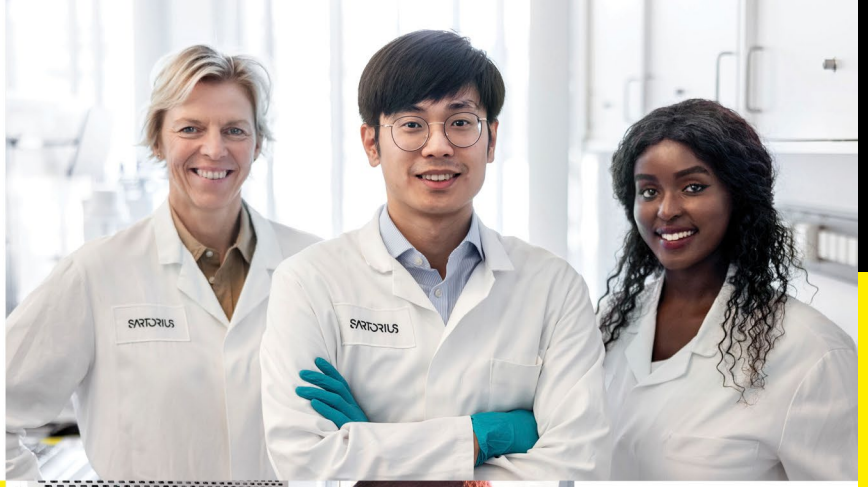

Simplifying Progress

Capital Markets Tutorial | November 2022:

Bioanalytics | Cell Culture Media | Chromatography

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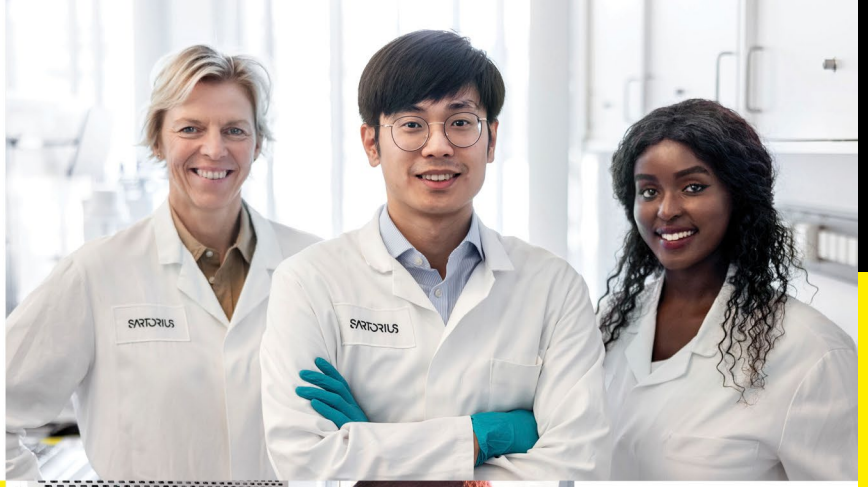


Simplifying Progress

Capital Markets Tutorial: Bioanalytics

Gerry Mackay, Fiona Coats

SARTORIUS

Lab Products & Services (LPS): premium supplier for Life Science research and quality control labs

~€720mn
Sales revenue 2021

17.6%
Sales CAGR[1] 2016-2021

26.1%
EBITDA margin[2] 2021

~50%
Recurring revenue

Portfolio includes lab instruments, consumables, software and services

Bioanalytics

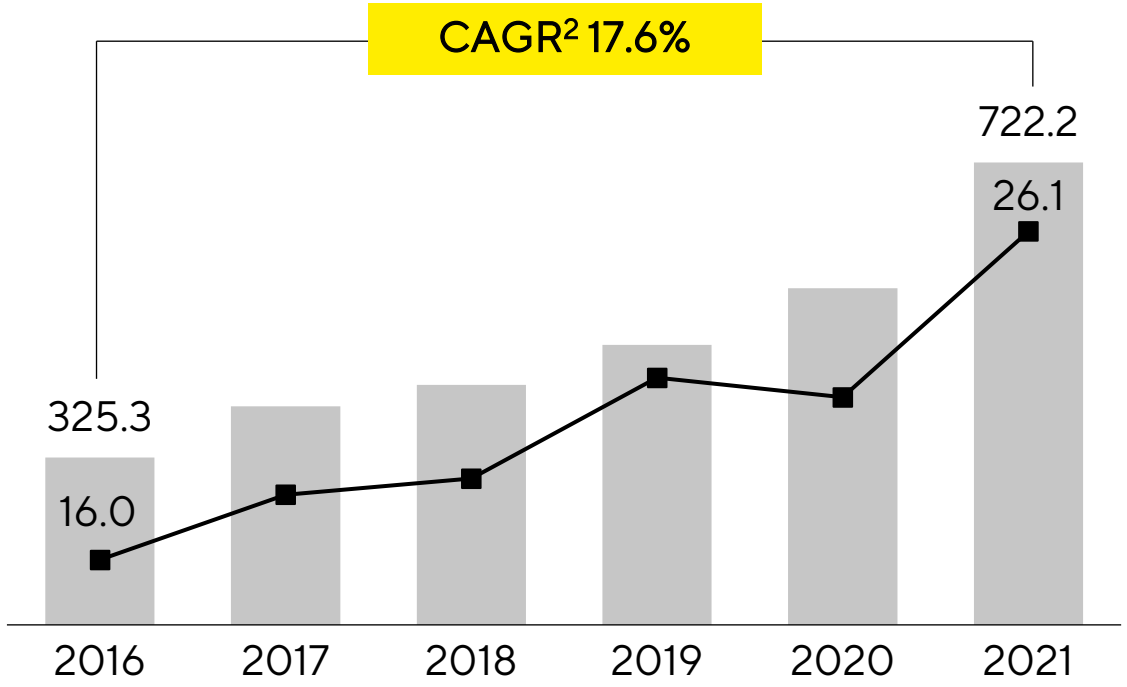
Lab instruments

Lab consumables

1 In constant currencies 2 Excluding extraordinary items

Continuous transition to a higher growth and profitability profile for LPS

LPS sales revenue, € in millions; EBITDA margin[1] in %



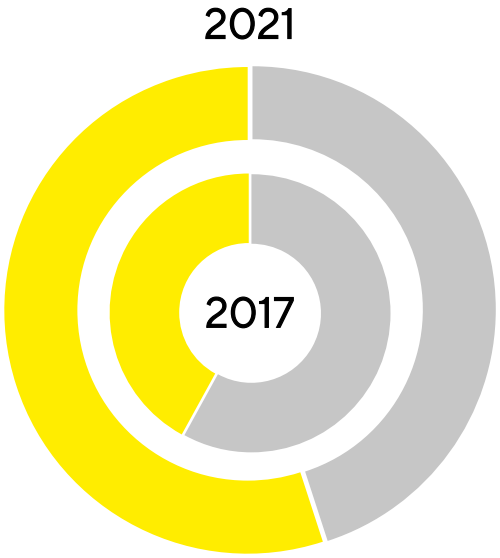
Growth drivers

- Sales & Marketing pivot to attractive segments and regions
- Attractive portfolio mix coupled with M&A
- Launch of innovative products
- Improved brand awareness

