Edition 2024 / 2025

CLIB

networking biotechnology
creating sustainability

Transformation towards a Sustainable Bioeconomy

Dear CLIB members,

we live and work in troubled times! The geopolitical situation continued to be unstable last year, with many major and also minor armed conflicts shaping the day-to-day politics. The suffering of the directly affected populations in those areas is a tragedy.

As another consequence of these conflicts, trade routes have become more uncertain, supply chains are disrupted, and the cost of fossil fuels remains high. On the one hand, this increases the competitiveness of our activities in the development of an alternative, non-fossil bioeconomy, but on the other hand, it burdens the current business of many of our members in the classic chemical sector, reducing the financial freedom for new investments.

This makes a funding policy which supports long-term technological developments as well as an investment-friendly political environment all the more important. Particularly in the context of the structural change in the Rhenish mining area, there are already many measures pointing in the right direction, and we are also experiencing many positive impulses at national and European level.

We are very pleased that we not only managed to keep our membership numbers constant, but even increased the number of members in our cluster slightly. Even though every member who decides to leave the cluster is a loss, the overall growth shows that, especially in these times, belonging to a strong network like CLIB is considered worthwhile.

As an internationally oriented association, we are pleased that we continue to have a large number of members from different countries. This is also demonstrated by the intensive collaboration with members, partners, and projects across national borders. In addition to the long-standing cooperation with policy makers in North Rhine-Westphalia, especially with the Ministry for Economic Affairs, Industry, Climate Action and Energy (MWIKE), we are particularly pleased about the renewed intensified cooperation with policy makers at the German federal level. The industrial bioeconomy dialogue platform played a particularly important role here.

The bioeconomy continues to face major challenges. We see a large number of processes that are proving promising on a laboratory and pilot plant scale. However, their scale-up to production scale continues to be held back by the lack of suitable pilot and demo facilities. It is concerning that Germany is clearly falling behind compared to other nations. We will continue our efforts to create increased scaling opportunities which are accessible to our members.

With the newly created Focus Groups, our members can participate even more strongly in the cluster's thematic work and set their own priorities in terms of content. With the three topics currently in focus – C1 use, food & feed, and biomaterials & recycling – we already cover a wide range of our cluster's thematic areas. Great to see how many of our members joined the groups when we inaugurated them in late 2023.

Via these Focus Groups, we are providing our members with a third opportunity for thematic cooperation, in addition to our established major events, such as the CLIB International Conference and the CLIB Networking Day, as well as the diverse webinars and on-site events resulting from the project work.

We live in troubled times indeed and the challenges can be daunting. Despite all the difficulties and unavoidable setbacks, we remain convinced that the bioeconomy will continue to play an essential role in the climate-friendly transformation of industry and society in the future. With our focus on a sustainable bioeconomy, we as the CLIB community are pursuing the right goals in the long term!

Dennis Herzberg

Roland Breves

CLIB: Networking Biotechnology – Creating Sustainability

CLIB is an international open-innovation cluster of large companies, small- to medium-size enterprises (SMEs), start-ups, academic institutes and universities, as well as other stakeholders active in biotechnology and the circular bioeconomy as a whole. In our non-profit association, the members shape our cluster's interests and activities, and we work to promote industrial biotechnology in sustainable processes. Active since 2008, we celebrated our 15th anniversary in 2023 and have built a strong and trustworthy network since our formation. Together with our members, we are putting our mission into practice: networking biotechnology – creating sustainability.

Our membership of over 100 organisations comprises an international share of about 25 % (see figure 1). We are based in Düsseldorf, in the state of North Rhine-Westphalia (NRW): the chemistry and industry heartland of Germany, well connected to the neighbouring chemical regions of the Netherlands and Belgium. We do not see ourselves as a regional, but an international cluster, connected by a joint vision for biotechnology in a sustainable circular bioeconomy. We connect our members within and beyond the cluster to initiate new research and business projects. Our goal is to network stakeholders along and across value networks and to identify new opportunities.

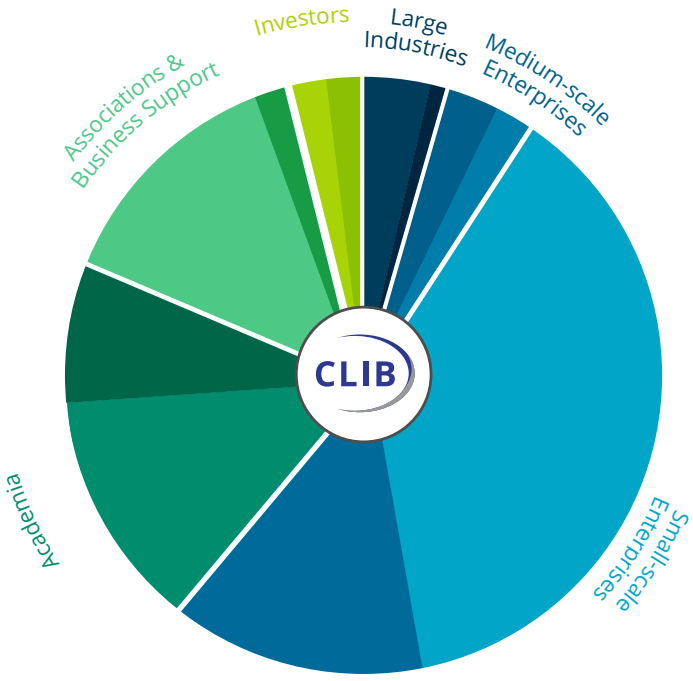


Fig. 1: CLIB members. Categories subdivided in national / international members

Structure & Strategy

To achieve this, we actively include diverse industries and markets including biotechnology, chemistry, food and feed, home and personal care, textiles, and others into our network. At CLIB, we interlink feedstock owners, technology providers, processing industries, and consumer industries, and this is clearly reflected in our membership structure.

An invention only becomes an innovation however, if it can be implemented and commercialised. Especially start-ups and SMEs benefit from access to a thriving ecosystem comprising experts and facilities essential for bringing an innovation to market. To this end, CLIB offers within its network competence in intellectual property (IP) and legal issues, techno-economic evaluation, process development, and scale-up. Of course, it needs financing, to bring novel processes and products to scale. This is why we actively involve investors in CLIB, including business angels, development banks, and venture capitalists. Furthermore, our members also include consultants, infrastructure providers, pilot plants, and other networks.

Both the circular- and the bioeconomy are a global effort, requiring an international approach. Our members and strong partners in Europe, China, and Canada are the cluster's links to global markets. CLIB is also active on the EU-level: in the public-private partnership Circular Biobased Europe (CBE) JU of Horizon Europe, and the 3Bi intercluster. Closer to home, CLIB has worked to form strong trilateral contacts between its German home state of NRW, the Netherlands, and Flanders in the well-established BIG-Cluster initiative. More regionally, the Realise-Bio (see page 19) project connects areas in NRW and the Netherlands to specifically build cross-border value chains by bringing diverse stakeholders together.

CLIB networking biotechnology creating sustainability

CLIB e. V.

CLIB is a registered association under German law, based in Düsseldorf, NRW. The main bodies of our association are the Extended Board, the Advisory Board, the newly formed Focus Groups, and the annual General Assembly. Our Extended Board (see page 37 – 39) has 12 seats, with each group of members (industry, SME, academia, and others) represented by three seats. The Extended Board meets at regular intervals throughout the year to make strategic decisions, and it elects the Executive Board of four chairpersons. CLIB receives strategic input from an international Advisory Board made up of eight experts from academia and industry (see page 40 – 41). The Focus Groups serve as meeting points for members interested in specific issues and meet regularly to discuss current developments and possible collaboration (see page 6). The General Assembly is called once a year to give members an overview of current activities and strategy and to allow them to vote, comment and provide input.

At the CLIB office in Düsseldorf, or from their desks at home, the CLIB team (see page 36) of nine employees shapes, drives, and delivers the cluster activities.

CLIB Strategy

In 2022/2023, leading up to our 15th anniversary, we had undertaken a thorough evaluation of our cluster's work, achievements, and ambitions, which culminated in the updated CLIB Strategy we presented for the first time in our last brochure. In the past year, our focus was on implementing this strategy. To better involve our members, we decided to set up three thematic working groups – the CLIB Focus Groups - which are explained below.

Our vision and our mission statement reflect the cluster's essence. The **vision** highlights that creating a sustainable bioeconomy is the common goal of all stakeholders in our cluster:

CLIB, the Cluster Industrial Biotechnology, drives the transformation towards a sustainable bioeconomy through its strong network.

Our **mission statement** emphasises the central role of industrial biotechnology for our cluster as well as how we work to reach our vision. It also hints at our strategic pillars:

As CLIB, we deliver value based on industrial biotechnology to all our members and other stakeholders via our strategic pillars. We work together across disciplines, sectors, regions, and nations to create sustainable products and processes.

Our six **strategic pillars** mentioned in our mission statement show the broad scope of our work, and how we structure our activities to the aims set out in the strategy. This structure is followed in the brochure you have in front of you right now. The following chapters will introduce each pillar and describe the activities and projects most associated with them. Our six strategic pillars are (also see figure 2, page 7):

- ***Networking & Partnering***
- ***Improving Framework Conditions***
- ***Accelerating Tech Development***
- ***Facilitating Scale-Up***
- ***Developing Bioeconomists***
- ***Fostering Entrepreneurship***

In setting out our new strategy, we described all pillars with a short sentence, our **strategic goals**, to clarify CLIB's key activity and role in this area. For example, at the CLIB office we do not perform any technology development ourselves, but we rather accelerate the process from invention to innovation by supporting our members in their activities. Likewise, we do not scale-up biotech processes, but act as a facilitator. The most obvious change in our strategic pillars is that the element "Education" has been divided into the pillars "Developing Bioeconomists" and "Fostering Entrepreneurship". With this change, we want to better reflect two different aspects which are essential for the circular bioeconomy. One is well-trained specialists, without whom the bioeconomy of tomorrow cannot be implemented. The other is the support of start-ups and entrepreneurs, who are the drivers of innovations in the sector. In this strategic pillar we also deal with issues on financing and investing in innovations.

To keep our strategy on track, we regularly discuss future growth areas for biotechnology as well as other current topics with the Extended Board and Advisory Board. From them, we receive suggestions on how to extend the network and which competencies to include. It goes without saying that we will remain active on state, federal, and EU-levels and that we will continue our established collaborations in Europe and abroad.

Our latest strategic initiative is the establishment of three **CLIB Focus Groups**, where our members can actively contribute in discussing current trends, new developments, and ongoing challenges. The Executive Board chose three fundamental areas: feedstocks, methods & technologies, and products & markets and set the initial topics of the first three CLIB Focus Groups. The groups are open to representatives from all CLIB members and help to establish direct contacts between academia, large companies, SMEs, and startups. They are member-led, with each group steered by a Focus Group lead. For the first year, these are Heleen De Wever (VITO) for the Focus Group C1 Feedstocks, Martin Lindmeyer (Yncoris) for Biomaterials & Recycling, and Tobias Bunke (Leiber) for Food & Feed. In the Focus Groups, members initiate collaborations, strengthen their network, and spark new cooperation projects. The groups can also discuss and define topics which can be highlighted by CLIB towards governments and funding programmes. These new CLIB bodies will enable the structured involvement of our members beyond the existing bodies of our association and help us to better align our daily work to the benefit of our members.

We invite all our members to work with us to achieve our cluster's ambitions. We welcome your comments on the strategy and your involvement in its realisation – this is an invitation to enter an active exchange with us. While our strategy is continuously adapted to the current developments, CLIB itself remains a dependable partner as our claim remains

networking biotechnology – creating sustainability.

Improving Framework Conditions

CLIB works to improve framework conditions to foster a supportive ecosystem for the circular and bioeconomy (see p. 16).

Accelerating Tech Development

CLIB accelerates knowledge and technology transfer from invention to innovation, to help bring products and processes to industrial application (see p. 18).

Networking & Partnering

CLIB networks and partners its members with relevant stake-holders across disciplines, sectors, and regions in Germa-ny and beyond (see p. 10).

CLIB

Facilitating Scale-Up

CLIB supports its members in scaling-up thier processes to bring innovations to market implementation and commercialisation (see p. 20).

Fostering Entrepreneurship

CLIB identifies financing opportunities for innovations and supports people to become successful bioeconomy entrepreneurs (see p. 24).

Developing Bioeconomists

CLIB helps to provide people with the necessary knowledge and skills to understand, innovate, and run the circular and bioeconomy (see p. 22).

Fig. 2: The six strategic pillars of the cluster's strategy

Member Benefits

The team at the CLIB office works to bring benefits to all our cluster's members. Like all networks, we depend on our members, and can only act as an amplifier of your own commitment. We invite you to become involved in the network, to share your innovations, and to collaborate. The CLIB team is always ready to get in touch and discuss how we can support you – so don't hesitate to contact us with your ideas or questions!

CLIB is an advisor

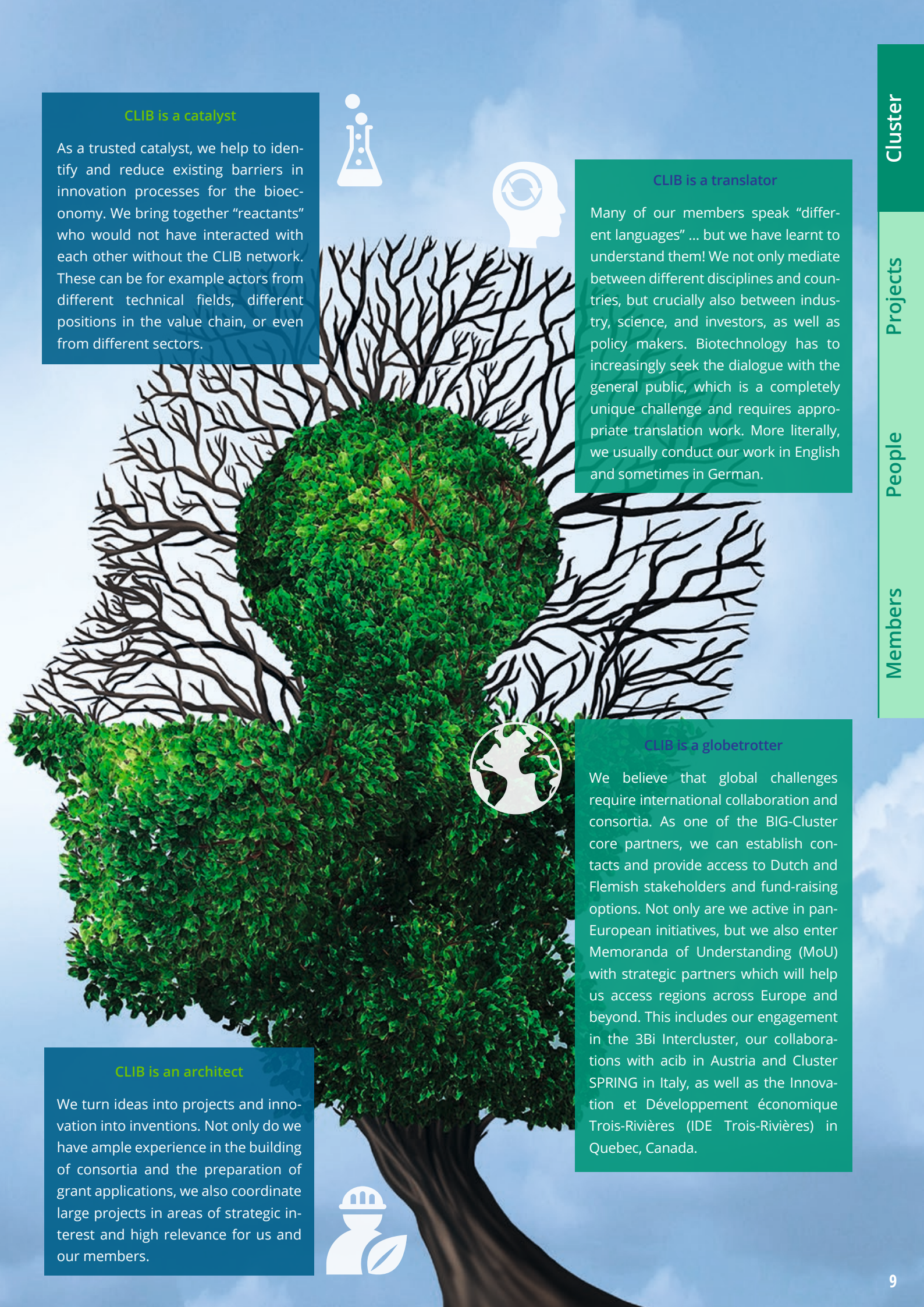
We support start-ups in identifying their intellectual property, developing their business model, and finding investors with different risk acceptances and investment volume. We help young enterprises to cross the infamous "valley of death", so they can scale up towards market entry. We also make efforts to inspire and educate future bioeconomy experts through innovative programmes, events, and coaching.

CLIB is a networker

We connect our members with each other and create an innovative matrix through carefully chosen additions to our network. Our experience of more than 15 years gives us fast and reliable contacts to partners, experts, and investors. We organise numerous events and workshops for our members. Depending on the topic, the circle of participants, and the desired output, these events vary in format. We organise online, hybrid, and on-site events and we utilise various online tools to improve the participant's interaction and experience. This helps us keep our more distant members connected, communicate efficiently, and reduce carbon footprints. Because personal contact remains as important as ever, we will continue to organise in-person events and are always happy to schedule a meeting with our members.

CLIB is a scout

We keep our eyes and ears open for our members. Through our well- developed international and interdisciplinary network, the CLIB team of scientist with different academic backgrounds can sift through and identify relevant information on developments and innovations in the technologies and markets pertinent to the circular bioeconomy. We are close to the current and future developments in several initiatives and keep the interests of our members in mind.



CLIB is a catalyst

As a trusted catalyst, we help to identify and reduce existing barriers in innovation processes for the bioeconomy. We bring together "reactants" who would not have interacted with each other without the CLIB network. These can be for example actors from different technical fields, different positions in the value chain, or even from different sectors.

CLIB is a translator

Many of our members speak "different languages" ... but we have learnt to understand them! We not only mediate between different disciplines and countries, but crucially also between industry, science, and investors, as well as policy makers. Biotechnology has to increasingly seek the dialogue with the general public, which is a completely unique challenge and requires appropriate translation work. More literally, we usually conduct our work in English and sometimes in German.

CLIB is a globetrotter

We believe that global challenges require international collaboration and consortia. As one of the BIG-Cluster core partners, we can establish contacts and provide access to Dutch and Flemish stakeholders and fund-raising options. Not only are we active in pan-European initiatives, but we also enter Memoranda of Understanding (MoU) with strategic partners which will help us access regions across Europe and beyond. This includes our engagement in the 3Bi Intercluster, our collaborations with acib in Austria and Cluster SPRING in Italy, as well as the Innovation et Développement économique Trois-Rivières (IDE Trois-Rivières) in Quebec, Canada.

CLIB is an architect

We turn ideas into projects and innovation into inventions. Not only do we have ample experience in the building of consortia and the preparation of grant applications, we also coordinate large projects in areas of strategic interest and high relevance for us and our members.

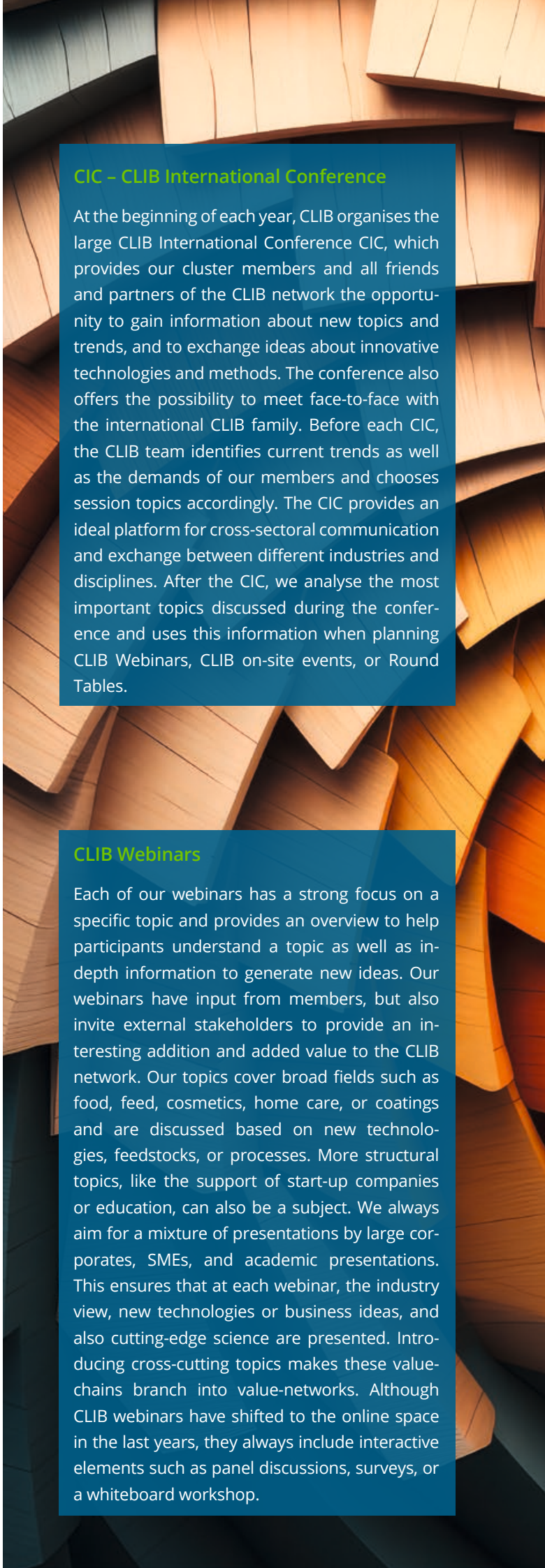
Networking & Partnering

CLIB networks and partners its members with relevant stakeholders across disciplines, sectors, and regions in Germany and beyond.

Throughout our more than 15 years of networking experience, we have established a structured networking process to enable all our members to network within and beyond the cluster. In this way, we continuously initiate the formation of project consortia for R & D & I initiatives and establish contacts with investors or public funding bodies. We find the most promising partners for our members on regional, national, or international level – always having their individual requirements in mind.

On the international level, we are in close collaboration with other initiatives to cover a broad variety of topics and trends. For example, CLIB is part of the 3Bi Intercluster sharing information, organising events, and connecting our members with clusters in France, the Netherlands, and UK. We are also part of BIG-Cluster, jointly fostering the transition of the chemical industry in NRW, Flanders, and the Netherlands together with our partner clusters (see page 33). In bilateral collaborations, we cooperate with acib (AT) and Cluster SPRING (IT) to help companies access funding programmes, promote events, and to connect our members respectively. On a global perspective, CLIB has entered a collaboration with IDE-TR in Canada to share best practices and scout projects on lignocellulose valorisation.

