austria wirtschaftsservice aws

aws Preseed & **aws** Seedfinancing

Projects supported in 2021

© BMDW/Christian Lendl

Margarete Schramböck
Federal Minister for Digital and
Economic Affairs

Federal Ministry
Republic of Austria
Digital and
Economic Affairs

Each year, the aws Seedfinancing programme facilitates the establishment of around 20 companies in the pre-foundation phase and the foundation of another 20 startups in the high-tech sector, thereby not only supporting the Austrian economy but also making a decisive contribution to the Austrian innovation system. Austria as a business location is experiencing a real boom in the biotech, pharmaceutical and medtech industries, not least due to the aws Seedfinancing programme.

aws Seedfinancing supports startups specialised in technical industries, in the area of “green technologies” and in the life sciences. The current Life Science Report Austria demonstrates the importance of this sector, which has created 5,000 new jobs and around 1,000 companies with € 25.1bn in sales since 2018. Reasons for these positive results include the effective state funding system available to innovative companies and/or startups, as well as stable and long-term research strategies. Moreover, the life-science sector is not only an economic driver, but also strengthens the quality of the healthcare system by developing innovative solutions. Consistent financing of startups via aws LISA Seedfinancing is an excellent measure to further increase the number of life-science companies in Austria through newly founded firms and enterprises attracted to relocate to Austria.

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Leonore Gewessler
Federal Minister for Climate Action,
Environment, Energy, Mobility, Innovation
and Technology

Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology

Times of global crises always hold the opportunity for change. The fight against the climate crisis is such an opportunity. In fact, it is precisely innovative solutions aimed at advancing climate protection that also provide incentives needed for strengthening the economy. Such initiatives are a valuable contribution to achieving the climate goals and the “Sustainable Development Goals” set by the United Nations.

Against this backdrop, the Austrian Ministry for Climate Action introduced “Green Seed” as a new focus within the framework of the Seedfinancing programme in 2021. It is earmarked for highly innovative startups whose business models address the challenges posed by the climate crisis. Last year, the Austrian Ministry for Climate Action awarded more than € 5m to projects with exceptional future potential. In view of the enormous success in 2021, the funds allocated for the next two years were increased. They will be used specifically to support initiatives that focus on the circular economy, the transition to sustainable transport modes and carbon-neutral cities, i.e. society’s most critical issues in the effort to achieve a turnaround in energy consumption, all of which have a major impact on the economy.

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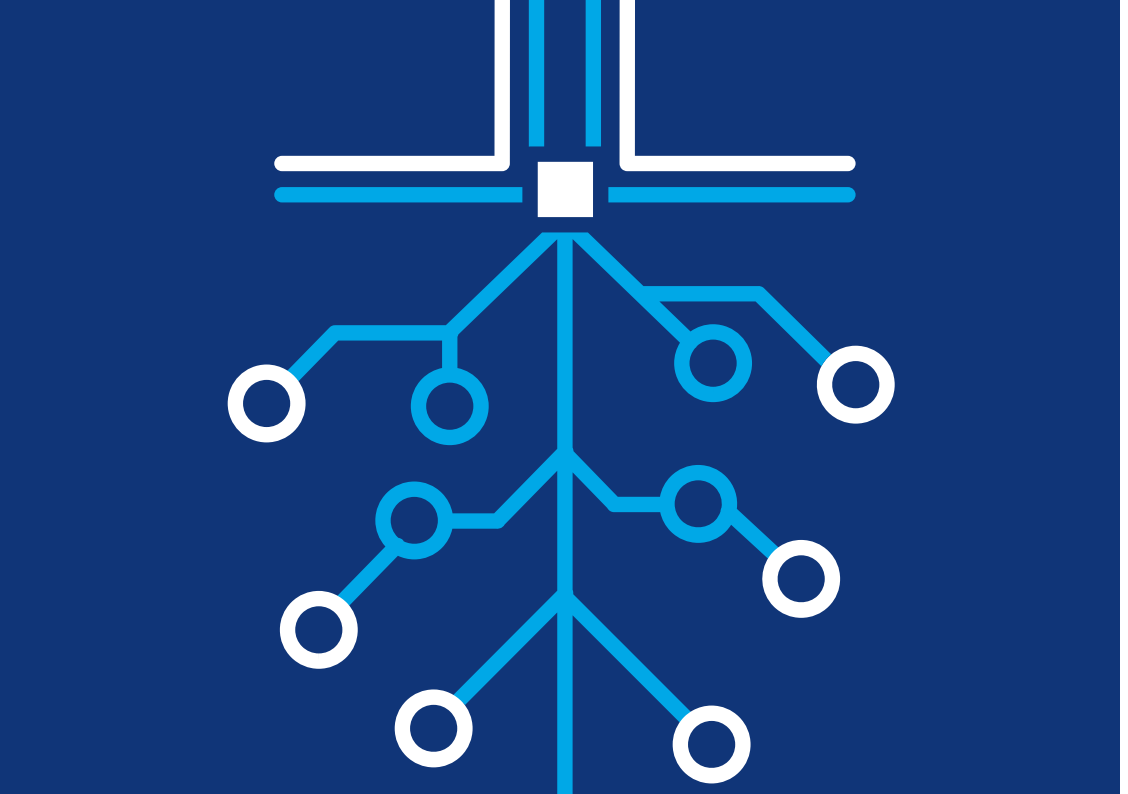
Edeltraud Stiftinger
Managing Director, aws

Bernhard Sagmeister
Managing Director, aws

The year 2021 has clearly demonstrated that the business location Austria can achieve good results even in turbulent times and has recovered its momentum in many areas despite the ongoing covid-19 pandemic. This is primarily due to the innovative strength of domestic startups and companies. In its capacity of funding bank of the Austrian federal government, aws accompanies these innovative businesses from their initial idea to international market success and helps to close financing gaps, especially in the first stages of the companies' development. Our aws Preseed and aws Seedfinancing programmes are central pillars of deep-tech funding.

Technology-oriented companies working in areas such as digitalisation, greening and life sciences that will be relevant in the future receive seed capital that is of critical importance in their planning and growth phases. Funding green-tech startups is a key priority. Particularly in challenging times, this support is necessary to empower companies to carry out innovative projects.

Moreover, aws also backs pioneering ideas by offering advice and assistance in the search for investors and cooperation partners. On the following pages, we present the projects we were able to support in 2021.



aws Preseed

aws accompanies high-tech enterprises during their pre-founding stage.

In order to make an innovative idea marketable, an enterprise needs a viable, ambitious business concept as a sound basis on which to set up a company. aws Preseed helps to fund costs arising during the early phases of foundation. Our special focus is on ICT, physical sciences, quantum technology, life sciences and green technology.

aws Preseed finances costs incurred by doing scientific work for and preparing the commercial utilisation of an innovative project. Such costs include expenses for studies and concepts, consumables and human resources. The maximum grant is € 200,000. It is paid out in performance-related tranches based on a milestone concept. The terms normally range from 18 to 24 months.

www.preseed.at

aws Seedfinancing

aws accompanies high-tech enterprises throughout their founding and company building phases. It supports all kinds of high-tech businesses, spinoffs of universities and non-university research institutions. Our focus is on ICT, physical sciences, life sciences and green technology.

Building up an internationally competitive enterprise takes knowhow, courage and capital. aws Seedfinancing aims to bridge the funding gap between the conception of an idea for a product and its marketability. The programme supports investments for founding and market development, external consulting services and resources. In addition, startups are given one-on-one assistance. The maximum grant is € 800,000, repayable subject to conditions. Repayment, at terms of up to twelve years, is made from profits earned or upon the sale or IPO of the company.

www.seedfinancing.at

Information and Communication Technology

AnyConcept

anyconcept.ai

The Graz-based company AnyConcept is making an automation software ready for serial production that permits users to automate recurring office tasks on the PC easily and intuitively.

AnyConcept's goal is to ease tasks office workers would want to delegate to an intern or temp student in a non-digital office setting. One such task is the monotonous transfer of data from one software to another – especially if there is no interface to digitally transfer the information. According to a study by Automation Anywhere, such activities take up to three hours per day.

AnyConcept founders Leander Zaiser, Manuel Weichselbaum, Pascal Goldschmid and Kevin Intering are developing an easy-to-use automation software that enables employees to delegate low-level micro-tasks to the AnyConcept software and thus have more labour time for creative freedom. A typical example is the transfer of information from applications such as Excel to systems such as ERP and vice versa. Moreover, the AnyConcept solution can also be used for filing and preparing standardised reports.

Virtual intern

The AnyConcept software is trained for its tasks in the same way as are new employees. Users simply show the AI how to perform a given process, which the software subsequently carries out like a virtual intern at the touch of a button or in the background at a specific time.

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Preseed

© AnyConcept

ANYCONCEPT

AnyConcept GmbH
Stremayrgasse 16/IV, A-8010 Graz

Founded in 2020
Founding team: Leander Zaiser (CEO), Manuel Weichselbaum (CTO), Pascal Goldschmid, Kevin Intering

anyconcept.ai

© Shutterstock

This is achieved through reinforcement learning and creates a new type of robotic process automation (RPA) software, in other words, showing instead of programming and “no code” instead of “low code”. With AnyConcept, users must only know what has to be done and need no programming skills to automate processes.

Service sector 4.0

Target customers work in the banking, insurance, telecoms, utilities and public sectors. All these industries are highly standardised, which is a prerequisite for the efficient use of RPA software. Later on, the potential customer group will be expanded to include SMEs, so that office processes can be easily and efficiently automated in this area as well. Currently, the company is at the “minimum viable product” stage, which will be completed in October 2022. During this period, individual pilot projects will be carried out with the company’s first partners.

Clir

www.clir.ai

The Graz-based startup is developing an AI-based software that can separate speech from background noise by using the computing power of smartphones.

As helpful as they may be, conventional hearing aids have a decisive drawback. They amplify not only the speech melody but also background noise. Hence users often find themselves in an indefinable soundscape which may impair speech comprehension.

The Graz-based startup Clir intends to develop an intelligent hearing aid that reacts in real time and makes hearing perception controllable.

Removing background noise

In his master's thesis at Graz University of Technology, Clir founder Andreas Krassnitzer developed an algorithm that uses neuronal networks to effectively distinguish speech from background noise. He could prove that speech intelligibility doubled when applying his algorithm. Based on this method, Andreas Krassnitzer is now developing a background noise filter for hearing aids and headphones that, if the user so wishes, solely transmits speech. In this way, it will be possible to separate desired from undesired effects, which enormously improves speech comprehension. The smartphone is to provide some of the required computing power in real time.

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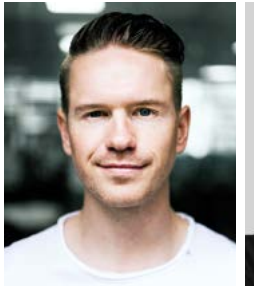

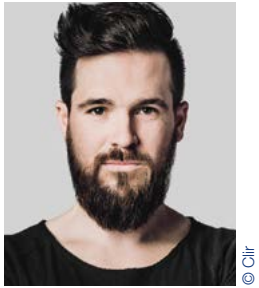

© Clir

clir

Clir Technologies GmbH
Stremayrgasse 16, A-8010 Graz

Founded in 2021
Founding team: Andreas Krassnitzer, Stefan Stücklschweiger

www.clir.ai

© Jeremy Bishop

Podcasters as first target group
The idea originated from work on artificial intelligence for autonomous driving and is also motivated by Andreas Krassnitzer's experience with his brother who has had a hearing impairment since birth.

However, in the first step, Clir wants to test its technology in nonmedical applications, as both headsets and hearing aids are basically audio-focused augmented reality devices. Clir uses AI and wireless communication technology to continuously fine-tune the results through automated development. The founders go to the market with a smartphone app that eliminates interfering noise in sound data. Initially addressing creators and producers of podcasts, their idea is to collect data and gather experience for optimising the AI models in a less sensitive area.

A licensing model for enterprises
The feedback from the market is expected to accelerate the development. Clir intends to bring its novel technology for hearing-aid and headset manufacturers to market maturity by 2025 and to offer a wide range of AI-based audio functions to business customers via a licensing model.

ImageTwin

www.imagetwin.ai

The Vienna-based startup is developing an AI-supported software service which automatically detects integrity issues in the form of plagiarism and manipulation of images in scientific papers, acting as a powerful addition to the peer-review process.

In the world of science, any irregularity detected in reproducing images in a research paper will have serious consequences which range from expensive investigations to the withdrawal and cancellation of academic titles, lasting damage inflicted on the image of universities and publishing houses or endangered or even abruptly ended research careers. While not always fraudulent or intentional, five out of 100 scientific papers contain problematic duplicates of images which are not discovered during manual peer reviewing.

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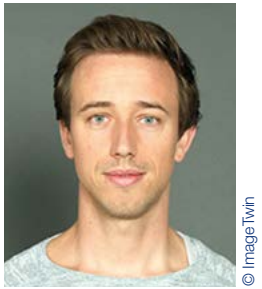
Software trained to recognise images

Markus Zlabinger and Patrick Starke, founders of the ImageTwin startup, have developed an AI-based solution that is able to identify duplicate images in scientific publications. The software is based on supervised machine learning, a method to train artificial intelligence to recognise duplicates of images in life-science publications. Each image is compared with a database that comprises millions of published articles. In addition, ImageTwin recognises



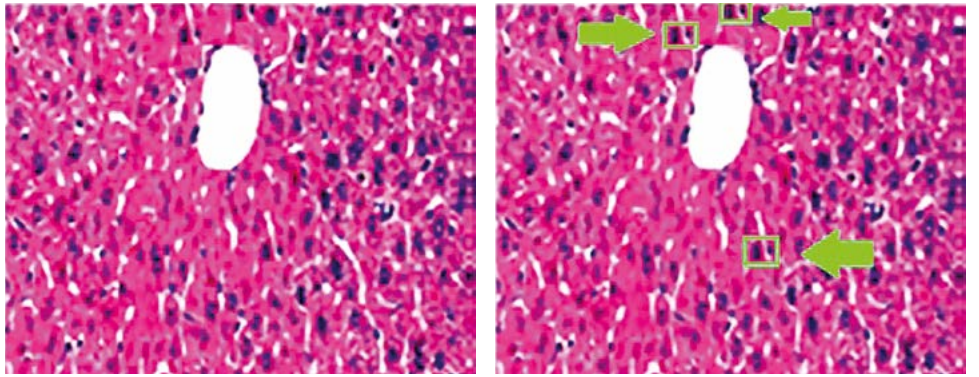
© ImageTwin

ImageTwin

ImageTwin AI GmbH
Taubstummengasse 11, A-1040 Vienna

Founded in 2022
Founding team: Markus Zlabinger, Patrick Starke

www.imagetwin.ai



© ImageTwin

manipulations in a given image and can automatically identify and mark problem sectors. The software will not only help uncover intentional deceptions, but also offers suggestions on how to improve the scientific work process.

Scientific and economic benefits

In 2016, Markus Zlabinger published his diploma thesis which dealt with the recognition of duplicate images. In early 2020, he decided to participate in a workshop organised by i²c, an innovation centre operated by Vienna's University of Technology, in order to test the business potential of his idea. The positive feedback he received encouraged him to further concentrate on the business side of his idea. In mid-2021, he was joined by Patrick Starke who contributes his business skills to the startup. Since the first half of 2022, initial prototypes of the resultant ImageTwin software have been in use at selected journals, publishing houses and universities. According to the founders, hundreds of cases of plagiarism and manipulation have already been uncovered, thereby contributing to the integrity of research.

lumiosys

www.schneeprophet.at

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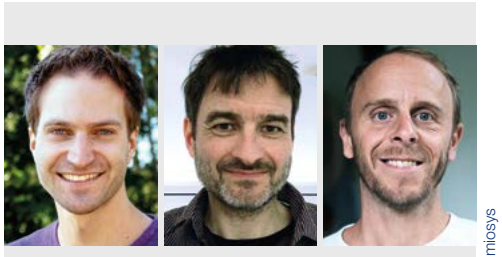
Preseed

The enterprise from Tyrol is creating a software solution that optimises all-weather snowmaking for ski pistes, which could save up to 50% in resources and costs.

Most Austrian winter sports resorts rely heavily on artificial snow. According to the Austrian Economic Chamber, some 70% of Austrian ski slopes have the equipment necessary for artificial snowmaking. Energy and water consumption for this purpose is considerable. Snow depth measuring systems and/or control software for snowmaking systems help operators to calculate requirements. Nevertheless, currently marketed products can only map the piste situation on a day-to-day basis but fail to provide information on future snow conditions on the slopes.

Forecasts enable planning

lumiosys, a Tyrolean startup and spinoff of the University of Innsbruck, has developed the first software that allows simulating progression of the snow cover as a factor of a freely adjustable snow management strategy. Using weather and snow depth data, the “Schneeprophet” software can compute how the snow cover will develop in all sectors of the entire region for up to two weeks in advance. The software simulates various artificial snowmaking scenarios for the region and instantly calculates their effect on costs. Such data help to find the best approach while using energy and water as sparingly as possible, thereby minimising both resource



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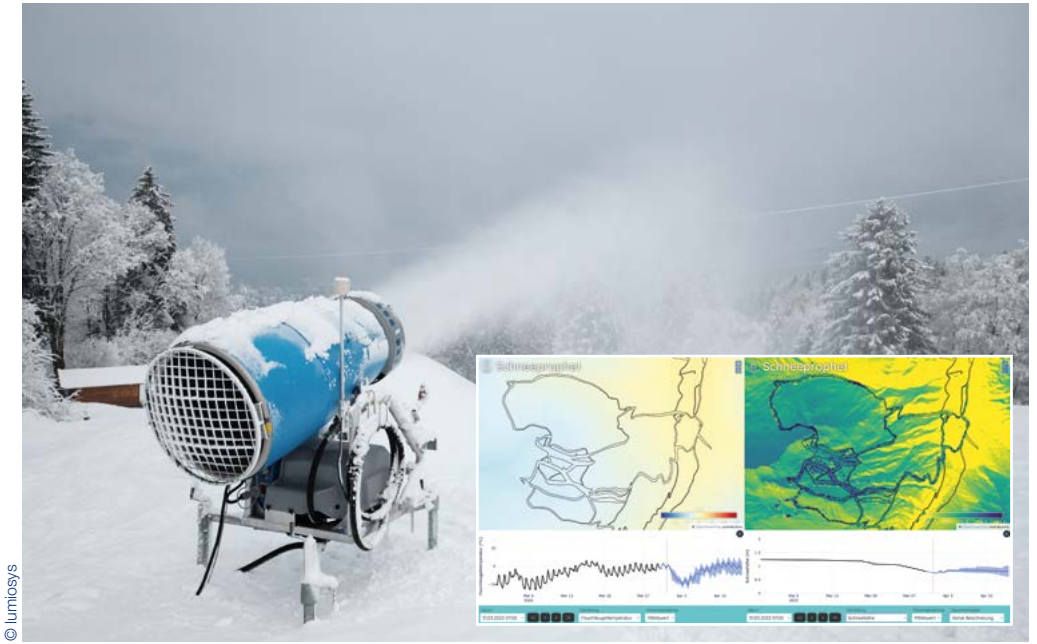
lumiosys GmbH
Innrain 52f/7, A-6020 Innsbruck

Founded in 2022
Founding team: Florian Hanzer, Ulrich Strasser, Michael Warscher

www.schneeprophet.at



© lumiosys

consumption and costs. As a result, the “Schneeprophet” can save several million euros per season in major ski resorts.

