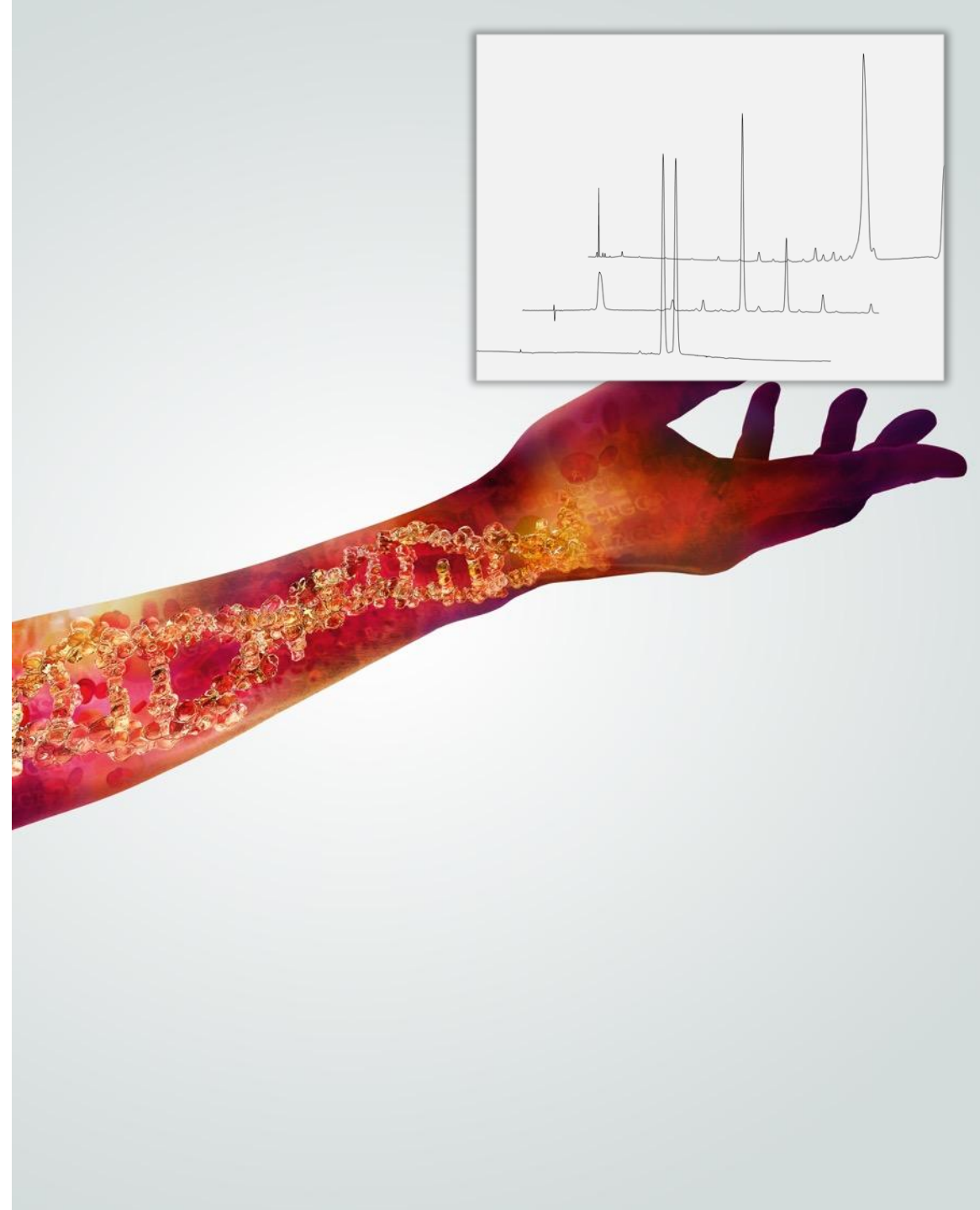


Strategy for chiral SFC separations at AstraZeneca

Anna Jonson

Separation Science Laboratory, Early Chemical
Development, Pharmaceutical Sciences, Gothenburg

Shimadzu Prep User meeting, 8 October 2025



AstraZeneca Gothenburg



The Gothenburg site in Sweden is one of AstraZeneca's six strategic research and development centers.

~3000 employees, from more than 50 nationalities.

Covering early R&D to GMP manufacturing

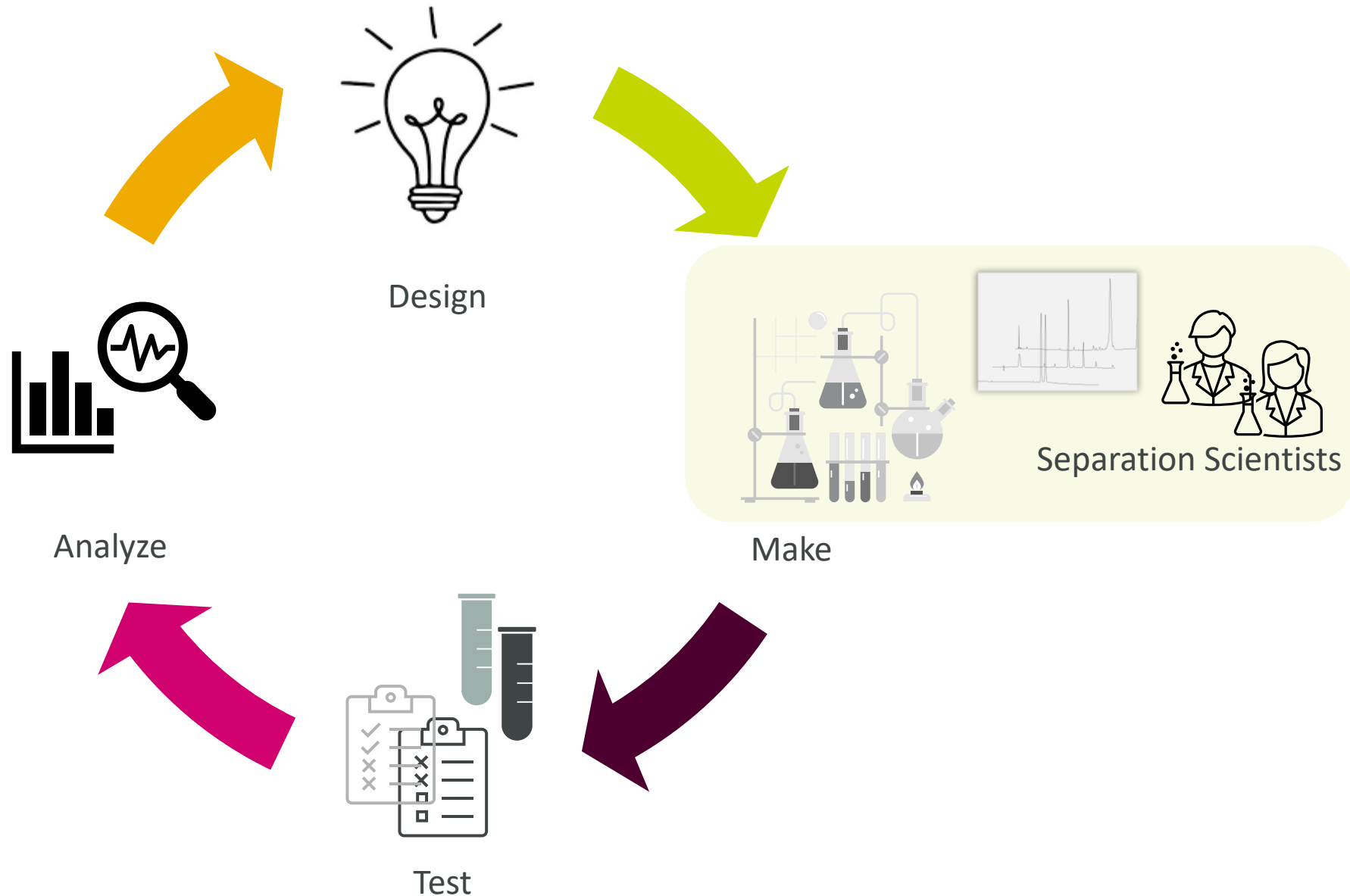
Separation Science Laboratory (SSL):