Our structured networking process consists of various building blocks, each having a specific target audience, information depth, and purpose. Our annual **CLIB International Conference CIC** opens the new year, showcases emerging trends, and connects them to markets. Especially relevant topics are taken up and presented in greater detail during **CLIB Webinars**, which run as online events and help participants to gain a better understanding of the technical or regulatory aspects of a topic. They often involve non-members as input-givers, extending our view beyond the network itself. We also organise a range of **CLIB on-site events**, which similarly focus on a specific topic but place a high emphasis on networking opportunities. **Roundtable meetings** are held with a smaller group of about 10 to 15 invited experts; these meetings cover a challenge or idea and build consortia, proceed to bilateral talks, or result in new and promising project ideas. New project ideas can be supported in many ways by the CLIB team, finally leading to promising project proposals.In autumn, the member-exclusive **CLIB Networking Day CND** brings together the entire cluster community. Our new **CLIB Focus Groups** (see page 6) are also exclusive to members and bring together experts to discuss current trends and challenges several times throughout the year.



CIC – CLIB International Conference

At the beginning of each year, CLIB organises the large CLIB International Conference CIC, which provides our cluster members and all friends and partners of the CLIB network the opportunity to gain information about new topics and trends, and to exchange ideas about innovative technologies and methods. The conference also offers the possibility to meet face-to-face with the international CLIB family. Before each CIC, the CLIB team identifies current trends as well as the demands of our members and chooses session topics accordingly. The CIC provides an ideal platform for cross-sectoral communication and exchange between different industries and disciplines. After the CIC, we analyse the most important topics discussed during the conference and uses this information when planning CLIB Webinars, CLIB on-site events, or Round Tables.

CLIB Webinars

Each of our webinars has a strong focus on a specific topic and provides an overview to help participants understand a topic as well as in-depth information to generate new ideas. Our webinars have input from members, but also invite external stakeholders to provide an interesting addition and added value to the CLIB network. Our topics cover broad fields such as food, feed, cosmetics, home care, or coatings and are discussed based on new technologies, feedstocks, or processes. More structural topics, like the support of start-up companies or education, can also be a subject. We always aim for a mixture of presentations by large corporates, SMEs, and academic presentations. This ensures that at each webinar, the industry view, new technologies or business ideas, and also cutting-edge science are presented. Introducing cross-cutting topics makes these value-chains branch into value-networks. Although CLIB webinars have shifted to the online space in the last years, they always include interactive elements such as panel discussions, surveys, or a whiteboard workshop.

CND – CLIB Networking Day

Each autumn, CLIB invites all its members to the CLIB Networking Day CND, an internal event exclusive to members. It is the best chance to get to know the other members of the network and meet old as well as new collaboration partners. We organise this event at one of our member's sites and celebrate our network. New and old members are invited to present themselves in short introduction to the audience - this is the best way for new members to integrate themselves into the cluster. Mutual interest can be immediately deepened in the dedicated networking sessions during the day.

CLIB Focus Groups

A new body of our association are the CLIB Focus Groups. They serve as meeting points for members interested in these issues and meet regularly to discuss current developments and possible collaboration. Newly introduced, the first three focus groups have been established on feedstocks: C1, process development: biomaterials & recycling, and products and markets: food & feed (see also page 6).

Project Development

Actors interested in a concrete project idea can be supported by the CLIB team in the formation of consortia, the more precise specification of a topic, or in the identification of suitable funding opportunities for new project ideas. We can also support the newly formed consortium in writing a funding proposal.

Round Table Meetings

Roundtable meetings are usually by invitation only and aim to develop concrete actions to initiate cooperation or collaborations, draft proposals and projects, or write policy papers. Their topics and possible cooperation partners are usually identified by the CLIB team or a CLIB member. We organise the discussions in small groups to support the early stage of a direct cooperation. CLIB can act as a mediator of such meetings, highlighting topics and directing discussion partners in a target-oriented way. Due to the large basis of trust between our members and us, this often happens without an NDA.

CLIB On-site Events

As a professional network, we recognise and appreciate the value of face-to-face interactions and serendipitous encounters. This is why we organise several on-site events throughout the year. These have strong networking components to promote the direct exchange between participants. Their thematic focus can be either related to a project, a topic, or a group of members. Examples are the Realise-Bio Annual Conference or the Annual SME and Start-up Pitch Event @CLIB. On-site events usually run half a day to a full day and carry an agenda balancing presentations to convey information with workshops or networking opportunities.

In Dialogue with CLIB

An integral part of the pillar ***Networking & Partnering*** are the diverse events organised by the CLIB team each year. Through these, we enable our members to get into contact with each other and create new links. We bring new topics to our member's attention, generate discussions about new technologies or developments, and facilitate networking. Some of these events are part of a specific project, many are open to members and non-members alike, but some are invitation-only. Our members receive special benefits, such as preferential access to the CLIB International Conference CIC and exclusive access to the CLIB Networking Day CND and the CLIB Focus Groups. A common denominator of all our events is that we aim to include different points of view, from academia, SMEs, industry, and others. We ensure that all our meetings facilitate discussions and networking.

CIC2023

The **CLIB International Conference 2023** was organised as a two-day in person conference in Düsseldorf – our first following the hybrid versions during the Covid-19 pandemic. The first day of the conference also served as a kick-off for the Triple-S project, while the second day hosted the FARMŸNG Satellite Event. Almost 200 on-site participants seized the opportunity to meet new and old contacts, to learn about exciting technologies, and to discuss how well biotechnology is already „**Setting sail for industrial implementation**". Keynotes by Alexander Pelzer (BRAIN Biotech) and Christian Lenges (IFF) highlighted the amazing advances in industrial biotechnology, but also warned how poor regulation can be a headwind for the bioeconomy.

The sessions "Feedstock-agnostic processes" and "Innovative production systems" continued with in-depth presentations from academics and SMEs on their innovations in using the entire toolbox of biotechnology to deal with a diversity of feedstocks and create a plethora of products. A panel discussion on future carbon cycles was introduced by Kathrin Rübberdt of DECHEMA, with an overview of existing and future technologies to close carbon loops, pointing out that only 0.4 % of plastics are currently recovered via chemical recycling and that the areas of logistics, pre-treatment, and scale up still need substantial improvement. The panellists debated the role of consumers and regulation in incentivising the development of new, measurably sustainable products.

The second day of the CIC2023 highlighted zero-waste biorefineries and scale-up. After an introduction to the world of insect farming and building of automated biorefineries, the speakers presented their visions of biorefineries – and some showed impressive examples of first-of-a-kind plants being built across Europe. Here, companies invest millions of euros into production facilities, which run on biobased feedstock. They included Fibenol which has built a biorefinery based on hardwood biomass (co-funded via the project SWEETWOODS), with an annual production capacity around 8,000 t / a of different lignin grades and 20,000 t / a cellulosic wood sugars. ENOUGH presented their facility which integrates with an existing grain processor and an ethanol plant, producing mycoprotein by aerobic fermentation in the range of 10 kt / a, with an expansion to 60 kt/a already planned. Almost a household name in the bioeconomy sector, Novamont has been pioneering the use of renewable feedstocks for bio-based plastics for many years. The company is however using a variety of feedstocks to produce an array of products, from bioherbicides to biolubricants, to biopolymers. In other presentations, SMEs presented their scaling projects, large corporates their bio-based challenges, and academics their process development. As always, the question of where to scale-up these innovations was also raised.

As last speaker of the CIC2023, Michael Brandkamp from the ECBF told the audience that the bioeconomy will increase exponentially in impact – a process we will most likely only recognise once it has happened, like the digital revolution of the past decade. On this high note, and with the videos of biorefineries taking shape in concrete and steel still in their minds, participants of the CIC2023 left with new ideas and networks – to continue their trip to industrial implementation.

CND 2023

The **CLIB Networking Day 2023** took place at the Covestro Idea-Lab in Leverkusen. For the fifth time, we organised this member-exclusive event which gives new members the perfect framework to introduce themselves, while also allowing long-standing members to give an update on their progress. On behalf of the host Covestro, CLIB board member Gernot Jäger gave a keynote on how biotechnology can benefit an innovative chemical company, especially regarding plastics.

Dennis Herzberg took the opportunity to look back on **15 years of CLIB history**, showing exclusive pictures from the cluster's archives. We gladly took this opportunity to thank long-time companions from the Advisory Board and the Executive Board: Manfred Kircher, Karl-Heinz Maurer, Hans-Jürgen Mittelstaedt, and Karl-Erich Jaeger. It was also the ideal opportunity to thank Tatjana Schwabe-Marković and Dennis Herzberg for their many years of work and commitment in the cluster office.

In a second keynote, Advisory Board member Prof. Ulrich Schwaneberg presented the Bio4MatPro competence centre, in the creation of which CLIB played a major role. This lighthouse project in the structural change of the Rhenish mining area intends to use biotechnology to bring new material innovations into application.

After the first networking break, new and established members of CLIB introduced themselves. Tobias Kirchhoff (BCNP) emphasised how important sustainability management will be for almost all companies from 2025 onwards – and how little most companies know about it so far. Jan-Dirk Küsters-Spöring from Enzymaster presented the range of services this enzyme specialist can offer, including enzyme, strain, and process development. VITO is not only the coordinator of our joint project COUNTLESS but – as Wouter Van Hecke presented – has also established the sustainable production of azeo-esters as a platform technology. Burkhard Ohs from Neste explained the need for and possible sources of regenerative feedstocks.

There was a recent change at the Chair of Biochemical Engineering at RWTH Aachen University, so postdoc Katharina Miebach gave an overview of the planned activities of the new professor Jørgen Magnus. For BRAIN Biotech, Alexander Pelzer showed how his company is driving the development of sustainable biobased processes in the three topic areas of enzymes & proteins, microorganisms, and processes. Finally, Petar Keković presented the start-up MicroHarvest, which wants to establish an efficient microorganism-based protein supply.

Realise-Bio Kick-off

On 1 January 2023 our new **Interreg VI A project Realise-Bio** started, aiming at realising the circular bioeconomy in the border region of Germany and the Netherlands. In April, we invited our network to join us for the kick-off in Düsseldorf. With around 70 registered guests the interest in the event was high and both during the talks and the breaks, guests and speakers took the opportunity to network across borders.

After a networking lunch to get nourished and fill out the networking board, the official part of the event started. CLIB Cluster Manager Dennis Herzberg and Marcel Claus from the Gemeente Venray led through the program bilingually.

Edwin Hamoen from Wageningen Food and Biobased Research set the baseline with his keynote. In his talk he highlighted the importance of technological and organisational solutions for the optimal use of biobased resources to enabling the transition to an economical viable, circular, biobased, and healthy society. He stated that the circular and biobased economy is not a small undertaking but is connected to large markets and a healthy transition process should always happen within the planetary boundaries. Following the keynote, we had invited six SMEs to present their sustainable ideas and pitch, which cross-boarder model projects they might realise within the cascade funding of the project.

Sarvesh Poddar from Sustanix Materialtech presented their biobased and biodegradable cellulose-based coatings. Pablo R. Outón from INDRESMAT gave a pitch on bio-based polyurethane foams for insulation materials, followed by Tom Bovee from Compas Agro who investigate how fibre-rich plants can be used in peat-free substrates in crop production. A quite exotic idea was presented by Zsofia Kollar, CEO of Human Material Loop, a materials innovation company that develops products from waste human hair sourced at hair salons. Next in line was Ludo Poels from My-Pro, a company that processes residues from the food and agriculture sector into high-quality protein that is suitable for use as animal feed. Finally, Peter Witt from AgroGreen presented how to drastically reduce the amount of liquid manure and digestate using a purely physical process.

At the end of the event, everyone took the opportunity to get together again and discuss the topics they had just heard. Networking continued for over an hour after the official end of the event, and we were happy to have been able to connect so many innovators with each other.

SME Pitching Event

There are many great ideas and inventions out there and plenty of small companies putting these ideas into action. But finding the right partner to help you scale, can be a challenge. On 16 August 2023 CLIB organised the second **SME & Start-up Pitch Event** in Düsseldorf to bring together companies with consultants, experts from the industry and investors and provide a network of support.

With eleven pitches given by Algae Scope, BluCon Biotech, CSBR, Dutch Sustainable Development, ETB Global, Human Material Loop, Metgen, Pectcof, Protiomix, qCoat, and Yoku and more than 50 participants the event was a full success. The businesses presented ranged from just after founding to companies active for 25 years and expanding their business. Using feedstocks like sugars, algae, or human hair and addressing sectors like bulk chemicals, textiles, polymers, or food and beverages.

Some participants had travelled across Europe to join the event and connect with innovators, consultants, industry, and investors. The invited guests enjoyed the pitches and used every minute of the Q & A sessions to ask questions and find out more about the young companies. Networking continued during the break and also long after the end of the presentation programme.

Triple-S Kick-Off

In May 2023, we organised an online event for the Triple-S project under the title **Sustainable – Smart – Scalable: Realising the potential of biotechnology**. To present and discuss which criteria can help us identify promising early stage inventions and promote them to reach their potential we had invited two innovators and one investment expert. Jakob Müller (Evonik Industries) and Albrecht Läufer (BluCon Biotech) presented their road to innovation, while Daniela Arruda Costa of Capricorn Partners explained what they look for when investing.

Jakob stressed the importance of dedicated experts believing in a product, in his case to bring the bio-based rhamnolipids pioneered by Evonik to market. Equally important, he said, are early partnerships with reference customers, to help understand market demand and develop a successful product. In holistic technology development, multiple teams of experts within a company work on different aspects to get a final product to the market. Albrecht emphasised the scale and the challenges of a transition to biobased products. As an SME, his company relies on a network of trusted partners and external experts to meet these challenges, including some from other sectors which can lend their expertise in downstream processing. In his opinion, the high costs associated with scaling a biobased technology require a large addressable market to ensure the required return of investment. This also means developing technologies to utilise second generation biomass.

Daniela outlined how they decide whether to invest in a technology and product. She pointed out that not every

unique technology is worth investing in, even if it has a competitive advantage, can address a market gap, and provides a solution to a problem. In addition, innovators must show that their team is ready, knows the sector, and can scale the technology. External factors, such as economic downturns or disruptions of value chains are hardly in the control of innovators, but they can negatively influence a company's outlook. Investors who can afford to take a longer view are however able to carry on despite such devaluation, if the underlying business case is sound.

All three speakers agreed that the market is the most important factor of an innovations' chance for success. They pointed out that products must ensure sustainability and alignment with existing regulation. We took all experts' and participants' input to help us elaborate the Triple-S guidelines and used it to prepare the Co-creation workshop held in November 2023.

C1 ThinkTank

In June 2023, we, in collaboration with the NWO-funded Dutch project **MicroSynC**, organised the first in-person C1 ThinkTank meeting since the Corona pandemic. Under the motto "**From Ideas to Action – Envisioning the Future of Gas Fermentation**" numerous members of the MicroSynC consortium, of the ITN-EJD ConCO$_2$rde project (see page 29), and of the established CLIB C1 community joined the event in the inspirational close-to-nature venue near Lunteren, the Netherlands.

First, two thematic input talks set the stage. Koen Quataert from Bio Base Europe Pilot Plant presented the design, commissioning, and operation of BBEPP's mobile gas fermentation container, that has been in service at various sites since beginning of 2023. Robin Post van der Burg from Torrgas shared his vision of an easy-to-use container application for the torrefaction of agricultural residues minimising the climate-damaging burning of agricultural waste. After these presentations followed the core of the ThinkTank meeting: a three-stage group work on shaping the future of gas fermentation.

Together with all participants we brainstormed, discussed, and challenged ideas by looking at potential gas sources, industrial customers for the products, and marketing and communication tools. With a specific focus on the possibilities and challenges in the use of mobile pilot plants for gas fermentation, we identified ways of linking (syn) gas emitting industries with potential customer industries using the products of a gas fermentation process.

The activities of the CLIB C1 ThinkTank community will continue under slightly adapted framework conditions as one of the three new **CLIB Focus Groups** (see page 8).

In Dialogue wih CLIB

Events like the ones above are your chance to **stay in dialogue with CLIB**. We hope this short summary of six of the numerous events CLIB organised or co-organised in 2023, gave you a good overview. We thank all our speakers and partners and hope that all our participants found the events a valuable opportunity to extend their knowledge and network. We regularly publish summaries of all events on our CLIB website – and we invite you to stay tuned and save the dates for our upcoming events, listed in our calendar.

> *Since biotechnology makes an important contribution to a climate-neutral society, the opportunity to build and grow a network on these topics at CLIB is particularly appreciated. It enables its members to be noticed and activity in a huge network to find ideas, support and opportunities. The fact that CLIB members cover the entire value chain for biotechnological innovations is a remarkable added value of the cluster.*
>
> Silko Grimm, Evonik Operations
> Karl-Heinz Maurer, Aachen Proteineers

Improving Framework Conditions

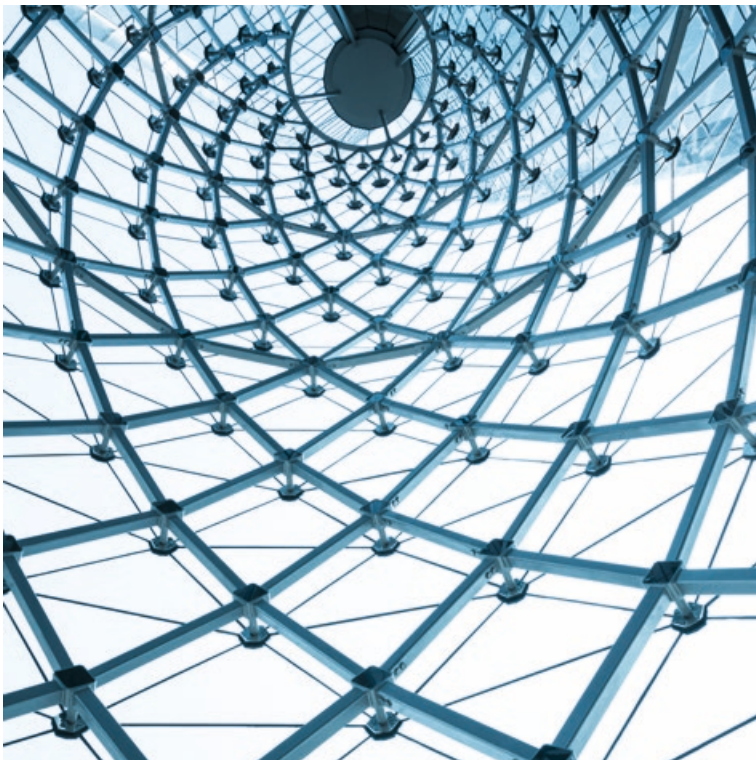
CLIB works to improve framework conditions to foster a supportive ecosystem for the circular and bioeconomy.

In this strategic pillar, CLIB focuses on improving the political, regulatory, and social framework conditions for industrial biotechnology and the circular bioeconomy. In recent years, it has become increasingly apparent that it is precisely these external factors which can decide the fate of entire biotechnology business sectors. Unfavourable or even harmful framework conditions can mean the end for a technology, while favourable conditions help convince investors and bring an innovation quickly to the market. While products and entire sectors need to become competitive in the long-term, the still rather young sector of circular bioeconomy – in our view – needs initial support to become the norm. Its companies and products enter an established market, and are competing with traditional, fossil-based industries. To help them enter the market and become sustainable alternatives, fair conditions for biotechnology need to be created. This includes pricing in external costs and consequences of other technologies. CLIB does not act as a lobbying association, but advises decision-makers, prepares strategy papers, and advocates a knowledge-based approach to the evaluation of new technologies. Given this huge challenge, CLIB can obviously not improve the world on its own. We depend on and collaborate with the competent partners and strong networks, which we maintain and expand.

Circular Bio-based Europe Joint Undertaking

First, CLIB is very active on EU level, as a founding member of the Biobased Industries Consortium (BIC). This is the private partner in the **Circular Bioeconomy Europe Joint Undertaking** (CBE JU), which is the foremost funding programme for industrial projects in the circular bioeconomy. CLIB is currently chairing the Programming Working Group, the body responsible for elaborating the strategy and calls of the JU. Here, we represent several of our SME members, and make sure that biotechnology as a key technology for the bioeconomy remains in focus. We also connect with the relevant and leading stakeholders in the sector and scout new collaboration opportunities for our members in the CBE JU.

On German federal level CLIB is active in the project **TransBiB**. This "**Transfer Network to Boost industrial Bioeconomy**" aims to accelerate the biological transformation of industry and society through a joint project across federal states and the bioeconomy model regions.



Experts and multiplicators for bioeconomy will work together, pool their knowledge, and build a strong network. The consortium will communicate this knowledge towards industries and society, make opportunities and chances visible to them, and consequently inspire stakeholders to accelerate Germany's biological transformation (see page 32).

CLIB has also helped to shape and improve processes at regional level in recent years. A lot of work has gone into the preparation and further development of the strategy papers on structural change in the Rhenish mining area (the so-called WSP). Since then, CLIB has remained involved in the ongoing development of the structural change and mediates as a contact between politics, our members, and the Zukunftsagentur Rheinisches Revier (ZRR), which is the corresponding development agency in the region. Our goal is to install industrial biotechnology as a key technology for the region and to keep the bureaucratic hurdles as low as possible to achieve a broad participation of different stakeholders. We are happy to continue supporting **Bio4MatPro** as flagship project in the structural change (see page 28). In this **Competence Center for the Biological Transformation of Materials Science and Production Engineering**, more than 60 partners from academia and industry are collaborating to realise the biological transformation of industries.

Bio4MatPro
Kompetenzzentrum zur Biologischen Transformation der Materialwissenschaft und Produktionstechnik

Moreover, CLIB is currently supporting several other projects in the structural change region. These are already at an advanced stage and will hopefully launch this year, so be prepared for exciting news. With our track record it is fair to say that CLIB is one of the most experienced players in this (not always easy) process. We are happy to share our experience and support those of our members who want to contribute to a successful structural change with their own project ideas.

It is important to us to exchange learnings and information with other regions that are also in the process of transformation. Thus, in the project **BIOTRANSFORM** (see page 29), six case-study regions across Europe are being compared to explore new paths to sustainability. All of these regions have different major industries which include forestry, agriculture and food production, lake ecosystems, tourism, and chemicals. At first sight, they all seem to be affected by transformation processes in completely different ways, but they nevertheless show similarities upon closer examination. Within the project, the partners are developing comprehensive information packages and assessment tools for policymakers. This way, BIOTRANSFORM will not only identify new pathways for the case-study regions themselves, but will also support other regions in their transition towards circular bio-based systems.

BIOTRANSFORM
TRANSITION PATHWAYS TO CIRCULAR BIO-ECONOMY

> *For us, as CEO of a biotech SME, and as representative of the chemical industry in NRW, it is essential that framework conditions are improved concerning the hurdles in administration and public funding. CLIB is constantly in contact with governments and ministries to improve the framework, but also active in helping its members to get access to public funding, e.g. as a member in CBE-JU. The HiPerIn 2.0 project is another great example how CLIB pushes awareness for the opportunities in bioeconomy in NRW also on a governmental level.*
>
> Hans-Jürgen Mittelstaedt, VCI NRW
> Peter Welters, Phytowelt GreenTechnologies

Accelerating Tech Development

CLIB accelerates knowledge and technology transfer from invention to innovation, to help bring products and processes to industrial application.

