



FLASH NEWS

No. 53-2022 – THE BIOTECH INDUSTRY INTELLIGENCE REPORT

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1. EQUIPMENT & TECHNOLOGY

Biocatalysis/Bioconversion

4020 - Nuclear magnetic resonance (NMR) spectrometry used to better understand how PET depolymerisation enzymes work.

In partnership with [Toulouse Biotechnology Institute](#) (TBI), Carbios, the company specialising in the enzymatic recycling of plastic and textile polymers, published a scientific article describing the use of nuclear magnetic resonance (NMR) spectrometry to study the thermal stability of PET depolymerisation enzymes and the enzyme's adsorption mechanism. According to Guy Lippens, Ph.D. CNRS Director of Research and co-author of the article: *'NMR is an extraordinary biophysical technique for visualizing an enzyme directly in solution. Our study is the first to use NMR as a complementary technique to crystallography and molecular modelling to observe a PETase. This gives new perspectives to better understand the functioning of these enzymes and it makes it possible to imagine new ways of improving these enzymes.'* This innovative approach, which took months of development, opens new pathways for the enzymatic recycling of plastics and textiles.

Publication: An NMR look at an engineered PET depolymerase. Journal: Biophysical Journal. DOI: 10.1016/j.bpj.2022.07.002.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4021 - Recycling plastics using enzymes: new enzymatic engineering platform developed by directed evolution, new enzyme created.

Researchers from [Manchester Institute of Biotechnology](#) (MIB) have developed a new enzymatic engineering platform capable of quickly enhancing the properties of enzymes that degrade plastic, in order to make them better at recycling plastics on a large scale. Their integrated, automated platform can successfully assess the plastic degradation ability of around 1,000 enzyme variants per day. To test their platform, they went on to develop a new enzyme, HotPETase, through the directed evolution of IsPETase. IsPETase is a recently discovered enzyme produced by the bacterium *Ideonella sakaiensis*, which can use polyethylene terephthalate (PET) as a carbon and energy source. While IsPETase has the natural ability to degrade some semi-crystalline forms of PET, the enzyme is unstable at temperatures above 40 °C, far below desirable process conditions. This low stability means that reactions must be run at temperatures below the glass transition temperature of PET (~65 °C), which leads to low depolymerisation rates. To address this limitation, the team developed a thermostable enzyme, HotPETase, which is active at 70 °C, which is above the glass transition temperature of PET. This enzyme can depolymerise semi-crystalline PET more rapidly than previously reported enzymes and can selectively deconstruct the PET component of a laminated packaging material, highlighting the selectivity that can be achieved by enzymatic recycling. Moving forward, researchers are hopeful their platform will prove useful for developing more efficient, stable, and selective enzymes for recycling a wide range of plastic materials.

Next step: work together with engineers specialising in process engineering, as well as scientists specialising in polymers to test HotPETase in real-world applications.

Publication: Directed evolution of an efficient and thermostable PET depolymerase. Journal: Nature Catalyse. DOI: 10.1038/s41929-022-00821-3.

More information: [Manchester.ac.uk](#)

En savoir plus : [Chem Europe.com](#)

Synthetic biology

4022 - A step towards *Escherichia coli* (*E. coli*) strains with greater phage resistance?

A team made up of researchers from the School of Pharmaceutical Sciences at Wuhan University (China), the First Affiliated Hospital of Shenzhen University (China) and the [Korea Advanced Institute of Science & Technology](#) (KAIST) Department of Chemical and Biomolecular Engineering has successfully developed *E. coli* strains with much greater phage resistance, potentially reducing fermentation failure. To do so, the team developed a new type II single-stranded DNA phosphorothioation (Ssp) defence system derived from *E. coli* 3234/A, which can be used in multiple industrial *E. coli* strains (e.g., *E. coli* K-12, B and W) to provide broad protection against various types of coliphages. Furthermore, they developed a systematic genome engineering strategy involving the simultaneous genomic integration of the Ssp defence module and mutations in components that are essential to the phage life cycle. This strategy can be used to transform *E. coli* hosts that are highly susceptible to phage attack into strains with powerful restriction effects on the tested bacteriophages. This endows hosts with strong resistance against a wide spectrum of phage infections without affecting bacterial growth and normal physiological function. More importantly, the resulting engineered phage-resistant strains maintained the capabilities of producing the desired chemicals and recombinant proteins even under high levels of phage cocktail challenge. The team's work provides a systematic solution for engineering phage-resistant bacterial strains, especially industrial bioproduction strains, to protect cells from a wide range of bacteriophages. Considering the functionality of this engineering strategy with diverse *E. coli* strains, the strategy reported in this study can be widely extended to other bacterial species and industrial applications, which will be of great interest to researchers in academia and industry alike.

Publication: Systematic strategies for developing phage resistant *Escherichia coli* strains. Journal: Nature Communications. DOI: 10.1038/s41467-022-31934-9.

More information: [Science Daily.com](#), [Phys.org](#)

Processes

4023 - Fermentation on solid substrate: definition, advantages and applications.

The [Lesaffre](#) Group defines fermentation on solid substrate as a process in which micro-organisms grow in an environment with little to no water available. The fermentation surface or substrate serves as a source of food to the micro-organisms that grow there. It is solid, rather than soluble. Filamentous fungi are the most suitable type of micro-organism for solid fermentation, as this cultivation method reproduces their natural habitat. But bacteria can also be used, in composting for example, as well as yeast to produce ethanol or food. This process can thus be used to produce living micro-organisms as well as enzymes (cellulases, xylanases, proteases) or other molecules of interest. Solid fermentation can also be used to modify the substrate, for example to improve the raw material quality from a functional and nutritional point of view. One of the strengths of this process compared to fermentation in a submerged or liquid environment, is its low environmental impact: the need for water is lesser than in a liquid environment, there are less effluents and less energy is consumed for drying. The process also uses very few chemical products. Historically used to prolong the shelf life of food products and improve their nutritional qualities, fermentation on solid substrate can help tackle challenges related to the environment, energy and even farming. It can be used in health and animal feed applications, as well for human food, especially with the growth of the vegan and meat alternative market. It can also be used to produce biofuel (biodiesel, bioethanol), with the added benefit of lower production costs, thanks to the cheap substrates used. Among the many other applications are bioremediation (the use of micro-organisms to clean up the soil), composting, methanation, carbon capture from the air, fungal leather production for the textile industry, packaging, home insect control, and more. The process can also be used to produce stable biopesticides that do not dry out, for control of parasites and plant disease.

Info: The teams at [Metaspora](#), the [Agrauxine by Lesaffre](#) production site dedicated to producing fungal biomass by fermentation on solid substrate, reproduce this process in the best possible conditions: sterilisation of the substrate, white room, temperature control, etc. The resulting spores are identical to natural spores, and of excellent quality.

En savoir plus : [Lesaffre.com](#)

4024 - Is a local, sustainable alternative to palm oil possible?

This is the question asked by NextVegOil partners, the German research consortium made up of the Universities of Aix-la-Chapelle, Bochum, Düsseldorf and Münster. The partners are looking to develop a biotechnological process to produce a microbial oil similar to palm oil from agricultural waste streams that cannot be used profitably or for food or feedstock for industrial chemical production. In the study, the waste generated from corn harvest is used. To develop their bioprocess, researchers looked at the single-cell fungus *Ustilago maydis*, the pathogen responsible for “corn smut”. They then discovered, then demonstrated at laboratory level, that the fungus is capable of producing oil instead of surfactants, if its synthesis process is interrupted at a precise moment at genetic level. Researchers also discovered that this oil’s fatty acid profile is very close to that of palm oil, which makes it highly promising as a potential substitute product. For the time being, the teams are trying to find optimal parameters for this new bioprocess to be scaled up to commercial level. They must also make sure that the oil produced by this microbial method meets food standards. In the longer term, researchers hope to optimise the fungus’ performance so that the resulting oil better matches the properties of palm oil. In terms of applications, the palm oil substitute could be used in the energy sector to produce biofuel, but also in the agri-food sector, to produce vegan cheese for example. NextVegOil has received approximately €1.1 million in funding from the [Bioeconomy Science Centre](#) (BioSC) for the next three years.

More information: [Hhu.de](#)

4025 - New bioprocess to convert agricultural waste into industrial enzymes and other value-added products.

Researchers from the Madras [Institute of Technology](#) have identified a bacterium called *Bacillus* sp PM06, with a fermentation capacity to hydrolyse very low-cost lignocellulosic wastes without pre-treatment. This bacterium, which has been isolated from sugar cane waste press mud, has been tested on agricultural waste from wheat, sago and rice crops. It has been proven to be most effective on wheat waste.

Publication: Production of multienzymes, bioethanol, and acetic acid by novel *Bacillus* sp. PM06 from various lignocellulosic biomass. Journal: Biomass Conversion and Biorefinery. DOI: 10.1007/s13399-022-02418-z.

More information: [Press release](#)

4026 - Bacteria used to produce energy-dense biofuel.

Scientists from the [Lawrence Berkeley National Laboratory](#), USA, used an extraordinary antifungal molecule made by *Streptomyces* bacteria to develop a totally new type of fuel that has projected energy density greater than the most advanced heavy-duty fuels used today, including the rocket fuels used by NASA. The molecules used for this new biofuel are called POP-FAMEs, for ‘*polycyclopropanated fatty acid methyl esters*’. The structure of these molecules contains multiple triangle-shaped three-carbon rings that force each carbon-carbon bond into a sharp 60-degree angle. The potential energy in this strained bond translates into more energy for combustion. The unusual structure also means the molecules take up less volume, relatively speaking. Having made an inventory of genomes of the *Streptomyces* species bacteria to find those that could be used in rocket fuel, scientists discovered the ‘*necessary ingredients*’ to make POP-FAMEs in the *S.albireticuli* strain. The resulting fatty acids contain up to seven cyclopropane rings chained on a carbon backbone, earning them the name ‘*fuelimycins*’. In a process similar to biodiesel production, these molecules require only one additional chemical processing step before they can serve as a fuel. The simulation data suggest that the biofuel will have energy density values of more than 50 megajoules per litre, compared to 32 megajoules per litre for petrol 35 megajoules for kerosene-based rocket fuel.