1 Excluding extraordinary items 2 In constant currencies

Focus on attractive Life Science market and more balanced regional profile

Sales revenue share by segment, 2021 vs. 2017

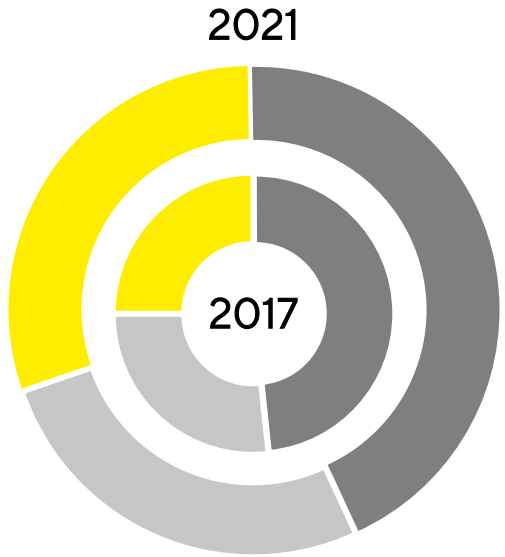


Life Science research
~55% (~42%)

of which Bioanalytics
>30pp (~14pp)

Applied research
~45% (~58%)

Sales revenue share by geography, 2021 vs. 2017



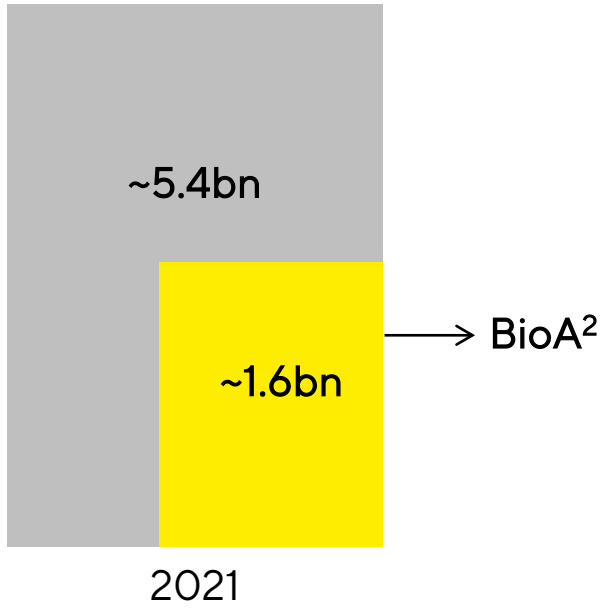
Americas
~32% (~25%)

Asia|Pacific
~29% (~27%)

EMEA
~39% (~48%)

Bioanalytics portfolio strengthens position in Life Science research market

Total addressable LSR[1] market, in €



Strategic considerations

- Focus on Bioanalytics to address faster growing customer and product segments
- LSR market growing mid-to-high single digit while Bioanalytics in the teens
- Higher synergies between LPS and BPS[3] in LSR than in AR[4]

Growth drivers

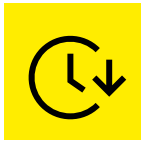
- Rich pipeline of novel molecules and proliferation of biosimilars
- Digitalization across all processes, from discovery to supply
- AI and big data continue to transform the industry

1 Life Science research 2 Bioanalytics 3 Bioprocessing Solutions 4 Applied research; Source: Various market and analyst reports and company financials

Bioanalytical tools address pain points of Life Science customers

Developing a new drug is costly, time-consuming, and involves a high risk of failure

~€500m
average costs of drug discovery



>4-5 years
time required for R&D and testing

Only 1 out of 10,000
molecules make it to the market

Bioanalytics improve R&D productivity by...

...digitizing and automating key steps in molecule and cell line development

...providing customers with valuable data and analytics to make better decisions earlier in the process

...decreasing likelihood of late-stage failure, shortening time-to-clinic, and achieving better results faster

Time-to-market is key for customers: being first-in-class is more important than being best-in-class

Source: Association of the British Pharmaceutical Industry; Duxin Sun et al.: Why 90% of clinical drug development fails and how to improve it?, July 2022

SARTORIUS

Powerful solutions to enhance molecule and cell line development processes

Target ID | validation
Incucyte SX5

Library screening
iQue3

Lead selection
CellCelector

Lead optimization
Octet

Molecule development

Cell line development

Gene cloning & initial selection
Octet

Clone selection
CellCelector

Confirmatory analysis
Octet

Cultivation & media optimization
Ambr 15

Evaluation & characterization
iQue3

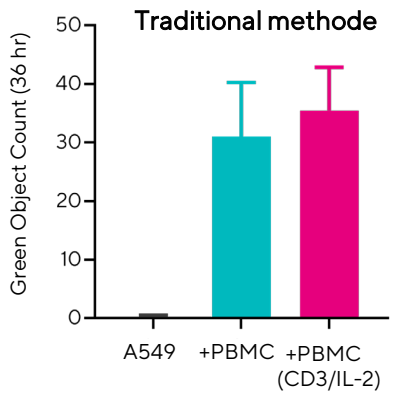
Case study: Incucyte reveals biology over time for deeper insights

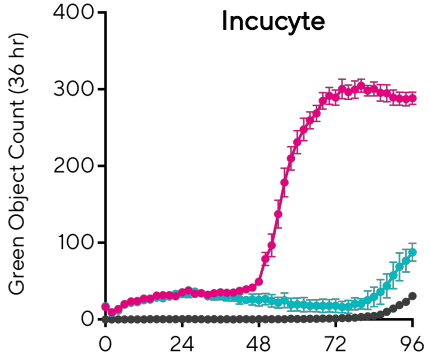
Incucyte allows for deeper understanding of cellular behavior to accelerate drug discovery and research

- **More information about drug candidates**
  Time-dependent effects of experimental treatments in living cell models to reduce late-stage drug failures
- **More relevant testing**
  Leverage advanced cell models to recapitulate physiological and pathological conditions
- **Boost productivity**
  Parallelize experiments with 6x more capacity than traditional approaches

