



PORTON

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Enabling public's early access to good medicines

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Porton Overview



02

**Leading Technology
Platforms**



03

**Excellent Operation
System**





The development history of Porton

2005

Porton Launched



2006

Manufacturing Facility in Changshou, Chongqing started operation;
Established Process R&D Centers in Chongqing & Chengdu



2008

Launched Porton USA/Europe and Shanghai R&D Center



2013

Awarded "Leading CMO 2012";
Successfully received 1st USFDA Audit with Zero 483



2014

Porton (Stock code: 300363) Listed on the Growth Enterprise Market of Shenzhen Stock Exchange



2017

Acquired J-STAR Research Inc. (USA) to expand process chemistry CRO services



2018

Launched Suzhou Porton Biologics Ltd. and started GCT CDMO services



2020

Successful European Medicines Agency (EMA) on-site inspection;
Started formulation CDMO business



2021

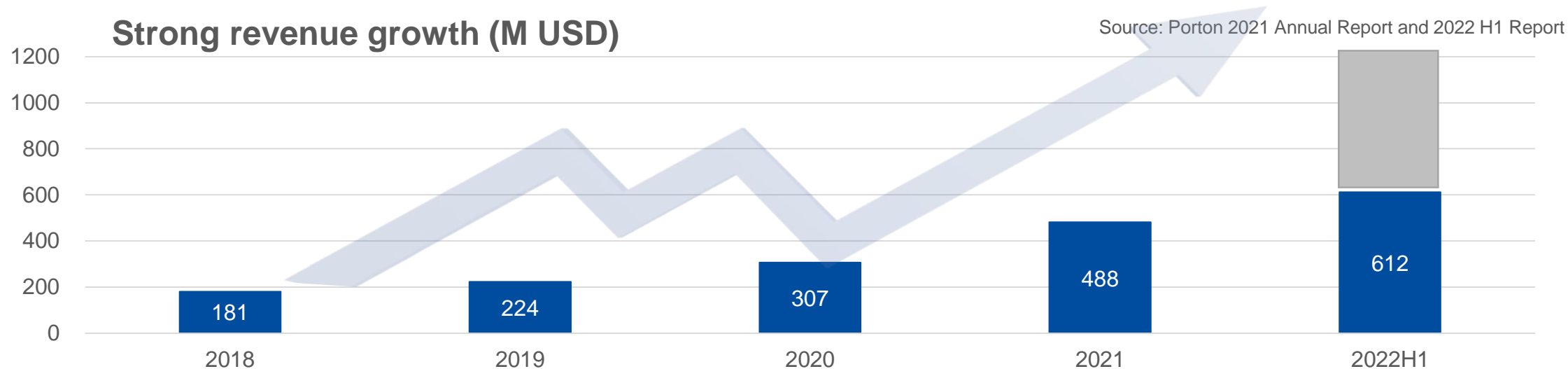
Industry-leading multi-purpose 109 workshop goes on stream



2022

Chongqing Intelligent Formulation Facility about to be completed;
Construction of new DP facility (USA) and DS facility (Slovenia)

Performance growth is driven by serving our global customers



488
M USD

2021 revenue

50%

5000
+

Employees

1400
+

R&D staff

700
+

Accumulated clients

2000
+

Accumulated projects

Porton is a trusted partner to the pharmaceutical industry

80%

Top 20 Big pharma

700+

Accumulated clients

200+

Active customers

200+

Biotech

Quoted in the customer's recognition of Porton

“These are great results. Congratulation Porton team! Great Job on this activity and we are very grateful for all your help, diligence and hard work.”

“I want to thank you and the Porton team for the great support you provided to us in 2021...for me important was the seamless collaboration between your company and *** and this needs to be acknowledged.”

“Congratulations and great team effort!
Indeed it really has set great example for transformative tech transfer.”

“As 2021 draws to close, we’d like to share our gratitude with the Porton team. You are all amazing. We thank you for your outstanding contribution to Pfizer medicines...”

Global R&D centers and production bases match the diverse needs of customers 博騰



US

J-STAR (subsidiary)

Lab number: 20+ area : ~7000m²
R&D personnel : 130+(50%+of doctor)

Europe

R&D base in Slovenia

operational in September 2024

CHN

Chongqing API R&D Center

Lab number: 20+ area: 7000m²+
R&D personnel: 200+

Changshou manufacturing

Capacity: ~ 1000 m³

Jiangxi manufacturing

Capacity: ~500m³

Yuyang manufacturing

Capacity: ~600m³

Shanghai API R&D Center

Lab number: 30+, area : 7000m²+
R&D personnel : 400+

Shanghai DP R&D Center

Lab number: ~20, area: ~3000m²
R&D personnel: 100+

Shanghai manufacturing

Capacity: ~100m³

Chongqing DP R&D and manufacturing Center

Lab number: ~10, area : ~1145m²
R&D personnel : 84+

Chengdu API R&D Center

Lab number: 9, area : 3100m²+
R&D personnel : ~92

Porton Advanced (subsidiary)

Biologics R&D, Manufacturing

02

Leading Technology Platform



Members of the Porton Scientific Advisory Board



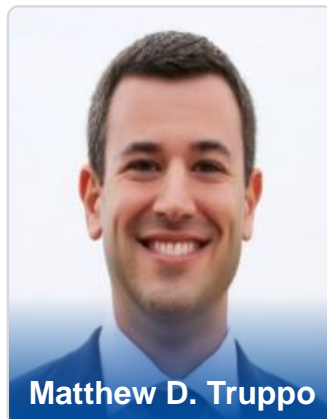
Dr. Yongkui Sun

- Chairman and founder of IONOVA Life Science
- Member of the US National Academy of Engineering



