



APELOA

Pharmaceutical CDMO

Dec 2024

Technology for Health

APELOA Overview



At Apeloa, part of the Hengdian Group, one of China's largest private enterprises, we are committed to delivering high-quality APIs, Intermediates and Regulatory Starting Materials (RSMs) from R&D to GMP commercial-scale production



\$1.7 B revenue

2024 milestone

7,000+

Employees

36 years

Founded

8 manufacturing sites

cGMP, ISO9001, ISO14001,
OSHAS18001

4 sites passed



3 sites passed



2 sites passed





Technology for Health

1989



Start-up

Listing



2001

2012



Restructuring

Management Integration



2017

2020



Development Focus

Global Expansion



2023

Confidential ● ● ●

What APELOA is doing



**API &
Intermediates**



CDMO



FDF



**Aesthetic &
Care Ingredients**



CDMO Manufacturing sites



Shandong Tospo (ISO)

RSM, Int.
Area: 300,000 m²
Capacity: 642 m³



Shandong Hanxing (ISO)

RSM
Area: 533,330 m²
Capacity: 5,378 m³



Anhui Apeloa Biotech (cGMP)

RSM, Int., API
Area: 583,000 m²
Capacity: 1920 m³



Zhejiang Biotech (cGMP)

RSM, Int., API
Area: 141,000 m²
Capacity: 3232 m³



Zhejiang Apeloa Jiayuan (cGMP)

RSM, Int., API
Area: 250,533 m²
Capacity: 4364 m³



Zhejiang Apeloa Tospo (cGMP)

RSM, Int., API
Area: 166,500 m²
Capacity: 632 m³



Zhejiang Apeloa Kangyu (cGMP)

RSM, Int., API
Area: 408,700 m²
Capacity: 1,449 m³

CDMO R&D Centers



Hengdian Zhejiang - CHINA

80,000 sq ft
250+ chemists
Lead optimization / Process / CMC



Pudong Shanghai - CHINA

64,000 sq ft
300+ chemists
Screening / Library / Process



Boston - USA

17,000 sq ft
30+ chemists
Tech Development Platform



Commercial

Phase III

Phase II

Phase I

Preclinical

Discovery

Capacity



Chemical Synthesis

Total Capacity
11,000 m³

Reactor Size
50 - 45,000 L

APIs
4,000 MT / year

Intermediates
38,000 MT / year

Bio-Production

Total Capacity
6,570 m³

Reactor Size
50 - 120,000 L

APIs
2,000 MT / year

Intermediates
2,000 MT / year

Technology Platform: FLOW CHEMISTRY

Full life-cycle services from lab to production



+ 10 years project experience

Over 30 dedicated FTEs
(R&D, Production)

+ 20 types of reactions

Fluorination
Oxidation
Nitration
Hydrogenation
Azidation
Ozonation
Organolithium
Photoreaction Addition

from g to Kg scale

CAPABILITY	
T	-78 ~ 250°C
P	-0.1 ~ 5x10 ⁶ Pa



Continuous Process

Green

Safe

Economic

Fast

Flexible

Technology Platform: SYNTHETIC BIOLOGY & ENZYME CATALYSIS



Strain platform

Strain improvement and optimization

Fermentation

Fermentation process optimization

Separation

DSP optimization

Biotransformation

Enzyme screening, evolution and process optimization

**Process development
(1-3 months)**

**Pilot test
(1-2 months)**

**Manufacture
(1 month)**

Capabilities

- Plasmid construction, multi-component gene assembling
- Gene knock-in/knock-out, gene overexpression
- Transcription factor, RBS & promoter engineering
- Various microbial chassis, including *Escherichia coli*, *Streptomyces* spp., *Pichia pastoris* & *Saccharomyces cerevisiae*
- Strain acclimatization & rejuvenation
- Strain mutagenesis & screening
- High-throughput screening

Recent case studies

- Gene replacement in a streptomyces to eliminate a prominent impurity in the fermentation process;
- Screen and engineer a strong promoter for a PKS gene cluster in a fermentation strain to enhance the production titre by 20%;
- Overexpression of certain limiting genes to enhance the metabolic flux to a desired product, which increased fermentation titre by 10%;
- Development of CRISPR-based approaches for the construction of plasmid-free recombinant strains.