Target ID | validation → Library screening → Lead optimization → Candidate characterization

Molecule development





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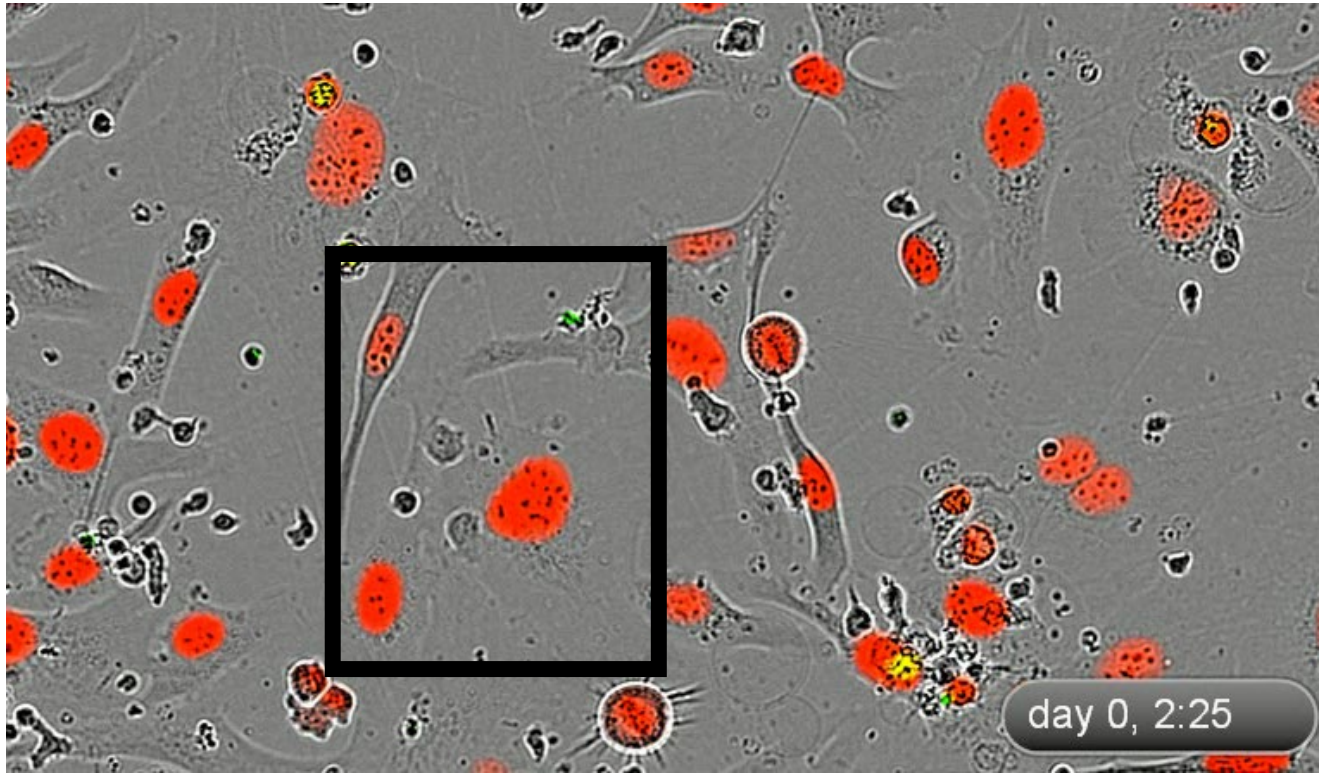
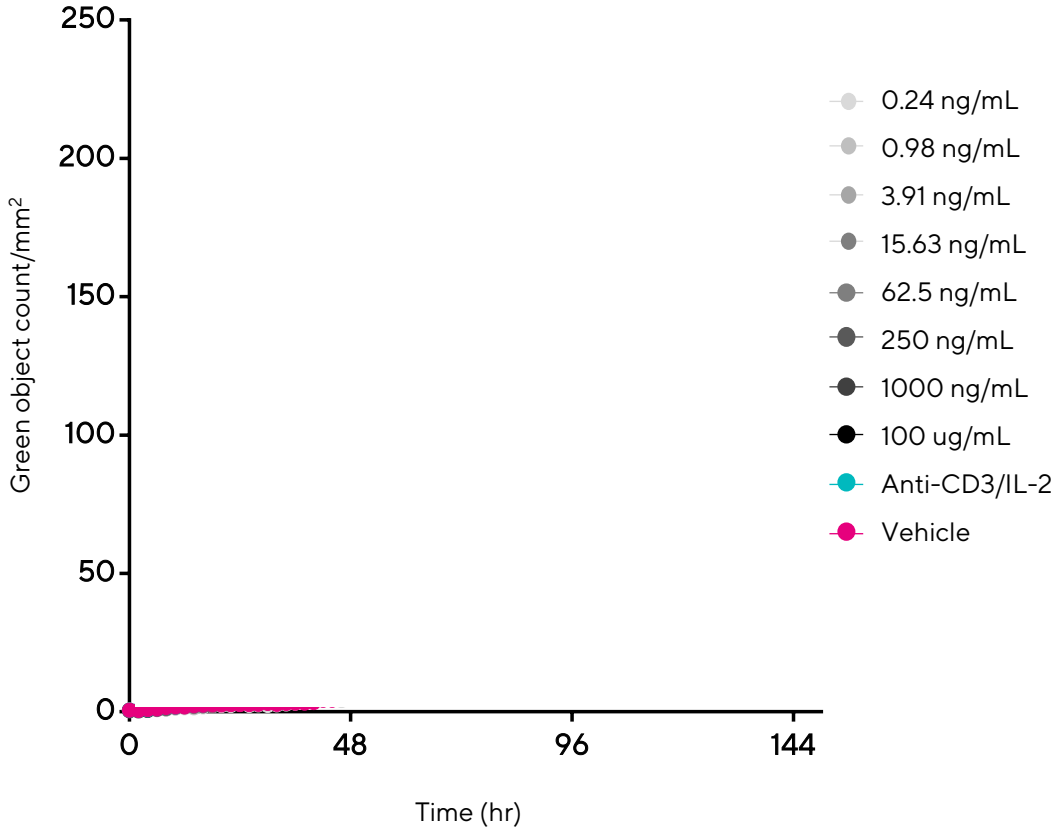
Dive deeper into accurate and reproducible results with Incucyte

