



EnginZyme

Enabling the future of green chemical manufacturing

EnginZyme, leading the way for a green chemical industry

EnginZyme was founded in 2014 with the vision that all of our everyday products are sustainably produced by unlocking the potential in enzymes. By replacing traditional fossil-based manufacturing with its technology platform, EnginZyme seeks to play a key role in solving one of the fundamental challenges of our time – how to produce better, greener, and affordable products that we use every day.

Its cell-free biomanufacturing platform combines the power of nature with the efficiency of the chemicals industry by leveraging engineered, immobilised enzymes. It overcomes the limitations of fermentation and promises increased productivity at lower costs, enabling better, greener, and cheaper products for everyone.

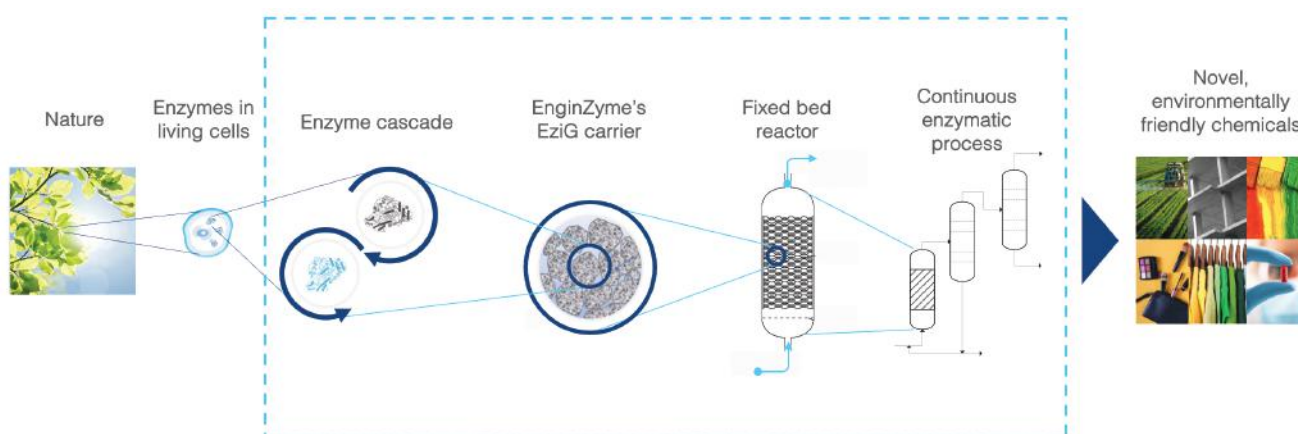
Composed of a multidisciplinary team of experts in biocatalysis, organic chemistry, enzyme and process engineering, automation, AI, and machine learning, EnginZyme has facilities for complete research and process development incorporating a high degree of automation for fast, accurate development. EnginZyme is utilising its technology platform to develop biocatalysts and bioprocesses for products in personal care, nutrition/nutraceuticals, and bio-based chemicals to be licensed or brought to market in collaboration with key chemical industry partners.

Replacing fossil fuel with a green, efficient alternative

EnginZyme's solution harnesses the power of biology without needing the cell itself and all the complexity that goes along with it. It combines the efficiencies of the existing chemical industry with the sustainability of utilising biology in a cost-efficient technology platform, to unlock the potential of biological solutions for the production of chemicals.

Driving the next generation of synthetic biology is the use of enzymes, the workhorses of fermentation, without the limitation of being inside cells. EnginZyme's cell-free synthetic biology solution mimics nature by utilising enzymes, single or cascades, and transforming them into workable inefficient chemical processing solutions, resulting in maximum efficiency and sustainability. This technology platform gathers what is needed to enable bioprocessing to become scalable, economical, and robust to compete with the traditional, bespoke technologies used by the chemical industry today.

The EnginZyme cell-free synbio technology



The EnginZyme solution

Four key capabilities make EnginZyme's solution unique:

1 Stable heterogenous multi-reaction (cascade) catalysts:

EnginZyme combines a series of enzymes out of the cell and immobilises them on its proprietary technology EziG. Enzymatic cascades are sequences of successive enzymatic reactions where the product of the preceding reaction is consumed in the following reaction. By employing a series of enzymes, it is possible to synthesise products from complex reactions. When improving the enzymes, the focus is on increasing the stability of the biological catalyst system, enabling extensive reusability which has the most significant impact on operating cost. Combined with immobilisation using our proprietary platform, the result is a bespoke, heterogeneous catalyst similar to what is already well understood by the chemicals industry.

