3xper Innoventure Limited

Aug 2025

Our Legacy

Murugappa

- 125 years legacy
- Market cap – US$ 50bn, Revenue – US$ 10bn
- EBITDA – US$ 1.4 bn, PAT – US$ 1bn
- 9 listed companies and >83,000 people

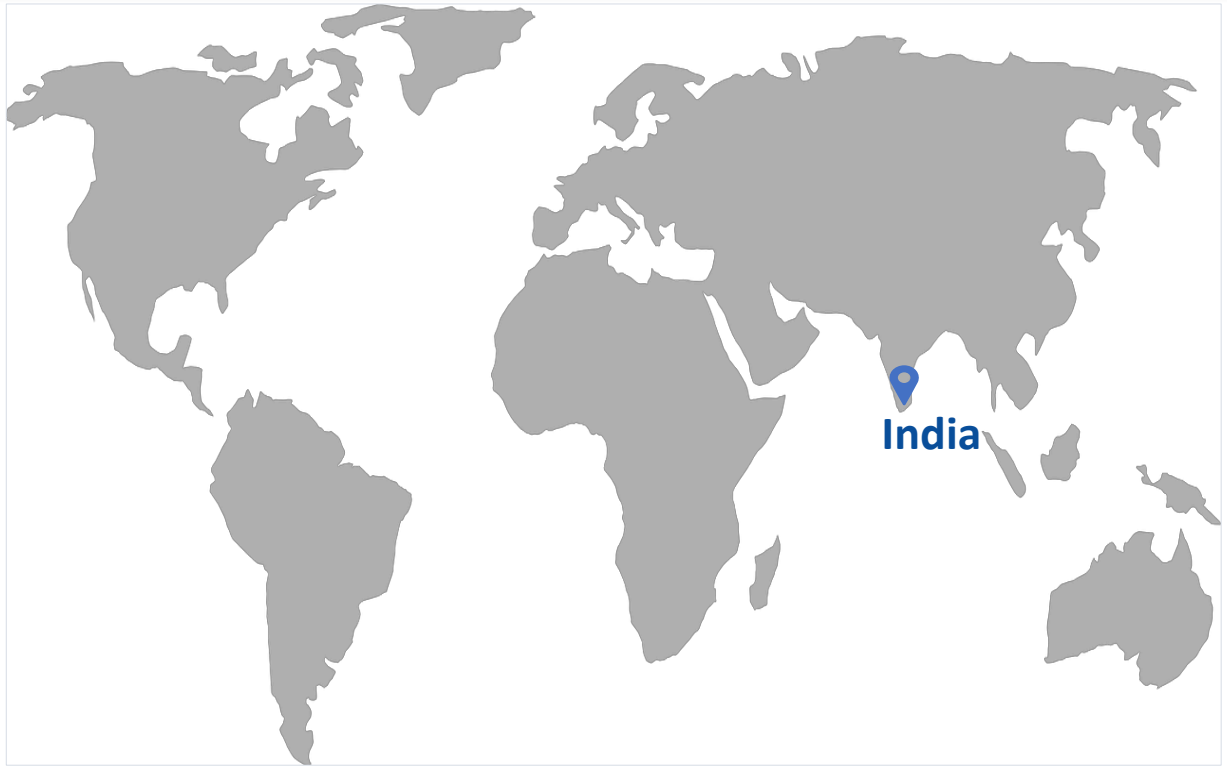
Tube Investments of India (Ltd)

- One of the listed companies of Murugappa group
- Business interests in automobile, financial services, medical devices etc.

