



Biotage Capital Markets Day

23 May 2024




Biotage®

Disclaimer

This presentation may contain certain forward-looking statements, which by their nature, involve risk and uncertainty because they relate to events and depend on circumstances that will occur in the future. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied by these forward-looking statements. Accordingly, investors and shareholders should not place reliance on these statements

Biotage – Who We Are

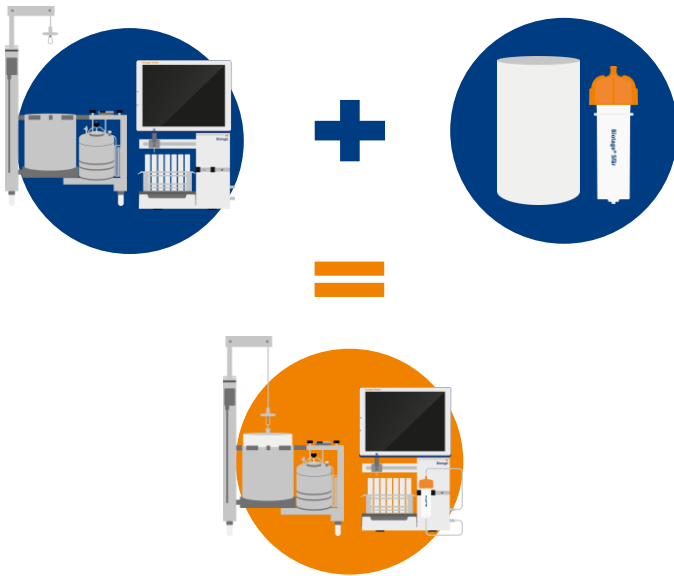
Global Go-To Separations Company, supporting customers from drug discovery and development through to analytical and diagnostic testing with intelligent and sustainable workflow solutions.

Our expertise and top tier separation solutions play a key role in streamlining our customers' workflows and improving their efficiency and speed of delivery



Biotage – The Global Go-To Separations Company

1. Comprehensive Suite of Workflow Solutions



2. Capabilities for Every Clinical Stage

✓ Drug Discovery

✓ Small-Scale Process

✓ Process Scale-Up

✓ Technology Transfer

✓ Full-Scale Manufacturing

3. Support for a Broad Modality Pipeline

- Gene & Cell Therapies
- mRNA
- Drug Delivery Vehicles (LNPs, Exosomes etc.)
- Antibodies & mAbs
- pDNA
- Peptides
- Oligonucleotides
- Synthetic Therapeutics
- Small Molecules

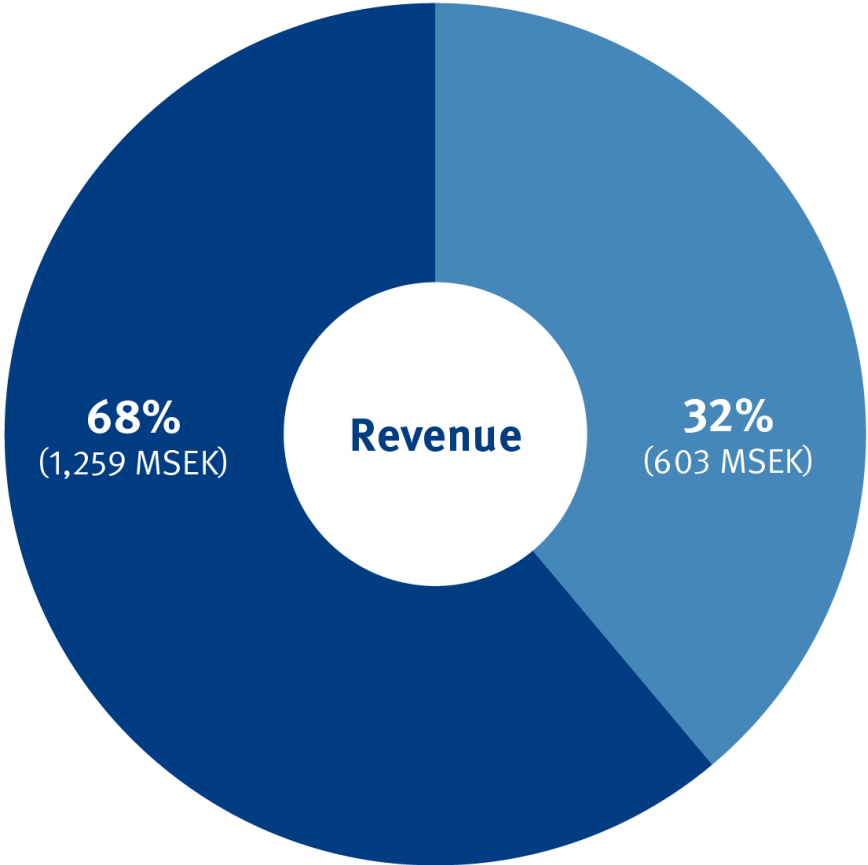
<<< Separation expertise & technologies in small & large molecules >>>

Our Solutions Span Across Two Primary Market Segments



Drug Discovery, Development & Manufacturing

Research, development, and manufacturing solutions for the pharma and biopharma sectors.



Diagnostics & Analytical Testing

Diagnostic and analytical testing solutions for clinical, forensic, and doping laboratories.

Global Footprint & Reach



Products sold in more than +80 countries



Direct sales revenue >90%



Recurring revenues >70%



~ 5000 customers



18 locations globally and 7 R&D sites

Biotage Headquarter

Uppsala, Sweden

Biotage Canada

Joliette, Quebec

Biotage USA

San Jose, CA
Charlotte, NC
Salem, NH
Boston, MA

Biotage UK

Cardiff, Wales
Southampton, England
Oxford, England
Cambridge, England
Stonehouse, England
Isle of Man, British Isles

Biotage India

New Delhi, India

Biotage Korea

Seoul, South Korea

Biotage Japan

Tokyo, Japan

Biotage China

Shanghai, China

Biotage Singapore



Broad and “Sticky” Solutions Provider

<<<< Recurring >>>>

Systems

Consumables

72%

Services



28%



60%



12%

Driving Margin Growth

Commercial

- More use of e-commerce
- Astrea recently launched; wider Group following
- Increases efficiency, reduces processing costs and enhances customer experience
- Expansion of Astrea customer base at attractive pricing

Costs

- Strategic procurement activities targeting lower cost of sales
- Integration activities driving operating cost synergies
- Maximising use of Group facility space
- Modular and flexible approach to manufacturing expansion in Astrea allowing lower than anticipated capital spend

Operational

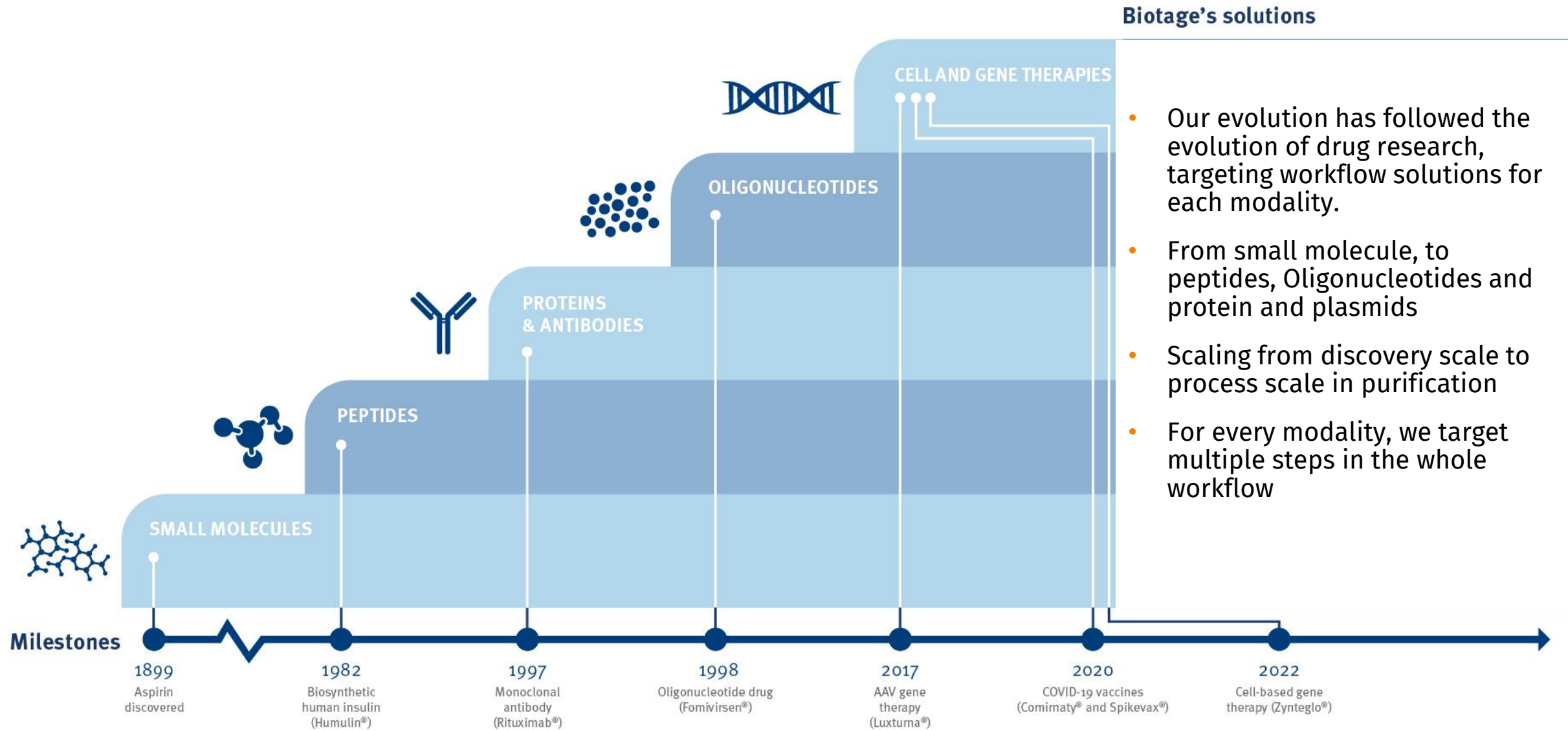
- Increased volume through production sites driving lower cost of sales (sweating 'fixed assets')
- Within Astrea, more shift patterns, reducing cycle times and bigger batch sizes all driving lower unit costs of production
- In and out-sourcing materials and media
- Increased automation of product manufacture
- R&D process re-engineering; lowering product bill of material costs