2 Automation:

Automation is core to all activities at EnginZyme. EziG's inherent density makes it possible to easily distribute 96 well plates. The "generalness" of EnginZyme's solution allows the use of robotics and automation, HT screening, multifactorial analysis, and machine learning. The capability of repurposing any biocatalyst in an automated manner makes enzymatic catalyst development faster than ever before. Its applicability throughout every development step enables fast, repeatable results from multi-variable screening.

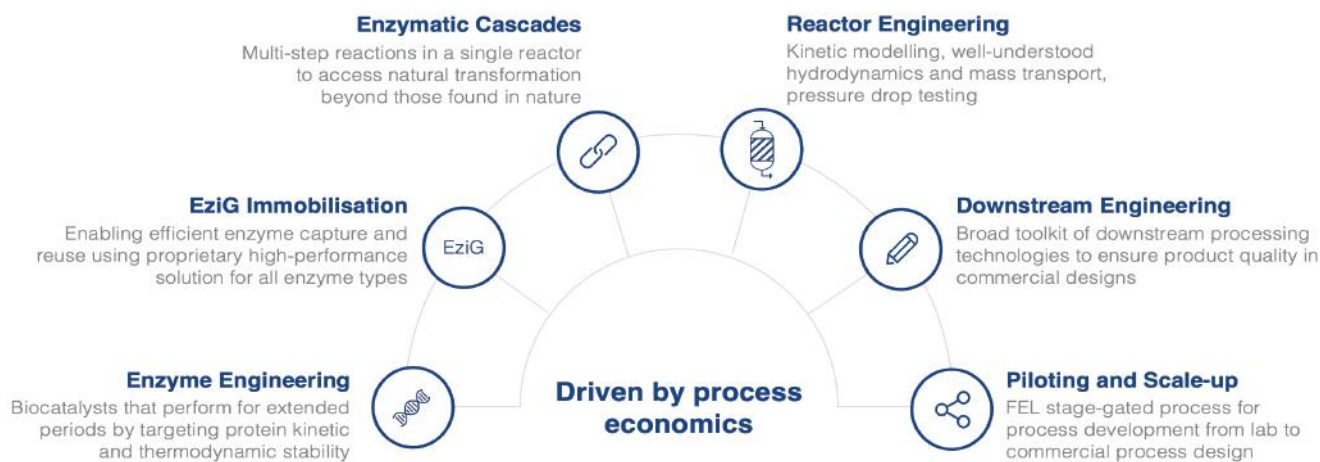
3 Continuous operation:

The EnginZyme immobilisation technology allows the utilisation of biocatalysts in continuous operation. This is standard within the industry and is compatible with most of the current infrastructure, enabling easy and reliable production scale-up. The use of flow chemistry adds inherent benefits such as higher throughput and increased quality with lower energy consumption.

4 Process engineering and scale-up:

Contrary to many companies designing enzyme solutions, EnginZyme does not only focus on the performance of the catalyst but will evaluate and design a complete process solution from starting material to product, encompassing reaction kinetics, purification modelling, economic evaluation, and lab validation. By working closely with the enzyme engineering and catalyst development teams, the process engineering team can influence the screening of the biocatalyst, enabling the design for the optimal economic solution without unnecessary iterations. By designing with the end commercial solution in mind, the scale-up of the process will be faster with mitigated risk.

A holistic approach to enzymatic biomanufacturing process development



We're looking for partners!

EnginZyme actively seeks partnerships to scale up and commercialise processes for visionary and innovative companies. Contact business@enginzyme.com for more information.

About EnginZyme

EnginZyme seeks to solve one of the fundamental challenges of our time; how to produce chemicals, foods, materials, and other products that modern society relies on, in a truly sustainable way. Its technology platform utilises nature's catalysts, enzymes, by combining the power of biology with the efficiency of the chemical industry in a best-of-both-world solution. EnginZyme was recognised as a Technology Pioneer by World Economic Forum in 2021 and is backed by Sofinnova Partners, Industrifonden and SEB Greentech VC. To learn more, visit www.enginzyme.com.