Dr. Lizhu Wu

- Researcher of Technical Institute of Physics and Chemistry
- Academician of Chinese Academy of Sciences



Matthew D. Truppo

- Global Head of Research Platforms, Sanofi



Dr. Guangsheng Luo

- Professor in the Department of Chemical Engineering, Tsinghua University
- Changjiang Scholar



Dr. Yiqin Gao

- Professor at the College of Chemistry and Molecular Engineering, Peking University
- Changjiang Scholar



Dr. Wenjun Tang

- Researcher at Shanghai Institute of Organic Chemistry
- Chinese Academy of Sciences



Dr. Xiaoguang Lei

- Boya Distinguished Professor at the College of Chemistry and Molecular Engineering, Peking University

Our R&D team is led by industry leading experts and technologists



Feng Shi
Vice President
Small molecule
products division



Yingjun Bai
Vice President
Small molecule
products division



Shanming Kuang
Head of Center for
Pharma
Crystallization
Porton Shanghai



Jiwu Ruan
Senior Director
Molecular Building
Block Division,
Small molecule
products division



Jian Zhao
Vice President
of formulation R&D



Guoqiang Dong
Vice president
of formulation
analysis



Songhe Wang
Director of Biocatalysis



Jusheng Guo
Senior Director
of Fluid Chemistry



Xichun Feng (Photo)
Senior Director
of Fluid Chemistry



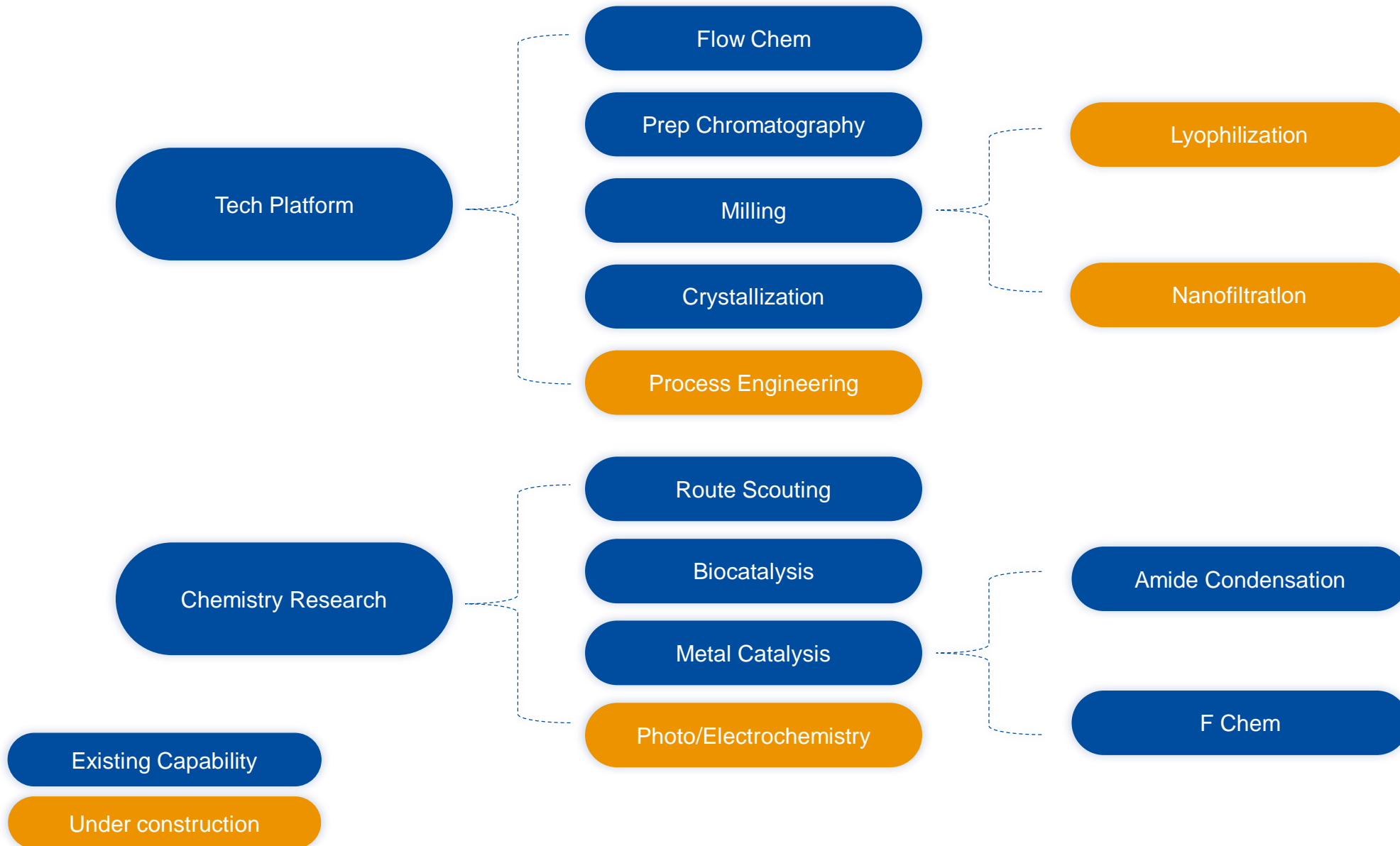
Fei Sheng
Director of
Center for
Pharma Crystallization