The work was supported by the U.S. Department of Energy Office of Science and Office of Energy Efficiency and Renewable Energy.

Next steps: create a process for eliminating two oxygen atoms from each molecule, to add 'dead weight'. Increase the bacteria production efficiency to generate enough for the combustion tests. Study how to modify the multi-enzyme production pathway to create polycyclopropanated molecules of different lengths. In the longer term, find how to use plant waste food sources (like inedible agricultural residue and brush cleared for wildfire prevention), to make the fuel production process completely carbon-neutral.

Publication: Biosynthesis of polycyclopropanated high energy biofuels. Journal: Joule. DOI: 10.1016/j.joule.2022.05.011.

More information: [Press release](#)

En savoir plus : [Chem Europe.com](#), [Fred Zone.org](#), [Netcost Security.fr](#)

Miscellaneous

4027 - The six projects funded by the 3BCAR Carnot institute.

This year, the [Institute](#) has selected 6 projects:

- **METHA-SPRAY project:** Biomethane capture by Absorption and Enzymatic Biotransformation into Droplet Spray. The main aim of the project is to develop biobased technology that can be adapted to different purification systems, with the potential to alleviate the problem of CH₄-heavy gas emissions. The project involves [Laboratoire de Chimie Agro-industrielle](#) (Agro-industrial Chemistry Lab) and [Toulouse Biotechnology Institute](#). It should last 36 months.
- **ZYPO project:** Chemical-Enzymatic Functionalisation of Recalcitrant Synthetic Polymers. The aim of this project is to demonstrate the possibility of functionalising/degrading commodity plastics using fungal metalloenzymes along with chemical catalysis approaches. The project involves [Laboratoire Biodiversité & Biotechnologie Fongique](#) (Fungal Biodiversity and Biotechnology Lab) and [Laboratoire de Chimie des Polymères Organiques](#) (Organic Polymer Chemistry Lab). It should last 24 months.
- **HYPE project:** Synthesis and functionalisation of hyper-ramified polymers from rapeseed oil with high erucic acid content (where 13-docosenoic acid is a monounsaturated fatty acid). The aim of the project is to synthesise type AB₂ multifunctional monomers derived from erucic rapeseed oil as a basis for hyper-ramified polymers whose structure will be controlled. It involves [Institut des Corps Gras](#) (ITERG) and [Laboratoire de Chimie des Polymères Organiques](#) (Organic Polymer Chemistry Lab). It should last 24 months.
- **HYSSYH project:** Bioelectrochemical synthesis of soluble hydrogen to improve hybrid [metal-microorganisms] catalysis of CO₂ reduction in building blocks. The project proposers wish to assess a new generation of microbial electrosynthesis process to build platform molecules from organic matter contained in effluents or biowaste, from CO₂ and from decarbonised electricity. The project involves [Laboratoire de Génie Chimique](#) (Toulouse Chemical Engineering Laboratory) and [Toulouse Biotechnology Institute](#). It should last 36 months.
- **MEMOS project:** Repositories for searching meta-omic data in the field of environmental biotechnology, towards expert knowledge of complex microbial systems. The aim of the project is to provide tools for industrialists from the sector and the broader scientific community to capitalise on meta-omic data from environmental biotechnology, by compiling FAIR (Findable, Accessible, Interoperable, Reusable) data with a view to improving processes. The project involves [Laboratoire de Biotechnologie de l'Environnement](#) (Laboratory of Environmental Biotechnology) and the [Procédés biotechnologiques au service de l'Environnement](#) (Environmental Biotechnology Processes) unit. It should last 36 months.
- **OBEINN project:** Oil BodiEs for INNovative food products: From plant seed processing to digestive fate. The OBEINN project reinvents traditional oil biorefinery processes by offering organic solvent-free processes of extracting the lipid bodies present in protein-oil crop seeds or cereal fractions that are rich in lipids and nutritional interest, and explore functions of the lipid bodies extracted in different formulations, such as infant formulas. It should make it possible to create a database of the physical and chemical

features of lipid bodies and their formulations. The project involves [Ingénierie des Agropolymères et Technologies Emergentes](#) (the Agropolymer Engineering and Emerging Technologies unit), [Laboratoire de Chimie Agro-industrielle](#), (Laboratory of Agro-Industrial Chemistry), [Institut Jean-Pierre Bourgin](#), the [Qualiment](#) network, [Science et Technologie du lait & de l'œuf](#) (the Science and Technology of Milk and Eggs unit) and [Biopolymères Interactions Assemblages](#) (the Biopolymers, Interactions, Assemblies unit). It should last 36 months.

The project outcomes are to be used in the mid-term by companies wishing to take part in the bioeconomy.

En savoir plus : 3BCAR.fr

2. APPLICATIONS & MARKETS

Food and feed

4028 - Archer Daniels Midland (ADM) & Asia Sustainable Foods Platform

The American multinational specialising in agro-industry and the feedstock business, and the Chinese company owned by the [Temasek](#) investment fund, focused on accelerating the commercialisation of sustainable foods in Asia, today announced the official inauguration of their joint venture company, ScaleUp Bio. It is the first company in Singapore to provide contract development and manufacturing organization services for precision fermentation for food applications, and is to equip itself with a new facility with fermentors capable of converting up to 10,000 litres. Located in the Tuas district (West Singapore), the facility will be wholly owned and operated by ScaleUp Bio and is targeted to be operational by mid-2023. In addition, ScaleUp Bio has entered into a multi-year partnership with A*STAR's Singapore Institute of Food and Biotechnology Innovation (SIFBI) to establish a joint lab focused on precision fermentation. The future facility will be situated within the Food Tech Innovation Centre (FTIC) at Biopolis. It will provide start-ups with fermentors that can support up to 100L in capacity, associated downstream processing units and relevant testing, as well as analytical equipment for full optimisation. It is expected to be operational in the first quarter of 2023.

The joint lab and new facility will provide technological development and precision fermentation for companies producing a wide variety of bio-based products, including alternative proteins. The aim of both is to serve growing consumer demand in Singapore and the wider Asia-Pacific region.

More information: [Press release](#)

4029 - BASF & Lallemand

The German chemical group has announced that it has sealed an agreement with Danstar Ferment AG, subsidiary of Canadian company Lallemand, which specialises in the development, production and commercialisation of yeast-, bacteria-, mushroom- and enzyme-based solutions, to sell them their BASF Nutrilife® baking enzyme portfolio and related activities. Indeed, Lallemand recently entered into enzyme development and production, and this acquisition will further broaden their product portfolio and geographical footprint. Lars Asferg, President of Lallemand Bio-Ingredients, had this to say: *'We look forward to continuing to provide Nutrilife® customers with enzyme expertise as well as access to innovative ingredients based on the Lallemand yeast and bacteria technology platforms.'*

More information: [Press release](#)

4030 - Bel & Superbrewed Food

The French cheese group and the British [company](#), which has developed natural ingredients based on a platform of alternative proteins produced from biomass fermentation, have concluded an exclusive strategic collaboration to enable Bel to develop a line of cheese products incorporating the protein developed by Superbrewed Food. Named Superbrewed Protein, this high-quality protein contains all nine essential amino acids. For example, a 30-gramme serving meets the U.S. Food and Drug Administration's requirements for being a 'good source' of five B-vitamins, including a full day's supply of B-12, and a 'good source' of six essential minerals, such as iron, phosphorus and magnesium. This protein should be commercially available from Superbrewed Food in the first half of 2023. Bel Group's goal is to develop a full range of cheeses with this ingredient and be able to propose these new products to consumers very soon.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [Process Alimentaire.com](#), [Agro Media.fr](#)

4031 - Capagro

Off the back of the success of its first venture capital fund Capagro I, the management [company](#) is announcing the launch of a successor fund: Capagro Agri-Food Innovation Fund II (Capagro II). The aim of this €200 million fund is to support the growth of the European start-ups generating sustainable inventions with the potential to make deep changes in AgTech and FoodTech. Capagro II will principally act as lead or co-lead via initial sums of between €3 and 10 million invested in the capital of about fifteen predominantly European companies. Like its predecessor, the new fund will cover the entire value chain of the agri-food sector, from farm to fork, with an 'ecosystemic' approach that integrates the planet, humans and animals. The key sectors for Capagro II are bio-intrants, robotics, specialty ingredients, innovative packaging, alternative proteins, personalized nutrition, new distribution channels and promising emerging sectors, such as 'carbon farming'. The new fund has already brought together the following investors with the sectoral experts of Capagro: Avril Group, LSDH, Terrena, Bel Group, Crédit Agricole Group (IDIA) and Bpifrance. It has also welcomed the agricultural cooperative group Euralis, and is opening its doors to other institutional and industrial investors and family offices for the current round of fund-raising. The launch of Capagro II is combined with a first investment – as lead investor – in the capital of French start-up [Cuure.com](#), a European player in nutrition and personalised healthcare operating in the promising market that is food supplements. Customers of this internet start-up fill in online forms, which are then processed with the help of algorithms to set out the most suitable programme of food supplements for each user.