Drug Discovery & Development

Small Molecules, Peptides, Oligos

Following the evolution of Drug Research



- Our evolution has followed the evolution of drug research, targeting workflow solutions for each modality.
- From small molecule, to peptides, Oligonucleotides and protein and plasmids
- Scaling from discovery scale to process scale in purification
- For every modality, we target multiple steps in the whole workflow

Strong and Growing Market Spaces



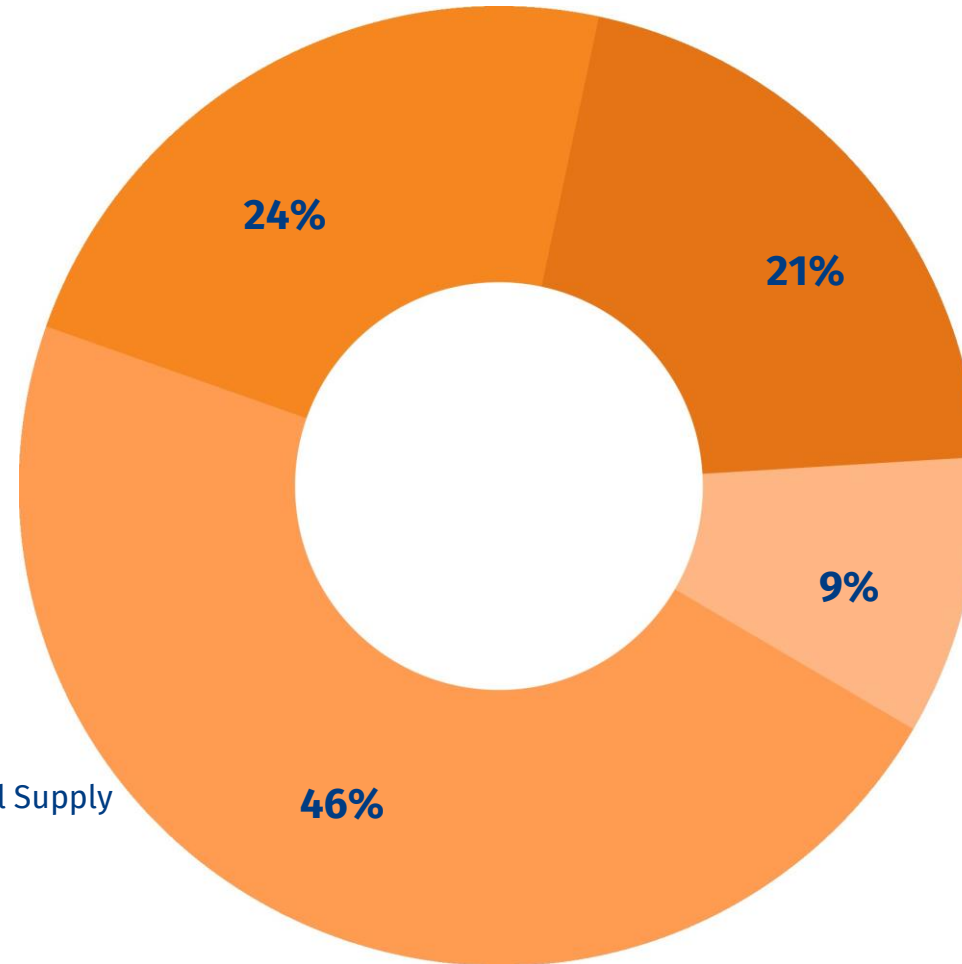
Focusing on Key Customer Segments



Academia & Government
Drug Discovery Research and
Regulatory Testing



Pharma & Biotech
From Discovery to Commercial Supply

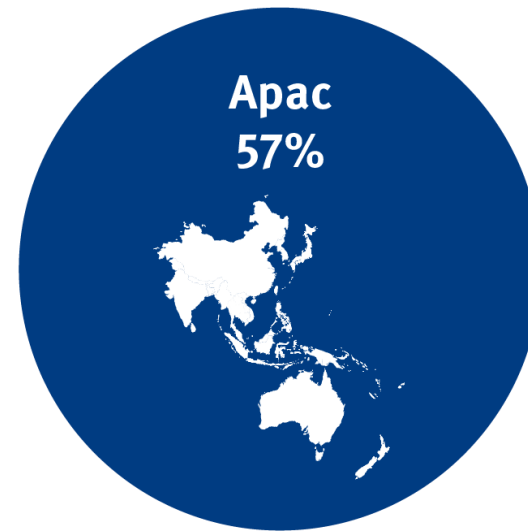
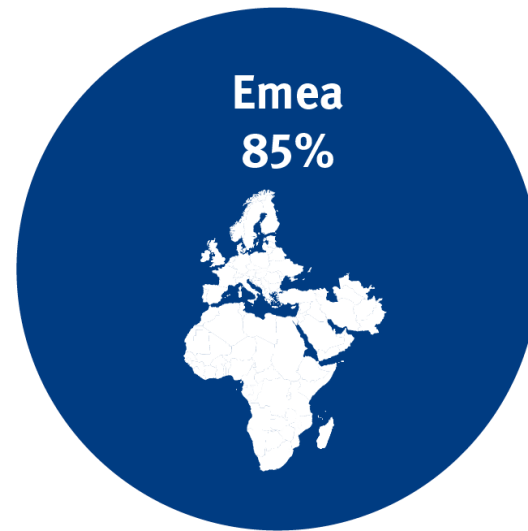


Clinical & Healthcare
Speed and Efficiency in Patient
Diagnostics and Monitoring



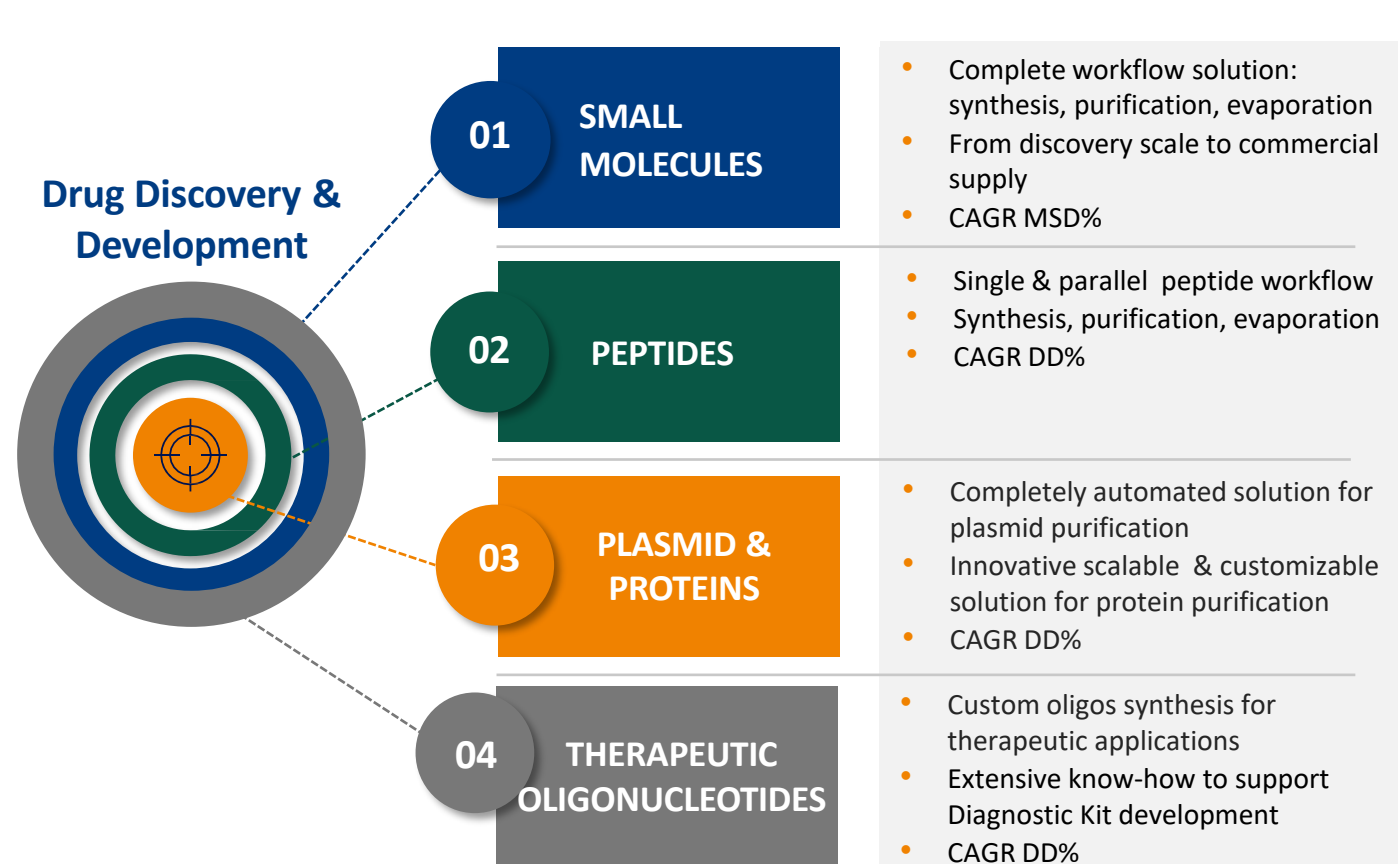
Applied & Industrial Lab
Enabling Advancing Research,
Development and Product Quality

>90% Direct Sales Revenue & Direct Relationships



- < 5% of revenue currently coming through e-commerce – this is a significant opportunity for growth