Mike Zhou
Vice President of
Manufacturing Operation

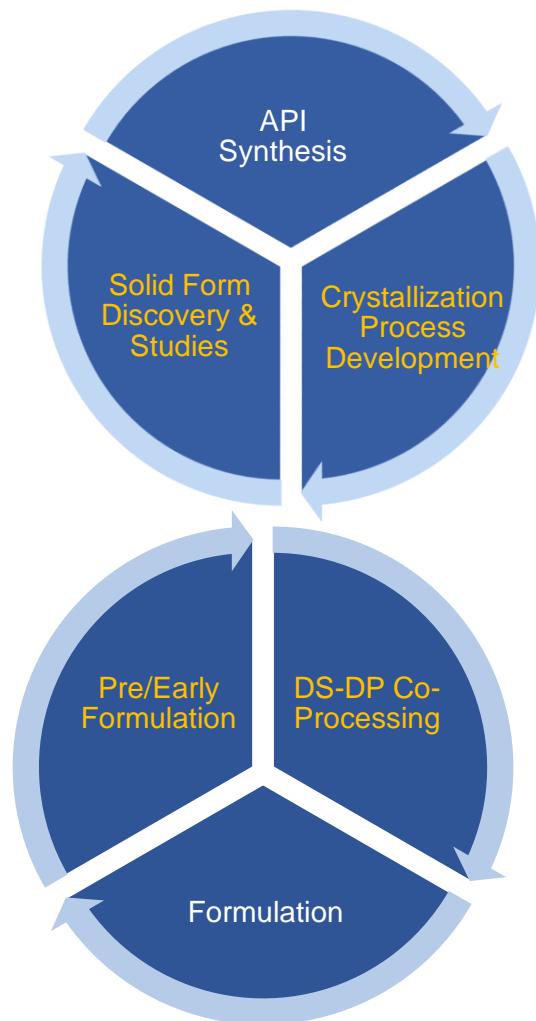


Yingchao Zhao
Formulation R&D
Expert



Capability

- Polymorph study & evaluation
- Salt/cocystal study & evaluation
- Single crystal structure determination
- Crystallization process development
- Commercial production support
- Chiral resolution & scale up
- Solid state characterization
- Pre-formulation development
- Amorphous solid dispersion study
- DS-DP co-processing development



0.05~0.5 g

Screening

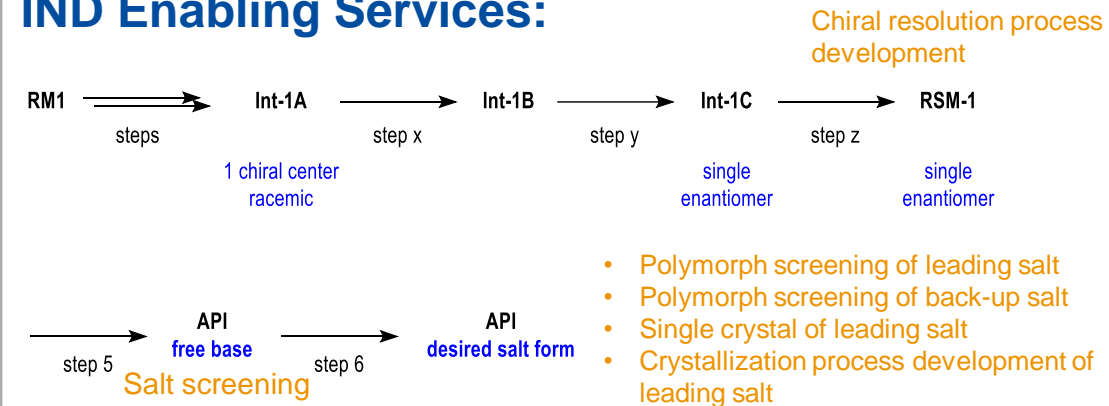
0.5~40 g

Development

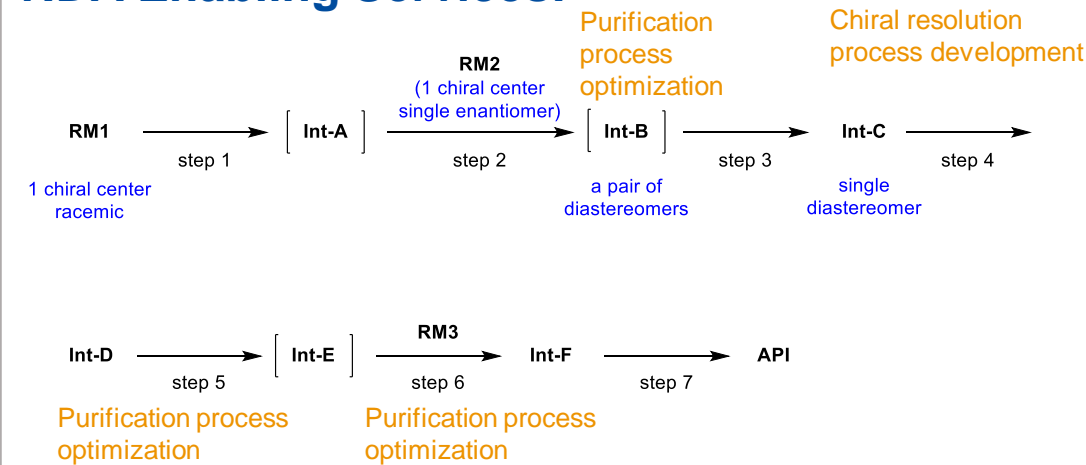
30~400 g (5-100kg)

Processing

IND Enabling Services:



NDA Enabling Services:



