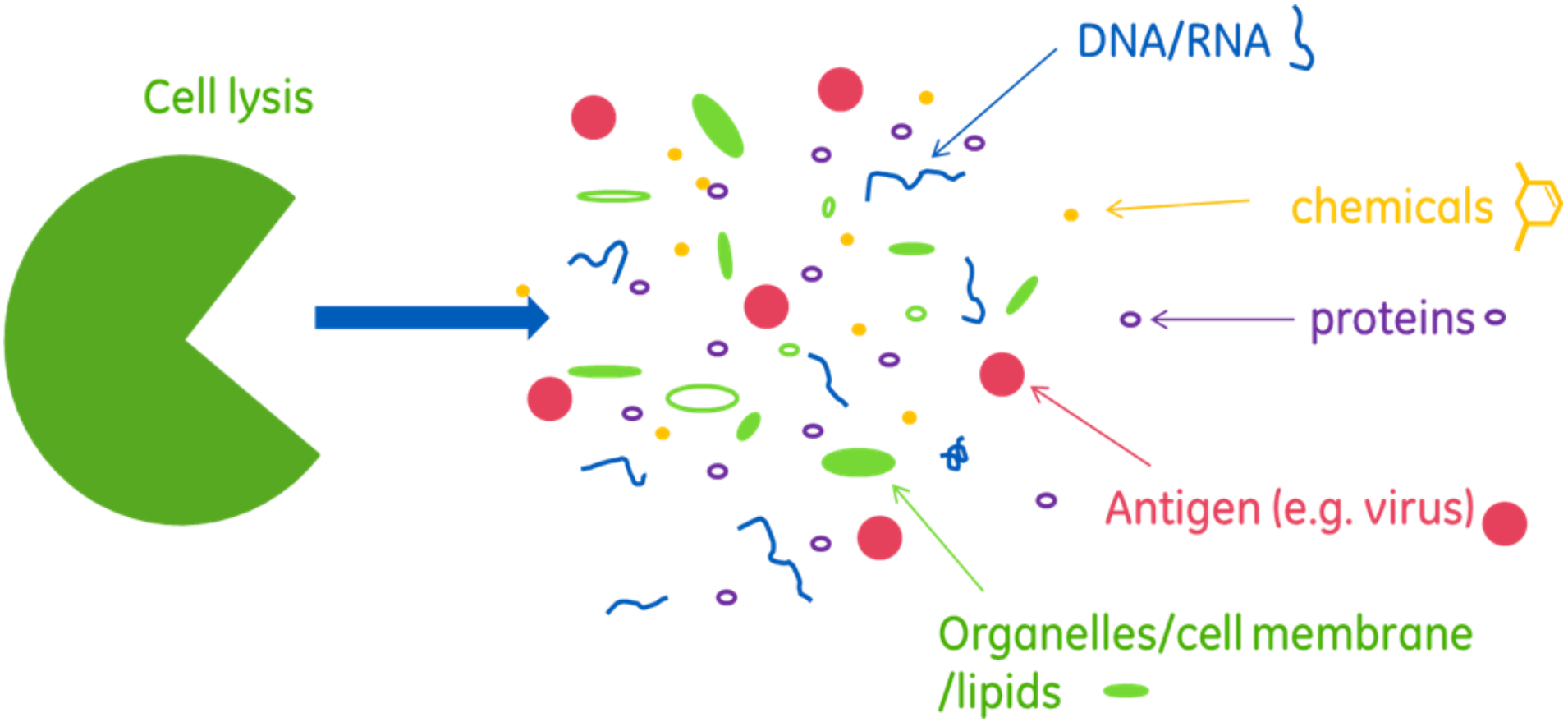

ULTA NFF Filters


Pre-packed columns
and resins

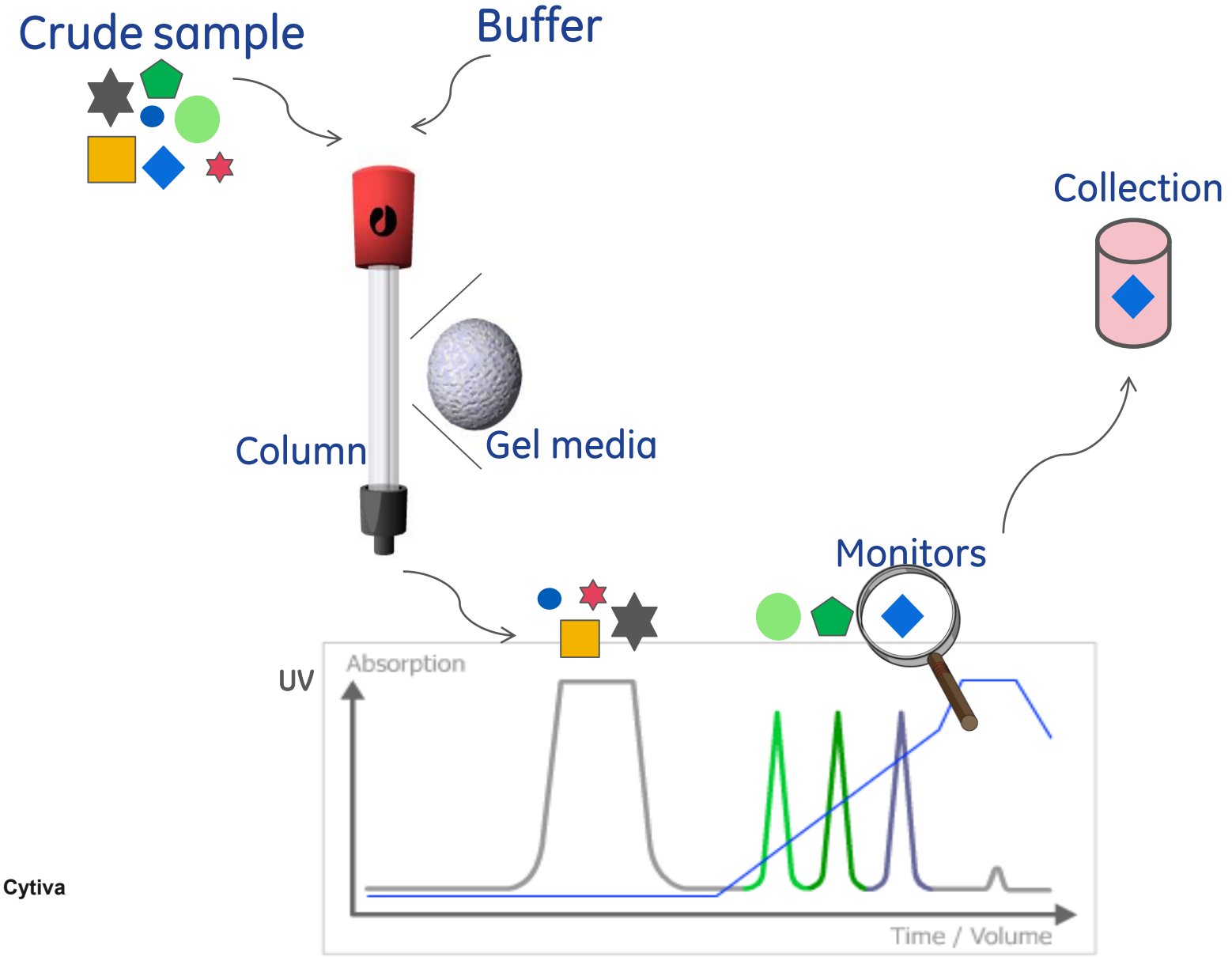


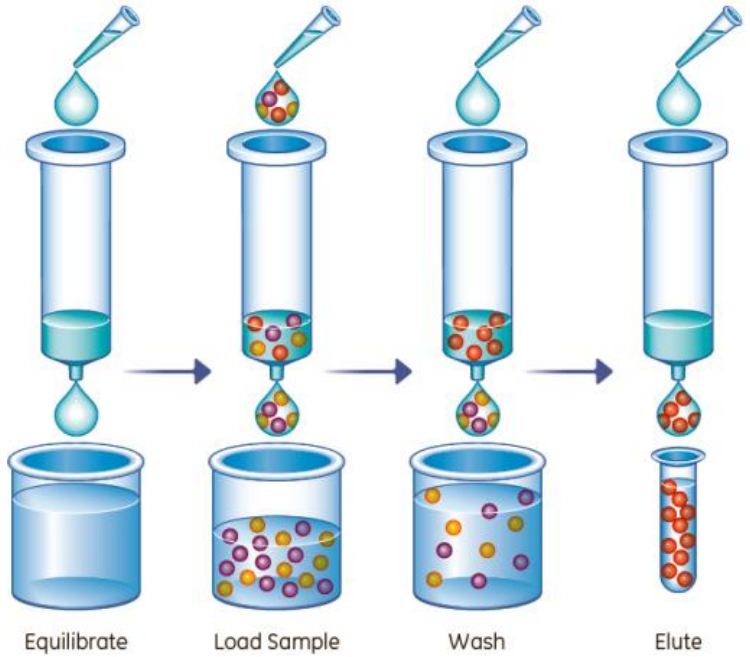
Introduction to protein purification

Sample purification and preparation

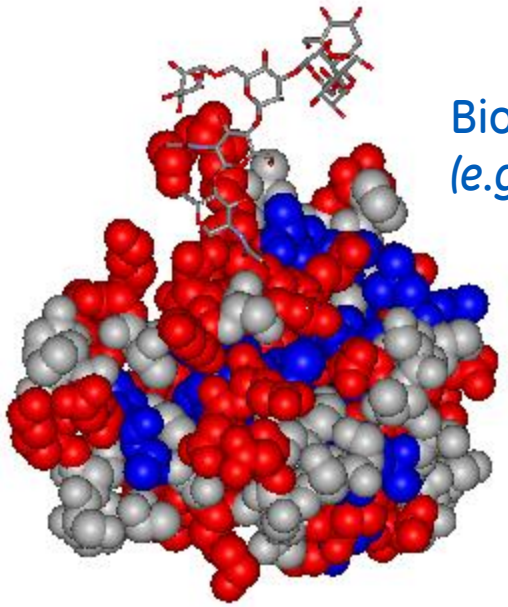


LC, Liquid Chromatography





Protein properties that matter for protein purification



Biospecific affinity (*e.g.*, a tag) ---- Affinity chromatography (AC)

Net charge ------ Ion exchange chromatography (IEX)

Hydrophobicity --- Hydrophobic interaction chromatography (HIC)

Size ---------- Size exclusion chromatography (SEC) or gel filtration

The Principle of Affinity Chromatography



The Principle of Ion Exchange Chromatography

GE Healthcare
Life Sciences

imagination at work

The Principle of Hydrophobic Interaction Chromatography

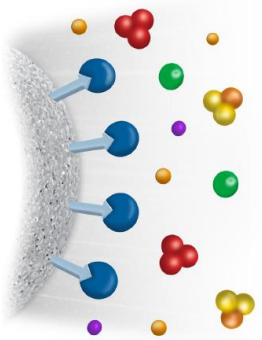


Principles of gel filtration chromatography- size exclusion chromatography

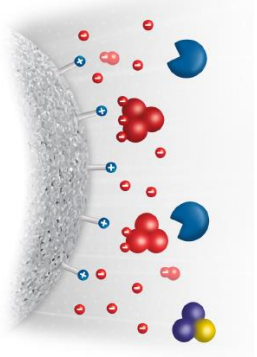


The principles of chromatography techniques

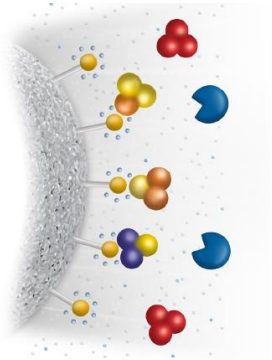
Affinity Chromatography (AC)



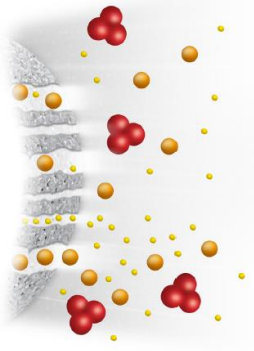
Ion exchange Chromatography (IEX)



Hydrophobic interaction Chromatography (HIC)



Size exclusion Chromatography (SEC)

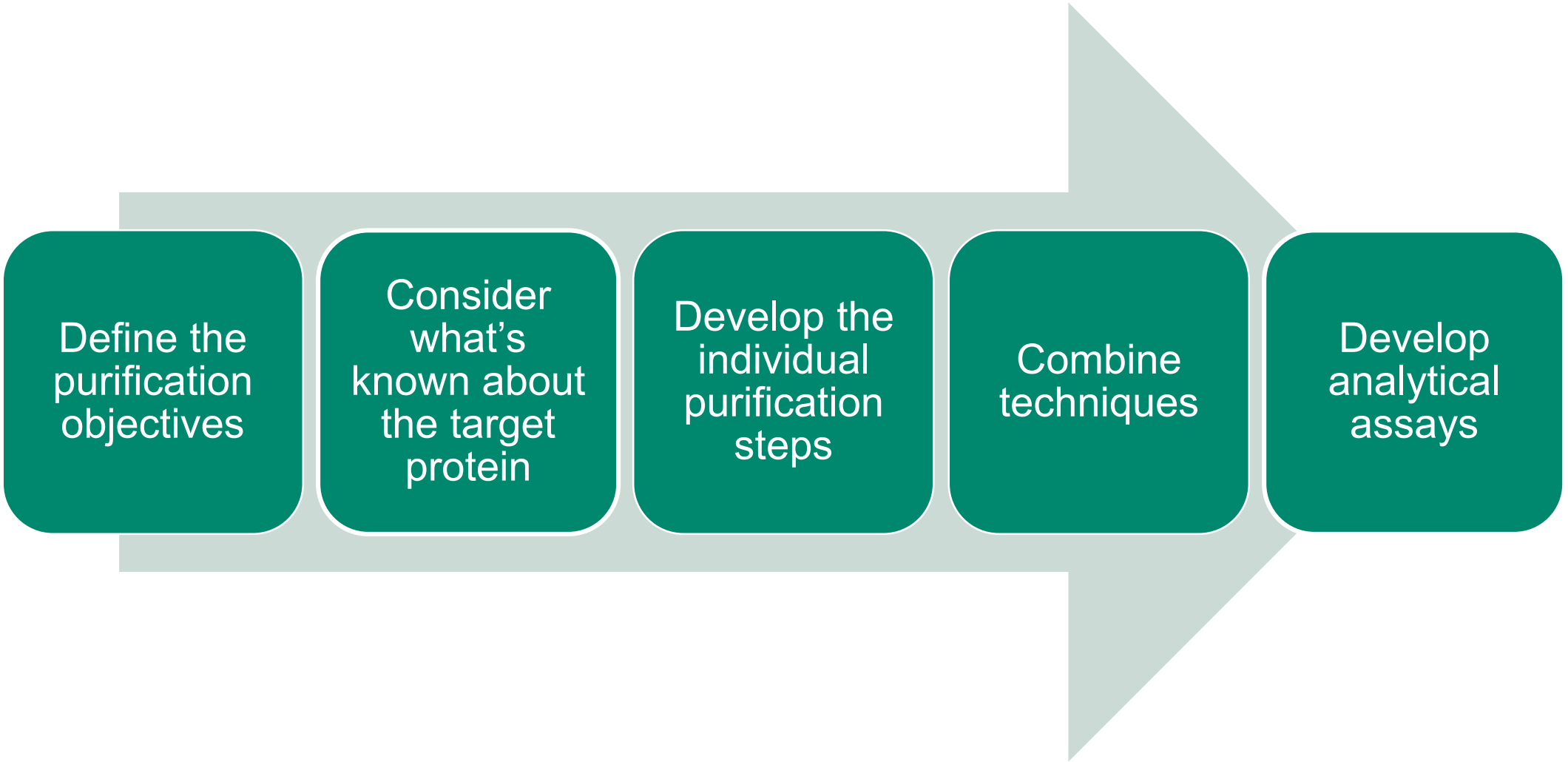


- Bind – elute principle
- Requires specific elution conditions
- Concentrating effect