From research project to user software

The lumiosys founding team has a plethora of scientific experience. Florian Hanzer (managing director and CTO) is a computational scientist; Michael Warscher (managing director and COO) and Ulrich Strasser (a professor at the University of Innsbruck) bring along the requisite geographical knowhow. The technology driving the “Schneeprophet” was developed in a series of research projects pursued over a period of 20 years. Thanks to Preseed funding, the system is now being converted into a modern Software-as-a-Service (SaaS) solution for practical applications. A marketable product should be available in time for the 2022/23 winter season. By 2025, the founders aim to supply 15 ski resorts with their software.

sendance

www.sendance.at

The Linz-based company is developing permeable and adaptable sensors for measuring pressure distribution that can be used for fitting prostheses or as in-shoe sensors for diabetics.

Conventional sensors may be either small or large, but they are always hard and jagged. Embedding these measuring devices in flexible or soft surfaces is problematic: they pinch, hurt or do not deliver the desired readings. Linz-based sendance – the name was coined by merging “sensor” and “impedance” (resistance in an AC circuit) – is working on a flexible alternative: the spinoff of the LIT Soft Materials Lab at Johannes Kepler University Linz (JKU) is developing permeable and conformable sensors that can be seamlessly integrated into the surfaces of arbitrarily shaped plastic or wooden objects. The sensors do not interfere with the mechanical properties of the surface – they adapt to it. In this way, they can measure touch, pressure, humidity and temperature. Moreover, they sensitise objects to their environment.

The first field of application are custom-made orthopaedic aids such as prosthetic sockets or footwear for diabetic patients. In conventional solutions, the fit of the medical devices strongly depends on the orthopaedic technician’s skill, and pressure sores or chronic wounds are therefore not uncommon. With sendance electronics, such problems are a thing of the past.

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Preseed

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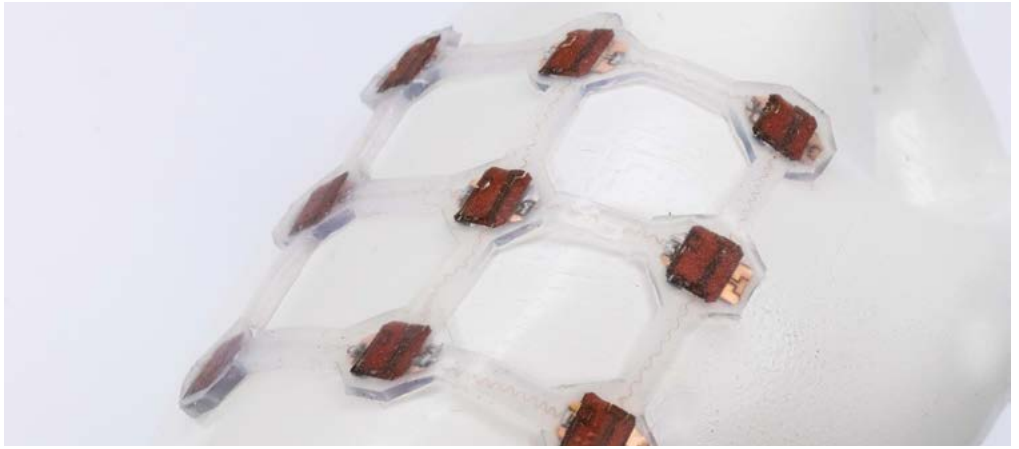
sendance GmbH
Altenberger Straße 69, A-4040 Linz

Founded in 2021
Founding team: Robert Koeppe (CEO), Daniela Wirthl, Thomas Stockinger, Yana Vereshchaga

www.sendance.at



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Proof of concept
Robert Koeppe, an experienced manager from Bavaria, founded and sold a startup for light sensor technology while he was still a doctoral student in Linz. Jointly with Daniela Wirthl, Yana Vereshchaga and Thomas Stockinger he set up and patented the sendance-grid technology platform. By developing a sensory orthosis (an externally applied orthopaedic aid) for correcting chest deformities, the startup has demonstrated the excellent performance of its supple sensors. In combination with the sendance-cloud data management solution, it is now possible to use sensors in applications where this was impractical in the past.

Additional areas of application
Until mid-2022, the startup will continue to work from the Open Innovation Center at Johannes Kepler University Linz, where sendance uses a server room as laboratory, together with part of the open office space. The decision on whether and where new locations for production machines are needed will be taken by summer. At least for the pilot production, the company will build the production machines in-house. sendance is also exploring fields other than orthopaedic technology in which its sensors can be used, e.g. for applications in furniture construction and wound care.

Sodex Innovations

www.sodex.at

The startup from Vorarlberg is working on software-supported assistance systems which turn conventional excavators into autonomous machines for driverless digging.

Sodex Innovations (the company's name is an acronym of SOftware-Driven EXcavator) is developing assistance and automation systems which turn construction equipment into autonomously operating digging and lifting machines that do not need human control from the driver's cab. The company wants to produce a modular add-on which will turn excavators into digitalised tools. Sensors and a newly developed control system will allow the vehicle to excavate square pits autonomously and without the help of a human operator.

The device needs no markings on the ground; thanks to the Sodex assistant, measuring and pegging out a site is no longer required. The laser-supported sensors keep exactly to the specified dimensions. As another major plus, the Sodex controller allows a single operator to monitor several excavators simultaneously, thereby greatly accelerating the workflow. The Sodex system can be retrofitted and mounted to a large range of different excavators regardless of their brand and size.

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Preseed

School leaves its mark

Bernhard Gantner, Raphael Ott and Ralf Pfefferkorn, graduates of a technical college in Vorarlberg, developed their idea of a "world with high-speed building sites" as

© Sodex Innovations

sodex
SOFTWARE MIT TIEFGANG

Sodex Innovations GmbH
Zelfenstraße 30, A-6774 Tschagguns

Founded in 2021
Founding team: Bernhard Gantner, Raphael Ott, Ralf Pfefferkorn (CEO)

www.sodex.at

© Sodex Innovations

part of a school project. Once graduated, they first demonstrated their “smart” excavator at com:bau, an international trade fair at Dornbirn, in 2020 and have been fine-tuning it ever since. The Sodex assistant uses novel sensor technology which delivers spectacular results. The special software made in Vorarlberg allows developing high-tech solutions for the challenges posed by robotics, machine learning, sensor fusion and safety concerns. The Sodex sensors make for extremely accurate surveying which, in turn, leads to a new level of precision in excavation work.

Initial target group: civil engineering companies

Even though Sodex systems fit all types of excavators, the founding team has set its sight at civil engineering companies as its first target sector, because they seem to be more amenable to new technologies. The startup wants to open up the market in the German-speaking countries through a wide-ranging sales network.

gnista.io

www.gnista.io

gnista.io is a software platform for managing sensor data which helps industrial enterprises to increase their energy efficiency and thus save on energy costs.

Whether simple temperature-registering thermostats for heating systems or complex sensors in industrial production plants: modern workplaces are fitted with a multitude of measuring instruments for all kinds of purposes. They spew out enormous quantities of data day after day, of which only a fraction is actually used. Many enterprises lack the requisite special knowhow and/or resources to get the best out of their own pool of data. Yet these unused sensor data offer a great potential for making operations more energy-efficient – not just because unused energy curbs performance but also because policies such as carbon pricing put exploding energy costs right at the focus of a business.

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Processing self-generated data

Campfire Solutions, a startup founded by Benjamin Mörzinger, Anna Pölzl and Markus Hoffmann, knows what to do. The gnista.io software they developed picks up the material where it is generated: measured data are directly imported into the software where they constitute the basis for the respective analysis. Customers simply enter the sensor data (such as machine performance or temperature) generated by their production plants. The software then creates digital twins – virtual copies of products, devices

© Stefan Diesner

gnista

Campfire Solutions GmbH
Am Tabor 36, A-1020 Vienna

Founded in 2021
Founding team: Markus Hoffmann, Benjamin Mörzinger, Anna Maria Pölzl

www.gnista.io

© Ant Rozetsky

or entire plants – which incorporate all the relevant data of their originals, so that the digital twins can simulate, vary and optimise workflows. Moreover, the software enables data processing with embedded AI algorithms. gnista.io is kept as simple and clear as possible. Data tagging and drag-and-drop systems make it easy to operate the software, enabling users to generate analyses within the enterprise: results remain in-house, safe from data leaks.

Visualising workflows of relevance for the climate

The software developers also emphasise their product's ability to compare and correlate own results with those of other users. The aim is to create comparable sectoral standards for sustainable energy production.

As an added bonus, gnista.io helps users to reduce costs. The easy-to-use tool visualises energy and carbon consumption, revealing weak points in the company's energy cycle. Its data furnish the figures an enterprise needs to make decisions on more energy- and cost-efficient workflows, enabling it to save up to 20% of its annual energy costs. Mobilising unused production data increases output, and saving energy substantially contributes to climate protection.

Legitary

www.legitary.com

A spinoff of Vienna's University of Technology, Legitary has developed a patented machine-learning method to verify streaming figures and detect anomalies such as missing streams.

The covid-19 pandemic robbed musicians and owners of music rights of all their live revenues from the music market. As streaming became their chief source of income, it is all the more important for them to be able to check and verify such revenues. At present, professional musicians have to trust that platforms (such as YouTube and Spotify), distributors and labels are properly accounting for their streaming figures.

Legitary's algorithm detects missing streams and potential fake streams. After all, royalties depend on the number of plays, a system that is prone to irregularities. Legitary is the first to make expensive audits affordable for a large number of artists. Its low-cost, quick check (a Legitary audit takes minutes rather than weeks) offers music providers a quick way to identify the potential for discrepancies, and thus to decide whether further (legal) steps or a full audit might be worthwhile.

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Seedfinancing

One billion dollars missing

The past years were rather eventful for the Vienna-based company: by the end of 2021, Legitary had analysed some 100 billion streams worldwide in collaboration with labels, distributors and auditors. When extrapolating the discrepancies found onto the entire music business,

© Legitary

Legitary GmbH
Taubstummengasse 11/4, A-1040 Vienna

Founded in 2019
Founding team: Peter Filzmoser (VP Technology), Nermina Mumic (CEO), Günter Loibl (VP Business Development)

www.legitary.com

© Legitary

Legitary came up with a sum of about one billion US dollars per year which are incorrectly billed. Legitary has already had its patent application granted in the United States, Canada and Japan, and is filing for another patent.

Co-founder Günter Loibl has worked in the music industry for more than 20 years. After an auditor reported on the problems caused by the growing amount of data in music streaming at a trade show, Günter Loibl set out to find a scientific method for solving the problem. Nermina Mumic (CEO and data scientist) and Peter Filzmoser (VP Technology and professor at Vienna's University of Technology) turned the idea into a business plan.

New target groups

Considering the fact that about half of Legitary's clients come from the United States, the company has set up a subsidiary in Los Angeles and is extending its presence in the US market. In the near future, Legitary's algorithm will be used not only in the music streaming business, but also by video streaming and gaming services, which, in the long term, will open up a market that is seven times as large.

MyPrivacy

www.myprivacy.cc

MyPrivacy offers platforms and users a cryptographic solution that enables them to share data with external recipients in a secure, simple and flexible manner.

The propensity of storing and processing data in the cloud has created ever greater risks for enterprises. Unlike in-house networks that are usually run with due regard to privacy, the cloud has no effective security and compliance standards. The risk of digital industrial espionage, hacker attacks, viruses and other digital threats is substantially higher in cloud-based environments.

Each transaction can be traced

MyPrivacy's software security solution offers a corrective to the increasingly urgent problems of data security: the cryptographic technology patented by the Vienna-based company provides users with a tool that permits them to securely share confidential data with external recipients beyond the boundaries of corporate firewalls and group directives. SafeSpace by MyPrivacy enables secure workflows, event-based activities, upload filters and content integrity. It uses methods such as digital watermarking, digital signatures and steganography (hiding a secret message within a non-secret file or message). All such actions, whether instigated by the system or the owner or recipient of the data, are logged as immutable evidence for forensic purposes. The MyPrivacy technology completely obfuscates all data and metadata, as well

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© Eveline Toplak

MyPrivacy GmbH
Argentinierstraße 53/16, A-1040 Vienna

Founded in 2018
Management and founder: Christoph Drescher (CEO), Zoltan Fazekas (CTO), Erwin Toplak (Founder)

www.myprivacy.cc

© Pixabay

as links between users, and makes them invisible for unauthorised third parties by saving a folder or file in the cloud as blocks of the same size with random character strings and fixed lengths. Moreover, call data (data on who interacts with whom in the cloud) cannot be viewed by cloud providers and cloud applications, and thus cannot be hacked.

Experienced team

MyPrivacy was founded in Vienna in 2018 and taken over by Erwin Toplak, a former board member of Kapsch-TrafficCom, in 2019. Subsequently, Christoph Drescher, who contributed his experience with founding enterprises, came on board as managing partner. The company targets sectors that need to share their data with maximum privacy such as the health sector, medical systems, financial service providers, banks and insurance businesses.

ParityQC

parityqc.com

A spinoff of the University of Innsbruck, ParityQC is developing an operating system which solves optimisation problems on quantum computers and is on its way to becoming the industry standard for all brands of quantum computers.

Platforms in all parts of the world put considerable effort into the development of quantum computers. Quantum computers have the potential to outperform traditional (super)computers whenever several variables need to be interlinked. Applications to run on quantum technology are extensive, ranging from abstract problems such as protein folding for faster and cheaper drug development (drug design) to analogous issues such as optimising traffic routes on a day-to-day basis or setting up a smart grid for powering electric cars.

On their own

The patented ParityQC architecture (a blueprint for quantum chips) offered by the spinoff of the University of Innsbruck is a novel approach to the way quantum computers will be built in the future. A key advantage is that it is compatible with all current quantum hardware platforms (superconducting transmons, atoms, ions, etc.) and methods (digital and analog). The architecture was developed and patented, in 2015, by Wolfgang Lechner jointly with Philipp Hauke and Peter Zoller. Rejecting a lucrative takeover offer, patent holder Wolfgang Lechner, in January 2020, decided to launch ParityQC himself, together with Magdalena Hauser, an

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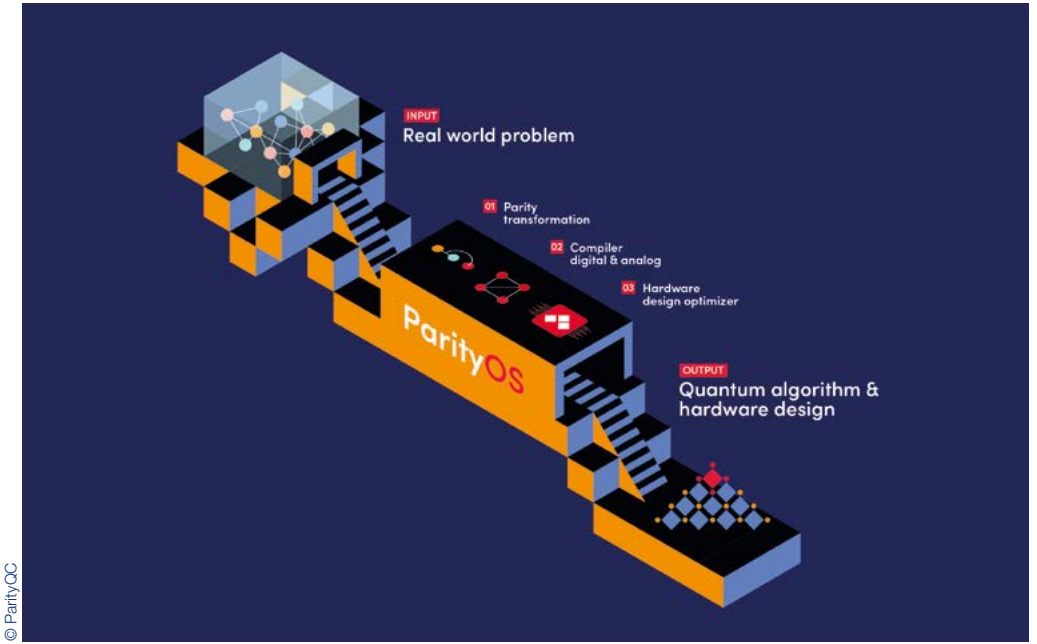
© guentheregger.at

parityqc

Parity Quantum Computing GmbH
Rennweg 1, Top 314, A-6020 Innsbruck

Founded in 2020
Founding team: Wolfgang Lechner, Magdalena Hauser

parityqc.com



© ParityQC

experienced startup entrepreneur and former managing director of the Institute for Entrepreneurship Cambridge-Tirol.

Hardware manufacturers as target group

The customers of ParityQC are manufacturers of quantum chips who are presently struggling with fundamental technical challenges. The company's ParityOS operating system autonomously links these problems and develops solutions. Manufacturers can access the architecture made in Innsbruck via a licensing model without wasting significant resources on software implementation.