- Support projects from early to late phase
- Support from small molecules up to large molecules and New Modalities
- From mg to kg

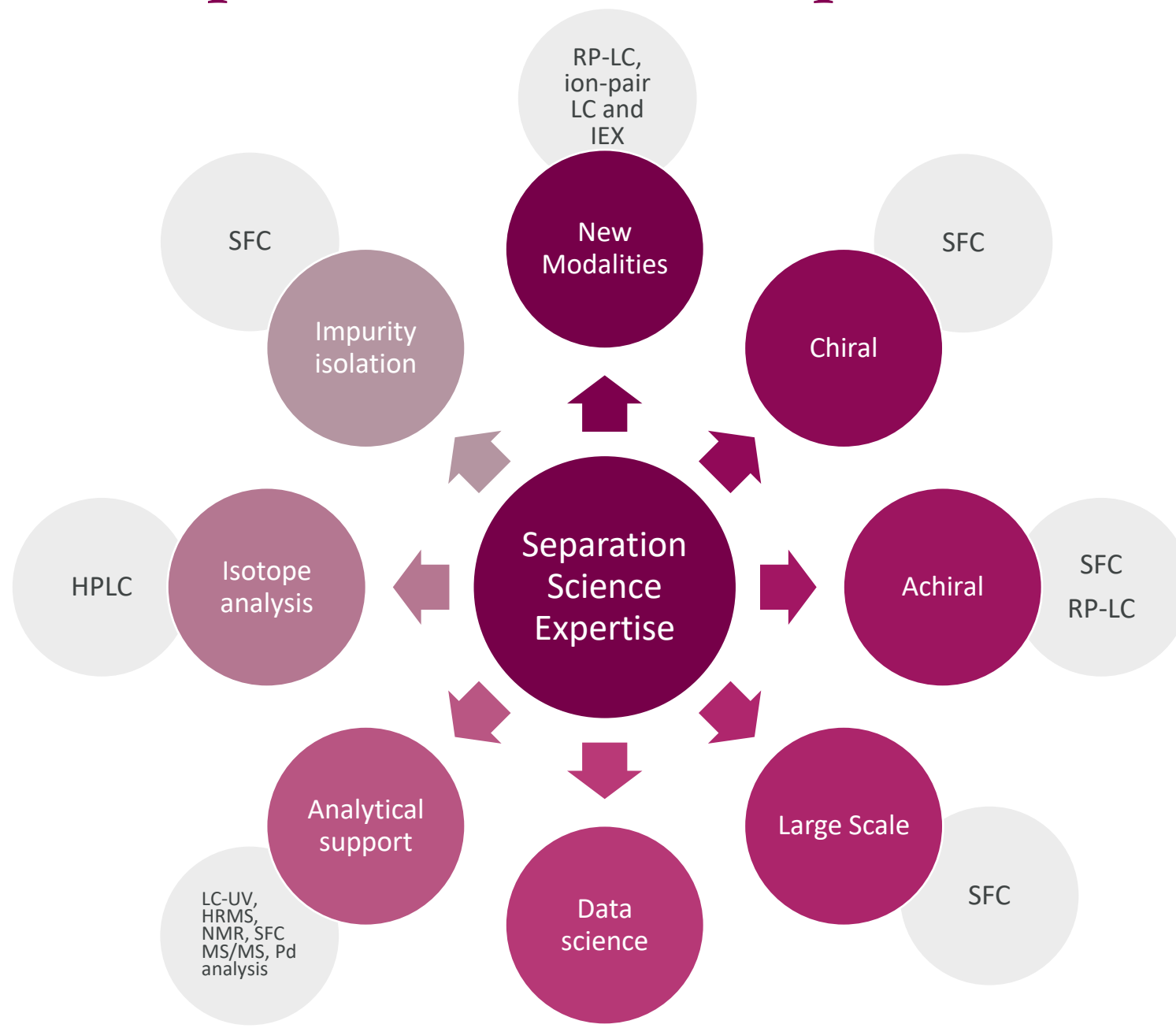
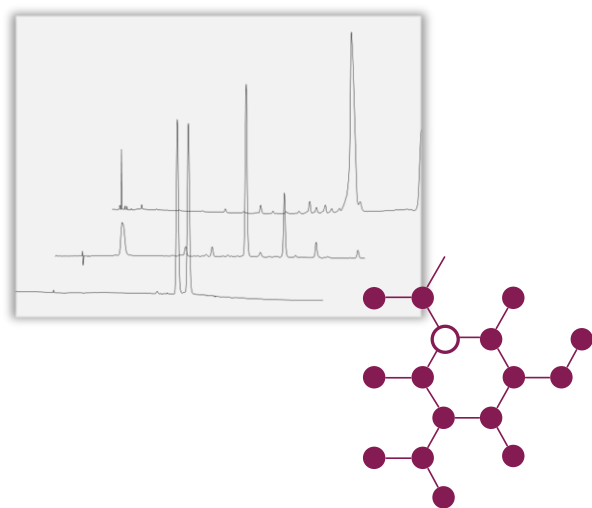