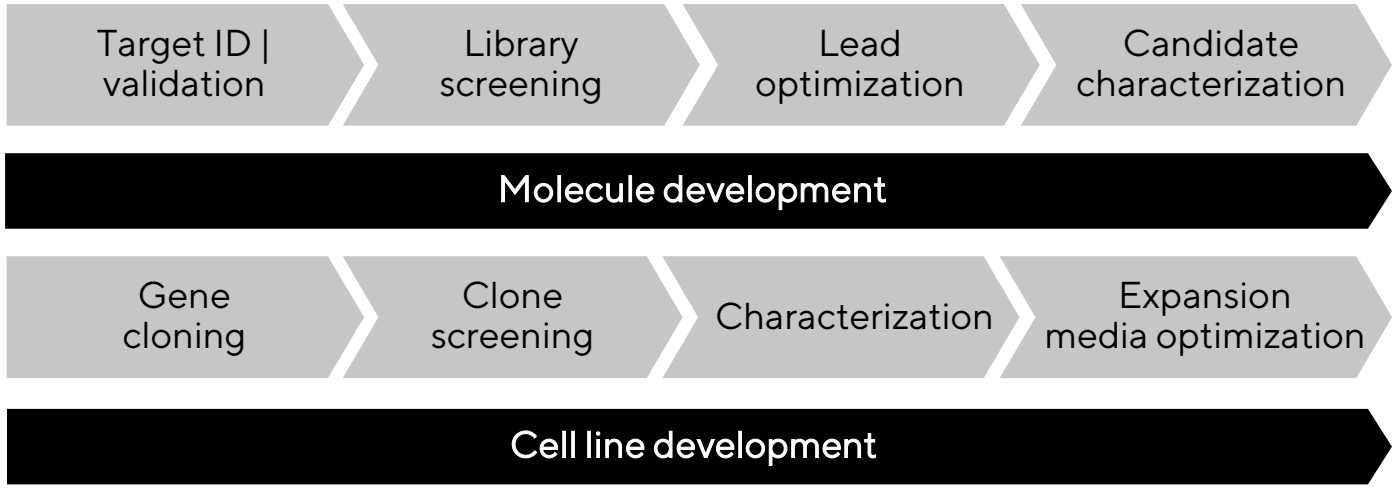




Case study: Octet reduces screening time and increases throughput

Octet BLI solutions reduce titer and CQA screening time during cell line development by up to 99% vs. traditional methods

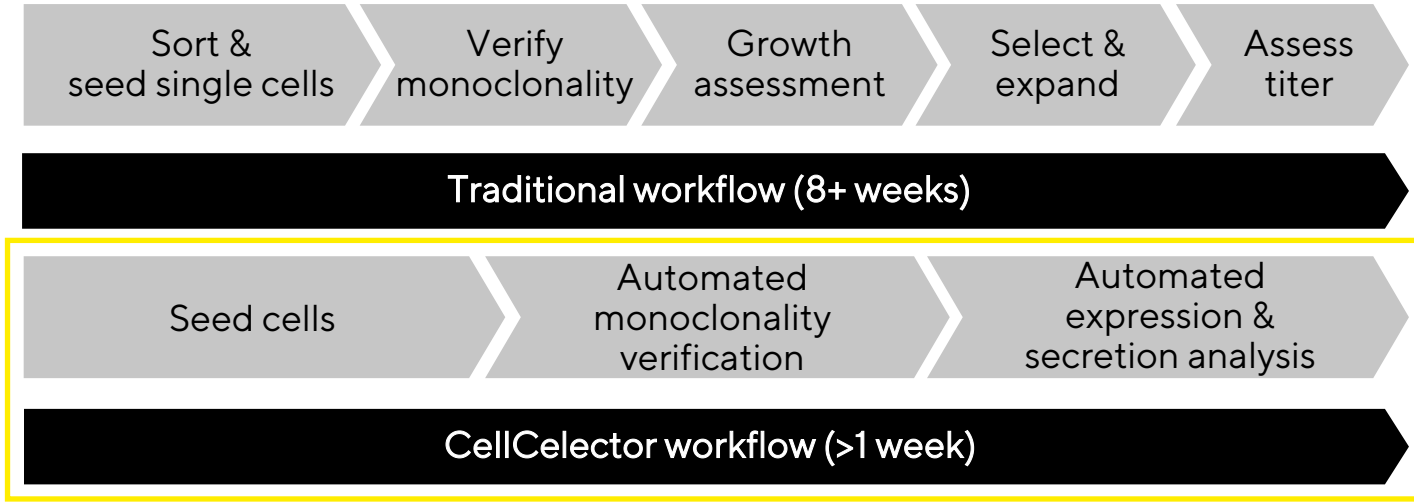
- **Fast time to results**
  Protein titer measurements in <2 minutes
- **Rapid, detailed information**
  on molecular interactions
- **Simplified characterization of workflows**
  Robust, easy-to-use platform



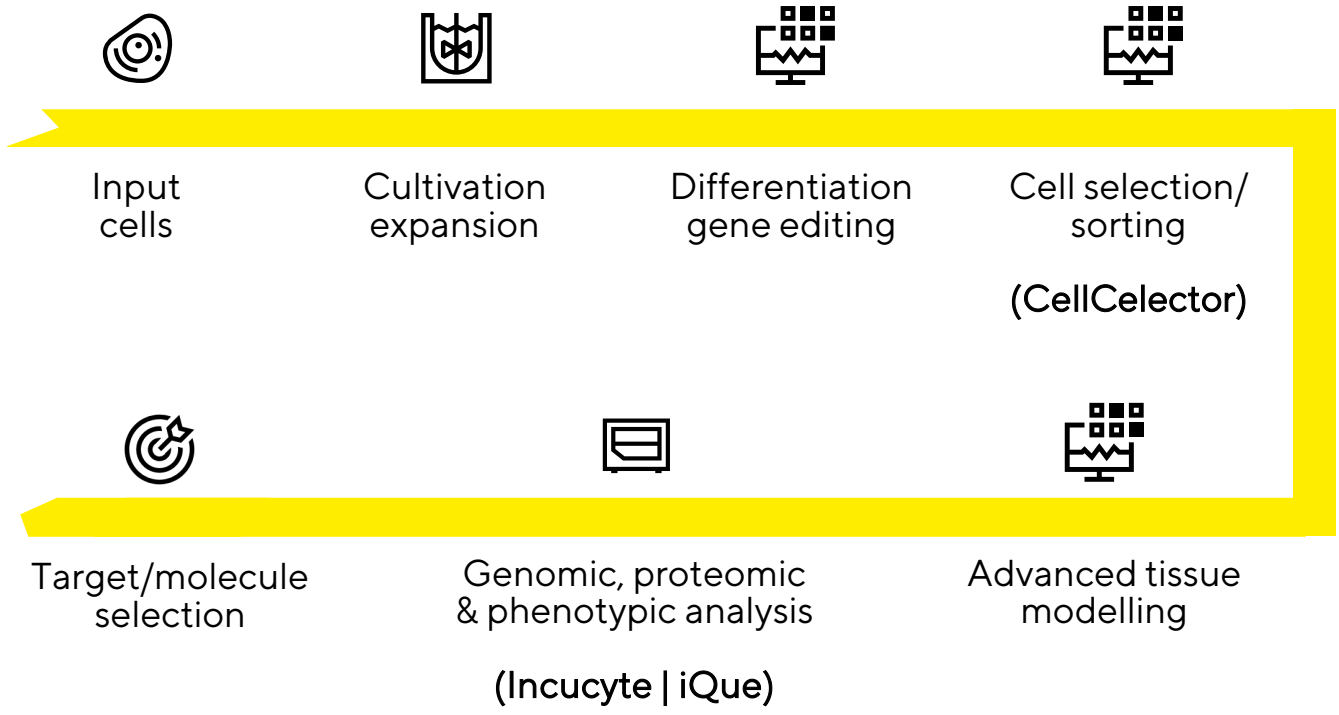
Case study: CellCelector picks best cells reducing time for clone selection