Targeting Key and Hot Modalities



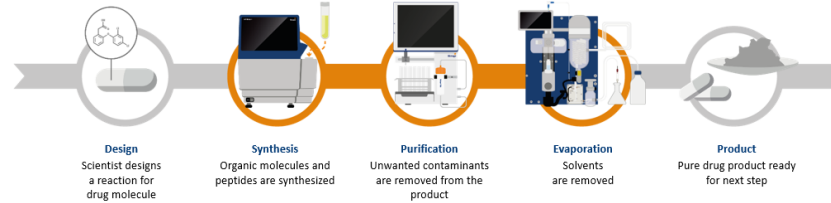
Market Size

49.5 BSEK

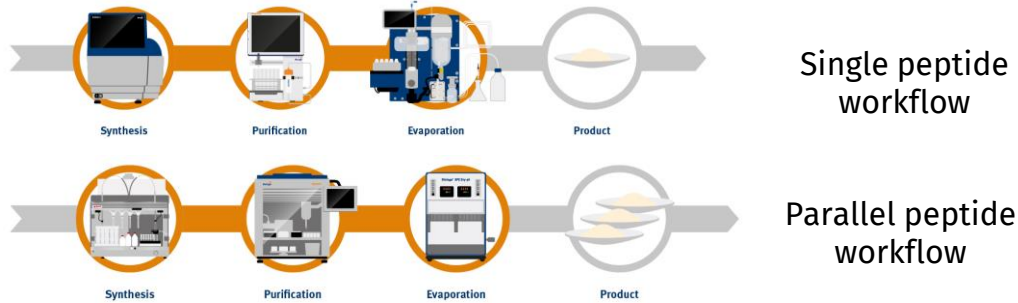
CAGR 9%
2023-2028

Focusing on the Workflow for each **Modality**

SMALL MOLECULES



PEPTIDES



PLASMID & PROTEINS



THERAPEUTIC OLIGONUCLEOTIDES



- Systematically expanding the portfolio to add workflow components
- This multicomponent approach separates us from competition, normally focusing on a single step
- Further expansion opportunities in a range of modalities

Following the **Market Trends in Drug Discovery & Development**

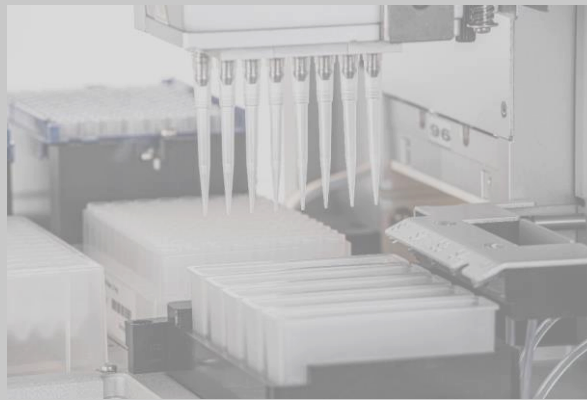
Precision Medicine, Biopharmaceuticals and Advanced Treatments

A suite of solutions for customers engaged in the discovery, development, and manufacturing of precision medicines.



Miniaturization, Biomarker Analysis and Molecular Diagnostics

New advanced workflow solutions for peptides, oligonucleotides and biomolecules.



Water Supply, Environmental Awareness, Food Safety

Products to fulfill needs related to food safety and water quality i.e., testing of PFAS.



Exploiting interesting niches - Peptides

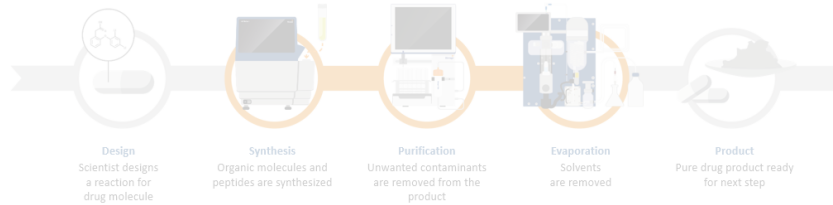
- Peptides are an **attractive modality** for developing therapeutics, due to their high specificity and low toxicity.
- The global peptide market is expected to rise with a **CAGR of 9.6% from 2022 to 2031***
- Recently **One out of five (20%) drugs** approved by FDA are **TIDES** (peptides or oligonucleotides), in addition to antibody-drug conjugates (ADCs) containing peptides.



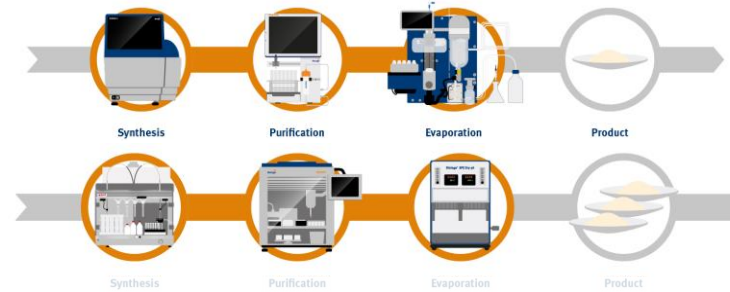
*Transparency Market Research report: Peptide Therapeutics Market – 2023-2031 (November 2023)

Our unique offer in the **Peptide Workflow**

SMALL MOLECULES



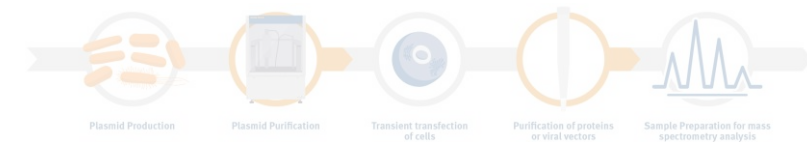
PEPTIDES



Sequential Peptide Synthesis Workflow

Parallel Peptide Synthesis Workflow

PLASMID & PROTEINS



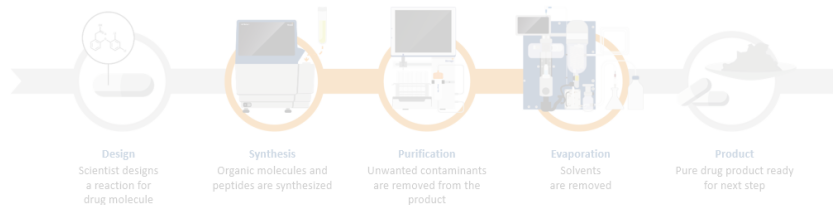
THERAPEUTIC OLIGONUCLEOTIDES



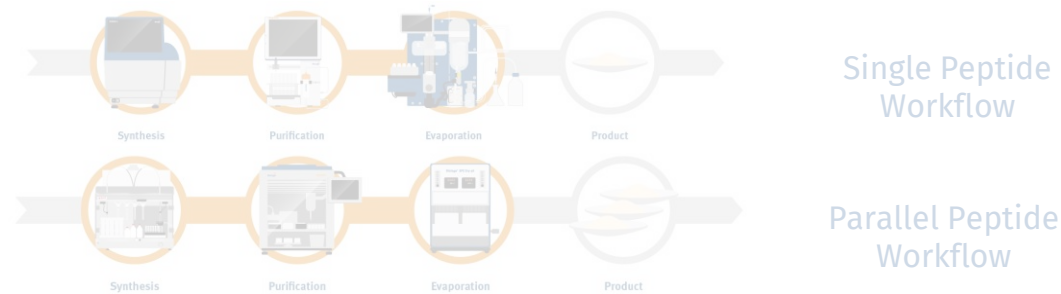
- **Uniquely positioned** in offering a sequential and parallel **peptide workflow**
- **Market leader with parallel synthesis** platform Syro and two solutions for purification enabled by our **automation platform Extrahera**
- Our automated high-throughput synthesis and parallel peptide purification strategies combined provide **a complete solution for rapid and environmentally friendly peptide library production.**

Disrupting the standard **Plasmid & Protein** Workflow

SMALL MOLECULES



PEPTIDES



PLASMID & PROTEINS



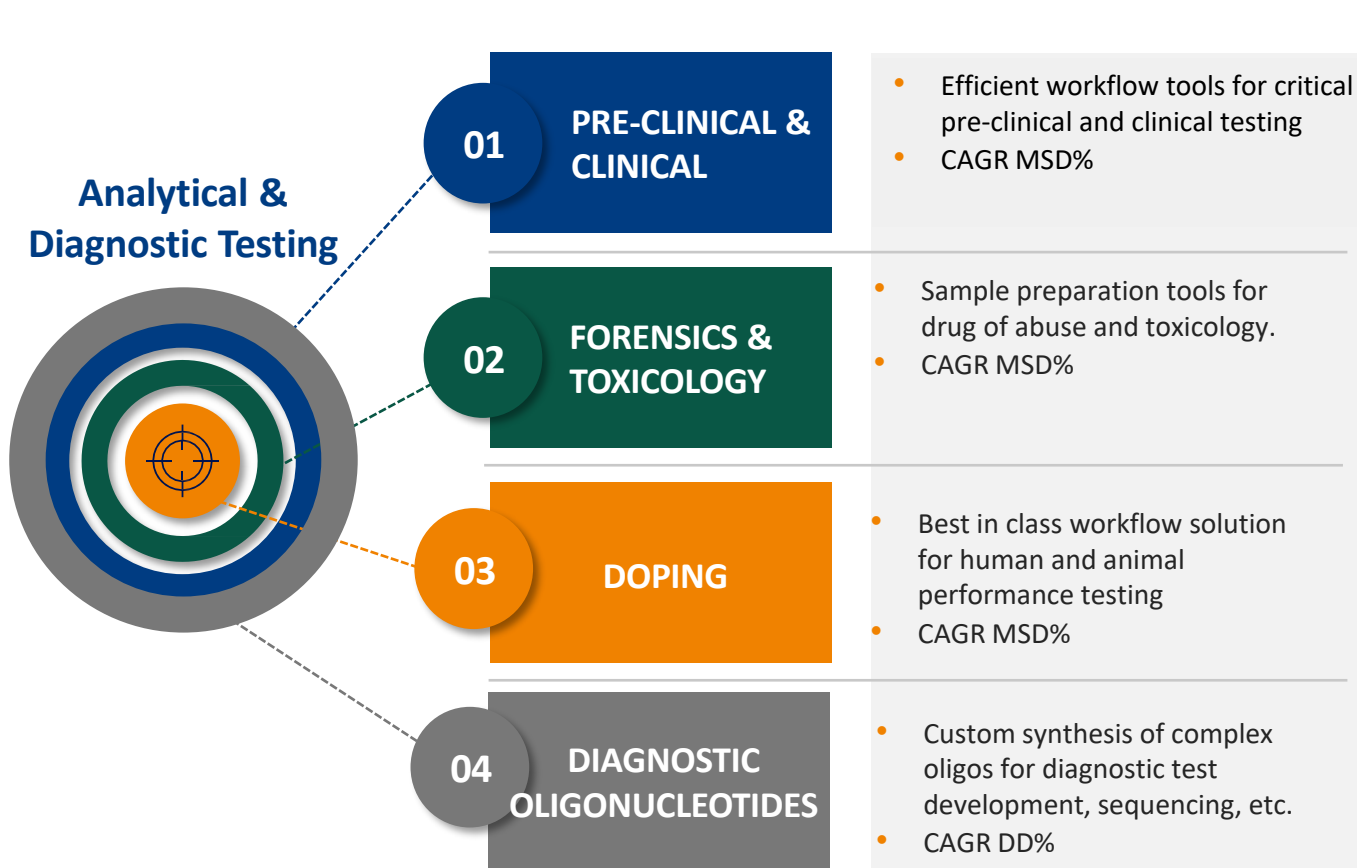
THERAPEUTIC OLIGONUCLEOTIDES



- We have automated (previously manual) plasmid purification
- Preparing to launch version II of our automated platform
- Our PhyTips portfolio is uniquely positioned for high throughput biomolecule purification
- Compatible with all major liquid handling robots
- Versatile; 1–96 samples at a time with a wide range of available resins
- Gentle purification with high purity and high recoveries