- Diffusion – no binding
- Any elution conditions
- Diluting effect

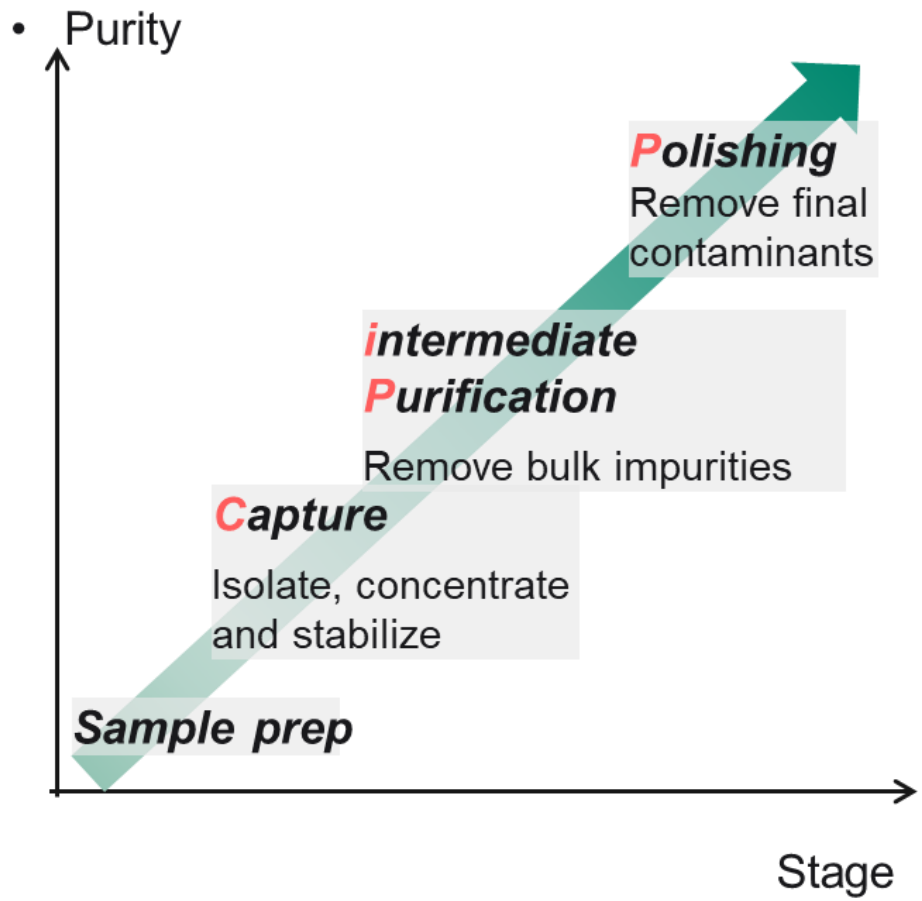
Purification strategy

Purification protocol development - step by step

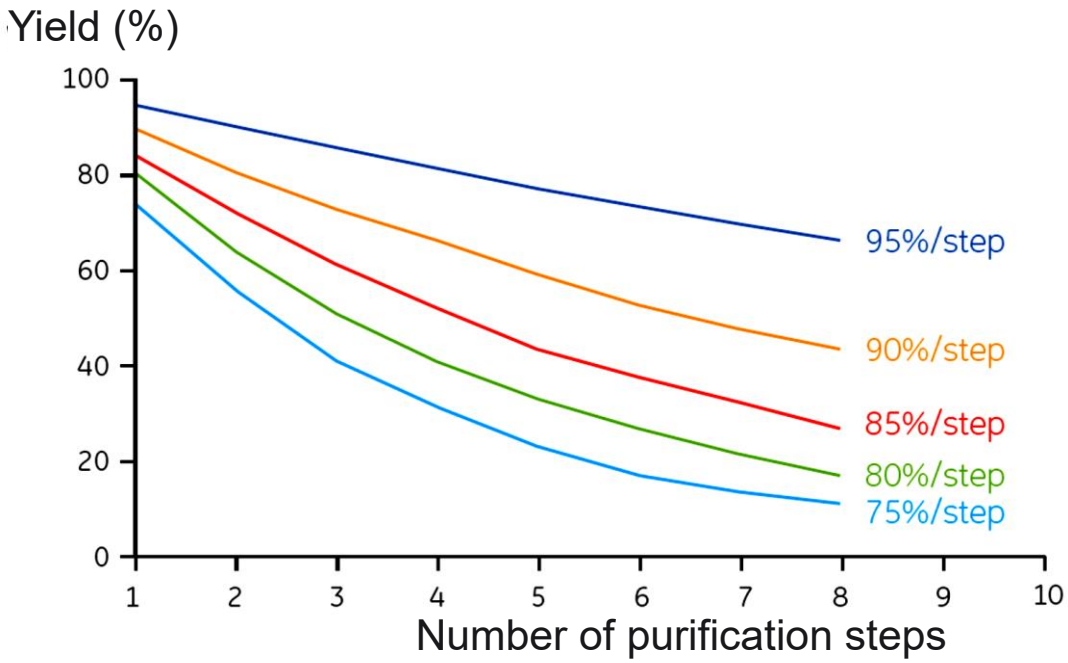


Introduction to CiPP purification strategy

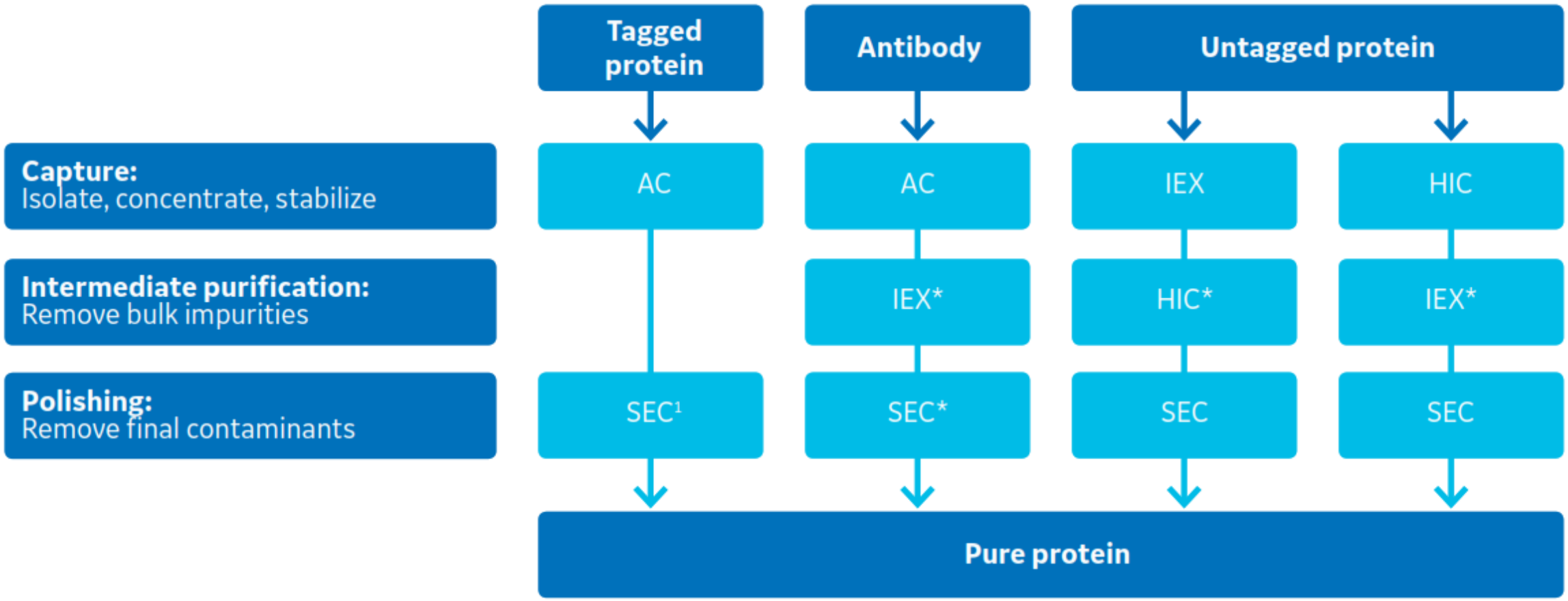
Purification strategy combining multiple steps



Protein recovery plotted against the number of purification steps

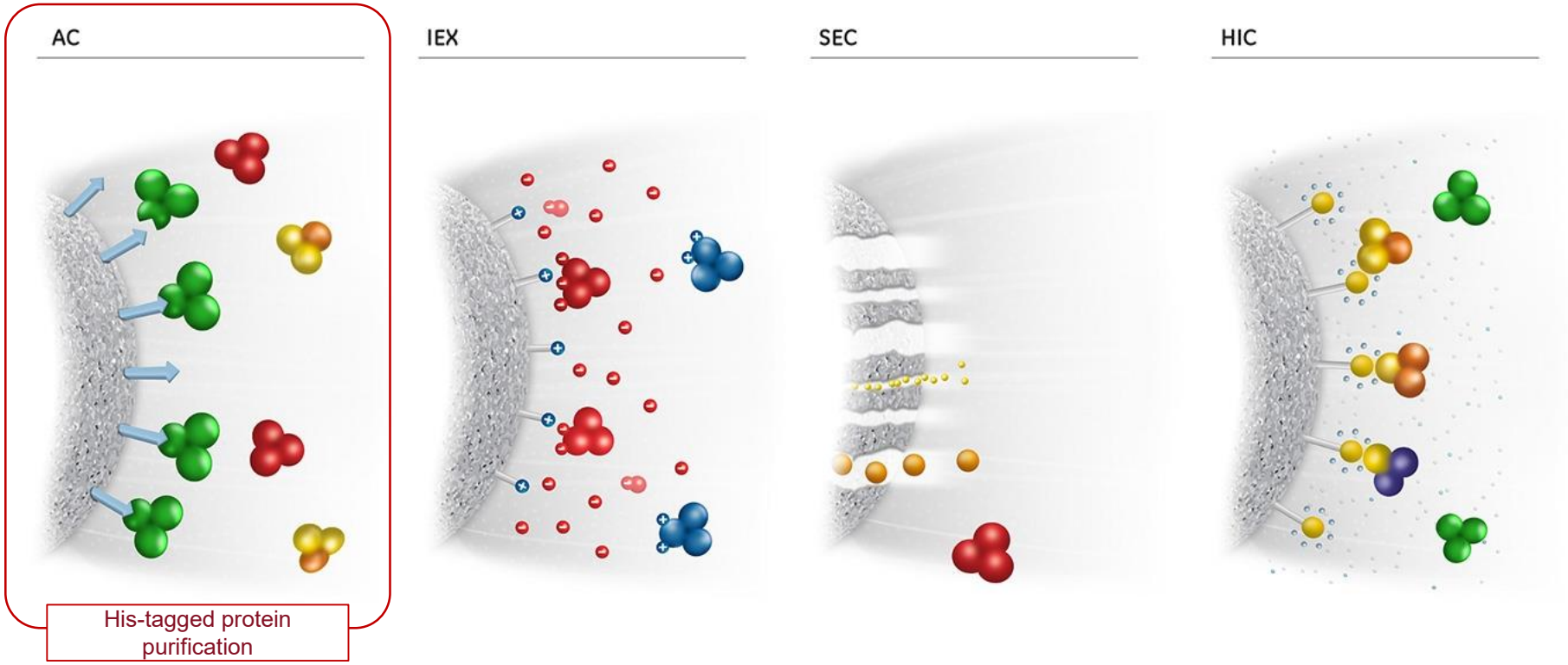


ÄKTA™ system provides efficient purification of your target protein



Application examples: Recombinant protein

How are affinity-tagged proteins purified?



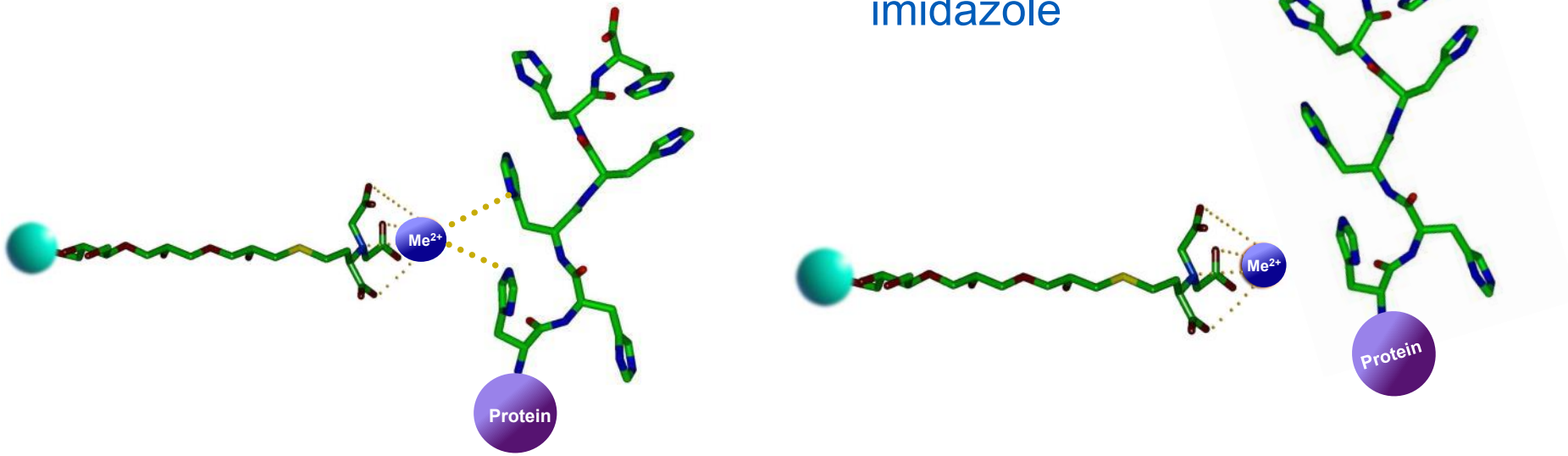
Chromatography techniques enable separation of proteins based on differences in specific properties.

Principle of histidine-tagged protein purification

IMAC resin

Binding of histidine-tagged protein

Elution of bound protein with imidazole



IMAC = Immobilized metal ion affinity chromatography

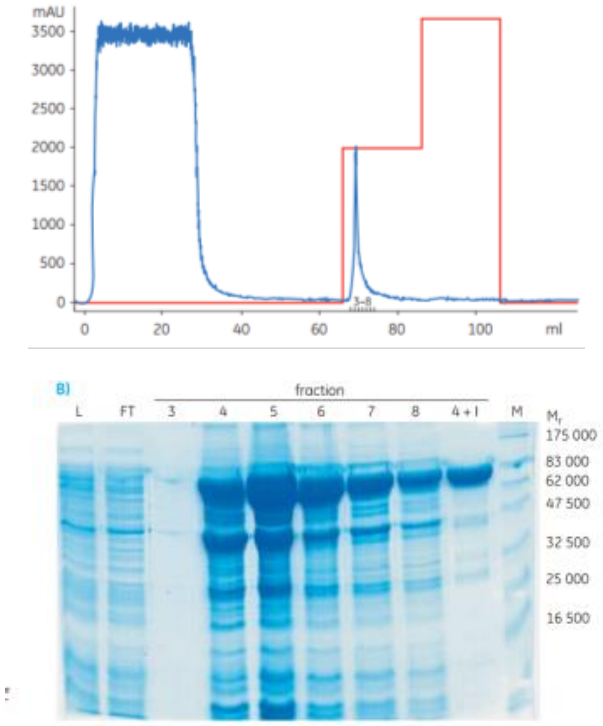
There are many ways to improve protein purity and yield

- Sample conditions
- Optimize binding conditions
- Optimize elution conditions
- Multi-step purification

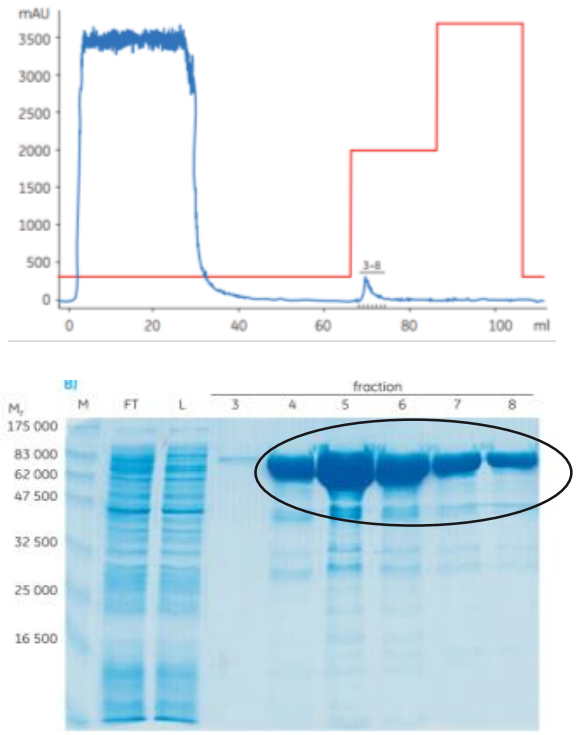


Addition of imidazole to the binding buffer has a positive impact on protein purity*

No imidazole in the binding buffer



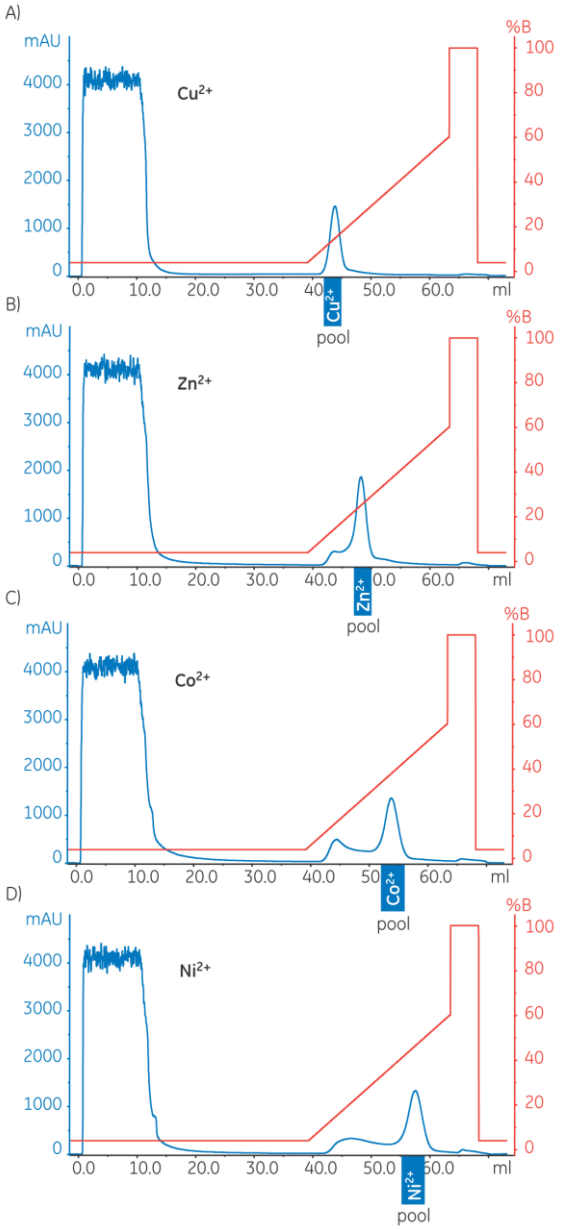
Imidazole in the binding buffer



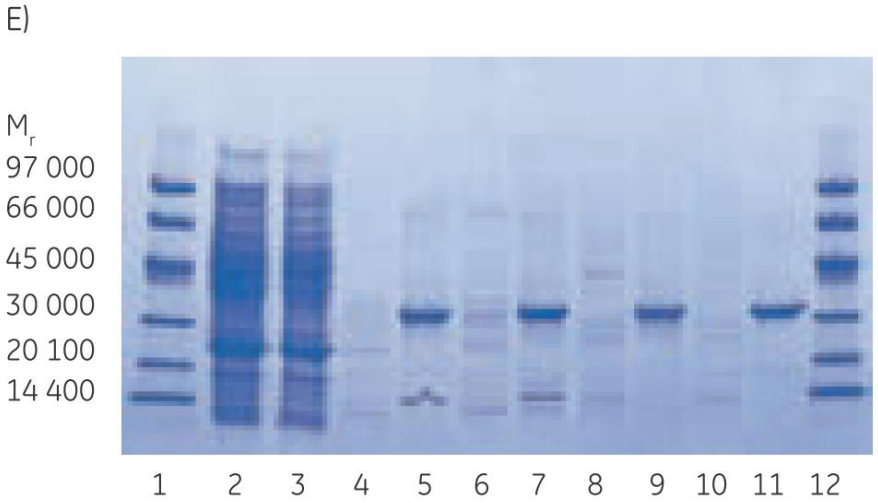
Adding imidazole to the binding buffer prevents nonspecific binding of other proteins that occur naturally in the host cell.

* In all application examples shared in this presentation, different ÄKTA™ chromatography systems from GE Healthcare's Life Sciences were used for purification.

Optimizing using different metal ions





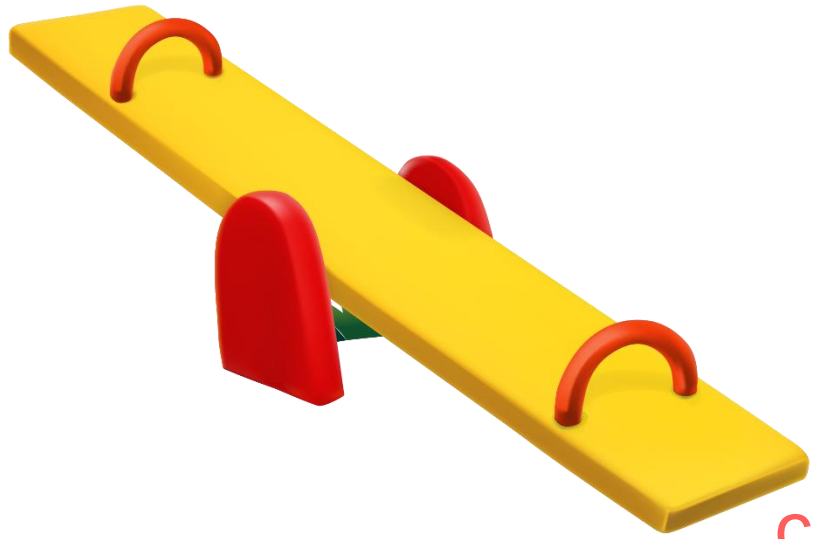


- Ni 2+ is generally used for histidine-tagged recombinant proteins.
- Co 2+ is also used for purification of histidine-tagged proteins, since it may allow weaker binding and reduce the amount of contaminants that may bind.