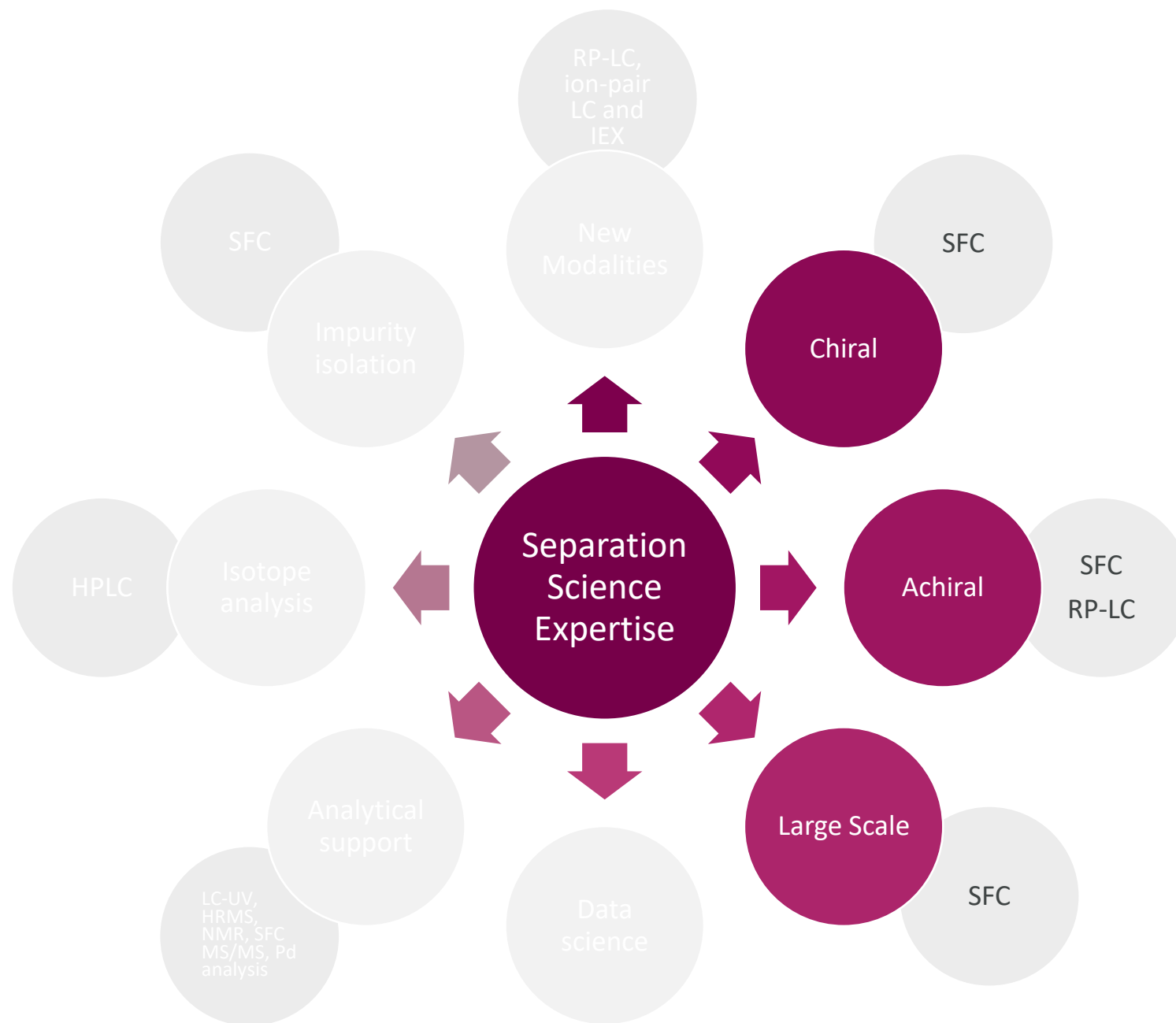
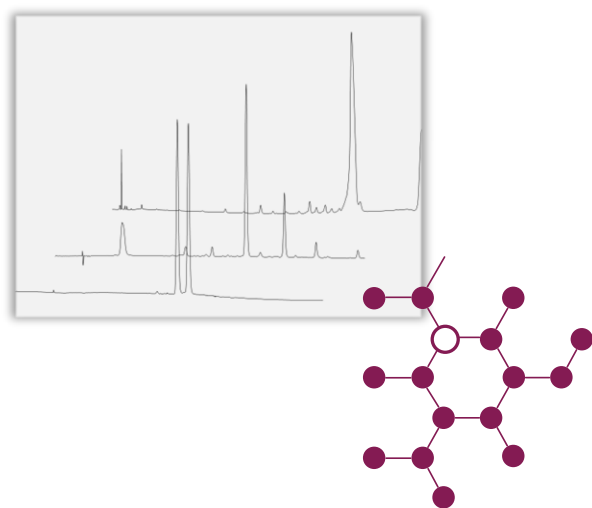
Drug Development Cycle – DMTA Cycle



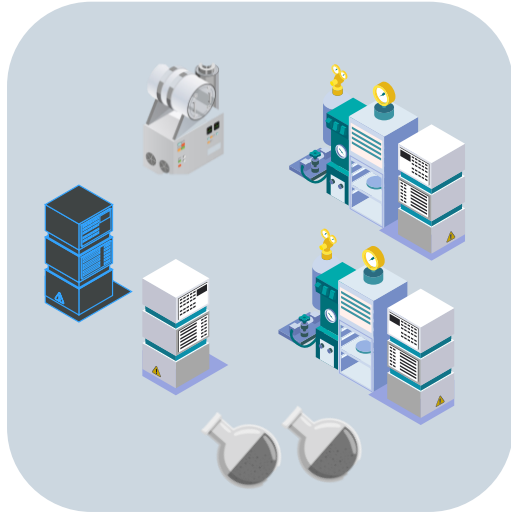
Separation Science Expertise and Techniques