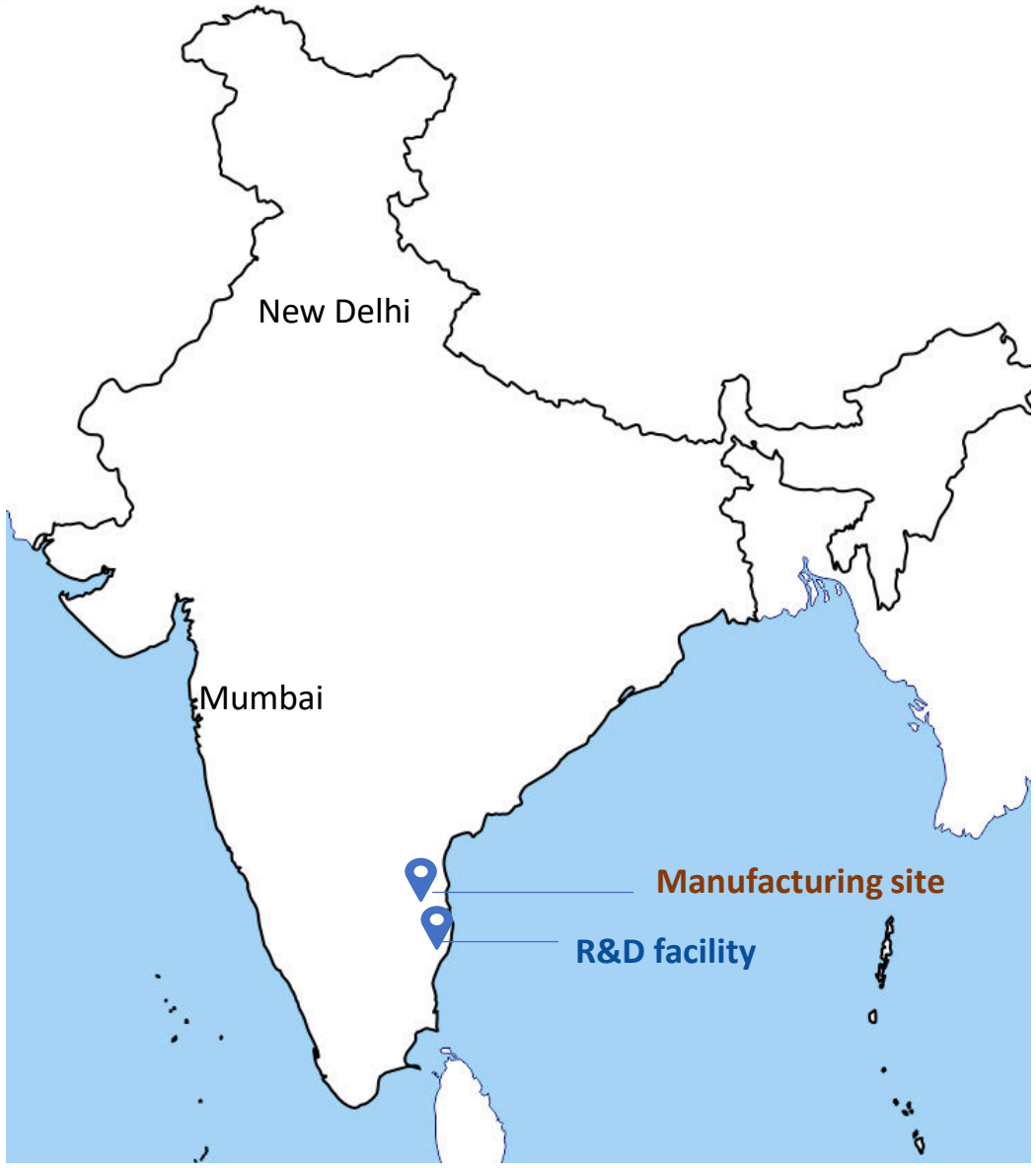
3xper

- Subsidiary of TII and part of Murugappa Group
- Strategic expansion to cater global innovators companies in pharma and biotech space