CellCelector integrated workflow saves 5+ weeks, compared to traditional method

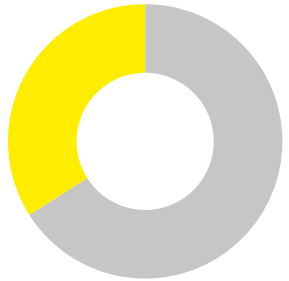
- Technology for automated analysis, selection and isolation of cells
- Monoclonality verification and single cell productivity measurement on a single platform
- Workflow is saving time and costs; superior performance compared to competing methods



Also in Advanced Therapies workflow, Bioanalytics instruments are increasingly used



Advanced Therapies customers[1] (2021)



Advanced Therapies market

Expected CAGR 2021-2026[2]

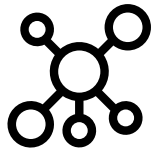
~30%

1 BioA solution: Products by top ~100 Advanced Therapies customers; 2 Global data, analyst reports

Leverage strong positioning in Bioanalytics to continuously gain share in strongly growing Life Science market

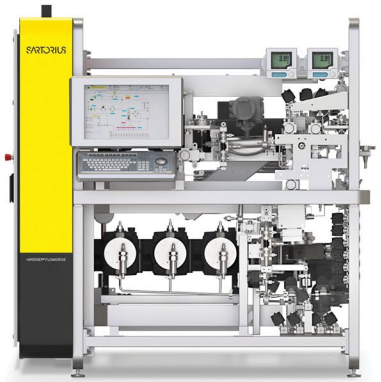
Continue expansion in North America and establish strong footprint in China

Provide workflow solutions for advanced cell models & new drug modalities (e.g. CGT)



Capitalize on strong software competence

Expand share of recurring revenue



Simplifying Progress

Capital Markets Tutorial: Cell Culture Media & Chromatography

René Fáber, Hugo de Wit, Michaela Pischke

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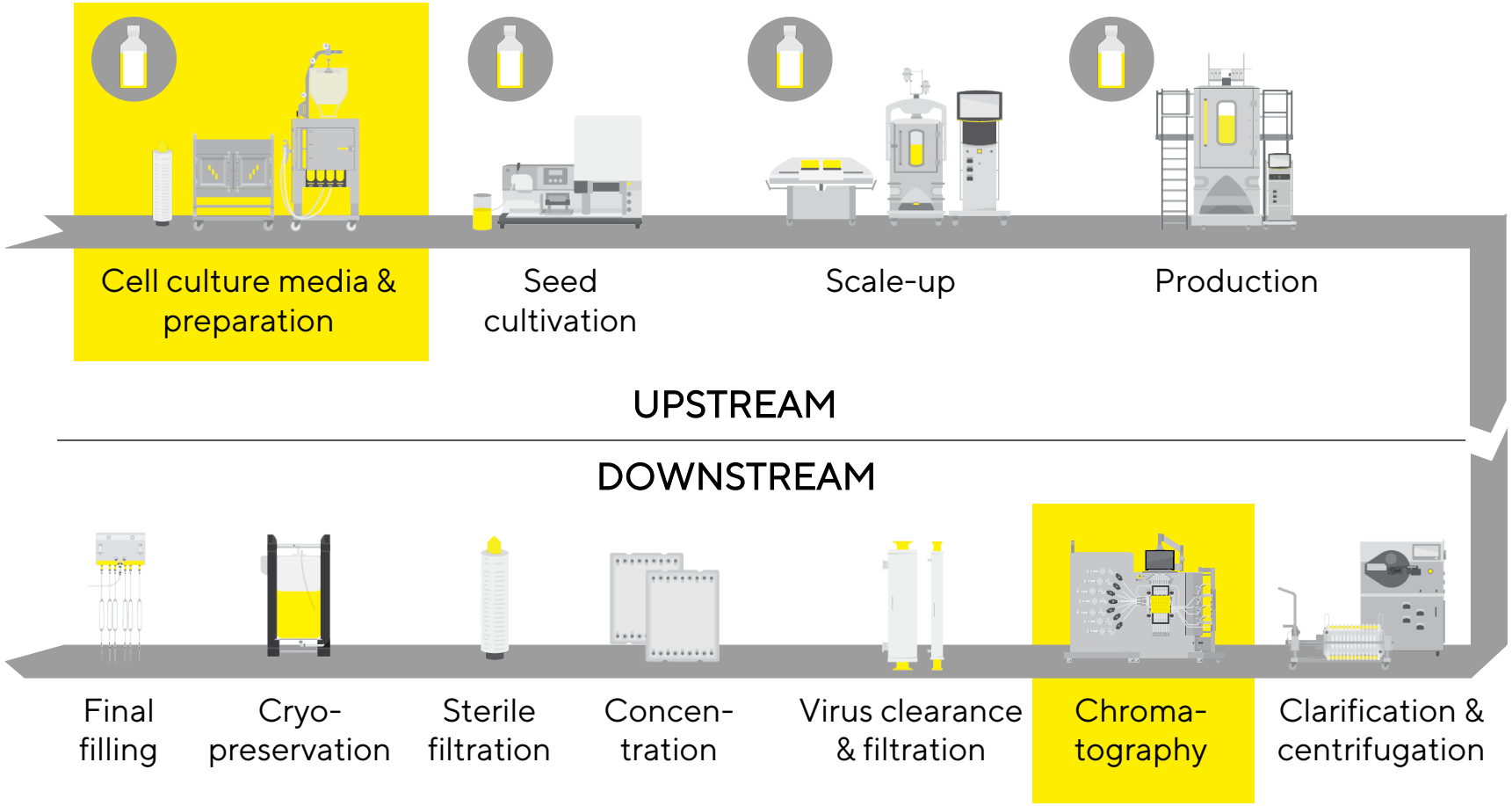
Bioprocess Solutions (BPS): solution provider for biomanufacturing