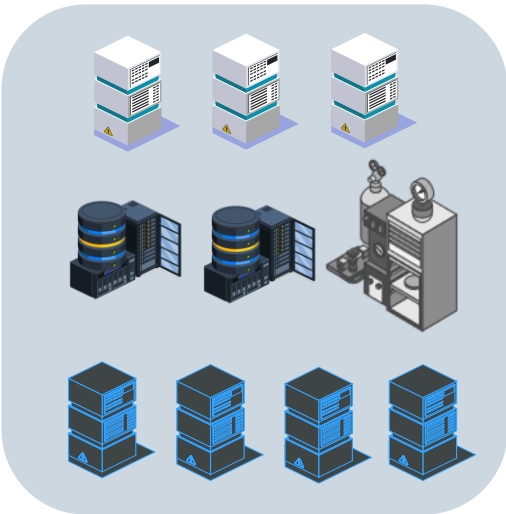
Separation Science Expertise and Techniques



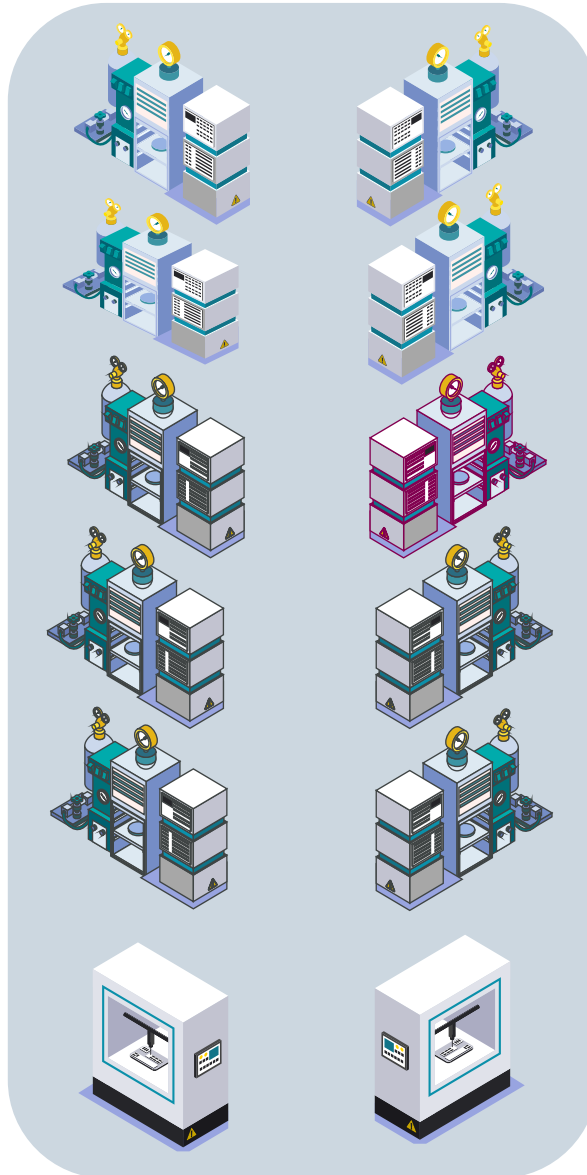
Laboratory Instrumentation Footprint



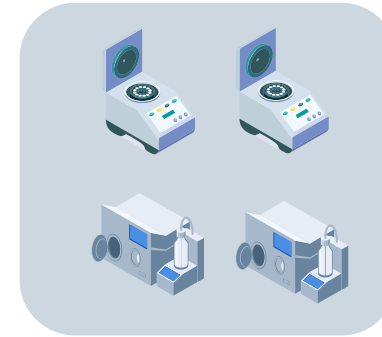
Large Scale Lab



Analytical Lab



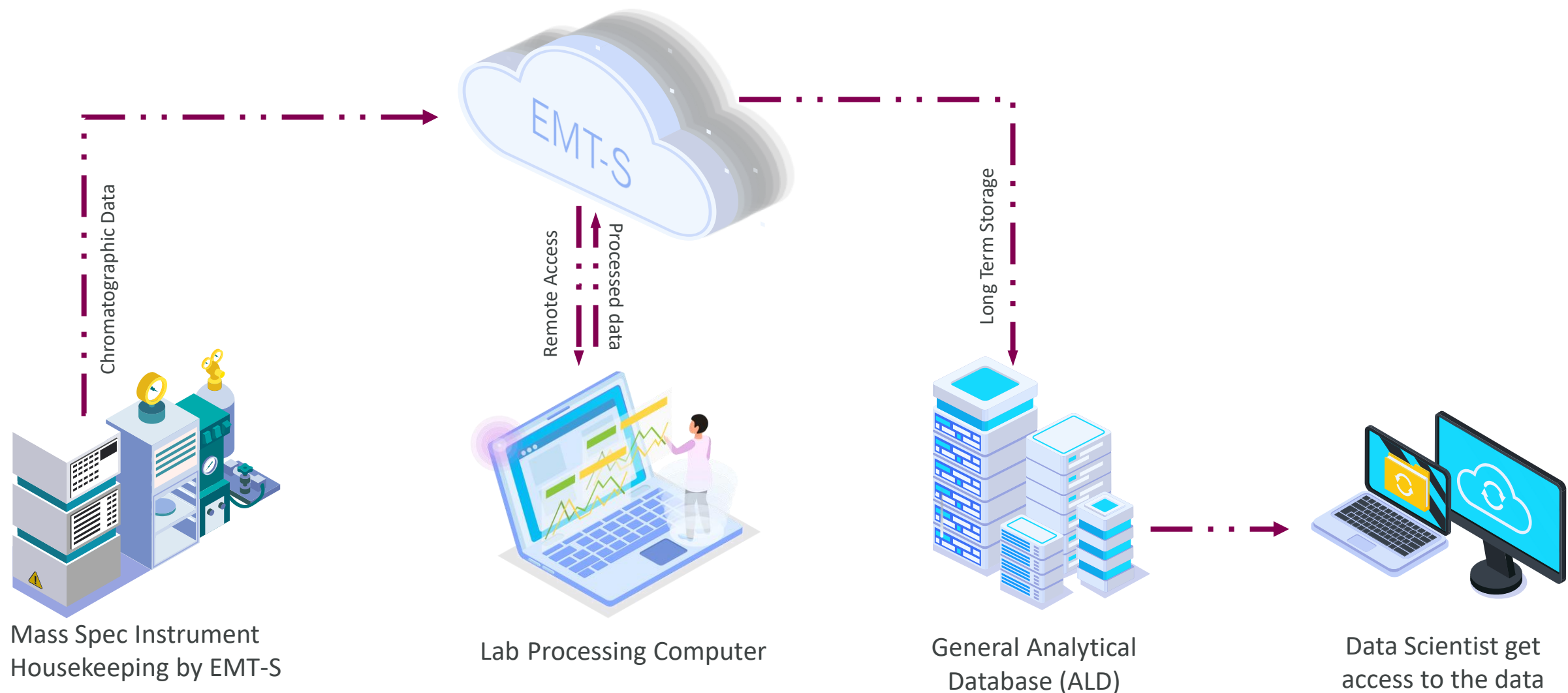
Prep Lab



Drying Module



Data Management



Tracking Multiple Molecules and Data Simultaneously

SUBMITTED	METHOD OPTIMIZATION	PREP QUEUE	PREP ACTIVE	DRY DOWN REFORMAT	QC	REVIEW	CLOSE
ITX nr Request type Project 1 Chemist Amount Requestor Date 	ITX12349 Chiral Project ZX Wave 1 245 mg Chemist 2025-09-09 <a>Add info <a>SFC  	  	ITX12340 Chiral (liq submission) Project X Wave1 131 mg Chemist 2025-09-08 <a>Add info <a>SFC ITX12348 Achiral Project X Other 50 mg Dry sample Chemist 2025-09-08 <a>Add info <a>SFC <a>Anna	ITX12345 Achiral (liq submimssion) Project XX Wave 1 75 mg Dry