The pressure on companies to bring innovative sustainable products to market is growing quickly, due to pressures from global framework conditions. Many countries across the globe have set ambitious goals to lower their carbon footprint, improve the environmental impact, or avoid hazardous intermediates. Brand owners want to keep up with or anticipate these regulations, but also need to respond to changing consumer demands and markets. Processes and products will need to become fossil-free, more sustainable, and environmentally friendly. Adding to this challenge are recent price increases for energy and resources, partly fuelled by the ongoing political instabilities and armed conflicts. Navigating these complex issues in a globalised economy means dealing with fragmented supply chains, different policies and regulations, and a range of production prices across different continents. Europe wants to stay competitive and remain a global player in innovation and production. This might require moving away from existing value chains and instead developing industrial value networks, which are able to dynamically adapt to the increasingly complex circular value chains and volatile global developments.

We see biotechnology and the circular bioeconomy as key elements to meet these challenges. Our members are working to develop bio-based processes, which use renewable resources and are often less resource and energy demanding compared to conventional processes. They can also be more resilient and regional. New inventions in this key enabling technology are constantly being generated, especially by academic research, and need to be developed to reach higher technology readiness levels (TRL). Accelerating this technology development is important to ensure more processes succeed in reaching the market. The development of bio-based processes is challenging because they are often more complex and still less well understood than conventional processes. This makes them more difficult to model, predict, and optimise – a process, which is time-consuming, risky, and costly. This can lead to inventions being stuck without their innovation potential ever realised, even before they make it to a demonstration stage.

Innovations can arise either through an invention-driven technology push, from academia to industry; or be driven by market pull, from industry to academia. Invention-driven technology development mostly begins in academic research when promising results lead to initial ideas for applications. In this case, CLIB can leverage its network to connect researchers with relevant companies as reference customers or with industry experts as advisors, or to come up with novel ideas for application. Market-driven technology development usually starts with an application idea from industry, for example when existing processes or products need to be optimised to keep up with changing demands or regulations. The CLIB network is a great inspiration-giver for these impulses in a B2B setting. We also take consumer market demands into account and scout whether biotechnological processes can provide the advantage needed to generate a new sustainable product. CLIB acts as a networker to identify and connect suitable partners from the academic or SME environment with corresponding industry actors. The CLIB team works to keep a broad overview of industry trends, novel fields of application, as well as current research to best inform our members. Within our cluster as well as in our external partnerships, we foster a trustful atmosphere, where new collaborations can be initiated. Whether innovations are pushed by technology or pulled by the market, CLIB brings together target-oriented consortia, either regionally, nationally, or internationally.

In the **FuturEnzyme** project, for example, CLIB members Henkel, Evonik, INOFEA, and the Heinrich Heine University Düsseldorf are working with other international partners to develop enzyme-based processes and products that make specific consumer products (such as detergents, cosmetics, textiles) more sustainable and efficient (see page 31).

In the cross-border project **Realise-Bio**, CLIB successfully networks actors from NRW and the Netherlands to establish a circular bioeconomy based on regional cooperation

Realise BIO
Interreg Projekt

and local resources (see page 31). As follow-up of the successful Circular-Bio project, Realise-Bio takes the support one step further and provides Dutch-German model projects with vouchers, enabling them to increase their TRL. The collaborative model projects develop a range of technologies to utilise biogenic raw materials, such as the residual and side-streams produced in large quantities in the border region, in a circular economy.

In parallel to technological development, both a life cycle assessment (LCA) and a techno-economic evaluation (TEE) need to be performed in order to assess the benefits of a technology. Ideally, this is an iterative process leading to the development of optimal processes in terms of both economic and sustainability performance. CLIB includes experts among its network who can perform such assessments and can provide important input in early process development. Furthermore, by integrating investors and IP experts into our network, we make sure SMEs and start-ups can overcome non-technological and financial hurdles to accelerate their technology development.

In the CLIB project **Triple-S** (see page 32), we are analysing which criteria can help evaluate and predict the success of an innovation. This includes their technology development and scalability, and also their sustainability – bringing together the holistic view on tech development and assessment via LCA and TEE. Triple-S then aims to identify, support, and also transfer biotechnological and biobased technologies to other sectors, with the vision to realise a future-proof and environmentally friendly economy in NRW and beyond.

CLIB is not only involved in the formation of new consortia, but also supports existing consortia in identifying suitable public funding sources at regional, national, or international level, as well as in writing project proposals. This support is particularly helpful for SMEs and companies for which public funding is new territory. In individual cases, when projects support the mission of the cluster, the CLIB office can also become involved as a partner, or even as coordinator in such publicly funded projects. In these projects, we always fulfil the additional role of a translator between disciplines, departments, and organisations. Expectations and objectives in a project can differ between project partners, especially so between those from academia and industry. In such cases, CLIB communicates actively and effectively between the partners to ensure the project generates a satisfactory outcome for all stakeholders.

Triple-S
Sustainable Smart Scalable

In addition to the topic-specific formation of consortia, we also provide a more general technology radar for our network. Through regular events such as CLIB Webinars (see page 10), or the CLIB Focus Groups, we create a platform for our members to gain an overview of current and new trends, perspectives, and innovative technologies across disciplines. Often, ideas are created from the impulses or discussions at these events, which serve as the initial spark for a new R & D project.

We are happy to see our work in accelerating technology development leading to numerous new project consortia emerging from our network which focus on applied research to bring technologies closer to market application. Since 2008, we have supported more than 90 project consortia and helped our members access over 71 M EUR in public funding.

> *Today, new technological breakthrough innovations are urgently required to achieve the climate-driven transformation of economy, society, and industry. This can only be achieved by intense collaboration of all partners along the value chain from science to commercial success. For this, CLIB provides an excellent platform accelerating collaboration and innovation.*
>
> Roland Breves, Henkel
> Claas Heise, NRW.BANK

Facilitating Scale-up

CLIB supports its members in scaling-up their processes to bring innovations to market implementation and commercialisation.

New processes for innovative products are essential for the transformation of the industry and the preservation of its capacity for value creation. Throughout the year, CLIB encounters numerous exciting ideas, excellent research results, and ground-breaking innovations in the field of industrial biotechnology. For these to establish themselves on the market, scale-up is required in most cases somewhere along the path to market entry. This not only involves the increase in scale to produce a sufficiently large quantity to satisfy the initial consumer demand, but also includes a conversion of the process to meet industrial requirements such as runtime, costs, and manageability.

Scale-up is therefore seen by some as the supreme challenge in industrial biotechnology. Certainly, process development becomes very costly at this point. Therefore, sharp brains are indispensable for companies to continue successfully and cross the valley of death, but so is the necessary infrastructure. Due to the increasing importance of industrial biotechnology, the corresponding framework conditions, and the technology developments achieved in the last years, we expect numerous biotechnological processes taking the step to large scale in the coming years. However, scale-up infrastructure continues to be in short supply. At CLIB, almost all conversations with companies, whether they are young start-ups looking to change the food industry or global corporations looking to create a renewable raw material base for their basic chemicals, come down to this: there are too few scale-up opportunities. Considering the importance of this topic, CLIB is active in various areas to address this problem and accelerate the establishment of new, urgently needed processes.

While we ourselves do not provide scale-up services, several of our members are active in this area either by providing infrastructure, consulting services, or insights into non-technological aspects, such as LCA or TEE. Exclusive for our members, we maintain a collection of facilities and services from our network, where members can identify relevant contacts for their scale-up and analytics needs . We support our members in connecting to relevant partners and help initiate and find funding for scale-up projects. Scale-up is also an important aspect we support in the pillar “Improving framework conditions” (see page 16).

In the **TransBIB** project, CLIB is leading the work package to map scale-up infrastructure in model regions across Germany that could lift biotech processes to a higher TRL. Publishing these results on an online platform will help to make this information widely accessible and help innovators find the infrastructure they need. It will also include a gap analysis to identify yet unmet needs and inform politicians, investors, and decision-makers.

In addition to these activities, CLIB also supports specific projects that deal with the topic of scale-up. One example is our involvement in the EU-funded project **FARMŸNG**. This CBE JU flagship has built an insect-rearing biorefinery on a greenfield site near Amiens in northern France. When fully ramped-up, it will be a first-of-a-kind facility, bringing this new type of biorefinery to scale in order to produce insect protein and oil for feed and food, as well as a fertiliser product.

Another important topic for CLIB, and indeed the entire sector has been scaling up the utilisation and valorisation of lignocellulose. In addition to side streams from the food industry or the agricultural sector, lignocellulose is the feedstock of particular importance for a bio-based economy. Using it to replace bulk chemicals, which are currently produced very cost-effectively from fossil raw materials, means that scale-up is of particular importance. As indirect successor of the BIG-Cluster project ALIGN, the EU project **COUNTLESS** (led by VITO) has launched recently and aims to take valorisation of lignin to the next (demonstrator) level. Hopefully, this project will soon demonstrate that you can make "everything from lignin, including money".

COUNTLESS
extending the biobased chemicals portfolio

Scale-up of innovative processes is not only important, but urgent if they are to make a significant contribution to the climate targets or the structural change transformation in time. We strongly believe that industrial biotechnology plays a key role to meet the many challenges faced by our society: regional structural change, climate change, and climate mitigation. But it can also convince consumers by generating innovative, beneficial, and amazing products which can improve our lives.

> *In order to decouple our value creation from non-renewable and non-circular raw materials, it is crucial to bring new innovative processes to industrial scale as quickly as possible.*
>
> Gernot Jäger, Covestro
> Ludo Diels, VITO

Developing Bioeconomists

CLIB helps to provide people with the necessary knowledge and skills to understand, innovate, and run the circular and bioeconomy.

Biotechnology and bioeconomy are growing industries with a strong interdisciplinary background. Both factors can make it hard to find a sufficiently large and suitable workforce. However, to take full advantage of its chances, it is essential to have well-trained personnel implementing and running the circular bioeconomy. For this reason, CLIB is continuing to work on improving the education and training of bioeconomists on all levels, from school to university to training on the job.

At CLIB, we think that the education of bioeconomists needs to provide deep technical expertise as well as solid interdisciplinary and transdisciplinary skills to ensure the workforce is well equipped to meet the demands of the sector. More than twenty academic and research institutes are currently CLIB members and provide high quality education to students and doctoral candidates every day. As a cluster, we bring together actors from the most diverse parts of the bioeconomy, from start-ups to industry and from professors to patent attorneys or investors. With this diverse network, CLIB can help to diversify education and provide different points of view. CLIB brings together academia and industry to enrich academic education with an industrial perspective.

Students learn about industrial requirements from an early stage onwards and understand how research results can be evaluated for their application potential.

CLIB has a track record in supporting academic education in a number of different projects, past and present. We coordinated the CLIB-Graduate Cluster Industrial Biotechnology, with over 120 doctoral students the largest in NRW. In 2018, we coordinated the creation of a massive open online course (MOOC) on "Biobased Products for a Sustainable (Bio) economy", which was made available to student and adult learners worldwide. Currently, we are supporting two European MSCA doctoral networks, **ConCO$_2$rde** (see page 29) and **BiodeCCodiNNg** (see page 28). In these, CLIB is active in training the doctoral candidates from across Europe in skills related to career development, entrepreneurship, exploitation of results, but also in IP protection or scientific writing. We additionally bring in CLIB members who provide the students and their academic mentors with an insight into how the industry approaches process development. Through this combination of excellent academic knowledge, interdisciplinary work, and a set of transferable skills, as well as the understanding of industry needs, the graduates of these networks will be able to shape the future bioeconomy.

In addition to the work in these dedicated projects, we are active in co-organising the annual "**NRW PhD Day 'Future Bioeconomy'**", where we again use our network to provide young doctoral students with a better understanding of the diverse aspects of bioeconomy and its related career paths. In 2023, three CLIB members joined the PhD Day as speakers.

However, the bioeconomy sector is growing fast and needs experts to run it. Industries and companies cannot afford to wait for the next generations of young bioeconomists to emerge from their studies but need to start the transformation with their current staff and the workforce available. This is why we are not only active in supporting the education at academic institutes, but also in training professionals. In the recently started project **TransBiB – Transfer Network to Boost industrial Bioeconomy** (see page 32), CLIB is currently active in a mapping exercise. Starting with surveying industry needs, we will analyse

how they match with current academic and vocational training options. The subsequent gap analysis will be the basis to draft solutions, like curricula for life-long learning.

In the Rhenish structural change, CLIB and RWTH Aachen University have been active in the last years to initiate a new kind of graduate cluster: **AUFBRUCH**. If the proposal is approved, this new concept will unite a consortium of 37 work groups from seven academic partners, bringing together expertise in biotechnology, chemistry, process engineering, economics, and social sciences. Thereby, AUFBRUCH will provide doctoral students with an excellent disciplinary education, promote interdisciplinary cooperation, and emphasise transdisciplinary interaction with stakeholders in industry and society. Through interactive event formats, doctoral students will gain the right mentality, background knowledge, and a strong connection to the Rhenish mining area to pave the way for new start-ups.

The global implementation of a sustainable and circular bioeconomy is the prerequisite for achieving the UN Sustainable Development goals and to combat climate change. In this endeavor we need well-educated people to transfer knowledge, techniques and methodologies between schools, universities and industries.
CLIB supports and enables this transfer by providing knowledge exchange, access to its network and supporting educational programs such as University Graduate Clusters.

Stephan Lütz, TU Dortmund University
Volker Wendisch, Bielefeld University

BiodeCCodiNNg

CLIB is also active in networking and creating synergies with education initiatives and projects across Europe. We have joined the **HR Expert Network of BIC** (Biobased Industries Consortium, see page 33). Together with experts from across Europe, we want to gain a better understanding of the challenges bio-based industry faces in recruiting skilled personnel and develop possible solutions to increase the numbers of people wanting to work in the bioeconomy and ensure their training. While degree programmes are available for the many different disciplines feeding into the field of bioeconomy, degree programmes which reflect the interdisciplinary nature of bioeconomy are as yet slow to emerge.

With these different activities, CLIB wants to help increasing the knowledge about biotechnology and generate openness and optimism. We hope to inspire more young people, as well as working professionals, to become curious about the circular bioeconomy and consider it as a career option.

Fostering Entrepreneurship

CLIB identifies financing opportunities for innovations and supports people to become successful bioeconomy entrepreneurs.

We recognise that there is a clear distinction between inventions and innovations. Researchers or engineers produce many **inventions**: they construct new metabolic pathways in production organisms, conceive a new reactor design, or generate a novel bio-based material. However, none of these is industrially significant before it is implemented in a market and thereby becomes an **innovation**. For this leap to happen, not only does the technology need to be developed and the process scaled-up (see page 20), but the right people need to seize their opportunities and overcome hurdles to drive the implementation into the market. These are entrepreneurs in bioeconomy, and they need an ecosystem enabling them to innovate. Consequently, CLIB has defined the facilitation and support for entrepreneurship in biotechnology and bioeconomy as one of its strategic pillars, and approaches this from two different angles.

We directly engage aspiring and active entrepreneurs:

- We work to inspire people to put their invention into innovation and become entrepreneurs.
- We give successful entrepreneurs a stage and encourage them to talk about their challenges, hurdles, and achievements to create awareness among researchers, companies, investors, and other stakeholders.
- We educate entrepreneurs to develop the skills and competencies necessary to be successful.

We target stakeholders and support structures:

- We identify relevant funding opportunities and make entrepreneurs aware of them.
- We build a network of investors within the CLIB membership and beyond.
- We maintain a network of supporters, mentors, and service providers for entrepreneurs.
- We create synergies with other structures to offer our founders the greatest possible access to support.
- We work to create an innovation-friendly ecosystem which can remove obstacles and make a critical difference for successful entrepreneurs.

Many scientists are not aware of the possibilities that lie dormant in their results or maybe would not envision themselves as becoming an entrepreneur. We want to inspire them, and young people especially at early stages in their training or education, to become entrepreneurs. For this reason, several of our projects aim to raise their enthusiasm, coupled with the necessary support, to take the first – or subsequent – steps into the business world.

Our **G-BiB**, the **Global Biobased Student Competition** had been aimed at master and PhD students who already had a concrete idea based on their research. It not only inspired them to take the leap but provided them with the tools to actually become entrepreneurs, via masterclasses, individual mentoring, and enabled them to build their own network of supporters and investors at an early stage. The G-BiB ran for four editions and of the more than ten German teams supported by CLIB directly, four have since transformed their idea into a business and started a company. We will continue to inspire students and aim to continue similar competition formats for example in the graduate cluster **AUFBRUCH** expected to start in 2024.

To support start-ups and SMEs to increase their investment readiness level and take the next steps in growing their business, we became a partner of the **MPowerBIO** project. Providing direct support to SMEs via trainings and a course programme, as well as indirect support by helping clusters across the EU to better advise their SMEs, this project was designed to empower SMEs to cross the valley of death. The project was able to support more than 280 SMEs from all over Europe. The training programme developed in MPowerBIO continues to be available for entrepreneurs to learn from through **BioeconomyVentures**, an EU-project aiming to build a platform and ecosystem for biobased start-ups and

spin-offs, connecting them to supporters and investors. We continue to be an Ambassador for the platform and in this role we brought together entrepreneurs, mentors, and investors in SME and Start-up Pitch Events @CLIB (see page 14).

To offer a maximum of support and network to the entrepreneurs connected to CLIB, we have built further strong connections to other initiatives, projects, and partners in Germany and across Europe. As a network, we deeply believe in the value of creating synergies and working together, rather than competing.

In Germany, we cooperate with the start-up competition Plan B, which is hosted by BioCampus Straubing and focuses on green, biobased business ideas. We exchange learnings and have joined as each other's jury members

in evaluating the start-ups. More locally, our member **chemstars.NRW** is fostering start-ups in the chemical industry to increase their number and quality. The initiative has been a collaboration partner for a few years now, providing their expertise to our projects, while we help them in supporting industrial biotechnology start-ups active in the chemical industry.

Also in NRW, we are joining forces with the local cluster **BIO.NRW**, who want establish the Biotech Circle, modelled off their established Investor and Business Angel Circle which is focusing on red biotechnology. In 2023, we already successfully organised two smaller events for selected start-ups to pitch and connect with a group of investors, corporate venture capitalists, and business angels to not only get the chance to find their next investor, but also to receive direct feedback and recommendations, and will continue to build the Biotech Circle in 2024. For an entrepreneur, knowledge and mentoring are essential, but not sufficient to grow a company. The financials, funding and investment, are the other major factor to reach the market, and CLIB is also active in identifying financing options. These could be investors or business angels, but also open calls for public funding. For our members, we screen for relevant calls and publish them monthly in our member-exclusive newsletter. We also aim to coordinate projects which allow for cascade-funding and can financially support innovative projects. Since January 2023, we are able to support entrepreneurs in Germany and the Netherlands with up to 75.000 euros of funding for innovation and scaling projects in the framework of the Interreg Deutschland-Nederlands project **Realise-Bio** (see page 31).

Our support for entrepreneurship in biotechnology described above, from inspiring students to educating founders to supporting young companies, focuses on the entrepreneurs themselves.

We are also pleased to have built a strong network of relevant stakeholders as important partners for these start-ups within the cluster. Roughly 10 % of our members are either investors or have a venture capital division in their company. We have patent attorneys, advisors, experienced founders, and service providers such as scale-up facilities among our members, who can support entrepreneurs both with advice and action. Together with them, we help to create a supportive, innovation-friendly ecosystem in the cluster.

> *CLIB is the perfect contact point for startups. As a biotech cluster, all talk the same language which makes it easy to find investors, potential customers and partners, and scale-up facilities and to benefit from the broad CLIB network.*
>
> Cornelia Bähr, b.value
> Frank Kensy, b.fab

CLIB networking biotechnology creating sustainability

Projects & Initiatives

CLIB can join projects when these support the mission of the cluster and align with the strategic interests of the cluster and its members. This is not possible in all cases where we support a proposal but is decided on a case-by-case basis. Over the years, we have supported many projects. Here is an overview of the ones we are currently involved in, funded on a regional, national, and EU-level. The level of involvement by CLIB varies, ranging from project partner, work package leader, to project coordinator.

Current CLIB Projects

Bio4MatPro

Funded by: SofortprogrammPLUS, BMBF
Duration & volume: 2022 – 2025, 27 M EUR
Partners: RWTH Aachen University*, CLIB, > 60 partners from academia & industry in subprojects (all DE)
Your contact at CLIB: Tobias Klement, Dennis Herzberg
Website: www.bio4matpro.rwth-aachen.de

The Bio4MatPro competence centre bundles the capabilities of the research and industrial landscape in the Rhenish region and in NRW for the biological transformation of industries through the biological transformation of material science and production technology. The project combines the expertise of a powerful mix of large companies and SMEs, an established start-up centre, and excellent academic institutes. It will link these to investor funds via a venture capital driven incubator. By founding start-ups and expanding existing business models, sustainable jobs are created in the region. This is achieved by focusing on local and renewable sources of raw materials, on companies in the region, and the binding commitment to local value creation.

The thematic focus of the Bio4MatPro competence centre is to utilise local, renewable raw materials instead of petro-chemical-based feedstocks to develop the region into a resource-efficient bioeconomy model region. Today's product concepts need to be rethought to enable a future-oriented industry that is ecologically and economically sustainable. This process of "Biological Transformation" together with digitalisation represents the next major leap forward to a sustainable and circular industry. In Bio4MatPro, the application of bio-based materials, the integration of biological functionalities, and the development of scalable and biocompatible processes and machines for large-scale production will generate highly valuable products and machines to drive this transformation of industries forward.

BiodeCCodiNNg

Funded by: Horizon2020, Marie Skłodowska-Curie Actions
Duration & volume: 2023 – 2026, 2.6 M EUR
Partners: University of Groningen* (NL), CLIB, 17 additional partners from 8 European countries
Your contact at CLIB: Katrin Kriebs
Website: www.biodeccodinng.eu

BiodeCCodiNNg is a doctoral network project which delivers a comprehensive doctoral training programme to educate Europe's next visionaries with out-of-the-box thinking and an entrepreneurial mindset to expand the repertoire of enzymes for industrial biotechnology.

Scientifically, the project wants to create novel biocatalysts for industrial and pharmaceutical biotechnology by combining basic research and applied engineering. It aims to deliver new synthetic routes to chemically relevant products in more efficient and cleaner ways than the current ones. The consortium will discover and characterise novel NN- and CCzymes, elucidate their structure, and engineer them towards new reactions and industrial biocatalytic applications.

CLIB is involved in training of the doctoral candidates and in supporting them in exploiting the project's results.