More information: [Press release](#)

En savoir plus : [Agro Media.fr](#), [LSA conso.fr](#), [L'Usine Nouvelle.com](#), [Les Echos.fr](#)

4032 - Clean Food Group

The British [start-up](#), whose ambition is to develop sustainable lab-grown alternatives to palm oil, has announced that it has raised £1.65 million in a seed funding round. The operation was carried out by [Agronomics](#) investment fund (which holds a 35% stake in the company) with the help of [SEED Innovations Limited](#) investment fund. The new fund will help it pursue its work into producing a viable yeast-based alternative to palm oil. This 'lab-grown' alternative could contribute to reducing the environmental impact of a wide range of palm oil-based products found on supermarket shelves in great numbers. In addition to its research work, Clean Food Group also plans to invest more in developing a large-scale pilot plant and obtaining regulatory approval for new products.

More information: [Clean Food.group](#)

4033 - Conagen

The American [company](#), specialising in the biomanufacturing of high value-added ingredients for food industries, has announced the commercialisation of an expansive portfolio of natural sweetness enhancers for taste modification using its patented precision fermentation technology. The enhancers could be used to make sugar-free food and beverages. Conagen has also announced a partnership with start-up [Sweegen](#) to develop modern natural sweeteners that can replace up to 100% sugar in particular food and beverage applications and bitter blockers to mitigate up to 80-100% bitterness in consumer trending products, such as energy drinks, sauces, and confectionery products with low to no sugar.

More information: [Press release](#)

4034 - iMEAN

The [start-up](#) whose technology is based on the reconstruction of digital organisms (predictive models) has announced that it has agreed a partnership with the [Laboratory of Microbiology](#) at the University of Ghent in Belgium (LM-UGent) and the Belgian group [Puratos.fr](#), which offers a full range of innovative food ingredients and services for the bakery, patisserie and chocolate sectors. The goal of this partnership is to create a one-of-a-kind genomic database of food-grade bacteria that will make it possible to identify enzymes and molecules with specific functionalities. Ultimately, this will result in more innovative, cleaner ingredients for the food industry and consumers. Thanks to previous research work, Puratos and LM-UGent have access to genomic database of 1,000 food-grade micro-organisms that contains not only their genomic data but also all metadata available related to the strains such as origin, environmental pH, temperature, humidity, oxygen, sugar and salt concentration. Now, the two Belgian partners can count on iMEAN's distinctive expertise in micro-organism metabolism as well as bio-informatics and software development to lead the construction of the database and development of a web interface to import, visualise and query all the data. This database will allow Puratos and LM-UGent to search and identify specific enzymes and metabolic pathways that can be used to produce enzymes or molecules with interesting functionalities such as flavour compounds and organic acids that can be used in the food industry.

More information: [Press release](#)

4035 - METabolic Explorer (METEX)

The industrial biochemistry company has stated that its subsidiary METEX NØØVISTAGO has begun consultation with its staff representative bodies with a view to temporarily adjust the production volume of amino acids at its site in Amiens, France. This flexibility around its production tool will help METEX confront the ongoing impact of the current economic climate (challenges for the livestock value chain, highly volatile context of inflation affecting feedstocks and energy in particular). Business activity will continue to function as normal. This temporary modulation in activity and stock held by METEX NØØVISTAGO will help it meet demand from its clients over the coming months. The aim of the initiative is for METEX to retain its ability to bounce back by continuing to roll out its diversification strategy, to include low-carbon, high value-added products for the animal well-being and health markets. In addition, METEX states that it has systems in place to cover gas supply for vapour production, and ARENH quotas for its supply of electricity.

En savoir plus : [Communiqué de presse](#)

METEX has announced it has completed the life cycle analysis (LCA) of all the amino acids produced at its site in Amiens, France. The results of the study show that production origin has a significant effect on the carbon footprint of the amino acids: the average environmental impact of French low-carbon production is five times lower than Chinese production and three times lower than production elsewhere. This new data for the sector represents an important lever for optimising its environmental impact, because its European customers in livestock value chains get greater environmental performance from local amino acids. The LCA results will progressively be made available to customers and users of its low-carbon amino acids produced and marketed through its METEX ANIMAL NUTRITION brand as the NOOVALIFE™ range. Furthermore, METEX has announced that it has won a prize in the INNOV'SPACE competition organised by the SPACE 2022 international livestock conference - currently taking place in Rennes. The quality of this low-carbon approach, classed two stars, for its level of interest, was recognised by a jury of independent experts rewarding the greatest innovations in livestock farming. At SPACE, METEX also won a prize for its INNEUS® range launched last April: an innovative range of solutions for strengthening the integrity of the intestinal barrier of pork and poultry, boosting their immune system and lowering oxidative stress.

En savoir plus : [Communiqué de presse](#)

4036 - Phytolon

The Israeli [start-up](#), which developed a new technology based on baking yeast fermentation to produce food colouring, has announced that it has secured \$14.5 million in series A funding, led by [DSM Venturing](#), the venture capital branch of its Dutch company Royal DSM, with investment from Cibus Fund, Ginkgo Bioworks (in-kind investment in the form of foundry services), [Trendlines Agrifood Fund](#), [Arkin Holdings](#), [Millennium Foodtech](#), [Agriline](#) (administered by Consensus Business Group), Stern Tech and OpenValley/Yossi Ackerman. Phytolon offers a range of natural colouring ranging from yellow to purple, with competitive colouring performance and cost-in-use, for multiple food categories such as meat alternatives, dairy products, frozen products, baked goods, confectionery and snacks. The start-up has already achieved semi-industrial production scale, and has indicated its readiness to request regulatory authorisation in the US and Europe. The new funds should help it move its technology forwards to eventually commercialise its colouring.

More information: [Press release](#)

4037 - Signature of a framework agreement over health risk assessment link to the use of recycled materials in food packaging.

While the use of recycled materials in food packaging is coming up against plenty of technical difficulties linked to the assessment and management of health risks linked with potential contamination, [LNE](#) (French national metrology and testing lab), [INRAE](#) (French national research institute for agriculture, food and the environment), [IPC](#) (French industrial centre for plastic and composite processing) and [CTCPA](#) (Technical centre for farm produce conservation) have signed a framework agreement that should allow them to offer a response to the rapid growth in societal demands, written in law, surrounding the health risks of such materials. The agreement, lasting five years, should also make it possible to put forge a multidisciplinary partnership representing the different stakeholders in the food packaging value chain, capable of harnessing its highest level of knowledge and expertise to apprehend the many consequences (technological, economic, health-related) of generalised adoption of recycled materials for food packaging. Several studies have been carried out to assess:

- the performances of functional barriers or decontamination processes,
- the risks associated with certain recycled material practices (shaping, conditions of use by the agri-food industry and consumers) or their management (origin, market, ageing, traceability),
- the compatibility of recycled materials (by themselves or in combination) with the food and its transformation process.

The partnership should result in safety assessment methods being made available for recycled materials. It will also encourage the emergence of protocols and reference materials to guide industry (chemicals, plastics, agri-food, distribution, mass catering, waste collection and recycling) and thus help develop the circular economy and waste reduction.

En savoir plus : [Communiqué de presse](#)

Biocontrol/Biostimulation

4038 - FMC Corporation & BioPhero

The American chemical group has announced it has signed a definitive agreement to acquire [BioPhero](#), a Danish company that developed a *'highly efficient'* yeast fermentation process, allowing it to produce pheromones at a lower cost and with fewer production stages than by chemical synthesis. With this acquisition, which cost FMC Corporation \$200 million (€197.5 million), the group will be able to add a cutting-edge pest control technology based on biobased pheromones to its product portfolio and R&D pipeline. The purchase should go through by the end of Q3 2022.

More information: [Press release](#)
En savoir plus : [L'Usine Nouvelle.com](#)

Chemistry & materials

4039 - Avantium

The Dutch chemicals company, which wants to make polyethylene furanoate (PEF) an alternative to polyethylene terephthalate (PET), has announced that building work has begun on its first plant, which will be located in the Delfzijl industrial zone, in the Netherlands. The future site should enable it to manufacture around 5,000 tonnes per year of furandicarboxylic acid (FDCA), a monomer derived from 100% plant sugars, used to manufacture PEF. The recyclable polymer can not only replace PET in most current applications (particularly bottles and food trays); it also displays a better barrier and functional characteristics. The future plant should enter into service in late 2023, which mean the commercial launch of the PEF in 2024.

Avantium has also announced that it has reached an agreement with Brazilian company AmBev, the biggest brewery in South America and fifth worldwide, which has committed to buy PEF from the Delfzijl plant to manufacture bottles for its non-alcoholic beverages to be sold in Latin America. The chemicals company has also announced that it has reached a conditional purchase agreement with LVMH, the French group specialising in the luxury market, which will use the biobased plastic to package its various beauty product and perfume brands, including Parfums Christian Dior, Givenchy Parfums and Guerlain.

More information: [Press release](#), [Press release](#)

En savoir plus : [L'Usine Nouvelle.com](#), [L'Usine Nouvelle.com](#)

4040 - Carbios

The French specialist in enzymatic recycling of plastic polymers and textiles has announced that its Chief Scientific Officer, Professor Alain Marty, has received the Biocat Award in the 'Industry' category. Professor Alain Marty is recognised for his significant achievements in the field of enzymatic recycling of plastics and PET fibres. This award recognises his work on enzymatic optimisation and the use of enzymes' extraordinary specificity to the circular economy of plastics.

Recap: Since 2004, this award has been given to scientists who have made remarkable contributions to the field of biocatalysis. It is considered one of the most distinguished in biotechnology.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4041 - ChainCraft

The Dutch [company](#), which develops and exploits proprietary fermentation processes to produce biochemicals from organic waste, has announced that it has raised €11 million in a fresh round of funding. ChainCraft produces medium chain fatty acids (MCFA), which can be used in existing and new applications in animal feed, lubricants, plasticisers, polymers, coatings, and flavours and fragrances. The company also produces the C6 fatty acid Caproic Acid, can serve as an important intermediate for a C6 chemistry platform. The new funding round was made possible thanks to the participation of investment companies [Convent Capital](#) and [Horizon 3 Biotech](#), venture capital fund [Shift Invest](#) and mutual fund [PDENH](#). The new funds will allow it to build an industrial-scale production plant and kick on with the expansion of its demonstrator plant in Amsterdam, the Netherlands.