sample Chemist 2025-09-08 <a>Add info <a>LC ITX12346 Chiral Project Z Wave 3 700mg Chemist 2025-09-08 <a>Add info <a>SFC <a>Anna	ITX12345 Chiral (liq submission) Project X Wave1 25 mg Chemist 2025-09-08 <a>Add info <a>SFC <a>Victor	ITX12347 Achiral Project Y Wave3 105 mg Dry sample Chemist 2025-09-08 <a>Add info <a>SFC	



Run lists

Name	Method	Mass
ITX12349_blank_20250904	blank	-
ITX12349_ELN-2025-08-12_M1	M1_range_5_40	450
ITX12349_blank_20250812	blank	-
ITX12349_ELN-2025-08-12_M2	M2_range_5_40	450

Report

Automatic uploads of results into other applications (i.e. lab journals, internal data bases)

Vendor-neutral Global Database

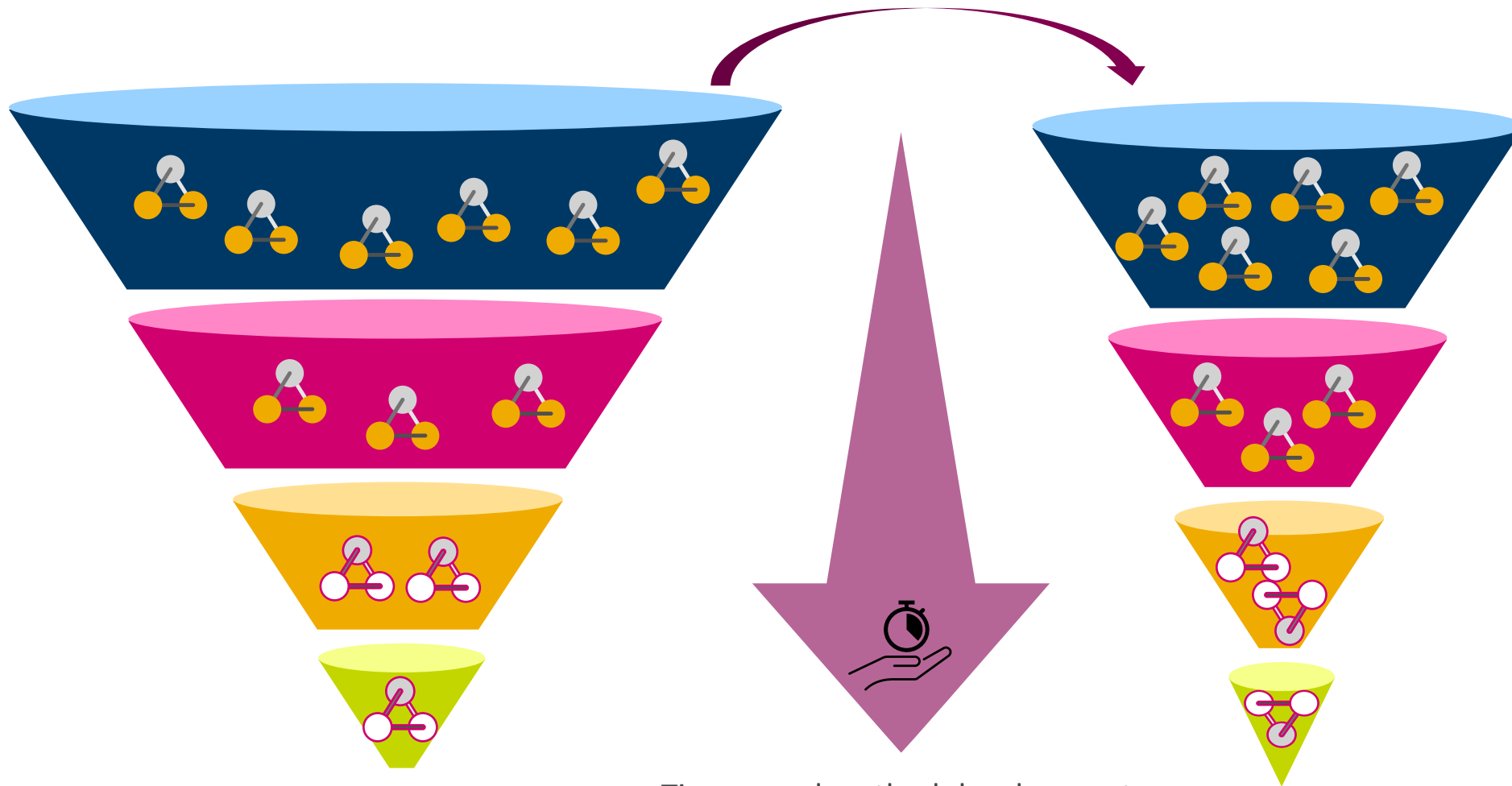


Data

.raw refine



The method development process



Time spend method development

- Digitalization
- Automation
- Prediction
- Save time
- Save resources
- More sustainable operations