*coordinator

BIOTRANSFORM

Funded by: Horizon Europe, GA ID 101081833
Duration & volume: 2022 – 2025, 2 M EUR
Partners: VTT* (FI), CLIB, 8 additional partners from 6 European countries
Your contact at CLIB: Peter Stoffels, Tatjana Schwabe-Marković
Website: www.biotransform-project.eu

BIOTRANSFORM is a coordinating and support action, which will provide European policymakers with an adequate assessment and policy development framework, knowledge base, and expert support ecosystem to accelerate the transition from linear fossil-based systems to circular bio-based systems. BIOTRANSFORM's "assessment package" will be tested by and provided for European policymakers and will include 3 complementary tools: (i) a resource flow analysis tool including circular innovations, (ii) a cutting-edge quick environmental, social, and economic assessment tool, and (iii) a logistics management tool.

Within the project, 6 case-study regions will develop a multi-actor approach to develop and test the framework. These regions are Andalusia (Spain), Northern Burgenland (Austria), Western Macedonia (Greece), Finland, Charles Spa Region (Czech Republic), and North Rhine-Westphalia (Germany), and they represent several important industries and scenarios for Europe such as forestry, agricultural food production, lake ecosystems, tourism, and chemicals. CLIB will focus on bio-based resources and their potential use in transformation pathways of the chemical industry in NRW.

ConCO$_2$rde

Funded by: Horizon2020, Marie Skłodowska-Curie Actions
Duration & volume: 2021 – 2024, 2.9 M EUR
Partners: acib GmbH* (AT), CLIB, 15 additional partners from 5 European countries
Your contact at CLIB: Katrin Kriebs
Website: www.conco2rde.eu

ConCO$_2$rde is a European innovative training network that brings together a diverse team of chemists, synthetic biologists, enzyme technologists, and process engineers. Their main objective is to train 11 early stage researchers (ESR) in different research disciplines that together allow the conversion of CO_2 by smart autotrophic biorefineries.

The concept is based on autotrophic microorganisms that utilise renewable energy for the accumulation of biomass and, therefore, to provide novel potential sources for future materials for our society. The network of ConCO$_2$rde combines chassis strain development of these autotrophic microorganisms with process engineering to bring biotechnological processes to the next level.

CLIB is involved in training the 11 ESRs and integrating the project consortium into its broad C1 network.

*coordinator

COUNTLESS – Cost-effective production of lignin platform chemicals: Extending the biobased chemicals portfolio

Funded by: CBE JU
Duration & volume: 2023 – 2027, 6.9 M EUR (5.4 M EUR funding)
Partners: VITO* (BE), CLIB, 12 additional project partners from across Europe
Your contact at CLIB: Tatjana Schwabe-Marković, Tobias Klement, Sabine Kortmann
Website: http://countless-project.eu

COUNTLESS will access lignin, an abundant natural resource, to produce platform chemicals and demonstrate their applicability and cost-effectiveness in a variety of end-use cases from bulk to specialty applications. This will enable the transition from fossil-based to bio-based chemical building blocks – supporting sustainability and climate action goals. In the project, the 13 partners will build a demonstration plant (at VITO) for the continuous catalytic hydrogenolysis of lignin, and will demonstrate the use of the defined lignin fractions in applications from construction to cosmetics. CLIB leads the work package on communication, dissemination, and exploitation.

The COUNTLESS project is supported by the Circular Bio-based Europe Joint Undertaking and its members under Grant Agreement No 101112453.

FARMŸNG – FlAgship demonstration of industrial scale production of nutrient Resources from Mealworms to develop a bioeconomY New Generation

Funded by: Horizon2020, BBI JU, BIC
Duration & volume: 2019 – 2024, 19.6 M EUR
Partners: ŸNSECT* (FR), CLIB, 17 additional project partners from across Europe
Your contact at CLIB: Tatjana Schwabe-Marković
Website: www.farmyng.eu

Increasing the production of protein for both feed and food is a major challenge in order to keep up with the increasing global demand. Beetles are protein-rich and can be sustainably farmed, with a relatively light environmental footprint in terms of production and processing. The use of insect protein is already allowed in pet food and feed for aquaculture and is starting to be approved for human consumption in the EU. In the FARMŸNG project, a fully automated, vertical insect farm (a biorefinery flagship) has been built near Amiens, France. Researchers and engineers from different partners developed the industrial- and automated-scale breeding and transformation of Tenebrio molitor (mealworm) for the production of insect protein, oil, and fertiliser. FARMŸNG aims to produce 1,500 tonnes of protein and 400 tonnes of oil per month – rates never demonstrated in the insect protein production market. CLIB is a project partner, tasked to disseminate the projects results and to support business model development.

FARMŸNG has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 837750.

*coordinator

FuturEnzyme

Funded by:	Horizon2020
Duration & volume:	2021 – 2025, 6 M EUR
Partners:	CSIC* (ES), CLIB, additional 14 project partners from across Europe
Your contact at CLIB:	Markus Müller, Tobias Klement
Website:	www.futurenzyme.eu

The consumer goods industry is aiming to make its products more sustainable, environmentally friendly, and functional. Enzymes can play a major role in innovative alternative processes to make consumer products greener and thus increase their acceptance by consumers.

FuturEnzyme brings together a strong international network of experts to identify, design, optimise, produce, and test novel enzymes in real-life consumer products. In a structured way, three exemplary processes or products from the detergent, cosmetics, and textile industry are analysed and assessed for their potential of implementing new enzymes. The resulting in silico and in vitro optimised enzyme candidates are produced at gram scale, implemented in the conventional processes or products, and tested for their beneficial effect in performance and life-cycle assessment (LCA). After the end of the project, the established workflow should also help other industries and sectors to make their processes and products more sustainable.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000327.

Realise-Bio

Funded by:	Interreg Deutschland – Nederland
Duration & volume:	2023 – 2025, 3.4 M EUR
Partners:	CLIB*, 3N Kompetenzzentrum, Niederrhein University of Applied Science, USV Agrar (all DE), Brightlands Campus Greenport Venlo, Gemeente Venray, LLTB, Universiteit Maastricht (AMIBM) (all NL)
Your contact at CLIB:	Katrin Kriebs, Peter Stoffels, Dennis Herzberg Sabine Kortmann
Website:	www.realise-bio.com

Realise-Bio identifies and activates new and known actors in a targeted and low threshold manner and builds a strong network in the region. The most important instrument for realisation is cascade funding for at least eight German-Dutch consortia. These model projects will receive intensive technical support to help them overcome the "valley of death" with their innovations and to bring their circular products to the market. For the technical coaching of the model projects, all project partners are involved in order to identify possible hurdles and opportunities and to provide a comprehensive view of the sustainability of the innovation. To this end, the competencies of the project partners complement each other, covering areas such as logistics, life cycle analysis, or analysis of brand entry barriers.

In 2023, the Realise-Bio project was recognised as a project of strategic relevance by the Interreg Deutschland-Nederlands programme. CLIB and its partners will continue to address regional challenges in this cross-border partnership.

*coordinator

TransBIB

Funded by: BMWK
Duration & volume: 2023 – 2026, 5.6 M EUR
Partners: TUM Campus Straubing*, CLIB, 12 other academic and knowledge partners in Germany, as well as 5 associated partners and subcontractors
Your contact at CLIB: Dennis Herzberg, Markus Müller, Katrin Kriebs

TransBiB –Transfer Network to Boost industrial Bioeconomy – aims to accelerate the biological transformation of industry and society through a joint project across federal states and the bioeconomy model regions. Experts and multiplicators for bioeconomy will work together, pool their knowledge, and build a strong network. The consortium will communicate this knowledge towards industries and society, make opportunities and chances visible to them, and consequently inspire stakeholders to accelerate Germany's biological transformation.

CLIB will be active in involving the chemical and biotechnological industry in the dialogue, mapping value chain networks, identifying scaling demands and options, and supporting the education and training of industries and their implementers.

Triple-S

Funded by: MWIKE NRW
Duration & volume: 2023 – 2025, 600,000 EUR
Partners: CLIB*
Your contact at CLIB: Tobias Klement, Tatjana Schwabe-Marković, Katrin Kriebs, Markus Müller, Sarah Refai, Peter Stoffels
Website: www.clib-cluster.de/triple-s

Triple-S
Sustainable Smart Scalable

The Triple-S project aims to identify, support, and transfer those biotechnological and biobased technologies which can make a significant difference to realise a future-proof, climate- and environmentally friendly business location in NRW, once they are scaled-up and implemented in the market. We have developed Triple-S criteria based on sustainable, smart & scalable indicators, which define whether a technology can fundamentally make a difference in the coming industrial transformation. Whether a technology ultimately succeeds as an innovation is additionally dependent on other external factors. Through the criteria-based assessment of technologies in terms of their impact potential, Triple-S goes beyond previous projects and activities of CLIB. The added value for stakeholders in NRW lies particularly in the support for classifying their innovation projects and in demonstrating the potential of biotechnology, especially for economic sectors that have not yet been familiarised with this key technology. Triple-S will help to develop promising technologies into innovations, accelerate their scaling, and promote the implementation of their potentials in new industries.

*coordinator

Partnerships & Collborations

3Bi

Partners: CLIB (DE), Bioeconomy4Change (FR), Circular Biobased Delta (NL), BioVale (UK)
Your contact at CLIB: Tatjana Schwabe-Marković

CLIB has been working with the other European bioeconomy clusters B4C (France), BioVale (UK), and Circular Biobased Delta (CBBD) in the 3Bi intercluster. Here, we joined forces with other European clusters to reach a wider network, organise joint events, and connect our members. CLIB and the partner clusters in 3Bi benefitted from each other's expertise and networks and aim to bring additional value to their respective members. We continue to explore possibilities to collaborate with European partner clusters.

BIC / CBE JU

Partners: CLIB is a member of the Biobased Industries Consortium (BIC)
Your contact at CLIB: Tatjana Schwabe-Marković
Website: www.biconsortium.eu

CLIB is a founding member of the Biobased Industries Consortium (BIC), a non-profit association based in Brussels. It is the private partner of the Circular Biobased Europe (CBE JU), the bioeconomy PPP in the current Horizon Europe framework. By being active in BIC and CBE, we see a chance for industry to identify knowledge and technology gaps to be addressed in collaborative funded projects, to de-risk much needed investment in reaching higher technology readiness levels (TRLs) for biobased processes, and to create a critical mass in bringing the best ideas to bear on innovation in the biobased sector. As a cluster member, we represent several of our SMEs in BIC. We are a member of the programming core team, which we are chairing since 2021, a member of the human resources team, and give active advice on future strategic orientations and work programmes of the PPP.

BIG-Cluster – BioInnovation Growth mega-Cluster

Partners: CLIB (DE), Circular Biobased Delta (NL), Catalisti (BE)
Your contact at CLIB: Katrin Kriebs, Dennis Herzberg
Website: www.bigc-initiative.eu

BIG-Cluster is an initiative of clusters and networks in the trilateral area Flanders-Netherlands-NRW established in 2013. The focus of BIG-Cluster is to support the bio-based approach of the transition of the chemical industry towards climate neutrality and circularity. Its scope includes all processes using bio-based feedstocks and biotechnological processes using any feedstock. Even though funding for this initiative has long stopped, the partners continue to work together towards their joint goal.

BioeconomyVentures

Partners: Irish Bioeconomy Foundation (IE)
Your contact at CLIB: Tatjana Schwabe-Marković
Website: www.bioeconomyventures.eu

While the BioeconomyVentures project has ended, the project coordinator is keeping the platform alive for investors and innovators to come together. CLIB was an Ambassador of the project, which supported us to continue the annual SME and Start-up Pitch Event @CLIB during the last two years. CLIB will continue to be an Ambassador for the Bioeconomy Ventures platform.

networking biotechnology
creating sustainability

People & Boards

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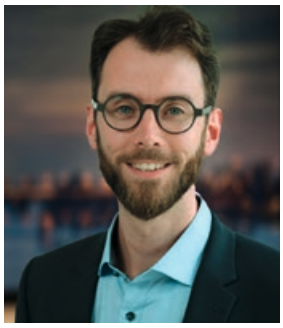

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Members of the CLIB Extended Board

Dr. Roland Breves – *Chairman*

Roland Breves, Chairman of the CLIB Board, is Head of Corporate Microbiology of Henkel AG & Co KGaA in Düsseldorf, which is a corporate function and acts for all business units, including Cosmetics, Laundry and Home Care, and Adhesives. After studying chemistry and obtaining a PhD in microbiology (on chitinases from Streptomyces) in Hannover, he worked as a post-doc at the IPK Gatersleben on plant cell wall degrading enzymes.
After joining Henkel in 1997 (initially in Cognis Biotechnologie), he was responsible as head of laboratory for the development and expression in Bacillus of detergent enzymes. In 2000, he joined the microbiology department as project leader „Smart Hygiene". Topics were non-biocidal mechanisms against microbes and their negative impacts, e. g. malodour and biofilm formation, as well as prebiotic cosmetics. In addition to these explorative and classical microbiological topics, the department develops innovative concepts for biomaterials like adhesive bioconjugates. Roland is active in several national and international expert groups (DIN, CEN, DECHEMA, AISE).

Dr. Karl-Heinz Maurer – *Vice Chairman*

Karl-Heinz Maurer co-founded the start-up Aachen Proteineers in 2019. From 2011 to 2019, Karl-Heinz was part of the Senior Leadership at AB Enzymes GmbH, where he held positions including Director of Business Development and Regulatory Affairs, Head of Global Business Organisation (Marketing and Sales), Director of Global Marketing, and Head of Regulatory Affairs and Special Projects. From 1986 to 2010, he worked in different positions in the Henkel organisation (including Cognis Biotechnology), starting in R & D Biotechnology, which he directed from 2000 to 2010 as Director Biotechnology (Corporate, later Laundry and Home Care division).
Karl-Heinz is a biochemist and microbiologist by training and received his doctorate from the University of Tübingen in 1994. In 2007, he was one of CLIB's co-founders (in his function at Henkel at the time). He was also co-founder and Chairman of the Board of the Industrieverbund Mikrobielle Genomforschung (now Industrieverbund Weiße Biotechnologie) until 2018. In 2009, he received an honorary professorship from the University of Greifswald).

Prof. Dr. Volker F. Wendisch – *Vice Chairman*

Volker F. Wendisch holds the Chair of Genetics of Prokaryotes at the Faculty of Biology at Bielefeld University. He is Deputy Scientific Director of the university's Center for Biotechnology (CeBiTec) and speaker of its research area "Metabolic Engineering of Unicellular Systems and Bioproduction". He served as Senator of Bielefeld University, Vice-Dean of Biology from 2014-2016, and Dean of Biology 2016-2018. Volker received his diploma in biology from Cologne University. After having completed his PhD at the Institute of Biotechnology 1 of the Forschungszentrum Jülich in 1997, he worked as postdoctoral researcher at University of California, Berkeley, CA, USA. In 2004, he received the venia legendi in microbiology from HHU Düsseldorf. From 2006 – 2009, he was Professor for Metabolic Engineering at the University of Münster. His research interests concern genome- based metabolic engineering of industrially relevant microorganisms, systems and synthetic microbiology. From 2018-2021, he coordinated the multi-university ERDF.NRW- funded research infrastructure "CKB – CLIB Kompentenzzentrum Biotechnologie".

Hans-Jürgen Mittelstaedt – *Treasurer*

After his studies of law at the Universities of Bonn and Freiburg, Hans-Jürgen Mittelstaedt worked as an attorney in Düsseldorf from 1988 to 1992. In 1992, he joined the Association of the Chemical Industry (VCI) at the department of environmental legislation. He held several positions in Frankfurt and Brussels before he became CEO of VCI NRW, the Association of the Chemical Industry in North Rhine-Westphalia. In this position, he is also CEO of BPI NRW, the Association of the Pharmaceutical Industry in North Rhine-Westphalia. Hans-Jürgen is one of the founding members of CLIB and has been holding a position on the Extended Board since the foundation of the cluster.

Dr. Cornelia Bähr

Cornelia Bähr is Senior Investment Manager at the deep tech investor b.value AG. Her focus is on sustainable material solutions for the chemical industry and on functional ingredients for consumer products. As an employee from the very beginning, she helped to establish and conceptually drive the b.value AG. She is also a board observer of the Hamburg located start-up traceless materials GmbH. Prior to joining b.value AG, Cornelia assisted the then Enquete Commission of the NRW regional government investigating the "Future of the Chemical Industry" as a scientific advisor at the VCI.NRW, before she joined the CLIB team as a scientific advisor and led the cluster activities on the utilization of carbon containing process gases.
Cornelia studied biology at the RWTH Aachen University and earned her doctorate in biochemical engineering from the Aachener Verfahrenstechnik of RWTH Aachen University. Already at that time, the commercialisation and scalability of technical inventions were the driving force behind her research activities.

Prof. Dr. Ludo Diels

Prof. Ludo Diels, Dr. in chemistry & biotechnology, works as Professor Emeritus at the University of Antwerp, and is senior advisor Sustainable Chemistry for the Flemish Institute for Technological Research (VITO) in Mol, Belgium. He is the former chair and now portfolio manager of the Advisory and Programming Group of Processes4Planet for A.SPIRE under the public-private-partnership, which is defining the research agenda for 10 European process industry sectors towards competitive, climate neutral, and circular production. He is strongly involved in the set-up of a bio-based economy in Flanders and Europe, and the collaboration between Europe and India on bioeconomy and water business. Ludo is member of Advisory Board of the World Bio-Economy Forum and responsible for bio-based products; and chair of the Advisory Board of the Shared Research Centre on Bio-aromatics (BIORIZON). He is founding father of the BIG-Cluster and the Vanguard Initiative on bio-aromatics. He is also working on the combination of bio- and circular economy with a strong emphasis on the use of wood and wood residues (strong focus on lignin) for integrated applications in many sectors.

Dr. Silko Grimm

Silko Grimm currently manages the political networks for the innovation department of Evonik Operations GmbH. In this position, he advocates the research and innovation interests of the company in the European policy environment. He maintains the relationships of Evonik with European institutions and international associations such as CEFIC, SusChem, A.SPIRE, and BIC. He is also Co-Speaker of the German Platform of NanoBioMedicine. His professional career started at the Business Line Health Care of Evonik; Division Nutrition & Care as innovation project manager in 2011. In the field of micro and nanoparticle drug delivery systems, he was responsible for several publicly funded projects and product development projects. From 2016 till 2022, he was Director of Strategic Projects and Head of the Project Management Office of the business line Health Care. Silko received his PhD in engineering science from the Martin Luther University Halle-Wittenberg and the Max Planck Institute of Microstructure Physics and studied physics and computer science at the Merseburg University of Applied Sciences.

Dr. Claas Heise

Since 2008, Claas Heise is responsible for NRW.Venture, the venture capital activities of NRW.BANK in Düsseldorf, Germany. NRW.Venture includes the management of several venture funds focused on NRW, which total more than 60 investments. He is also responsible for over 15 investments in European venture capital funds and manages fund-of-fund activities sponsoring now 13 regionally focused seed capital funds. From 2006 to 2008, Claas was partner at Innovature Capital Partners. He joined Deutsche Telekom in 1995 and held a variety of management positions including as the Managing Director for T-Venture of America from 2002-2006. He helped found TRAIAN and joined the start-up in 2000, where he led the partnership business development efforts. Claas received his PhD in physics and worked for seven years in science, including a postdoc at the Harvard & Smithsonian Center for Astrophysics. He received a Feodor-Lynen Fellowship and a NASA grant. Claas is also a graduate of NVCA's Venture Capital Institute.

Dr. Gernot Jäger

Gernot Jäger is heading the Competence Center for Biotechnology within Covestro. He joined Covestro (formerly Bayer Material Science) in 2012 and has held different responsibilities in Innovation Management, Process Research, Project Portfolio Management, and the Competence Center for Catalysis. He continues to contribute on various public committees including DECHEMA (Biochemical Engineering, board member), GDCh (Sustainable Chemistry, board member), and VCI (renewable resources). In addition, he is a private lecturer at the RWTH Aachen University and gives lectures about the biotechnological use of alternative raw materials.
Gernot studied biotechnology at RWTH Aachen University and received his PhD (summa cum laude) in biochemical engineering from the "Aachener Verfahrenstechnik" in 2012. His research areas include industrial biotechnology, pharmaceutical biotechnology, and process development/ conceptual design.

Dr.-Ing. Frank Kensy

Frank Kensy studied bioprocess engineering at RWTH Aachen University. There, during his doctoral studies with Prof. Jochen Büchs, he developed the BioLector technology, which is now used around the globe for early bioprocess development. Frank gained his first professional experience at Rhein Biotech GmbH in Düsseldorf in the field of fermentation development for recombinant proteins. From RWTH Aachen University, he and colleagues founded m2p-labs GmbH, which he grew to a leading manufacturer of microbioreactors and led as managing director for almost 10 years. Afterwards, he advised start-ups and biotechnology companies in the field of innovation management and bioprocess development.
Since 2018, he is founder and managing director of b.fab GmbH, which specializes in the utilisation of CO_2 using electrochemistry and biotechnology. Frank has 20+ years of experience in the biotech industry and has led several industry and funded R & D projects at national and European level.

Prof. Dr. Stephan Lütz

Stephan Lütz was appointed Professor as Chair of Bioprocess Engineering at TU Dortmund University in 2016. Previously, he was manager and head of bioreactions at Novartis Pharma AG and a lecturer at the Biozentrum of the University of Basel. From 2003 to 2008, he was in parallel head of the "Technical Biocatalysis" working group at the Institute of Biotechnology of Jülich Research Centre and scientific assistant at the Chair of Technical Chemistry and Biotechnology at the University of Bonn. He has been associated with CLIB for many years, most recently as head of the activities of the CLIB Competence Centre for Biotechnology (CKB) at TU Dortmund.
Stephan is a trained chemist and received his doctorate from the University of Bonn in 2004, and his venia legendi in biochemistry in 2012. In his research, he is fascinated by nature's power of synthesis, which he wants to utilise for the production of relevant valuable and active substances.

Dr. Peter Welters

After his studies of biochemistry and his doctorate at the Max-Planck-Institute for Plant Breeding Research in Cologne, Peter Welters spent three years at the University of California, San Diego, and two years in Rouen, France, as a postdoc. In 1998, he founded Phytowelt GmbH and in 2002, he was appointed CEO of GreenTec GmbH, a spin-off company of the MPI in Cologne. In 2006, both companies merged to form Phytowelt GreenTechnologies GmbH with Peter as CEO. The company offers contract research in the fields of agrobiotechnology and industrial biotechnology. In addition, the company developed and commercialises an enantiopure, natural, bio-fermented raspberry flavour: R-alpha-ionone. In 2018, Phytowelt received the "Most Innovative European Biotech SME Award" by EuropaBio (category agricultural biotech) and Phytowelt's BBI-JU funded project BioForever was among the TOP 20 of European Biorefinery Projects of the internet platform BiofuelsDigest. Peter is also a founding and board member of CLIB and a board member of DIB.

Members of the CLIB Advisory Board

Dr. Kai Baldenius

Kai Baldenius is a chemist by formation. After having received a PhD from Hamburg University, he spent a post-doc research year at The Scripps Research Institute, and then joined BASF in 1993. At BASF, Kai served in various positions in Research, Process Development, Production, Marketing and Sales. From 2009 to 2018, he led BASF's biocatalysis research group. In 2019, Kai left BASF to become an independent consultant for applied biotechnology. Baldenius Biotech Consulting offers advice to venture capital and young start-ups for best technology positioning.