More information: [Silicon Canals.com](#)

En savoir plus : [L'Entrepreneur.co](#)

4042 - Circa

To advance and promote the development and commercialisation of renewable chemistry, the sustainable biochemicals company has launched the Circa Renewable Chemistry Institute, a new centre for industrial innovation. Based at the [Green Chemistry Centre of Excellence](#) at the University of York, UK, the institute will be tasked with supporting customer and market applications for renewable chemicals, including Circa's portfolio of bio-based products based on platform chemical levoglucosenone (LGO).

More information: [Press release](#)

4043 - Genecis Bioindustries

The Canadian biotechnology [company](#), which develops bacteria and a fermentation process to recycle food waste into polyhydroxyalcanoates (PHA), has announced that it has raised \$7 million (around €7 million) in a series A funding round. The operation was led by American venture capital firm [Khosla Ventures](#), with investment from [BDC Capital](#), [Gullspang Re:food](#), [AME Cloud Ventures](#), [IT Farm](#) and Heinz Group. Genecis has also secured a \$3 million (around €3 million) credit facility from [Silicon Valley Bank](#), subject to customary closing conditions. The new funds should help speed up the commercial roll-out of an initial product range, as well as continue with the integration of their technology with the StormFisher biogas plant in London, Canada.

More information: [Press release](#)

4044 - Genomatica & Aquafil

Having successfully produced pilot-scale quantities of plant-based nylon-6, the American biotechnology company and Italian nylon-6 specialist have now advanced to produce pre-commercial quantities at demonstration scale which will help determine the final design of future commercial plants. In terms of applications, the biobased nylon-6 could be used to produce textiles, technical plastics (especially automobile parts) or even carpets.

Recap: in this partnership, Genomatica supplies a caprolactam, a key intermediate needed to obtain nylon-6, that is 100% renewable and produced by fermenting sugars found in plants using optimised micro-organisms. Aquafil will produce bio-nylon in a demonstrator plant in Slovenia.

More information: [Press release](#)

En savoir plus : [L'Usine Nouvelle.com](#)

4045 - Huue

The American [start-up](#) specialising in the production of biobased colouring has announced it has raised \$14.6 million (€14.7 million) in a series A funding round. The operation was led by [Material Impact](#) with investment from [Climate Tech VC](#), [HSBC Asset Management](#), [SOSV's IndieBio](#), [iGlobe](#) and Nobel prize winner and CRISPR Technology inventor Jennifer Doudna and Professor Jamie Cate. The new fund will be used to accelerate commercial scale-up of its sustainable indigo colouring, produced using enzymes. The new product will be used in the fashion industry, but Huue is already working on potential applications in food and cosmetics.

More information: [Press release](#)

4046 - Lactips

The French company specialising in soluble bioplastics derived from casein inaugurated its first industrial unit in Saint-Paul-en Jarez, France on 7th September. The Lactips site covers 12,000 m² of land, housing a production unit and a research centre (3,200 m²) as well as administrative premises (1,000 m²). This new operational plant offers a current production capacity of 1,500 tonnes per year of pellets with the ambition of eventually reaching 10,000 tonnes per year. This site will gradually be able to accommodate six production lines and meet the specific standards of the food industry. Lactips will soon be recruiting around ten new employees for production line operators, technicians and operators from the plastics and food industries.

Lactips' goal is to make the passage *'from a deeptech, greentech start-up to a high-growth industrial SME recognised on the market as a pioneer in the ecological transition of plastics.'*

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

Lactips has announced the appointment of Alexis von Tschammer as Managing Director. Von Tschammer has a chemical engineering degree from CPE Lyon, and began his career in the US in 1996, at Multibase SA, a Dow Corning group company, world leader in silicon thermoplastic solutions and materials. Returning to France in 2000 at Multibase's Grenoble headquarters, he was global head of the automobile airbag activity, then Sales and Marketing Director and member of the Executive Committee. In 2009, he became Managing Director of the family group Estour, with highly specific know-how in packaging, bag manufacture, papers, interior packing and materials for industry, agri-food and catering. In charge of steering the operational management committee, he planned the growth strategy, industrial tool management and business development focused on key accounts. In 2015, he joined the Mitsubishi Chemicals Performance Polymers division (MCPD), world leader in elastomer materials. He occupies a global Business Unit Management role and oversees the transformation strategy towards reduced environmental impact solutions. Alexis Von Tschammer takes over from Marie-Hélène Gramatikoff, who led the start-up's development from its inception in 2014 with Frédéric Prochazka, leaping from a French university diploma to an industrial enterprise with more than 50 people.

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4047 - LG Chem & Archer Daniels Midland (ADM)

The Korean chemicals company and the American multinational specialising in agro-industry and the feedstock business have announced they will launch two joint ventures to produce lactic acid and PLA in the US. The first, GreenWise Lactic, will be majority-held by ADM and is set to produce 150,000 tons of corn-based lactic acid annually. It will utilise ADM's fermentation capacity at its Decatur site, USA. The second joint venture, LG Chem Illinois Biochem, is to be majority-held by LG Chem and relying on its bioplastics expertise to build a facility that will use GreenWise Lactic's products. The future facility, on which work is set to begin in 2023 and production in late 2025 or early 2026, will have a production capacity of around 75,000 tonnes of PLA annually. Pending definitive investment decisions, the two new entities will be based in Decatur.

Info: The new partnership means LG Chem could become the third biggest player in the PLA market, behind NatureWorks and Total Corbion PLA.

More information: [Press release](#)

En savoir plus : [L'Usine Nouvelle.com](#), [Zone Bourse.com](#)

4048 - MetGen & Futurity Bio-Ventures

The Finnish [company](#), which designs and commercialises new enzymatic solutions for industrial biorefineries, has signed a licensing agreement with the New Zealand [company](#) that uses responsible forestry plantations to produce renewable materials and chemical products. The license is for the METNIN™ technology platform developed by MetGen, which facilitates the breaking-down of lignin by enzymes. The agreement will enable Futurity to develop a full range of high value lignin-based products including resins and adhesives, foams, composites, bio-based chemicals and polymers.

More information: [Met Gen.com](#)

4049 - Polymer Group & Fraunhofer IAP

After several years of collaboration between the Polymer Group and the Fraunhofer Institute for Applied Polymer Research IAP, the former has managed to develop 'flexible' PLA copolymers whose mechanical properties allow for a much broader range of applications than conventional materials, often stiff and brittle. To achieve this, the partners have combined the usually separate process steps of polymerisation and compounding in a single process. This new production method saves time, energy and costs. This novel class of bioplastics will be marketed under the name Plactid®. The Polymer group has also created another subsidiary, SoBiCo GmbH (Solutions in BioCompounds), which will be tasked with finding new applications for the novel PLA. This success means Polymer Group has been able to open a 2,000 m² plant that should be able to produce 2,000 tonnes of PLA. In the mid-

term, the company plans to relocate to a new site on an area of around 17.5 hectares, capable of producing 100,000 tonnes per year. Polymer Group may invest anywhere between €30 and 50 million to achieve this.

Info: Polymer Group aims to up the share of bioplastics and sustainable materials in its portfolio to 30% by 2030.

En savoir plus : [Press release](#)

4050 - Technip Energies

The French company specialising in project management and engineering for the energy and chemical industry, and Finnish company [MetGen](#), which designs and markets novel enzymatic solutions for industrial biorefineries, have announced a collaboration for the industrialisation of MetGen's METNIN® technology to facilitate the breaking-down of lignin by enzymes.

The pair have signed a memorandum of understanding to jointly bring a standardised solution for lignin refining to the global market.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#)

Technip Energies has announced the acquisition of the Biosuccinium® technology developed by Dutch chemicals company **DSM**. This technology synergises with recently developed proprietary bio-polymer technologies and provides a commercially referenced production of biobased succinic acid (bio-SAc) that serves as feedstock for the production of polybutylene succinate (PBS). PBS itself is fully biodegradable and, if based on bio-SAc, is an ideal biobased sustainable packaging material for food contact applications. The purchase includes a wide range of patent families and proprietary yeast strains, which have been demonstrated in production facilities of licensees at large scale. The acquisition price was not announced.

Info: Biosuccinium® technology will be the only technology for production of biobased succinic acid to be licensed on the market.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4051 - Wacker Chemie AG & Technical University of Munich (TUM)

The German [chemicals company](#) and the [Technical University of Munich](#) (TUM) have deepened their partnership with the founding of the TUM Wacker Institute for Industrial Biotechnology. The goal of the new institute is to develop and implement sustainable biotechnology processes for all sorts of applications. The two partners will bring their combined forces to bear on researching new approaches for the production of specialty chemicals and active ingredients from renewable resources. Wacker will provide the institute with more than €6 million in research funds over the contractually agreed term of six years. The new institute will commence its work in the 2022/2023 winter semester.

More information: [Press release](#)

En savoir plus : [L'Usine Nouvelle.com](#)

4052 - Research and training centre dedicated to biobased composites and plastics opened.

The training centre is a partnership between The University of Queensland and The Queensland University of Technology, alongside the Queensland Government, Kimberly-Clark Australia, Plantic Technologies, Australian Packaging Covenant Organisation, Minderoo Foundation and City of Gold Coast. It is based at UQ's School of Chemical Engineering. It should help develop biobased composites and plastics with minimal environmental impact. The training centre will also focus on training to develop industry-ready researchers in chemical and materials engineering, polymer chemistry, environmental science, social science, policy and business. The project required an investment of \$13 million (€13.1 million).

4053 - Publication of the results of the life cycle analysis (LCA) of applications using Avantium's PEF.