Analytical & Diagnostics Testing

Market Overview – Analytical & Diagnostic Testing



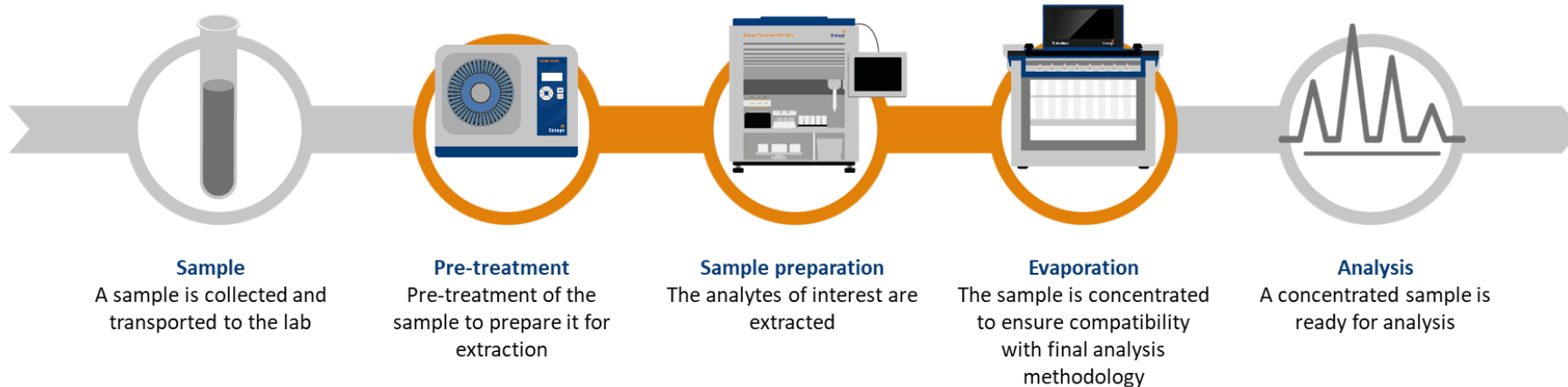
Market Size

23.4 BSEK

CAGR 7%
2023-2028

Workflow for Analytical and Diagnostics Testing

- Our Analytical Testing portfolio serves the **widest range of customers** across a wide variety of market segments and applications
- The portfolio of consumable products is by far the broadest to ensure optimization for a customer's discrete demands on commercially interesting applications along with common **workflow components**
- Whilst customer workflows are generally quite similar, their choice of extraction consumables may differ, so we offer our support in **developing the best method** in partnership with customers as needed – this differentiates us from our competition who practice “one solution fits all” approach



Market Leader in Doping – The best choice for the 2024 Olympic & Paralympic Games

The French Anti-Doping Laboratory (LADF) conducts examinations on blood and urine samples collected for anti-doping controls.

Biotage delivers a fully automated sample preparation process with 11 Biotage® Extrahera™ workstations, solid phase extraction consumables and evaporation.

“The automation brings relief for the staff, as well as increases quality and security by minimizing manual handling and potential errors.”

Magnus Ericsson, Director, LAFD



Following the Market Trends in Analytical Testing

Precision Medicine, Biopharmaceuticals and Advanced Treatments

A suite of solutions for customers engaged in the discovery, development, and manufacturing of precision medicines.



Miniaturization, Biomarker Analysis and Molecular Diagnostics

New advanced workflow solutions, such as for peptides, large molecules and oligonucleotides.



Water Supply, Environmental Awareness, Food Safety

Products to fulfill all the needs related to food safety and testing drinking water, i.e., testing of PFAS.



Hot Trends & Market Disruptors – Pre-Clinical and Analytical & Diagnostic Testing

Oligonucleotides

- Emergence of DDS tech (pandemic) and new therapeutic modalities (mRNA) must be monitored within the ADME framework of drug discovery,
- Targeting oligonucleotide therapeutic development and demand for prep solutions
- Mostly discovery stage projects, paired with Extrahera install base, e.g. vaccine (Orphan/Main) projects.

Disruptive Technology

Dual Flow Extraction (DFE)

- High-Throughput format for use on existing lab automation
- Utilize current sorbent technologies with new consumables platform
- Expands leverage into high volume environments with miniaturization and speed
- Diversifies product offering and expands portfolio scope
- Format flexibly: to be used on Extrahera & various HT-liquid handler platforms.

Following the **Market Trends in Analytical Testing**

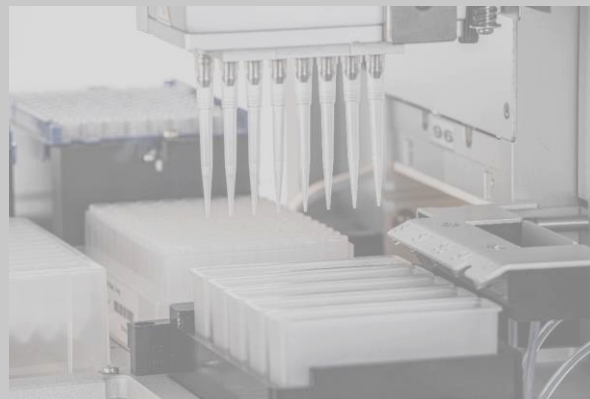
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Market Overview – Food, Water & Environmental Testing



PFAS Testing



Water

Release of Biotage “Medusa” targeting PFAS in water (drinking etc.) for current regulatory statues in NA (EPA) and EU (ISO)
Global initiative on “forever” chemicals, market is established and growing,



Food & Agriculture

PFAS impact in food supply emerging; focus direct application on EU Market with current Product Line
Opportunities for new consumables in combination with existing



Biological Fluids

Fast, effective clean-up for a wide range of PFAS compounds in biological fluids: serum, whole blood, plasma, urine

Effective Analysis of PFAS in Biological Fluids



- PFAS poses significant health risks upon human exposure and monitoring is expanding rapidly.
- The analysis of PFAS in biological fluids presents a significant challenge for researchers, as it requires precise quantitation at low levels.
- This task is further complicated by the complex nature of samples and the diverse structural characteristics of PFAS compounds.

[1] [Per- and Polyfluoroalkyl Substance Toxicity and Human Health Review: Current State of Knowledge and Strategies for Informing Future Research, 2020.](#)

[2] [Techniques to characterize PFAS burden in biological samples: Recent insights and remaining challenges, 2024.](#)

Astrea


Biotage®

Building a process chromatography company from a pharmaceutical company asset

- In 2020 Gamma, a Bioproduction roll-up vehicle of KKR acquired the chromatography assets of Prometic
- We started to play in the Bioproduction market with a well-developed knowledge of what customers are looking for and with the quality discipline of a pharma company
- Since 2021 we have achieved a revenue CAGR of 75% and increased margins by over 20 points. We are growing at rates way above normal market growth
- We're scaling the business infrastructure in line with our opportunity, driven by a motivated and cohesive work force
- Built a commercially focussed high performance R&D team who are bringing to market game-changing approaches to separation technology
- In 2023 Astrea Bioseparations was awarded 'The Best Places to Work in Biotech': of the 32 companies listed, one of only two came from the UK*

**Perspectives on Job Satisfaction in the Biopharmaceutical Ecosystem, BPI survey Dec 2022*

Background on Astrea

- The original focus under pharmaceutical ownership was the separation of blood products, although not high growth or a future development focus area for us, it is certainly a business which is attractive and we continue to benefit from
- Our offering today services the needs of various parts of the pharma-biotech market with a growing focus upon the Cell & Gene Therapy market
- We own a very small percent of the non-protein A resin (estimated at \$1.4bn)* and column market (estimated \$1.2bn)*, which both have a normalised growth rate of 7-8% - plenty of space to manoeuver and grow above this
- Our size and approach has enabled us to rapidly grow in the high value resin and column markets and given us a platform to now deploy our highly disruptive **AstreAdept**[®] technology
- We built a commercial team based on principals that we have learnt in the past and ensured that it joins up from Product Management at one end through to Production at the other

**See market size slides*

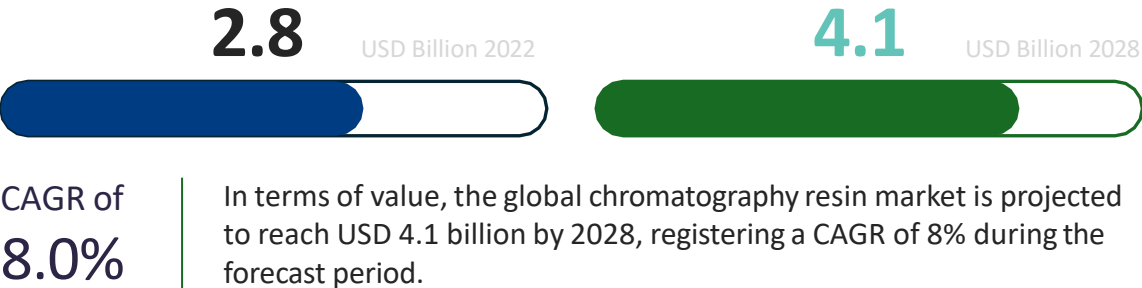
What Astrea brings to the market today

- We produce our own world class highly mono-dispersed agarose bead – PuraBead[®], in the UK and Canadian production facilities
- Produce high quality resin products in the UK, many of which exist in FDA-approved processes in
 - the production of drugs; currently, three of the top ten BioPharma conduct audits
- We manufacture and can pack columns of various sizes from lab-scale production through to large production scale in the US and UK
- Produce our initial Astre**Adept** offering in a pilot plant in the UK – full scale manufacture will be transferred to our clean-room manufacturing facility (Isle of Man)