Software standard for quantum technology

The first year went extremely well: after just one year, the startup has already acquired paying customers on three continents. In 2021, the first subsidiary was set up in Germany. By 2022, ParityOS is expected to run on at least two more platforms and become the industry's standard.

Quantics

quantics.io

Quantics supports companies with SaaS-based planning software that requires very little data to forecast how products will sell in the future.

Predicting sales figures, organising supplies, planning finances: as commercial enterprises are faced with ever more heterogeneous and short-lived conditions, predicting future developments gets increasingly difficult.

The Viennese start-up Quantics has developed a planning software that automatically adapts to ongoing changes, thereby reducing forecasting errors by up to 70%. Based on primarily proprietary data, the software predicts how products will sell in the future. The impact of price indices, the economy or marketing activities can be included in the calculations. Especially for difficult to predict demand patterns such as slow-moving goods or batch deliveries, Quantics is significantly more accurate than comparable software.

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Forecasts even with small amounts of data

Quantics complements existing business software. The more data that are available in the company, the more precise will be the forecast, but even a relatively small amount is enough. Data on past sales transactions or deliveries of goods, master data on products and production and/or distribution sites suffice for Quantics to build on them. Further data on clearance sales and discount promotions, shifts in demand or loyalty club schemes permit more accurate forecasts but are not required.

© Quantics

QUANTICS

Quantics GmbH
Wasagasse 31/2/27, A-1090 Vienna

Founded in 2020
Founding team: Resul Akay, Johannes Matt, Christof Bitschnau, Vladyslav Vasylevskyy

quantics.io

© Pixabay

Innovation for businesses

The founding team consists of data scientists and experts in Software as a Service (SaaS) who met at work. Problems in sales and demand planning as well as companies' reluctance to innovate arguing that existing solutions are expensive and often insufficiently accurate, tipped the scales in favour of taking matters into their own hands.

Quantics charges a monthly fee for the use of its solution. The forecasting software pays off for companies with sales of € 20m or more. In the Seedfinancing phase, the software is brought to market maturity and is already used by the startup's first domestic customers.

Tributech

www.tributech.io

The Linz-based company is developing a data management technology that permits tracking and tamper-proofing the sharing and using of data.

Data are the new gold of the digital age, though their value is primarily generated by the collaborative processing of information. Preserving the integrity and security of data is crucial – rare values in the world of bits and bytes. Tributech's business idea offers a secure solution for this challenge. The software company has developed a novel data asset management technology that permits customers to share and use data consistently and reliably across systems, companies or even ecosystems. A blockchain-based and patented trust layer ensures that the data have not been manipulated or corrupted.

A trusted framework for sharing data

Business cooperation often fails due to the way data are handled. Partners are afraid to grant third parties access to their data. This is where the founding team around Patrick Lamplmair, Thomas Plank and Simon Pfeifhofer comes in. Tributech's solution permits peer-to-peer transports of data between companies while ensuring a high degree of transparency and traceability for all users. Tributech's solution shows who accessed the data and whether they are still original or have been altered.

The Tributech starter kit comprises modular hardware and associated software services. Hence, it is a comprehensive plug-and-play

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© Tributech

tributech
TURNING DATA INTO FACTS

Tributech Solutions GmbH
Peter-Behrens-Platz 8, A-4020 Linz

Founded in 2018
Management: Alexander Sztatecsny, Patrick Lamplmair, Thomas Plank

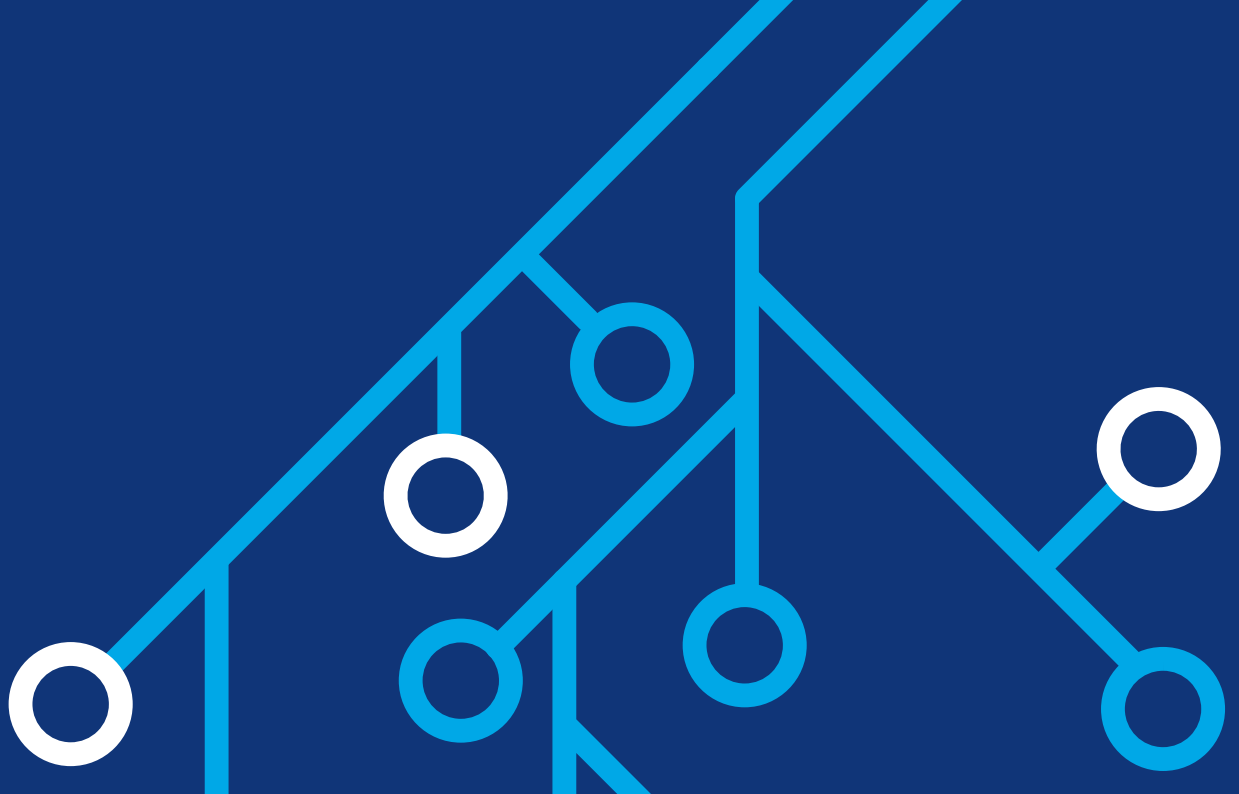
www.tributech.io

© Tributech

solution for the fast and easy setup of data ecosystems, which does not require complex application steps and complicated integration processes.

Target group: sectors working collaboratively

Tributech offers its technology and services on a global scale to companies for whom collaborative work is standard practice. For the time being, its focus is on the manufacturing and automotive industries. Moreover, the Tributech team also advises customers on how to turn data into corporate assets, as some data may be useless for one company yet prove lucrative to others. The startup suggests ways and means to exploit such data.



Physical Sciences

fibionic

www.fibionic.com

fibionic is developing a process that produces fibre-reinforced composites of the bionic type at ultrarapid speed, which should drastically reduce material input and yield very light and efficient structures.

The wings of a dragonfly serve as a model. They contain fibre-reinforced structures only where they are absolutely necessary. The wings' extraordinary stability, with weight cut down to a minimum, turns insects into aerial artists. It is a principle that the Tyrolean enterprise fibionic has taken to heart. Its two founders, Thomas Rettenwander and Johannes Mandler, are working on an invention that uses reinforcements in fibre composites solely on an as-needed basis, thereby reducing material input by up to 50% compared to conventional composites, while at the same time improving product performance. The patented manufacturing technology permits cost-effective production of bionic composites in large quantities. This saves on resources, makes structures lighter and the manufacturing method almost infinitely scalable – the Tyrolean process has all the prerequisites to make a decisive impact on sustainable light-weight construction in all industries.

Extremely fast production time

fibionic is the world's fastest technology for positioning fibres in line with the

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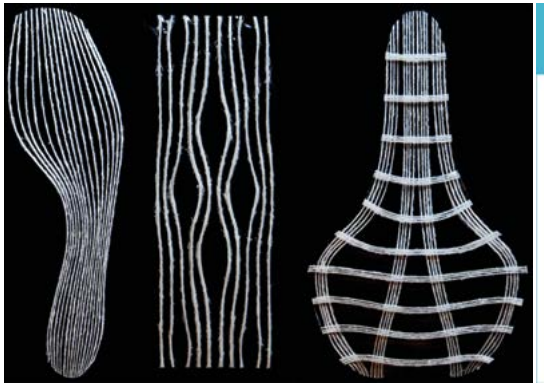
© fibionic

fibionic

fibionic GmbH
Dörferstraße 7/2, A-6065 Thaur

Founded in 2021
Founding team: Thomas Rettenwander, Johannes Mandler

www.fibionic.com



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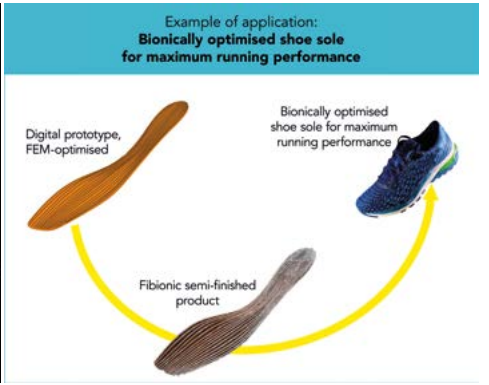

bionic model. The founders' process places reinforcing fibres 50 times more rapidly than previous methods. Accordingly, bionically optimised fibre structures can, for the first time, be used effectively and at low cost to produce large batches.

Less weight, same stability

Implementation of this biologically inspired engineering method ("bionics" is a portmanteau of "biology" and "electronics"), together with the special production process involved, gives fibionic users a clear competitive edge. Both production and use lower the carbon footprint, production itself does not generate unnecessary waste, and the cost of components is trimmed. Moreover, the load to be borne is pared down to the absolute minimum.

From sports to cars

Applications abound in all fields that use load-bearing structures. The bionically optimised materials show their strengths in the sports sector (shoe soles, bicycle components) as much as in automotive and mechanical engineering (robot arms, drones). Serial production of the first components should commence in late 2022, demonstrating the capacity of the production process and design method.

Inmox

inmox.com

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The startup based in Vienna is developing an intelligent sensor for monitoring the condition of industrial gearboxes in order to optimise maintenance intervals and reduce costs.

Gears translate rotary speed into torque. In other words: they provide the drive with the requisite power. They are key elements of the powertrain in wind turbines, in the paper industry, in cars and in helicopters (and in many other machines). Gears are exposed to enormous forces that cause wear and tear. Regular maintenance is necessary to ensure their functionality and safety. Maintenance works are typically carried out at fixed intervals, but their timing may be alternatively determined by experience subject to a large safety margin.

So far, exact data for predictive maintenance have been hard to come by. Accordingly, operators tend to discover damage too late or waste money by carrying out inspections too early. Inmox intends to solve this problem. Founders Michael Aufreiter and Daniel Kagerbauer are developing an intelligent chip detector and the requisite software which detects wear particles in (wind turbine) gearboxes and predicts when maintenance is advisable. The object is to identify the “sweet spot”, i.e. the ideal time for maintenance, which is a prerequisite for significant savings in maintenance costs.

Optimised maintenance phases

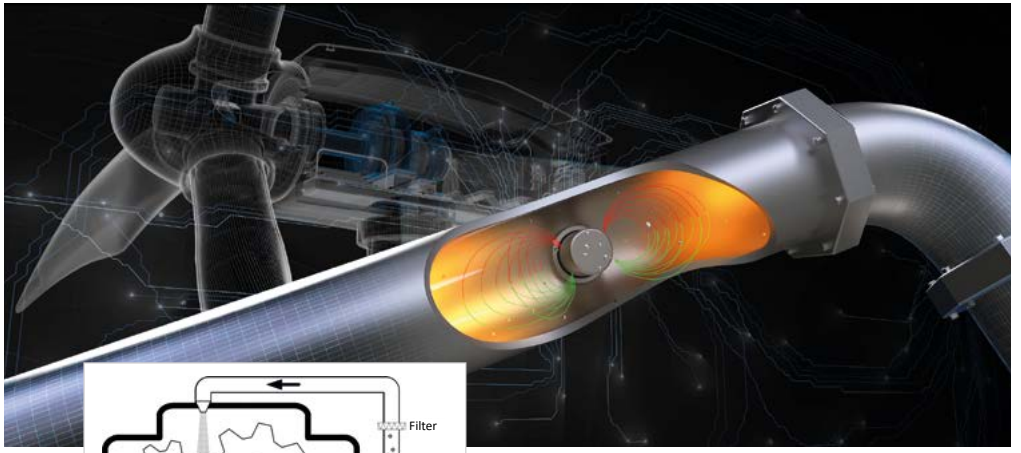
The new technology detects wear particles and takes just seconds to identify their

© Inmox

Inmox GmbH
Maria-Jacobi-Gasse 1, Media Quarter Marx 3.2, 1. Stock,
A-1030 Vienna

Founded in 2021
Management: Michael Aufreiter, Daniel Kagerbauer

inmox.com



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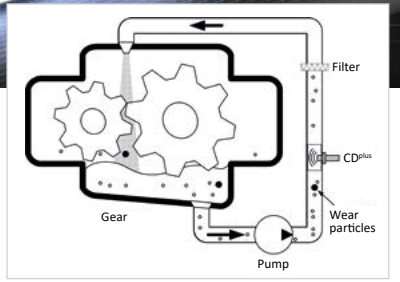

origin and risk potential. This increases safety in active gears and pinpoints the need for further maintenance. Improving predictability saves up to 40% of the costs that could arise from a damaged gearbox.

Moreover, existing software-based condition monitoring systems can be provided with an additional parameter that allows them to draw more efficient conclusions regarding the actual condition of the gearbox and the need for its maintenance.

Useful in many sectors

Inmox is testing its application in wind turbines in order to make generation of renewable energy more reliable, as this sector is frequently faced with gear damage that entails high consequential costs. The founders plan to use the growth phase to expand into other target areas such as aviation, the manufacturing industry and cable car/ropeway engineering.

Plasmateria

www.plasmateria.com

Vienna-based Plasmateria is developing a safe and environmentally friendly process for coating the inner surfaces of components, which deposits chromium coats as well as ceramic layers.

Plasmateria has come up with a novel coating technology that deposits materials and coatings not previously available on the market. The focus of the new process is on coatings deposited on the inside of components, such as a cylinder fitted into a hydraulic actuator. Flexible coatings add desired properties to the underlying material and/or compensate for negative characteristics.

In its first stage, Plasmateria's coating technology wants to furnish an alternative to the industrial hard-chrome plating of inner surfaces. The use of hexavalent chromium (Cr(VI)) for hard-chrome plating is banned or severely restricted in many countries due to the material's toxicity. The coating process developed by founders Bernhard Kohlhauser and Martin Jaroš, on the other hand, is a safe and environmentally friendly alternative that offers a choice of depositing not just layers of chromium but also ceramic coatings with significantly better results.

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Semiconductor industry as target market

The R&D-experienced founders (who met at a Swiss company of similar interests)

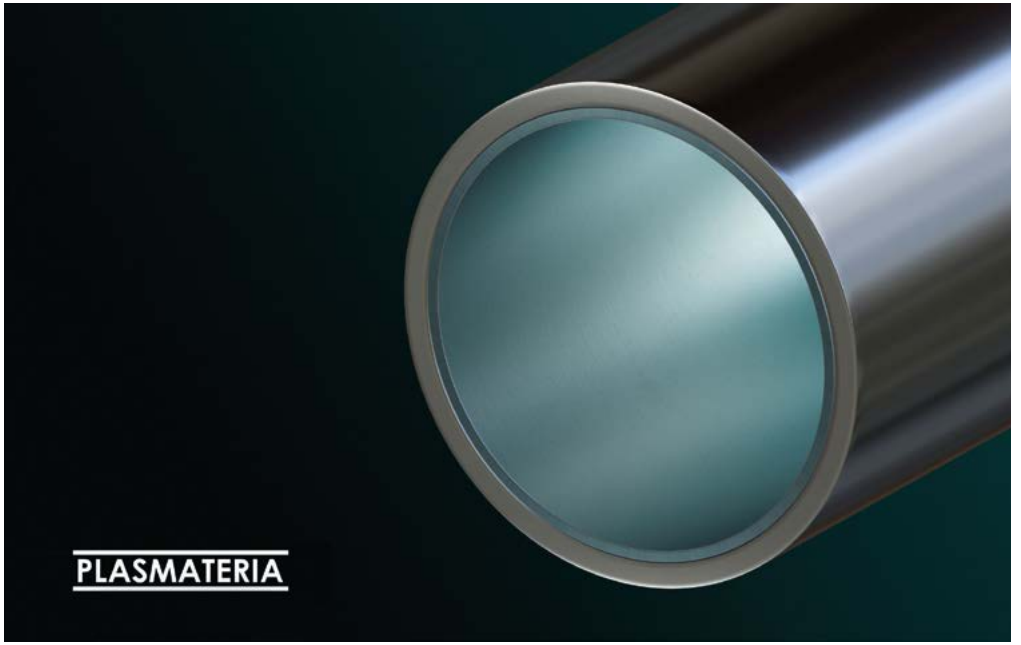
© Plasmateria

PLASMATERIA

Plasmateria GmbH
Gutheil-Schoder-Gasse 8-12, A-1100 Vienna

Founded in 2021
Founding team: Bernhard Kohlhauser, Martin Jaroš

www.plasmateria.com



© Plasmateria

have set their sights on the semiconductor industry. Many microelectronic components obtain their properties through an interplay of coating processes. In microelectronics, requirements are particularly stringent: the smaller and more powerful the component, the greater the demands on the material. In very thin layers, even tiny impurities or defects in a printed circuit can cause a wafer to fail. Such impurities are typically introduced into the process by the manufacturing equipment and can therefore be suppressed by special coatings on the surface. Plasmateria is working on a special coating technology that deposits high-purity and ultra-dense alumina coatings that meet all the requirements for wafer production.