According to a study led by Nova-Institute as part of the European [PEference](#) project, replacing polyethylene terephthalate (PET) with the polyethylene furanoate (PEF) produced by Dutch chemicals company Avantium to produce 250 ml and 500 ml bottles results in reductions in greenhouse gas (GHG) emissions of around 33%. Using PEF would also lead to 45% lower finite resource consumption of fossil fuels and reduce the pressure on abiotic resources (minerals and metals) by 47% due to the mechanical properties of PEF enabling light-weighting. What's more, PEF offers a good passive barrier for O₂ and CO₂ and could potentially contribute towards reducing the environmental footprint of packaging solutions by increasing the shelf life of products, enabling a reduction in the weight of packaging, and by improving recyclability.

Recap: the main component in PEF is FDCA (2,5-furandicarboxylic acid). It can be produced from sugars (fructose), e.g., from wheat, corn and sugar beet. FDCA is polymerised with plant-based monoethylene glycol (MEG) to form a 100% plant-based PEF polymer. PEF can also be produced from cellulose, and so from agricultural and forestry waste streams. Avantium's current process uses European wheat starch. Avantium plans to roll out the world's first commercial FDCA plant in 2024.

More information: [Press release](#), [Biofuels Digest.com](#), [Packaging Europe.com](#)

4054 - Calimero project launched to improve life cycle sustainability assessment methods in certain sectors of the bioeconomy.

Led by a consortium made up of 12 partners from 7 countries, the [Calimero](#) (Industry CAse studies anaLysis to IMprove EnviROnmental performance and sustainability of bio-based industrial processes) project aims to improve current Life Cycle Sustainability Assessment (LCSA) methodologies of certain sectors from biobased industries. Indeed, according to the Calimero project partners, the PEF (Product Environmental Footprint), developed by the European Union to ensure harmonisation among Life Cycle Assessment (LCA) methodologies for products, presents relevant gaps for sustainability measurements for biobased industrial processes: biodiversity and ecosystem services impacts assessment methodologies, relevant toxicity characterisation factors as well as dynamic systems to account GHG emissions or methods to include circularity, criticality and socio-economic indicators. With bio-based industries from the construction, woodworking, textile, pulp & paper and biochemicals sectors, Calimero also means to identify the main sources of pollutants and potential feasible solutions, to ultimately establish a frame and specific recommendations for biobased industries to evolve in all PEF indicators, plus those added by Calimero. The project is funded in the topic HORIZON-CL6-2021-ZEROPOLLUTION-01-06 by the European Research Executive Agency. It has a €3.5 million budget, funded entirely by the European Union. It is coordinated by Spanish private consultation company for innovation [Contactica](#), and should last until 30th June 2025.

More information: [We Loop.org](#)

En savoir plus : [We Loop.org](#), [L'Usine Nouvelle.com](#), [Environnement Magazine.fr](#), [Industrie Mag.com](#)

Energy

4055 - Boeing

Having broadened the scope of the 2019 cooperation agreement with the Japanese Ministry of Economy, Trade and Industry to include sustainable technology, the American aircraft and aerospace manufacturer has announced that it will open a new research and development centre in Japan to focus on sustainable aviation fuels (SAF),

electric/hydrogen propulsion technologies and composite materials. Following the announcement, Boeing has been invited to join ACT FOR SKY - a consortium of 16 companies aiming expand the use of Japan-produced SAF. The consortium was founded by Boeing airline customers All Nippon Airways (ANA) and Japan Airlines (JAL), along with global engineering company JGC Holdings Corporation, and biofuel producer Revo International. The new Boeing Research and Technology (BR&T) centre will be located in Nagoya, which is already home to many of Boeing's major industrial partners and suppliers.

More information: [Press release](#)
En savoir plus : [Aero Buzz.fr](#)

Boeing and American company [Alder Fuels](#), which has developed technology for converting forest and farm residues into sustainable aviation fuel (SAF), have announced a new partnership to scale SAF globally. The terms of the contract will see Boeing support testing and qualification of Alder Fuels' SAF on its airplanes. The pair also hope to bring about policy progress when it comes to speeding up the transition to renewable energy in aviation.

More information: [Press release](#)

4056 - BP & Bunge Bioenergia

British oil major BP and Mexican company Bunge, specialising in ethanol production from sugar cane, put their Brazilian joint venture BP Bunge Bioenergia up for sale in August. Today, Emirati public investment company [Mubadala Investment Company](#) and energy company Raizen SA - a joint venture of Shell and Cosan SA, specialising in biofuel and sugar production - are in the final acquisition phase for the joint venture. However, there is no clear deadline for concluding a deal, nor any guarantee that a sale will be agreed. According to estimations, BP Bunge Bioenergia may be worth \$1.8 billion (€1.79 billion), based on an industrial average of \$55 (€54.9) per tonne of milling capacity.

If the sale goes through, it would be Mubadala's first investment in ethanol in Brazil. As for Raizen, the operation would consolidate its leadership as the country's top ethanol producer.

More information: [Reuters.com](#)
En savoir plus : [Zone Bourse.com](#), [Zone Bourse.com](#)

4057 - Global Bioenergies

The French biotechnology company and project coordinator has announced the successful end of the Residual Wood Conversion to High-performance drop-in Biofuels (REWOFUEL) project, of which the objective was to demonstrate the conversion of wood residues into sustainable high-performance components for road and aviation fuels. The project ran from 1 June 2018 to 30 June 2022 bringing together several European industrialists such as Repsol, Sekab and Fibenol, with the involvement of SkyNRG, Peab, Neste, IPSB, Technip FMC, Metex NoovistaGo and Energie Institut JKU. For this project, sugars from wood were supplied by Sekab and Fibenol. After this stage, Peep Pitk, Chief Development Officer at Fibenol said: *'We have been impressed by the performance of Global Bioenergies' bio-isobutene process with our wood sugars. From 2023 we are producing these wood sugars at 20,000 tonnes per year capacity at our plant in Imavere, Estonia and looking forward to taking this collaboration to the next level.'* For his part, Bernard Chaud, Head of Industrial Strategy at Global Bioenergies, said: *'We have shown that bio-isobutene produced from second generation sugars from wood can be used to produce both octane booster for road transportation as well as Sustainable Aviation Fuel.'* As a result, batches of bio-isooctane, bio-ETBE and sustainable aviation fuel have been produced by Global Bioenergies and then tested by Repsol, Spain's leading oil company. Batches of sustainable aviation fuel were produced and transferred to SkyNRG, leader in the sustainable aviation fuel industry. Significant work has been coordinated by SkyNRG for the certification of these isobutene derivatives as a sustainable aviation fuel. Meanwhile, by-products from the ligneous part of wood chips have been incorporated by Peab into successfully implemented bitumen products. Producing bitumen with a better environmental footprint will help to optimise overall road transport performance. The proteins resulting from fermentation are intended to be used in animal feed. The experiments conducted by Metex NoovistaGo in this respect have produced positive results. Finally, the Energie Institut JKU has carried out life cycle analyses of the

various segments of this value chain and has quantified the reduction in CO₂ emissions according to different configurations, which can lead to savings of up to 85% compared to the benchmark fossil solution.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

Global Bioenergies has announced that it has sold to **Repsol**, the Spain-based multi-energy company, a volume of 100% renewable ethyl tert-butyl ether (ETBE) to be used for formulation and performance assessment of gasoline. ETBE, which is mainly used as a component in gasoline for road fuel, but also in fuel for propeller planes, is widely used because of its high octane level. However, standard ETBE, which is added up to around 15% in current gasoline, is only partially renewable as it is currently produced from renewable ethanol combined with fossil isobutene. To produce fully renewable ETBE, Global Bioenergies converted wood residues into isobutene and combined it with renewable ethanol.

Recap: This is the second order received by Global Bioenergies for bio-isobutene derivatives - in June, Anglo-Dutch oil company Shell ordered two bio-isobutene derivatives to carry out fuel performance testing.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4058 - Lufthansa & Shell

The German airline and the Anglo-Dutch oil company have signed a non-restrictive memorandum of understanding that could see Shell supply up to 1.8 million tonnes of sustainable aviation fuel (SAF) to Lufthansa in airports around the globe, starting in 2024. The terms of the contract state that Shell must use as many as four different technological pathways and a wide range of feedstocks to produce its SAF. This memorandum of understanding contributes to Shell's ambition for SAF to represent 10% of its global aviation fuel sales by 2030, and the Lufthansa group's ambition to boost availability, the ramping up of the market, and the use of SAF as a central element in its sustainability strategy. The agreement has a term of seven years.

Info: According to the German airline, such an agreement would be *'one of the most significant commercial SAF cooperation in the aviation sector, as well as the largest SAF commitment of both companies to date.'*

More information: [Press release](#)

En savoir plus : [RTBF.be](#), [Fluids and Lubricants.com](#),

4059 - TotalEnergies and SARIA

The multi-energy group and the [leader](#) on the European market for the collection and valorisation of organic materials into sustainable products, have concluded an agreement to develop sustainable aviation fuel (SAF) production on the Grandpuits zero-crude platform in France. This agreement is a major step in securing feedstock supply (used cooking oils and animal fats) eligible to produce SAF, and will enable the SAF production capacity to reach 210,000 tonnes per year, 25% higher than foreseen in the initial project announced in 2020. Under this agreement, TotalEnergies will take 50% of a production activity of SARIA, that will supply animal fat esters to Grandpuits. SARIA will take an equivalent stake in the biofuels business of the Grandpuits biorefinery, which will remain operated by TotalEnergies. SARIA will also directly supply used cooking oils.

More information: [Press release](#)

En savoir plus : [Communiqué de presse](#)

4060 - Launch of the BioTJet project, sequel to the BioTFuel project.