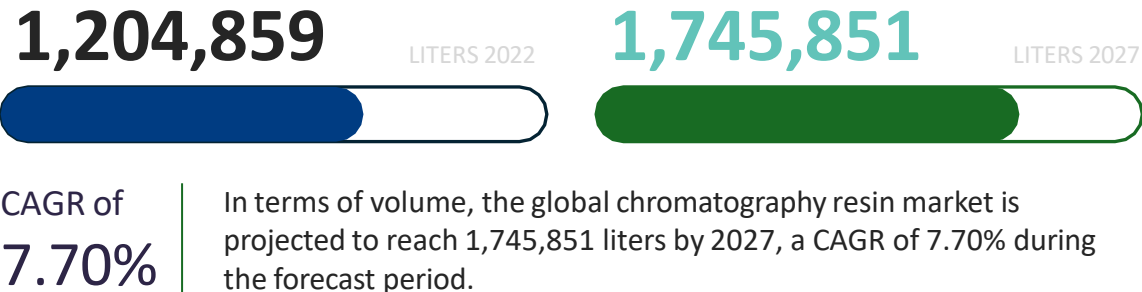
Resin Business

Global resin market estimated to be \$2.8 Bn (2023) and growing with an 8% CAGR. Roughly, half of the market is comprised of Non-Protein A resins

Global Chromatography Resin Market Value



Global Chromatography Resin Market Volume



MarketsandMarkets: Protein A Resin Market – Global Forecast to 2023-2030
 MarketsandMarkets: Chromatography Resin Market – Global Forecast to 2028
 MarketsandMarkets: Bioprocess Solutions Market Assessment Study Feb 2022
 ResearchandMarkets: Chromatography Resin Market – Global Forecast to 2028

Market Size Summaries (2023)

- Total Resin Market : **\$2.8 Bn**
- Protein A Resin Market : **\$1.4 Bn**
- Non-Protein A Resin Market : **\$1.4 Bn**

Protein A Resin Market, By type, 2018-2025 (USD Million)

Type	2018	2019	2020	2025	CAGR (2020-2025)
Recombinant Protein A	544.2	661.2	781.1	1,418.0	12.7%
Natrual Protein A	251.4	294.4	334.7	498.2	8.3%
Total	795.6	955.7	1,115.8	1,916.3	11.4%

Source: Annual Reports, SEC Filings, Investor Presentations, Press Releases, Journals, Articles, The Chromatographic Society (ChromSoc), Chinese American Chromatography Association (CACA), Chromatographic Society of India, European Society for Separation Science, Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), American Association for Laboratory Accreditation (A2LA), World Bank, National University of Singapore (NUS), ASTM International, European Medicines Agency (EMA), Expert Interviews, and MarketsandMarkets Analysis

PuraBead - enabling precise purification for your application

Predictability for customers:

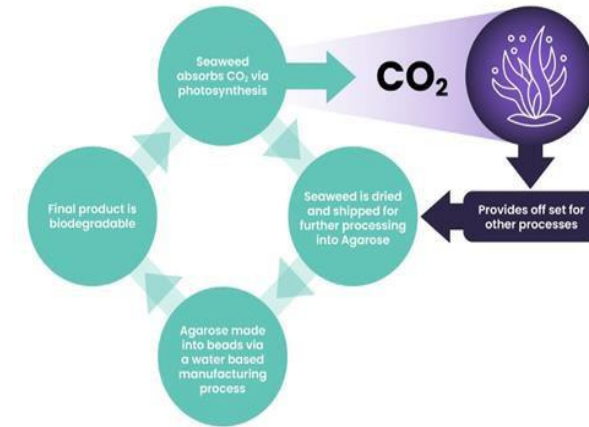
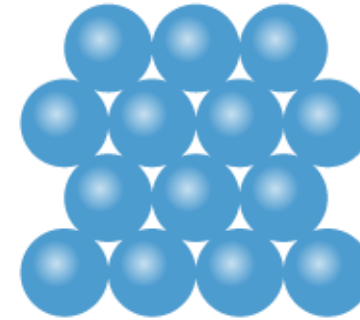
- Consistent bead size manufacture confers accurate flow performance
- Tuneable performance from size selection and synthetic ligand matrix coupling

Assured supply:

- Manufactured for over 20 yrs
- Multiple sites of manufacture
- Multiple raw material suppliers
- Batch sizes up to 1000 L

Environmentally-friendly:

- Derived from seaweed and our manufacturing process circumvents use of organic solvents and oil
- No microplastics



Adaptable

Used for multiple applications

Speed of delivery

Exceed customer lead time expectations from order > delivery

Sustainable

Competitor bead manufacture necessitates use of organic solvents

Manufacturing capabilities: resins

Manufacturing Lab / Cleanroom space totalling approximately >500 m²

Areas capable of being classified as ISO 14644 class 7 and 8 (Fed class 10,000 and 100,000) for the manufacture of adsorbents (includes surface bacterial and viable & non-viable air particle monitoring of the rooms)

Base bead manufacture in Isle of Man and Montreal

10 cleanroom Work bays, 3 additional non-cleanroom work bays for ligand manufacture and 2 large cleanroom suites for drying/column packing/Astre**Adept** assembly.

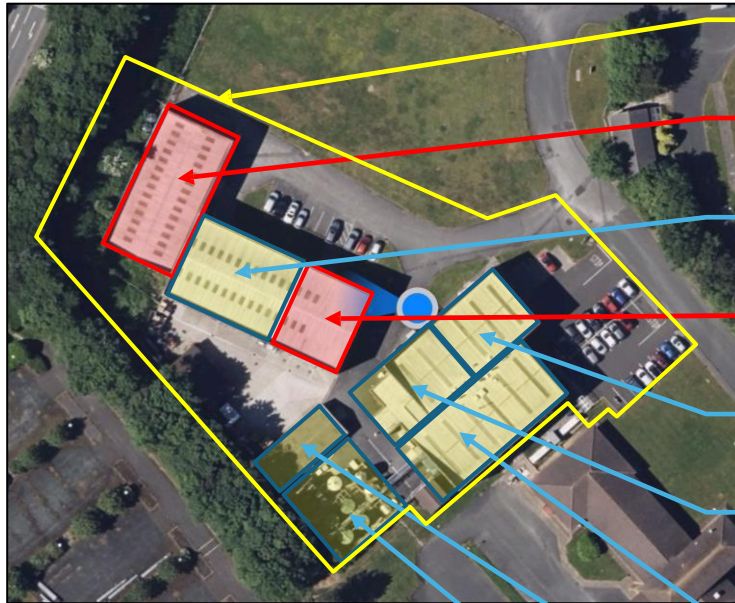
All flexible workspaces to cope with changing requirements

New plant adds 3-6 additional work bays Q2 2024

Batch sizes of 1 – 1,000 L



Resin & Base Bead Manufacturing – Isle of Man



Current Isle of Man Site

Unit 4 Building

Unit 2B Warehouse

Unit 2B Offices

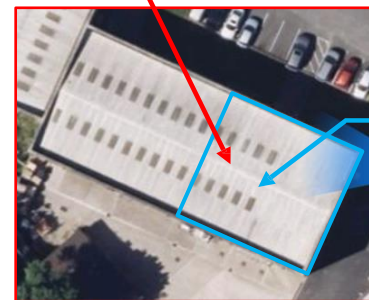
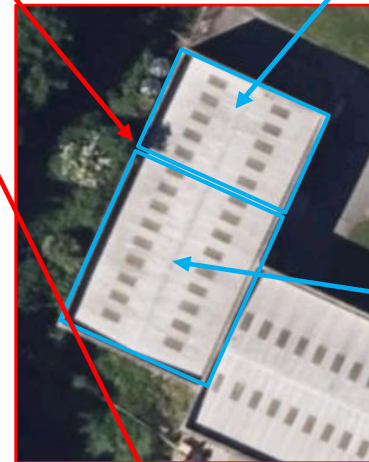
Unit 2 Reception & Offices

Unit 2A Manufacturing

Unit 1 Manufacturing

Solvent Storage

Effluent Plant



Expansion Projects

Bead Manufacturing (Ground & 1st Floor)

- 2 x New bead manufacturing equipment (inclusive of all ancillary equipment) to be installed during initial construction phase.
- 2 x Additional to be installed as part of phase 2 to meet continued growth.

Resin Manufacturing

- 3 x New downflow booths (inclusive of all ancillary equipment) to be installed during initial construction phase.
- 3 x Additional to be installed as part of phase 2 to meet continued growth.

Unit 2B Production Office (1st Floor)

- New and collaborative office space for production team
- New Staff room and additional toilet facilities for all
- New and inviting meeting spaces

Column Business

Global column market estimated to be \$1.2 Bn (2023) and growing with an 7% CAGR

COLUMNS	PRE-PACK	EMPTY
+6.7% CAGR	+5.9% CAGR	+6.9% CAGR
\$1.4 Bn	\$0.3 Bn	\$1.1 Bn

MarketsandMarkets Preparative and Process Chromatography Market – Global Forecasts to 2026, Published January 2022



Biotage



Capital Markets Day



Evolve[®] columns – solutions from process development to manufacture

Broad applications:

- Suitable for pilot and production scale
- Customizable pre-packed options available to match customer need(s)

Adaptability:

- High chemical and high salt tolerance broaden applications
- Refresh Kits provide flexibility to re-use our columns for other project(s)



Product synergy

Our columns, our resins

Speed of delivery

Lead time and supply chain
agility

Sustainable

Fully replaceable wetted flow
both enables column re-use

SNAP columns & packing service

Broad customer applicability:

- Suitable for pilot and production scale
- Customizable pre-packed options available to match customer need(s)

Versatility:

- Configurable column materials combined with customizable pre-packed resin – serve multiple applications
- Rapid manufacture and delivery