BrightComSol

www.brightcomsol.com

BrightComSol, a startup from Vienna, is developing highly stable, light-emitting perovskite quantum dots. Thanks to this novel technology, the luminous nanocrystals can, for the first time, be used cost-effectively in displays and X-ray devices.

Nanocrystals have unique properties. One type, known as perovskite quantum dots (PQDs), is able to glow in particularly brilliant colours, which makes these crystals suitable as an extremely bright source of light for industrial use. By varying their size or chemical composition, the PQDs can be made to glow in all colours of the visible spectrum. Moreover, they can convert light invisible to the human eye (such as X-rays) into visible colours. As the quantum dots can be manufactured at low cost, they may well revolutionise the production of solar cells, displays, monitors and scintillators.

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Breakthrough

So far, PQDs could not be used for industrial purposes, as it was impossible to replicate their unique properties in mass production. BrightComSol is employing a proprietary technology to produce PQDs in large quantities and to provide them with the long-term stability required by polymer film. As a result, they can be offered at low cost for mass-produced X-ray cameras and displays.

Double-track strategy

The enterprise is currently focusing on

© Katharina Schiffl

BrightComSol GmbH
Simon-Zeisel-Haus, Muthgasse 11, A-1190 Vienna

Founded in 2020
Founding team: Behzad Shirmardi (CEO), Erik Reimhult (CSO)

www.brightcomsol.com

© Behzad Shirmardi

two products: BrightLeaf™ is a PQD-loaded thin film that converts high-energy photons into green light. BrightComSol markets it as scintillators that convert X-rays into visible light. BrightSplash™, the company's second product, is a resin formulation that allows third parties to use their own PQD-containing devices and polymer film for photon conversion. BrightSplash™ is of particular interest to manufacturers of displays as it permits production of the latest generation of LCDs with the purest and most vibrant colours.

Next generation

BrightComSol was founded by Behzad Shirmardi and Erik Reimhult in 2020 as a spinoff of the Department of Nanobiotechnology at the Vienna University of Natural Resources and Life Sciences. Its objective is clear: the Viennese startup intends to become the technological and market leader for the next generation of quantum dot-based scintillating and colour-generating resins, inks and thin film.

DrainBot

drainbot.com

DrainBot has developed the first fully automated robot for servicing tunnel drainage systems. The use of robots makes long tunnel closures unnecessary and significantly reduces the consumption of water for cleaning.

Tunnels need servicing, as motorists find out when they are kept waiting outside a closed tunnel tube because of "maintenance works". It is especially the drainage pipes in the tunnel walls that need the operator crew's attention because they tend to get clogged. To prevent harm, the drains are regularly flushed with high-pressure systems that consume massive quantities of water. This purging often requires the partial or complete closure of the tunnel, entailing traffic holdups and congestions.

Cheaper, cleaner, more sustainable

This is where the startup run by infrastructure expert Philipp Lepold and co-founder Slaven Stekovic comes in. Thanks to its technology, DrainBot is able to clean tunnel drainage systems autonomously, thus shortening closure times required for cleaning. Preventive maintenance is also simplified, thereby extending the periods in which a tunnel can be used.

Normally, the drains are cleaned by high-pressure jets with about 400 litres of fresh water per minute. DrainBot, on the other hand, uses only process water held in the drainage pipes. As a result, the operator finds the tunnel's maintenance

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© DrainBot

DRAINBOT

DrainBot GmbH
Riesstraße 19c, A-8063 Eggersdorf bei Graz

Founded in 2019
Founding team: Philipp Lepold (CEO), Slaven Stekovic (CFO/COO)

drainbot.com

© DrainBot

cost plunging while its climate protection rating is substantially improved.

No supervision on site

The DrainBot system consists of a modular robot unit for cleaning, and several charging stations. Rather than using fossil fuel, it is powered by electricity from a battery built into the robot's body, which gives it a range of more than ten kilometres. Human supervision on site is not necessary, and the system works while traffic continues to flow. DrainBot envisages maintenance cost cuts of 10-30%. The startup's target group are operators of (underground) railways and roads, as well as industrial clients. The DrainBot systems come in add-on modules for use in existing and new tunnels of any length.

Kape

www.kapeskateboards.com

The startup from Linz is developing skateboards made from recycled ocean plastic that are optimised in terms of shape and production and are substantially more durable than conventional boards made from laminated plywood.

Seven laminated layers of maplewood: this is what 95% of all skateboards have looked like inside since the 1970s. They quickly lose stability, flexibility and “pop”, as dedicated skaters say. The boards made by Kape founders Peter Karácsonyi and Daniel Jahn are designed to do much better: no wood splinters, no scratched designs and a longer performance than conventional laminated plywood. They have set their sights high: among beginners, a skateboard typically has a useful life of a couple of weeks, and professionals may well need a new board every three or four days.

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Better to the environment and more stable

Kape intends to replace throwaway skateboards by a make that has a much longer lifespan: the company’s plastic skateboard lasts about eight times longer than a run-of-the-mill version. It is partly made from recycled ocean plastic and can in turn be recycled. This is not the only sustainable feature emphasised by its makers: the skateboard is much more abrasion-resistant, and its special shape provides for higher jumps and greater stability. A patent application

© Kape Skateboard

kape

Kape GmbH
Hafenstraße 47-51, A-4020 Linz

Founded in 2020
Founding team: Peter Karácsonyi (CEO), Daniel Jahn (COO)

www.kapeskateboards.com

© Hannes Mautner

has already been filed for the underlying technology.

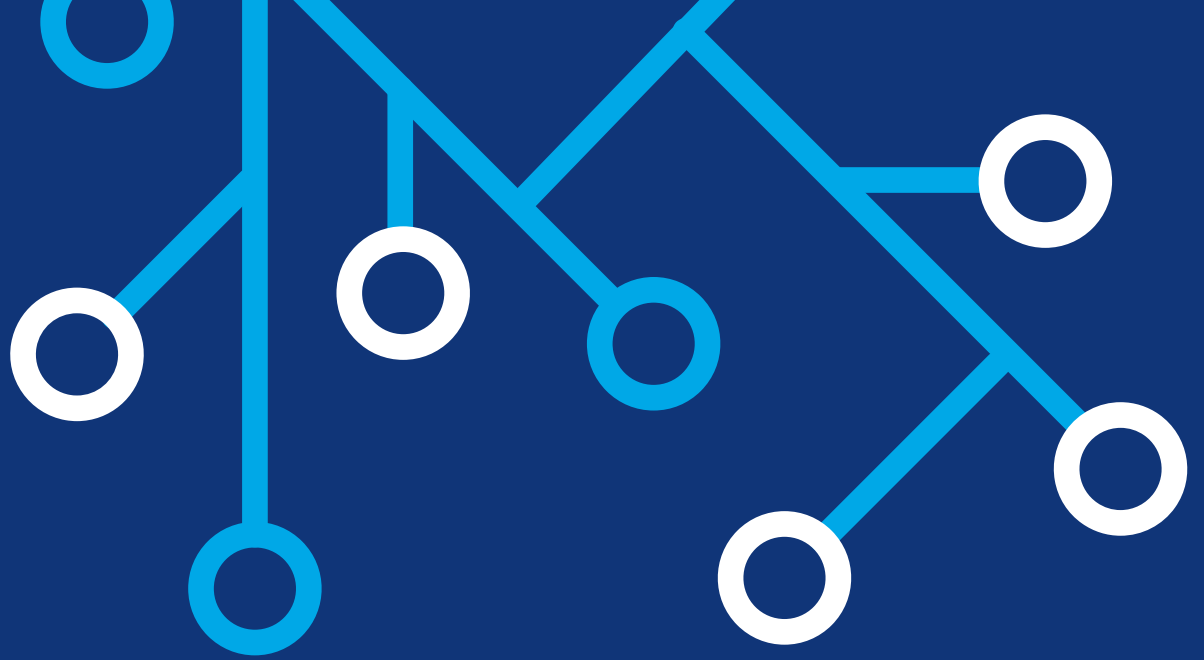
Innovative technology, familiar features

Boarders who think of switching from wood to plastic want comparable properties in their board. Accordingly, in designing the shape and choosing the materials, Kape has paid meticulous attention to emulating the sound of a new timber board. Wooden skateboards also serve as a model when it comes to rigidity. Even more important was keeping the board at its customary weight. Kape therefore shapes the core of its skateboard so that it withstands the forces to which it is exposed.

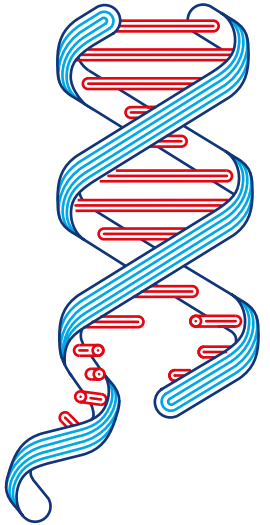
Speedily into the market

In developing their technology, the Kape founders cooperated with Austrian and German plastic companies. The venture has been rewarding: the process can also be used in other areas such as the automotive industry.

Meanwhile, successful pitches to investors have made the startup ready for the market. Following an intensive R&D phase, the Linz-based company completed the first proof of concept with its Vanguard Board in 2021. The first decks are already being produced, and several partners will shortly undertake their distribution.



Life Sciences



aws LISA – Life Science Austria

Bringing life sciences from the lab to the market

Austria as a business location will benefit from the most innovative ideas only once they have made it from the lab to the market. Austria Wirtschaftsservice (aws) has established Life Science Austria (LISA) as a one-stop shop that spans the entire value-added chain of startups in the life sciences. LISA provides customised support at every stage of a startup's development.

www.lifescienceaustria.at

Ascense Medical

www.ascense-medical.com

The Viennese company is developing an elastic aortic stent graft designed to maintain the Windkessel function and significantly reduce long-term sequelae.

Ascense Medical is working on an aortic stent graft specifically designed for treating type B aortic dissections (approximately three patients per 100,000 population/year). A stent graft is a self-expanding vascular prosthesis which is advanced into the aorta through the groin in a folded state and placed at the desired location. The innovation of Ascense Medical's stent graft is the material from which the prosthesis is made. The company is currently developing a material that mimics the aorta's native elasticity to maintain its Windkessel function. This reservoir function ensures that the elastic aorta expands during systole (heart pumps blood into the circulatory system). The elastic recoil of the aorta during diastole preserves a steady flow of blood despite the pulsatile (unsteady) ejection from the left ventricle.

As currently available vascular prostheses and stent grafts lack this elasticity, they may cause hypertension, cardiac hypertrophy and other complications. The novel material and design are expected to reduce the risks and long-term sequelae associated with the non-compliant aortic stent grafts currently on the market. Production costs

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© Ascense Medical

Ascense Medical GmbH
Blindengasse 40/15, A-1080 Vienna

Founded in 2021
Founding team: Michael Moore (CEO), Roman Gottardi, Martin Czerny, Bartosz Rylski

www.ascense-medical.com

© Pixabay

of the vascular prosthesis well below the prices charged until now are another strong point.

Founders motivated by experience

Michael Moore, Roman Gottardi, Martin Czerny and Bartosz Rylski founded Ascense Medical in Vienna in 2021 to develop and market products for the treatment of aortic diseases. Michael Moore has decades of experience in stent graft development as a senior biomedical engineer. Roman Gottardi, Martin Czerny and Bartosz Rylski are cardiovascular surgeons specialised in the treatment of aortic diseases, have treated patients with aortic diseases for more than 20 years and are international leaders in medical science.

Other areas of application

In the future, the elastic prosthesis material developed by Ascense Medical could be the basis for a wide variety of medical products. The founders envisage its use not only for aortic dissection, but also for other aortic pathologies. At a later stage, the new material might be used for developing surgical vascular prostheses and stent grafts for various other applications.

After successfully completing the feasibility study, building up a laboratory in Vienna for developing, testing and assembling the product is on the agenda for 2022. A clinical trial is scheduled to start in 2024, and obtaining CE marking of the product for the European market is a goal for 2026.

KinCon biolabs

kincon-biolabs.eu

The University of Innsbruck spinoff is developing biosensors to identify effective drug candidates for personalised therapy approaches.

Kinases are enzymes that control biological processes in cells. These “molecular switches” play a key role in practically all biological processes that take place in the body’s cells. Defective kinase activities, which are usually caused by mutations, can trigger serious illnesses such as cancer or Parkinson’s disease. So-called kinase inhibitors are effective drugs which inhibit the function of these mutated enzymes. In cancer therapy, kinase inhibitors have become frequently prescribed blockbuster drugs. However, some of these medicines cause side effects, are not very effective or lead to the development of resistances. Therefore, researchers are always on the lookout for new, maximally effective inhibitors.

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Speeding up the search for new active agents

Pharmaceutical companies are increasingly searching for more effective agents (new lead molecules) to efficiently switch off the mutated kinase variants. When developing such personalised therapy concepts, a key challenge is to find the lead molecule that is most effective in blocking the mutated kinase. KinCon’s biosensors support quick decision-making on this issue, so that drug development can be controlled more accurately.

© KinCon biolabs

KinCon biolabs
Innrain 66, A-6020 Innsbruck

Founded in 2022
Founding team: Eduard Stefan (CEO), Philipp Tschaikner (CSO)

kincon-biolabs.eu

“Personalised” KinCon biosensors

Biochemical engineer Eduard Stefan and molecular biologist Philipp Tschaikner founded KinCon biolabs as a spinoff of the University of Innsbruck in 2022. The company uses patented biosensor technology that can determine kinase activities directly in intact cells. The genetically encoded KinCon biosensors are designed in such a way that successful inhibition of the investigated kinase leads to enhanced and quantifiable light emission. The expandable KinCon biosensor platform permits the systematic profiling of lead molecules in a mutation-specific disease context. Utilising KinCon technology speeds up and improves the cost- and time-intensive search for new drugs.

NovoArc

www.novoarc.at

NovoArc plans to produce and market stabilising lipids that protect active pharmaceutical ingredients from degradation in the body. Hence, in many instances injections may be replaced with tablets.

The human body can only poorly or not at all absorb many of the pharmaceutical agents that are taken orally: they are broken down by acid and enzymes in the stomach and pass through the intestine without being efficiently absorbed. The problem can frequently be circumvented by injecting them. However, injections have drawbacks: for one, they frighten many patients, and secondly, they usually require medical staff to administer them.

Fats as protective shell

The idea of NovoArc founding member Julian Quehenberger may offer a solution. His technology works with specific components of a microorganism, so-called lipids (from the Greek “lípos” for “fat”). As lipids are hydrophobic, i.e. completely or largely insoluble in water, they can form a shell that protects active agents from unwanted degradation. Encapsulated in these tiny bubbles known as liposomes, the substances can safely pass through the stomach and be absorbed in the intestine. This improves tolerability, which, in turn, promises higher patient compliance.

Easy storage, better medical care

Partners David Wurm, Julian Quehenberger and Oliver Spadiut

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Preseed

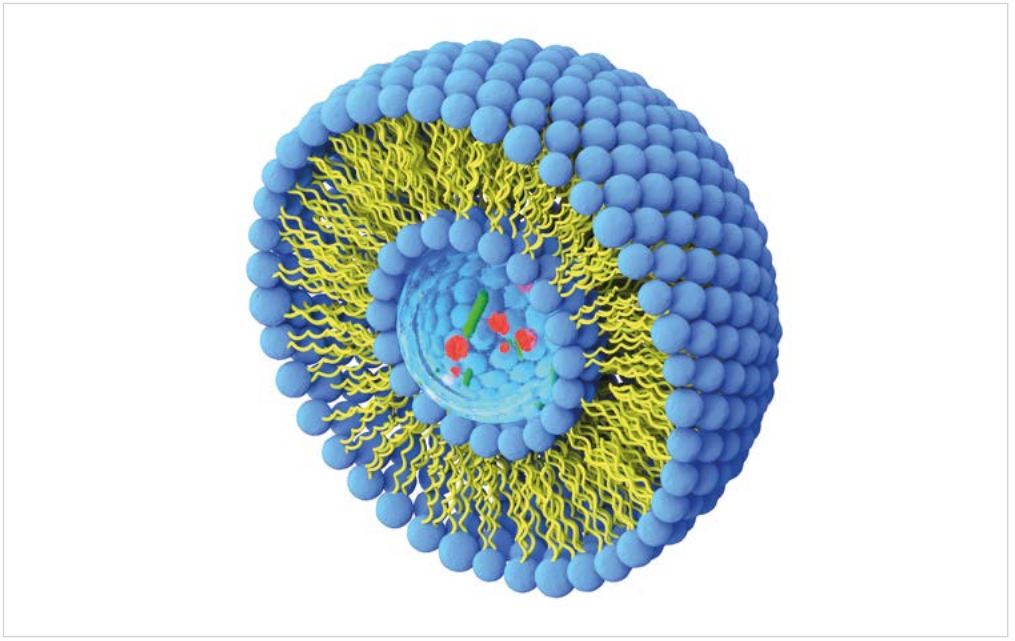
© NovoArc

NovoArc

NovoArc GmbH
Fillgradergasse 7/8, A-1060 Vienna

Founded in 2021
Management: David Wurm (CEO), Julian Quehenberger (CTO), Benedikt Trauttmansdorff-Weinsberg

www.novoarc.at



© NovoArc

founded NovoArc not just to study these stabilising lipids. Because the novel technology excels by increasing the storage stability of active ingredients, they also want to produce and market them for utilisation in the pharmaceutical industry. Certain drugs and vaccines that must normally be stored at temperatures of up to -70 °C can thus be kept at room temperature. Maintaining temperature-sensitive cold chains consequently becomes obsolete, which not only reduces costs but makes medical care in remote areas much easier.

Bringing the idea to production

For the time being, the founders want to fully focus on technology, marketing and business development. To this end, the team is currently being expanded. Setting up their own plant to produce lipids in sufficient quantity and quality to replace injections with tablets is envisaged for 2025.

Rockfish Bio

www.rockfishbio.com

The Viennese startup is developing novel drugs for treating age-related diseases. Their active principle is based on the targeted clearance of aged cells from the body.