Analytical Chiral Screen Setup

Instrument



Modifiers

A: IPA/NH₃ 20 mM
B: EtOH/NH₃ 20 mM

C: MeOH/NH₃ 20 mM
D: ACN/NH₃ 20 mM

Oven 1

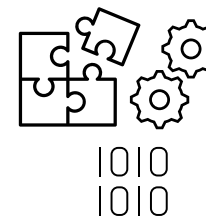
Chiralpak IA
Chiralpak IB
Chiralpak IC
Chiralpak ID
Chiralpak IE
Chiralpak IF

Oven 2

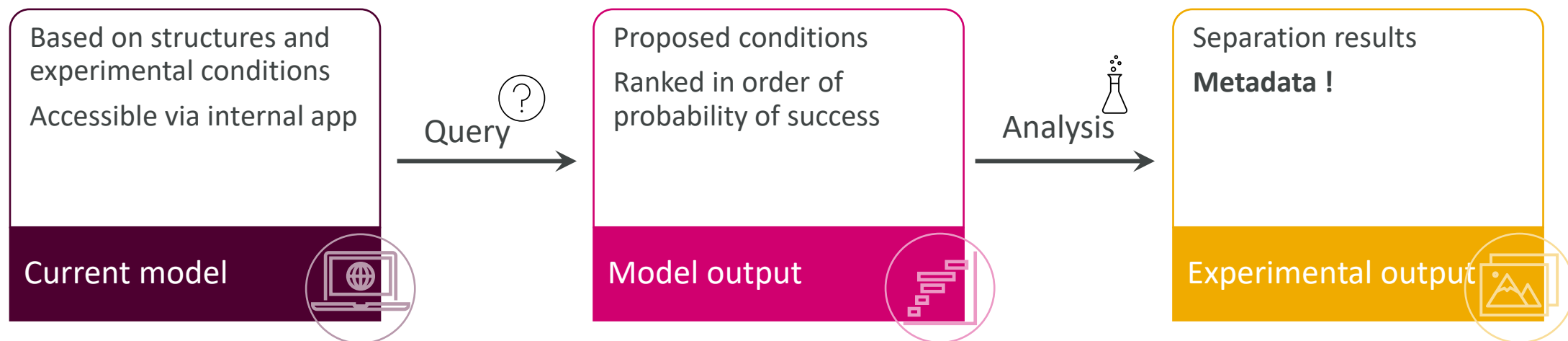
Lux i-A3 (IG)
Chiralpak IH
Chiralpak IJ
Chiralpak IK
Chiralpak IM
(S,S) Whelk-O1