~€2.73bn
Sales revenue 2021

36.2%
EBITDA margin[1] 2021

~75%
Recurring revenues

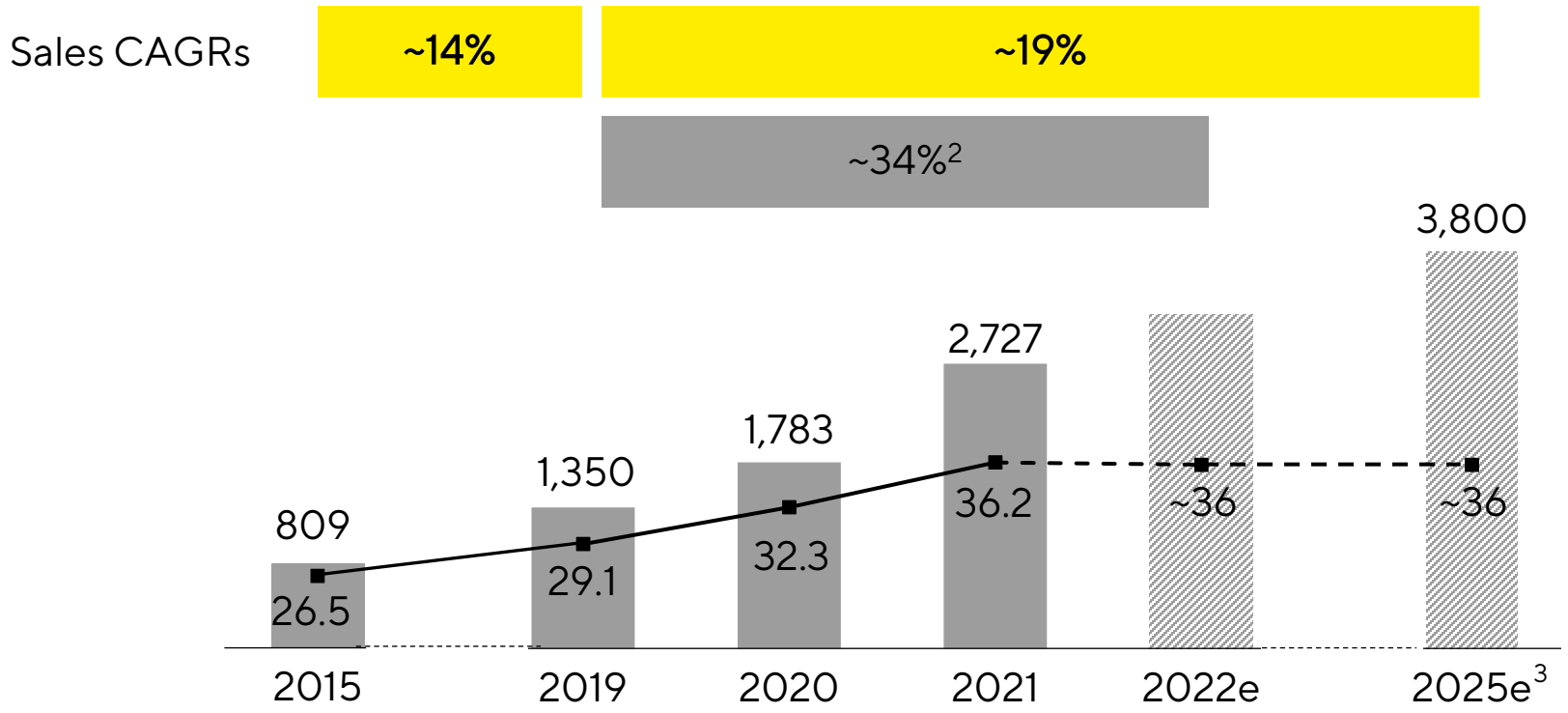
~90%
Sales share biopharma



1 Excluding extraordinary items

Running ahead of initial mid-term plan in terms of sales growth and margin expansion

BPS sales revenue, € in millions; EBITDA margin in %[1]



- Mid-term targets were increased in 01/ 2021 (sales) and 01/2022 (margin)
- 2019-2022 extraordinary growth driven by Corona vaccines and some customers' changed ordering pattern
- Normalization ongoing since mid of 2022
- Strong fundamental market dynamics unchanged

1 Excluding extraordinary items 2 Based on mid-point guidance 2022 3 Based on mid-term targets up to 2025: published in 2018, updated in 01/ 2021 (sales) and 01/2022 (margin)

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M&A strategy: adding innovation, increasing share of wallet

Enhancing relevance for Life Science customers

Broadening cell culture media and components portfolio

Expansion of downstream portfolio

Strengthening of positioning in Advanced Therapies

Biological Industries

CellGenix

Xell

Albumedix

WaterSep BioSeparations

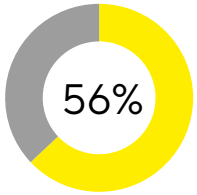
BIA Separations

Chromatography businesses from DHR[1] and Novasep

1 Danaher Corporation

Addressing customer needs with a strong, differentiated portfolio

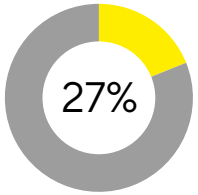
Protein-based therapies



- mAbs
- Bi-/Multi-specifics
- Bioconjugates | ADCs
- Recombinant proteins and peptides
- Protein-based vaccines

~10%

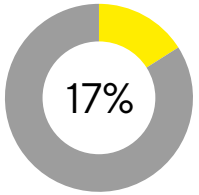
Viral-based therapies



- Viral vectors for gene therapy
- Virus and viral vector vaccines
- Oncolytic viruses
- Novel modalities (e.g., mRNA, DNA, Exosomes)

~20%

Advanced therapies



- Cell therapy (e.g., iPSC, MSC)
- Gene-modified cell therapy (CAR-T)