Adaptable

Suitable for multiple laboratory applications

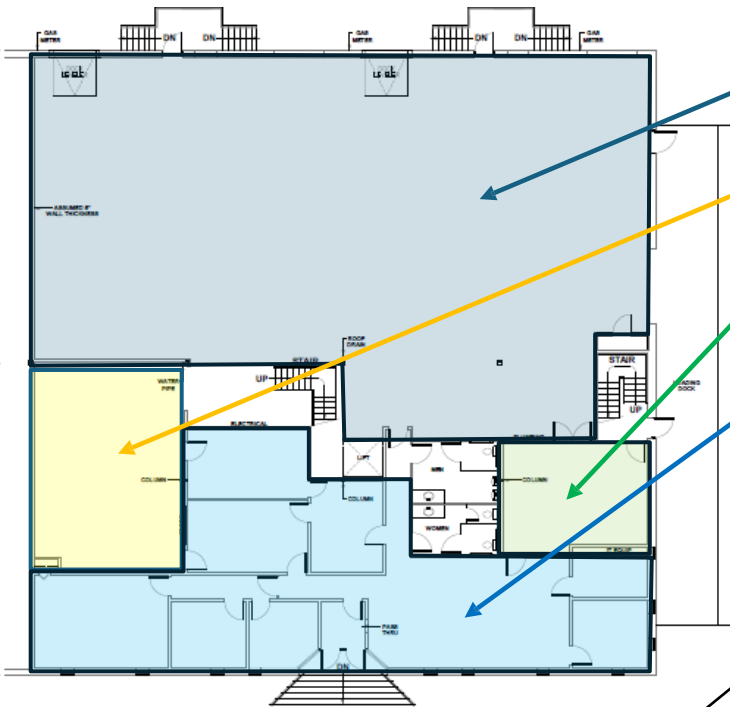
Product Synergy

Our columns, our resins

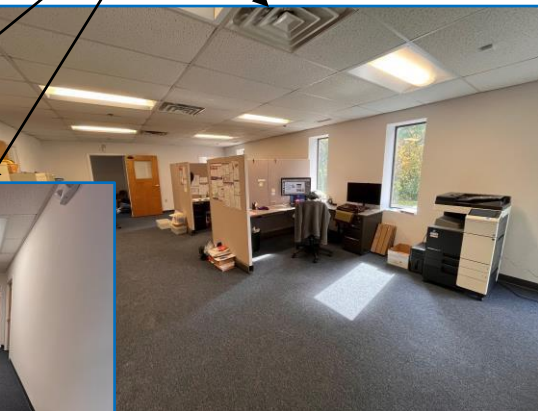
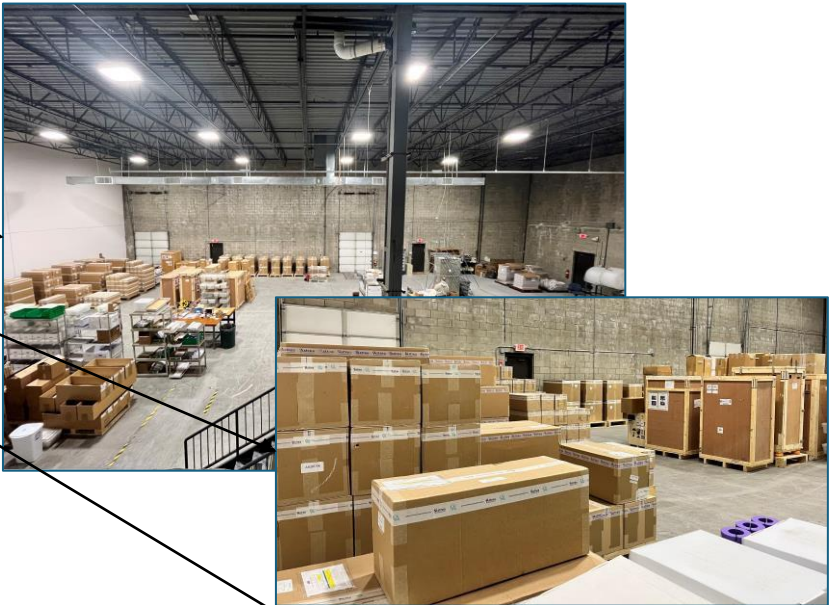
Unique

Patented SNAP design

Column Assembly & Packing – Canton, MA



- Warehouse
- Assembly & Shipping
- Temporary Laboratory
- Office & Admin Areas



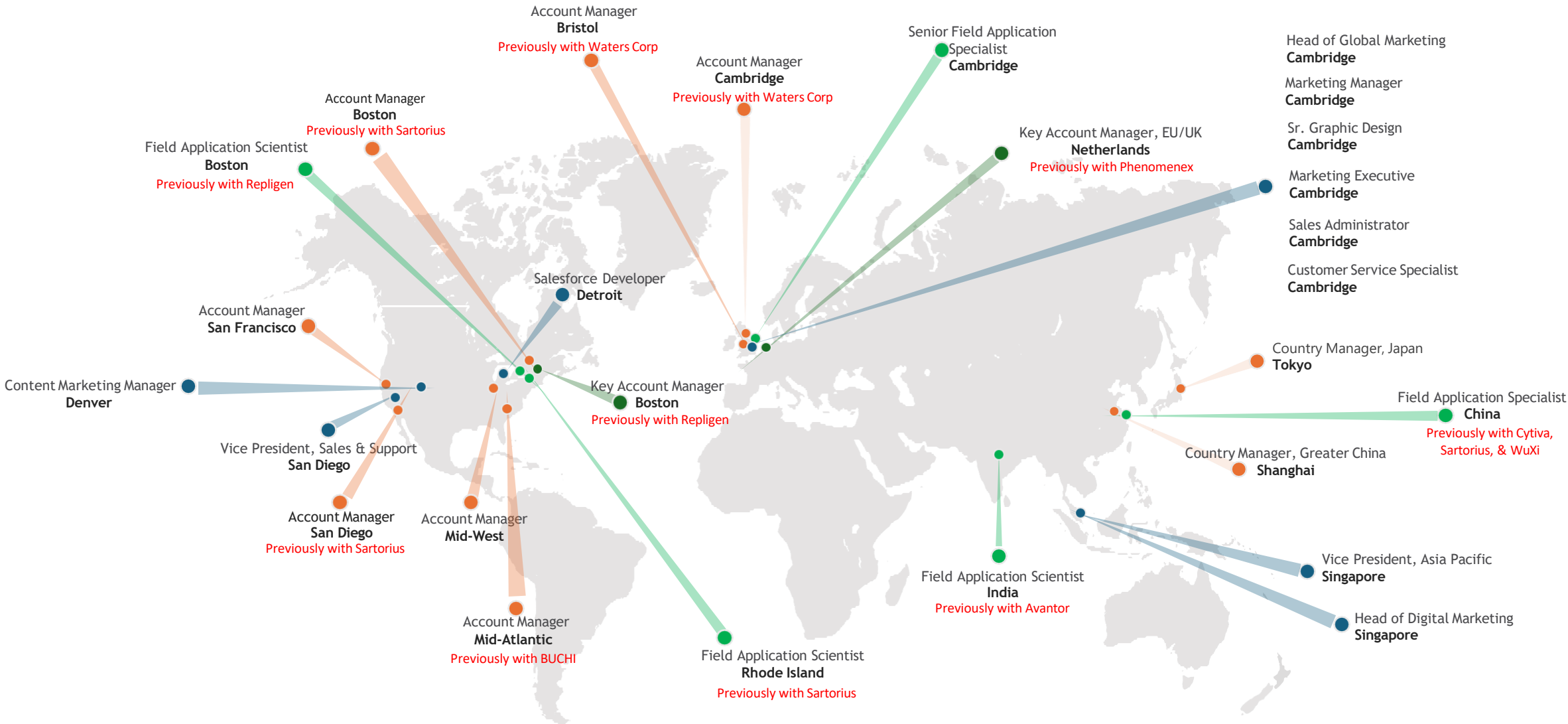
EXISTING FIRST FLOOR PLAN
1/8"=1'-0"

Commercial Approach

2021 Astrea Sales Team



2024 Large Molecule Direct Go-To-Market



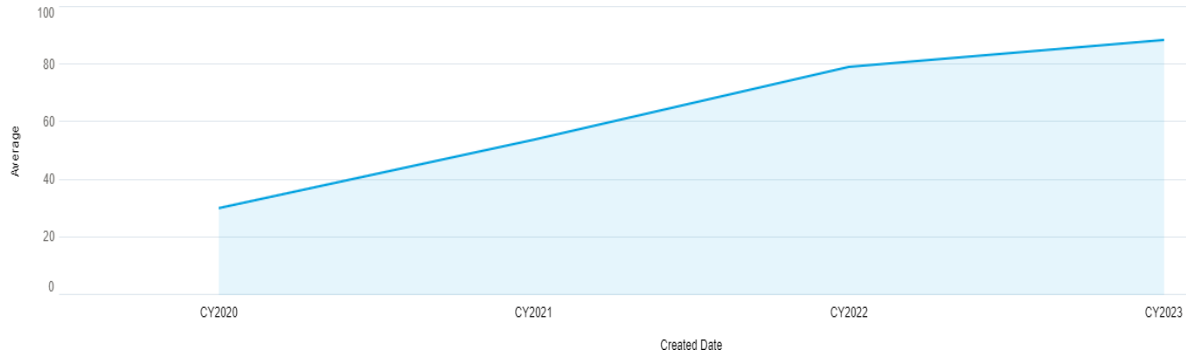
Commercial Trends

- Since 2020, Astrea's overall success is underpinned by drastic improvement in key leading indicators to revenue
- Astrea's commercial team has penetrated deeper into the market each year by initiating more sales conversations resulting in rapid opportunity prospect and attractive win conversion rates
- While Astrea has excelled in growing their overall deal size with existing customers, they have also been able to open the door to new customers at an aggressive rate

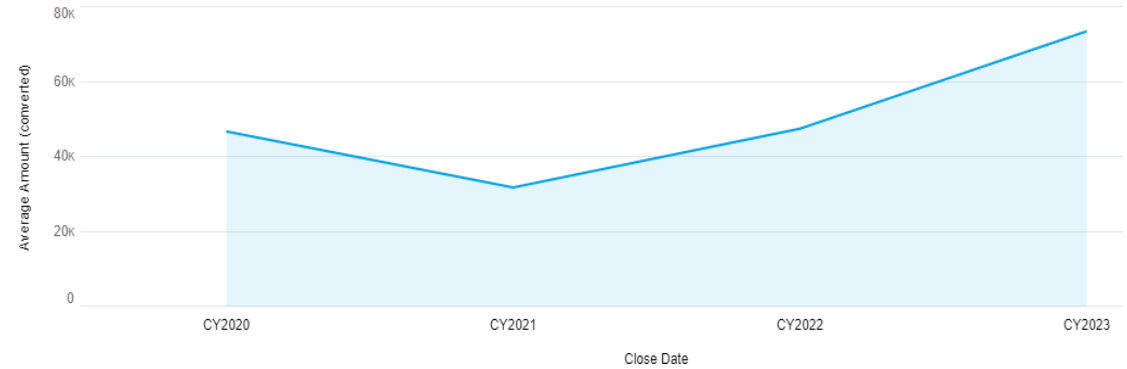
We're selling more products, to more customers, in less time