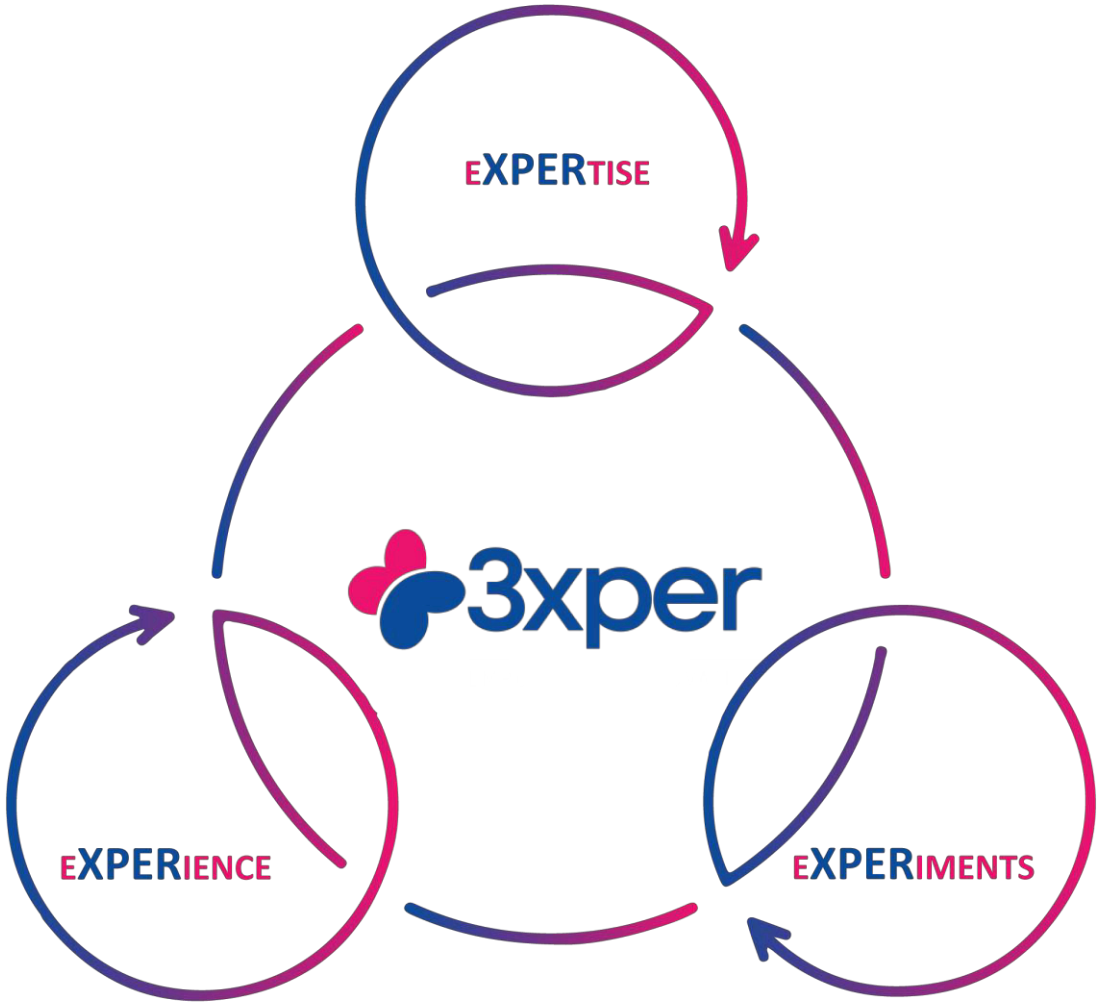
Our R&D and Manufacturing Locations



- Our R&D facility is spread over 18,000+ sft at TICEL Bio park, an R&D ecosystem located in Chennai, Tamil Nadu India.
- Our green-field Manufacturing facility is strategically located at Naidupetta, Andhra Pradesh, located about 60 miles from Chennai.



The Brand Story



3xper is coined from keywords that form backbone of our Services

- e**XPER**tise : Access to the sharpest talent in the business
- e**XPER**ience : Seasoned professionals with experience leading core functional domains
- e**XPER**iments : Core priority to Research & Innovation

Service Offerings & Capabilities

02

Services Overview

3xper envisions a full-scale end-to-end chemistry service offerings providing seamless and efficient solutions across **Development and Manufacturing services.**

Our service offerings across the discovery development continuum

Development → **Scale-up** → **Commercial Manufacturing**

Development Chemistry

- Early Phase synthetic and Analytical chemistry
- Synthesis of building blocks, Scaffold and metabolites.
- Process feasibility, development, optimization
- Continuous Manufacturing/ Flow chemistry & Enzymatic transformations
- Analytical Method Development, Qualification & Validation
- Impurity synthesis and characterization.
- Supply of Key intermediates & Active Ingredients.

Manufacturing

- Commercial manufacturing of Starting materials, Intermediates, and Active Ingredients.
- Continuous Manufacturing/ Flow chemistry and enzymatic transformations
- Backward integrated of Advanced Intermediates and Key starting materials.