Reaction types for HTS

Buchwald-Hartwig coupling

Suzuki coupling

Heck coupling

Negishi coupling

Miyaura type Borylation

Amide Reduction

C-H activation

Ullmann coupling

Sonogashira coupling

Ketone α -arylation

Pd cat. Cyanation

Pd cat. halogen reduction

Carbonylation

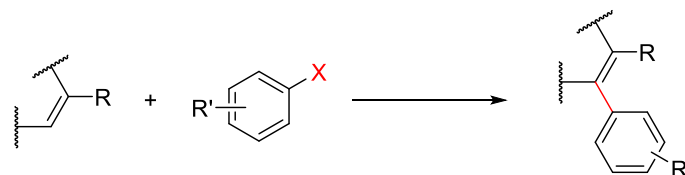
Kumada coupling

Kochi-Furstner coupling

- Low substrate demand (10-30 mg)
- High screening reaction efficiency
- High screening reaction flux (96 conditions/time)
- 90+ metal catalysts, 130+ ligands; Glove box, Genevac, LCMS/HPLC
- Continuing service package include HTS, g-scale demo, reduction of catalyst loading

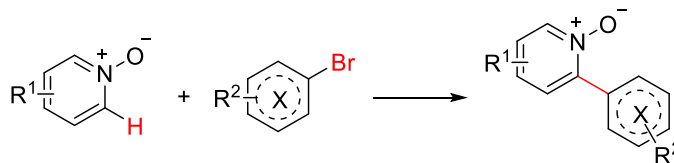


Heck Coupling



- Original: 55% yield
- New: changed catalytic system, 80% yield, 500 Kg of product produced

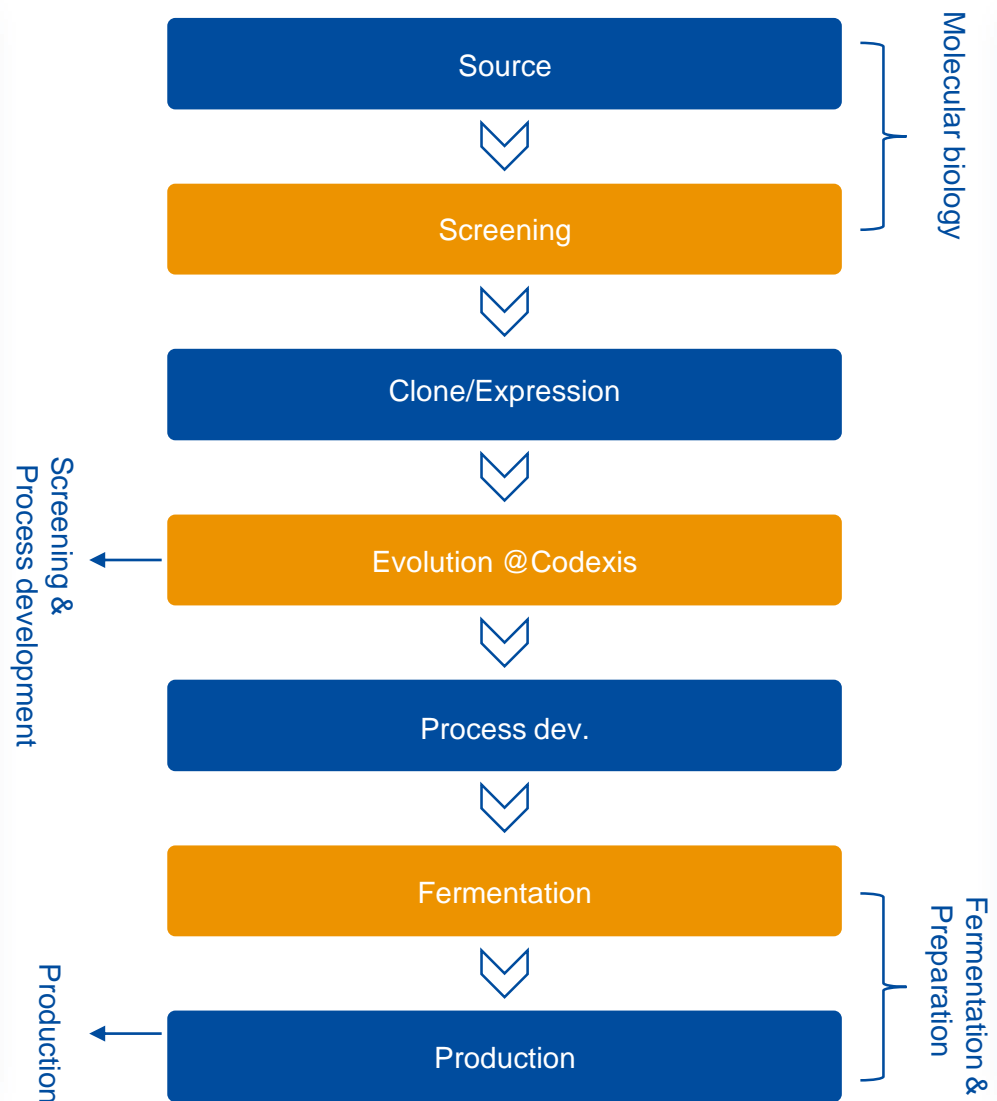
C-H activation



- Original: need one reagent as solvent, Pd deactivated quickly
- New: changed catalytic system, stabilized Pd, used the reagent in stoichiometric quantity, more than 1 ton of product produced

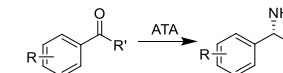
Capabilities

- Enzyme library: 50 types, close to 2000 enzymes, including >1000 on-shelf enzymes from Codexis in 16 types
- End-to-end services from enzyme source to production
- HTS, 1wk/round
- Evolution collaborated at Codexis
- 5~300 L fermentation facility
- ~80 kg cell lysate/week to support hundred kg compound production (empirically)
- Protein residue analysis