Method Optimization

- Increasing imidazole concentration
- Co ion

Selectivity



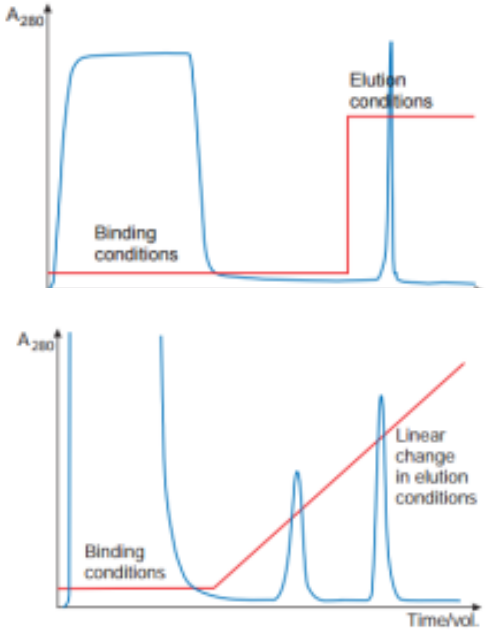
capacity

- Decreasing imidazole concentration
- Ni or Cu ion

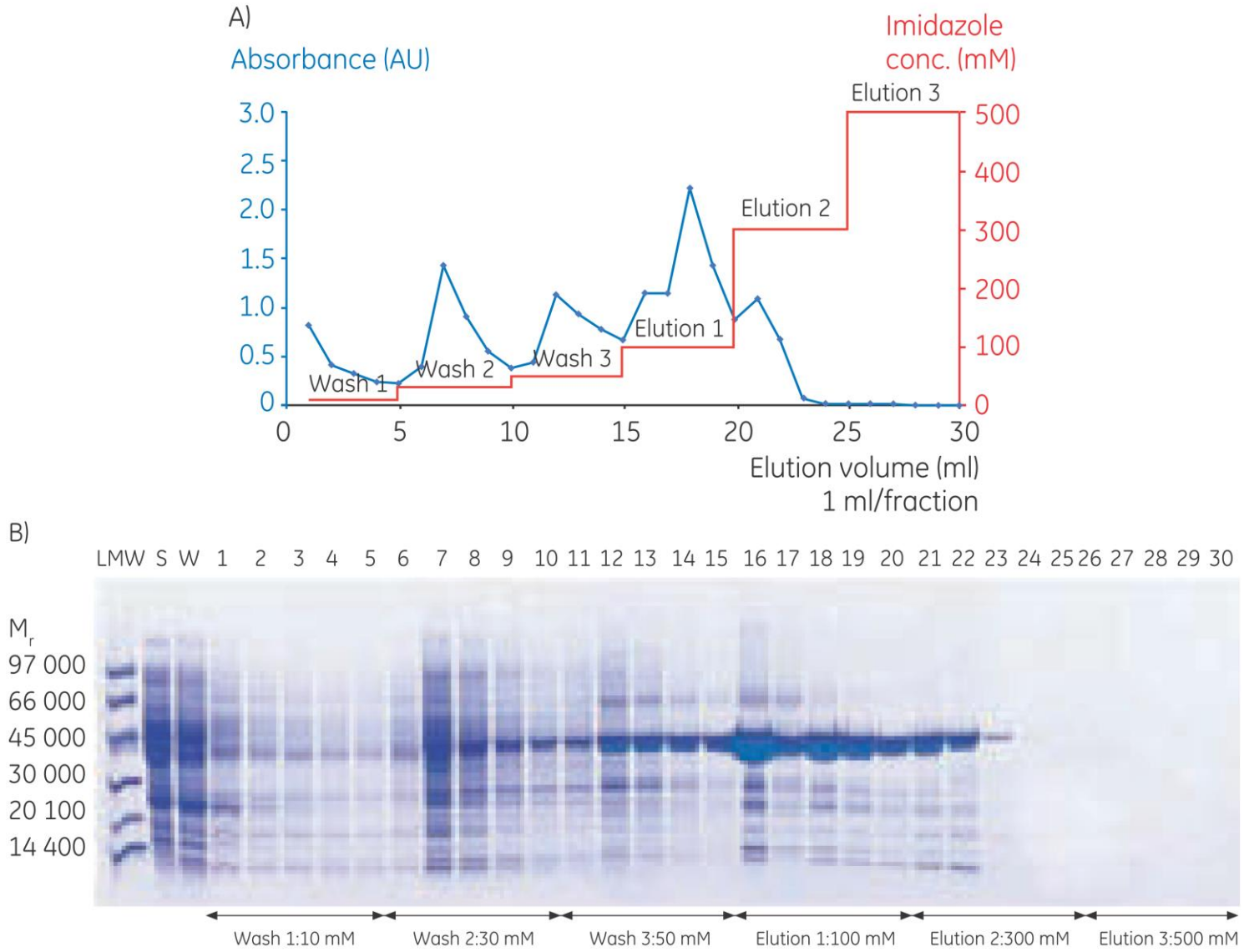
Different elution conditions can be used

- Bound histidine-tagged proteins are eluted by increasing the imidazole concentration
- This can be done by using linear gradient elution or step elution
- Linear gradients are conveniently created using a chromatography system
-

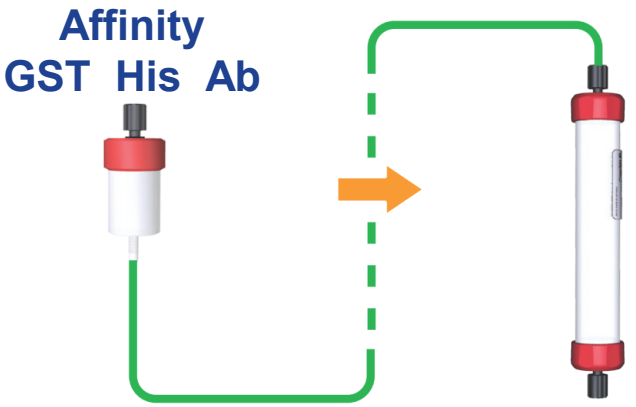
Method	Pros	Cons
Step elution	• Quick elution • Simple to perform with a single pump • Lower buffer volume needed • Concentrated eluate	• Eluted peak may contain several components
Linear gradient elution	• Better peak separation is achieved, high purity of target protein • Allows scanning for optimal elution conditions	• Eluted protein is more dilute

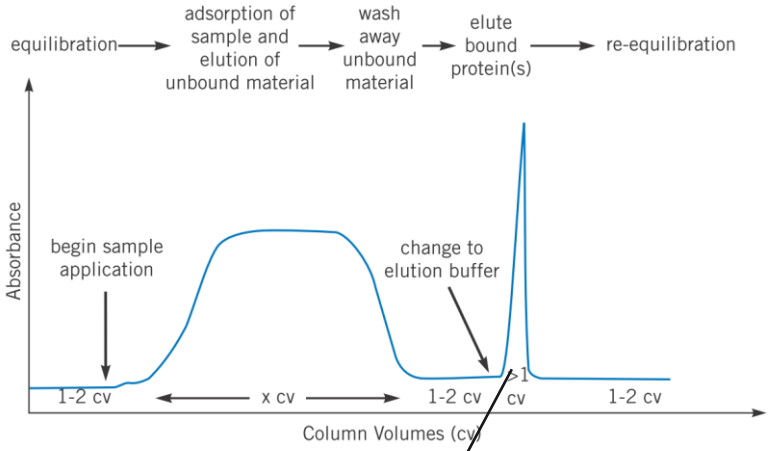


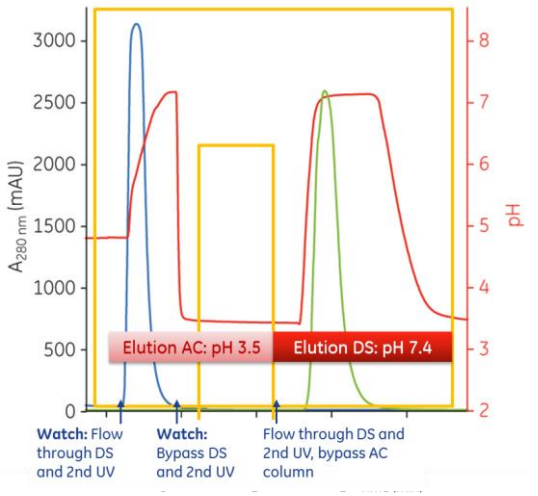
Different elution conditions can be used

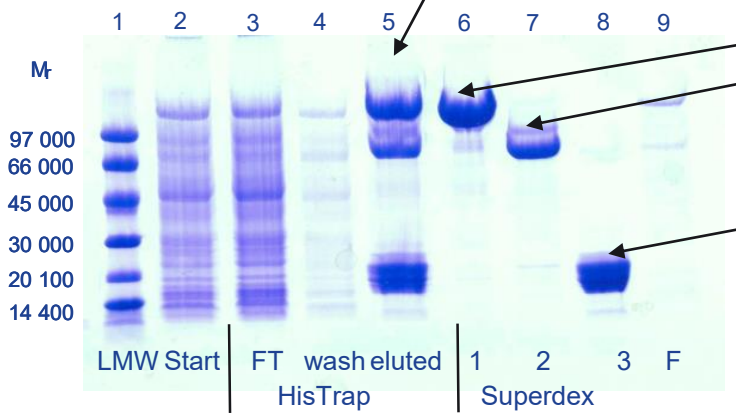


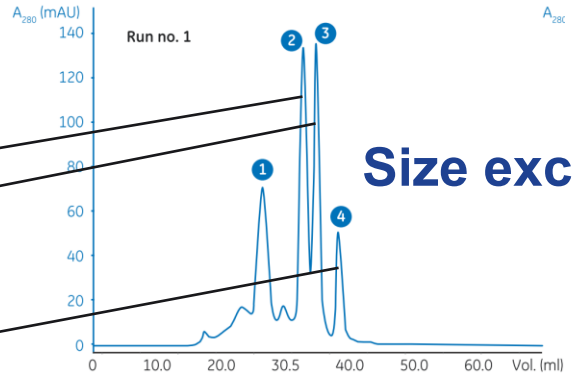
Impact of multi-step purification on protein purity