~30%

Unmet needs

Process intensification	Yields	Robust manufacturing

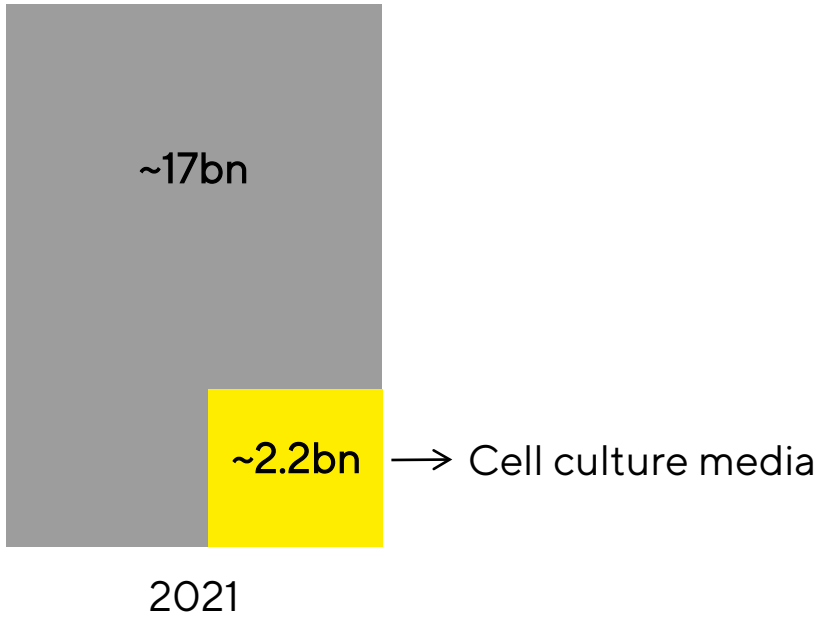
Share of molecules in R&D pipeline; source: GlobalData, November 2022

Expected market CAGR 2021-2026, Sartorius estimates

SARTORIUS

Cell culture media (CCM) business: well positioned in an attractive market

Total addressable BPS market[1], in €



Strategic considerations

- Leverage the leading position in upstream processes
- Media are specified into the process and part of the approval and therefore difficult to replace
- Recurring revenue with attractive gross margins

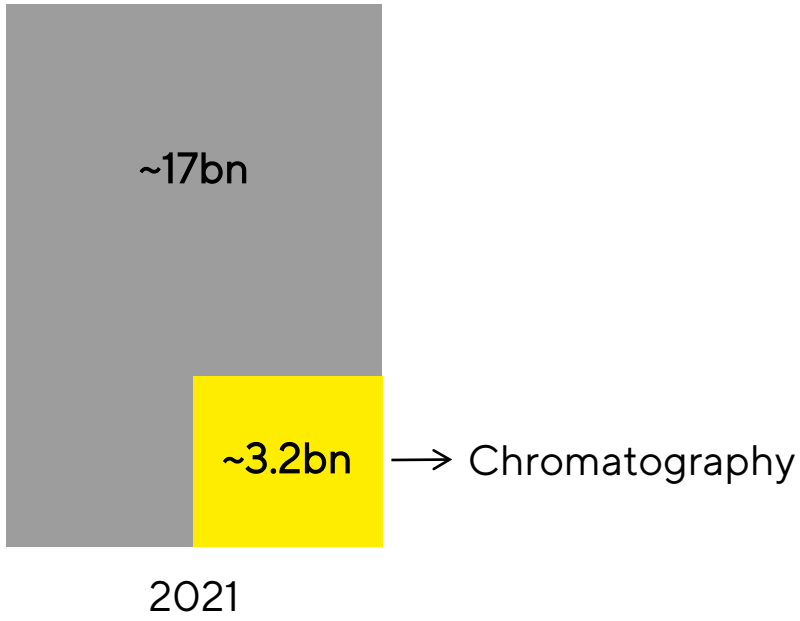
Growth drivers

- Media market expected to grow in line with the modalities of the biopharma market
- Focus on faster growing Advanced Therapies
- Demand increases as drug candidates move through clinical phases, continuous demand after approval

1 Sources: GlobalData, Citeline, Alliance for Regenerative Medicine and BCC Research; Sartorius estimates

Chromatography business: recent acquisitions significantly strengthened BPS' positioning

Total addressable BPS market[1], in €



Strategic considerations

- Chromatography an essential step in purification of biopharmaceuticals
- Sartorius' purification offering broadened through "classical" plus innovative assets
- Focus on intensified chromatography and cell & gene therapies

Growth drivers

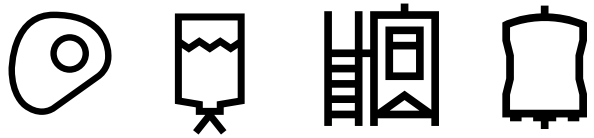
- Healthy and strong pipelines of novel modalities
- Growing need for process intensification in mAbs and biosimilars
- Strong positioning of monolith and membrane technologies & strategic portfolio fit for intensified market

1 Sources: GlobalData, Citeline, Alliance for Regenerative Medicine and BCC Research; Sartorius estimates

Extensive synergies in CCM's sales and manufacturing network

Cross-selling synergies within existing portfolio

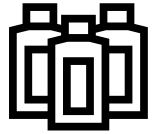
- CHO cell line
- Cell line development
- Bioreactors
- Fluid Management
- BIA monoliths



Synergies within cell culture media operations

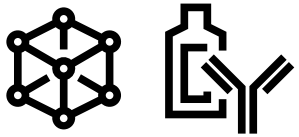
Biological Industries

manufactures own portfolio and media portfolio of CellGenix



CellGenix

supplies growth factors and cytokines as raw material for BI[1] media production

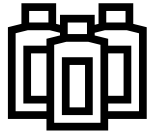


Albumedix

supplies and produces critical components for BI[1] and CellGenix media

Xell

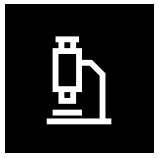
produces HEK and CHO portfolio



1 Biological Industries

CCM trend #1: regulatory requirements for GMP grade critical raw materials

When new modalities start to enter the clinic phases, there is a need for regulated quality products and regulatory support to obtain approval



Research / discovery / development phase

- Use RUO[1] media and additives
- No need for regulatory advice/support
- Focus on efficacy getting the treatment to work

Clinical trials / market supply phase

- Need for FFM[2]/cGMP[3] media and additives, DMF[4]
- Need for regulatory understanding to file and obtain approval for trials and market
- Beside efficacy focus on safety and quality

1 Research Use Only 2 Fit for Manufacturing use 3 current Good Manufacturing Practice 4 Drug Master File

SARTORIUS

Case study CellGenix: regulatory know-how and state-of-the-art products support accelerated approval