Selected cases

➤ Chiral amine preparation



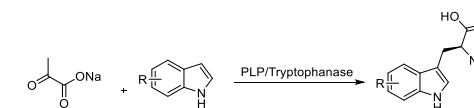
- Ellman reagent replaced by ATA
- Two steps less
- Overall yield improved by 100+%
- Cost down by 40+%
- PMI reduced by 60+%

➤ Chiral alcohol preparation



- TP enzyme replaced by Porton enzyme
- Substrate loading improved by 50%
- Reaction time shortened to ~1/3

➤ Noncanonical amino acids preparation



- Material cost down by 60+%
- Production cost down by 50+%
- Yield improved by 100+%
- PMI reduced by 50+%

Main Service

- Enables flow chemistry technology transfer from the custom to Porton for the production.
- Provide the flow chemistry from R&D POC(Proof of concept) to kilo demo batch and to pilot and commercial production.
- Could perform the FTE service for the specific reaction that custom want to apply flow chemistry

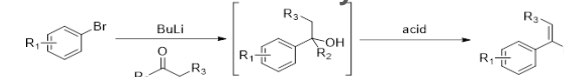
Capability

Reaction type/workup process	Production(scale)
Nitration	(60-1,300kg)
Sodium azide reaction	(1-50kg)
Ozonolysis	(1-40kg)
Hofmann rearrangement	(70kg)
Lithiation reaction	(1-2500kg)
Iodination	(1-50kg)
Bromination	(1-100kg)
Organic azide reaction	(350kg)
Oxidation by H ₂ O ₂	(200kg)
High temperature & high pressure	(20kg)
Liquid-liquid separation	(1-2500kg)

Selected cases

- Telescoped**

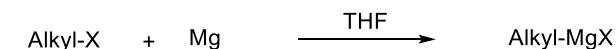
Lithiation/Addition/Dehydration



- 2 reaction steps in series by flow (lithiated and addition reaction + elimination reaction)
- Productivity: consume 100kg substrate per day, overall scale 2.5 metric tons product



- Continuous Grignard reagent preparation**



- Continuous magnesium turnings addition
- Continuous magnesium settle and filtration
- Productivity: consume 20kg Mg per day, overall scale 300kg product
- Stable Grignard concentration could do the next step directly



Photochemistry

- 8- to 96-well screening plates
- Corning G1 reactor for scale-up
- Various light source including mercury lamp and LED, covering UV, purple, blue, green and white light from 254 to 520 nm
- 30+ organic dye catalysts
- Ni and Cu catalysts shared with metal catalysis group



Exploration



Screening



Process dev.



Production

Electrochemistry

- Power source: switchable mode potentiostat, constant current/potential mode.
- Multi functional electrochemical workstation: performing cyclic voltammetry experiments.
- Electrodes: metal and carbon materials, including more than 10 materials.
- Electrolytic cells: one chamber cell and divided cell
- 10+ electrocatalyst



Preliminary successful cases

Borylation



Halogenation



Hydro-dehalogenation



Decarboxylative Coupling



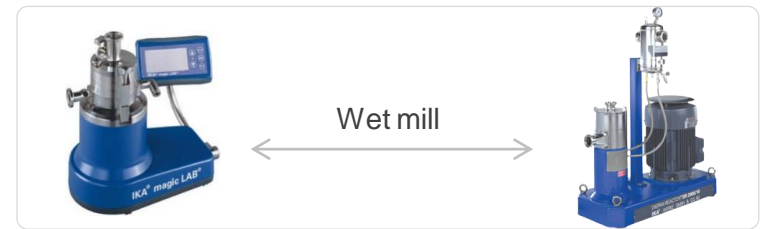
Isomerization of Alkenes



Reductive Coupling



Ring reduction



- Safety test
- Powder characterization method development, transfer and validation
- Selection of milling technology
- Milling feasibility study

- Milling parameters or conditions screening
- Operating window screening study and Design of Experiment (DoE) study
- Particle size control strategy

- Non-GMP/GMP milling production (covers D_{90} from <10 to $\sim 400 \mu\text{m}$)
- Process improvement, optimization & validation
- Production troubleshooting



Algorithm-driven innovative AI pharmaceutical R&D company

Jointly promote the provision of "computing + experiment + process development and manufacturing", a brand-new drug design and solid-state R&D and process development and manufacturing services for global customers, committed to improving drug R&D and manufacturing efficiency



Specialized in protein engineering technology development with world-leading biocatalytic technology

Porton has been authorized with its worldwide exclusive CDMO to introduce its advanced technology, providing comprehensive biocatalytic solutions to global pharmaceutical companies



World-leading provider of process control solutions

Enhance the safety, flexibility and reliability of manufacturing with the help of Honeywell's stable manufacturing operation and management system and digital technology, and improve the project delivery level with more convenient, transparent and compliant manufacturing management process

03

Excellent Operating
Systems

Integrate global resources to provide customers with products in line with international standards

Manufacturing

APIs and intermediates GMP
commercial manufacturing

Product lifecycle
management

Development and application of
biocatalytic technology

Second generation process development or
continuous improvement

Highly potency compound synthesis

Development and scale-up of
continuous flow chemistry

Manufacturing Facilities

YuangYang Site, Hubei

RM Site, 580m³

Acquired in Aug. 2021



Changshou Site, Chongqing

Main Site, 821.94m³

cGMP Main Site

Close to Chongqing R&D Center
Mini-plant, Pilot Plant & Commercial
Plant GMP Int. & API Manufacturing,
GMP Hydrogenation