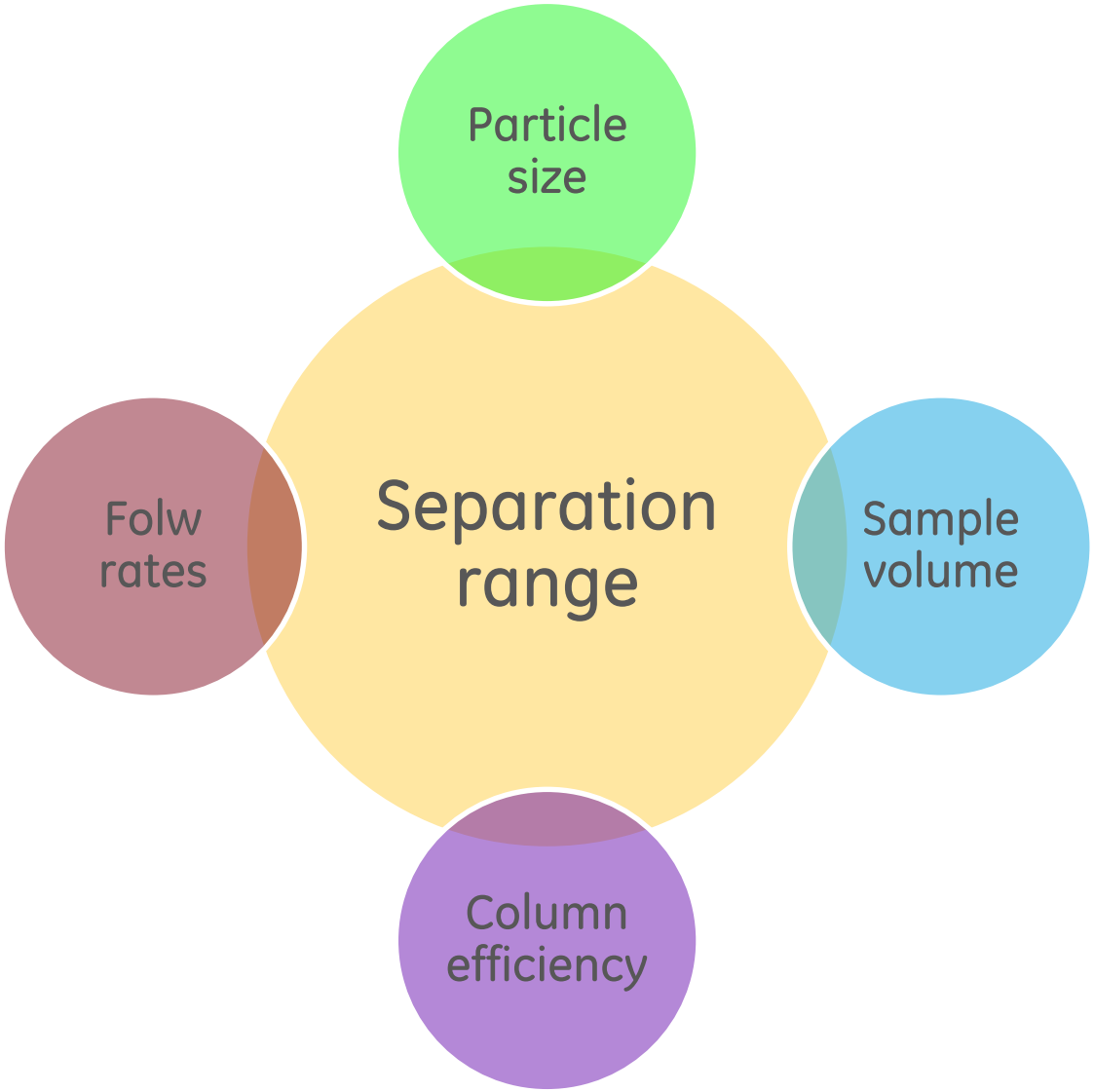




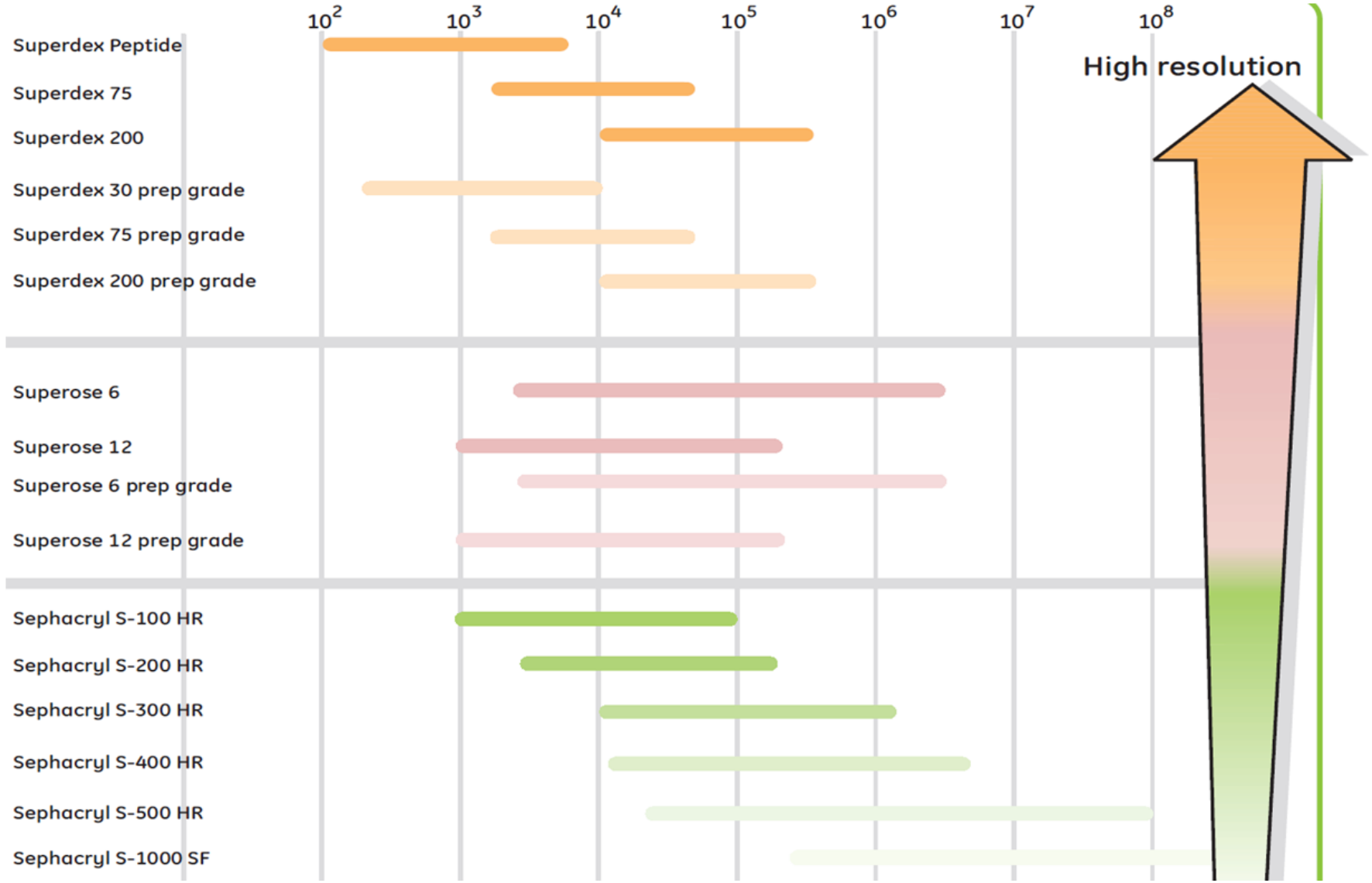
Size exclution

Application examples: Advance purification

How to choose media and column - GF

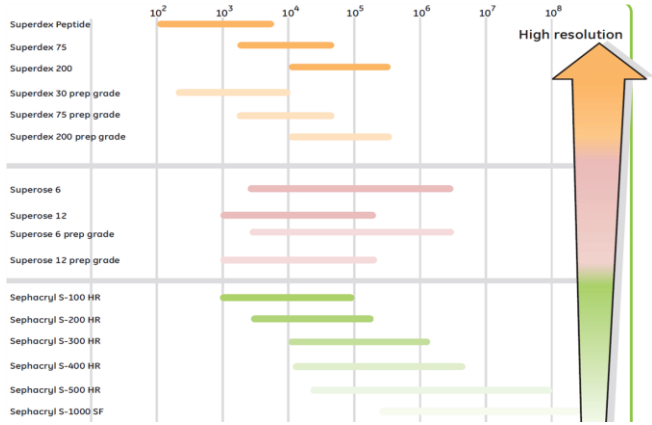


How to choose media and column - GF

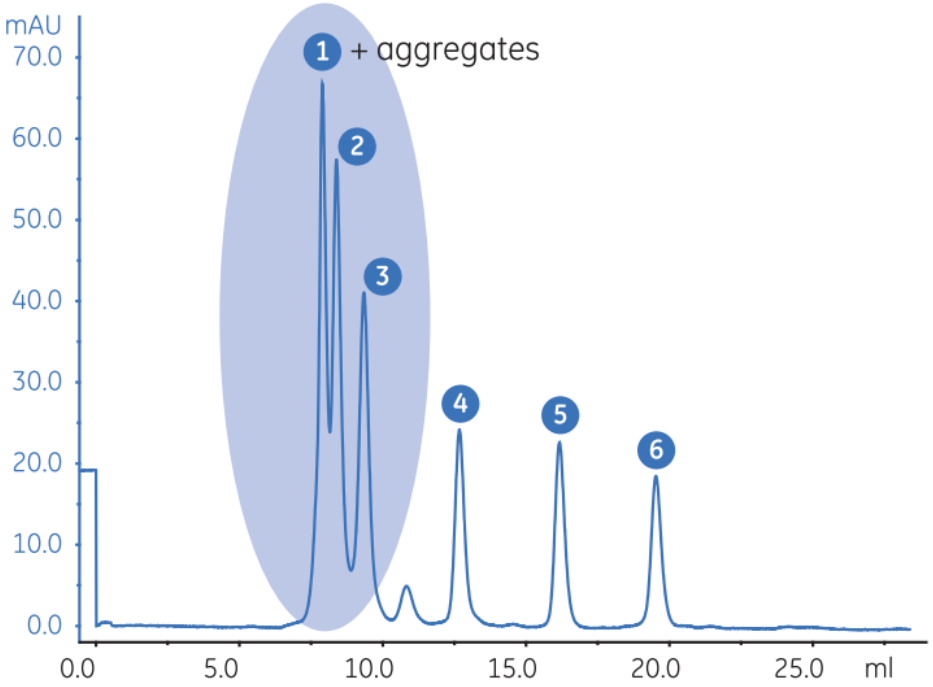


How to choose media and column - GF

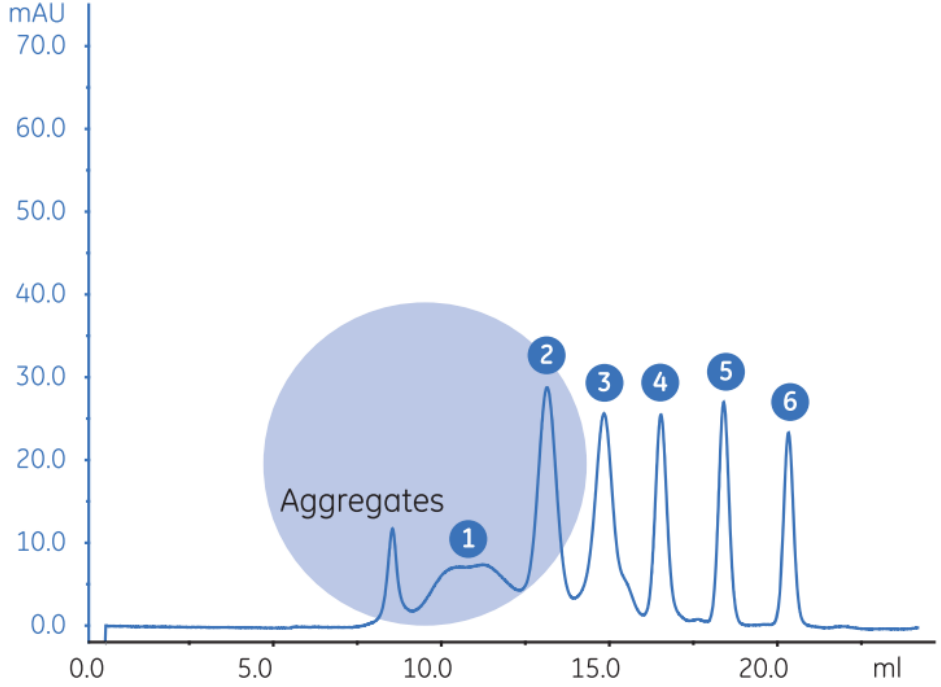
Sample:	M_r
1 IgM	970,000
2 Thyroglobulin	669,000
3 Ferritin	440,000
4 BSA	66,000
5 Myoglobin	17,600
6 Vitamin B	1,300



Superdex 200 Increase 10/300 GL

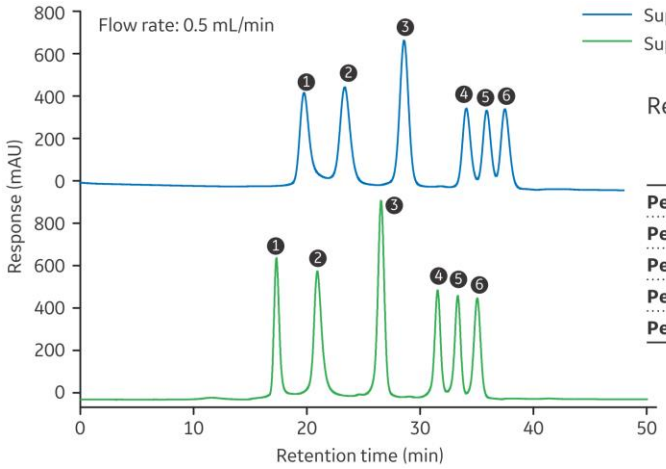


Superose 6 Increase 10/300 GL



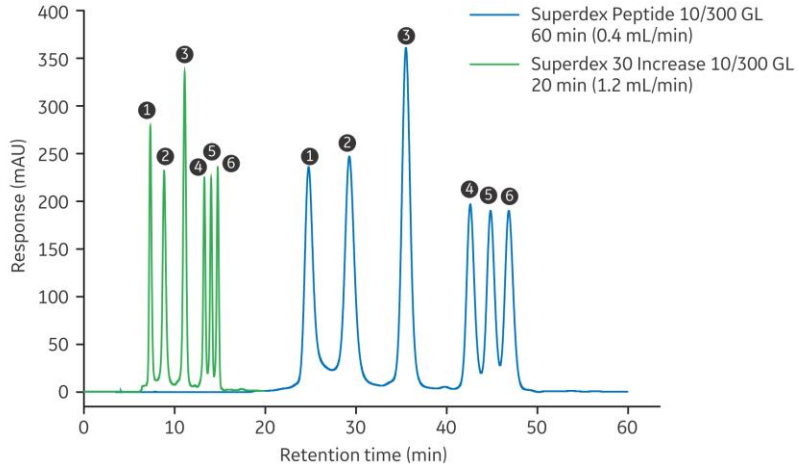
How to choose media and column - GF





Resolution (Rs) data

	Superdex Peptide	Superdex 30 Increase
Peak 1-2	2.19	3.41
Peak 2-3	3.24	4.84
Peak 3-4	3.88	4.94
Peak 4-5	1.33	1.82
Peak 5-6	1.16	1.64

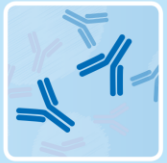




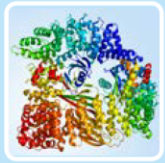
Superdex 30 Increase
Peptides and other small biomolecules
Fractionation range M_r ~ 100 to 7000



Superdex 75 Increase
Recombinant tagged proteins
Fractionation range M_r ~ 3000 to 70 000

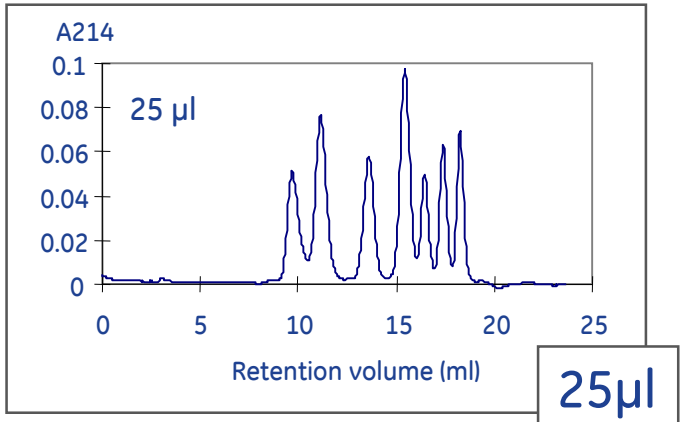


Superdex 200 Increase
mAb and other antibodies
Fractionation range M_r ~ 10 000 to 600 000



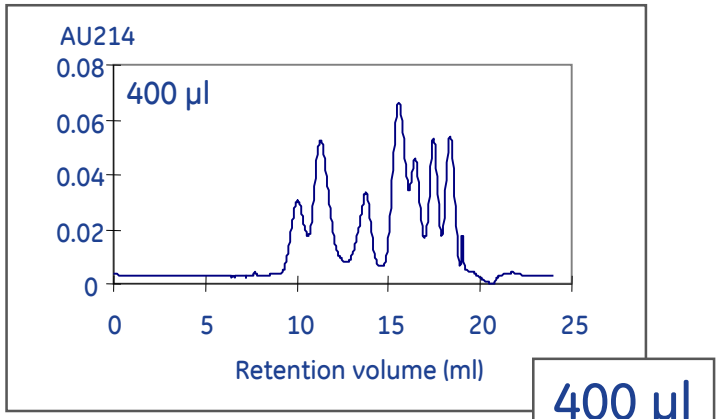
Superose™ 6 Increase
Larger proteins and protein complexes†
Fractionation range M_r ~ 5000 to 5 000 000

How to choose media and column - GF



25µl

0.1% Vt



400 µl

<2% Vt

Superdex™ Peptide column：10/30_24ml

Desalting and buff exchange 25% CV

PD-10 (gravity) loading capacity 2.5 ml
HiTrap™ 5 ml loading capacity 1.5 ml
HiPrep™ 53 ml loading capacity 15 ml

Polishing–Fractionation 0.5% ~ 5% CV

µl – analytical column 1% CV
- 10/300 loading capacity 250 µl
- 5/150 loading capacity 50 µl

ml – preparative column 5% CV
- 16/60 loading capacity 5 ml
- 26/60 loading capacity 13 ml

AKTA

Proven technology
Continues ÄKTA™ tradition

- Incorporates over 50 years of experience in protein research
- Backed by 30 years of experience in developing protein purification systems
- ÄKTA systems are used by 100,000 researchers globally



1959—Sephadex™, the world's first gel filtration medium



1982—FPLC™ system released, predecessor to ÄKTA systems

2019—ÄKTA™ go : provides efficient purification of your target protein



- **2012** - ÄKTA pure: protein purification your way
- **2015 upgrade**





1996—ÄKTAexplorer™, single platform for all chromatography techniques

New Generation of ÄKTA System

New System

Transition from manual to automated purification
Education in protein purification



ÄKTA™ start

Achieve desired purity with ease in routine purifications
Make the most of valuable bench/cold room space



ÄKTA™ go

Flexibility in research
Match most current and future purification challenges



ÄKTA™ pure

Productivity in process development
Fast and secure development of purification processes



ÄKTA™ avant

Functions & Price

Classic System



ÄKTAprime™



ÄKTApurifier™ UPC



ÄKTAFPLC™



ÄKTApurifier™



ÄKTAexplorer™

ÄKTA™
Productivity in process development

Flexibility in research
Match most current and future purification challenges



ÄKTA™ pure

Productivity in process development
Fast and secure development of purification processes



ÄKTA™ avant

Prepare for GMP environment.
Smaller GMP batches for early clinical studies Scale-up and robustness testing



ÄKTA pilot 600

ÄKTAprocess is a versatile platform providing thousands of configuration possibilities. The system is available in three flow rate ranges that extend up to 2000 L/h.



ÄKTA process

Functions & Price & Scale-up

Hitrap



HiScreen



XK/Hiscal e



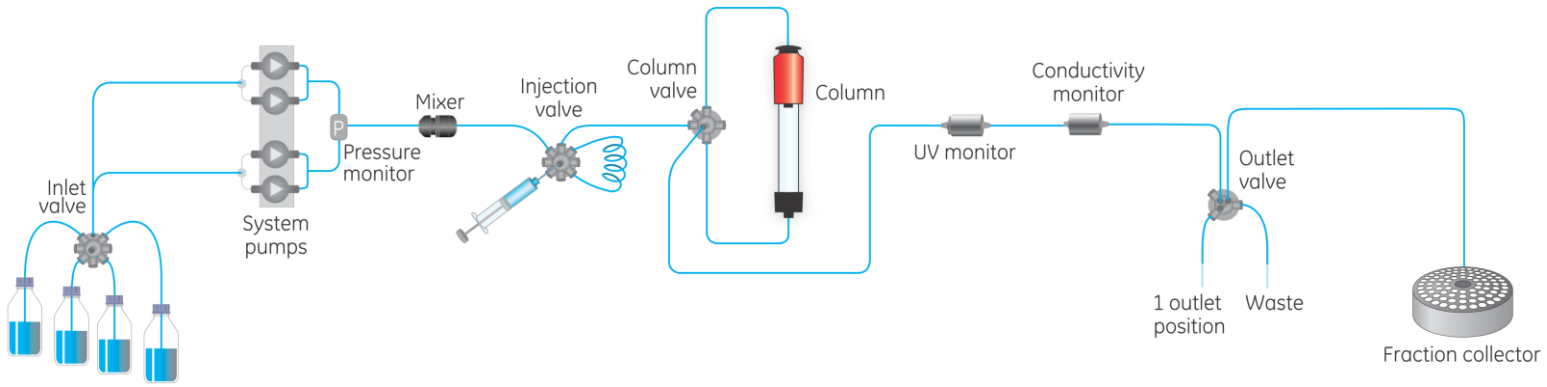


BPG

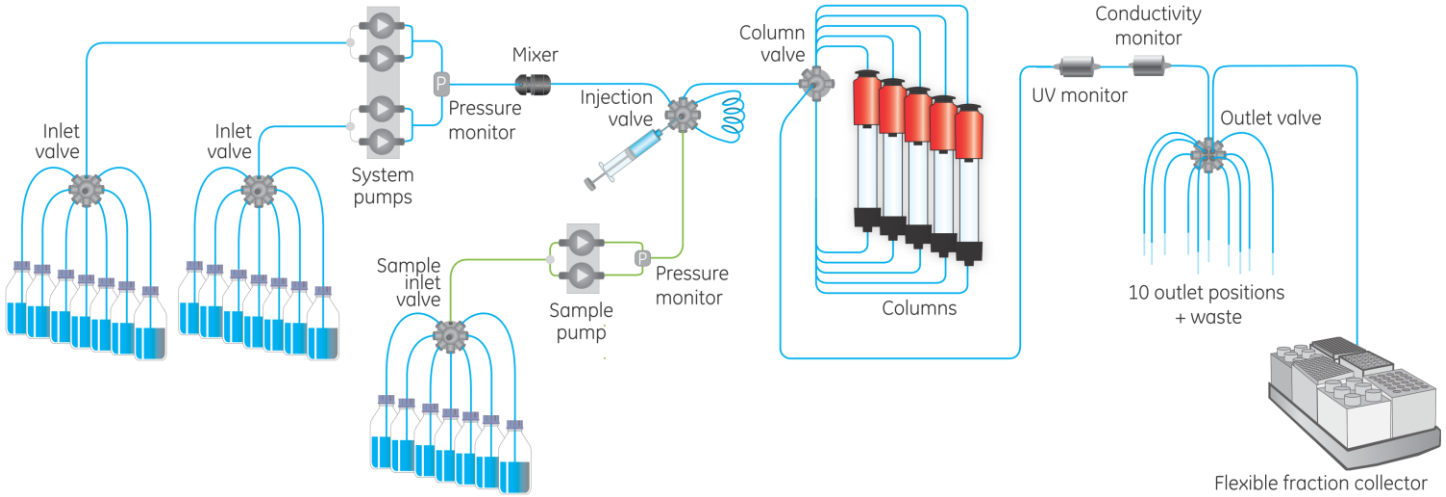


AxiChrom

ÄKTA Pure

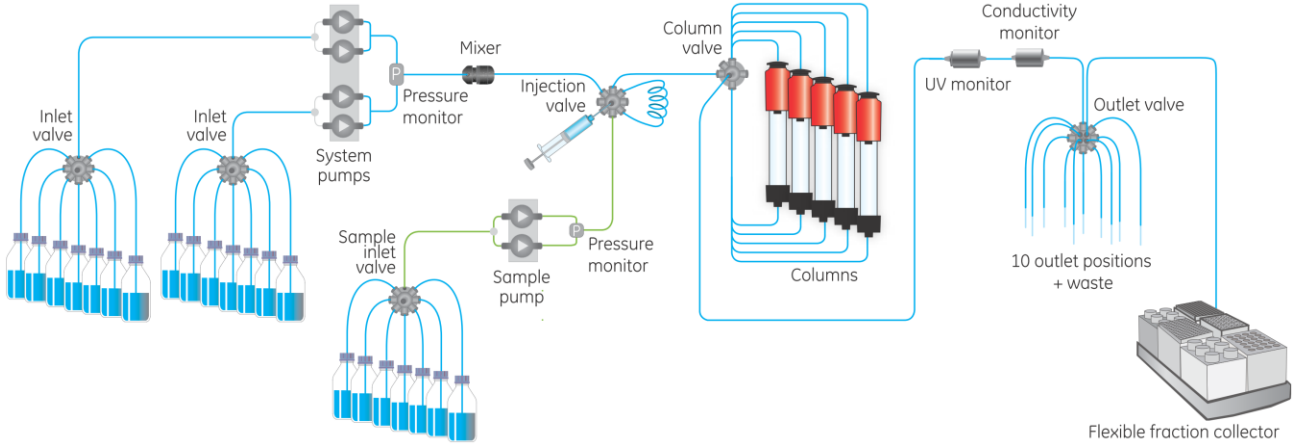

Inlet valve
System pumps
Pressure monitor
Mixer
Injection valve
Column valve
Column
UV monitor
Conductivity monitor
Outlet valve
1 outlet position
Waste
Fraction collector



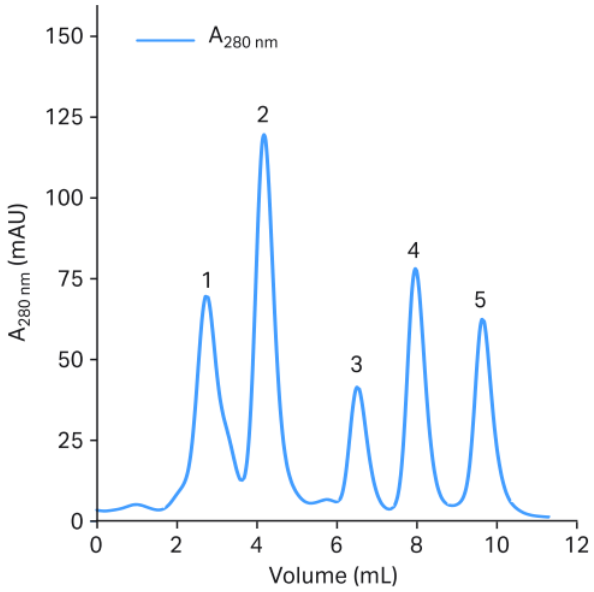

Inlet valve
Inlet valve
System pumps
Pressure monitor
Mixer
Injection valve
Column valve
Columns
Sample inlet valve
Sample pump
Pressure monitor
Conductivity monitor
UV monitor
Outlet valve
10 outlet positions + waste
Flexible fraction collector