Prof. Dr. Stefanie Bröring

Stefanie Bröring is full professor at Ruhr University Bochum, holding the Chair for Entrepreneurship and Innovative Business Models. Additionally, she serves as the academic director of the World Factory Start-Up Centers. Stefanie accumulated diverse consulting and industry experiences, primarily in roles related to new business development in the chemical and agricultural sectors, before pursuing her academic journey with studies in Lübeck, Münster, and Rotterdam. She completed her Ph.D. at the University of Münster in 2005, at the Institute of Business Administration, Department of Chemistry and Pharmacy. Her research in the field of "The Front End of Innovation in Converging Industries" also took her abroad to the University of Quebec at Montreal and the Institute of Nutraceuticals and Functional Foods in Quebec City, Canada. Stefanie's research interests encompass various aspects of technology and innovation management. Her focus areas include the challenges within the emerging bioeconomy, industry convergence, and the dynamics of technology-based ventures and entrepreneurial ecosystems. Overall, her work contributes to the advancement of sustainable technologies and business models.

Dr. Manfred Kircher

Manfred Kircher brings more than 30 years of experience in the chemical industry and in the development of bioeconomy clusters with companies, research institutes, and public administration to his consulting work. His career milestones are biotechnological research and development (Degussa AG, Germany), production (while delegated to Fermas; Slovakia), venture capital (delegated to Burrill & Company; USA), and biotechnology partnering and branding (Evonik Industries AG; Germany). Delegated by Evonik, he chaired the Board of CLIB since the clusters foundation and chairs its Advisory Board since 2012. In 2014, Manfred founded KADIB, a consultancy for bioeconomy. Since 2019, he is member of the Board of BioBall e. V. In 2020, he has been appointed to the Advisory Board for Sustainable Bioeconomy of the State Government of Baden-Württemberg and as Chairman of the Organics Valorisation Section of the European Federation of Biotechnology (EFB). Manfred has been certified as a bio-economy expert by the EU Commission.

Per Henrik Larsen

Per Henrik Larsen is a Chemical Engineer from the Technical University of Denmark (DTU). He has worked in biotechnology since 1982, starting his career as process engineer in the downstream production of enzymes at Novo Industry, today know as Novozymes/Novonesis. He worked for 24 years at Novo in various positions in production management and technology, ranging from managing fermentation, downstream and formulation departments to general site management and global strategic roles. He was in charge of building the company's enzyme manufacturing site in China. After leaving Novozymes, he joined DSM Food Specialties for 10 years, first as site manager for their enzyme plant in France and later as global responsible for operational excellence and global manufacturing. He is today Vice President Strategic Projects at Lallemand Bio-Ingredients. Per's experience covers large scale production of biotech products from scale-up to commercial production. He has also worked as consultant to the biotech industry.

Dr. Dr. h.c. Christian Patermann

Christian Patermann studied Law, Economics, and Languages in Germany, Switzerland, and Spain and completed his doctoral thesis in law at the University of Bonn in 1969. He entered the German public service in 1971 by joining the Federal Ministry of Science and Education. From 1974-78, he was Science Counsellor at the German Embassy in Washington D.C., USA. He returned to the Ministry of Research and Technology, to hold several positions in Germany and international organisations (ESA, ESO, EMBL). In 1996, he joined the European Commission, DG Research and Technology, where he was Director for Environment and Sustainability, Programme Director for Biotechnology, Agriculture & Food Research (launching the Knowledge based Bioeconomy at the EC), and co-chair of the EC-US Task Force Life Sciences and Biotechnology Research. He retired in 2007 but remains active in advising on EU affairs and the bioeconomy. He was a member of the 1st German Bioeconomy Council from 2009-2012 and has been strongly involved in the Global Bioeconomy Summits in Berlin (2015/18/20). Since 2021, the annual BioSC Supervision Award, honouring young scientists for their outstanding coaching of doctoral students in the bioeconomy, is presented as the „Christian Patermann Award".

Dr. Kathrin Rübberdt

Kathrin Rübberdt studied chemistry at the University of Göttingen and Leipzig University and received her PhD in Göttingen. Complementing her scientific studies, she also received an additional degree in economics at the FernUniversität Hagen. In 2001, she started her career with Accenture in strategic management consulting. In 2007, she joined AMR International Ltd. as a project manager. Since 2008, she has been working at DECHEMA Gesellschaft für Chemische Technik und Biotechnologie e.V. (Society for Chemical Engineering and Biotechnology) as Head of Communications and from 2011 also as Head of the Biotechnology Department. In July 2021, she became Head of Division "Science and Industry" at DECHEMA.

Prof. Dr. Ulrich Schwaneberg

Ulrich Schwaneberg studied chemistry and received his PhD (supervisor Prof. R. D. Schmid) from the University in Stuttgart in 1999. After a post-doc at Caltech in the lab of the Noble laureate Prof. Frances H. Arnold, he was appointed Professor at Jacobs University Bremen in 2002. In January 2009, he moved to RWTH Aachen University as Head of the Institute of Biotechnology and is since 2010 co-appointed in the Scientific Board of Directors at the DWI Leibniz Institute for Interactive Materials. Together with Prof. Bergs, he coordinates the competence center Bio4MatPro (one of two BMBF flagship projects in the bioeconomy model region). Uli serves in the board of directors in the Bioeconomy Science Center and is Speaker of the RWTH profile area Molecular Science & Engineering. He is a cofounder of the companies SeSaM Biotech and Aachen Proteineers. His special interest is protein engineering to provide tailored proteins as building blocks for the biological transformation of material science and production. In 2016, he received the BMBF-Forschungspreis for the next generation of bioprocesses. Uli has published >370 original manuscripts and is coinventor on >25 patents, mostly with industry.

Dr. Willem Sederel

Willem Sederel is a chemical engineer and polymer scientist, who graduated cum laude from the University of Technology Twente in Enschede (NL). After a postdoc on biomedical materials at Case Western Reserve University in Cleveland, Ohio, he started his industrial career with Shell in Amsterdam in 1977, and then moved to General Electric Plastics where he fulfilled global leadership roles in process, product and application development and marketing. His last role before retiring from his 36-year long career in industry was Global Innovation Leader with SABIC. Willem joined Biobased Delta in 2013 as director and chairman and became president Circular Biobased Delta in 2020. Willem is also the founding father of the Green Chemistry Campus in Bergen op Zoom which opened in 2011. In 2021, he was appointed non-executive director of Synova LLC, a scale-up company which produces high value chemicals from mixed, contaminated plastic waste. Willem contributed to the transition agenda biomass and food in the Netherlands. For many years, he has been a member of the Policy Group Innovation of the Dutch Chemical Branch Organization VNCI and of the Advisory Board of Biorizon.

Industry

Covestro Deutschland AG
Evonik Industries AG
Henkel AG & Co. KGaA
IFF International Flavors & Fragances Inc.
Uniper Kraftwerke GmbH

Large and Mid-sized Enterprises

Corbion NV
Neste Germany GmbH
Pfeifer & Langen GmbH & Co. KG
Stahl Holdings B.V.
Zentis GmbH & Co. KG

Small-scale Enterprises

Aachen Proteineers GmbH
Altar S.A.S.
Aminoverse B.V.
Amphi-Star B.V.
Axxence Aromatic GmbH
b.fab GmbH
b.value AG
Bio Base Europe Pilot Plant B.V.
BioHalo ApS
BioMatter Designs, UAB
biotechrabbit GmbH
BIOWEG UG
bitop AG
Blucon Biotech GmbH
BRAIN Biotech AG
Carbon Minds GmbH
ChiralVision B.V.
c-LEcta GmbH
CO2 BioClean GmbH
Colipi GmbH
Concord Blue Engineering GmbH
Corvay Consult GmbH
econutri GmbH
Enzymaster Deutschland GmbH
Enzymicals AG
evoxx technologies GmbH
Exazyme GmbH
Heinrich Frings GmbH & Co. KG
Ginkgo Bioworks Netherlands B.V.
Global Entrepreneurship Centre powered by Flow gGmbH
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Jäckering Mühlen- und Nährmittelwerke GmbH
KFCircular GmbH
Kuhner Shaker GmbH
LanzaTech Inc.
Leiber GmbH
LignoPure GmbH
Lignovations GmbH
LXP Group GmbH
MicroHarvest GmbH
Mitsui & Co. Deutschland GmbH
mk2 Biotechnologies GmbH
Pectcof B.V.
Phytowelt GreenTechnologies GmbH
Savanna Ingredients GmbH

Members

Scientific Bioprocessing, Inc. (sbi)
SenseUp GmbH
Senzyme GmbH
SeSaM-Biotech GmbH
Sophie's BioNutrients BV
SynergyCom SOOO*
the better green TEC GmbH
The Oater
Ucaneo Biotech GmbH
Ulrich Windmöller Innovation GmbH & Co. KG
Wesselmann Energie & Filtration GmbH

Investors and Founders

Capricorn Venture Partners NV
European Circular Bioeconomy Fund GmbH (ECBF)
NRW.BANK
Sofinnova Partners SAS

Infrastructure (Business Support & Networks)

BCNP Consultants GmbH
BioBall e.V.
BioIndustry e.V.
BioRiver – Life Science im Rheinland e.V.
BlackIP GmbH
Chemstars.NRW
Eder Schieschke & Partner mbB
Flanders Investment & Trade
IBioIC Industrial Biotechnology Innovation Centre
KADIB - Kircher Advice in Bioeconomy
nova-Institut GmbH
PROvendis GmbH
Scheele Jaeger Wetzel Patentanwälte
Schnee Research
Verband der Chemischen Industrie (VCI) NRW
YNCORIS GmbH & Co. KG

Academia (Universities & Research Institutions)

Bielefeld University CeBiTec
Bundesanstalt für Materialforschung und -prüfung (BAM)
FRC Biotechnology of the Russian Academy of Sciences*
FH Aachen
Forschungszentrum Jülich GmbH
Fraunhofer IGB
Fraunhofer IME
Fraunhofer UMSICHT
Fraunhofer WKI
Heinrich-Heine-Universität Düsseldorf
Hochschule Hamm-Lippstadt
Niederrhein University of Applied Sciences
Novo Nordisk Foundation Center for Biosustainability
Qingdao Institute of Bioenergy and Bioprocess Technology
RWTH Aachen
SCION – New Zealand Forest Research Institute Limited
TH Köln – University of Applied Sciences
TU Delft
TU Dortmund University
TU Eindhoven
Flemish Institute for Technological Research, VITO
Wageningen University and Research

Honorary Member

Prof. Dr. Rolf Schmid

*Collaboration currently resting

CLIB networking biotechnology creating sustainability

Aachen Proteineers GmbH

Aachen Proteineers is a start-up focussing on coating solutions. We have developed a platform technology to adhere various biomolecules to a wide range of surfaces using special peptides. This technology intensifies processes, cuts cost, and achieves very high coating densities in water at room temperature. We tailor these peptides regarding application conditions, surface specificity, and binding strength through protein engineering strategies, such as directed evolution.

We are currently evaluating products for research, diagnostics, and process technology markets, and are open to discussing new applications and to exploring them in partnerships.

Arnold-Sommerfeld-Ring 2, 52499 Baesweiler

Phone: +49 157 79280363
Internet: www.aachen-proteineers.de
Founding year: 2019
Number of employees: 3

ALTAR S. A. S.

The competitiveness of Industrial Biotechnology processes is often hindered by the low performance of the microorganisms. To unlock the potential of this promising field, we must shift the paradigm and no longer adapt processes to the metabolic limitation of industrial microbial hosts, but instead adapt microorganisms to industrial requirements.

Altar develops enabling technologies for the adaptation of microbial strains to industrial requirements. Our automated fluidic platform harnesses natural selection for the adaptive evolution of microorganisms. It has successfully proven to leverage metabolic engineering and non-GMO development for a wide range of organisms (bacteria, yeasts, microalgae) in several industrial fields (food, feed, chemicals, biofuels, materials, health, cosmetics...).

5 rue Henri Desbrueres, 91000 Evry
France

Phone: +33 688 284235
Internet: www.altar.bio
Founding year: 2017
Number of employees: 6

Aminoverse B. V.

Aminoverse puts the right enzyme in your hands!

With 40+ years of cumulated experience in enzyme R & D, Aminoverse solves enzyme challenges with enzyme discovery and evolution for both start-ups and large corporates active in pharma, F & F, fine chemicals, agtech, nutrition, feed, diagnostics, laundry, biofuels and climatetech.

As fee-for-service CRO, projects are tailored to meet any budget and timeline.

Hightlights:

- Combined offering of 200 m^2 ML-1 wet lab and state-of-the-art *in silico* / bioinformatics services
- Enzymes for biocatalysis up to kg scale: unspecific peroxygenases and ketoglutarate-dep. oxygenases
- NextGen enzyme engineering service powered by proprietary, lab-proven machine learning algorithms helping clients to de-risk and accelerate enzyme development campaigns

Daelderweg 9, 6361HK Nuth
the Netherlands

Phone: +31 4520 848 15
Internet: www.aminoverse.com
Founding year: 2020
Number of employees: 15

Amphi-Star B. V.

Amphi-Star has developed a proprietary technology platform for the cost-efficient and ecological production of biosurfactants.

We are a founders-led spin-off company that is the result of 15 years joint development between Ghent University (Inbio.be) and the Bio Base Europe Pilot Plant. We derisk the early development stage for biosurfactant production, guide and support technology transfer to industrial manufacturers and collaborate intensely for further development and improvement of the licensed technology.

Tempeliersdreef 8, 9920 Lievegem
Belgium

Phone: +32 484148732
Internet: www.amphi-star.be
Founding year: 2021
Number of employees: 1

Axxence Aromatic GmbH

Axxence Aromatic was founded in 1986 and is a privately held company with its head office in Emmerich, Germany. Over the years our focus has been the dedication to be one of the most reliable and innovative sources within our prime field of expertise: NATURAL AROMA INGREDIENTS for the flavour & fragrance industry worldwide.

By strategic investments in R & D of both novel natural ingredients and new manufacturing processes, we constantly strive to expand the use of our products in existing and new applications as well as markets.

Axxence has around 100 employees. Sales offices and warehousing are present in Germany, France, USA and Japan. Manufacturing and R & D facilities are located in the Slovak Republic.

Tackenweide 28, 46446 Emmerich

Phone: +49 2822 685610
Internet: www.axxence.com
Founding year: 1986
Number of employees: 100

b.fab GmbH

b.fab is specialized in the efficient conversion of CO_2 and renewable energy into biotechnological value chains. CO_2 and water are abundantly available and are therefore our starting point to build a sustainable circular bioeconomy. We use formate as our central mediator to bind and store CO_2 and H_2 (made from water) in liquid form. Our bioprocesses start with the feedstock formate and we use Synthetic Biology to design specific pathways and to convert formate into value-added chemicals. Our platform is build on anaerobic and aerobic microbial production hosts to provide flexibility in the process design and adaptation to specific product requirements.

b.fab offers formatothropic strains, bioprocesses and technology licences.

Gottfried-Hagen-Str. 60-62, 51105 Köln

Phone: +49 221 56092741
Internet: www.bfab.bio
Founding year: 2018
Number of employees: 6

b.value AG

b.value is an early-stage venture capital provider focussing on biotechnology and advanced materials. It invests in deep tech start-ups at the seed stage combining exceptional entrepreneurs and groundbreaking technologies to provide solutions for a sustainable world of tomorrow.

b.value aims to build a forward-looking portfolio of fast-growing deep tech companies that define the production processes and markets of the future. In doing so, it is building the bridge from research and development to the global markets. Its in-depth technology expertise and many years of operational experience in building and managing biotech and high-tech companies enable b.value to identify the most promising deep tech start-ups and support them financially and strategically in order to realise their full potential.

Otto-Hahn-Straße 15, 44227 Dortmund

Phone: +49 231 79300196
Internet: www.b-value.de
Founding year: 2016
Number of employees: 5

BCNP Consultants GmbH

BCNP Consultants GmbH is specialized in the industries biotech, chemistry, nanotech and pharma (BCNP). The three divisions of BCNP Consultants are:

BCNP strategy

On basis of our business analyses (market and competitor analysis, technology comparisons) you are able to design and sharpen your business model, to write the business case and to identify new M & A targets.

BCNP connect

On the basis of our vivid business networks in the life sciences industry we bring you together with relevant people in order to support you in filling your customer pipeline.

European Chemistry Partnering

Since 2017 innovators – from chemistry to bio-economy, from engineering to digitization - have been meeting twice a year: In February at the European Chemistry Partnering and in September at the ECP Summer Summit.

Varrentrappstr. 40-42, 60486 Frankfurt am Main

Phone: +49 69 15 32 25 678
Internet: www.bcnp.com
Founding year: 2002

Bielefeld University – Center for Biotechnology (CeBiTec)

CeBiTec is one of the largest faculty-spanning central academic institutions at Bielefeld University. Its purpose is to bundle the biotechnological activities and research projects at the university, to foster cross-linking of research approaches and technologies from different research fields, and to develop innovative projects within its two main research areas 'Large Scale Genomics and Big Data Bioinformatics' and 'Metabolic Engineering of Unicellular Systems and Bioproduction'.

The availability of comprehensive technological infrastructure as being provided by CeBiTec's Technology Platforms is crucial for a successful scientific work.

Furthermore, the CeBiTec considers itself as a central communication platform and a 'think tank' of the university with respect to initiatives and activities with a dedicated biotechnological perspective.

Universitätsstr. 27, 33615 Bielefeld
Phone: +49 521 106 8760
Internet: www.cebitec.uni-bielefeld.de
Founding year: 1998
Number of members: 179

Bio Base Europe Pilot Plant VZW

Bio Base Europe Pilot Plant is an open innovation pilot and demonstration facility for process development, scale-up and custom manufacturing of biobased products and processes from lab to multi ton scale. We combine technologies (biomass pretreatment, biocatalysis, green chemistry, (gas)fermentation, biorefining and downstream purification) for advanced manufacturing of biobased products utilising a wide and flexible spectrum of modular unit operations. As such, our team of highly trained and experienced engineers and bioprocess technicians facilitates the translation of your biobased laboratory processes into viable industrial processes.

From 2013 to 2019, Bio Base Europe Pilot Plant successfully conducted 322 bilateral (private) projects with 124 different small, medium and large sized companies. On top of these private/bilateral projects, Bio Base Europe Pilot Plant has been involved in more than 50 public project consortia.

Rodenhuizekaai 1, 9042 Gent
Belgium
Phone: +32 9 335 70 01
Internet: www.bbeu.org/pilotplant
Founding year: 2008
Number of employees: 109

BioBall e. V.

The aim of the Innovation Space Bioeconomy in the Metropolitan Area - BioBall is to promote the material use of biogenic residual and waste materials - under the special conditions of the densely populated and industrialised Frankfurt Rhine-Main metropolitan region.

The BioBall Innovation Space intensifies the direct exchange between private and municipal business, science and politics throughout Germany, initiates new project ideas and promotes innovative research and development projects to establish a sustainable, bio-based economy. This not only helps to close raw material cycles and reduce greenhouse gas emissions, but also to leverage untapped economic potential.

Bioökonomie im Ballungsraum e. V.
c/o Provadis School of International Management and Technology AG
Industriepark Höchst, Gebäude B845, 65926 Frankfurt am Main
E-Mail: bioball@provadis-hochschule.de
Internet: www.biooekonomie-metropolregion.de
Founding year: 2019

BioHalo ApS

At BioHalo we are at the forefront of revolutionizing the halogenated chemicals industry. With our cutting-edge biofluorination technology, we offer a greener and more sustainable alternative to conventional fluorochemistry practices. Our primary mission is to develop bio-based materials that serve as safe and eco-friendly replacements for harmful PFAS forever chemicals in various industrial formulations without compromising on performance.

At BioHalo, we are committed to driving positive change in the chemicals industry by promoting environmental consciousness and responsible manufacturing. We firmly believe that environmental responsibility goes hand in hand with innovation, and it is this core belief that drives us forward. Join us as we revolutionize industries and create a positive impact on the world, one bio-based breakthrough at a time. Together, we can build a healthier, more sustainable tomorrow.

Ole Maaløes Vej 3, 2200 Copenhagen
Denmark
Phone: +49 159 01862728
Internet: linkedin.com/company/biohalo
Founding year: 2023
Number of employees: 2

BioIndustry e. V.

BioIndustry e. V. is a regional life science cluster of companies, research and training institutes, technology centers, biotechnological service providers and public business development organizations. BioIndustry has been committed to strong interdisciplinary networking between science and companies, especially in the Ruhr area, but also in eastern Westphalia. The focus of its activities are the promotion and support of biotechnology in science, research and development, and in the application and implementation of novel biotechnological processes.

By actively supporting the transfer of ideas to the market, BioIndustry helps to generate novel product and process-innovations in the region.

Otto-Hahn-Str. 15, 44227 Dortmund

Branch office: c/o Bio-Security Management GmbH, Siemensstr. 14, 59199 Bönen
Phone: +49 238 3919 224
Internet: www.bioindustry.de
Founding year: 2000
Number of employees: 2

Biomatter Designs, UAB

Biomatter is a synthetic biology company that creates new proteins for health and sustainable manufacturing. The company has developed the Intelligent Architecture™ platform that addresses limitations of current engineering approaches to unlock completely new horizons for digital protein design and development.

Biomatter partners with leading companies from diverse industries to create new products and technologies based on unique enzymes that capture existing markets and enable blue-ocean opportunities.

Zirmunu g. 139A, LT-09120 Vilnius
Lithuania
Phone: +370 604 65260
Internet: www.biomatter.ai
Founding year: 2018
Number of employees: 20

BioRiver – Life Science im Rheinland e. V.

BioRiver - Joining forces for Life Sciences & Biotechnology

Founded in 2004, BioRiver – Life Science im Rheinland e.V. is fully committed to representing the Life Sciences sector in the bioregion Rhineland as an independent industry organization. The essential aims of BioRiver are to build a strong network within the biotech sector, to improve the political and economic conditions as well as to market the bioregion Rhineland and its members. Thanks to the strong profiles of the partners in the network, it has been possible to initiate various collaboration projects and gain direct access to experts in both business and academia.

Merowingerplatz 1a, 40225 Düsseldorf

Phone: +49 211 3160610
Internet: www.bioriver.de
Founding year: 2004
Number of employees: < 10

biotechrabbit GmbH

biotechrabbit GmbH was founded in 2011 in Henningsdorf; already 4 years later, in 2015, a second research and production site was opened in Berlin/Adlershof. Biotechrabbit is a team of top class scientists, experienced managers and business developers who are determined to offer highest quality products and services for diagnostic companies and life science research. We value the relationships with our partners and customers and are driven to exceed current limitations with flexibility, innovation and highly customized solutions to match specific requirements.

biotechrabbit's offering includes enzymes for molecular diagnostics, antibody generation and production, high-capacity protein fermentation, lyophilization for diagnostic test kits and pharma, highly parallel, cell-free protein synthesis, mRNA for therapeutics, site-directed amino acid incorporation for labeling or cancer biotherapeutics, and a full molecular biology products catalog.