✓ USFDA, PMDA, WHO and EMA Inspected

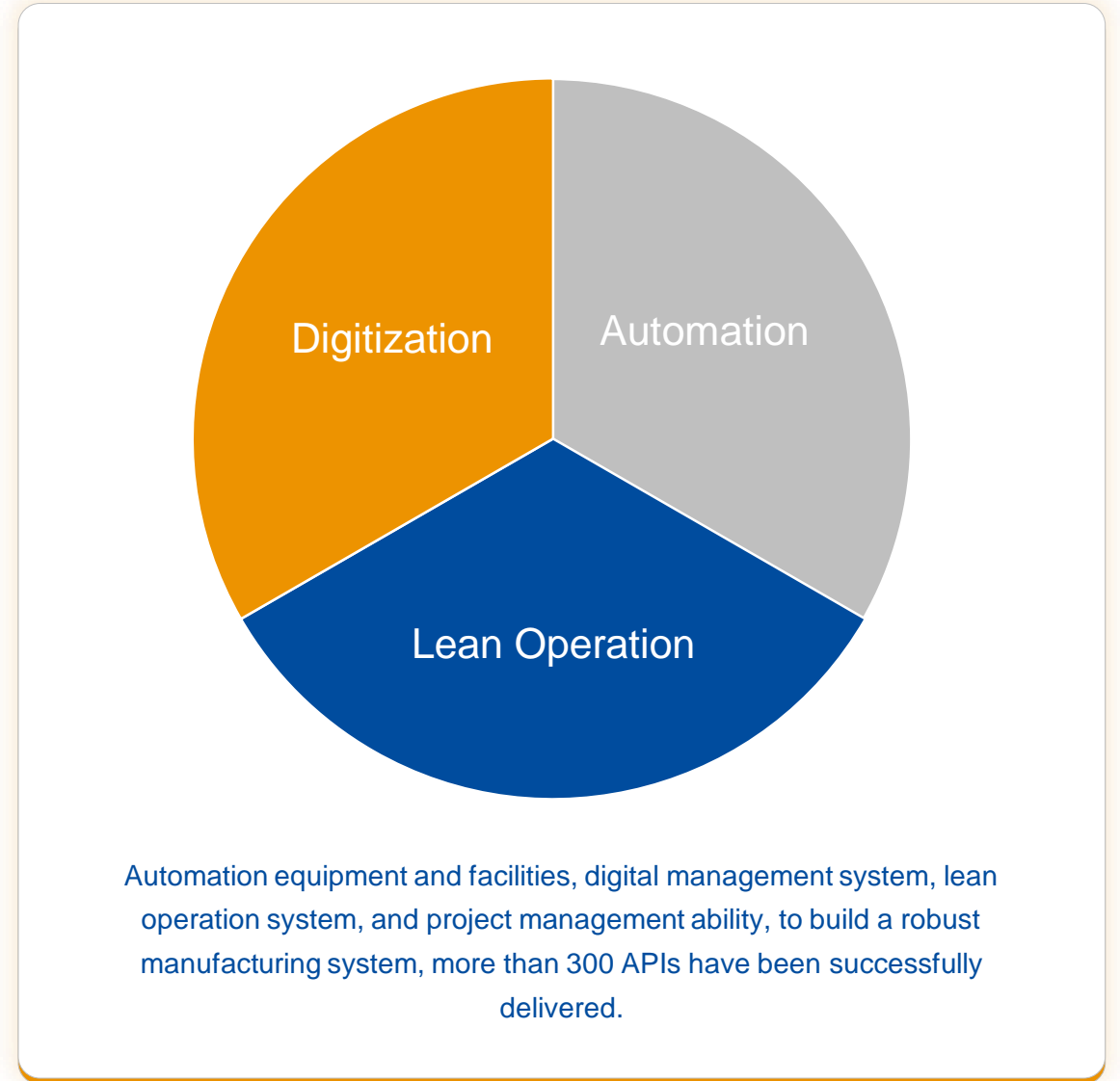
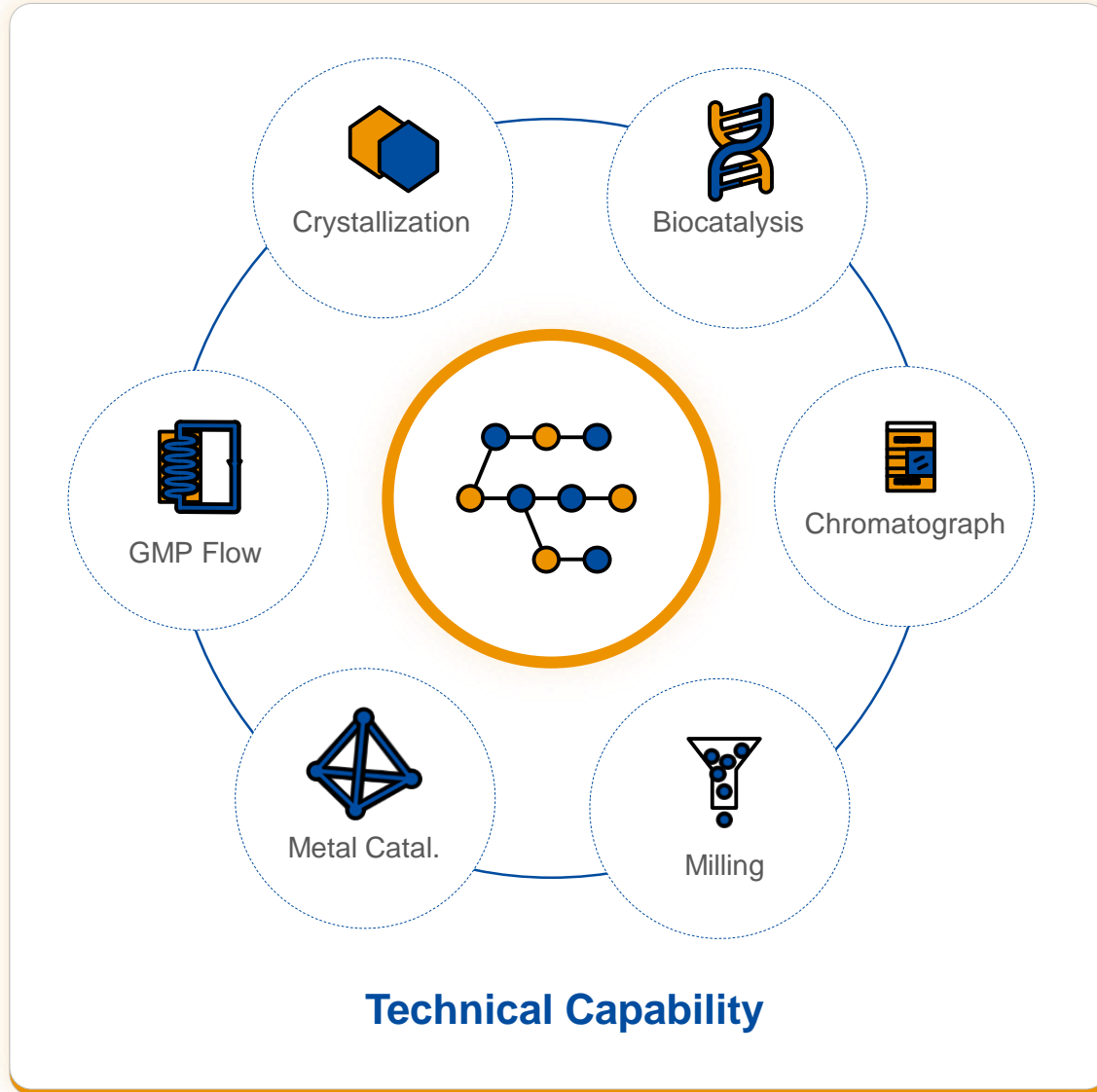
Dongbang Site, Jiangxi