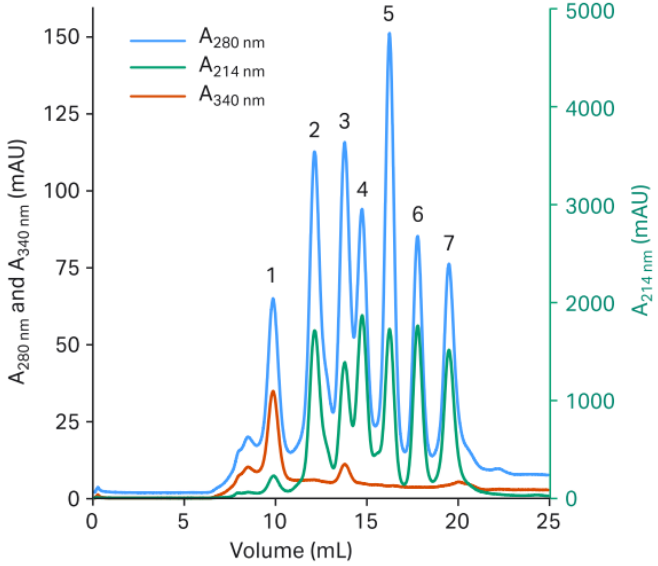


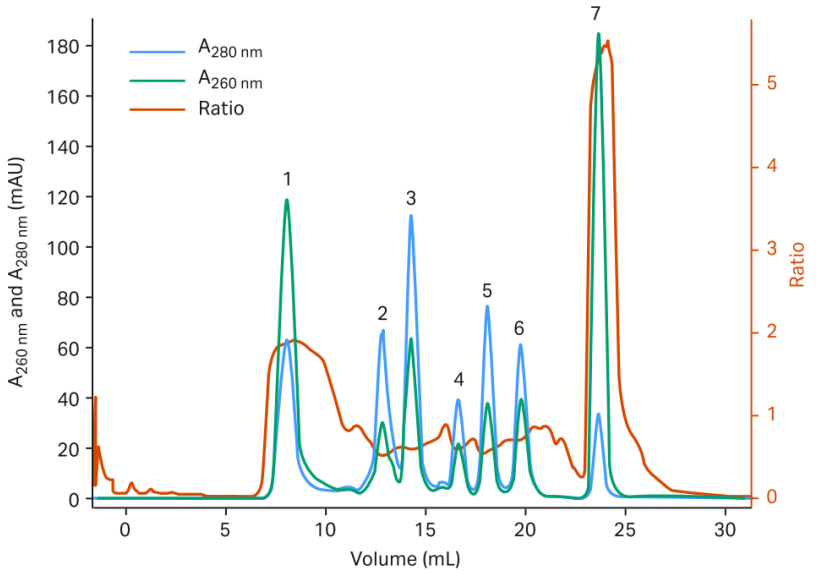
ÄKTA Pure


Inlet valve
Inlet valve
System pumps
Pressure monitor
Mixer
Injection valve
Column valve
Columns
Conductivity monitor
UV monitor
Outlet valve
10 outlet positions + waste
Flexible fraction collector
Sample inlet valve
Sample pump
Pressure monitor




A280 nm
A280 nm (mAU)
Volume (mL)


A280 nm
A214 nm
A340 nm
A280 nm and A340 nm (mAU)
A214 nm (mAU)
Volume (mL)

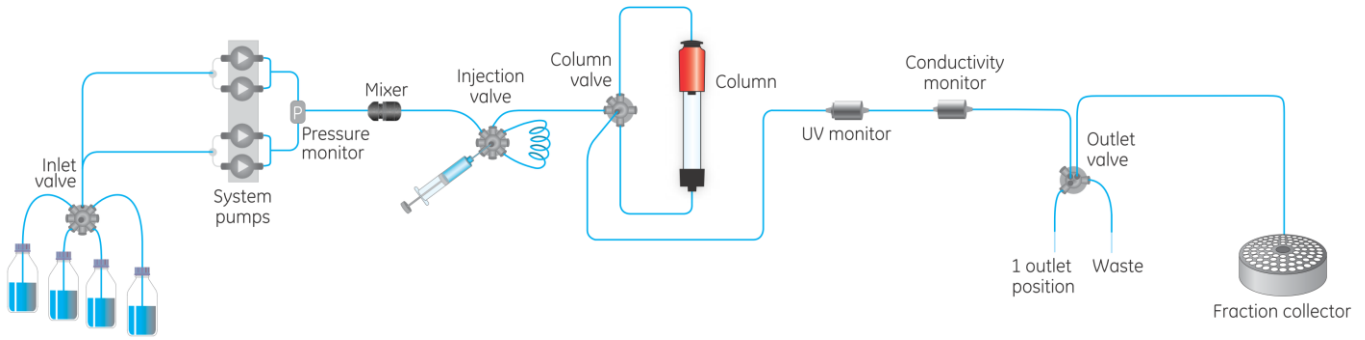

A280 nm
A260 nm
Ratio
A260 nm and A280 nm (mAU)
Ratio
Volume (mL)

ÄKTA™

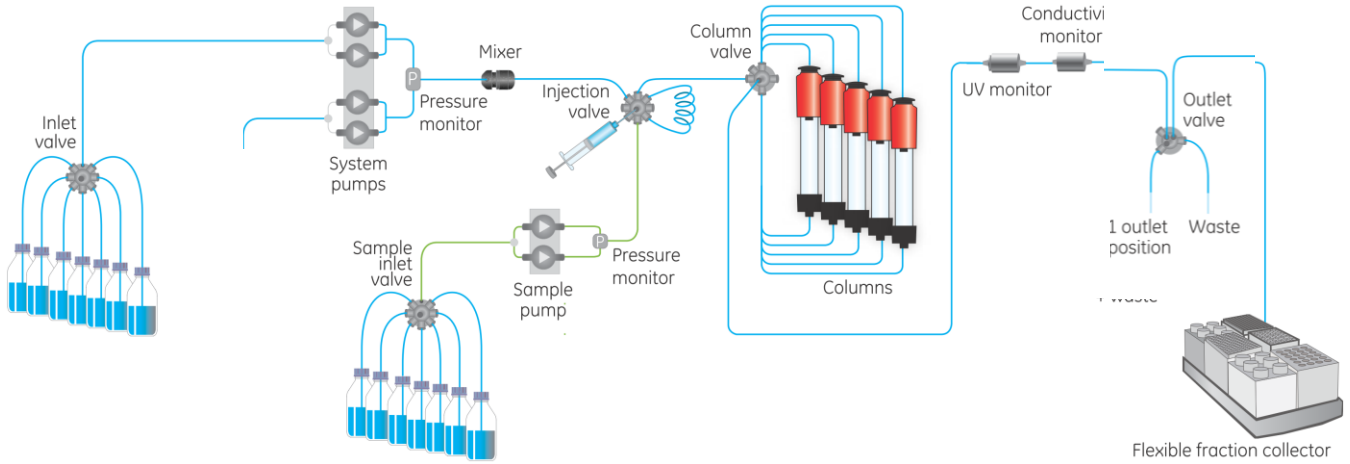
Standardization

Automation Documentation

ÄKTA 機型	流速範圍	耐壓	應用	軟體
Avant & Pure 25	0.001-25 ml/min	20 MPa	分析到製備級	UNICORN 7.3

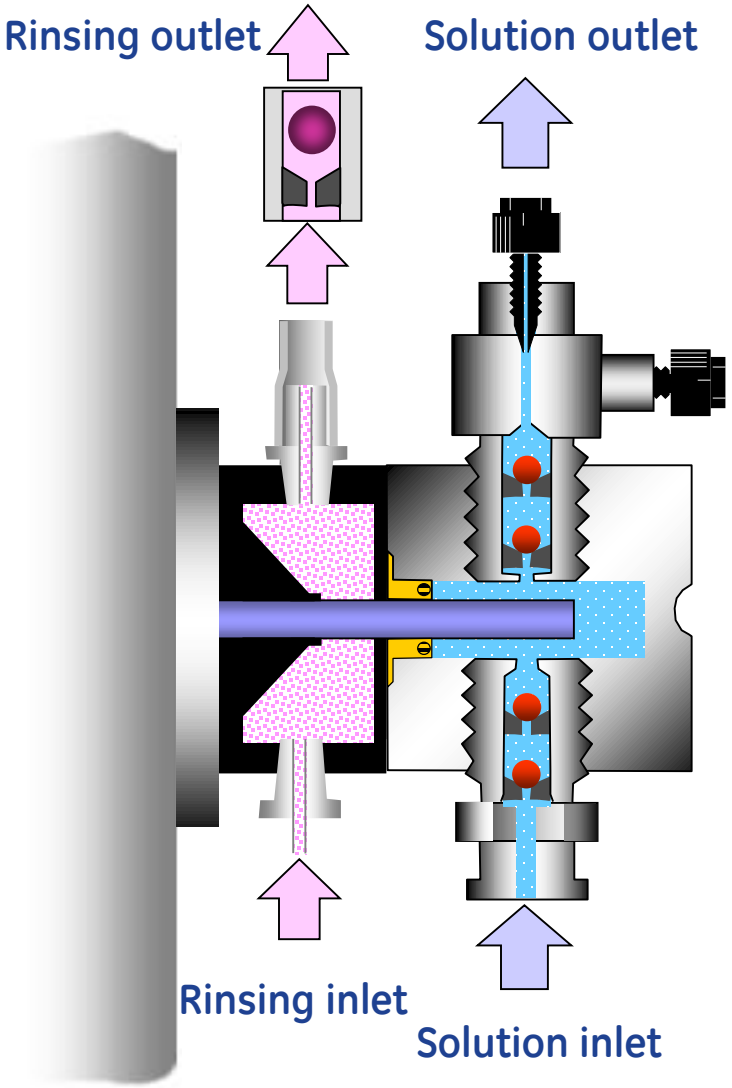


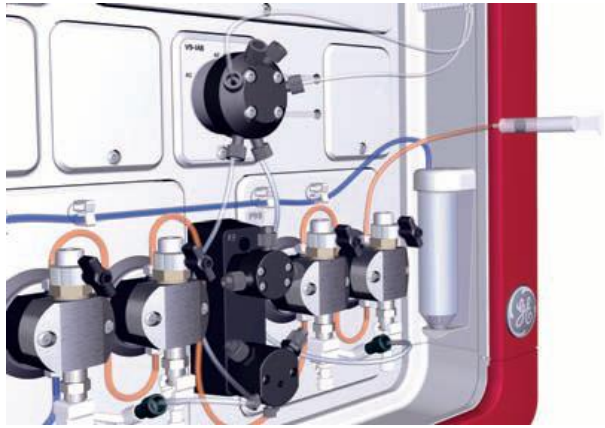






System Pump Design





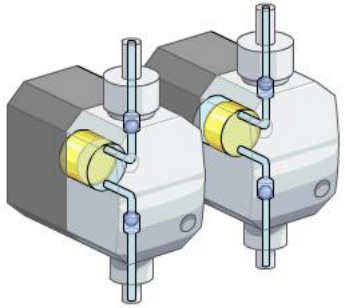


Pump head rinsing system

Function：

--Rinse piston；

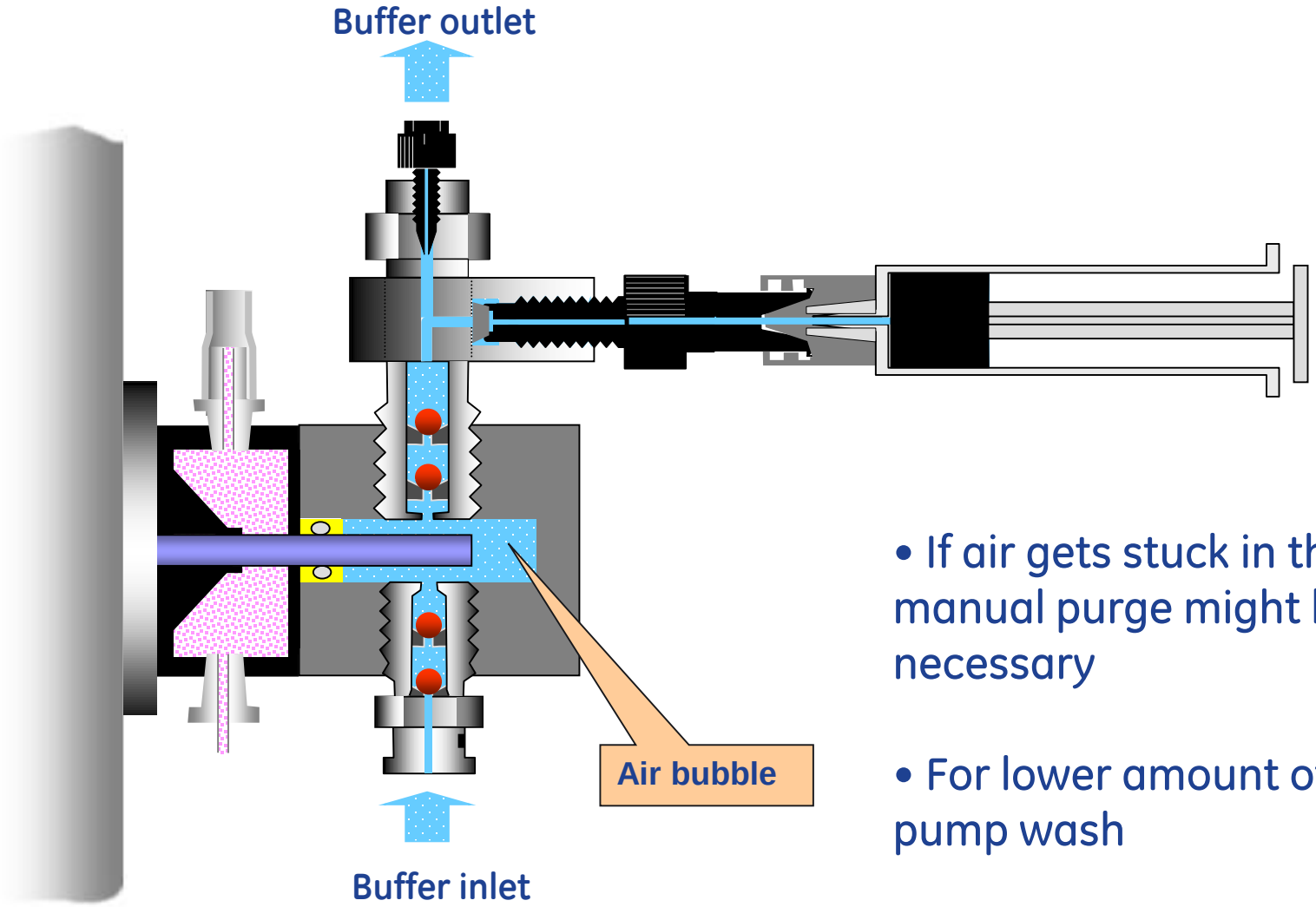
--Rinse out buffer salt；

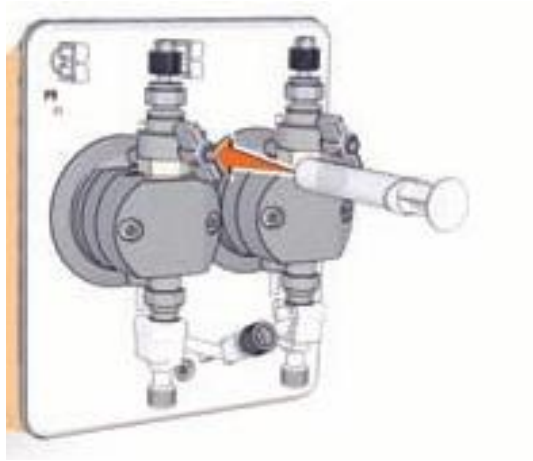


Maintenance： 20% EtOH

（change rinsing solution every week）

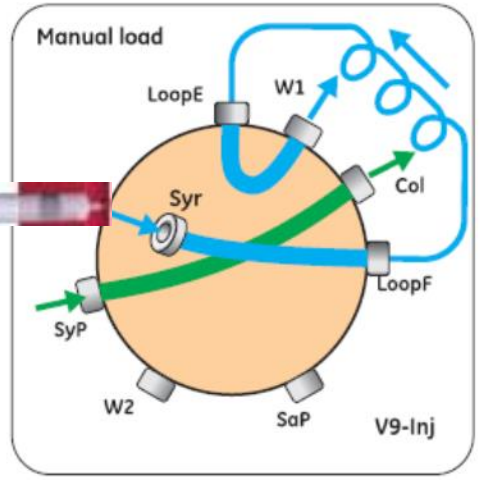
System Pump Design

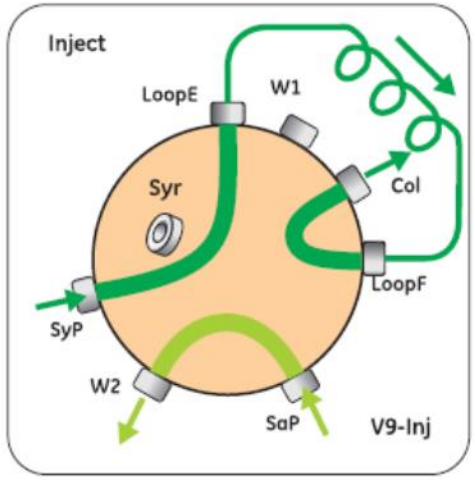


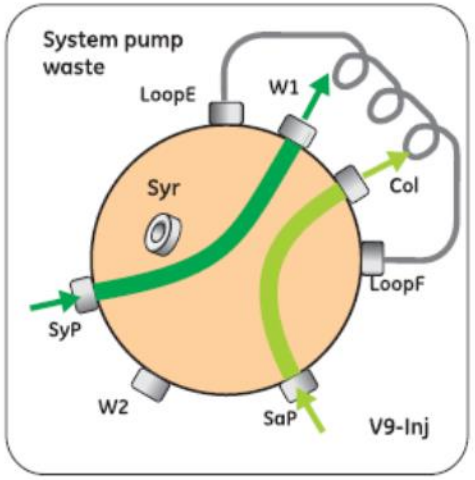


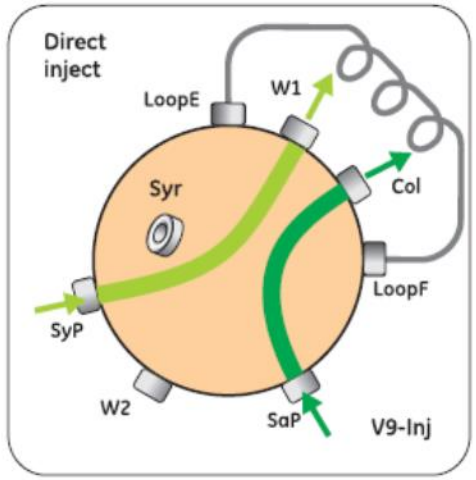
- If air gets stuck in the pump, manual purge might be necessary
- For lower amount of air, use pump wash