Research & Development

2a

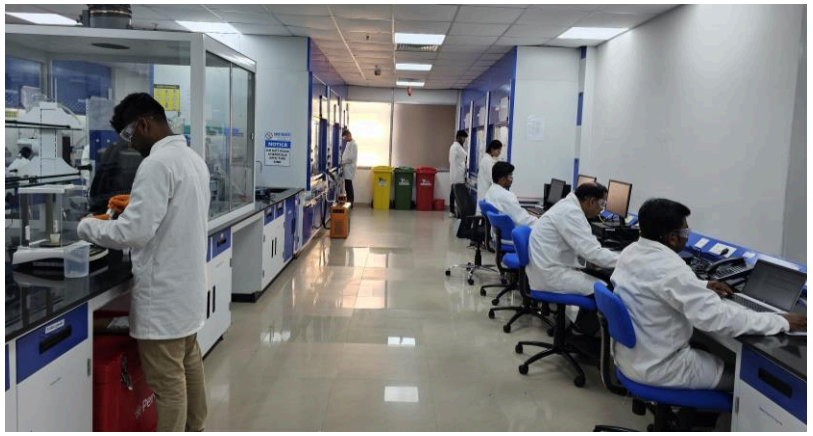
People- R&D

- **Initial pool of 80+ Scientists (MSc / PhD / Post Docs) with extensive experience and expertise in CRO/ CDMO projects**
  - 50+ Chemists with 5 to 10 years of experience
  - 5 Team leads with 10 to 20 years of experience
  - 3 Group leaders with more than 20 years of experience
  - 20+ Analytical Chemist with 5 to 15 years of experiences
  - 5 Process Engineers for scale up and Manufacturing

Infrastructure

Infrastructure

- State-of-the-art facility built at 18,000 sq. ft with dedicated synthetic and analytical labs across four modules.
- 50+ Fume hoods and 5 walk-in Fume hoods
- Autoclaves (100mL to 5L) supported with enough safety features with all gas detectors
- MPLCs for quick purifications
- Temperature controlled storage facility
- Kilo lab – All glass reactors at 10L & 20L equipped for operations from -90 ^{o}C to 220 ^{o}C.
- Equipped with Huber system to handle temperature range of -80 deg C to 220 deg C
- Ideal for material generation, process robustness studies, scale up and crystallization studies



Chemistry expertise

Metal reactions

- Organometallic reactions under Schlenk
- Target based on Low temperature metalation / trans metalation

Heterocyclic Chemistry

- Macrocycles – large ring lactams
- Fused rings
- Bioisosters
- Preferential partial reduction of fused heterocycles under high pressure
- Nucleosides
- Nucleotides

Specialty chemistry

- Carbohydrates
- Late stage Fluorination / Methylation
- Remote C(sp3)−H functionalisation
- Free radical chemistry
- Prodrugs
- Chiral chemistry
- Transition metal catalysed coupling reactions

Hazardous reactions

- Azide
- Diazo chemistry
- Peroxide chemistry
- Pyrophoric reaction
- Nitration
- Free radical

R&D - Hydrogenation facility

- Autoclaves – 100ml (2 nos.), 500mL (2 nos.), 1L, 2L and 5L (Amar Equipment) – SS 316L
- All autoclaves are housed in a dedicated room with double brick concrete walls.
- Facility equipped with emergency exit opening to common corridor
- Can handle pressure reactions up to 20 bar (design pressure is 100 bar)
- Can handle temperature up to 250 deg C
- Closed loop gas distribution system – Hydrogen and Nitrogen
- Hydrogen and Oxygen detectors with auto alarm system

Analytical R&D Labs- Infrastructure

- 400 MHz NMR
- UPLC/MS (SQD) with AP-ESI/APCI ion sources
- UPLC MS/MS (Triple quad) with AP-ESI/APCI ion sources
- UPLC with DAD & ELSD detectors
- HPLC with VWD, DAD & RI detectors
- GC-MS-FID with Head Space
- Preparatory HPLC with open bed fraction collector (UV, DAD)
- FT-IR & UV