RM Site, 497m³

Acquired in Jul. 2015

ISO Authorized
Back-Integration Site for
Economical Raw Materials





Our facilities operate under full compliance to first-class international standards

Pre-clinical/Clinical stage

Focus: risk management
Ensure high quality delivery

Commercialization stage

Focus: lifecycle management
Continuous iterations of process improvement

ICH Compliance

NMPA
国家药品监督管理局
National Medical Products Administration

2014

FDA 4 times

Since 2015

Pmda

2017

EMA

2019

World Health Organization

2021

AUDIT Over 200 times

Since 2009



Recognized by global customer supply chain awards



Janssen Global
Supplier Bronze
Award



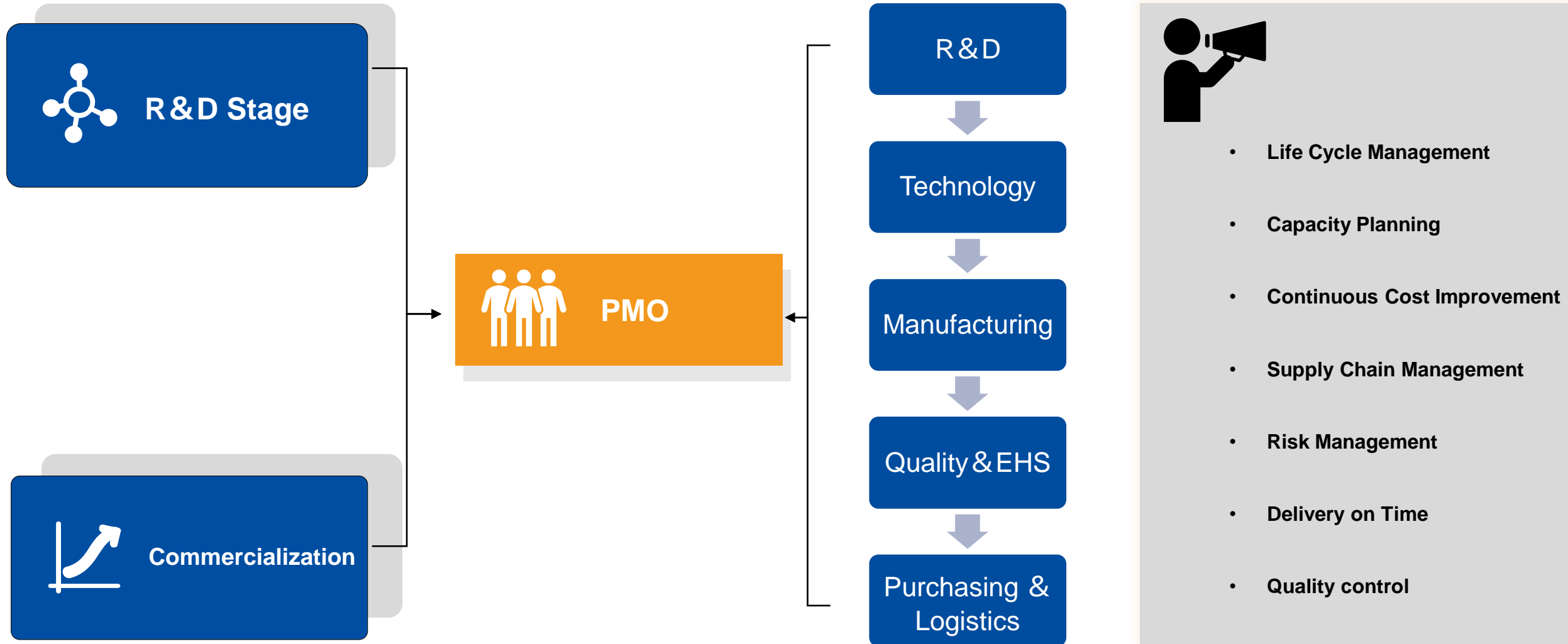
CDMO Award from
Roche



Janssen Global
Supplier Excellence
R&D Award



CMO Leadership
Award by *Life
Science Leader*

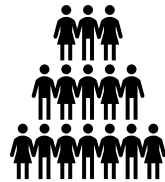


Quality Systems

Quality system strictly following ICH guidelines



500+ quality system personnel, accounting for 13% of total employees



Smart Manufacturing Digital System (SMDS)



20+ Quality culture establishment



Inspection Records

NMPA
国家药品监督管理局
National Medical Products Administration

2019



2018



2020

EMA

2019



2013/ 2015/ 2016/ 2019

60+ customer quality audits per year



On-site audit



online audit

Physical Security

- Site perimeter monitoring
- Critical area monitoring
- Controlled access of secured areas
- Document control systems
- IT infrastructure control systems

Information Assets & Network Security

- Multi-tier data management with access restriction
- External information security management
- Approval systems for data access & sharing