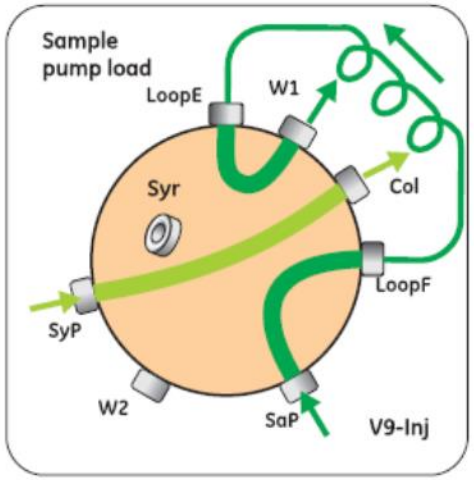
Injection Valve

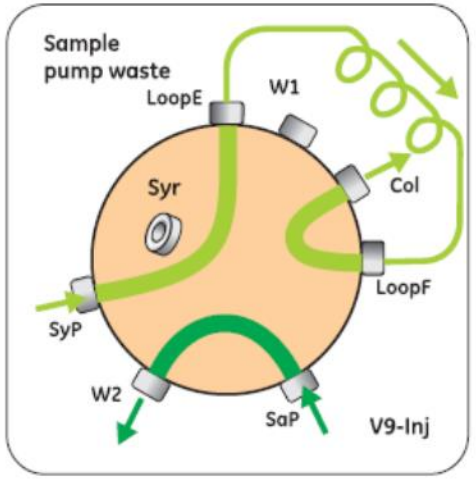














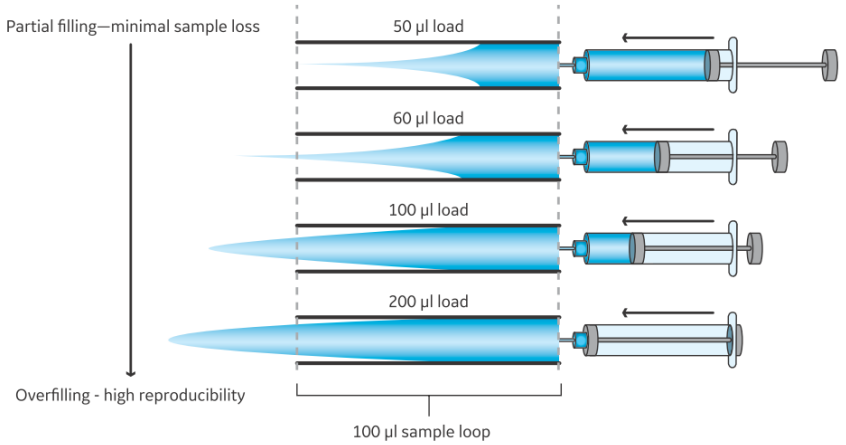
Injection Valve-Loop





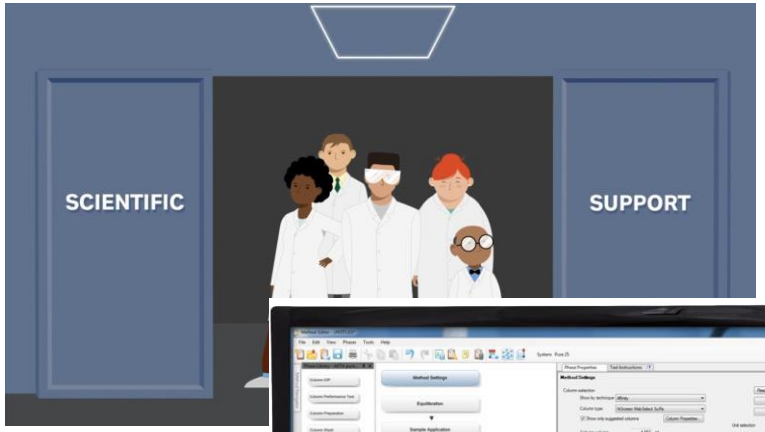


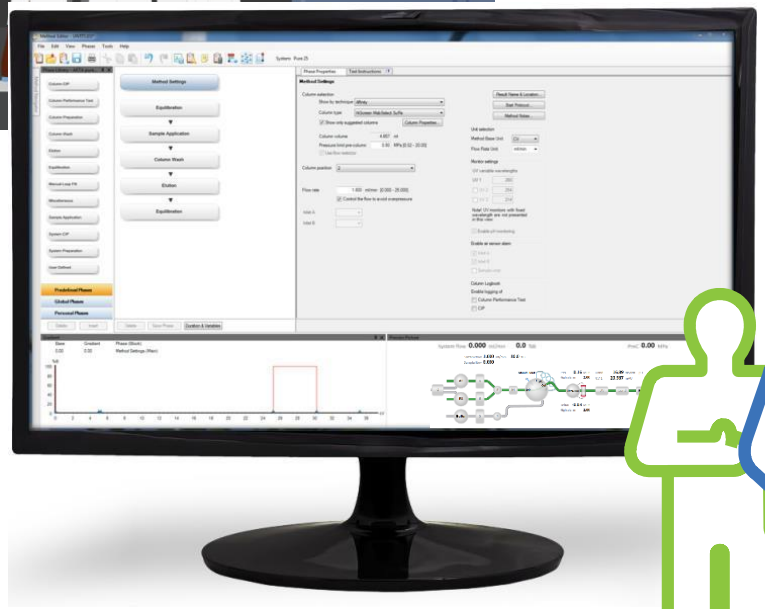
- Sample loop- 10µL, 100µL, 500µL, 1mL, 2mL,5mL
- Superloop- 10mL, 50mL, 150mL



ÄKTA™
Productivity in process developmer





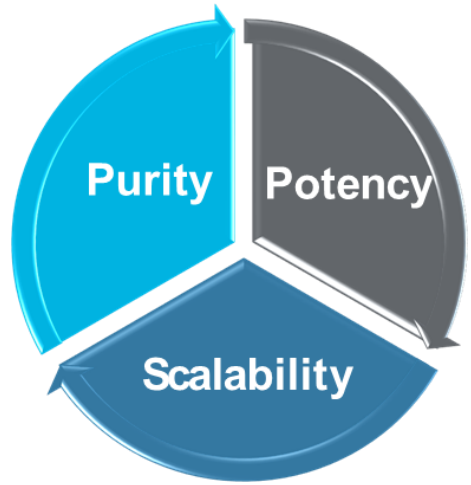




Standardization

Automation

Documentation

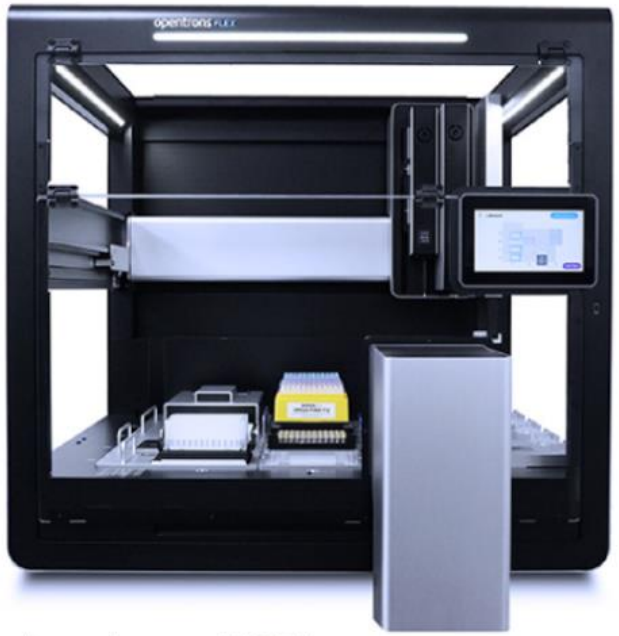


Application examples: New tool 1

AI + 生物製藥

RNAutomation™

Integrated Platform for Custom SAM, mRNA, and circRNA Synthesis and Purification



* opentrons FLEX 2025





產品編號	品名	規格	配基/表面	特點
28967056	Protein A Mag Sepharose Xtra	2 × 1 ml	Protein A	超高結合量 27 mg human IgG/ml IP、co-IP
28967062		5 × 1 ml		
28967066	Protein G Mag Sepharose Xtra	2 × 1 ml	Protein G	
28967070		5 × 1 ml		
28903059	Ab Buffer Kit	一套	抗體純化試劑組	
28913567	Protein A/G HP SpinTrap Buffer Kit	一套	Crosslink 試劑組(不含Urea and DMP)	
17152104011150	Sera-Mag SpeedBeads Protein A/G	1 ml	Protein A/G 混和	1μm 粒徑均一 雙磁層
17152104010150		5 ml		
28985738	Streptavidin Mag Sepharose	2 × 1 ml	Streptavidin	Biotin 標籤蛋白偶連
28985799		5 × 1 ml		
28951380	NHS Mag Sepharose™	4 × 500μl	N-hydroxysuccinimide	無標籤蛋白偶連
28967388	His Mag Sepharose Ni	2 × 1 ml	Ni 螯合	His 標籤蛋白製備
28967390		5 × 1 ml		
11003400	His Buffer Kit	一套	His 純化配套試劑	
38152103011150	Sera-Mag Oligo(dT)-Coated Magnetic	1 ml	Oligo(dT)14	mRNA 製備
38152103010150		5 ml		
28948964	MagRack 6 (1.5ml 離心管)	一組	磁力架	快速取得磁珠




cytiva

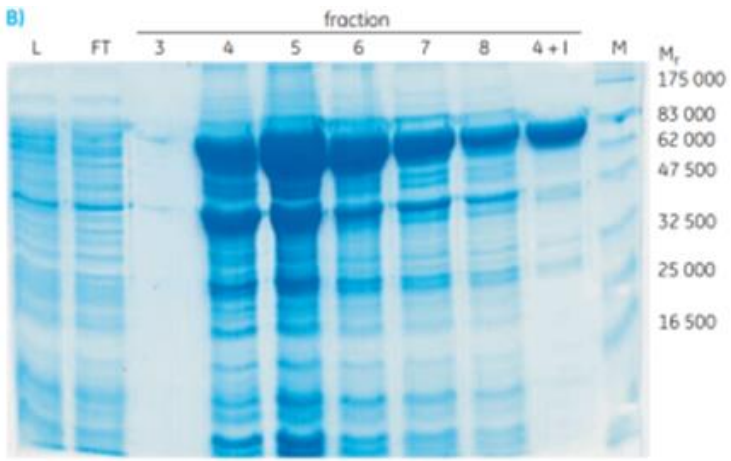
Application examples: New tool 2





Chromatography technique
Histidine-tagged protein purification

Binding Capacity/Column
At least 40 mg histidine-tagged protein/ml



	Glutathione Sepharose 4B	Glutathione Sepharose 4 FF	Glutathione Sepharose HP
Matrix	4% agarose	Highly cross-linked 4% agarose	Highly cross-linked 6% agarose
Ligand	Glutathione	Glutathione	Glutathione
Mean particle size	90 µm	90 µm	34 µm
Binding capacity*	> 25 mg/ml medium	> 10 mg/ml medium	> 7 mg/ml medium
Chemical stability	All commonly used aqueous buffers, e.g., 1 M acetate, pH 4.0 and 6 M guanidine-HCl for 1 h at room temperature	All commonly used aqueous buffers, e.g., 1 M acetate, pH 4.0 and 6 M guanidine-HCl for 1 h at room temperature	All commonly used aqueous buffers, e.g., 1 M acetate, pH 4.0 and 6 M guanidine-HCl for 1 h at room temperature
Recommended flow rate	Sample loading <100 cm/h; wash and elution 100 to 300 cm/h	Sample loading <100 cm/h; wash and elution 100 to 300 cm/h	Sample loading <100 cm/h; wash and elution 100 to 300 cm/h
pH stability	4 to 13	3 to 12	3 to 12
Storage	4°C to 30°C in 20% ethanol	4°C to 30°C in 20% ethanol	4°C to 30°C in 20% ethanol

* Binding of GST to glutathione is protein-to-protein and flow-rate dependent. Lower flow rates often increase the binding capacity. This is important to consider during sample application.

產品編號	品名	規格	結合載量	特點
17075601	Glutathione Sepharose 4B	10 ml	>25mg/ml	文獻最多 結合載量最高
17075605		100 ml		
17513201	Glutathione Sepharose 4 FF	25 ml	>10mg/ml	膠體高穩定性、耐高流速(手動、上機) FF: 高效率　HP: 高解析度
17513202		100 ml		
28952361	GST Buffer Kit	1 Kit		
27084301	PreScission Protease	500 units		PreScission Protease Leu Glu Val Leu Phe Gln Gly Pro　4°C 作用，含 GST-tag
27084601	Thrombin Protease	500 units		Thrombin Leu Val Pro Arg Gly Ser

手動、預裝柱

產品編號	填充膠體	品名	規格
28401745	Glutathione Sepharose 4B	GSTrap 4B	5 × 1 ml
28401748			5 × 5 ml
28952359		GST SpinTrap	50 x 50 µl
28952360		GST GraviTrap	10 x 2 ml
17513001	Glutathione Sepharose 4 FF	GSTrap FF	5 × 1 ml
17513102			5 × 5ml
17514302	Benzamidine FF 結合類蛋白酶	HiTrap Benzamidine FF	2 × 1 ml
17514401			1 × 5 ml

Cytiva

簡單 不需移除標籤、不需洗脫溶劑

有效 提升蛋白純度、增加蛋白活性

特殊標籤

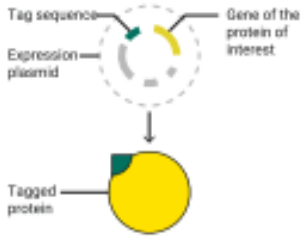
Protein Select™

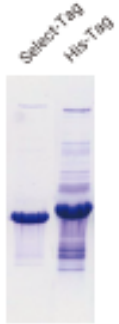


Sequence of Cytiva Protein Select tag

1	10	20	30
MVKIVSRKS	LGVQNVYDIG	VEKDHNFLLA	NGLIASN

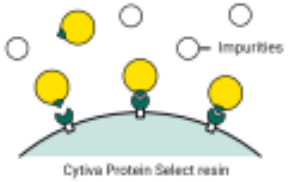
1. 設計質體，表現具有該序列之重組蛋白

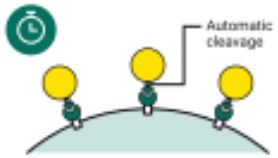




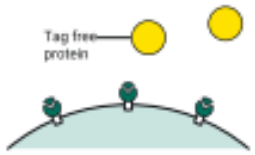
- 提升純度
- 節省步驟
- 提高活性

2. 親和性結合至膠體，靜置 2-4hr





3. 無需換液取得高純度目標蛋白



產品編號	品名	規格	結合載量
17542101	Cytiva™ Protein Select™ resin	25 ml	>20mg/ml
17542102		50 ml	
17542103		500 ml	

產品編號	填充膠體	品名	規格
17542151	Protein Select™	HiTrap™ Protein Select™ column	1 x 1 ml
17542152			5 x 1 ml
17542153			1 x 5 ml
17542154			5 x 5 ml

Application examples:

DLS

PARTICLE CHARACTERIZATION AT ANTON PAAR



0.3 nm — 12 µm

10 nm — 3.5 mm

0.5 µm — 16 mm

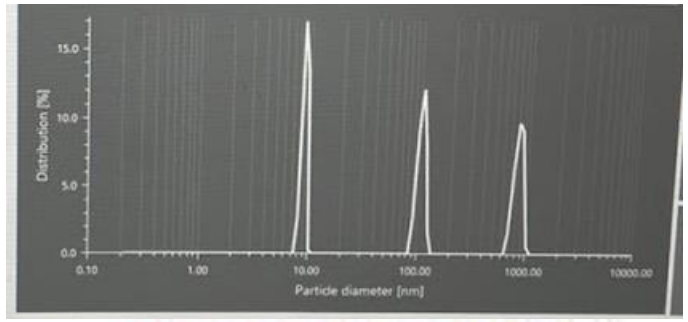
Litesizer DLS
Dynamic Light Scattering

Litesizer DIF
Laser Diffraction

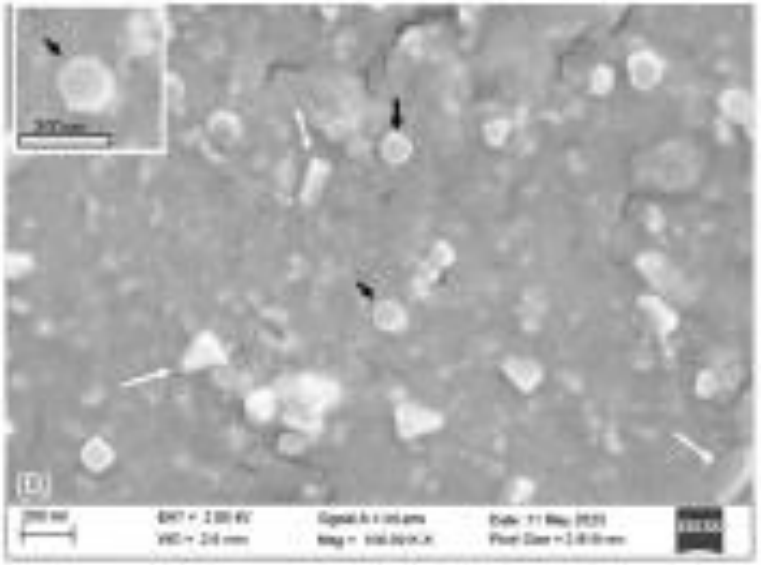
Litesizer DIA
Dynamic Image Analysis

Exosome Preparation Process

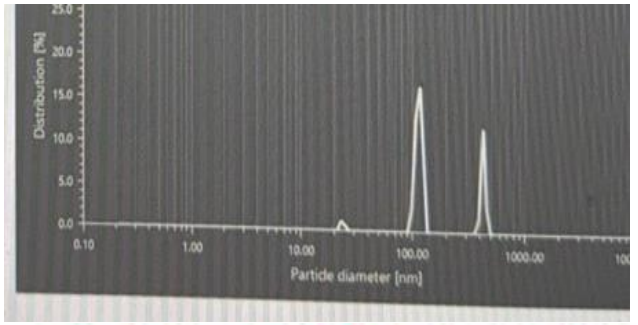
Exosome Isolation | Ultracentrifuge | TFF 100/300KDa



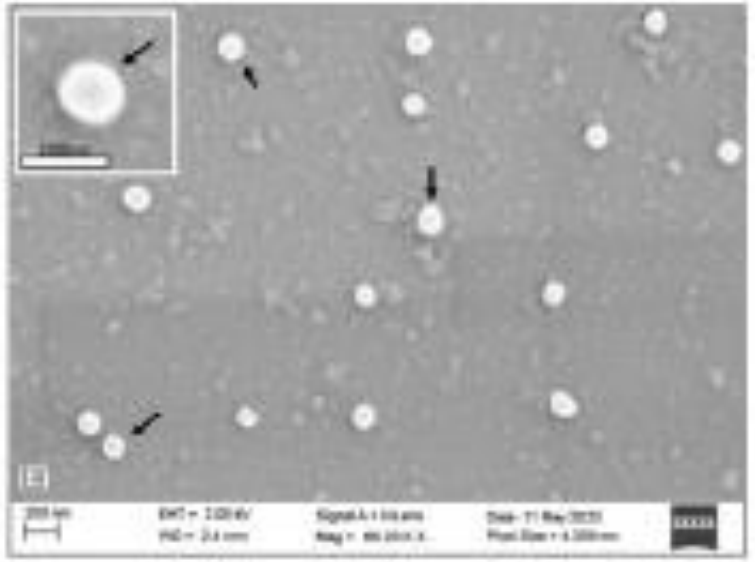
After concentration with TFF



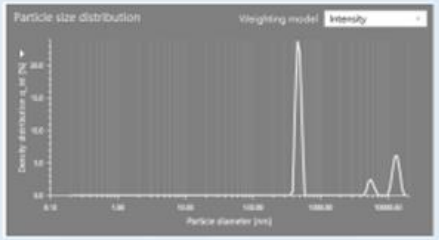
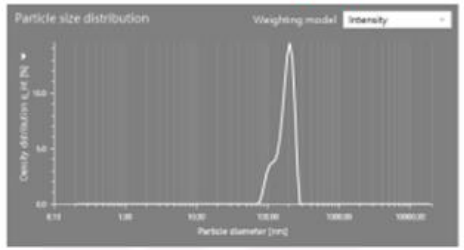
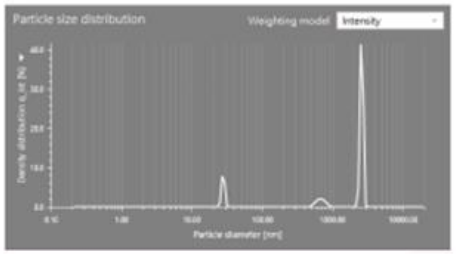
Protein removal | SEC | Capto Core