Steered by [Elyse Energy](#), specialising in low-carbon fuels, in partnership with IFP Energies nouvelles, Avril, Axens and BioNext, the aim of the project is to produce sustainable aviation fuel (SAF) using the BioTFuel process. In the new project, Elyse Energy particularly wishes to study the injection of hydrogen produced by water electrolysis into

the process. This should help improve production yield without having to consume additional biomass, and practically double biokerosene production from equivalent feedstock.

Recap: the BioTFuel process is used to produce biofuels from forest and/or farming residues, thus avoiding conflicts with other biomass usages. It involves four stages: drying and torrefying the biomass; gasification of the stock; purification of the syngas; and a Fischer-Tropsch reaction.

En savoir plus : [L'Usine Nouvelle.com](https://www.usinenouvelle.com)

Health & Cosmetics

4061 - Afyren

The French company that produces seven organic acids (carboxylic acids (C2-C6)) through fermentation, has announced the signing of two new commercial contracts for organic acids produced at its Afyren Neoxy factory. The deals, involving a European and an American player, are for applications in the field of cosmetics and nutraceuticals. With these new deals, Afyren now has contracts signed for its products in all six of its priority markets: food, feed, flavours & fragrances, lubricants, life sciences and material sciences. The new contracts also mean that Afyren secures 70% of its site's production volume of organic acids, and opens up prospects for future plants outside of France.

More information: [Press release](#)
En savoir plus : [Communiqué de presse](#)

4062 - Biosyntia

The Danish [company](#), which produces vitamins and nutraceuticals for food, cosmetics and pharmaceuticals using its microbial fermentation in sugar technology, has announced it has secured a Series B funding round of €11.5 million. The [European Circular Bioeconomy Fund](#) (ECBF), [Sofinnova Partners](#) and [Novo Seeds](#) participated in the operation. The investment will allow the company to enter the production phase of its active ingredients as well as expand the pipeline of products. The first product to be commercialised is a bio-based biotin (vitamin B7), for use in dietary supplements, food, and beauty products.

More information: [Press release](#)

4063 - Circa & Merck

The American pharmaceutical lab has found it can produce its cancer treatment candidate drug nemtabrutinib using a new synthesis pathway. Indeed, a key amino alcohol, intermediary N-1 of the active ingredient, can be produced, in two steps, from Cyrene, a derivative of the biobased levoglucosenone produced by Norwegian group Circa, by way of a biocatalysis step in particular. The initial manufacturing process relied on an 11-step synthesis. The new pathway reduces this to two steps thereby reducing energy utilisation and both carbon dioxide and wastewater generation.

More information: [Press release](#)
En savoir plus : [L'Usine Nouvelle.com](https://www.usinenouvelle.com)

4064 - Ginkgo Bioworks & Sumitomo Chemical

The American biotechnology company and the Japanese chemicals company, partners as of 2021, have launched a new cell programming project that should enable Sumitomo Chemical to leverage Ginkgo's extensive codebase and expertise in organism engineering to design a strain that will produce a desired molecule by fermentation. The target molecule of this latest project is planned to be used in the personal care and cosmetic industries and is envisioned to augment or replace one that is otherwise currently gathered from animal sources. The pair are also

looking to produce molecules in a sustainable fashion that are used across a broad range of industries (agriculture, pharmaceuticals, chemical and industrial products, etc.).

More information: [Press release](#)

4065 - Givaudan & LanzaTech

The Swiss aroma and perfume maker, and the New Zealand-based company specialising in carbon recycling by biotechnological means, have announced a collaboration for the development of sustainable fragrance ingredients from renewable carbon. The pair hope to leverage LanzaTech's experience to establish novel, sustainable synthesis pathways to key fragrance ingredients used across the Givaudan portfolio.

More information: [Press release](#)

En savoir plus : L'Usine Nouvelle.com

4066 - Shiseido Beauty Innovations Fund & Jiangsu Trautec Medical Technology

The investment fund created by the Chinese subsidiary of the Japanese cosmetics and luxury products company in partnership with asset management company [Boyu Capital](#), has announced it has invested \$14.8 million (€14.6 million) in [Jiangsu Trautec Medical Technology](#), a company specialising in the development and production of recombinant collagen-based biomaterials for mainly medical and cosmetics industries. Furthermore, Shiseido has announced it will form a strategic partnership with Jiangsu Trautec Medical Technology to work together in areas such as product R&D, raw material supply, and sales channels to accelerate the exploration of new areas in functional skincare.

More information: [Press release](#)

En savoir plus : Industries Cosmetiques.fr

4067 - Toulouse Industrial Biotechnology for Health (TIBH) has its certification renewed for five years.

On the strength of its results since being certified as part of the Biopharmacy challenge to 'improve yield and control production costs' in August 2020, and its road map for the next five years, industrial integrator TIBH has had its 'Biotherapy-Biomanufacturing' certification renewed. Renewal of its certification means it can continue to explore the potential offered by the development of alternative biopharmacy production processes using microorganisms or microalgae (rather than mammal cells). Renewal will also help it to:

- Obtain €600,000 in funding for biomanufacturing equipment,
- Be identified in call for proposals related to the France 2030 programme's national strategy, and as a potential partner for project developers - industrial or academic - in biopharmacy production,
- Continue to place its expertise in industrial biotechnology R&D project execution at the disposal of health industries and boost its ability to consult on innovative biopharmacy production projects.

Since its initial certification as part of the Biopharmacy challenge led by the French general secretariat for investment, TIBH has begun three innovative research projects for producing biopharmaceuticals:

- PHAEOMAbs: the goal of this project is to increase the production yield of monoclonal antibodies by the *Phaeodactylum tricorutum* alga.
- BiopRNA: the goal of this project is to take the production of therapeutic messenger RNA by fermentation to pre-industrial scale.
- Magi@Line: in collaboration with start-up MagIA Diagnostics, the goal of this project is to develop a technological solution for real-time monitoring of bioprocesses, such as the production of therapeutic antibodies.

Recap: TIBH was created by TWB, in collaboration with CRITT Bioindustries and TBI.

En savoir plus : [Toulouse White Biotechnology.com](#), [Le Journal des Entreprises.com](#), [L'Usine Nouvelle.com](#)

Multi-market

4068 - Avril

The French agro-industry group, whose ambition is to become leader in plant processing solutions for the transition in agriculture, food production and the environment, has announced it has raised €1.180 billion in an operation carried out over the summer of 2022. For the first time, this financing includes extra-financial performance criteria, namely three Environment, Social and Governance (ESG) criteria that reflect its Corporate Social Responsibility (CSR) priorities:

- Climate concerns: a 30% reduction in greenhouse gas emissions associated with Avril's activities (scopes 1 & 2) by 2030 (vs. reference year 2019),
- Personal safety: the accident frequency rate (TF2, with and without resulting days off work),
- Gender parity: the proportion of women among the Group's top management.

For this transaction, Avril received advisory services from Lazard Bank and UGGC. The banking pool includes the following companies: ARKEA, BNP Paribas, Commerzbank, Crédit Agricole CIB, Crédit Agricole d'Île de France (Agent), Crédit Mutuel-CIC, ING, Intesa Sanpaolo, KBC, La Banque Postale, Le Crédit Lyonnais, Natixis and Société Générale. The financing, structured around a €900 million bank loan together with a €280 million securitisation program for trade receivables, reinforces the Group's financial position and provides it with greater flexibility. These additional resources are intended, on the one hand, to finance operations at a time of sharply rising raw material prices and, on the other, to bolster the Group's development. In keeping with its strategic priorities and ambitions, Avril will continue to intensify and accelerate its growth momentum, through new acquisitions and structural investments across its four priority markets: specialty ingredients, consumer goods, renewable energies, as well as products and services for the agriculture world.

More information: [Press release](#)
En savoir plus : [Communiqué de presse](#)

4069 - BioInnovation Institute (BII)

The international, non-profit commercial [foundation](#) supported by the [Novo Nordisk Foundation](#), operating an incubator to accelerate innovation in the field of life sciences, has announced the launch of its new [Venture House](#) programme. Formerly known as Creation House, the new Venture House programme consists of the same 18-month long programme with a risk-free convertible loan of €1.3 million. It is exclusively aimed at early-stage start-ups that have already benefited from its 12-month [Venture Lab](#) programme offering a convertible loan of €500,000. Venture Lab was created to support business acceleration, scientific and team development. BII also announced the four new start-ups selected for the new programme: [EvodiaBio](#), [HEI Therapeutics](#), [Stimuliver](#) and [Ampa Medical](#). Among the four start-ups, EvodiaBio specialises in producing sustainable, natural aromas for the food and beverage industry. Its disruptive yeast-based technology enables consumers to enjoy the benefits of non-alcoholic beer without having to compromise on taste.

More information: [Press release](#)

4070 - Constructive Bio

The British [start-up](#), holds an exclusive licence to develop synthetic genomes and non-natural polymers using bacterial strains, has announced it has raised \$15 million (€14.8 million) in seed funding. The operation was led by investment fund [Ahren Innovation Capital](#), with the participation of [Amadeus Capital Partners](#), [OMX Ventures](#) and [General Inception](#). The new funds will enable it to develop and commercialise the technology developed by Professor Jason Chin from the Medical Research Council Laboratory of Molecular Biology based in Cambridge, UK, in order to create new enzyme classes, pharmaceutical products and biomaterials.

More information: [Press release](#)
En savoir plus : [L'Entrepreneur.co](#)

4071 - Ginkgo Bioworks & Zymergen

The two American biotechnology companies have announced they have entered into a definitive agreement under which Ginkgo will acquire Zymergen in an all-stock transaction that values Zymergen at an approximately \$300 million (€296 million) market capitalisation. Under the terms of the agreement, Zymergen stockholders will receive a fixed exchange ratio of 0.9179 Ginkgo shares for each Zymergen share, representing 5.25% pro forma ownership of Ginkgo following the transaction. Following the acquisition, Ginkgo plans to integrate Zymergen's core automation and software technologies for scaling strain engineering capacity into its foundry, including Zymergen's machine learning tools. Ginkgo will support also Zymergen's plans to evaluate strategic alternatives for their advanced materials and drug discovery businesses. The transaction is expected to be completed by the first quarter of 2023, subject to the required approvals, and other closing conditions.