- Audit tracking

Third-Party Security

- Thorough project risk assessments
- Supplier audits
- Contract management
- Ongoing third-party support services

Human Resources Security

- Employee background check
- Intellectual property tracking

data presentation



100%

Employee annual physical examination coverage rate



~60 hours

Average hours of safety training



73 Times

Various emergency drills

System overview

Process safety: Based on the 14 elements of process safety promulgated by OSHA, the process risk of the device is assessed through the combination of HAZOP + LOPA qualitative + semi-quantitative analysis methods.

Environmental protection: Proton always implements the concept of green chemistry, proposes corresponding solutions while managing the process, and develops and implements effective treatment for the generated pollutants at the end of the production process.

The overall system maturity is currently at level 4 with a mature risk management and control system



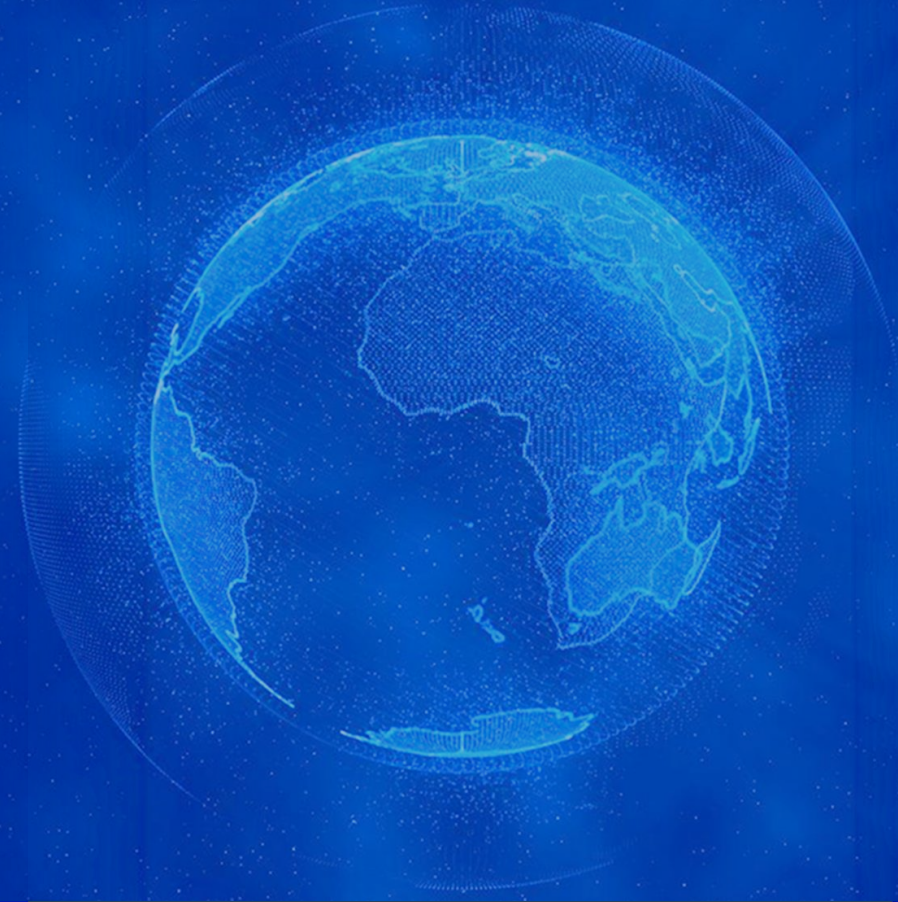
- Follow the best practices of the global pharmaceutical industry to establish an EHS management system
- Successfully **passed 80+ EHS special audits**, including **9 global Top20 pharmaceutical companies**

Solving Complex Problems
through a **Robust** Internal
R&D and Quality System

First Class & Consistent
Customer Service

Value Creation via
Innovation and
Discovery through
Technical Platforms

To be the most open, innovative and reliable pharmaceutical platform in the world



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Enabling public's early access to good medicines