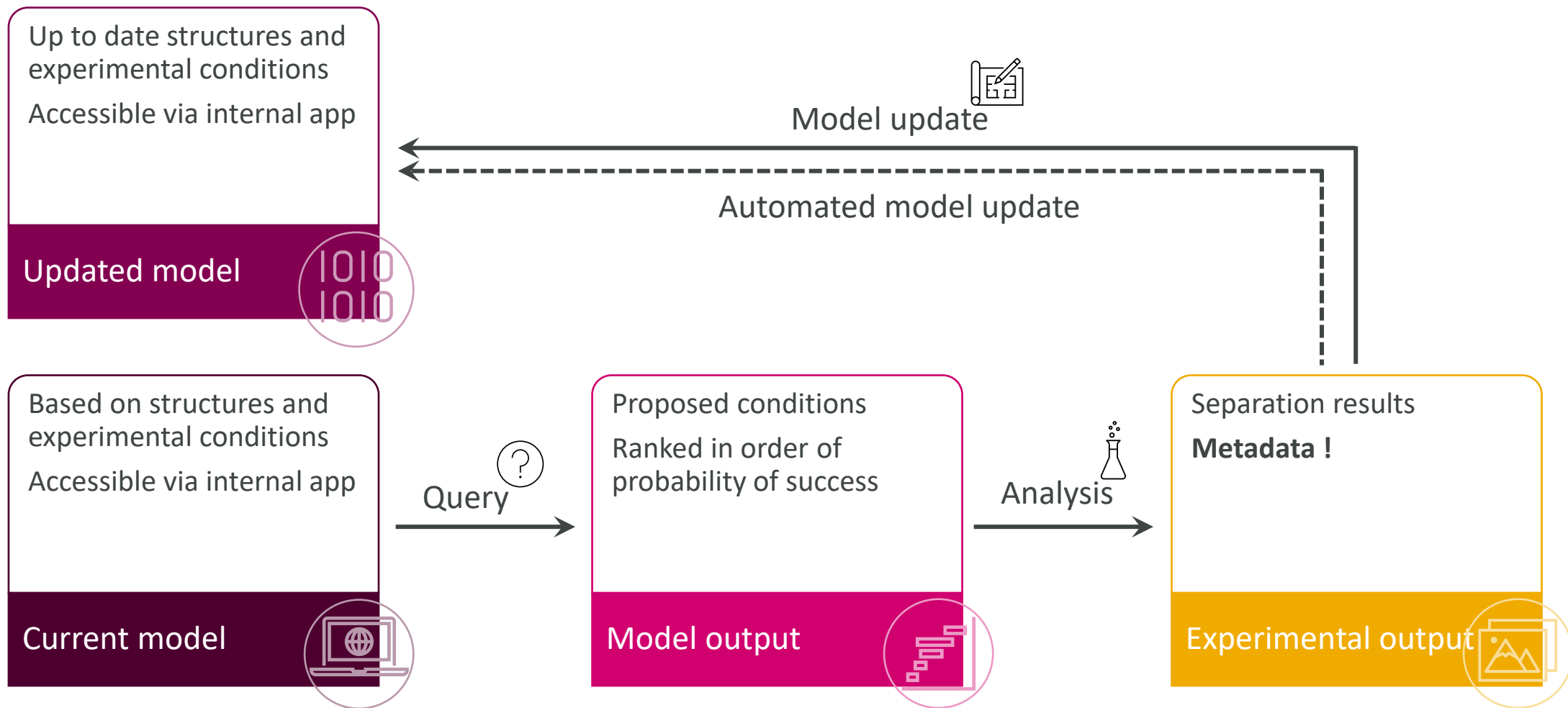
Oven 3

Lux A1
Chiralpak IN
Lux C1
Lux C2
Lux C3
Lux C4



Analytical Chiral Prediction





Green Aspects in our Analytical Chromatographic Process

Minimizing Instrument Time and Electricity Usage

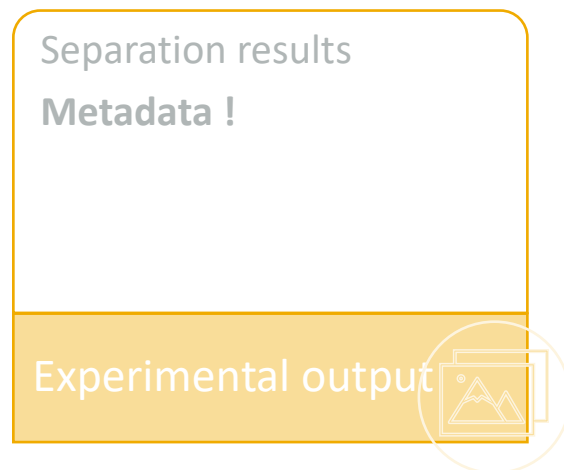
Enhancing Efficiency

Decreasing Solvent Usage and chemical waste

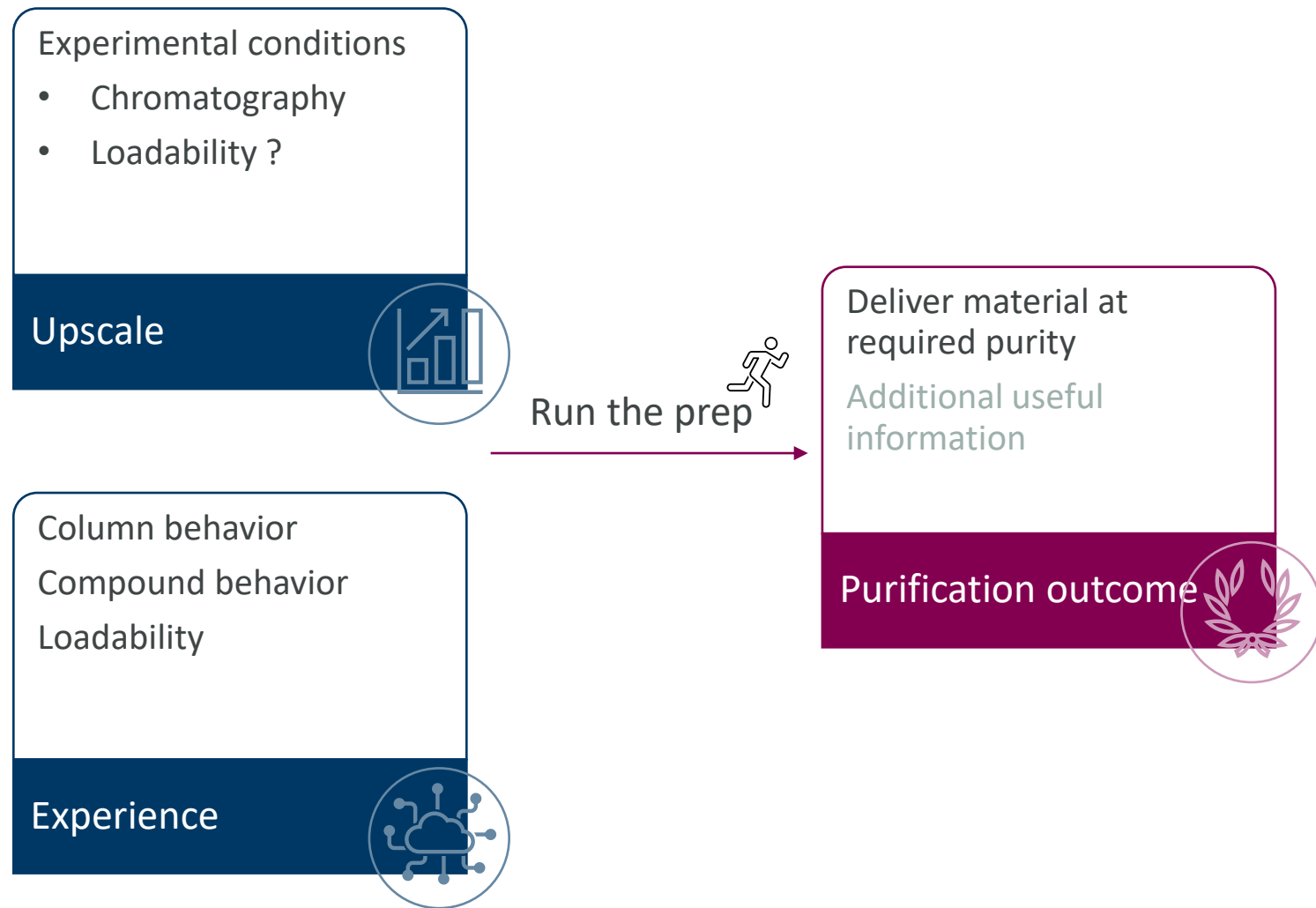
Optimizing workflows and adopting sustainable practices, to decrease our carbon footprint



Analytical aspects



Preparative aspects



Approach for Preparative Chromatographic Setup

Instrument



Shimadzu Nexera Prep

Injection: vial 4 ml

Fractionation:

Open tubes (25 ml)

Duran bottles (500 ml)

Flow: 70-130 ml/min



PIC 600

Injection: 500ml bottle -10L tank

Fractionation:

5L bottles, 25 L or 50 L tanks

Flow: Up to 600 g/min

Connected to continuously rotavapors

CO₂ infrastructure



- 6 m³ tank
- Recycled from waste gas in other manufacturing industries



Solvents



Acetonitrile
Methanol
Ethanol
2-propanol
Ethyl acetate
Methyl tertbutyl ether
Tetrahydrofuran
Heptane
Water