More information: [Press release](#)
En savoir plus : [L'Usine Nouvelle.com](#)

4072 - Global Bioenergies

The industrial biotechnology company has provided a review of its situation and outlook based on four horizons, each corresponding to a volume and a production cost, and one or more target markets.

The first horizon involved the conversion of renewable resources into isobutene and derivatives on the scale of a few tonnes per year. Production was carried out at the demo plant in Leuna, Germany, which has now been dismantled. While these volumes enabled a number of process validations, the production cost was too high to allow the marketing of isobutene or its derivatives on this basis. However, a marketing approach was identified: isododecane, a derivative obtained by combining three isobutene molecules, is the basis for the formulation of all longwear eyes and lips make-up. This led to the creation of the LAST® brand.

The second horizon is just beginning and involves producing isobutene in tens of tonnes per year. A fully French value chain has been set up comprising five stages, four of which are carried out at toller facilities. Only the second stage, involving the production of isobutene itself, takes place in a unit owned by Global Bioenergies. This unit has been built over the last few months at the Pomacle site near Reims. The construction phase is now complete, and commissioning is underway. The unit is expected to reach maximum capacity of nearly two tonnes of isobutene per week by the end of 2022. Part of this isobutene will be converted into isododecane and sold as a make-up ingredient to major cosmetics industry players under the Isonaturane® 12 brand. The isobutene not converted into Isonaturane® 12 will be sold directly or converted into other compounds of the isobutene product tree in order to trigger the start of commercial operations for the third horizon.

The third horizon will consist of constructing and commissioning in 2025 a plant capable of producing 2,000 tonnes of isobutene and derivatives per year. This operation will be headed by an SPV, which is currently being set up and will initially be a wholly owned subsidiary of Global Bioenergies. The production cost of isobutene and its derivatives will be significantly reduced due to major economies of scale and the fuller integration of production stages. Isonaturane® 12 sales will target not only the make-up market, but also the much larger skincare and haircare markets. The plant may also be able to serve other markets, including materials and fuels.

The fourth horizon, which is expected to take shape within five years, will consist of setting up a unit to produce tens of thousands of tonnes of isobutene per year at a reduced cost, enabling the aviation fuel market to be targeted. Many Western countries are strongly committed to reducing CO₂ emissions in this sector with its high environmental impact.

More information: [Press release](#)
En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4073 - Lesaffre

The French group specialising in fermentation has announced the acquisition of American company [Recombia Biosciences](#), specialising in high-throughput genome editing and synthetic biology. This acquisition is the

culmination of a strategic partnership initiated in 2020 to leverage Recombia Biosciences' genome-editing technologies and accelerate the development of yeasts for sustainable production of fermented ingredients by Lesaffre. Recombia Biosciences staff will be assigned to the Lesaffre Bioengineering Centre of Excellence. The American company will keep its name and will continue to grow dynamically. At this stage, its main mission will be to exploit its proprietary technologies to benefit the diverse businesses of Lesaffre worldwide. The future direction of Recombia's scientific and technology programmes will be jointly defined by a specific Lesaffre-Recombina Board chaired by Recombina cofounder Lars Steinmetz. The ability to generate thousands of yeast strains in parallel, combined with laboratory automation, will exponentially accelerate the development of projects in the health, environment and energy fields.

More information: [Press release](#)
En savoir plus : [Communiqué de presse](#)

Lesaffre has modernised its [exploreyeast.com](#) website (French site: [Toutsurlalevure.fr](#)), which aims to inform as many people as possible about the benefits of this micro-organism for food, but also its many other applications in sectors as varied as baking, health and well-being, agriculture and even bio-fuels. To meet this challenge of raising awareness, the site offers contents translated into four languages and a variety of information through a fun and educational approach. On this site, Lesaffre uses the hashtag #PoweredByYeast *'to illustrate the passion that drives the group's teams to explore the superpowers and benefits that yeast brings to the production of many fermented products, particularly in terms of texture, taste and nutritional composition.'* Lesaffre has also announced that other actions and tools will soon be revealed in order to continue to share knowledge about this micro-organism.

More information: [Press release](#)
En savoir plus : [Communiqué de presse](#)

Lesaffre has announced the construction of a new yeast production plant to be located on the outskirts of the city of Narandiba, 45 kilometres south of Presidente Prudente and about 600 kilometres west of São Paulo. Among the innovations implemented at this new site, an "over-the-fence" concept has been integrated with the company Cocal, which produces sugar cane, sugar, ethanol, electrical energy and biogas with a high level of technological innovation and flexibility. This concept, formalised through a partnership contract, consists of creating synergies between both companies' processes. Under the terms of the contract, Cocal, which benefits from a privileged geographical location, close to raw materials and consumer market will supply Lesaffre with the raw materials needed for the yeast production process, in addition to the clean energy produced by the group from sugar cane. For its part, Lesaffre will supply Cocal with vinasse, a by-product of the fermentation process, to produce biogas and ensure the fertigation of sugarcane fields. According to Jean de Lataillade, president of Lesaffre in Latin America: *'Through this partnership with Cocal, our goal is to implement a circular economy that allows us to produce sustainable goods while reducing the waste of our resources and waste. Our goal is for our yeast plant to be a benchmark for sustainability and innovation in production processes.'* Entry into service is scheduled for 2024.

More information: [Press release](#)
En savoir plus : [Communiqué de presse](#), [Agro Media.fr](#)

4074 - METabolic Explorer (METEX)

The industrial biotechnology company has announced the appointment of Laurent Bastian as its new Chief Financial Officer. Having obtained degrees from the Ecole Nationale des Ponts et Chaussées and the Ecole Normale Supérieure Ulm, France, Laurent Bastian began his career as a civil engineer at Vinci. He has nearly 20 years' experience in operational financial management in sectors of activity such as engineering and construction, renewable energy and utilities, services and software. In particular, he has spent around ten years occupying leading roles in management control for industrial companies such as Naval Group and Albioma, where he introduced management and steering systems. He was also Chief Financial Officer for the ESI Group, a compartment B-listed company on the Euronext Paris stock exchange.

En savoir plus : [Communiqué de presse](#), [L'Usine Nouvelle.com](#)

4075 - 'START And GROw' programme launched.

This programme has been launched by INRAE in partnership with AgroParisTech and Institut Agro with the aim of improving detection and support for project developers, from the idea phase through to creation, to expand the number of start-ups created from research results. Its ambition is to bring out new ideas and initiatives from research work, encourage knowledge transfer to start-ups and offer them R&D support. The first call for ideas organised by INRAE Transfert was posted in September, aimed at scientists from INRAE, AgroParisTech and Institut Agro, whether they be researchers, engineers, research professors, PhD students or postdoctoral researchers. Over three months, the scientists will take part in group work sessions in teams, before presenting their project before the START And GROw jury (made up of experts in start-up guidance, funders, competitiveness clusters, training officers and coaches, among others). The scientists will leave with a bespoke action plan for their project, and will be supervised by a team of coaches and a dedicated valorisation lead. The action plan progress will be presented 18 months later, in front of the START And GROw jury. The aim is to carry out this series of calls for ideas and coaching every quarter, to boost the ability to innovate on the back of research results, and detect and support around thirty project ideas every year.

With this new programme, INRAE aims to support 100 new start-ups by 2026, stemming from - or in close collaboration with - its laboratories.

En savoir plus : [Communiqué de presse](#), [POC Media.fr](#)

3. PUBLIC POLICIES & REGULATIONS

In France

4076 - France 2030: 'Future Ferments' challenge.

Steered by [ANIA](#) (the French national food industry association) and INRAE, and funded by the state to the tune of €48.3 million, the 'Future Ferments' challenge is intended to mobilise natural fermentation techniques to speed up the agricultural and food revolution towards healthy, sustainable, traceable food. It should provide support to scientists and companies in a collective approach to help roll out scientific and industrial projects based on natural ferment cycles, to position France among the leaders in this innovative field, and make its companies more competitive. Concretely, the 'Future Ferments' challenge is a one-of-a-kind innovation and research platform in Europe, uniting French food companies from ANIA and the excellent academic research led by INRAE. These two programme leaders have designed it to be a source of support for pre-competition projects fully funded by the state, and for R&D projects partnered by companies, to speed up the development of early-stage companies. The next stages of 'Future Ferments' are already laid out, with the inauguration of a platform in Saclay in 2023 and the first call for research proposals in early 2023.

En savoir plus : [Communiqué de presse](#)

4077 - i-Lab competition 2022: 5 Genopole-certified start-ups among the winners.

Among the 78 prize winners at the 24th i-Lab innovation competition were five biotech start-ups from Genopole, the biocluster in Évry, France, dedicated to innovation in health and sustainable development:

- [Phagos](#), winner of a *Grand Prix* for 'the most promising projects for sustainable development and societal impact in particular', proposes bacteriophage viruses as a natural alternative to the antibiotics used in agriculture and especially in aquaculture.