Technology Platform: HIGH POTENCY APIs

APELOA

- Auto temperature and pressure control
 - DCS and dedicated HEPA
- Bay segregation:
 - Suitable containment
 - 6 bays for RSM/Intermediates and APIs
 - Dedicated waste treatment
- 400 m² HP lab for trial & testing

OEB 4

Large reactor area
(Exposure value: < 0.5 ug/m³)

2,000 L ~ 10,000 L GL reactors



- Total reactor volume: **75 m³**
- 35 reactors, 3 sets distillation units
- Filter drier: 6 - Conical drier: 1
- Prep-HPLC: DAC 100, DAC 150, DAC 300
- Lyophilizer: 0.5 m², 1 m², 5 m²
- Jet mill, Hammer mill and Wet mill

OEB 5

Small reactor area
(Exposure value: < 0.05 ug/m³)

20 L ~ 1000 L Glass/GL reactors



Technology Platforms: TPD/PROTAC – Peptides – ADCs



TPD/PROTAC

80+ PROTAC focused FTEs

Strong analytical and ADME capability

One-step conjugation with POI Binders

Flexibility with US-China sites

ADCs – Payloads & Linkers

Dedicated team with 30 scientists

Linkers/toxins/payloads preparation under cGMP condition

Flow chemistry process for hazardous reaction

Peptides



Synthesis



Purification



Lyophilizer



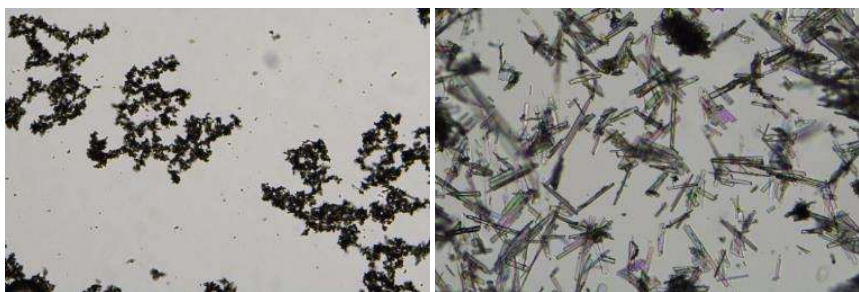
Analysis

Dedicated team with 20 scientists

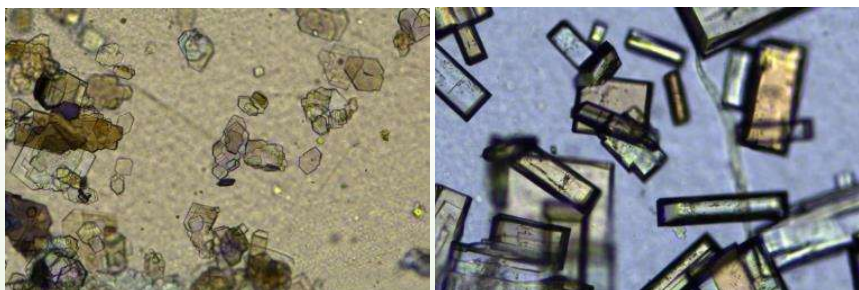
LPPS & SPPS (up to 100 kg scale)

Amino acid analysis and enantiomeric purity

Technology Platform: CRYSTALLIZATION & SOLID-STATE SCREENING



Morphology and impurity control



Polymorph control



Platform Function

Early solid form screening: salt, cocrystal, polymorph, solvate

Pre-formulation study

Fast fit-for-purpose crystallization development,
crystallization optimization and scale-up

Chiral resolution via crystallization

Solid-state attributes control

ESG System at APELOA

Sustainability & Decarbonization

✓ Laws & Regulation

Under ISO14000, ISO45001, OSHAS18001

✓ EHS Facility

Waste water treatment capability : **50,000** MT/day

RTO for waste gas treatment : **30,000** m³/h

Waste-to-energy: **75** MT/day

Expense in EHS: **>\$80** Million/year

✓ Audits

12 ESG audits from client in 2023

248 supplier EHS & quality audits in 2023

✓ Empowering our community

>\$2 Million donation during Covid-19 pandemic

Yearly sponsorships for **>600** elderly people & **>60** juveniles

✓ Tackling climate change

Exploring green technology and renewable energy adoption

Measuring GHG emission and energy consumption



"Reaction Basis" EIA/SIA permit for CDMO manufacturing platform



Mission

Enabling global clients in expediting the delivery of affordable medications