We humans age and so do our cells. After a certain number of divisions, they stop growing and become “senescent”. Although these cells remain metabolically active, they lose their ability to divide. They look different from cells that are capable of reproducing and, among other things, they release inflammatory substances that can trigger diseases.

The number of senescent cells in the body increases with age. Most recent findings indicate that this phenomenon is crucial in triggering many serious illnesses. Pharmaceutical agents that selectively kill these cells are called “senolytics” and have already proved their efficacy in numerous preclinical studies. However, these senolytics are often repurposed cancer drugs that come with severe side effects for patients. Besides, their efficacy is often limited to particular organs.

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Preseed

A new pathway to drug development

Biotechnologist Ingo Lämmermann, founding member of Rockfish Bio, identified a new metabolic pathway that governs various cell-ageing processes and is overactivated in many age-related diseases. It was shown to be suitable for developing senolytic agents with markedly improved properties. Agents that inhibit

© Rockfish Bio

ROCKFISH BIO

Rockfish Bio GmbH
Reichsratsstraße 15/15, A-1010 Vienna

Founded in 2021
Founding team: red-stars.com data AG (CEO: Thomas Streimelweger), Ingo Lämmermann (CSO), Johannes Grillari, Otto Kanzler (CEO)

www.rockfishbio.com

© Pixabay

selected parts of this pathway are already in daily clinical use and usually have very few side effects. The new substances that are based on the pathway identified by Rockfish Bio promise maximum efficacy with no or only mild side effects. In cell culture trials, the test substances were effective in all examined cell types and by far superior to already known senolytics.

High-profile founding team

The founding team of Rockfish Bio comprises scientists and experienced startup managers. In addition to Ingo Lämmermann, these are Johannes Grillari, Director of the Ludwig Boltzmann Institute for Traumatology, and CEO Otto Kanzler, a former manager at the pharmaceutical company Boehringer Ingelheim, who has already gained startup experience in several businesses.

BRAVE Analytics

www.braveanalytics.eu

The Med Uni Graz spinoff is developing a laser-based measuring technology that permits the continuous characterisation of (nano) particles in real time.

One nanometre is one billionth of a metre. Nanoparticles are clusters of atoms or molecules of 1 to 100 nanometres in size – in other words, they are really tiny. Nanoparticles can be found everywhere in everyday life as both natural components and artificially added ingredients of the most diverse substances: in food such as milk as lipid droplets, in sunscreens where they ensure that UV radiation does not cause skin damage, in eye drops, vaccines and other medical products. The properties of a product, and thus its effectiveness, largely depend on the (nano)sizes of its ingredients, which must remain constant as any changes will alter the material's behaviour.

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Seedfinancing

Seventy times faster than current methods

In order to obtain the respective desired properties, the size of the particles must be constantly checked, which is usually done in a tedious process in the laboratory.

With their "OptoFluidic Force Induction" technology (OF2i®), founders Christian Hill and Gerhard Prossliner have developed a continuous measurement that is 70 times faster than currently used methods. Thanks to this patented technology,

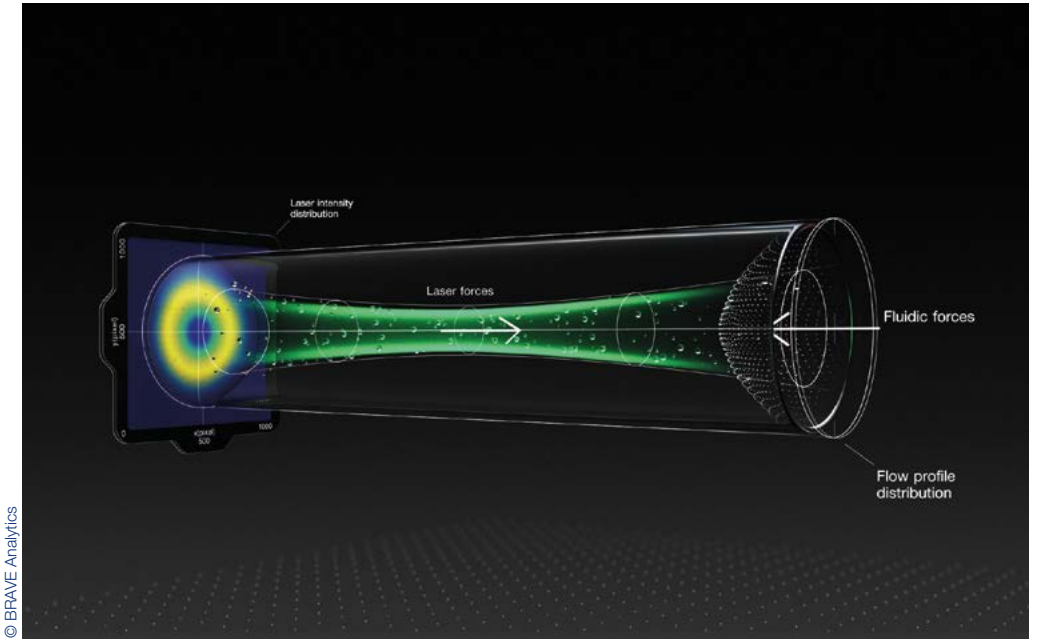
© Alexander Leljak, BRAVE Analytics

BRAVE ANALYTICS

BRAVE Analytics GmbH
Neue Stiftingtalstraße 2, Eingang B, A-8010 Graz

Founded in 2020
Founding team: Gerhard Prossliner, Christian Hill

www.braveanalytics.eu



© BRAVE Analytics

particle properties that are crucial for the quality of the product such as size, purity or concentration can be measured automatically, online and in real time. The results are more accurate and thus more meaningful than previous measurements.

Food, pharma and biotech industries

BRAVE Analytics is a spinoff of the Institute of Biophysics at the Medical University of Graz (MUG). At the end of 2020, the startup was accepted into the EU's Horizon 2020 research programme together with the university. The lightning-fast measuring technology can be utilised in the pharmaceutical and biotech industries, in the areas of food technology, dental care, coating, but also for environmental analyses. The company's goal is to get the sensor station BRAVE B1 for online process control by biotech and pharma firms ready for series production and to the market by 2025.

Celeris Therapeutics

celeristx.com

The Graz-based startup is developing a platform that uses deep-learning methods to support the research and design of novel drugs (degraders) and to generate new pharmaceutical molecules.

Diseases are caused by pathogenic proteins (targets). Currently, 80% of all targets in the human body cannot be addressed pharmaceutically. This also holds true for Alzheimer's disease and various types of cancer. Developing drugs to combat these diseases requires an enormous research effort. The health-tech company Celeris Therapeutics uses deep-learning algorithms to develop Celeris One, a platform that detects hitherto unknown relationships between molecules in existing data sets. This process also generates entirely new (de novo) molecules, which can be synthesised and subsequently used as medicines. Thanks to the high degree of automation of the company's technology, pharmaceutical researchers can save critical time in the initial stages of their work. The fact that developing an active substance takes 15 years will soon be a thing of the past.

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New horizons in chemistry

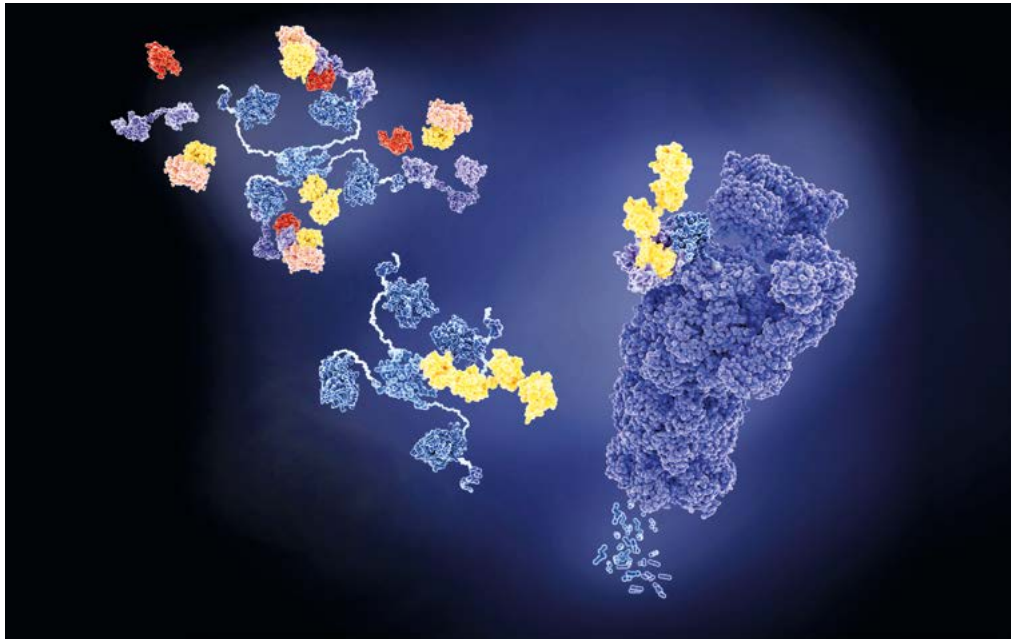
Christopher Trummer and Jakob Hohenberger founded a deep-learning business that uses innovative, computer-based methods to develop medicines for Alzheimer's and similar diseases. Modern medicinal products

© Celeris Therapeutics GmbH

Celeris Therapeutics GmbH
Salzamtsgasse 7, A-8010 Graz

Founded in 2021
Founding team: Christopher Trummer (CEO), Jakob Hohenberger (COO)

celeristx.com



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(deactivating pathogenic proteins) do not suffice to combat many diseases. A new type of drugs (degraders such as PROTACs) uses natural cell-based processes to degrade proteins. This class is most promising in the fight against Alzheimer's, Parkinson's and various cancers. It is, however, very complex and requires entirely novel solutions for computer-based research and development. Jakob Hohenberger and Christopher Trummer are actively pursuing this approach to designing medicines.

Numerous areas of application

The technical solution offered by Celeris Therapeutics is the cloud application Celeris One, which offers deep-learning approaches with 3D representations that can be utilised in many areas. This platform is mainly used by pharmaceutical and biotech companies whose focus is on the "targeted protein degradation" of pathogenic proteins. Celeris Therapeutics has already attracted renowned equity investors.

Cutanos

www.cutanos.com

The Viennese spinoff is developing an innovative platform technology which specifically delivers antigens to Langerhans cells in the skin. The company wants to explore novel immunotherapies.

The immune system protects the human body against bacteria, viruses and other threats. So-called dendritic cells (DCs) that recognise and fight these pathogens play a key role and recruit other immune cells which, in turn, also attack pathogens. Moreover, dendritic cells are responsible for the body's tolerance of endogenous structures (autoantigens). This complex interplay is achieved by an orchestra of different types of DCs.

Targeted delivery

Christoph Rademacher, Professor of Molecular Drug Targeting at the University of Vienna, and his long-time postdoc Robert Wawrzinek founded Cutanos to develop both antiviral vaccines and therapies against autoimmune diseases with the help of specific dendritic cells. They are exploring how to make immunomodulations more precise and effective.

In years of work at the Max Planck Institute of Colloids and Interfaces, the team developed a molecule (ligand) that works like an address label and is solely recognised by a very specific type of immune cells in the skin, the so-called Langerhans cells (LCs). If these

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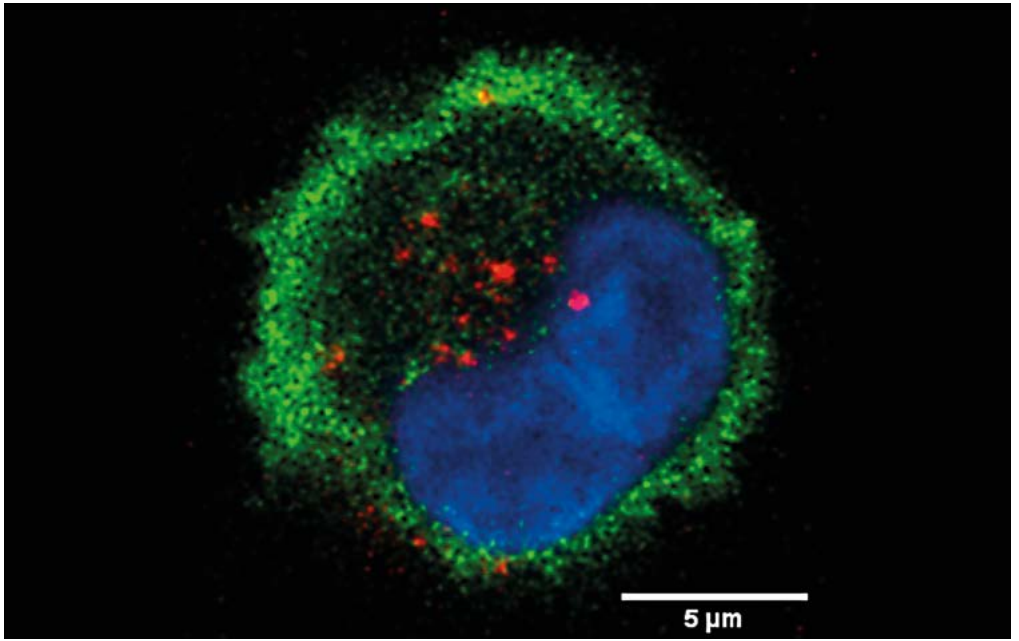
© Dr. Maxime Denis

CUTANOS

Cutanos GmbH
Althanstraße 14 (UZA 2), A-1090 Vienna

Founded in 2021
Founding team: Christoph Rademacher, Robert Wawrzinek (CEO)

www.cutanos.com



© Cutanos

ligands are loaded onto carriers (e.g. nanoparticles) that contain antigens, the antigens are exclusively delivered to LCs, to be presented to the immune system later on. Other cells do not absorb these modified antigens. The Langerhans Cell Targeted Delivery System (LC-TDS) should not only reduce the required drug load but also inhibit adverse immune responses. Since the Langerhans cells are located in the top layer of the human skin, the LC-TDS can be administered via minimally invasive methods such as microneedles.

For global vaccination campaigns

The modular character of Cutanos' technology ensures a high degree of compatibility with other technologies such as mRNA agents, recombinant proteins or various liposomal formulations. In the long term, Cutanos wants to establish itself as a partner for the development of innovative immunotherapies and for global vaccination campaigns.

Evobright

www.evobright.com

Evobright is researching a novel immunotherapy designed to fight specific types of cancer efficiently and gently.

A healthy immune system can recognise tumour cells as damaged tissue and destroy them. In some cases, however, this mechanism does not work, and cancer develops. Immunotherapies use the body's own system by strengthening existing defence mechanisms and making them target tumour cells. The approach is promising, but the few drugs that have already been approved are still used with caution.

More targeted, more effective, more tolerable

Klaus-Peter Künkele and Christoph Baumann, the founders of Evobright, have responded to this situation by researching a new generation of molecule-based immunotherapies. Unlike conventional methods, Evobright's therapy exclusively targets diseased tissue, which makes it much more effective. As it is also gentle on the patient's immune system, it is better tolerated than currently available medication.

The method developed by the two microbiologists is based on findings from microbial infection research and directed against solid tumours. It activates a specific type of immune cells – so-called gamma-delta-T-cells – which specialise in eliminating intracellular infections. With

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evobright

Evobright GmbH
Am Kanal 27, A-1110 Vienna

Founded in 2021
Founding team: Christoph Baumann (CSO), Klaus-Peter Künkele (CEO)

www.evobright.com

© Evobright

its first drugs currently in the pipeline, Evobright targets carcinoma for which novel, more efficient therapeutics with fewer side effects are urgently needed.

Cumulative industry experience

Evobright was founded in 2021. The company's name is a combination of the terms "evolution" and "bright" and roughly means "knowledgeable of evolution". The founders have more than 30 years of combined experience in the pharmaceutical industry and have been involved in the development of therapeutic antibodies successfully approved for the market. They want to continue to break new ground: in addition to tumour treatment, they also plan to develop therapy concepts for cardiovascular disorders and Alzheimer's disease over the next years.

Next steps

In 2022, the year after Evobright was founded, it provided proof of concept for the underlying technology. The company will use the funding from the Seedfinancing programme to actively progress with its novel method and advance the characterisation and development of Evobright antibodies. To this end, local laboratory capacities are currently being built up in Vienna. In the medium term, the company intends to test and outlicense the new immunotherapy in cooperation with partners from the pharmaceutical industry.

HeartBeat.bio

www.heartbeat.bio

HeartBeat.bio is developing a screening platform based on human heart organoids to revolutionise the search for novel drugs against heart diseases.

Most models of heart diseases currently used in preclinical settings are medically inadequate reconstructions because they lack the physiology, architecture and cell interaction of a normal human heart. Moreover, they do not contain a replica of the human ventricle, which is a prerequisite for measuring the heart's pump function.

Accurate replicas, reliable models

The cardiac organoids (cardioids) developed by HeartBeat.bio are derived from stem cells and mimic the natural structure of the human heart and ventricle much more accurately than has hitherto been the case. Using established methods, it is then relatively easy to generate a wide variety of different disease models.

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The fact that the cardioids can be manufactured and replicated at low cost qualifies them for routine use in pharmaceutical drug development. Hence, these organoids may well radically change pharmaceutical drug research in the field of cardiology. Target customers are pharmaceutical companies working in the cardiovascular field and contract research organisations.