- [Cearitis](#), winner of a *Prix National*, developed biocontrol technology to protect tree plantations from fruit flies. It uses two biobased products as biological alternatives to insecticides: a repellent to ward off pests and a product that recreates fruit smells to attract egg-laying females into traps. It has forged a partnership with the CNRS to help it transpose this technology from olive groves to other plantations.
- [Ever Dye](#), winner of a *Prix National*, is developing an innovative dye process for the textile industry, combining a pre-treatment solution and a new pigment produced from plant waste and minerals.
- [Standing Ovation](#), winner of a *Prix National*, produces casein (milk protein) using biotechnology (fermentation) and purification (Refine&From project) processes. This sustainable process, which is at pilot stage, could help meet the growing demand for milk-free cheese products.
- [ADLIN Science](#), winner of a *Prix National*, helps laboratories and researchers in molecular biology to generate and exploit their multi-omic data to eventually valorise them financially and scientifically. Its aim is to facilitate secure data sharing and private-academic research collaboration.

En savoir plus : [Gouvernement.fr](#), [My Pharma Editions.com](#), [L'Usine Nouvelle.com](#)

4078 - French Tech Agri20 programme: list of the 22 prize winners from the first edition.

As part of the 'French AgriTech' programme, the aim of which is to accelerate breakthrough technologies in the agriculture and food sectors, 22 start-ups were selected to join the 'French Tech Agri20' programme, which aims to uncover tech champions with breakthrough inventions meeting the primary challenges in food and agriculture. In this first edition, the prize winners came from eight different regions of France: (Occitania (5), Ile-de-France (5), Hauts-de-France (3), Nouvelle-Aquitaine (3), Pays-de-la-Loire (2), Brittany (2), Provence-Alpes-Côte d'Azur (1), Auvergne-Rhône-Alpes (1)). 50% were selected for their solutions at the crux of the sustainable agricultural system and green transition, 25% for their sustainable, healthy food alternatives, and 25% for future farm and living entrepreneurship projects. For a duration of one year, they will benefit from the help of [Mission French Tech](#), which will work closely with experts from the Directorate-General for Enterprise, and in partnership with Ministry for Agriculture and Food sovereignty. The prize winners will have access to French Tech representatives in over 60 public services, and bolster their visibility in France and beyond with influence and communication actions.

Info: Green Spot Technologies and MicroPep Technologies, partners of the TWB Consortium, were among the prize winners.



Source: lafrenchtech.com

En savoir plus : [Dossier de presse](#), [La French Tech.com](#), [Economie.gouv.fr](#), [Agri Mutuel.com](#), [Midi Libre.fr](#), [Les Echos.fr](#)

4079 - Biomethane: the French government takes two regulatory measures to grow the country's production capacity.

To achieve the objectives set out in the multi-year energy programme culminating in 2028, and break the dependence on fossil fuel power, the development of injected biomethane will rise to meet an injected production level of 14 to 22 TWh per year, and lift the proportion of renewable energy to at least 10% of gas consumption by 2030. To achieve this, Agnès Pannier-Runacher, French minister for energy transition, has taken two regulatory measures to rapidly expand the country's biomethane production capacity:

- Re-evaluation of the biomethane purchase price, to reflect inflation. This measure now accounts for the significant increase in construction costs for new sites,
- pushing back the deadline for service roll-out of projects that have completed the administrative procedures but whose construction work has been delayed. This act is to encourage the rekindling of certain projects that are currently at a standstill. It grants a deadline extension of up to 18 months for the entry into service of biomethane production plants, enabling projects that have completed the administrative procedures to proceed with the execution of construction contracts and carrying out the work.

Info: as of 30 June 2022, 442 plants were injecting biomethane in the natural gas networks. Their production capacity is up to 7.6 TWh per year, up 18% on the end of 2021.

En savoir plus : [Ecologie.gouv.fr](https://ecologie.gouv.fr), [Agri Mutuel.com](https://agri-mutuel.com)

Outside Europe

4080 - USA: national biotechnology and biomanufacturing initiative launched.

US President Joe Biden has signed an executive order to speed up biotech innovation and develop the country's bioeconomy in the fields of health, agriculture and energy. The initiative should help achieve the following goals:

- Increase national biomanufacturing capacity. The initiative will see the construction, revitalisation and securing of national biomanufacturing infrastructure across the US, particularly through investment in regional innovation and improving bioeducation.
- Develop market opportunities for biobased products.
- Stimulate R&D to solve the country's greatest challenges. The initiative will require federal agencies to identify the priority R&D needs to translate scientific discoveries in the fields of biology and biotechnology into breakthrough drugs, climate change solutions, food and farming innovation and more robust American supply chains.
- Improve access to quality federal data. The combination of biotechnology with massive calculation power and artificial intelligence can lead to important breakthroughs in healthcare, energy, agriculture and the environment.
- Train a diverse, qualified workforce. The initiative will broaden the possibilities for training and education for all Americans in the field of biotechnology and biomanufacturing, with emphasis on equity of race and gender, and support to developing talent in underprivileged communities.
- Rationalise regulations for biotechnology products, i.e. Improve the clarity and efficacy of the regulatory process around biotechnology products so that inventions and valuable products can reach the market more quickly, without compromising on safety.
- Make progress in biosafety and biosecurity, to reduce risk. The initiative will give priority to investment into applied research in biosecurity and encourage innovation therein, to reduce risk all throughout the life cycles of biotechnology R&D.
- Protect the American biotechnology ecosystem, making progress in confidentiality standards and practices for human biological data, cybersecurity practices for biological data, the creation of standards

for biology-related software and risk reduction measures targeting risks posed by the involvement of overseas competitors in the biomanufacturing supply chain.

The initiative should also advance international cooperation to leverage *'biotechnology and biomanufacturing to tackle the most urgent global challenges – from climate change to health security... and that biotechnology breakthroughs benefit all citizens.'*

In terms of budget, the White House plans to allocate \$1 billion (€1 billion) to the Ministry of Defence to fund the national bioindustrial manufacturing infrastructure over five years. Other expenses include a \$250 million (€250 million) subsidy programme administered by the Ministry of Agriculture to support sustainable American fertiliser production. Another sum of \$40 million (€40 million) will be used to extend the role biomanufacturing to active pharmaceutical ingredients, antibiotics and the key materials required to produce drugs and tackle pandemics. Other details should be revealed in the next days and weeks.

More information: [White House.gov](#), [Biofuels Digest.com](#)

En savoir plus : [Zone Bourse.com](#)

4. EVENTS

OCTOBER 2022

11th symposium of the Association Française des Biotechnologies Végétales (AFBV)

11 October 2022. Paris (France).

More information: [Website](#)

Les rendez-vous Carnot

12-13 October 2022. Paris (France).

More information: [Website](#)

Cosmetic 360

12-13 October 2022. Paris (France).

More information: [Website](#)

SynBio eureKARE

13-14 October 2022. Monaco (Principality of Monaco).

More information: [Website](#)

Annual Biocontrol Industry Meeting (ABIM)

24-26 October 2022. Basel (Switzerland).

More information: [Website](#)

European Forum of Industrial Biotechnology and the Biobased economy (EFIB)

26-27 October 2022. Vilnius (Lithuania).

More information: [Website](#)

International Genetically Engineered Machine competition (iGEM)

26-28 October 2022. Paris (France).

More information: [Website](#)

16th International Conference on Biobased Materials and Composites

27-28 October 2022. Los Angeles (United States).

More information: [Website](#)

NOVEMBER 2022

Les Journées de la Naturalité Innov'Alliance – 1st edition

9-10 November 2022. Avignon (France).

More information: [Website](#)

Tech day Recyclage des matériaux biosourcés

9-10 November 2022. Cébazat (France).

More information: [Website](#)

European Summit of Industrial Biotechnology 2022 (ESIB 2022)

14-16 November 2022. Graz (Austria).

More information: [Website](#)

DECEMBER 2022

World Circular Economy Forum

6-8 December 2022. Kigali (Rwanda).

More information: [Website](#)

16th International Conference on Industrial Biotechnology and Synthetic Biology

9-10 December 2022. New York (United States).

More information: [Website](#)

FEBRUARY 2023

5th International Conference on Industrial Biotechnology and Bioprocessing

13-15 February 2023. Rome (Italy).

More information: [Website](#)

CLIB International Conference (CIC2023)

14-15 February 2023. Düsseldorf (Germany).

More information to come.

7th European Chemistry Partnering (ECP)

22-23 February 2023. Düsseldorf (Germany).

More information: [Website](#)

MARCH 2023

IBioIC's 9th Annual Conference

15-16 March 2023. Glasgow (UK).

More information: [Website](#)

BIO-Europe Spring

20-22 March 2023. Basel (Switzerland).

28-30 March 2023. Online.

More information: [Website](#)

In Cosmetics global

28-30 March 2023. Barcelona (Spain).

More information: [Website](#)

MAY 2023

BIOKET (BIOeconomy Key Enabling Technology)

23-25 May 2023. Trois-Rivières (Canada).

More information: [Website](#)

SynBioBeta 2023

23-25 May 2023. Oakland (United States).

More information: [Website](#)

17th International Conference on Synthetic Biology and Metabolic Engineering

24-25 May 2023. Barcelona (Spain).

More information: [Website](#)

JUNE 2023

18th Conference on Renewable Resources & Biorefineries (RRB)

1-3 June 2022. Bruges (Belgium).

More information: [Website](#)

BIO 2023 (BIO International Convention).

5-8 June 2023. Boston (United States).

More information: [Website](#)

EUBCE 2023 - 31th European Biomass Conference & Exposition

5-8 June 2023. Bologna (Italy).

More information: [Website](#)

Metabolic Engineering Conference

11-15 June 2023. Singapore.

More information: [Website](#)

Plant Based Summit

13-15 June 2023. Lille (France).

More information: [Website](#)

JULY 2023

17th International Conference on Synthetic Biology and Metabolic Engineering

19-20 July 2023. Paris (France).

More information: [Website](#)

17th International Conference on Industrial Biotechnology and Synthetic Biology

19-20 July 2023. Toronto (Canada).

More information: [Website](#)

JUNE 2024

European Congress on Biotechnology

30 June-3 July 2024. Maastricht (the Netherlands).

More information: [Website](#)