Analytical Services

- At 3xper, we offer an extensive range of analytical services and solutions, all tailored to cater to the dynamic world of small molecules.
- We also provide Standalone Analytical Services- (FTE/FFS)

Method Development & Quantification

- Method Development using HPLC, GC, LCMS/MS, GCMS and other spectroscopic techniques.
- Assay Analysis, Method validation, verification, method transfer.
- Method development for Chiral compound; determination of % ee of the isomers.
- Quantitative analysis by NMR

Characterization Studies

- Structure elucidation of small molecules using LCMS/MS, GC/MS, 1D and 2D NMR techniques.
- Identification and characterization trace level impurities.
- Solid phase characterization studies using powder XRD, FT-IR, DSC and TGA techniques.
- Stability studies including photo stability testing.

Isolation and Purification

- Milligram to gram level isolation and purification of Achiral and Chiral compounds using preparatory HPLC
- Purity enrichment up to ≥ 99%
- Trace impurity isolation and quantification.

Manufacturing

2b

Manufacturing Facility

- ~100,000+ sq metre site for manufacturing facility with multiple scales of operations
  - **Pilot Facility**
    - To accommodate tech transfer projects and scale up supplies up to 10 kilograms (batch size).
    - Fully operational
  - **Production Block - 1**
    - To accommodate scaleup batches from a few kilograms up to 100 kilograms (batch size).
    - Fully operational
  - **Production Block - 2**
    - To accommodate Starting Material, Intermediates and Active Ingredients batches from 50 kg to 500kg to 4000kg [batch size].
    - Expected to be operational by Q1 2026

Pilot facility

- The pilot facility caters supplies ranging from 1 kg to 10 kg batch sizes
- Operates as a facility with separate intermediate areas
- Vessel sizes range from 50 L to 100 L
- The reactor MOC types available are GLR, SSR and AGR
- Equipped with all types of Downstream equipment such as Centrifuge, Driers, ANFD and Nutsche filter.
- Equipped to handle temperature ranges from -40^{o}C to 150^{O}C Celsius
- Reactors are equipped with dedicated heating and cooling systems

Production Block - 1

- Production Block facility will cater supplies upto 100 kg batch size
- Vessel sizes range from 50 L to 1000 L
- The reactor MOC types available are GLR, SSR, AGR, Hastelloy reactors
- Equipped with all types of Downstream equipment like Centrifuges, ANFDs, PNFs, RCVD.
- Temperature conditions from -80 deg C to 160 deg C

Production Block- 2

- Production Block- 2 facility will cater supplies from 50kg to 4000kg batch scale
- Vessel sizes range from 5000 L to 25000 L
- The reactor MOC types available are GLR, SSR, and AGR
- Equipped with all types of Downstream equipment like Centrifuges, ANFDs, PNFs, RCVD, Spray dryers.
- Temperature conditions from -80 deg C to 160 deg C

Access to Technology Platforms

Continuous Manufacturing

Developed flow process for two products for process involving nitration and other involves Hoffmann rearrangement.

Enzyme transformation / Biocatalysis

Collaboration with strategic partner. Expertise in library of enzymes like KRED, IRED, Transaminases, Nitrilases, Transesterases, Nitrile Hydratases, Dehydrogenases. Access to 20,000 library of enzymes.

Sustainability

04

Sustainability :

3xper continuously strives to work on green chemistries, waste reduction through continuous process, Biocatalysis and solvent recoveries to create a positive impact on the climate and environment.

3xper is committed to below:

Safety

Conduct robust risk assessments to safeguard resiliency of our

research, manufacturing,

and commercial activities.

Environment

Establish criteria and engage with stakeholders to demonstrate meaningful environmental performance and improvement across the manufacturing lifecycle of our products and services.

Compliance

Compliance with all Environment, Health and Safety (EHS) standards and statutory requirements.

Potential non-compliance is identified through self-assessment and corrective action will be implemented.

Health & Safety

Targeting Zero accidents

Stakeholders are empowered to report near miss or unsafe conditions to leadership team for appropriate corrective actions

Waste Management

Reduce waste from operations through hierarchy of control for handling waste: Reduce, Reuse. Recycle and disposal.