Our way of doing business combines the passion and pure curiosity of excellent researchers with the agile spirit of true entrepreneurs.

Volmerstr. 9, 12489 Berlin

Phone: +49 30 55578210
Internet: www.biotechrabbit.com
Founding year: 2011
Number of employees: 45

BIOWEG UG

BIOWEG pioneers a paradigm shift, replacing petroleum-based chemicals with innovative bio-alternatives through synthetic biology, fermentation, material science, and green chemistry. By utilizing waste & side streams we create high-value, 100 % biodegradable ingredients that outperform synthetic polymers.

BIOWEG's bacterial cellulose-based ingredients are 100 % animal- and GMO-free, globally scalable, and sustainably produced using only biotech and green chemicals. Offering environmentally friendly solutions that meet EU regulatory requirements, we are addressing the intentionally added microplastics in agriculture protection products, cosmetics, personal and home care, as well as in the food industry.

Professor-von-Klitzing-Straße 11,
49610 Quakenbrück
Phone: +49 160 1803370
Internet: bioweg.com
Founding year: 2019
Number of employees: 16

bitop AG

bitop AG is a biotechnology company focused on products based on extremolytes, a group of natural protective molecules responsible for the stress resistance of extremophilic microorganisms. bitop develops and employs fermentative and biocatalytic bioprocesses for extremolyte production.

The company offers innovative medical devices based on the extremolyte Ectoin® in the areas of allergy, dermatology, respiratory diseases, and dry epithelia with scientifically confirmed efficacy and tolerability. Furthermore, bitop offers extremolyte products like Ectoin®, Glycoin®, and 28Extremoin® as cosmetic active ingredients as well as hydroxyectoin as biostabilizer for diagnostics and life sciences.

Stockumer Str. 28, 58453 Witten
Phone: +49 2302 914400
Internet: www.bitop.de
www.ectoin.net
Founding year: 1993
Number of employees: 37

BlackIP GmbH

Full-Service IP Provider

BlackIP consulting | BlackIP legal | BlackIP finance | BlackIP support

BlackIP was founded in 2016 as a consultancy on intellectual property matters. As of 2023 the BlackIP legal patent law firm as well as BlackIP finance became part of the BlackIP Group. Jointly we now form a full service IP provider.

Visit us at www.black-ip.eu

Gartenstr. 20, 76870 Kandel
Phone: +49 7275 91 887 00
Internet: www.black-ip.eu
Founding year: 2016
Number of employees: 11

Blucon Biotech GmbH

Plastics from Nature for Nature®

BluCon Biotech is developing a unique technology by which L-lactic acid can be produced from non-food feedstocks like straw or wood by direct fermentation with BluCon's proprietary extremophilic production bacteria. The business purpose is to allow the bioplastic polylactic acid (PLA) to be produced on a sustainable basis and commercially competitive to fossil fuel based plastics.

BluCon Biotech collaborates with a network of expert groups and companies, at academia and in the industry, for efficient and rapid launch of its technology. BluCon is welcoming further collaborations regarding conversion of all kinds of feedstock to value added fermentation products, as well as collaborations with the purpose of PLA production.

Nattermannallee 1, 50829 Köln
Phone: +49 221 93338860
Internet: www.blucon-biotech.com
Founding year: 2017
Number of employees: 21

BIO.NRW
The Home of Biotech

BIO.NRW
The Home of Biotech

- Central Platform for Life Science Topics
- Effective Network for Scientists, Founders and Entrepreneurs
- Assisting Start-Ups and SMEs in Terms of Financing and Internationalization
- Supporting Students and Young Talents

Upcoming Events

05.03.24
13th Business Angel Congress (BAC) in Düsseldorf

22. – 26.04.24
Delegation to Singapore incl. Asia Bio Partnering Forum

03. – 06.06.24
NRW joint stand at the BIO International Convention in San Diego

29.08.24
Biotech Beats Reloaded in Cologne

04. – 06.11.24
NRW joint stand at the BIO-Europe in Stockholm

13. – 14.11.24
Stand and official partner at the Greener Manufacturing Show in Cologne

startups4.eu
www.startups4.eu

Email > bio.nrw@bio.nrw.de
Website > www.bio.nrw.de
Social Media >

BRAIN Biotech AG

BRAIN Biotech AG is an integrated solutions provider supporting the biologization of industries. Since its foundation in 1993, the company has developed from a sought-after R & D specialist into the BRAIN Biotech Group, which covers the entire value chain from R & D to production of enzymes and proteins.

BRAIN Biotech Group focuses on the development and production of specialty enzymes and proteins as well as the optimization of microorganisms as starter cultures for fermentation. BRAIN Biotech's engineers are experts in technology and process transfer to enable industrial scale production.

BRAIN Biotech's R & D services focus on the identification and development of new enzymes and the optimization of enzymes and microbial production strains already in use. Technology services include:

- enzyme and protein engineering,
- microbial strain development,
- bioprocess development,
- genome editing services.

Darmstädter Str. 34 – 36, 4673 Zwingenberg

Phone: +49 6251 9331 0
Internet: www.brain-biotech.com
Founding year: 1993
Number of employees: 350

Bundesanstalt für Materialforschung und -prüfung (BAM)

The Federal Institute for Materials Research and Testing (BAM) is a research facility under the authority of the Ministry of Economics and Technology. Its competences are to improve safety and reliability in chemical and materials technologies through research, testing, analysis, and information.

The division Biodeterioration and Reference Organisms performs research and development in the fields of

i) materials protection against biological deterioration

ii) biotechnology with bacteria.

We are especially interested in biotechnology and molecular biology of bacteria from extreme environments. Our expertise in molecular biology with extremophiles comprises a wide range of technologies to manipulate metabolic pathways with the goal to improve productivity of strains currently used in industry.

Unter den Eichen 87, 12205 Berlin

Phone: +49 3081041410
Internet: www.bam.de
Number of employees: 1,660

Capricorn Partners NV

Capricorn Partners is an independent European manager of venture capital and equity funds, investing in innovative European companies with technology as competitive advantage. The investment team of Capricorn is composed of experienced investment managers with deep technology expertise and a broad industrial experience.

Capricorn Partners is managing the venture capital funds Capricorn Sustainable Chemistry Fund, Capricorn Digital Growth Fund, Capricorn ICT Arkiv, Capricorn Healthtech Fund, Capricorn Cleantech Fund and Capricorn Fusion China Fund. In addition, it is the management company of Quest for Growth, quoted on Euronext Brussels, and the investment manager of Quest Cleantech Fund and Quest+, subfunds of Quest Management SICAV, registered in Luxembourg.

Lei 19, 3000 Leuven
Belgium

Phone: +32 16 28 41 00
Internet: www.capricorn.be
Founding year: 1993
Number of employees: 28

Carbon Minds GmbH

Carbon Minds is a data analytics start-up. We use our proprietary digital model of the global chemicals and plastics industry to offer our clients unprecedented levels of transparency about environmental impacts in global supply chains.

We bring down the cost of reaching climate targets by providing market intelligence that enables our clients to reduce their environmental impacts in the most cost-efficient way possible through the choice of suppliers. Our data covers thousands of suppliers, accounting for more than 80 % of the global greenhouse gas emissions due to chemicals and plastics production.

In addition to providing data, Carbon Minds builds digital twins of complex integrated production sites and uses novel optimization approaches to identify cost-efficient transition pathways.

Eupener Str. 165, 50933 Köln

Phone: +49 1573 7975079
Internet: www.carbon-minds.com
Founding year: 2019
Number of employees: 13

chemstars.nrw

Despite excellent research and various support structures, a comparatively low number of startups with ties to the chemical industry has emerged in Germany over the past years. But this is about to change.

chemstars is an initiative of market-leading companies from the chemical industry, the German chemical industry association (VCI) NRW and the Ministry of Economic Affairs, Industry, Climate Action and Energy of the State of North Rhine-Westphalia to foster entrepreneurship in the chemical space. We're on a mission to help create more and better startups with touch points to the chemical industry.

c/o BRYCK, Jakob-Funke Platz 2, 45127 Essen

Phone: +49 1512 1632727
Internet: www.chemstars.nrw
Founding year: 2021
Number of employees: 3

ChiralVision B. V.

ChiralVision produces immobilized enzymes and develops chemo-enzymatic processes for various markets including the environmental, cosmetic, fine chemical and pharmaceutical industry. Immobilization techniques are developed and used to produce immobilized enzymes in order to facilitate their separation, recycling and allow for continuous processes. Immobilization of enzymes makes processes more economically viable. Additionally the use of more extreme process conditions are possible for immobilized enzymes thereby increasing the technical feasibility of enzymatic processes.

ChiralVision also has a portfolio of unique enzymatically produced chiral compounds like unnatural amino acids.

Hoog-Harnasch 44, 2635DL Den Hoorn
the Netherlands

Phone: +31 85 068 5558
Internet: www.chiralvision.com
Mail: info@chiralvision.com
Founding year: 2006
Number of employees: 6

c-LEcta GmbH

c-LEcta is a global biotechnology company specializing in the development, production and distribution of enzyme products. The company uses world-class enzyme engineering and production technologies to provide its partners in the food and pharmaceutical industries with superior biotechnological solutions for innovative industrial applications.

Product development is based on the proprietary enzyme technology platform ENESYZ® and is carried out both in-house and in close cooperation with industry partners worldwide. c-LEcta supplies its products to more than 400 customers in over 40 countries. c-LEcta currently employs more than 130 people at its headquarters in Leipzig. c-LEcta is part of the Kerry Group.

Perlickstr. 5, 04103 Leipzig

Phone: +49 341 355 214 0
Internet: www.c-lecta.com
Mail: contact@c-LEcta.com
Founding year: 2004
Number of employees: 130

CO2BioClean GmbH

CO2BioClean prevents the release of industrial CO_2 emissions by capturing them before their release into the atmosphere. The CO_2 is transformed into 100 % biodegradable biopolymer (PHA) via an efficient fermentation process. Making use of this polymer, a versatile set of items ranging from textile fibres, packaging items, and interior design can be produced. The fermentation process used to produce the biodegradable polymers allows to tune the properties of the PHA such as aesthetics and mechanical properties, ranging from rigid to flexible, soft-touch and adhesive. This way, we can address requirements of complex end use applications.

Mergenthalerallee 73-75, 65760 Eschborn

Phone: +49 06 196 999 4221
Internet: www.co2bioclean.com
Founding year: 2019

COLIPI GmbH

We develop a Carbon Capturing & Transformation biotechnology platform that turns CO_2 & industrial side streams circularly to valuable biomaterials such as oils (triglycerides & free fatty acids) & proteins. The platform consists of a CO_2-O_2-H_2 bacterial gas fermentation & a classic yeast fermentation. Our enabler is a leading & patented gas fermenter & process design as well as 10 years of process know-how working with oleaginous yeasts. The greatest value proposition of our products is a zero CO_2 footprint enabling corporations to reach their ambitious decarbonization targets.

Harburger Schloßstr. 12, 21079 Hamburg

Phone: +49 40 76629 3740
Internet: www.colipi.com
Founding year: 2022

Concord Blue Engineering GmbH

Concord Blue is a waste management company that transforms nearly any form of local waste into a variety of clean, renewable fuels. Concord Blue has developed a revolutionary closed-loop system that efficiently and cost-effectively produces the highest quality sustainable energy with virtually no pollutants. Unlike other available waste-to-energy processes, Concord Blue's unique technology benefits the environment, fulfilling all international, EPA and European regulations for renewable energy and air emissions.

Königsallee 6-8, 40212 Düsseldorf

Phone: +49 211 320364
Internet: www.concordblue.de
Founding year: 1997
Number of employees: 160

Corbion NV

Corbion is the global market leader in lactic acid, lactic acid derivatives, and a leading company in emulsifiers, functional enzyme blends, minerals, vitamins and algae ingredients.

We develop sustainable ingredient solutions to improve the quality of life for people today and for future generations. For over 100 years, we have been uncompromising in our commitment to safety, quality and performance. Drawing on our deep application and product knowledge, we work side-by-side with customers to make our cutting edge technologies work for them.

At Corbion, we live our brand promise "Keep creating", through our science, clear understanding of the markets we serve, and of course through our creative people.

Corbion's strategy and every aspect of our operations are built around advancing sustainability and applying high ethical standards, whether this relates to the management of our global supply chain, responsible procurement of our raw materials, or the safety and wellbeing of our people.

Arkelsedijk 46, 4206 AC Gorinchem
the Netherlands

Phone: +31 183 695695
Internet: www.corbion.com
Founding year: 2013
Number of employees: 2,000

Corvay Consult GmbH

Corvay provides consulting and project management services to multinational, medium and small enterprises. Corvay builds and helps building businesses. Some examples: biotech cluster BioRegioN in Lower Saxony, Vakzine Projekt Management, advising Direvo and later building and managing BluCon Biotech Cologne. Recently we established Corvay Bioproducts, Leuna, developing bioproduction processes. Our trade company Corvay Specialty Chemicals is selling long chain aliphatic diacids and specialty enzymes to the chemical industry, and vitamin D3 to the food and feed industries; we are interested in expanding our specialty portfolio.

Corvay´s value for you:

i. high performance proven over 20 years
ii. operational expertise and international management experience
iii. efficient business network.

Sophienstr. 6, 30159 Hannover

Phone: +49 511 449895 0
Internet: www.corvay.de
Founding year: 2002
Number of employees: <10

Covestro Deutschland AG

Covestro is a world-leading supplier of high-tech polymer materials: innovative, sustainable, and diverse.

We are serving key industries (such as automotive, construction, and electro/electronics) around the globe with technologically leading processes. Our products and application solutions are used in many areas of modern life.

In line with our vision "We will be fully circular" we are on the way to a circular economy. Alternative raw materials (such as biomass, CO_2, plastic waste) and alternative production technologies (e.g. via biotechnology) are the basis for various new innovative products and production processes.

With approximately 17,200 employees Covestro posted sales of 12.4 billion euros in 2019.

It has some 30 major production sites worldwide that operate in a safe, efficient and ecofriendly way. The product range includes the high-performance polymer polycarbonate and precursors for polyurethanes that are used to produce foam.

Kaiser-Wilhelm-Allee 60, 51373 Leverkusen

Phone: +49 214 6009 2000
Internet: www.covestro.com
Founding year: 2015
Number of employees: 17,200

TU Delft

Delft University of Technology contributes to solving global challenges by educating new generations of socially responsible engineers and expanding the frontiers of the engineering science. In CLIB, TU Delft is represented by the Department of Biotechnology.

Research in the Department of Biotechnology is unique in addressing all relevant levels of organization in biotechnological processes: discovery, characterization, and engineering of enzymes as molecular catalysts; physiology, systems biology, and engineering of microbial cells and cellular networks; ecophysiology of microbial populations; design and integration of unit operations in industrial and environmental bioprocesses and analysis of socio-economic impact. These research activities are supported by state-of-the-art laboratory facilities and infrastructure.

Postbus 5, 2600 AA Delft
The Netherlands

Phone: +31 152789111
Internet: www.tudelft.nl
Founding year: 1842
Number of employees: 6,050

TU Dortmund University - Department of Biochemical and Chemical Engineering (BCI)

The Department of Biochemical and Chemical Engineering (BCI) in Dortmund is one of the largest and most successful departments of its kind in Europe. It is active in all areas of biochemical and chemical engineering. The strength of the department is its multidisciplinarity, linking various research areas, e.g. thermodynamics, technical (bio) chemistry, biotechnology and process engineering, thus covering all stages of (bio) process and (bio)catalyst development.

BCI has been an active partner in many CLIB-related projects (Graduate and Technology Clusters as well as the Kompetenzzentrum Biotechnologie CKB). The overall aim of the research is the design and optimization of safe, environmentally friendly and sustainable processes and products for the chemical, pharmaceutical, and related industries.

Emil-Figge-Str. 66, 44227 Dortmund

Phone: +49 231 755 5950
Internet: www.bci.tu-dortmund.de
Founding year: 1969
Number of employees: >200

Econutri GmbH

Econutri is a biotechnology startup developing an innovative high-tech bioprocess that uses carbon dioxide as a source for producing high-quality proteins in various forms. We are starting with proteins for animal feed.

Our special microorganisms grow in a highly efficient gas fermentation process and finally form a biomass consisting of up to 80 % high quality proteins. Applications are animal feed, human food or technical proteins.

Mariagrüner Str. 91, 8043 Graz
Austria

Phone: +43 6641691137
Internet: www.econutri.com
Founding year: 2021
Number of employees: 3

The European Circular Bioeconomy Fund GmbH (ECBF)

ECBF is the first venture fund exclusively dedicated to the bioeconomy. We invest in visionary European entrepreneurs who are driving the shift from a fossil-based to a bio-based economy.

ECBF aims to catalyze the transition towards a sustainable future by investing in biobased growth-stage companies with high potential for innovation, favorable returns, and sustainable impact. As a growth-stage venture capital fund, ECBF syndicates with private and public investors to bring circular technologies and bio-products to market, offering flexible financing tools from equity to mezzanine.

With a total of 300 million EUR under management, ECBF is focussing to deploy capital on attractive companies based in the EU-27 or 16-HORIZON 2020 associated countries active in AgTech, FoodTech, Industrial Biotech, Biobased Packaging or Construction Materials. Established in Luxembourg, ECBF is managed by Hauck & Aufhäuser Funds Services S.A. (AIFM) and advised by the experienced investment team of ECBF Management GmbH.

Poppelsdorfer Allee 17, 53115 Bonn

Internet: www.ecbf.vc/contact
Founding year: 2019
Number of employees: 26

Eder Schieschke & Partner mbB

The chemical department of the intellectual property law firm Eder Schieschke & Partner mbB has specialized in representing clients in the field of organic chemistry, biochemistry and biotechnology before the European Patent Office, the German Patent and Trademark Office, the German Patent Court and the European Intellectual Property Organization in all areas of intellectual property law.

Amongst obtaining patent rights, utility model rights and trademark rights Eder Schieschke & Partner mbB's expertise is also directed to license agreements, preparation of invalidity, infringement and freedom-to-operate studies, as well as German employee law.

As a member of CLIB, Eder Schieschke & Partner mbB is supporting the Cluster with the realization of IP coaching seminars for start-ups and SMEs.

Elisabethstr. 34, 80796 München

Phone: +49 89 278 148-0
Internet: www.eder-ip.de

Eindhoven University of Technology

Eindhoven University of Technology (TU/e) is a research university, founded in 1956, specializing in engineering science & technology. The Department of Chemical Engineering and Chemistry aspires to be an academic institution for education and research in chemical science and engineering of the highest international standard. The aim is to generate and to develop technology and scientific knowledge relevant for the long-term needs of society.

Scientific curiosity and the use of newly generated knowledge are the main driving forces behind the continuing enhancement of our expertise in (electro-)chemical reactor engineering, multiscale & multiphase modelling, process intensification, membrane processes and heterogeneous catalysis.

Groene Loper 5, 5612AE Eindhoven,
the Netherlands

Phone: +31 402479111
Internet: www.tue.nl
Founding year: 1956
Number of employees: 3,239

Enzymaster Deutschland GmbH

Enzymaster provides a one-stop solution for the development and commercialization of innovative and sustainable enzyme catalysis technologies. With our proprietary BioEngine® platform and long-term experience, we offer R & D services combined with establishment of complete technology transfer packages, and manufacturing collaborations to fine chemical, pharmaceutical, and other industries.

Our portfolio includes enzyme panel screening, smart enzyme engineering, process development, enzyme preparation by fermentation (up to 5 m^3), and biocatalytic manufacturing of small molecules in the multi-ton scale.

In addition to these services, we also offer general enzyme kits that represent various enzyme classes as well as customized enzyme kits that fit to the individual biotransformation needs of our customers.

Enzymaster Deutschland GmbH, a subsidiary of Enzymaster (Ningbo) Bio-Engineering Co. Ltd., represents your partner in the international market for enzyme applications and products manufactured by biocatalytic processes.

Green Magic Happens Here!

Mühlenhof 7-9, 40721 Hilden

Phone: +49 211 15821610
Internet: www.enzymaster.de
Founding year: 2018
Number of employees: 5

Enzymical®

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Your Experienced Partner for Biocatalytic Processes

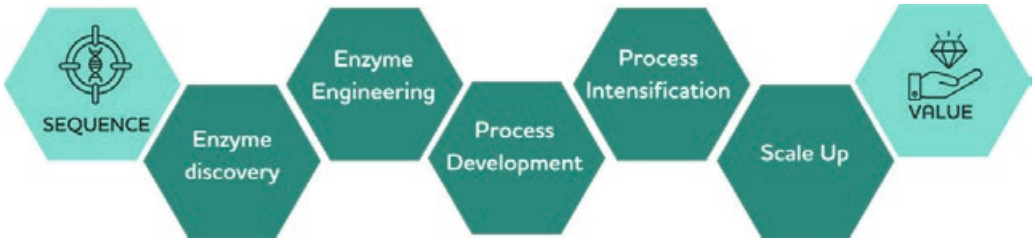
www.enzymicals.com

Founding member of:

ENZYME TECHNOLOGY ALLIANCE

SEQUENCE TO VALUE

www.enzymetechnologyalliance.com



Enzymicals AG

Celebrating 15 years of business this year, Enzymicals is your experienced partner for industrial biocatalysis from initial catalyst lead-finding to process optimisation and scale-up from gram to ton-scale. With technologies for the industrial implementation of cell-free manufacturing, we support the global industry to enable the change to biology-inspired production concepts.

Our services include biocatalysis, enzymology, cloning and expression services in multiple hosts and fermentation development for protein manufacture. Being part of a strong EU-based partner network ensures highest regard for your IP and supply chain security. Enzymicals adds value with tailor-made enzymes, customized chemicals and individual process solutions and enables greener and safer manufacturing procedures.

Enzymical®

Enzymes | Chemicals | Solutions

Walther-Rathenau-Str. 49a, 17489 Greifswald

Phone: +49 3834 515470
Internet: www.enzymicals.com
Founding year: 2009
Number of employees: 20

Evonik Industries AG

Evonik is one of the world's leading specialty chemicals companies.

We may not manufacture tires, mattresses, medications, or animal feeds, but Evonik is part of all of those products – and many more. While we often contribute only small amounts of material, those contributions are precisely what make the difference. That's because Evonik products make tires fuel-efficient, mattresses more elastic, medications more effective, and animal feeds healthier. That's what specialty chemicals are all about. And when it comes to specialty chemicals, we're among the best in the world.

Evonik is one of the world leaders in specialty chemicals. The company is active in more than 100 countries around the world and generated sales of 12.2 billion EUR and an operating profit (adjusted EBITDA) of 1.9 billion EUR in 2020. Evonik goes far beyond chemistry to create innovative, profitable and sustainable solutions for customers. More than 33,000 employees work together for a common purpose: We want to improve life, today and tomorrow.