An experienced founding team

Sasha Mendjan and Pablo Hofbauer, the two inventors of the HeartBeat.bio

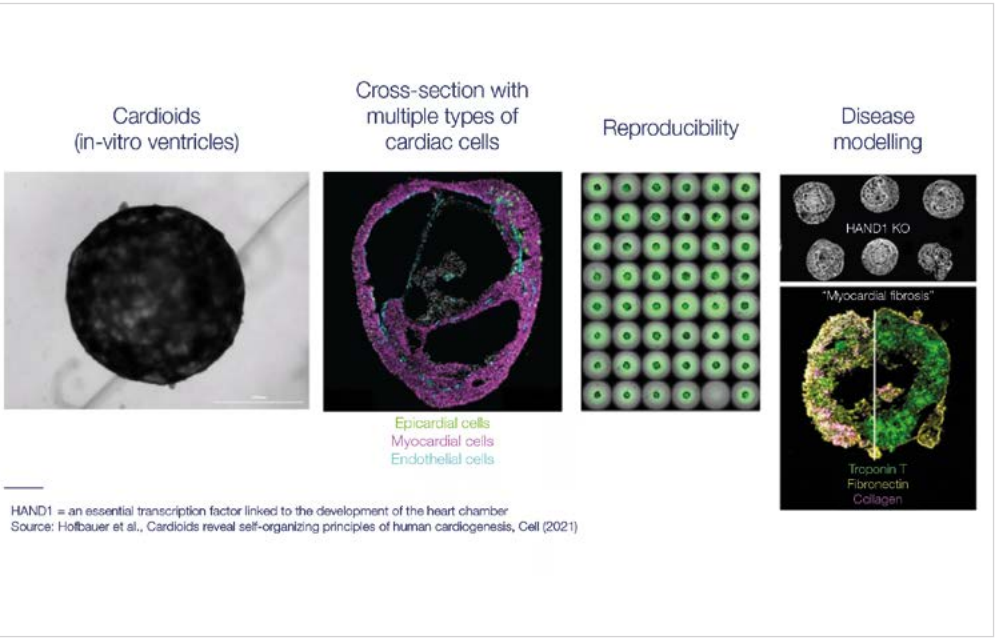
© HeartBeat.bio

HEART BEAT.bio
REINVENTING CARDIAC DRUG DISCOVERY

HeartBeat.bio AG
Vienna Biocenter 6, Dr.-Bohr-Gasse 7, A-1030 Vienna

Founded in 2021
Founding team: Oliver Szolar, Pablo Hofbauer, Sasha Mendjan, Michael Krebs (CEO)

www.heartbeat.bio



technology, are long-standing experts in stem cell biology, tissue engineering, regenerative medicine and cardiogenesis. Oliver Szolar and Michael Krebs, two startup managers and CEOs who have worked in the life sciences industry for more than 20 years, complete the team.

Next steps

In the seed phase, HeartBeat.bio wants to go ahead with the technological validation, establish an automated cardioid-based screening platform and develop disease models for genetic cardiomyopathies and myocardial fibrosis. The company's goal is to complete the development of the screening solution jointly with technology partners within the next three years and to use it as starting point for developing active substances in-house and in cooperative ventures.

Occyo

www.occyo.com

Occyo is developing a diagnostic tool for ophthalmologists. It uses a novel imaging and analysis module to provide sharp and standardised images of the strongly convex ocular surface.

More than 125 million patients worldwide are affected by ocular surface diseases. Available methods for examining the eyeball are rated as complicated and yield results that are difficult to interpret. To solve the problems posed by the examination of the eye's convex surface, the Innsbruck-based startup Occyo developed the Cornea Dome Lens (CDL), a handy tabletop device that, for the first time, supplies high-resolution images of the entire ocular surface.

The CDL offers reliable high image quality and reproducibility for the examination of the eyeball, irrespective of who operates the device. The randomly repeatable high quality of the diagnostic images is the key to telemedicine because they become comparable. In conjunction with artificial intelligence this, in turn, facilitates quick diagnosing. It is important to note that operating the Cornea Dome Lens is so simple that even patients or assistants can handle it.

Aiming high

The slit-lamp cameras used so far can only focus on a flat plane, whereas the surface of the eye is curved. It takes a manual multi-step process that

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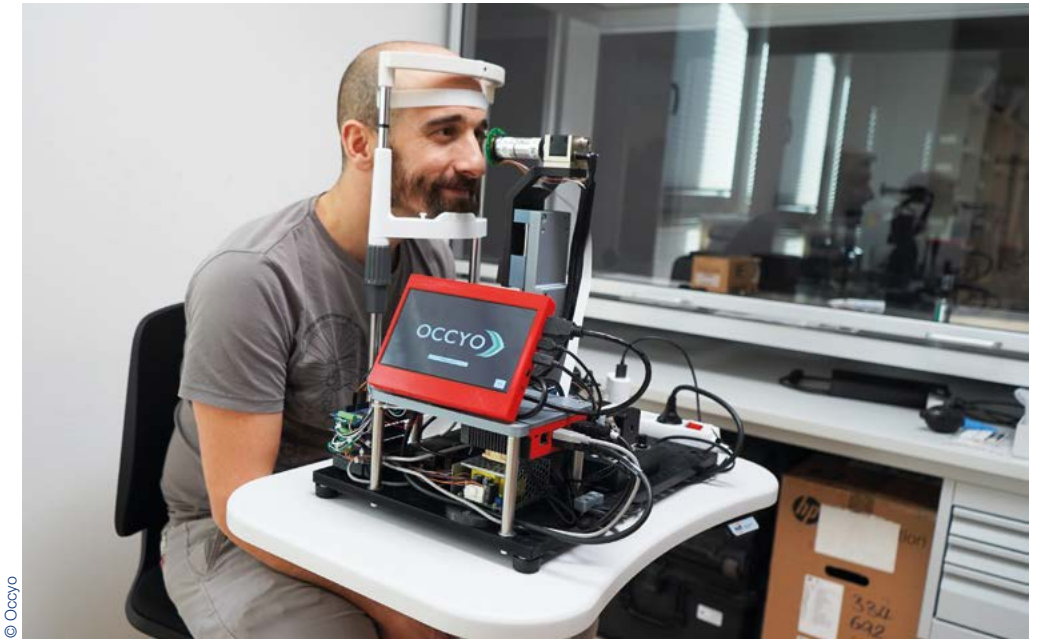
© Occyo

Occyo GmbH
Bleichenweg 13b, A-6020 Innsbruck

Founded in 2019
Founding team: Giulia Angi, Ulrich Hausmann, Vito Romano, Bernhard Steger

www.occyo.com



© Occyo

involves imaging different sections of the eye individually to compensate for the eye's curvature. Poor image quality and lacking repeatability render the quantification of results impossible: 73% of all ophthalmologists think the method needs to be significantly improved. Occyo is delivering: with a lateral resolution of 12 micrometres – i.e. the size of a red blood cell – at a field size of 21 millimetres and a mean curvature of 9 millimetres, the image quality of CDL optics is clearly superior to current diagnostic systems.

Founders

The two founders Vito Romano and Bernhard Steger met during a joint research stay in Liverpool. Their friends were thrilled by the idea to make ocular surface imaging more accurate, accessible for everyone and comparable. Giulia Angi got on board immediately. She brings many years of experience as a Google manager in the areas of digital health and big data to the company. Ulrich Hausmann rounds out the team as an expert in optical devices and software development.

Solgate

solgatetx.com

Solgate is developing pharmaceutical drugs that target solute carrier proteins whose balance is disturbed in neurological diseases, diabetes and cancer.

Solute carriers (SLCs) are a family of around 450 different proteins that have remained mostly unexplored as targets of pharmaceutical drugs. By virtue of their properties, they can access individual cells, acting as transporters and orchestrating the import and export of nutrients and the removal of waste products. These processes are out of balance in many illnesses such as cancer, diabetes or neurodevelopmental disorders.

The long-term goal of the team collected by Solgate's founder Ariel Bensimon is to bring novel drugs for treating these diseases to clinical use.

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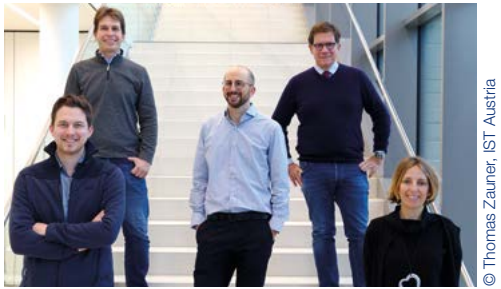
Seedfinancing

A platform for many areas of science

To open up this new area for research, Solgate has implemented a multidisciplinary experimental platform. Combining overlapping methods and adaptable experimental approaches, this platform pools the professional expertise of organic chemistry, molecular biology and cell biology. The platform is customised for the search of new drug candidates that influence the activity of SLCs.

Research accelerator

Solgate's development platform lets users



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Solgate GmbH
Plöcking 1, A-3400 Klosterneuburg

Founded in 2020
Founding team: Stefan Kubicek, Ariel Bensimon (CEO), Giulio Superti-Furga, Georg Winter, Gaia Novarino

solgatetx.com

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find, compare and analyse the effect of potential drug candidates more quickly and cost-effectively. Solgate offers its customers (primarily pharmaceutical companies) both the developed drugs and various platform-based methods for the targeted identification of disease-relevant SLCs.

A new type of cooperation

Solgate was founded by Ariel Bensimon, Stefan Kubicek, Gaia Novarino, Giulio Superti-Furga and Georg Winter in 2020. It is the first biopharmaceutical spinoff of the cooperation between the Research Center for Molecular Medicine of the Austrian Academy of Sciences (CeMM) in Vienna and the Institute of Science and Technology Austria (IST Austria) at Klosterneuburg.

Valanx Biotech

valanx.bio

The startup is developing a platform process for pharmaceutical research that uses synthetic amino acids for the controlled binding of protein molecules in drugs.

Pharmaceutical agents such as growth hormones or immune-boosting interferons are proteins whose degradation can be influenced by their targeted binding to other substances. Diseases that currently still require taking medicines several times a day could thus be treated with significantly less medication. Valanx Biotech takes advantage of this principle. The startup, located at IST Park near Klosterneuburg, is doing research on a platform process for drugs whose active substance binds to a protein. This method is expected to substantially simplify the development of active agents in synthetic biology and promises significant savings in time and resources for pharmaceutical research.

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Stable proteins are a challenge

Proteins have specific chemical characteristics. In order to be therapeutically effective, they need to be absolutely stable. Hence, synthetically produced amino acids often have to be modified, which is a complex process and a major challenge in drug development. Valanx Biotech founder Michael Lukesch developed a process that greatly simplifies protein modification and thus circumvents problem areas that render conventional methods difficult to master.

VALANX BIOTECH

Valanx Biotech GmbH
Plöcking 1, A-3400 Klosterneuburg

Founded in 2017
Management: Michael Lukesch (CEO)

valanx.bio

© Valanx Bio

Artificial docking site

The technology is based on a novel amino acid which is incorporated into the target proteins at defined locations with the help of a specially developed bacterium. In this way, the target protein is equipped with an artificial docking site to which the respective molecules can be attached.

A wide range of applications

Valanx's platform technology facilitates the development of active substances for numerous different indications. The biggest challenge Michael Lukesch now faces is to make his method as widely applicable as comparable established processes. Hence, the company's current development focus is on optimising production. In addition, Valanx is working on its first clinical product that will be used for treating autoimmune diseases.

Vertify

www.vertifymed.com

The Graz-based company Vertify develops medical software that supports the early and simple clarification of dizziness symptoms.

“Vertify” is a fusion of the terms “vertigo” and “identify”. This is exactly what the healthtech’s business idea is about: Vertify offers a method for identifying the cause of dizziness. After headache, dizziness is the most frequent leading symptom in clinical routine. Most incidents are caused by disorders of the inner ear (peripheral), the vestibular nerves or the brainstem/cerebellum (central). Hence, clarifying the cause of dizziness and diagnosing vertigo is an interdisciplinary challenge which previously required multiple examinations. Vertify wants to simplify this process.

Quick referrals

The founding team consists of Christoph Schöggler, who has founding experience as managing director of Aurox, ophthalmologist Bianca Bizjak, orthoptist Daniela Frühwirth-Kaspar and data scientist Christof Stocker. They are developing a medical software that supports the early and simple clarification of dizziness symptoms. This will facilitate the targeted referral of patients to specialists at an early stage, thus saving them from the ordeal of multiple examinations. The novel software is primarily intended for the primary health care sector (in Austria usually family doctors).

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© Vertify

Vertify GmbH
Stremayrgasse 16, A-8010 Graz

Founded in 2020
Founding team: Christoph Schöggler (CEO), Christof Stocker, Bianca Bizjak, Daniela Frühwirth-Kaspar

www.vertifymed.com

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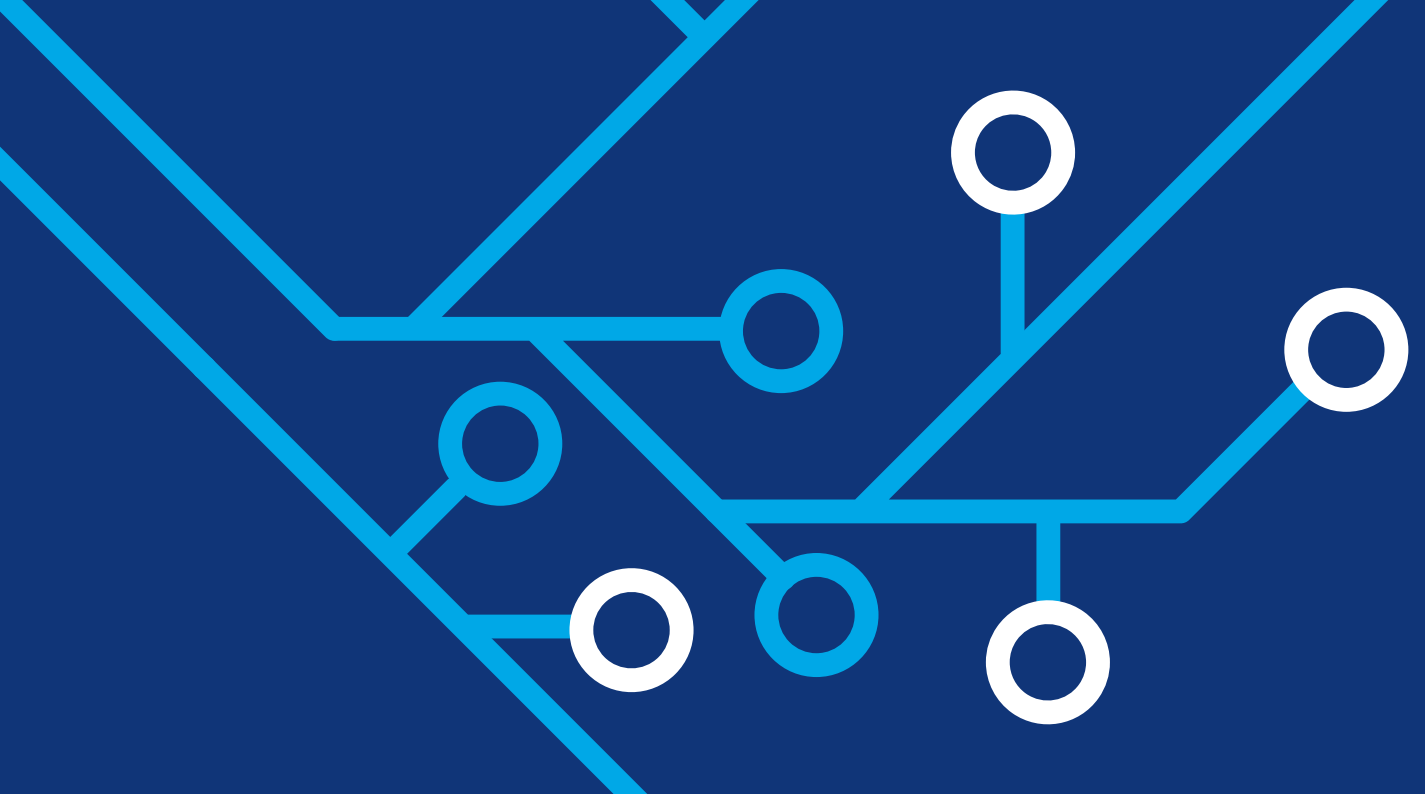
Designed for the primary health care sector

In primary health care, Vertify's software is loaded on the doctor's smartphone. As vertigo can be precisely diagnosed by examining the eyes, the app tests and automatically interprets eye movements (oculomotor activity) through video recordings and state-of-the-art machine-learning algorithms. So far, such tests have only been done by specialists with many years of experience in their field. Thanks to the software developed by Vertify, doctors working in primary health care can, for the first time, make accurate direct referrals to appropriate specialists. In addition, "adaptive" algorithms increase the accuracy of the software with the number of examinations and without collecting any personal data.

Faster and less costly referrals

Vertify's software will reduce the use of expensive imaging techniques such as magnetic resonance imaging whose diagnostic success rate for vertigo symptoms is low. Vertify plans to make the software available in Germany, Austria and Switzerland in 2022, to be followed by its introduction throughout Europe.



GreenTech

Arteria Technologies

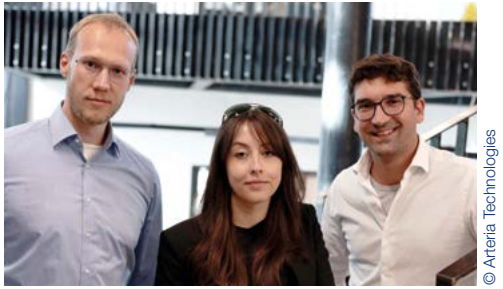
www.arteria-tech.com

aws
Preseed

Arteria is developing a platform for collecting and using utility data, which could achieve up to 15% savings in energy consumption in the grid.

One out of four households in Austria is supplied with heat from an energy network. Operating these networks generates about 10% of all annual CO_2 emissions. In order to plan and operate them more efficiently, utilities need digital tools that can collect operating data in realtime and optimise the energy grid away from the hubs. Although these data are already available in large quantities, they have not yet been sufficiently exploited.

Arteria Technologies is developing a web-based platform to collect such grid data and make them available for actual planning and operational projects. To this end, the Arteria team assembled by founder Stefano Coss is applying a network simulation tool ("digital twin") that supplies realtime insights into the grid behaviour of district and local heating systems, thereby quickly and easily pinpointing efficiency potentials and achieving up to 15% savings in primary energy. Moreover, the data open up a large range of new business opportunities with potential savings for utilities, specifically through sectoral coupling which allows better harmonisation of energy supply, mobility and industry, or the matching of supply and demand.



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Arteria Technologies GmbH
Schubertstraße 6a, A-8010 Graz

Founded in 2022
Founding team: Sebastian Dorfer, Catalina Gaona, Stefano Coss (CEO)

www.arteria-tech.com

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Learning from the data
Existing simulations use obsolete models or simply founder at the complicated operation and poor quality of user interfaces. Arteria, on the other hand, uses a hybrid approach combining physics and AI which can map heat networks of whatever size and complexity in realtime. User-specific dashboards provide a straightforward view of data and analyses of the heat network, showing which information is of actual relevance for users. Management and sales departments profit from the clear display of parameters such as costs, prices and quantities sold, while operators receive precise details of temperatures and pressure distribution in the grid. This facilitates handling of the integrated optimisation tools and dispenses with cumbersome computations in Excel or similar formats.