Case Studies

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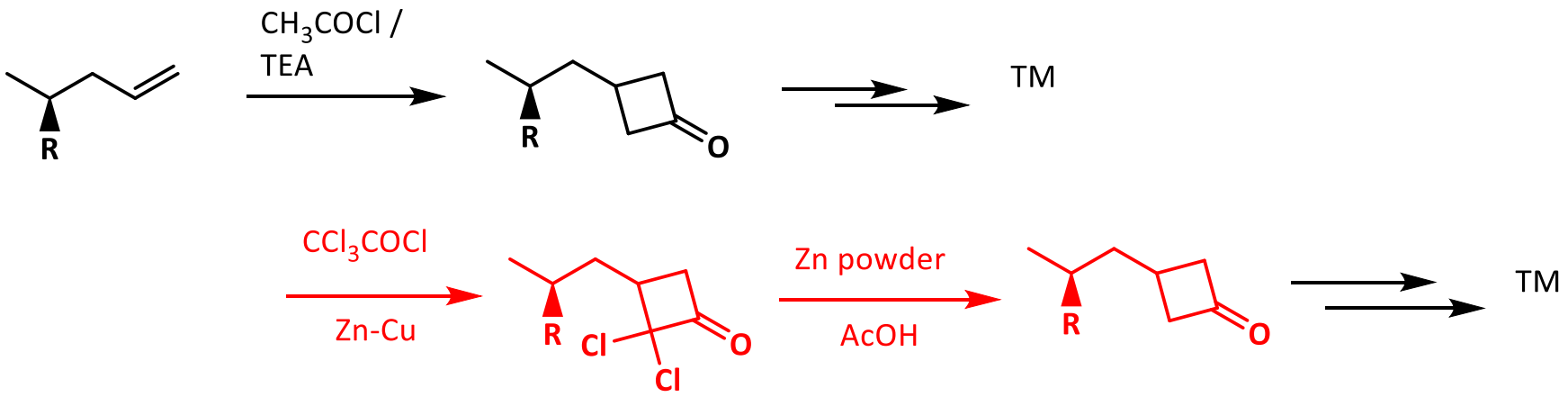
Chemistry Case study-1

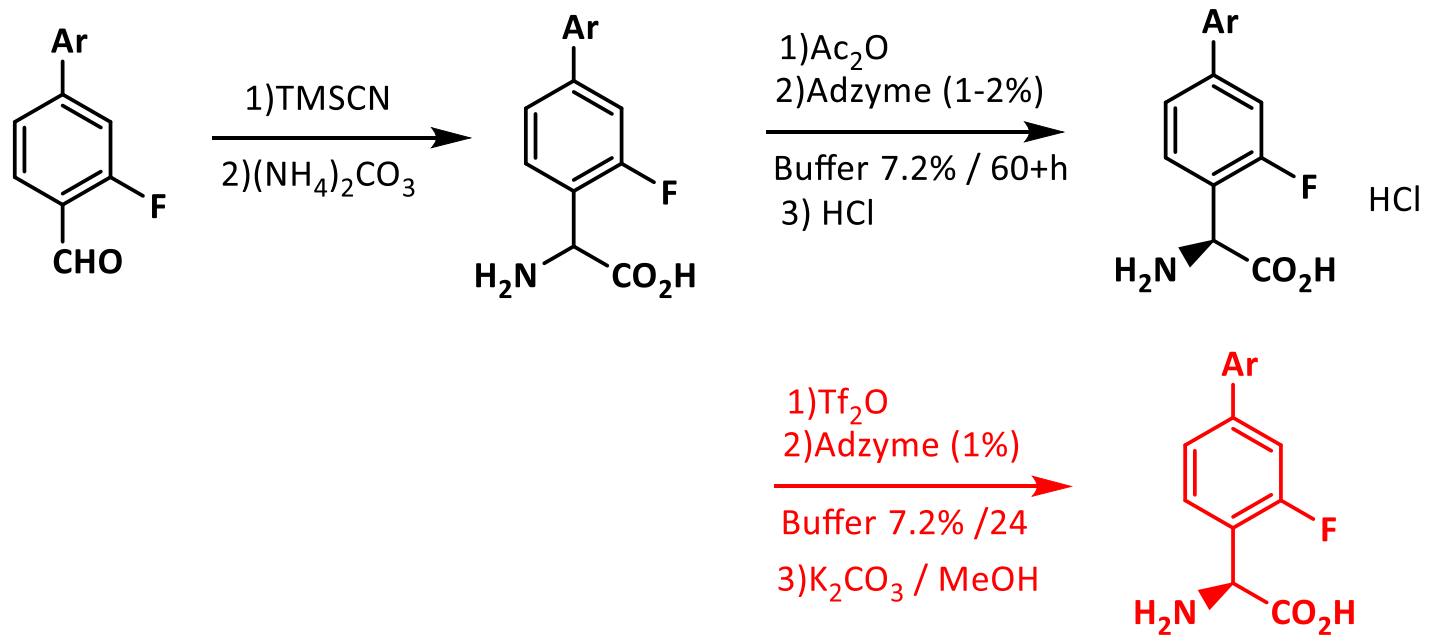
Dichloroketene as an alternative – Better conversion and faster turn-around time



