

CatLab \Rightarrow Advanced catalysis services

Life Science Technologies | Catalyst screening, reaction optimisation, and custom catalyst manufacturing at scale.



Catalyst screening and hit identification

Expand your catalyst screening capabilities to select the optimal catalyst

Advanced catalyst collection

CatLab offers an evolving, advanced catalyst and enzyme collection and expert support across multiple technologies.

Our extensive catalyst collection draws on JM's leading in-house portfolio, commercially available options, novel catalysts developed by our team, contributions from academic and literature sources, and bespoke enzyme recruitment.

Technical collaborators and project experience

Each collaboration begins with a tailored proposal from our technical experts. We assess feasibility and define success criteria based on longstanding experience.



Trusted by 300+ customers across industries.



Experience with a broad range of transformations.



Over 20 years of experience.

Heterogeneous catalysts

C=O, C=N, C=C, C≡C, aromatic and heterocyclic reductions, hydro-dehalogenations, N and O deprotections, nitro reductions, dehydrogenations

Homogeneous catalysts (coupling)

C-C (Suzuki, Heck, Negishi, Sonogashira), C-N (Buchwald-Hartwig), C-O, C-B bond formation, reductive carbonylations, cyanations, alkoxy-carbonylations, C-H activation, photocatalysis

Biocatalysts

C=O and C=N reductions to access chiral alcohols and chiral amines, C=C reductions, nitro reductions, cascade reactions, dehydrogenations

Chiral and achiral homogeneous catalysts (redox)

C=O, C=N, C=C chiral and achiral reduction, pressure and transfer hydrogenation, hydroformylation, ester hydrogenation, borrowing hydrogen reactions

Testing and analytical capabilities

- Screening capabilities: Small scale (<1 mL – 5 mL) to mini reactors (25 mL – 2 L).
- Reaction conditions: Low to high pressure with reactive gases (H₂, CO) along with bespoke requests.
- Chemistry handling: Including highly potent APIs or toxic compounds with advanced containment technologies.
- Analytical capabilities: NMR, GC, GCMS, HPLC, UPLC, LCMS, SFC, KF, DSC – including method development and side-product identification.

Process understanding and reaction optimisation

Improve the cost efficiency and scalability of your process

Efficient catalytic processes are the key to reducing costs, improving selectivity, and ensuring reliable scale-up. Our experts work with you to refine every aspect of your transformation, delivering performance and value at every stage.

Lower costs by optimising catalyst use

- Reducing catalyst loading, maximising yield and selectivity.
- Identifying optimal conditions, solvents, and temperatures.
- Applying cost modelling to determine the most efficient catalyst usage.

Greater selectivity for enhanced efficiency

- Obtaining critical scale-up insights such as quality of feedstock impact and mass transfer requirements.
- Kinetic modelling to understand reaction rates, catalyst inhibition, and/or deactivation.
- Characterisation of side products to support reaction optimisation.

Scalable success from lab to production

- Testing capabilities include parallel and stand-alone reactor studies, detailed kinetic studies and catalyst fate studies to guide removal strategies and metal recovery.
- Metal distribution mapping to support refining and purification.
- Proven track record of solving complex scale-up challenges.



Custom catalyst manufacturing

Delivering scalable catalyst solutions tailored to your process

When off-the-shelf catalysts don't meet your performance needs, we help you unlock new possibilities through custom development and scale-up.

Whether you're working with promising early-stage hits, small-quantity literature catalysts, or next-generation technologies, our team can support you in transforming these into commercially viable solutions.

Custom catalyst development and commercial scale manufacturing



Custom development

JM develops and manufactures bespoke catalysts, both metal-based and enzymatic.



R&D across technologies

Dedicated R&D teams span a range of catalytic technologies and are experienced in designing, developing, and optimising custom catalysts for demanding applications.



Catalyst manufacturing

Complex metal catalysts, ligands, and enzymes from lab-scale to our global production facilities.



Metal management

A range of financial methods to purchase platinum group metals securely and transparently.

Partner with Johnson Matthey's Life Science Technologies team to access advanced catalyst services and world-class technological expertise.







Why partner with Johnson Matthey Life Science Technologies?

Integrated catalysis expertise through JM's CatLab services, supporting projects from early development to scale-up.

- Experts in developing and optimising catalytic processes for pharmaceutical, agrochemical, and fine chemical companies.
- Proven track record across 300+ clients and complex transformations.
- Global footprint with facilities and tech transfer routes worldwide.

Let's deliver the catalyst you need



Contact us to start optimising your process.
Scan here for additional information or email
us at pharma@matthey.com