After enrichment superSEC resin



Exosome Preparation Process

Product	Supor EKV membrane in Mini Kleenpak syringe filter	Acrodisc Supor PES syringe filter
		
Level	BioProcess	Lab filtration
Pore size	**Double layer** **0.65 µm + 0.2 µm**	**Single layer** **0.2 µm**
Filter media	Polyethersulfone (PES)	Polyethersulfone (PES)
Effective filtration area	2.8 cm²	2.8 cm²
DLS Particle size result after filtration	Before filtration Peak1: 471 nm Peak2: 5644 nm Peak3: 13333 nm 	
	After BP filtration Peak1: 180 nm **Single peak** 	After Lab filtration Peak1: 27 nm Peak2: 679 nm Peak3: 2591 nm 

Litesizer 7



Dimensions (mm):
D460 x W485 x H135

Weight (kg): 18 kg

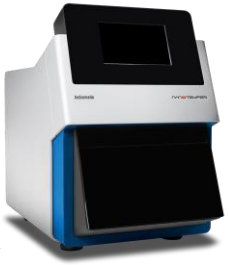
Measurement Mode	Method	Highlights & Specification	Device model
Particle Size & Particle Size Distribution **粒徑分佈量測**	Dynamic Light Scattering (DLS) **動態光散射射分析**	• 3 detection angles with automatic angle selection • Measurement range: 0.3 nm – 10 µm • Min. sample volume: 12 µL	• 700/500/100
Particle Number **顆粒濃度量測**	Colocalization **共定位**	• 10^{8}-10^{13}/ml	• 700
Zeta Potential **界達電位量測**	Electrophoretic Light Scattering (ELS) **電泳光散射射分析**	• signal processing via patented cmPALS (patented) • Anton Paar Omega cuvettes (patented) • Measurement range: ± 1000 mV	• 700/500
Molecular Mass **分子量量測**	Static Light Scattering (SLS) **靜態光散射射分析**	• Measurement range: 980 Da – 20 MDa • Measuring range (particle size): up to 40 nm	• 700/500
Transmittance **穿透率量測**	Light Permeability **透光率分析**	• continuous measurement for monitoring of sedimentation & aggregation • Measurement range: 1.28 - 1.50	• 700/500
Refractive Index **折射率量測**	Focus-dependent Scattering Intensity **Focus-dependent散射強度分析**	• required input parameter for DLS and ELS • only DLS based instrument on the market (patented)	• 700/500

21 CFR part 11 software: Audit trail, customizable user management, electronic or hard copy signing

Application examples:

Panta

NanoTemper基於標靶的藥物發現解決方案



Andromeda X

裂解液中蛋白表現篩選

標靶蛋白生產

篩選體系建立



Prometheus Panta

蛋白品質

製劑篩選

Dianthus

單點篩選

初步篩選



化合物驗證

Dianthus

親和力篩選



Monolith

中低通量親和力檢測

先導化合物優化

- 應用
- Proteins & Complexes
- Gene Therapy Vectors & VLPs
- Evs & Delivery Systems
- Nucleic Acids & RNP

一次實驗，平行監測樣品全面穩定性參數

nanoDSF

微量差式掃描螢光法

熔解溫度Tm
起始溫度Tonset

Backreflection

背反射技術

大聚集體形成溫度
$T_{turbidity}$

DLS

動態光散射

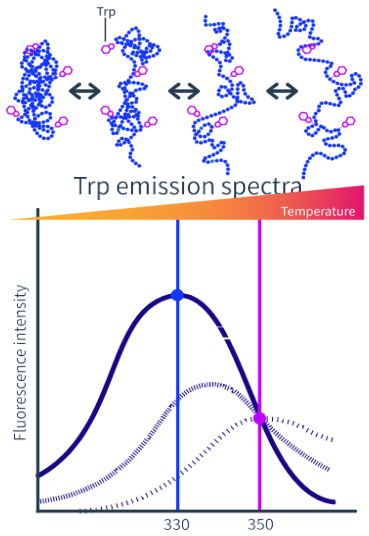
粒徑rH
均一性PDI
小聚集體起始溫度Tsize
自相互作用係數KD

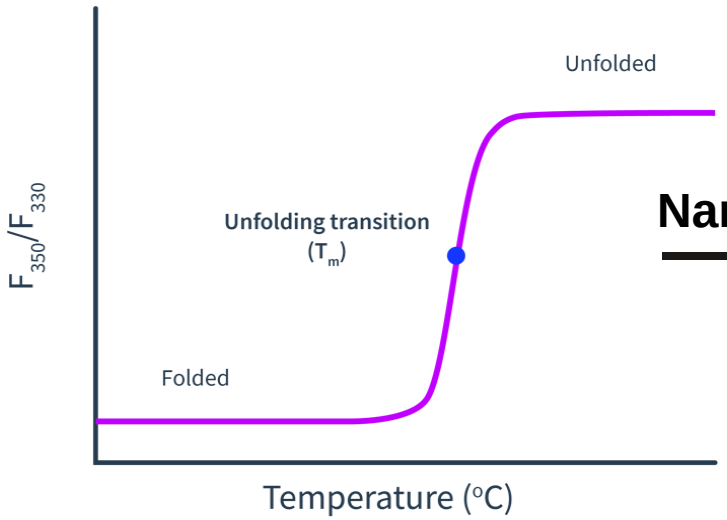
SLS

靜態光散射

小聚集體起始溫度
Tscattering
第二維裡係數B22

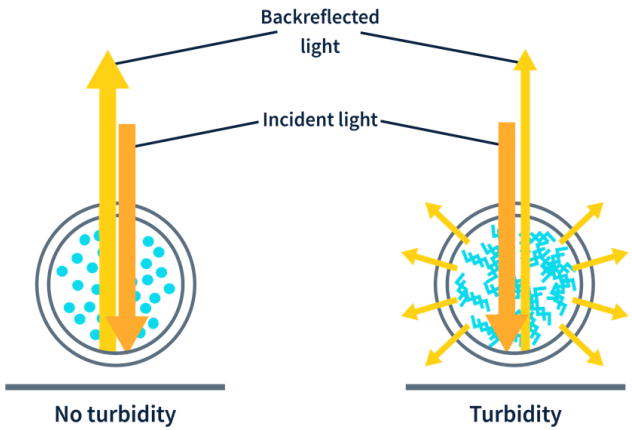
nanoDSF & Backreflection

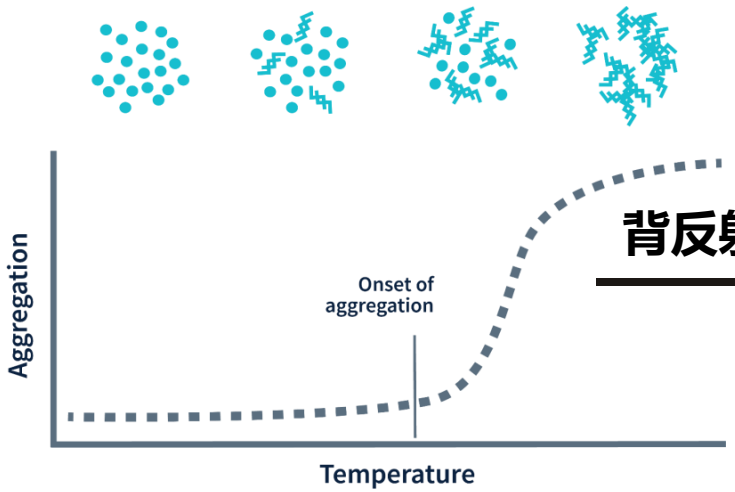




NanoDSF → **利用蛋白內源螢光，無需任何標記高靈敏： 一個色氨酸即可**

⇨ 蛋白變性 找出 Tm（熔解溫度）



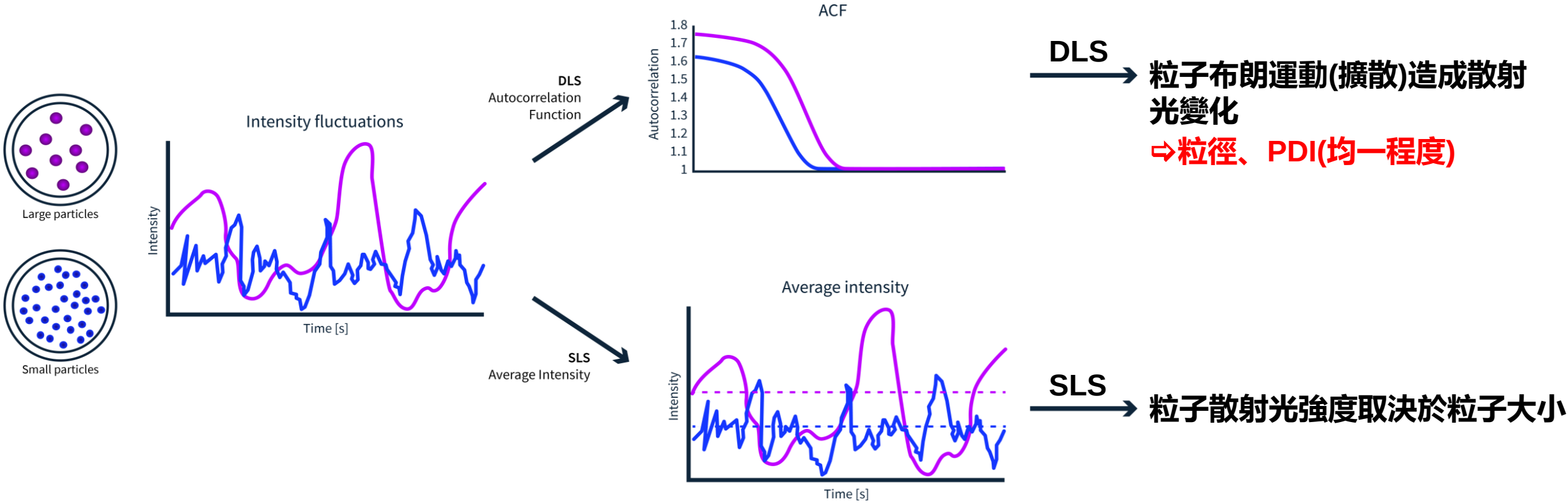


背反射 → **檢測蛋白大聚集起始時間與程度**

NANOTEMPER

level Discovering new boundaries 進階生物科技 Level Biotechnology Inc.

DLS & SLS



DLS → **粒子布朗運動(擴散)造成散射光變化**

⇨粒徑、PDI(均一程度)

SLS → **粒子散射光強度取決於粒子大小**

Panta 可以獲得分子穩定性全面概況分析

nanoDSF 差示掃描螢光	蛋白變性
測定參數	T_m, T_{onset}, C_m, E_a, ΔG, 復性

DLS 動態光散射	粒徑尺寸分析
測定參數	T_{size} . r_H . PDI ， k_D . Visocity

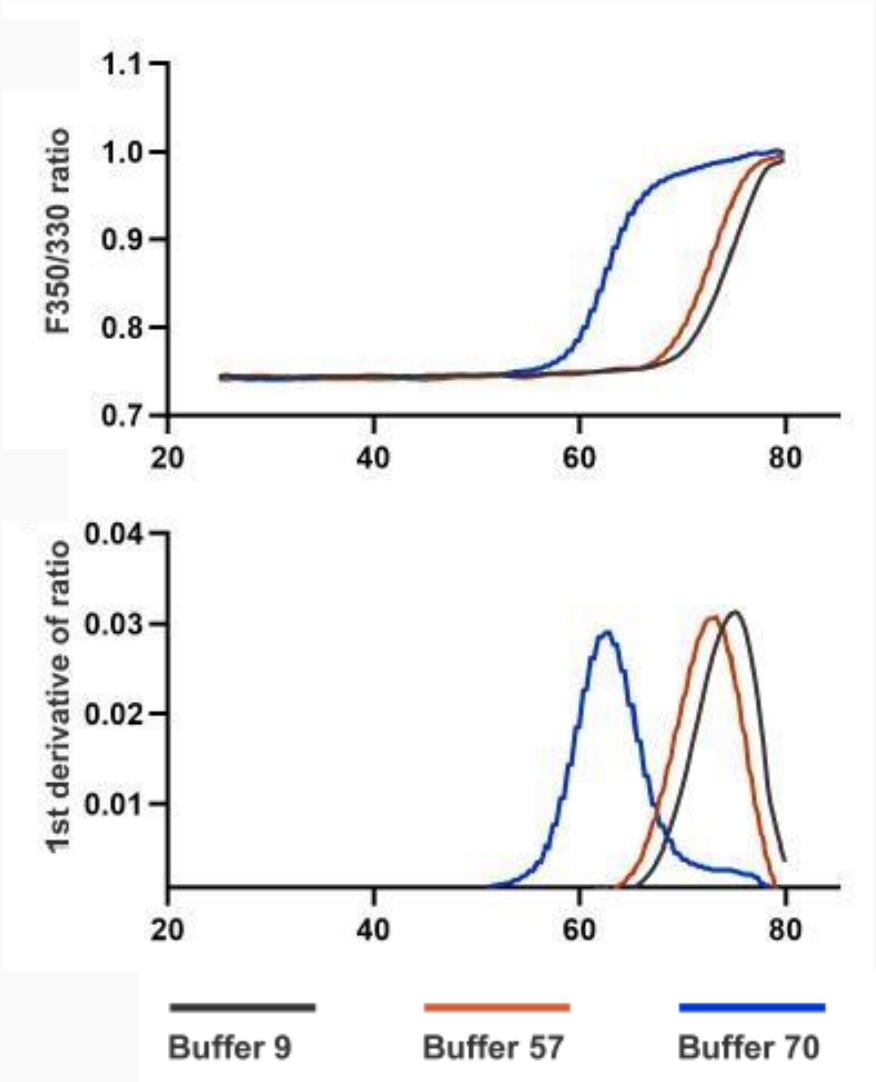


Backreflection 背反射	聚集
測定參數	$T_{turbidity}$

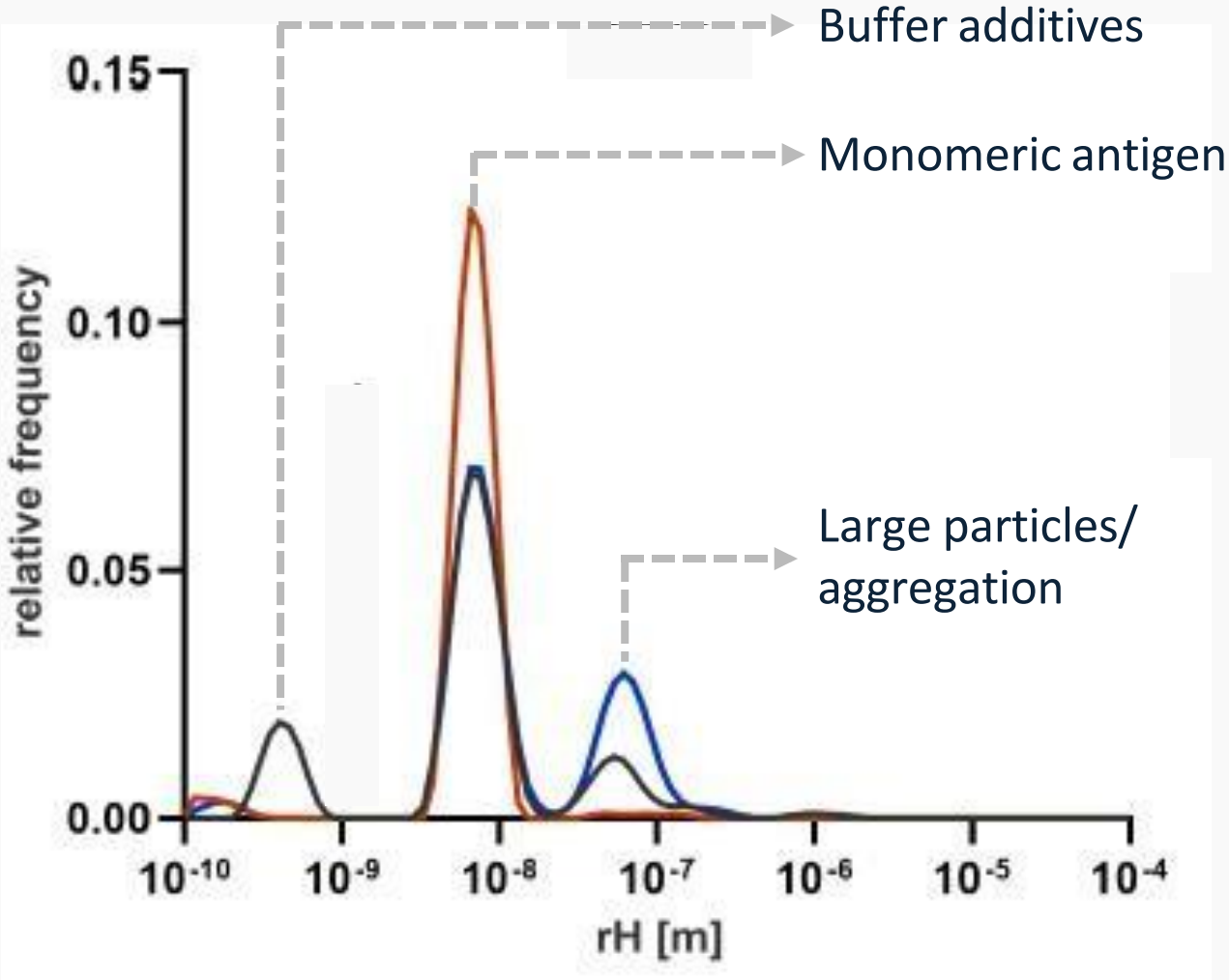
SLS 靜態光散射	分子量變化
測定參數	B22 ， MW ， $T_{scattering}$

level Discovering new boundaries 進階生物科技 Level Biotechnology Inc.

结合DLS數據膠體稳定性



解决深度问题



Popp C, et al. Multi-parameter formulation development for an HIV-vaccine protein with direct validation of epitope binding integrity and stoichiometry. 2020.

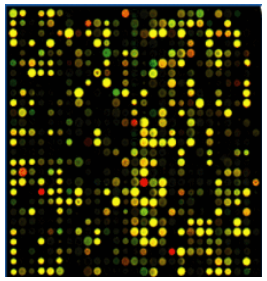
Application examples:

Biacore

The “omics” revolution: from gene to function

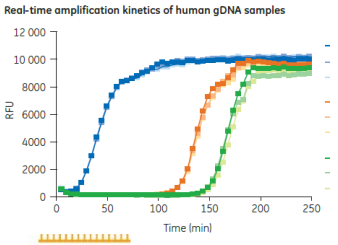
Functional analysis

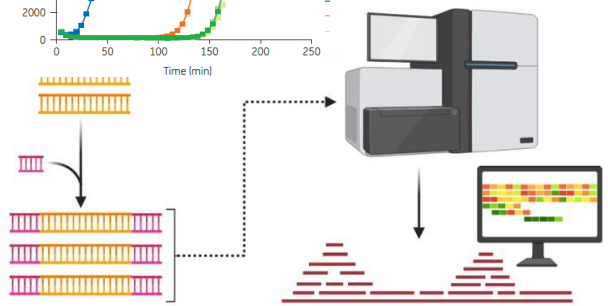
Genomics — Genetic level



DNA Microarray

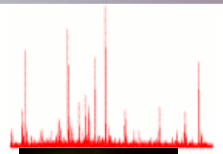






Discovery, sequencing, expression analysis

Proteomics — Protein level







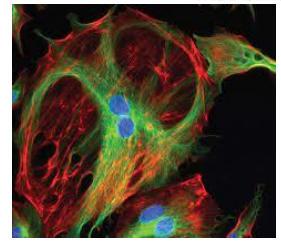




Identity, expression level, characterization, modifications, interactions, etc…

Cell biology — Cell level









Contextual function, localization, contribution to cell phenotype, lineage analysis,

Biomolecule interaction analysis technique

Protein-protein interaction

- Yeast two-hybrid system
- ELISA
- FRET
- Co-IP
- Western, Far-Western
- Mass Spectrometry

Protein–DNA interaction

- EMSA
- ChIP

- **End-point Tech**

  Two-hybrid screening、ELISA、Co-IP、ChIP、Western、MassSpec.