Driving digitalisation
Arteria has a vision of seriously accelerating the digitalisation of heat networks for the “Smart City” urban development concept. The platform and technology developed specifically for this purpose aim to set the requisite technological standard for this endeavour, and Arteria envisions making a substantial contribution to CO_2-free heat provision.

Circly

www.circly.at

Located in St. Pölten, the business is developing a modular AI toolkit which allows even small companies to manage perishable and fast-moving merchandise by using a self-learning software that cuts down on wastage.

In Europe, trade produces many million tons of food wastage per year. One third of this waste could be avoided.

Requirements planning uses statistical methods based on standardised data models, some of them actually in Excel tables – procedures that are problematic in that they concentrate solely on consumer thinking, with little concern given to external factors. Moreover, SMEs have little or no access to datasets of relevance to the sector. The result is inefficiencies and higher costs due to tied capital, spending on transport, storage and handling, and, in the worst cases, the wastage of valuable resources such as food and other perishables.

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AI-based modular toolkit

Founders Eric Ryan Weisz, Armin Kirchknopf (who met at a hackathon in early 2019) and Bernhard Lutzer (who rounds off the team as an expert for process analysis) intend to make AI-based sales and demand forecasts available to SMEs through Circly, a modular toolkit that fits all company sizes, with a federated machine learning concept working in the background. Pre-configured AI models allow SMEs lacking the requisite IT skills to exploit the potentials of big data, machine learning and data science in order to

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circly

Circly GmbH
Heinrich-Schneidmadl-Straße 15, PO Box T022N,
A-3100 St. Pölten

Founded in 2021
Founding team: Bernhard Lutzer, Eric Ryan Weisz (CEO), Armin Kirchknopf

www.circly.at

get accurate and flexible forecasts for requirements, sales and budgets. Circly's requirements forecasts are more precise than those provided by competitors and generate substantial savings in resources.

AI for everybody

Circly's algorithms are already at work in the field. Initial versions are applied by a well-known chain of drugstores, the Austrian Post and in trials run by Kastner, a wholesale food dealer. Circly is primarily targeted at producers and retailers of fast-moving consumer goods (FMCGs) and perishables (such as food and cosmetics). Circly's goal is to make AI and machine learning accessible to non-technical users and to provide them with sustainable management at all corporate levels through demand-based planning.

c-square bioscience

www.c-square.at

The startup from Tulln is developing an automated biomonitoring system which gauges the microbial infestation of industrial products in realtime, thereby minimising the use of chemical biocides.

Many production fields (such as the paper and pulp industry or the cooling lubricant industry) are continually faced with the problem of microbial contamination of their process fluids: bacteria, yeasts or fungi produce slurries and mould, attended by unpleasant odours. At its worst, such infestation may even disrupt production. The infestation is caused by the type and quality of the raw materials, production conditions and inadequate microbiological plant hygiene. Currently, biocides are used in the production process for prophylactic purposes, usually in excessive quantities. A large dose is necessary because it has not yet been possible to compute exact dosages to match production conditions.

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Preseed

Current measuring methods for microbial loads permit only delayed and frequently inadequate monitoring.

Automated measurement and dosing

Founders Gerald Krätschmer, Thomas Eichinger, Markus Enzenhofer and Michael Kunz aim to cut down on the use of biocides typically made from petrochemicals. The solution revolves around measuring required quantities in realtime by applying flow cytometry with an automated sampling and sample processing unit. The online data obtained




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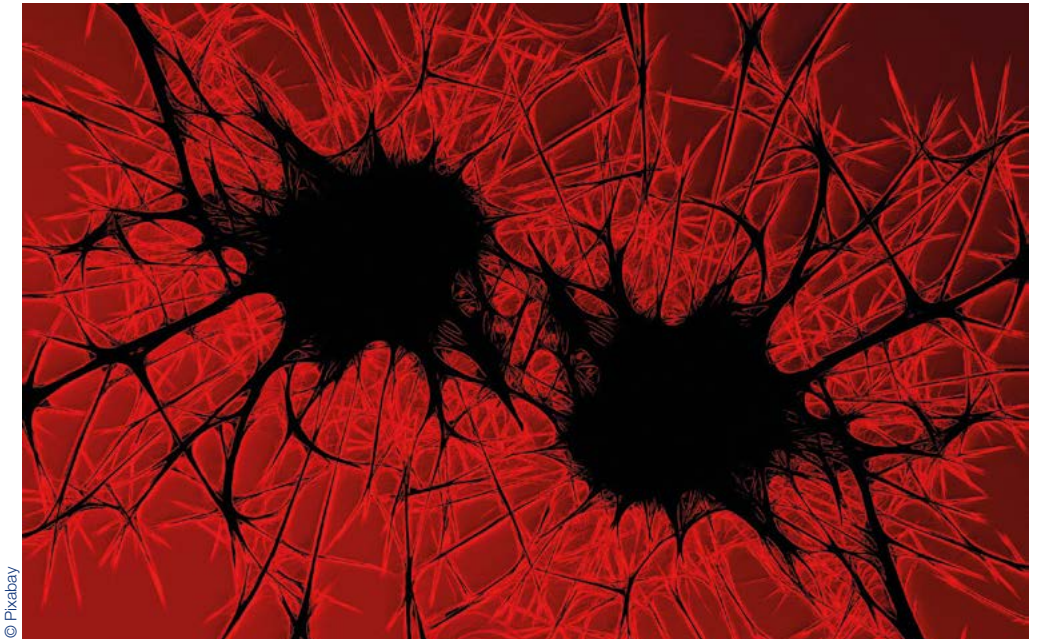
c-square bioscience GmbH
TFZ Tulln, Technopark 1, Gebäude C, A-3430 Tulln

Founded in 2021
Founding team: Gerald Krätschmer, Thomas Eichinger, Markus Enzenhofer, Michael Kunz

www.c-square.at



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by this measurement method are used to describe the timeline of the microbial infestation by mathematical kinetics models. Underlying algorithms map a closed loop to control biocide dosing pumps.

Marked reduction of biocide input

The data thus obtained are analysed with AI elements and used to continuously optimise biocide dosing. The method developed by c-square bioscience ensures that the quantity of biocides injected is kept to an absolute minimum. In addition to saving on chemicals, this greatly raises process reliability. Automated dosing and biocide reduction diminish the risk of triggering allergies and support the use of alternative biocides, resulting in lower environmental stress and healthier food. An application for a patent was filed for the algorithm generated by c-square bioscience in February 2021.

EcoSafe

aws
Preseed

The research team based at Tulln in Lower Austria is developing an environmentally compatible plant protectant that uses fungal metabolites to kill off harmful insects and mites.

Beehive death, also known as colony collapse disorder, has recently become a byword for an environment seriously out of balance. Yet the problem is not limited to the preservation of biological diversity: according to estimates by the Food and Agricultural Organisation (FAO), 71 out of the 100 crops which are crucial for feeding humanity are pollinated by bees. Losing this type of pollination would put the food supply for large parts of the world's population greatly at risk and would translate into a loss of hundreds of billions of euros every year.

From a global point of view, the recent mass collapse of honeybee colonies is chiefly due to the Varroa mite. To fight this pest, we need pesticides that are both safe for bees and harmless for the environment in general.

New biological basis

One possible approach has been developed by bioscientists who are increasingly directing their research interest to the targeted use of fungi. As some fungi are natural pathogens for insects, they can also be used for pest control. Currently approved preparations based on such insect-pathogenic

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EcoSafe GmbH
Technopark 1, A-3430 Tulln

Founded in 2022
Founding team: Arnold Dohr (CEO), Alexander Pretsch

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fungi exploit the toxic effects of fungus spores.

Three experienced pharmaceutical researchers in Lower Austria have now taken the next step: Arnold Dohr, Alexander Pretsch and Miroslav Genov intend to use the metabolites of fungi that are toxic to insects. When exposed to specific fermentation conditions, these fungi can be stimulated to produce so-called secondary metabolites which are very effective against insects and mites. As plant protectants, they target and kill not just aphids and red mites, but also specifically beet leaf weevils and palm weevils, yet they do not harm bees or human consumers.

Heading for approval

Based on the toxic opportunities offered by fungal metabolites, the researchers want to develop insecticides and acaricides (miticides) that combat plant diseases caused by insects and mites. EcoSafe's long-term goal is to get these metabolic agents licensed and bring them to the market. According to the founders, most of the research and development work required to obtain regulatory approval should be completed by 2026.

FermX

FermX is developing a novel technology for producing proteins from CO_2-derived methanol. This alternative to products made from animals also substantially reduces the need for other resources.

Demand for alternative protein products of non-animal origin has increased. This trend will most likely continue in the future and is triggered by growing food shortages, changing dietary habits and, above all, by the possibility to produce food in an eco-friendly way. After all, alternative proteins do not involve the exploitation of animals and their production requires significantly fewer other resources such as animal feed or water.

The interest in such products is fully in line with the trend towards more ecology and less energy consumption. According to forecasts, alternative proteins will account for around 11% (i.e. US$ 290bn) of the market by 2035, as compared to a slim 2% in 2020.

aws
Preseed

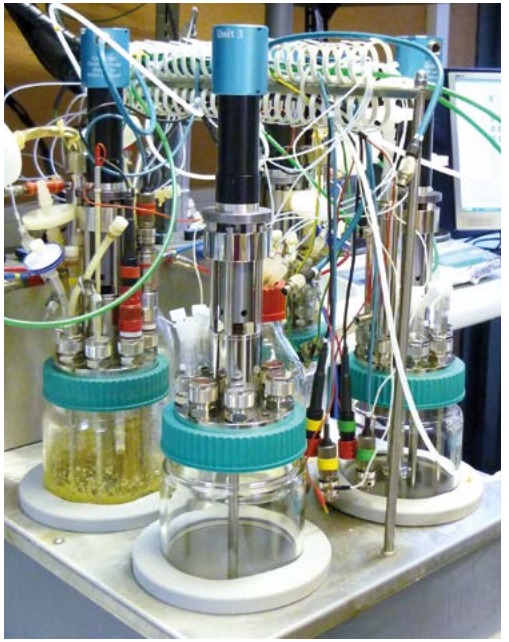
Methanol and yeast fungi

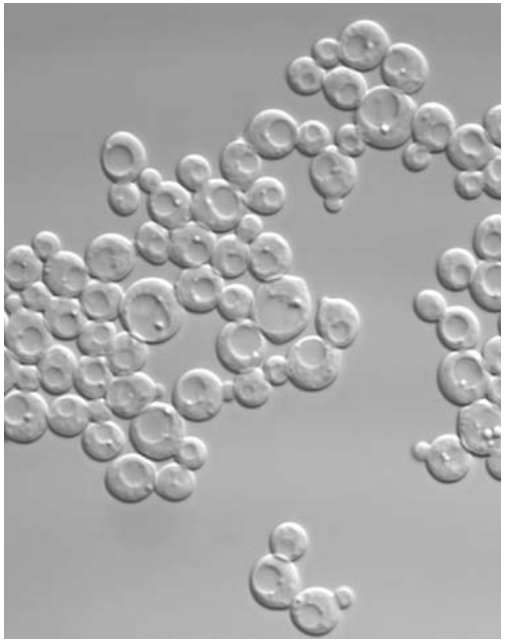
Viennese researchers Hans Peter Bissinger, Diethard Mattanovich and Matthias Steiger are breaking new ground. The company they founded in October 2021 uses synthetic biology and fermentation to develop a technology for the improved utilisation of methanol. This alcohol compound can be produced sustainably from CO_2 and renewable energies, but unfortunately is not readily

© FermX

FermX GmbH
Muthgasse 11/2, A-1190 Vienna

Founded in 2021
Founding team: Hans Peter Bissinger (CEO), Diethard Mattanovich, Matthias Steiger





© FermX

accepted by cells. To solve the problem and considerably reduce the use of other resources such as sugar as a basic nutrient, FermX isolates special natural yeast fungi and uses metabolites generated by bottlenecks in the metabolism of these fungi.

Conserving resources

FermX utilises platform technology to manufacture specific, nutritionally valuable proteins that are otherwise found in eggs, milk and meat. This not only substantially curbs the use of agricultural products such as sugar, but also virtually eliminates the need for resources such as farmland, water or chemicals.

The founders' primary business model is to develop and license the technology, while partners will manufacture the actual products. The company's strategy is to convince potential partners with its dedication to sustainability and efficiency and to conquer the market together.

Lignovations

lignovations.com

The spinoff of Vienna's University of Technology is developing a patented process to harvest lignin particles from biomass with a view to replacing harmful chemicals in the cosmetics industry.

Excessive ultraviolet radiation not only damages human skin – plants, too, are sensitive to UV light. However, in millions of years of evolution, nature has equipped them with a natural screen: they contain lignin which protects them from sunlight, oxidation and other negative environmental influences. Lignin is a highly complex, natural and extremely heterogeneous polymer. As a result, it is difficult to process industrially, which severely limits the widespread use of this valuable resource.

First application: suncreams

A process developed by Lignovations, a startup based at Tulln, aims to exploit lignin's properties for consumer products. The patented technology of the founding team around Martin Miltner turns large quantities of lignin into a standardised form that can be industrially processed. Lignin is extracted from lignified biomass and converted into colloidal particles that can be used in a variety of ways, e.g. in paints, wood preservatives, packaging materials or functional textiles.

Nevertheless, the first application for Lignovations particles is in suncreams. These contain UV blockers that

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lignovations

Lignovations GmbH
Technopark 1, A-3430 Tulln

Founded in 2021
Founding team: Victor Tibo (CFO), Angela Miltner (COO), Martin Miltner (CEO/CTO), Stefan Beisl (R&D)

lignovations.com

© Lignovations

may be harmful to both health and the environment. Cooperating with manufacturers of skin care products, Lignovations has demonstrated that the addition of lignin particles will substantially cut the content of blockers while ensuring the same screening effect.

New products and a pilot plant

Lignovations emerged from a research focus at Vienna's University of Technology. At present, it is preparing its commercial market entry, assisted by aws, the Austrian Research Promotion Agency (FFG) and investors. The company is building a pilot production plant in Lower Austria. By 2025, it intends to expand its portfolio by new functions and applications, and plans to build a scale-up facility for industrial production.

Oxygen Scientific

www.oxygenscientific.com

The startup from Graz is developing a lead-free, ecologically harmless oxygen sensor for use in medical devices such as ventilators and anaesthesia machines as well as in diagnostic situations.

Occasionally, breathing gets laborious for lack of oxygen. The “Greenflash” O_2 sensor is an environmentally friendly device that complies with the RoHS Directive regulating the use of hazardous substances in electric and electronic equipment. The sensor can be flexibly built into the existing infrastructure of healthcare facilities or fitted into new devices. Founders Arne Sieber (sensorics and biomedical engineering), Irfan Sehic (embedded systems and software development) and Milena Stoianova-Sieber (legal affairs) want to substitute the “galvanic” oxygen sensors commonly used in many industries by their own device.

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Compared to the innovation from Graz, the currently used sensor technology has serious drawbacks. Galvanic sensors have a limited service life and need to be frequently replaced. Moreover, their main component is a large lead anode. Lead is on the list of substances banned in electronic products and has so far been used only for lack of alternatives. Moreover, galvanic sensors are decidedly inaccurate. Oxygen Scientific wants to introduce a precise and ecological alternative to the galvanic oxygen

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OXYGEN SCIENTIFIC

Oxygen Scientific GmbH
Eichbachgasse 151, A-8041 Graz

Founded in 2021
Founding team: Arne Sieber, Irfan Sehic, Milena Stoianova-Sieber

www.oxygenscientific.com

© Oxygen Scientific

sensors market, which sells about two million units per year.

Learning from light

The “Greenflash” technology developed by Oxygen Scientific identifies dissolved and gaseous oxygen. It is based on fluorescence quenching: special dyes fluoresce when exposed to a green laser or LED. This fluorescent light is captured by a miniaturised optoelectronic system. The partial pressure and share of oxygen can then be calculated from its lifetime and amplitude. Unlike galvanic oxygen sensors, which have a typical service life of one to three years, the sensor spots from Graz remain operational for up to ten years.

Next steps to commercial viability

The first functional samples of the sensor have already been built. The sensor has been successfully tested at oxygen partial pressures of up to 2 bar. Currently, the company is taking the next steps towards commercial viability. In the long term, the target is to obtain a market share of 20% for medical oxygen sensors, equivalent to € 7m in sales. Other markets, such as industrial applications, automotive engineering and diving technology, are considered potential growth sectors.

Terawind

www.terawind.energy

Terawind is developing a wind power technology for complex terrain to harness the world's strongest winds for electricity generation.

Strong winds throttle the generation of renewable energy. When the wind force exceeds a certain level, conventional wind turbines literally close their wings: the rotor blades are adjusted to match their output to the rated power of the generator. Hence, compared to the theoretically available wind energy, energy generation is low. For Terawind founder Philip Krammer strong winds are an untapped resource. With his technology he intends to make the strongest winds in geographically difficult terrains around the world usable for energy production. To this end, his Vienna startup is developing a wind turbine that completely converts air currents of much higher velocities than has been the case up to now into useable energy.

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Ideally, the entire range of wind energy, from soft breezes to gusty gales and short squalls, is harvested. The technology is based on hydraulic-electric energy conversion with long-term energy storage. Depending on demand, the green electricity could thus be fed into the grid either directly or at a later date. Given the significantly higher yield, especially in terrain characterised by strong prevailing winds such as mountainous regions, the levelised cost of electricity (LCOE) will be comparatively low. Future locations suitable for applying the technology

© Terawind

Terawind GmbH
Technologiezentrum Seestadt, Seestadtstraße 27, A-1220 Vienna

Founded in 2021
Management: Philip Krammer

www.terawind.energy

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include, in particular, mountain ridges and plateaus, regions exposed to fall winds (mistral, bora), coastlines and offshore regions.