EVONIK
Leading Beyond Chemistry

Rellinghauser Str. 1-11, 45128 Essen

Phone: +49 201 177 01
Internet: http://corporate.evonik.com
Founding year: 2007
Number of employees: 33,000

evoxx technologies GmbH

evoxx technologies GmbH, a German industrial biotechnology company, is focussed on the development and production of industrial enzymes and biocatalytic processes. As European subsidiary of the global enzyme manufacturer Advanced Enzyme Technologies Ltd., a comprehensive product portfolio of enzymatic solutions for human nutrition, animal nutrition, bio- processing, and pharma industries is offered.

Product development is based on the proprietary technology platform covering the whole value chain from early enzyme and process development via scale-up and technology transfer to industrial scale production. evoxx´s industrial partners and customers not only benefit from the long-term experience of our interdisciplinary team but also from our unique metagenomics libraries, enzyme engineering and development skills, tech transfer experience, and large scale enzyme production capabilities. Depending on the requirements, we can work in bacterial or fungal expression systems. Our comprehensive technology platform is also used to develop and produce tailored carbohydrates, mainly for food industry. evoxx is located on the Creative Campus in Monheim am Rhein, Germany.

Alfred-Nobel-Str. 10, 40789 Monheim am Rhein

Phone: +49 2173 4099 40
Internet: www.evoxx.com
Founding year: 2006
Number of employees: 40

Exazyme GmbH

Exazyme's mission is to make designing chemistry and biology as easy as using an app – facilitating the ideas that shorten the wait to solve the world's most pressing problems: from CO_2 to cancer. Existing methods, like Directed Evolution and Rational Design, or open source tools, such as for structure prediction, have significant limitations. We leverage the power of AI to develop tools for the most efficient protein design and engineering.

Exazyme empowers biotech innovators to find optimal proteins and achieve superior results compared to standard methods, while significantly reducing the number of experiments – up to 100 times less. Exazyme is used by protein engineers in the pharmaceutical, industrial and green biotechnology industries.

Max-Urich-Straße 3, 13355 Berlin

Phone: +49 2173 4099 40
Internet: exazyme.com
Founding year: 2021
Number of employees: 7

Federal State Institution «Federal Research Centre «Fundamentals of Biotechnology» of the Russian Academy of Sciences»*

The Russian Academy of Sciences was founded by merging the A.N. Bach Institute of Biochemistry RAS (INBI RAS), the S.N. Winogradsky Institute of Microbiology RAS and the Centre «Bioengineering» RAS.

The Research Centre of Biotechnology RAS carries out basic and applied research in the fields of biochemistry and biotechnology, microbiology, genomics, bioengineering and genetic engineering, biocatalysis, system and structural biology, biogeotechnologies, bioremediation, agrobiotechnologies, food quality and safety.

The Centre is the key member of the Russian Technology Platform «Bioindustry and Bioresources–BioTech2030». The Russian National Contact Point on Biotechnology, three core facilities, an accredited testing laboratory, and an experimental greenhouse are operating at the Centre.

Leninsky prospect, 33, Bld. 2, Moscow 119071
Russian Federation

Phone: +7 495 9545283
Internet: www.fbras.ru/en
Founding year: 2014
Number of employees: 500

FH Aachen

With more than 15,000 students, almost 2,000 graduates every year, 10 faculties, about 100 degree programmes, twelve in-house and five affiliated institutes as well as four competence platforms, FH Aachen, with its two campuses in Aachen and Jülich, is one of the largest and most important universities of applied sciences in Germany. The Faculty of Chemistry and Biotechnology at FH Aachen University of Applied Sciences brings together the necessary skills for applied research in the fields of biotechnology, chemistry, physics and engineering.

Activities in the CLIB Cluster include Molecular and Industrial Biotechnology (Institute of Nano- and Biotechnologies, INB), Bioprocess Engineering and Downstream Processing, Sustainable Organic Chemistry (Institute of Applied Polymer Chemistry, IAP).

Heinrich-Mussmann-Str. 1, 52428 Jülich

Phone: +49 241 6009 53081
Internet: ww.fh-aachen.de/fachbereiche/chemieundbiotechnologie
Number of employees: 1,250

*Collaboration currently resting

Flanders Investment & Trade

Innovative clusters are of key importance to Flanders as a knowledge region. `Sustainable Resources, Materials & Chemistry' is as one of the five key value chains of Flanders Accelerates.

The strategic partnership between chemical sector federation essenscia and Flanders Investment & Trade (FIT) aims at sustainably strengthening and expanding the international position of Flanders' chemical sector through promotion, growth support for start-ups and SMEs, knowledge exchange and more.

With its consistent focus on innovation, its top position in chemical activities, combined with the 1st incubator for sustainable chemistry, BlueChem, Flanders is the ideal location for start-ups and growth companies to innovate, sustainably grow and succeed in the heart of Europe.

Stolkgasse 25-45, 50667 Cologne

Phone: +49 221 25 49 28
Internet: www.flandersinvestmentandtrade.com
Number of employees: 300 worldwide

Forschungszentrum Jülich GmbH - IBG-1: Biotechnology

IBG-1: Biotechnology is a leading institute in the field of microbial biotechnology and biocatalysis. Multipurpose microbial production platforms (e. g. *C. glutamicum*. *P. putida*) are used for the production of industrially, nutritionally or pharmaceutically relevant products (bulk / fine chemicals, natural products, enzymes / proteins) from renewable carbon sources. Methods of synthetic biology are used for establishing novel concepts in strain development and engineering of metabolic pathways. Moreover, multi-step enzyme cascades for cell-free biosynthesis are developed.

Process development is based on lab automation systems combined with extensive digitalization. IBG-1 runs an extensive "omics" platform (sequencing, proteomics, metabolomics and fluxomics) for strain characterization and a single-cell analysis lab. Microbial cultivation facilities range from microfluidic devices over parallelized mini bioreactor systems up to pilot plant scale. Lab investigations are tightly integrated with mathematical modelling, data analysis, experimental design and process optimization.

Wilhelm-Johnen-Str., 52425 Jülich

Phone: +49 2461 61 3294 (Prof. Bott)
3118 (Prof. Wiechert)
Internet: www.fz-juelich.de/ibg/ibg-1
Founding year: 1977
Number of employees: 120

Fraunhofer IGB

The Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB develops and optimizes processes and products for health, sustainable chemistry, and environment. In the field of industrial biotechnology we focus on establishing, optimizing and scaling up processes that take place with the help of enzymes or microorganisms. For example, hydrolases and oxidoreductases as well as a wide variety of bacteria, fungi and yeasts are used for this purpose.

In some cases, the desired conversion also becomes possible through combination with chemical transformation processes. In the development of the conversion processes under laboratory conditions and the optimization of the biocatalysts themselves, the focus is already on scaling up the processes and processing the products. At the Fraunhofer Center for Chemical-Biotechnological Processes CBP, the Leuna branch of the institute, infrastructure and pilot plants are available to scale up processes to production-relevant dimensions.

Nobelstr. 12, 70569 Stuttgart

Phone: +49 711 970 4167
Internet: www.igb.fraunhofer.de
Founding year: 1953
Number of employees: 368

Fraunhofer IME

The Fraunhofer Institute for Molecular Biology and Applied Ecology IME conducts research in the field of applied life sciences from a molecular level to entire ecosystems. By strategic orientation along the value chain, the Fraunhofer IME follows the mission to take innovative products closer towards the market, to develop enabling technologies, and provide scientific services to partners from academic institutions and industry.

In the area of industrial biotechnology, the Fraunhofer IME offers research in the field of directed evolution, classical strain improvement, metabolic pathway engineering, and fermentation. Besides scientific expertise, we possess state-of-the-art facilities for high-throughput screening, enzyme production & purification, fermentation process development, and protein crystallization and modelling.

Forckenbeckstr. 6, 52074 Aachen

Phone: +49 241 6085 0
Internet: www.ime.fraunhofer.de
Founding year: 1959
Number of employees: approx. 600, incl. international locations

Fraunhofer UMSICHT

The Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT is a pioneer for a sustainable world. With our research in the areas of climate-neutral energy systems, resource-efficient processes and circular products, we make concrete contributions to achieving the 17 Sustainable Development Goals (SDGs) of the United Nations. We develop innovative, industrially feasible technologies, products and services for the circular economy and bring them to application with all our strength. The focus is on the balance of economically successful, socially equitable and sustainable developments.

As an institute of the Fraunhofer-Gesellschaft, the world's leading organization for applied research, we are part of a global network.

By focusing on key technologies of relevance to the future and marketing the results to business and industry, Fraunhofer plays an important role in the innovation process.

Osterfelder Str. 3, 46047 Oberhausen

Phone: +49 208 8598 0
Internet: www.umsicht.fraunhofer.de
Founding year: 1990
Number of employees: 608 (520 in Oberhausen and Willich, 88 in Sulzbach-Rosenberg)

Fraunhofer WKI

The Fraunhofer Institut für Holzforschung, Wilhelm-Klauditz-Institut (WKI) works as closely and as application-oriented with the companies of the wood and furniture industries and the supplier industry as it does with the construction industry, the chemical industry and the automotive industry. Virtually all procedures and materials, which result from the research activities of the Institute, are used industrially.

WKI has extensive competence in the areas of intermediates preparation from biosourced raw materials and polymer synthesis. The focus was laid on the modification of vegetable oils, saccharides, utilising building blocks generated by industrial biotechnology, and the utilisation of lignin for various applications for generating coatings, adhesives, sealants and elastomers.

WKI stands for R & D along the value chain, starting with monomers to end-use applications.

Bienroder Weg 54E, 38108 Braunschweig

Phone: +49 531 2155 329
Internet: www.wki.fraunhofer.de
Founding year: 1946
Number of employees: 175

Ginkgo Bioworks Netherlands B. V.

Ginkgo Bioworks is a biotech company from the United States founded in 2009 by scientists from MIT.

Ginkgo is building a platform to enable customers to program cells as easily as we can program computers. The company's platform is enabling biotechnology applications across diverse markets, from food and agriculture to industrial chemicals to pharmaceuticals.

On 1 July 2021, Ginkgo Bioworks acquired Dutch DNA Biotech, adding a fungal engineering platform to its portfolio. Dutch DNA Biotech continues its activities under the name Ginkgo Bioworks Netherlands and keeps its focus on development of fungal strains and fermentation processes for the production of proteins.

Padualaan 8 Kruytgebuw 4 Noord,
3584 CH Utrecht
the Netherlands

Phone: +31 0880666194
Internet: www.ginkgobioworks.com
Founding Year: 2015
Number of employees: 21

Global Entrepreneurship Centre powered by Flow gGmbH

Based at Areal Böhler in Meerbusch, the Global Entrepreneurship Centre (GEC) is the first structure of its kind to address the scaling challenges of promising SusTechs - deep-tech start-ups with a clear sustainability and climate protection focus - from all over the world.

Launched in 2021, the GEC will initially support up to 20 start-ups per year in the sectors of building & living, textiles, mobility and agriculture & nutrition with access to venture capital, business development and advisory services and lab capacity.

The GEC is funded by the Rhenish region's "SofortprogrammPlus" initiative and the Rhine County of Neuss. In the long term it will be funded by its own resources. Up to 3,000 new jobs will be created by 2030 through the relocation of innovative companies taking part in the GEC programmes to the region.

Böhlerstr. 1, 40667 Meerbusch

Phone: +49 151 52451698
Internet: www.gec-europe.de
Founding year: 2021
Number of employees: 6

WE DESIGN AND BUILD YOUR BIOPROCESS PLANT
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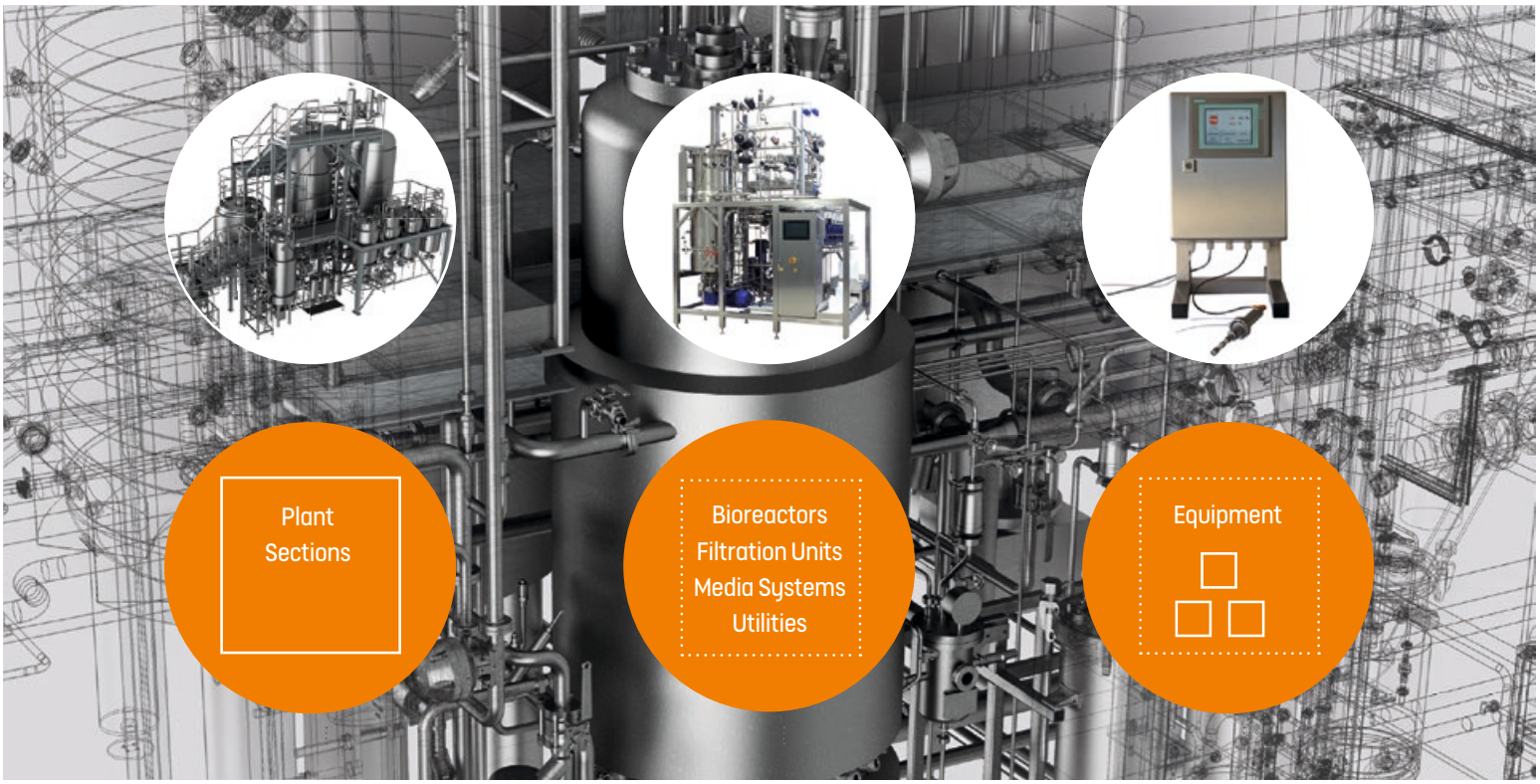

Heinrich Frings GmbH & Co. KG
Boschstrasse 32, 53359 Rheinbach

Tel.: +49 (0)22 26 89 29 - 400
Fax: +49 (0)22 26 89 29 - 401

marketing@frings.com
www.frings.com

FRINGS

The company Heinrich Frings GmbH & Co. KG is a worldwide supplier of machines, equipment and components for process technology in the industry sectors food, biotechnology, and the chemical industry, as well as environmental technology with special focus on fermenters and bioreactors.

FRINGS not only supplies customized systems for each application, but also offers assistance and consulting services. FRINGS has extensive know how and experience concerning process optimization and product development. For downstream processing FRINGS delivers membrane filtration systems (crossflow filtration) for many different industrial sectors.

Heinrich Frings GmbH & Co. KG

Boschstr. 32, 53359 Rheinbach

Phone: +49 2226 8929 400
Internet: www.frings.com
Founding year: 1878
Number of employees: 70

Heinrich Heine University Düsseldorf - Institutes of Bioorganic Chemistry (IBOC) & Molecular Enzyme Technology (IMET)

The Institutes of Bioorganic Chemistry and Molecular Enzyme Technology of Heinrich Heine University Düsseldorf are located on campus of the Forschungszentrum Jülich as part of the Institute of Bio- and Geosciences IBG-1: Biotechnology which holds a leading position nationally and internationally in the field of basic research and biotechnological applications of microorganisms.

The institutes work closely together currently covering as main scientific topics enzyme identification and characterization, microbial expression systems, enzyme immobilization and application in continuous flow processes, biocatalysis in synthetic organic chemistry and natural product biosynthesis.

Forschungszentrum Jülich,
Wilhelm-Johnen-Straße, 52428 Jülich

Phone: +49 2461 61 4158
Internet: www.iboc.uni-duesseldorf.de
Founding year: 2004
Number of employees: 45

Henkel AG & Co. KGaA

Henkel operates globally with a well-balanced and diversified portfolio. The company holds leading positions with its three business units - Laundry & Home Care, Beauty Care and Adhesives - in both industrial and consumer businesses thanks to strong brands, innovations and technologies.

Founded in 1876, Henkel looks back on more than 140 years of success. The DAX-30 company has its headquarters in Düsseldorf, Germany. Henkel employs more than 53,000 people worldwide, over 80 percent of whom work outside of Germany. In 2020, Henkel reported sales of 19.3 billion euros and an operating profit of 2.6 billion euros (adjusted for one-time gains/charges and restructuring charges). As a recognized leader in sustainability, Henkel holds top positions in many international indices and rankings.

Henkelstr. 67, 40589 Düsseldorf

Phone: +49 211 797 0
Internet: www.henkel.com
Founding year: 1876
Number of employees: 53,000

Hochschule Hamm-Lippstadt

Founded in 2009, the Hamm-Lippstadt University of Applied Sciences has developed rapidly, currently counting 5,000 students in 14 Bachelor and 10 Master degree programs. The focus is on the students, professional and individual development is supported by practice-oriented teaching which is oriented towards the needs of the changing society and the dynamic working environment.

Mentoring between scientific and practical experts, research marketing and reporting, founding, inventions and industrial property rights, promotion of cooperations between science, companies, and institutions are the main tasks. With doctoral studies, the HSHL offers the opportunity for a further scientific qualification in research projects for qualified graduates of Master degree programs.

Marker Allee 76-78, 59063 Hamm

Phone: +49 2381-8789-115
Internet: www.hshl.de
Founding year: 2009
Number of employees: 440

Industrial Biotechnology Innovation Centre

The Industrial Biotechnology Innovation Centre's (IBioIC) role, as a specialist in the Industrial Biotechnology (IB) sector, is to stimulate the growth of the IB sector in Scotland to £900 million by 2025. IBioIC connects industry, academia and government, and facilitates collaborations, provides scale-up capabilities, creates networks, and develops skills.

IBioIC supports transition into IB by helping companies to understand the benefits and opportunities, overcome any barriers and to make sure our members are in touch with the right people to guide them through the technology and its consequent translation and implementation in their business.

121 George Street, Glasgow G1 1RD
United Kingdom

Phone: +44 141 548 3192
Internet: www.IBioIC.com

IFF - International Flavors & Fragrances Inc.

IFF is an industry leader in food, beverage, health, biosciences and sensorial experiences and operates globally but with a significant research and manufacturing footprint in Europe. IFF has a deep histories of creativity, innovation excellence and a shared commitment to care for our communities. IFF's Vision is driven by its `Do More Good Plan', which has the ambition to innovate for progress – for people and the planet.

Across the four divisions of our business – Scent, Nourish, Health & Biosciences, Pharma Solutions – we are transforming the markets we serve by driving environmentally and socially conscious innovation, growing our robust research & development (R & D) pipeline, and developing an expanded suite of sustainable solutions to meet and exceed the expectations of our customers.

200 Powder Mill Road E353, 19803 Wilmington
USA

Phone: +1 302 5215296
Internet: www.iff.com
Number of employees: >22,000

INOFEA AG

INOFEA offers tailor-made enzyme solutions for the manufacturing process of high value compounds.

We develop enzyme-based solutions for an optimzed synthesis of small molecule APIs and Biologics, like mRNA based vaccines and therpeutics or ADCs. Our unique and patented enzyme immobilization and shielding technology increases stability while maintaining the enzyme's activity high. There is no loss of the enzyme during the process and the shield prevents leaching of enzymes. Our goal is to enable the production of much purer therapeutics and vaccines which results in enormous cost saving potentials and faster time to market. In the filed of small molucule APIs our technology is applied where soluble enzymes lack of stability, such as in the presence of organic solvents or high temperature.

Hofackerstr. 40b, 4132 Muttenz
Switzerland

Phone: +41 76 4050743
Internet: www. inofea.com
Founding year: 2014
Number of employees: 7

Jäckering Mühlen- und Nährmittelwerke GmbH

The Jäckering group of companies has developed over 100 years (foundation 1910) into a group of various activities reaching from wheat starch production to machinery business and by-product recycling in the PVC industry with its main production site in the harbour of Hamm in Germany.

Just recently an 85 Mio. € investment was executed by Jäckering in its mill and wheat-based biorefinery with an increase of its raw material input from 300,000 tons to 600,000 tons of wheat. The signs point to growth and expansion, with an important pillar in the biotechnological production of e.g. biobased plastics, organic acids as well as microbial astaxanthin and protein using the existing side-streams as substrates.

Research is already carried out together with leading universities and institutes. The research & development centre onsite is readily available and offers facilities for bioprocess development and up-scaling of up-stream-, down-stream- and fermentation processes from shaking flask over 10L and 300L up to 1500L. Approval for usage of GMO (S1) for research is possible.

Vorsterhauser Weg 46, 59067 Hamm

Phone: +49 2381 4220
Internet: www.jaeckering.de
Founding year: 1910
Number of employees: 100

KADIB - Kircher Advice in Bioeconomy

*K*ADIB offers comprehensive expertise in Industrial Bioeconomy. We provide consultancy in positioning profitable chemical and energy value chains in your Political, Economical, Societal, Technological, Legislative and Ecological (PESTLE) environment. *K*ADIB provides advice and moderates decision-making:

- Analysing the Bioeconomy Potential
- Designing strategic Bioeconomy Concepts
- Implementing Bioeconomy Strategies
- Focusing on Markets, Technologies and Business Opportunities
- For Industries, Research Institutes, Governmental Agencies

*K*ADIB works through its unique network of senior experts. *K*ADIB is a member of CLIB (Cluster Industrial Biotechnology) and BioBall (Bioeconomy in Metropolitan Regions).

Kurhessenstr. 63, 60431 Frankfurt am Main

Phone: +49 69 95104772
Internet: www.kadib.de
Founding year: 2014
Number of employees: 1

KFCircular GmbH

KFCircular is a consultancy company located in Berlin. KFCircular provides profound knowledge in circular economy especially renewable carbon and its utilization and integration into further processes. We have access to a patent portfolio covering the the COSLIF-type pre-treatment process called LX-Process in different regions also in Europe. Our team has scaled the LX-Process to a processing capacity of 500 t p.a.