- **Require Labeling**

  Two-hybrid screening、ELISA、FRET

- **Strong affinity only**

  ELISA、Co-IP、ChIP、Western、MassSpec、EMSA

- **Laborious、Time-consuming**

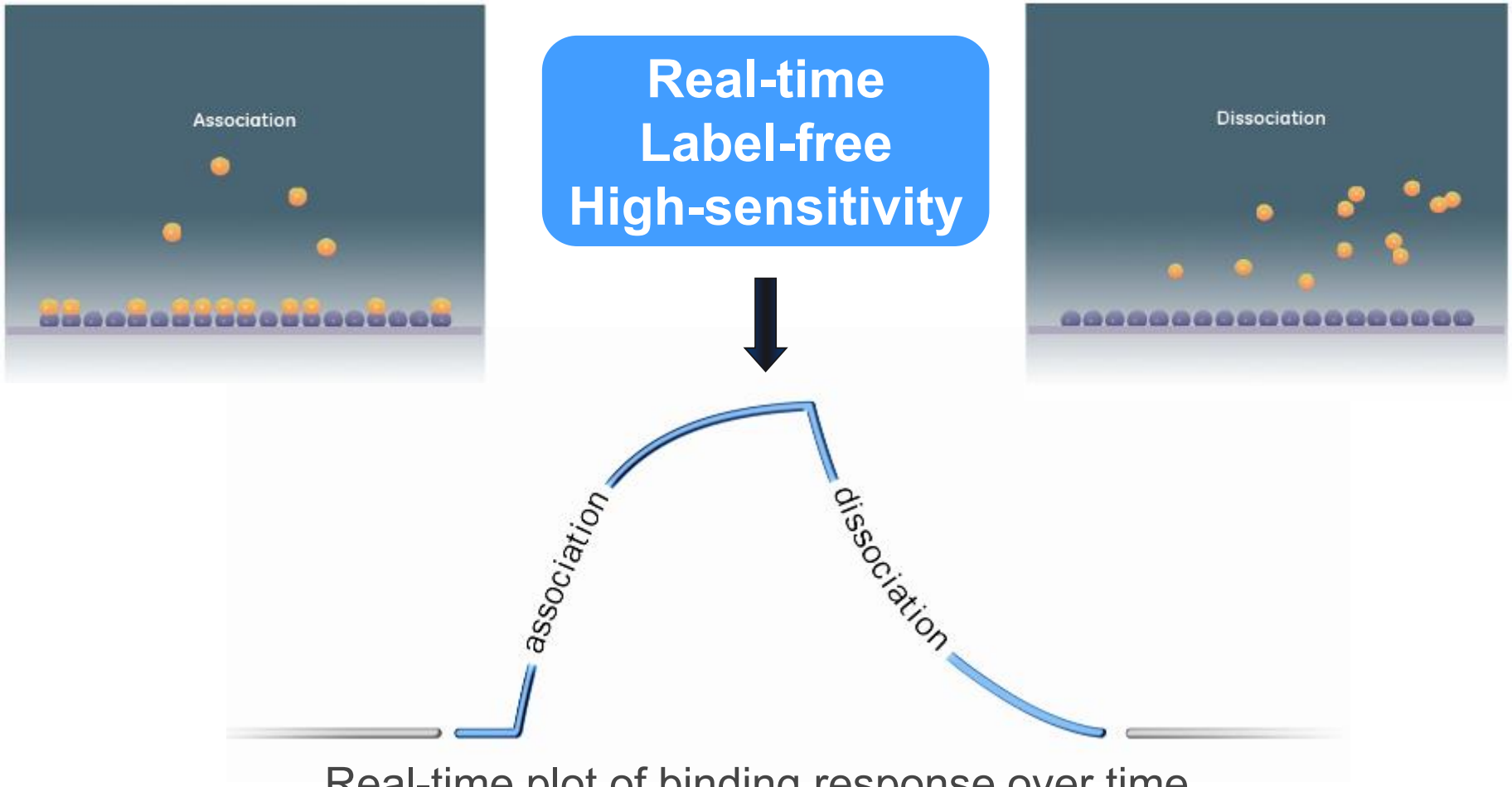
  ELISA、Western、EMSA

- **Inactive OR Semi-active Tech**

  ELISA、Western、MassSpec、EMSA

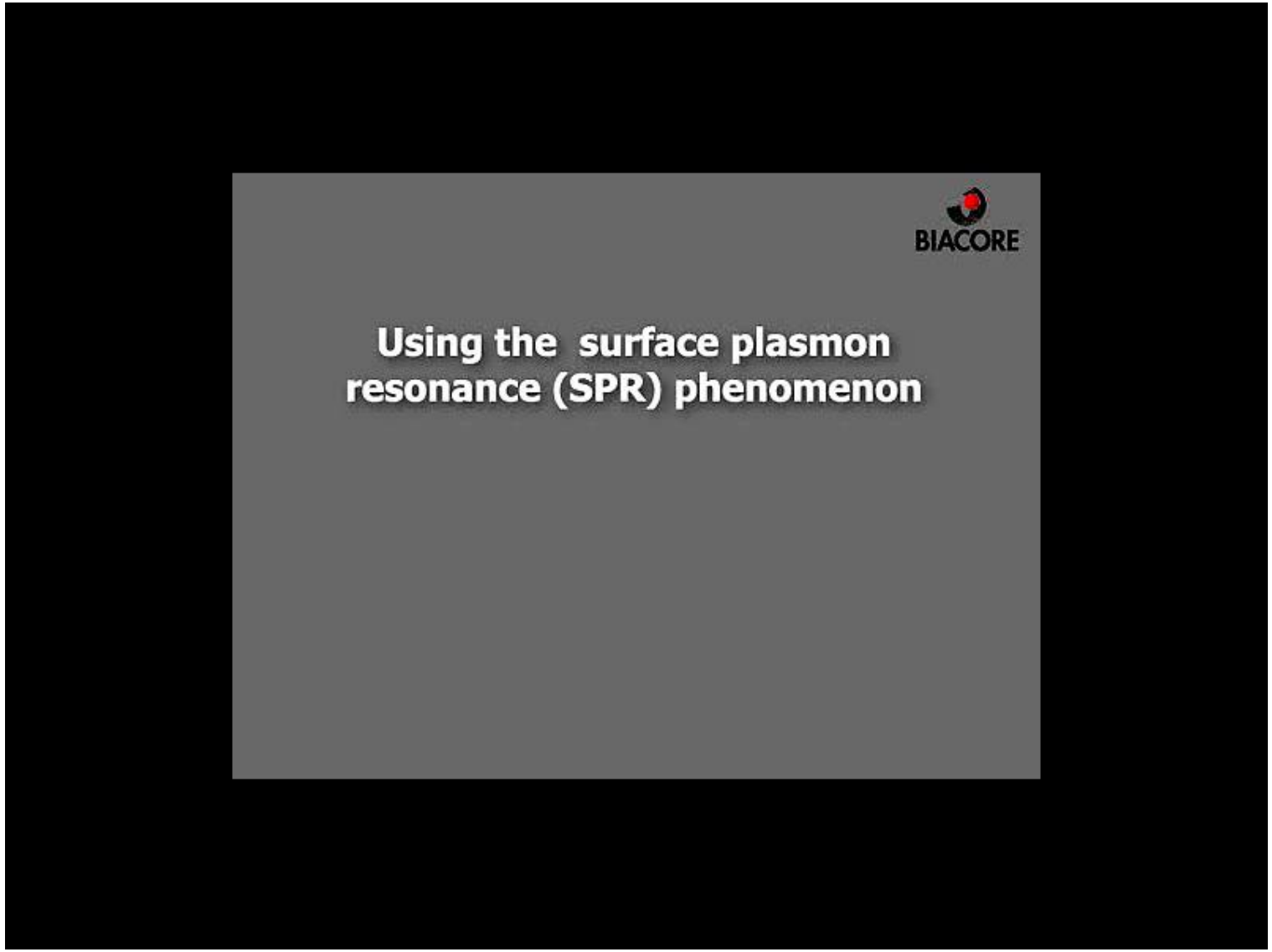
- **Less information**

Biacore™ systems monitor molecular binding events in real-time



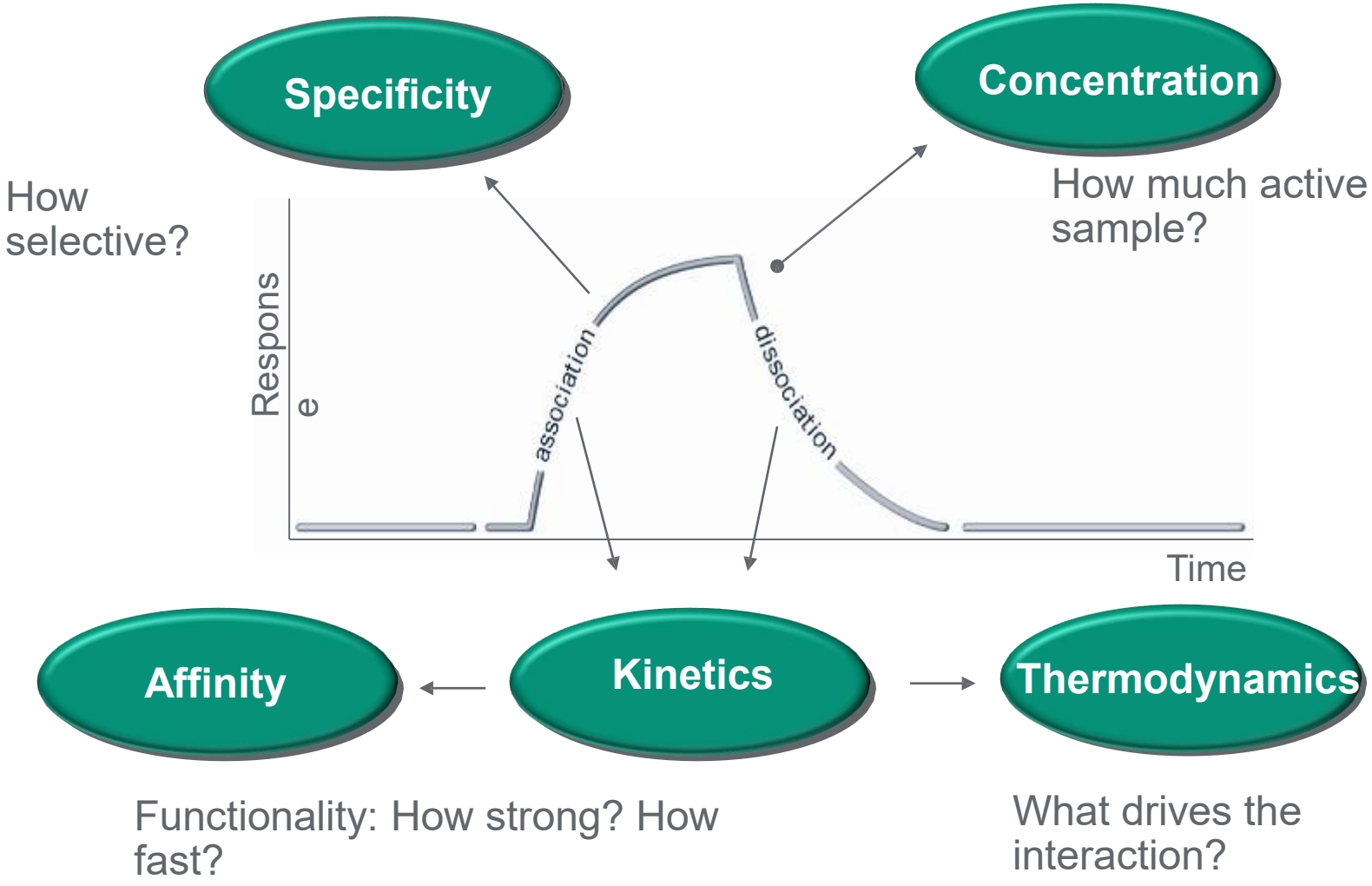
Real-time plot of binding response over time (sensorgram)

Surface Plasmon Resonance (SPR)

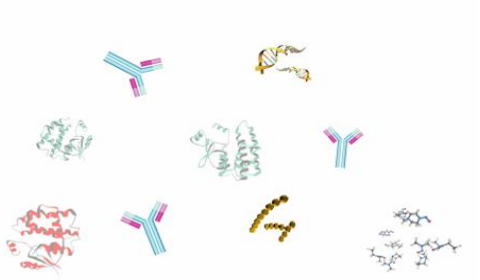


Interaction analysis

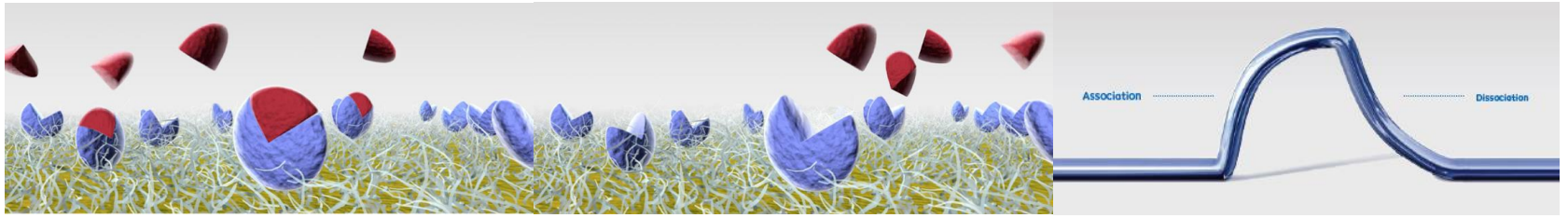
Possible questions to answer

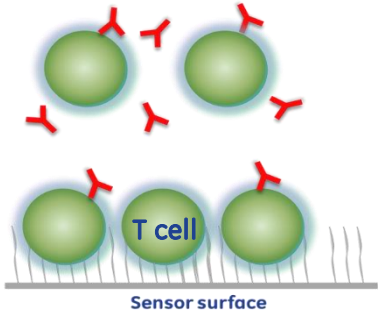


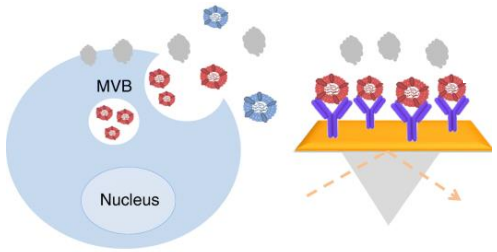
Real-time monitoring of binding events



Association **Dissociation** **Sensorgram**



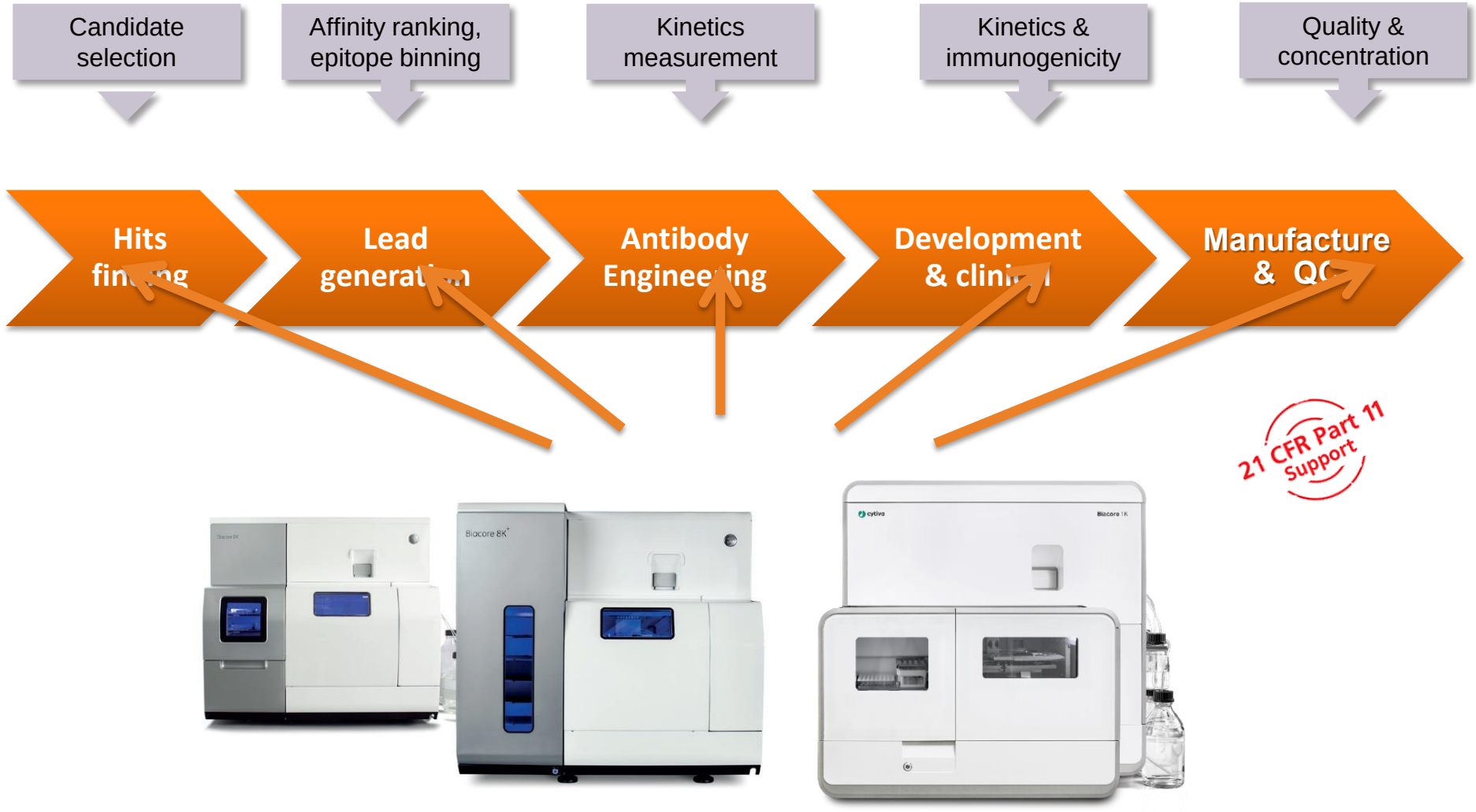




Antibodies
Proteins
Peptides
Compounds and fragments
Nucleic acids
Ions
Virus
Exome, Whole Cell, T Cell

Affinity
Kinetics
Screening
Specificity
Concentration
Epitope binning
Immunogenicity
Thermodynamics

Biacore™ Applications in Biotherapeutic Development



Thank you

Firstname Lastname

emailaddress@cytiva.com
0.000.000.0000