Energy costs in line with the market

The overall concept, which comprises harnessing stronger winds combined with long-time energy storage, paves the way for a low-cost base-load supply from wind energy. At the same time, it opens up previously inaccessible locations that have a high potential of wind energy (such as mountains) for easier and better exploitation. Especially in alpine terrain, the wind flow is characterised by turbulences and short gusts which are a major technological challenge that needs to be overcome.

The radical technological approach also opens up an entirely new field of innovation. Accordingly, Terawind intends to significantly advance the aerodynamic optimisation of the dual wind rotor which involves setting two rotors in a row in order to maximise the yield from the wind's flow energy. The company plans to develop the technology to market maturity within the next three years. To this end, a team of specialists will be set up to test several prototypes with ever larger rotor diameters.

Tree.ly

www.tree.ly

The aim of the digital platform operated by Tree.ly is to compute the carbon sinking capacity of forests and, subsequently, boost trade in CO_2 certificates for forested areas.

Given the rise of emissions and ever more restrictive climate laws, demand for CO_2 certificates is rising apace. By purchasing such certificates, enterprises in particular can compensate unavoidable emissions of pollutants and thus, at least on paper, turn into climate-neutral businesses. However, assessing and computing such emissions is a lengthy and expensive process.

Forest owners, on the other hand, have difficulties accessing the carbon market. In order to become tradeable, CO_2 certificates need to undergo a detailed certification process. This is where the startup from Vorarlberg comes in: Tree.ly's founding team around Jodok Batlogg and Eva King intends to tap the unused carbon-sinking potential of European forests. The Tree.ly platform is designed to become a marketplace for standardised and tradeable forest carbon certificates that allows owners of small forests as much as big forest operations to monetise their woodlands' contribution to combating climate change.

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Standardised and tradeable

Using the platform, forest owners can register and analyse a reported plot, calculate carbon credits and have the

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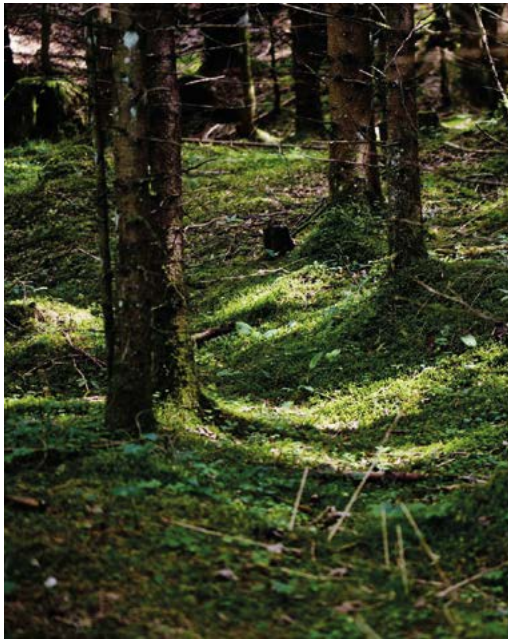
Tree.ly

Tree.ly GmbH
Sebastianstraße 6b, A-6850 Dornbirn

Founded in 2021
Managing director: Jodok Batlogg

www.tree.ly



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results certified. The analysis includes growth rates depending on altitude, type of trees and soil characteristics. Tree.ly is developing the underlying data models, supplementing them by robust calibration and error correction procedures.

Precise measuring data provide the added bonus that changes in the forest's biomass can be accurately tracked, which is a prerequisite for trustworthy certificates and the basis for trading verified emission reduction (VER) credits at transparent prices. The process and methodology used in Tree.ly's calculations comply with the EU's climate laws and the current ISO standard 14064-2 for quantifying carbon sequestration. In the long-term, the software should offer a simple method for large-scale implementation of CO_2 projects.

For large and small plots

Currently, the main target groups are operations of more than 500 hectares that can sink large quantities of carbon, which should cover the rising demand for CO_2 certificates on the market. In a second step, the platform will be opened to owners of tiny wood plots. At the time of the editorial deadline, contracts had already been concluded for a total area of over 10,000 hectares in the Vorarlberg pilot region.

AgroBiogel

www.agrobiogel.com

The spinoff of the Vienna University of Natural Resources and Life Sciences is developing a hydrogel from natural raw materials that keeps moisture in the soil longer and makes unproductive soil fertile in the long term.

Hotter summers and ever scarcer rainfall – in many regions, climate change is turning droughts from an occasional problem into a permanent condition. The consequences are particularly drastic for farmers, but could be mitigated by hydrogels. Usually applied in granular form, the additives absorb copious amounts of water and gradually release it back into the soil. Researchers at the University of Natural Resources and Life Sciences in Vienna have developed a wood-based hydrogel that can absorb extreme amounts of water.

Woody plants as raw material

The completely organic hydrogel keeps fertilisers in the soil, releases them gradually and thus prevents harmful leaching. As the hydrogel decomposes into humus after some years, it increases soil fertility. Unlike fossil-based hydrogels that have increasingly come under pressure and are subject to restrictions in their agricultural use, AgroBiogel uses woody plants for its hydrogels.

With Gibson Nyanhongo (who heads the Biomaterials Technology working group at the Vienna University of Natural Resources and Life Sciences in his

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© Keith Nyanhongo

AgroBiogel GmbH
Königstetter Straße 128-132, A-3430 Tulln

Founded in 2021
Founding team: Enrique Nacif, Gibson Nyanhongo, Johannes Paul Schwarz

www.agrobiogel.com

© Keith Nyanhongo

day job) as their spiritus rector, the founders of AgroBiogel have succeeded in developing their hydrogel to market maturity.

Biological reservoir

Soils mixed with the hydrogel can absorb up to 95% of the seepage water, cutting the need for irrigation by 40%. As the substance stores the added water, it can compensate irregular or reduced water supply and thus counteract droughts. By generating humus in the long term, the AgroBiogel additive can turn even sandy soils into farmland.

A true allrounder

The biohydrogel is preferably applied in the same way as are fertilisers. The product developed by the Tulln-based company can be used in open fields as much as in greenhouses and other artificial growing systems. The beginning of 2022 marked the start of the third phase of industrial scaling to prove that the daily production output meets the industry's demand. Seedfinancing money is used to expand the team. The company wants to be present in the drought zones on the European and African continents by 2025.

i4SEE TECH

www.i4see.com

i4SEE TECH is developing a software solution that is based on augmented intelligence technology which optimises maintenance and operation of wind turbines by analysing previous operating data.

Wind power is playing an ever greater role in post-fossil energy concepts. The requisite wind turbines require a high level of maintenance. The business idea underlying i4SEE TECH, a startup from Graz, exploits available operating data to make recommendations for inspecting, repairing and optimising large-scale energy-generating wind farms. By using augmented intelligence (not to be confused with artificial intelligence processes), founder Christopher Gray intends to set a new benchmark for operating entire wind turbine fleets. For companies that still use conventional maintenance routines, this transition will be a challenge in the short run. However, Christopher Gray is convinced that “predictive maintenance” will strengthen the position of wind energy as a cost-effective and competitive method of energy generation.

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New business fields

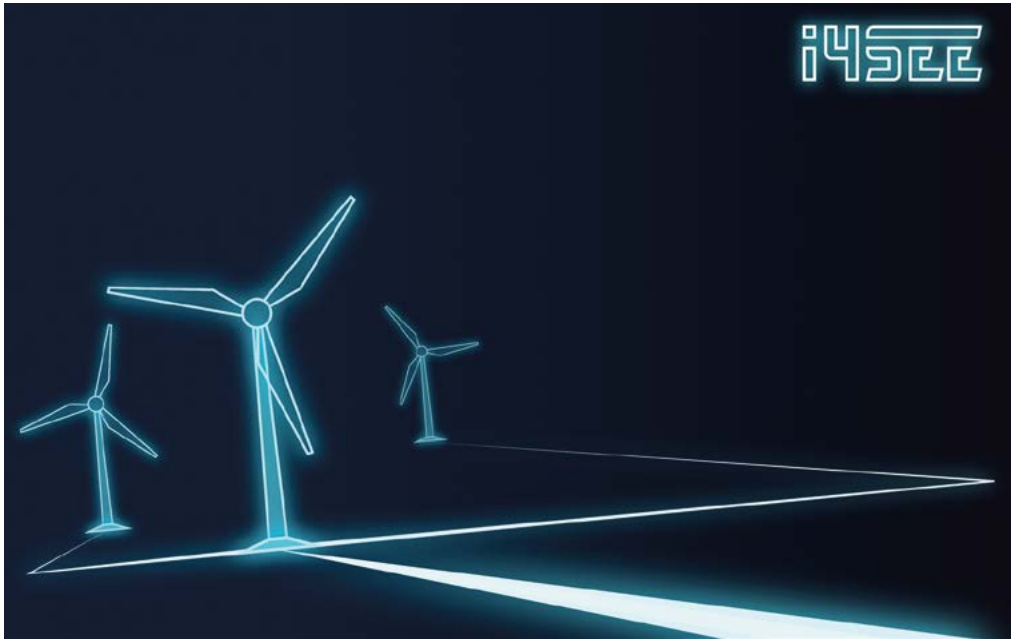
i4SEE TECH is about to extend the areas of application for its software whose modular structure lends itself to gradual introduction. In the future, its augmented-intelligence-based analyses will not only interact with centralised, cloud-based computer resources, but also generate data via distributed networks and edge-computing

© i4SEE TECH

i4SEE TECH GmbH
Unicorn Innovation Hub, Schubertstraße 6a, A-8010 Graz

Founded in 2019
Management: Christopher Gray

www.i4see.com



© i4SEE TECH

devices. Accordingly, the analytical software from Graz is “edge-ready”, which makes it appropriate for a wide range of applications.

Renewables as target sector

The company established in 2019 plans to make its solutions suitable for other technologies in the renewables field, including solar energy storage units and batteries. Utilities can deploy the self-learning data analysis software developed by i4SEE TECH quickly, at large scale and at low cost. The software thus is a major step towards making the generation and distribution of renewable energy sufficiently cheap to ensure its successful use at normal market conditions.

Kern Tec

www.kern-tec.com

Kern Tec has been developing special technologies to process the pits of stone fruits into high-end products such as speciality oils, milk alternatives, protein flours and substitutes for microplastics.

The pits of apricots, plums and cherries are generally regarded as waste. Yet both the shell and its soft core are primary sources of raw materials – if you know how to process them. The (soft) inner seeds are full of valuable oil and protein: 53% of an apricot pit consists of oil. Cherry pits, at 42%, have the largest amount of protein. The seeds from stone fruits can be processed into edible and cosmetic oils, protein flours and milk-alternative drinks or snacks. The processed hard shell can be a natural substitute for microplastics. Founders Fabian Wagesreither, Luca Fichtinger, Sebastian Jeschko and Michael Beitl have developed a processing and logistics chain that turns seeds and shells into precious raw materials.

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Turning waste into resources

Stone fruits (apricots, cherries, peaches and plums) are typically appreciated for their pulp only. In Europe, the stone fruit industry produces some 550,000 tons of kernels per year as a by-product which is thrown away or, at best, burned for heat. The main problem is the prussic acid contained in the kernels which has so far been the key reason for treating them as toxic waste.

© Kern Tec

Kern Tec GmbH
Wielandsthal 16, A-3130 Herzogenburg

Founded in 2019
Founding team: Fabian Wagesreither, Luca Fichtinger, Sebastian Jeschko, Michael Beitl

www.kern-tec.com

© Kern Tec

Detoxification leads to breakthrough

The founders developed two fully automated methods for splitting, sorting and detoxifying the pits. Kern Tec now operates its own production plant at Herzogenburg/Lower Austria, which processes up to one ton of kernels per hour. So far, the startup has handled around 1,000 tons of pits. In 2021 Kern Tec oils were first listed by major food chains. In the same year, the startup attracted positive reviews at Plug and Play's prestigious US Food Accelerator, one of the main schemes for startups in the food & beverages sector.

Purency

www.purency.ai

The Viennese startup is developing software for the analysis of microplastics that uses AI algorithms to determine not only the quantity but also the type of plastic.

Microplastics lurk everywhere. In every wash cycle, clothes release up to 2,000 tiny plastic fibres. In every corner of the world, ageing and decomposition break down packagings into tiny particles that find their way into food and living things. Microplastics are frozen into the polar ice cap, seep into the Amazon forests with the rainwater and are ingested by marine animals.

So far, there are no efficient methods to tackle this problem as we lack hard data on microplastics. However, sufficient data on the occurrence and source of plastic particles are a prerequisite for understanding their effects and finding globally valid solutions. The Microplastics Finder is Purency's contribution to reaching this goal.

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Standardised interpretation of data

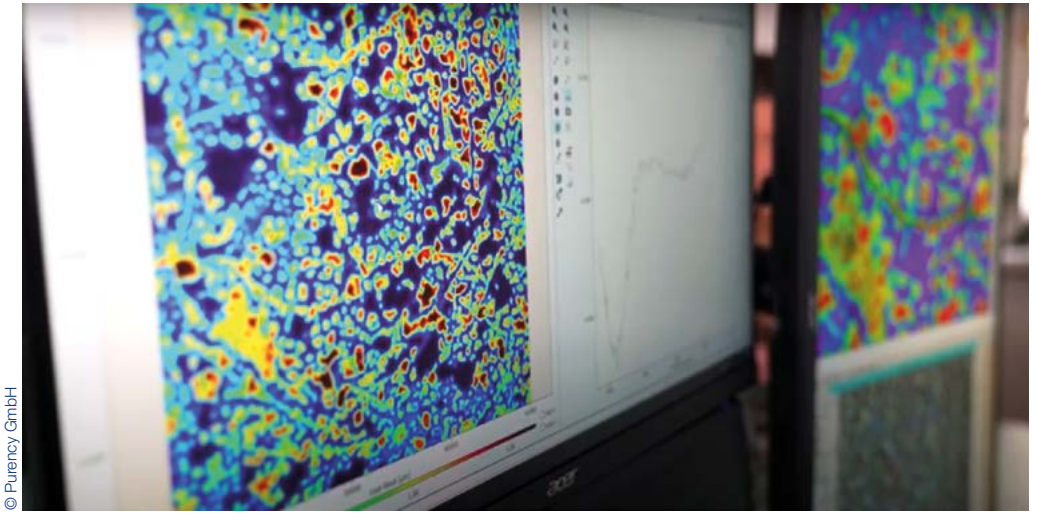
One of the biggest problems of laboratories is that methods for measuring microplastics are not comparable. Benedikt Hufnagl, a graduate in technical chemistry and process engineering at Vienna's University of Technology, tackled the problem in a roundabout way: he succeeded in automating the data analysis of microplastic measurements. The samples are irradiated with electromagnetic rays in the infrared range to identify the particles contained in them. Machine learning algorithms can automatically decode the large

© Purency GmbH

Purency GmbH
Walfischgasse 8/34, A-1010 Vienna

Founded in 2020
Founding team: Michael Stibi, Valerie Hengl

www.purency.ai



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amount of data generated in this process, which not only considerably accelerates the measuring process but, above all, standardises the method. Michael Stibi (technical chemistry, Vienna's University of Technology), Valerie Hengl (environmental technology, Vienna's University of Technology) and Aurelia Liechtenstein (business administration, Maastricht University) turned this idea into a business plan. The four graduates jointly founded Purency in August 2020.

Laboratories and environmental authorities as target groups

The Microplastics Finder can detect all polymer particles in a sample, classifying them by type, number and size. The current version processes infrared images with more than one million spectra and 5 GB each, distinguishes more than 20 polymer types and delivers results in about ten minutes. The target groups include all types of laboratories that analyse microplastics, irrespective of whether their focus is on research, contract work or issues relevant to the industry. Moreover, the company aims to cooperate with spectrometer manufacturers, environmental authorities and the food industry. As Purency enters the Seedfinancing phase, it starts to expand the distribution of the market-ready process and to fine-tune the tool's capabilities.

VTL GmbH

www.viennatextilelab.at

VTL is developing a method that makes microorganisms produce natural textile dyes. This technique is much more eco-friendly than conventional chemical dyeing processes.

Karin Fleck lets bacteria work for her. When the microorganisms metabolise, they produce intense colours that are used to obtain biogenic dyes, which are expected to eventually replace most of the conventional dyes used for textiles. Unlike common dye plants, the bacteria do not need farmland to grow. Moreover, they render intermediate steps superfluous as the biogenic dyes can be applied directly onto the fabric fibres.

Natural and versatile

The textile industry, and specifically textile dyeing, is said to be the second largest polluter of water worldwide. Almost all dyes are made from petroleum products, causing not only contaminated wastewater but also high CO_2 emissions.

This is not the case with biogenic dyes. They are of natural origin and utilise the biodiversity of endemic microorganisms. Thanks to their organic basis, they generate less waste in the dyeing process. Moreover, these dyes are versatile. They can either be applied directly or extracted and processed in the same way as other dyes.

Karin Fleck, founder of VTL (short for Vienna Textile Lab), came across the

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VIENNA TEXTILE LAB

VTL GmbH
Rudolf-von-Alt-Platz 4/13, A-1030 Vienna

Founded in 2021
Founder: Karin Fleck

www.viennatextilelab.at

© VTL

method during one of her stays in the Netherlands where a friend campaigned for sustainable methods in the textile industry. One field of experimentation was dyeing fabrics with colours generated by bacteria.

Research and business ventures

Demand in this sector is high: the fashion industry is continuously on the outlook for new materials that are consistent with the principles of the circular economy. VTL is currently researching how to get as much colour from the bacteria as efficiently as possible. Moreover, the startup is also greatly improving the scalability of colour production. Karin Fleck emphasises that she can match any tint with her bacteria. However, not every colour is suitable for textiles and not every shade can be produced economically.

The startup has made great strides forward since its Preseed phase. In the first quarter of 2022, VTL has cooperated with the European Space Agency (ESA) to study the antimicrobial effect of microorganisms on the inner layer of spacesuits. In addition, several European partnership projects are underway. One example is the ELIIT (European Light Industries Innovation and Technology) programme, which brings together creative industries and technology on an international level. Projects with global textile and luxury goods businesses are already in place.

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Projects supported in 2021

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Boosting key technologies

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