- The suggested route needs to be done under -20 °C
- Max 7% conversion was observed
- Dichloroketene reaction done at 50 °C
- Complete conversion observed
- Isolated yield 70%

Chemistry Case study-2

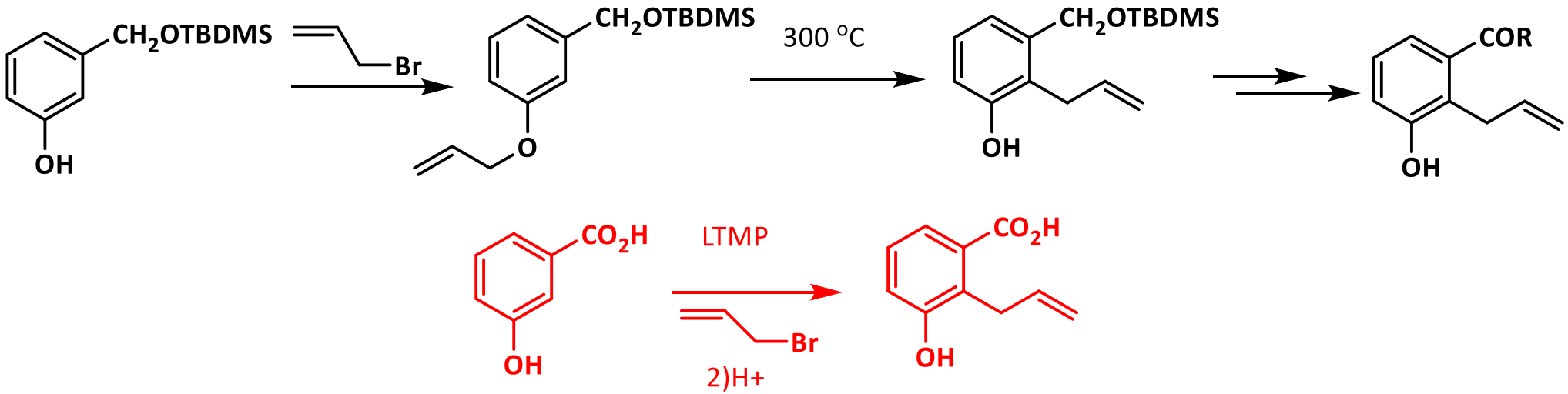
Achieving shorter reaction time with lesser enzyme loading enhanced scalability



- Enzymatic resolution was sluggish
- Required higher loading of the enzyme
- Acetic anhydride availability in bulk quantities was an issue
- Trifluoroacetamide proved to be a viable alternative
- Faster reaction with lesser loading of enzyme
- Easy deprotection