Commercial Trends

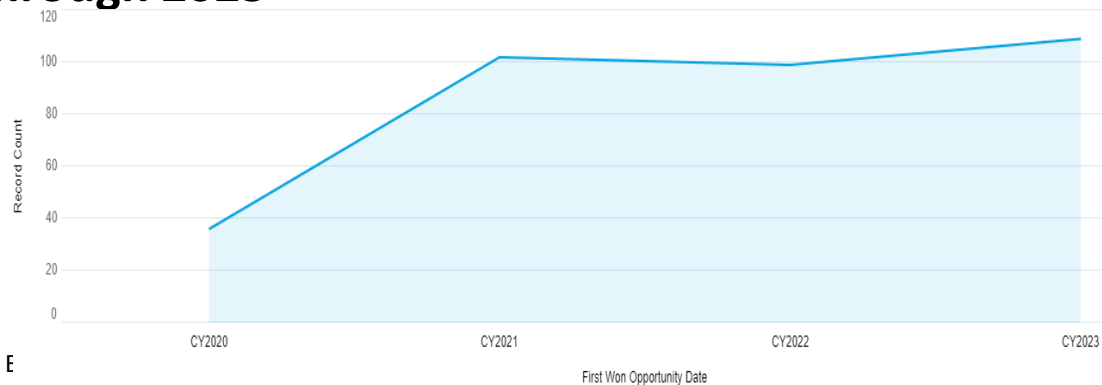
193% growth in average monthly new opportunities from 2020 to 2023



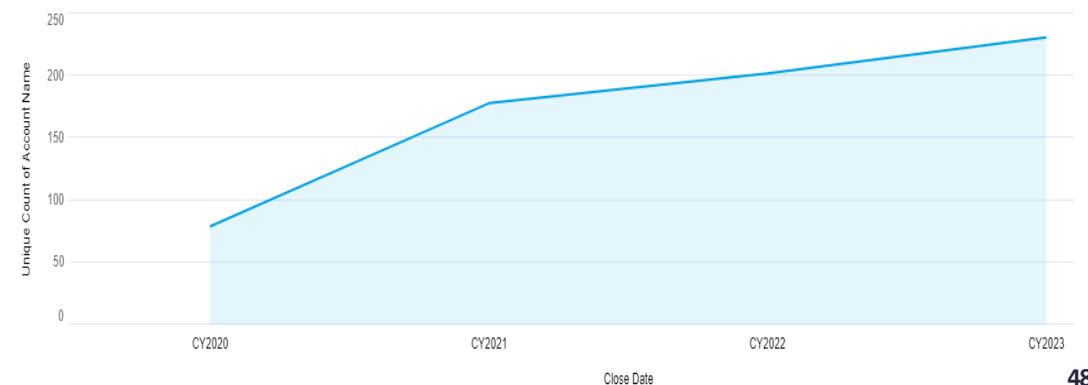
57% growth in average deal size from 2020 to 2023



183% growth in new customer acquisition from 2020 /2021; maintained the same level of acquisition through 2023



Number of unique customers tripled since 2020



R&D Innovation

The Future Of Large Biologics Separations **AstreAdept**

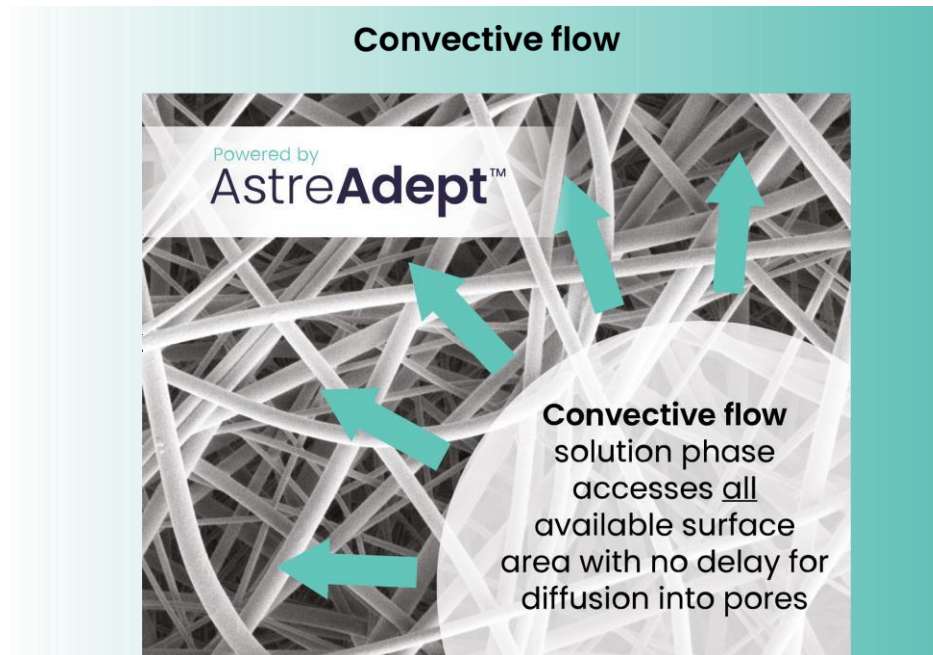
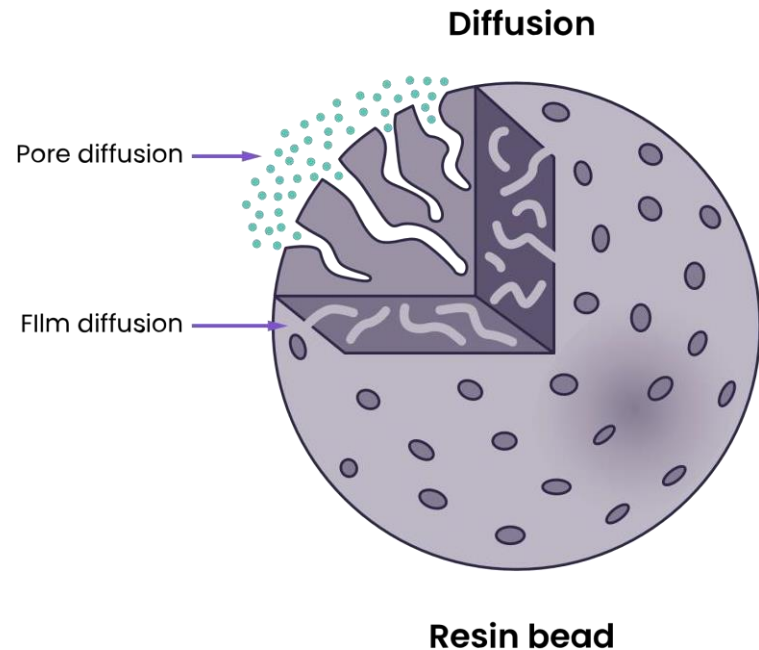
AstreAdept - a novel nanofiber material that addresses the challenges of purifying large and fragile modalities

Legacy adsorbents limitations:

- Reduced yield
- Long processing time
- Cost

AstreAdept technology:

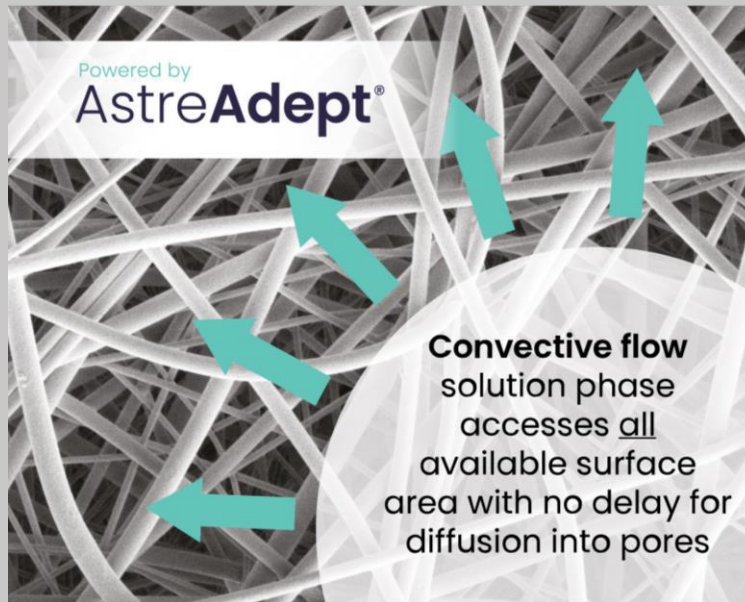
- Large surface area for binding sites
- Fast flow rate with low shear
- Reduced footprint



Purify larger modalities with higher viability for downstream use

AstreAdept - novel composite electrospun nanofiber adsorbent with expansive flowpath

Convective flow



- High Binding Capacity
- Fast Flow Rate
- Reduced Footprint

- Average mean flow path diameter 860 nm
- Giving excellent flow characteristics for ATMP targets

TARGET	DIAMETER (nm)
Lentivirus	80-100
Adenovirus	90-100
Exosomes	30-150
Adenoassociated Virus	~26
pDNA 4-5 kb	~100
pDNA 20 kb	275-286
pDNA 56 kb	313-342

Current processes rely on solutions for monoclonal antibodies that are not fit-for-purpose for purifying large and fragile cell and gene therapy modalities



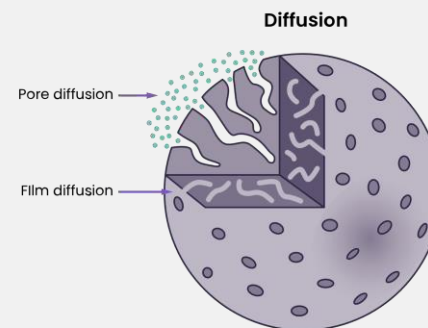
Key challenges in CGT manufacturing

- Low target production
- High target loss
- Low processing through-put
- Poor contamination removal
- Extended processing times