Strategic Approach to Recycling in Large Scale



Solvent recycling

- Modifier recycled from evaporation while purifying



Compound “recycling”

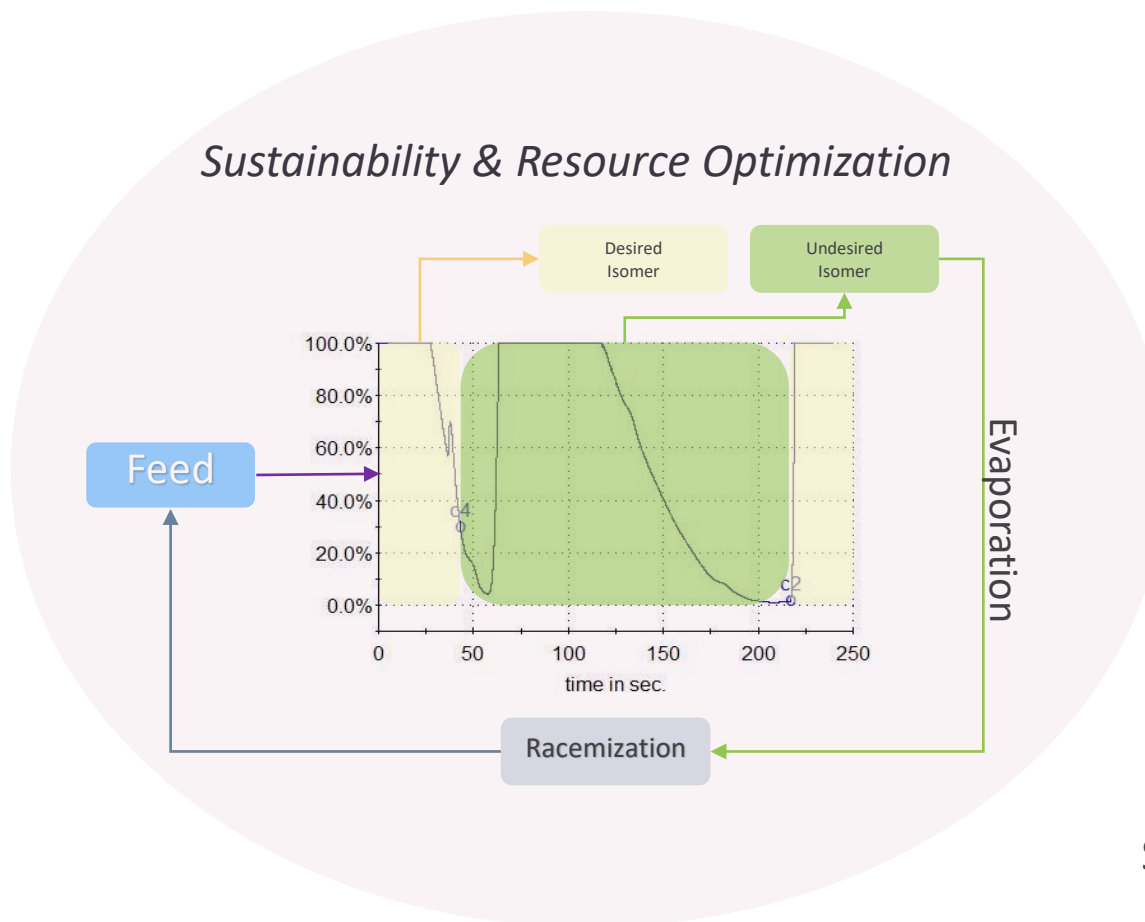
- Undesired isomer recycled when possible



Carbon dioxide recycling

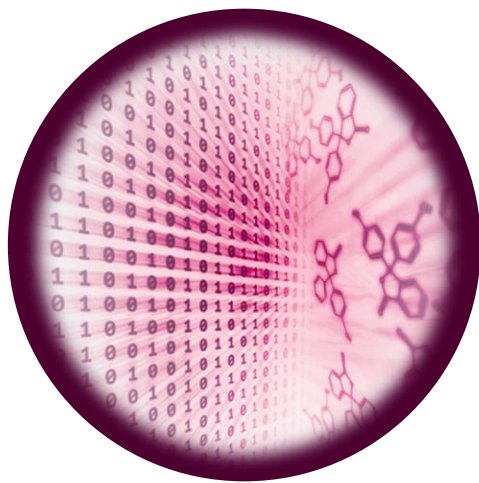


Stationary phase reuse/recycling



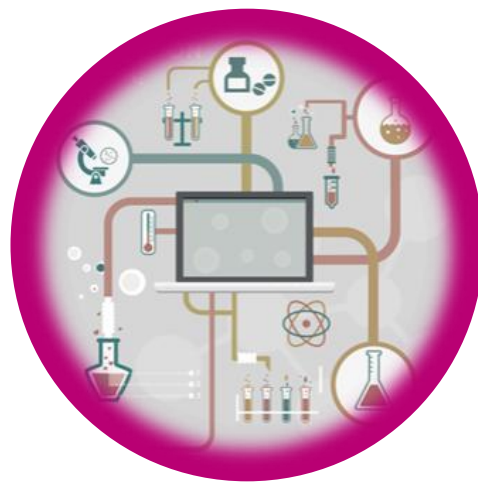
Future

Data-Driven Method Development & Analysis



Prediction-driven experiments

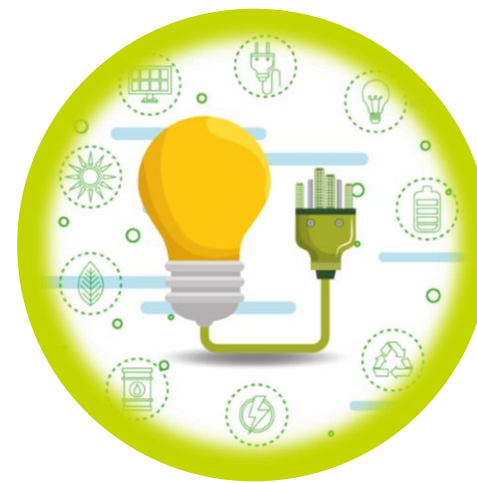
Continuous Innovation



Automation integrated across
all workflow stages

Keep the human in the loop

Commitment to Sustainability



Optimize resource use,
minimize waste, and make
green choices



Thank You
Questions?



Confidentiality Notice

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