Chemistry Case study-3

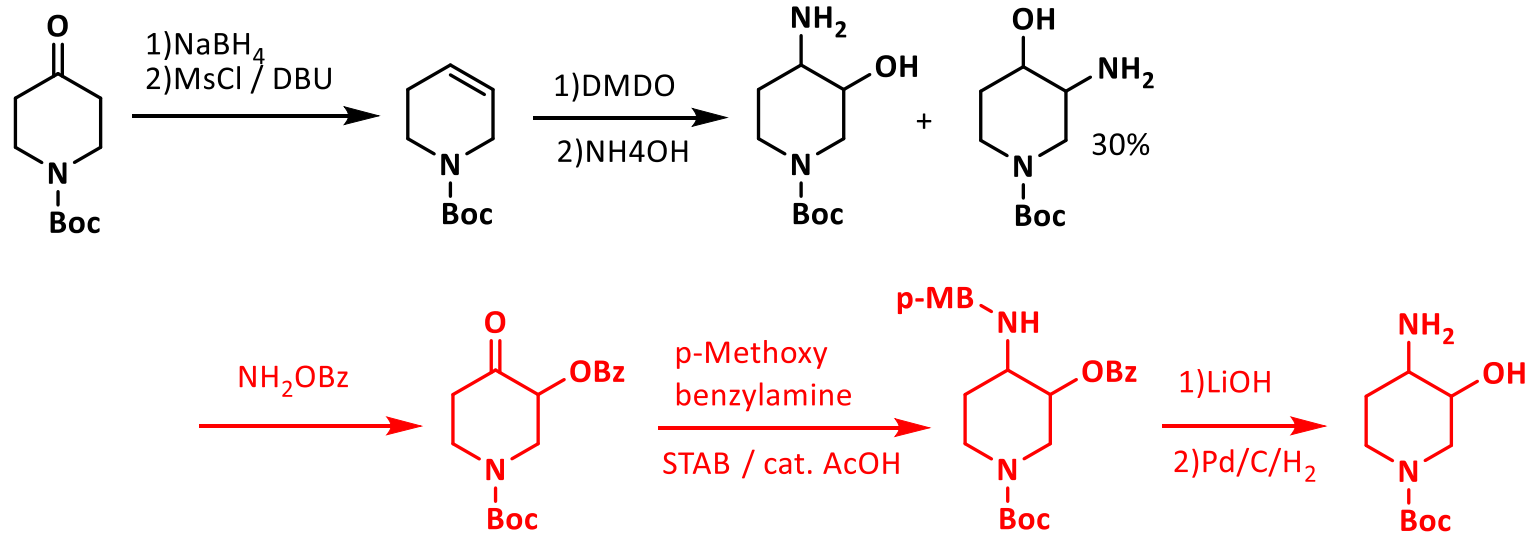
Simplified process for a KRM - Faster turn-around time



- Reported procedure involved high temperature Claisen rearrangement
- Not exclusive and less yielding along with other regio-isomers with chromatographic requirement
- Requires deprotection and Low temperature Swern oxidation for the secondary alcohol
- The developed route precluded all these issues and reduced the number of steps by 4

Chemistry Case study-4

Regiospecific synthesis of key intermediate



- Cleaner route developed which was regio-specific
- Safer to scale-up

Case study 5 - Nitration reaction in flow chemistry in a commercial Intermediate

Problem statement

- Product involves nitration and hence safety is of priority
- Large volume commercial intermediate with cost as the primary driver in the market
- Expected run away condition at 71 deg C with a heat of reaction >453 J/g with >9 bar pressure
- Global regulatory accreditation requirement

Solution offered

- Process was optimized using flow reactors of 10 ml/min capacity
- Optimized Residence time is between 0.5 min and 1 min.
- Reaction can be performed at 25 deg C instead of zero deg C without any impact on yield and quality
- 200 ml/min flow reactor is sufficient to supply >300MT per annum

Benefits achieved

- Safe and scalable process
- Reaction conversion and yield are comparable to batch process
- Nitration reaction contained from 2000 L to 200 ml/min
- Energy efficient process

Case study 6- Flow chemistry in a large volume commercial API

Problem statement

- Large volume commercial API with a well-established batch process
- Highly exothermic reaction involving Hoffmann rearrangement
- Cost is the driver in the market

Solution offered

- Flow chemistry to reduce the residence time of product's exposure to high temperature
- Efficiency in operations to enhance productivity
- Eliminate safety risk on exothermic reaction in bulk scale

Challenges faced

- Precipitation of the product during flow resulting in choking
- Challenge between reaction conversion vs product precipitation
- Work in progress to achieve optimal balance between conversion and precipitation

Thank you