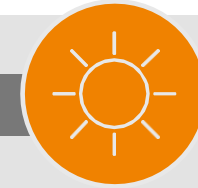


Legacy products are not fit for purpose

- Reduced yield
- Long processing time
- Cost



Capital Markets Day Resin bead

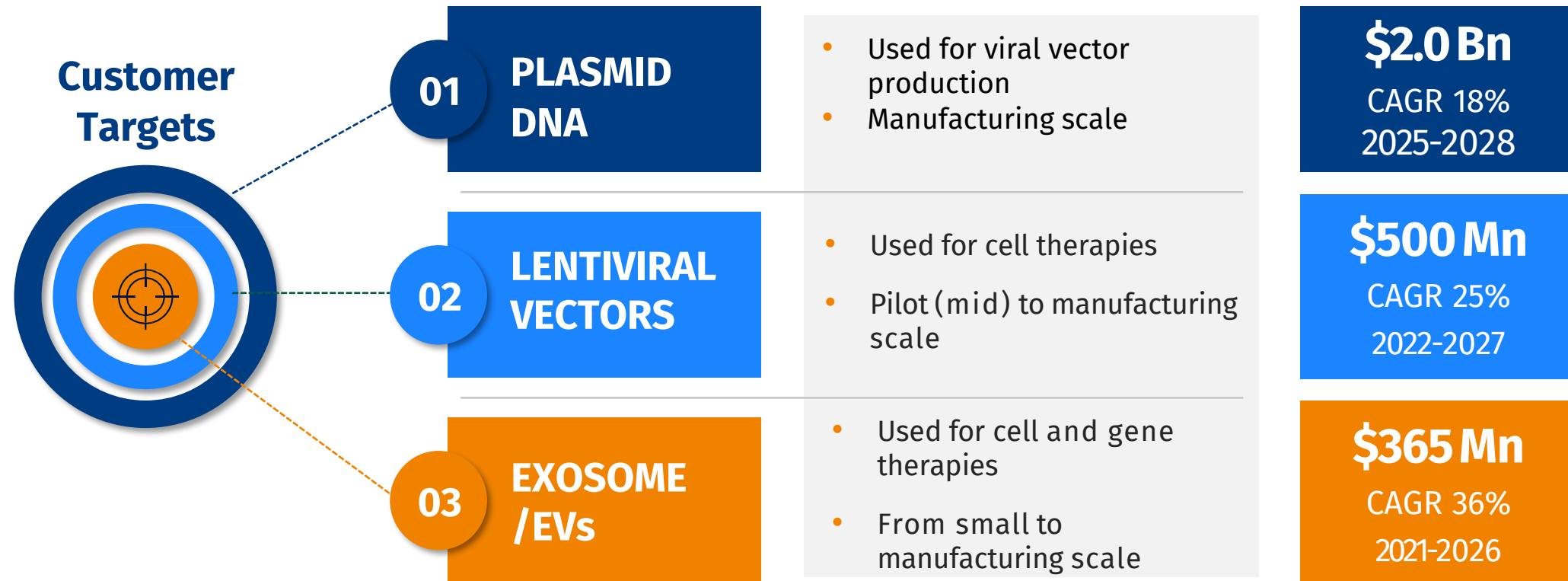


The solution

Success is dependent on accelerating Astre**Adept** product delivery to the rapidly growing CGT market, seizing new opportunities, and establishing Astre**Adept** as the new industry standard

Fiber Technology Addresses Needs in Fast-Growing Therapeutic Segments

Market Size



Small Molecules

Small Molecules

Comprehensive workflow solutions (synthesis, purification, evaporation) tailored for small drug molecules drug discovery. Purification solutions are available for the laboratory and for production.



Biotage® Initiator+



Biotage® Selekt

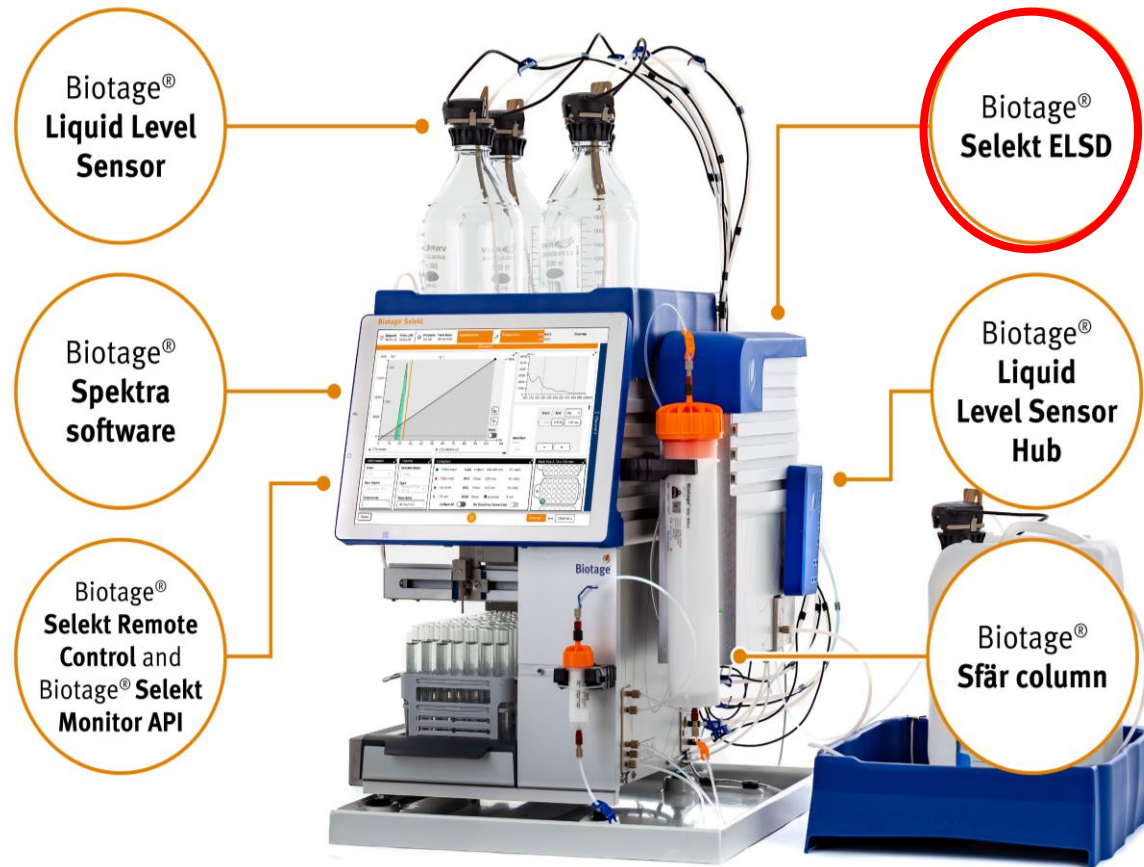


Biotage® V-10 Touch



Biotage® Flash 400

Biotage® Selekt

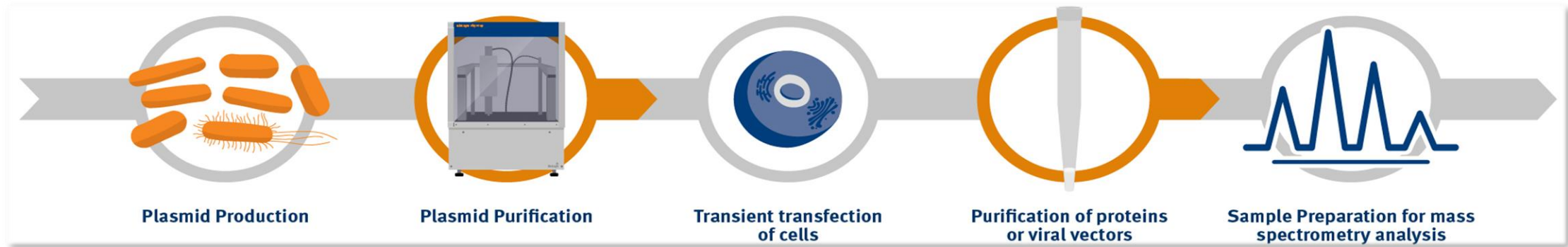


ELSD Launch is here

It will be used in combination with Biotage Selekt to support the customers to detect new type of compounds in their drug discovery phase.

Compounds that today is invisible to UV and thus impossible to separate using regular detection techniques

Biomolecules Workflow



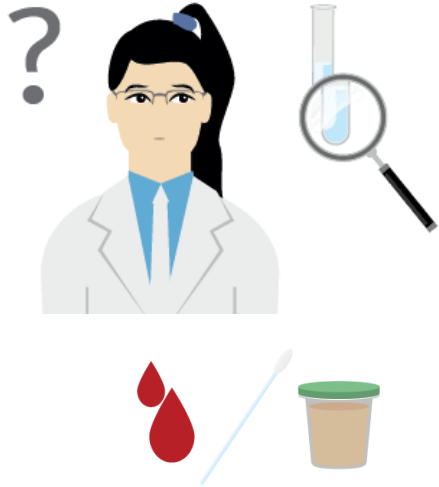
Biotage® Växel



Biotage® PhyPrep

- Unattended plasmid purification
- Flexible workflow scale
- Quality (yield, purity)
- Ability to use Astrea media it tips for "other" applications

Analytical and Diagnostic Workflow



Biotage® Lysera




Biotage® Extrahera



Biotage® TurboVap



 Biotage current offerings

SPE (Solid Phase Extraction) Technology

Step 1
Condition



Step 2
Equilibrate



Step 3
Load Sample





Step 4
Wash



Step 5
Elute



-  Interferences
-  Analyte of interest

Biotage® “Medusa” Automated Tube System



Why Choose the Automated Tube System?

- Removes analyst-to-analyst variation and maintains accuracy and precision.
- Allows users to walk away and perform other tasks in the laboratory.
- A robust system that processes many types of samples quickly, maximizing sample throughput for the most common samples.
- The system is designed specifically to minimize the use of per- or polyfluorinated materials in its construction.

Matrices

- Drinking Water
- Seawater
- Groundwater
- Runoff

Markets

- PFAS Testing
- Environmental
- Food
- Agricultural

Closing Comments

Biotage – A Differentiated Business

- ✓ **LARGE, HIGH GROWTH MARKETS WITH STRONG FUNDAMENTALS**
- ✓ **TRUE LEADERSHIP IN SEPARATIONS**
- ✓ **ATTRACTIVE RANGE OF TECHNOLOGY SOLUTIONS IN MAJOR MARKETS WORLDWIDE**
- ✓ **TOP-TIER FINANCIAL PERFORMANCE**
- ✓ **DIFFERENTIATED CUSTOMER COVERAGE**
- ✓ **PASSIONATE INNOVATORS**
- ✓ **EXCEPTIONAL M&A PLATFORM FOR LONG TERM GROWTH**