MSDS

Sartorius "Off-the-shelf" portfolio to satisfy customers' needs and help them overcome their challenges

Customer situation

- Customer develop new therapies in their laboratories for many years
- Regulatory requirements ask for safety and quality assurance beside efficacy before allowing clinical trials
- This means switching materials, repeating pre-clinical studies or delayed start of trials to comply with regulations

Sartorius solutions

- Enable safe, efficient and consistent manufacturing of cell & gene therapies and accelerated market approval
- Regulatory support for specific customer requests and/or respective regulatory agency (EMA[1], FDA[2], PMDA[3])

1 European Medicines Agency 2 Food and Drug Administration (U.S.) 3 Pharmaceuticals and Medical Devices Agency (Japan)

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CCM trend #2: new platforms for safe and reliable raw materials

Innovative technology platforms enable the replacement of animal and human sources for critical raw materials, increasing safety, quality and affordability

Customers' challenges using animal / human serum

- Contaminates from human/animal source
- Batch to batch variability
- Limited supply

Sartorius solution

- Safe recombinant source
- Defined quality, proven batch-to-batch consistency and controlled manufacturing
- Scalable supply

Case study Albumedix: enabling safer, scalable access to high quality and affordable critical raw material

Sartorius enables regulatory trend towards recombinant critical raw materials

Customer situation

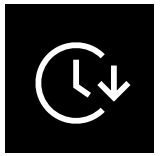
- Current commercial manufacturing for a vaccine developed decades ago
- Design and use of suboptimal manufacturing processes, using animal and human sourced material with risks of process carry-overs, batch to batch variability and high cost

Sartorius solutions

- Next-generation, serum-free, highly purified vaccine manufactured using serum-free media and recombinant rather than serum-derived excipients
- Result: vaccines stay therapeutically effective, safer, more affordable and stable, enabling distribution in more than 100 countries, including most of Asia and Africa

CCM trend #3: scaling-up solutions for new modalities

Especially for new modalities there is limited process know-how and scalability available, which is required for an efficient and economic market entry



New modalities process development

- Focus on getting the process to work in the lab
- Limited experience and manufacturing expertise available

New modalities manufacturing

- Focus moves to Cost of Goods
- Need for access to scalable process solutions
- Need for access to production know-how

Case study Biological Industries: combination of innovative products with scalable manufacturing solutions enables fast access to market

Sartorius combines media know-how and supply with proven solutions to freeze and thaw liquids in bags

Customer situation

- Started to use stem cell media selected on performance
- Supply of frozen media in bottles
- Larger quantity of media to be supplied in bags, once scale-up starts and moves to manufacturing scale
- Challenge to freeze/thaw bags in a consistent manner
- Solving the problems can be time-consuming and delay clinical trials

Sartorius solutions

- Celsius system, specifically designed for the controlled thawing and freezing of the bags containing liquid media
- Result: fast, scalable, robust solution, that supports short timelines towards clinical production at high and stable quality

Chromatography trend #1: from batch production to intensified processing

Batch

- Limited productivity
- Larger production footprint
- Higher resin consumption

Intensified processing

- 10x higher productivity
- 3x less footprint and CAPEX
- Higher product quality, less batch-to-batch variability

Levels of intensification in downstream processing

Level 0

Standard batch standalone unit operation

Level 1

Intensified, standalone unit operation: increases the individual step productivity; less resin usage; improved buffer management

Level 2

Connected process: at least two process steps; subsequent steps start before first step is finished; software orchestration is beneficial

Level 3

Continuous process: highly integrated connected process; steady-state flow; software orchestration is a must; long running times; closed processing

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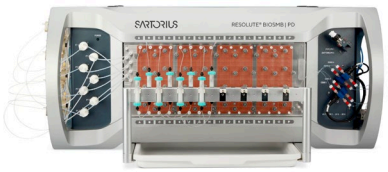
Sartorius' solutions for intensified processing

Process intensification leads to >10-fold higher productivity & saves up to 30% cost in clinical process



PD

Process 80/250

Resolute BioSMB

- Continuous chromatography systems
- Single-use flowpath
- Scalable

Pilot

Resolute BioSC

- One system combines up to 3 process steps
- Low footprint

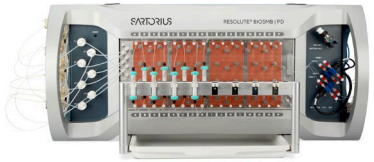
Case study large pharma: BioSMB improves footprint, productivity and flexibility at reduced costs

Before: single-column batch Protein A chromatography

- Column diameter: 40 cm – larger footprint and requires a lot of storage space
- Resin volume: 20L – Protein A one of the most expensive steps in downstream
- Specific productivity: 16g/L/h

Conversion to single-use multi-column Protein A step

- Resin volume: 3.85L, 80% reduction of protein A resin
- Reduction in overall cost
- Specific productivity: 56g/L/H



Chromatography trend #2: from multi-use, resin-packed columns to single-use chromatography devices

Resins

- Column packing & cleaning validation
- Large equipment footprint
- Less applicable to large biomolecules like viral vectors or plasmids

Membranes **Monoliths**

- High processing speed, high productivity
- High purification performance for new drug modalities
- Plug & play: ready-to-use formats, single use

Sartorius' solutions for high performance chromatography in novel and demanding applications

Sartobind Rapid A

- Single-use alternative to Protein A resins
- 20x higher productivity
- >30% cost reduction in clinical manufacturing

CIMmultus

- Unique high performance technology
- Specifically optimized for purification of new modalities, e.g. viral vectors, mRNA, plasmids
- Single-use and reusable options

Case study monoliths: scalability and robustness, high purity and yield

Molecule type
Adeno-associated virus AAV

Challenge

Achieving a scalable and robust separation of full from empty viral capsids with high purity and yield for multiple AAV serotypes

Sartorius BIA Separations products

- CIMmultus SO3
- CIMmultus QA
- PATfix

Key benefits

- Higher capacities than resin-based columns, due to large size channels, high flow rates with low pressure drops and high surface accessibility of binding sites for AAVs
- Downstream processing time reduced by 60%
- Significantly improves the recovery of AAV
- Plug & play cGMP formats, scalable from 0.05mL to 40L

Business result

- Integration of Sartorius BIA Separations' technologies into customer's cGMP facility (50L to 500L)
- Customer added a monolith-based process to its purification toolbox
- Included in customer's advanced analytical toolkit for process & product characterisation

Leverage global customer base by seeding new innovative products

Building relevance and significant share in new modalities

Continuously combining existing and acquired portfolios to create innovative solutions

Media and chromatography businesses contribute to differentiation and recurring revenue