Furthermore KFCircular has broad knowledge of digitization projects with workflow, LIMS and document management systems.

Biedermannweg 7, 14052 Berlin

Phone: +49 163 3010887
Internet: www.kfcircular.de
Founding year: 2022
Number of employees: 1

TH Köln - University of Applied Sciences

Gustav-Heinemann-Ufer 54, 50968 Köln

Phone: +49 221 8275-3051
Internet: www.th-koeln.de
Founding year: 1973
Number of employees: 1700

The TH Köln - University of Technology, Arts, Sciences offers students and scientists from Germany and abroad an inspirational study and research environment in the social, cultural, engineering, and natural sciences. Currently there are more than 24,000 students from about 120 countries enrolled in over 90 bachelor's and master's programs of 11 interdisciplinary faculties.

Climate change and scarce resources are some of the major challenges mankind will be facing in the coming decades. The faculty of Applied Natural Sciences at Campus Leverkusen engages itself in chemical and biotechnological research projects to address these 'great challenges' and actively contributes to the advancement of science and economy.

Kuhner Shaker GmbH

Kaiserstr. 100 , 52134 Herzogenrath

Phone: +49 2407 554 88 22
Internet: www.kuhner.com,
www.feedingtechnology.com
Founding year: 2015
Number of employees: 10

The Kuhner Shaker GmbH distributes shaking machines and application technologies for shaken bioreactor systems. Moreover, we produce and develop innovative feeding technologies for microtiter plates, shake flasks and spin tube bioreactors. The product portfolio covers bench top shakers, industrial shaking machines for GMP environments as well as the feeding technologies FeedPlate, FeedBead and FeedTube.

Kuhner Shaker is driven by a personal and trustful contact to our customers. Based on a long-term experience and our expert knowledge regarding shaken bioreactors we are capable to offer individual and custom-made solutions. As a partner of the science, we actively contribute to academic research projects.

LanzaTech Inc.

8045 Lamon Avenue, Skokie, 60077 IL
USA

Phone: +1 847 324 2400
Internet: www.lanzatech.com
Founding year: 2005
Number of employees: 120

Founded in 2005, LanzaTech has developed a fully integrated gas to liquid technology platform that produces fuels and chemicals from gas resources. The potential feedstock ranges from industrial waste gases (steel mills, refineries and phosphorous plants) to biomass syngas (MSW, organic industrial waste, and agricultural waste); as well as biogas.

LanzaTech employs a strong technical team based in the USA, China and Europe and has a rapidly growing patent portfolio. With agreements now in place across a variety of sectors internationally, including steel, aviation, refining and chemicals, LanzaTech's technology is being scaled to commercial production.

Leiber GmbH

Franz-Leiber-Strasse 1, 49565 Bramsche

Phone: +49 5461 9303 0
Internet: www.leibergmbh.de
Founding year: 1954
Number of employees: 230

Leiber refines the food side stream "Brewers' Spent Yeast" into innovative and nutritional products for the fields Life Science, Food and Animal Nutrition. We are a reliable partner for the brewing industry and bridging the gap between food industry and technology-driven markets like the biotechnology industry.

The Life Science division is dedicated to functional nutritional solutions for applications in Biotechnology, Nutraceuticals, and Agriscicence. Our Brewers' Yeast extracts are perfect for the fermentation industry. They improve the fermentation rate of a wide range of microorganisms, such as bacteria, fungi, algae and numerous other production organisms, because they are an important source of assimilable nitrogen and also contain B vitamins, minerals and other nutrients.

LignoPure GmbH

LignoPure is a pioneer in helping materials science and life science companies revolutionize their portfolio with tailor-made, sustainable product solutions. For this purpose, LignoPure uses the raw material lignin, which is as good as unknown, but actually the second most abundant biopolymer in the world!

We offer lignin-based solutions for your product ideas. LignoPure is a spinoff of the Hamburg University of Technology – a multidisciplinary team with expertise in process engineering, product development & business administration.

From its versatile biorefinery network, LignoPure can source suitable lignins and process them specifically for the customer's application. In addition, LignoPure offers tailor-made development services to the processing customer.

Harburger Schloßstr. 6-12, 21079 Hamburg

Phone: +49 40 428784295
Internet: www.lignopure.de
Founding year: 2019
Number of employees: 4

Lignovations GmbH

Lignovations has developed a patented technology to manufacture functional ingredients for cosmetics, coatings, packaging and more from upcycled biomass. By transforming lignin, a component of biomass that protects the plant into so called ‚Colloidal Lignin Particles', Lignovations' high-performance bio-material can replace non-renewable ingredients, such as UV filters, antioxidants, and emulsifiers.

Inkustr. 1-7, 3400 Klosterneuburg, Austria

Phone: +43 6802343367
Internet: www.lignovations.com
Founding year: 2021
Number of employees: 10

LXP Group GmbH

LXP is a tech company, active in the field of industrial biotechnology. The objective of the company is the development, marketing and licensing of technical solutions for the economic and ecological processing of plant residues on the basis of closed carbon and mineral cycles. Our mission is to maximize the ecological and economic efficiency of biotechnological processes.

The core technology is based on a patent protected pre-treatment process called LX-Process. This process provides alternative/2G-carbohydrates/-sugars and is easy to integrate into biotechnological processes. It allows the conversion of virtually all carbohydrates of lignocellulosic non-food materials to chemicals or biofuels. Additionally, sulphur free lignin is obtained.

Rheinstr. 3, 14513 Teltow

Phone: +49 3337 3774140
Internet: www.lxp-group.com
Founding year: 2009
Number of employees: <10

Microharvest GmbH

Protein unleashed from Nature

As the world faces an unprecedented challenge to meet the rapidly growing demand for protein, MicroHarvest is challenging the boundaries to provide the sustainable protein ingredients of the future.

Through our cutting-edge technologies and motivated teams, we harness the power of nature's best protein factories: microorganisms.

Our ambition is to produce nutritious, sustainable proteins to achieve the resilient food system of tomorrow – driving the impact of today.

MicroHarvest understands the needs of food, feed and pet food manufacturers and meets their requirements with a Smaller, Better, Faster solution.

Kasernenstrasse 12, 21073 Hamburg

Phone: +49 40 8081 39070
Internet: www.microharvest.com
Founding year: 2021
Number of employees: 24

Mitsui & Co. Deutschland GmbH

Mitsui & Co. Deutschland GmbH is a subsidiary of Mitsui & Co., Ltd., one of the most diversified and comprehensive trading, investment and service enterprises which covers a wide range of industries: Mineral & Metal Resources, Energy, Infrastructure Projects, Mobility, Chemicals, Nutrition & Agriculture, Iron & Steel Products, Food, Food & Retail Management, Wellness, IT & Communication Business, and Corporate Development Business.

We currently comprise 126 sites in 62 countries/regions and a network of more than 500 affiliates, employing approximately 45,000 talented people worldwide. In every arena, Mitsui & Co. provides high added value services and solutions that truly reflect our customers' needs. Our job is to imagine new businesses and bring them to life. Creating new value for this era and innovating for the next.

Herzogstr. 15, 40217 Düsseldorf

Phone: +49 211 9386418
Internet: www.mitsui.com/de
Founding year: 1954
Number of employees: 153

mk2 Biotechnologies GmbH

mk2 Biotechnologies develops, produces and investigates peptides & proteins using a revolutionary synthesis technology. Our innovative process allows the scalable and thus cost-efficient production of high-purity peptides & proteins for a broad range of applications.

Am Klopferspitz 19, 82152 Planegg

Phone: +49 89 693 132 07
Internet: www.mk2.bio
Founding year: 2020
Number of employees: 13

Neste Germany GmbH

Neste (NESTE, Nasdaq Helsinki) creates solutions for combating climate change and accelerating a shift to a circular economy. We refine waste, residues and innovative raw materials into renewable fuels and sustainable feedstock for plastics and other materials.

We are the world's leading producer of renewable diesel and sustainable aviation fuel, developing chemical recycling to combat the plastic waste challenge. We aim at helping customers to reduce greenhouse gas emissions with our renewable and circular solutions by at least 20 million tons annually by 2030. As a technologically advanced refiner of high-quality oil products with a commitment to reach carbon-neutral production by 2035, we are also introducing renewable and recycled raw materials such as waste plastic as refinery raw materials.

We have consistently been included in the Dow Jones Sustainability Indices and the Global 100 list of the world's most sustainable companies. In 2020, Neste's revenue stood at EUR 11.8 billion, with 94 % of the company's comparable operating profit coming from renewable products.

Fürstenwall 172, 40217 Düsseldorf

Internet: www.neste.com
Founding year: 1948
Number of employees: 4,800

Novo Nordisk Foundation Center for Biosustainability (DTU Biosustain)

Why not use the smallest factories to make the biggest possible amounts of high-value chemicals and pharmaceuticals biosustainably? The Novo Nordisk Foundation Center for Biosustainability at DTU is doing exactly this by developing new technologies for engineering microbes, turning them into cell factories, which are designed for efficient production of a specific compound in a commercially competitive way. The Center is part of a cluster of research centers that aim at attracting the world's best researchers, and thereby creating the basis for an internationally oriented and innovative research environment of the highest quality to benefit society.

Kemitorvet 220, 2800 Lyngby
Denmark

Phone: +45 45 25 80 00
Internet: www.biosustain.dtu.dk/english
Founding year: 2011
Number of employees: 323

Profit from our joint expertise!

Our research focus for the bioeconomy:

Applied Mycology | Biophysical Chemistry | Food Biotechnology | Industrial and Molecular Biotechnology | Microbiology | Sustainable Logistics and IT | Sustainable Organic and Polymer Chemistry | Sustainable Textiles

Please feel free to contact us: Andrea.Wanninger@hsnr.de

Niederrhein University of Applied Sciences

The Hochschule Niederrhein is one of the largest and top-performing universities for applied sciences in Germany. We are a renowned educational and research institution. With ten faculties, 245 professors, and more than 14,000 students, we are an important contact for companies from the region for research and transfer.

Our activities in CLIB include Molecular and Industrial Biotechnology, Sustainable Organic Chemistry (Faculty of Chemistry, Institute ILOC), Applied Mycology, Microbiology, Food Biotechnology (Faculty of Food, Nutrition and Hospitality Sciences, Competence Centers CCMB, KAMU), Sustainable Textiles (Faculty of Textile and Clothing Technology, Institute FTB), as well as Logistics and IT (Faculty of Industrial Engineering, Institute GEMIT).

Hochschule Niederrhein
University of Applied Sciences

Reinarzstr. 49, 47805 Krefeld

Phone: +49 2151 822 4047
Internet: www.hs-niederrhein.de
Founding year: 1971
Number of employees: 1,002

NRW.BANK

NRW.BANK is the promotional bank of North Rhine-Westphalia. NRW.BANK essentially orients its equity products on the business life cycle. With NRW.SeedCap it doubles initial investments of Business Angels in innovative start-ups. In addition, NRW.BANK supports start-up financing through its involvement in regionally based early-stage funds. Young, innovative and often technology-oriented companies are supported via “NRW.Venture”.

Within the “win NRW.BANK Business Angels Initiative” private investors support young entrepreneurs with capital and know-how. And the “NRW.BANK.Venture Center” is a specialist advisory unit for business founders from universities and research institutions as well as innovative start-ups.

NRW.BANK
Promoting Ideas

Kavalleriestr. 22, 40213 Düsseldorf
Friedrichstr. 1, 48145 Münster

Phone: +49 211 91741 4800
Internet: www.nrwbank.de
Founding year: 2002
Number of employees: 1,474

nova-Institut GmbH

nova-Institut GmbH has been working in the field of sustainability since the mid-1990s and focuses today primarily on the topic of renewable carbon cycles (recycling, bioeconomy and CO_2 utilization/CCU).

As an independent research institute, nova supports in particular customers in chemical, plastics and materials industries with the transformation from fossil to renewable carbon from biomass, direct CO_2 utilization and recycling.

Both in the accompanying research of international innovation projects and in individual, scientifically based management consulting, a multidisciplinary team of scientists at nova deals with the entire range of topics from renewable raw materials, technologies and markets, economics, political framework conditions, life cycle assessments and sustainability to communication, target groups and strategy development.

More information at: nova-institute.eu – renewable-carbon.eu

Leyboldstraße 16, 50354 Hürth
Phone: +49 2233 460 14 00
Internet: www.nova-institute.eu
Founding year: 1994
Number of employees: 50

Pectcof B. V.

Pectcof converts coffee pulp into valuable food ingredients. Our technology unlocks the full potential of coffee pulp, providing an enormous positive environmental and societal impact. The coffee pulp, the side stream of the second most traded commodity in the world, is currently dumped or landfilled. Pectcof's first product on the market, Dutch Gum, has been successfully tested as an emulsifier, stabilizer, texturizer amongst others in candies, sauces and soft drinks, offering superior functionality at best cost-in-use and allowing more flexibility in formulation development.

Our technology is a true example of biomass upcycling to novel and functional food ingredients, driven by consumer's demand for clean-label ingredients and their consciousness about social-environmental impact.

Villafloraweg 63A, 5928 SZ Venlo
the Netherlands
Phone: +31 622346385
Internet: www.pectcof.com
Founding year: 2012
Number of employees: 4

Pfeifer & Langen GmbH & Co. KG

Pfeifer & Langen operates five sugar factories in Germany. Sugar beets grown by farmers are processed to white sugar and the by-products sugar beet pulp and molasses. These products and intermediate products such as thick juice can be used as carbohydrate sources for biotechnological processes.

Pfeifer & Langen supplies sugar and sugar specialities for the food industry and the consumers. The production process of Pfeifer & Langen starts when the sugar beet seed is sold to the farmers and ends when the sugar is placed on the grocery shelves. We are looking for opportunities to use our expertise in the process chain beginning with agriculture and ending in the food retail trade for new processes and products connected with biotechnology. Even though we offer deep knowledge in the development of enzymatic processes and enzyme production.

Pfeifer & Langen is with its affiliated company Savanna Ingredients GmbH active on the field of production and sales natural functional carbohydrates.

Pfeifer & Langen

Aachenerstr. 1042a, 50858 Köln
Research Facility: Dürener Str. 40, 50189 Elsdorf
Phone: +49 221 4980 0
Internet: www.pfeifer-langen.com
Founding year: 1870
Number of employees: 2,300

Phytowelt GreenTechnologies GmbH

Phytowelt GreenTechnologies is an experienced SME performing R & D services and production in green and industrial biotech. Our knowhow in plant tissue culture and process engineering assists our clients in plant breeding or in the utilisation of secondary metabolites and enzymes for industrial use. Thus we enable the production of valuable molecules within plants via key technologies like protoplast fusion or gen editing, or outside of plants in microbes, via fermentation or bio-catalysis.

Our approach to combine plant and industrial biotechnology maximizes synergies and promotes sustainable development in the F & F, pharmaceutical or agricultural industry. Such technologies are developed in our state-of-the-art fermentation which is also available to external customers for pilot projects.

phytowelt

Head Office Kölsumer Weg 33, 41334 Nettetal

R & D Facilities : Stöckheimer Weg 1, 50829 Köln

Phone: +49 2162 77859
Internet: www.phytowelt.com
Founding year: 1998
Number of employees: 24

PROvendis GmbH

PROvendis acts as a professional service provider in the entire field of IP management for more than 40 universities and extra-university research institutions as well as for companies and start-ups.

We provide an exclusive access to licensable inventions of approx. 30,000 scientists from the areas of medicine, natural sciences and engineering.

Our Life Sciences Team consists of experienced innovation managers with professional expertise in the fields of biology, chemistry, medicine and pharma. They identify suitable partners, negotiate license agreements and promote long-term research collaborations.

PROvendis
we market innovation

Schlossstr. 11-15, 45468 Mülheim an der Ruhr

Phone: +49 208 94105 0
Internet: www.provendis.info
Founding year: 2001
Number of employees: 41

Qingdao Institute of Bioenergy and Bioprocess Technology Chinese Academy of Sciences

The Qingdao Institute of Bioenergy and Bioprocess Technology (QIBEBT), Chinese Academy of Sciences is one of China's primary national research institutions for renewable energy and green materials, focusing mainly on research and development of the resources, technologies, products and processes for bio-based energy and materials.

QIBEBT currently has a staff of 800, 470 of whom are full-time employees and 330 are graduate students. The institute offers PhD, Master and Postdoctoral programs in biology, chemical engineering and technology, and material science and engineering.

The institute attaches high importance to promoting international cooperation and has more than 170 global partners including Boeing, Shell, P & G and Total.

中国科学院青岛生物能源与过程研究所
Qingdao Institute of Bioenergy and Bioprocess Technology,Chinese Academy of Sciences

No.189 Songling Road, Laoshan District,
Qingdao, 266101
P.R.China

Phone: +86 532 80662640
Internet: http://english.qibebt.cas.cn
Founding year: 2009
Number of employees: 470

RWTH Aachen – Institute of Biotechnology

Prof. Schwaneberg's research group at RWTH Aachen University is a world leader in protein engineering using guided evolution and rational design. Projects range from basic research to understand structure-function relationships to method development for guided evolution and optimization of biocatalysts for sustainable production from renewable resources, including enzymes for the synthesis of pharmaceuticals, detergents and agricultural chemicals.

Prof. Schwaneberg is spokesperson of the profile area Molecular Science & Engineering of RWTH Aachen University, director of the competence center Bio4MatPro, member of the Centers for Molecular Transformation and Circular Economy, co-initiator of the Center Smart Industrial Agriculture and aims with his team to advance bioeconomy and the biological transformation of industries within a sustainable circular economy.

RWTH Aachen University, Institute of Biotechnology, Worringerweg 3
52074 Aachen

Phone: +49 241 80 24170
Internet: www.biotec.rwth-aachen.de
Founding year: 2008
Number of employees: 52

Savanna Ingredients GmbH

We are a spin-off from Pfeifer & Langen GmbH & Co.KG. As a 100% subsidiary, we are also part of the Pfeifer & Langen IHKG group of companies. Within this group, we form the Food'Or Group together with Endori and Naturkost Übelhör. As SAVANNA, we develop, produce and market functional carbohydrates. Functional carbohydrates are, among other things, sugars with special properties. Our product portfolio currently includes the single sugar allulose (crystalline & syrup) and the double sugar cellobiose (powder). We are based in Elsdorf, the traditional location of our Pfeifer & Langen parent company. Our corporate vision and mission motivate us in our daily activities.

Dürener Str. 67, 50189 Elsdorf

Phone: +49 2274 701 400
Internet: www.savanna-Ingredients.com
Founding year: 2017
Number of employees: 45

Scientific Bioprocessing, Inc (sbi)

Scientific Bioprocessing, Inc. (sbi) is a leading provider of modern sensors, actuators, and software solutions for shake flask bioprocesses. Our vision is to pioneer digitally simplified bioprocessing, with a primary focus on transforming standard shake flasks into smart shake flasks with bioreactor-like capabilities.

The platform behind this is our DOTS Platform with components like non-invasive biomass sensors, pH, and dissolved oxygen (DO) chemosensor pills, and feeding technologies. The DOTS Platform empowers researchers to conduct bioreactor-like experiments on a shake flask level, leading to enhanced bioprocess control, improved insights, and cost-efficiency in bioprocess development. Our team comes with years of bioprocessing experience, allowing us to offer you detailed support.

Arnold-Sommerfeld-Ring 2, 52499 Baesweiler

Phone: +49 2401 8049708
Internet: www.scientificbio.com
Founding year: 2011
Number of employees: 47

Scheele Jaeger Wetzel Patentanwälte

We Protect Your Intellectual Property

Scheele Wetzel is a boutique IP law firm offering services in in all areas of German and European patent, trademark and design law. Our clients range from large enterprises, small and medium sized businesses, universities, institutions to private inventors.

The firm is a cooperation partner of US based law firm RatnerPrestia PC with offices in Philadelphia, Washington and Wilmington. The attorneys at Scheele Wetzel have been shareholders of RatnerPrestia and thus have a strong personal and professional relationship to the firm, which allows them to solve client's needs in European law as well as US law on short notice. By combining our patent attorney services and technical expertise in engineering and natural sciences, we effectively support our clients in obtaining, defending and enforcing their intellectual property rights.

The firm is located directly beneath the European Patent Office in the heart of Munich.

Goethestr. 2, 80336 München

Phone: +49 89 12 501 21 70
Internet: www.sjw-patent.com
Founding year: 2021
Number of employees: 5

Schnee Research

Schnee Research sees itself as a mediator between financial markets (e.g. investors) and small to mid-sized companies in different areas (e.g. biotech, chemical industry). Having worked for some years as analyst in the financial industry (independent research house, and rating agency), I now keep strong ties to the chemical industry from by background as a trained chemist (Dipl.-Chem.) and to biotech from my thesis work. My business activities in the area of white biotechnology are focused on evaluation and scouting. I focus on the analysis and evaluation of privately owned as well as listed biotech companies or their development projects.

I was contracted as independent specialist by an investment bank to consult and assist a white biotechnology company in obtaining funding. Schnee Research offers two different services directly or via its cooperation partners faireseach (pure-play financial research) and Breslin. As a consequence, Schnee Research can span an investment bank's value chain with its entire network. The services of Schnee Research are closer to the money market than to production.

P. O. Box 1104, 63461 Maintal

Phone: +49 6181 9455 262
Founding year: 2002
Number of employees: 1

SCION – New Zealand Forest Research Institute Limited

Scion is a New Zealand Crown Research Institute that specialises in research, science and technology development for the forestry and wood-derived materials: tree improvement, wood-related bioenergy, industrial biotechnology and high-value manufacturing. Scion is developing biorefinery processes to create new green chemicals and biopolymers from renewable resources, with a focus on lignocellulosic biomass: soft wood.

We develop microbial and enzyme-based processes that can be used by industrial partners for the production of valued compounds, enzymes and other biological products.

Scion is New Zealand's centre of expertise in bioplastic research and development: production and manufacturing of biopolymers as plastics, adhesives, coatings, foams, pulp/packaging, and fibre-composites.

49 Sala Street, 3010 Rotorua,
New Zealand

Phone: +64 7 343 5899
Internet: www.scionresearch.com
Founding year: 1947
Number of employees: 300

SenseUp GmbH

Using their novel natural evolution technology, SenseUp has developed powerful and universal production platforms for proteins and peptides, as well as RNA. These platforms are quickly adaptable to a huge number of individual products for different applications and markets, such as pharma, food, and crop science.

SenseUp have now started developing a range of innovative RNA products based on microbial fermentation using their patented Corynebacterium and natural evolution technology and addressing animal health and crop protection.

The aim is to develop sustainable and effective commercial products that are ready for industrial-scale production at low cost and can be launched in the years to come in cooperation with strategic industrial partners.

c/o Campus Forschungszentrum,
Wilhelm-Johnen-Straße, 52428 Jülich

Phone: +49 2461 61 5529
Internet: www.senseup.de
Founding year: 2015
Number of employees: 12

Senzyme GmbH

Senzyme GmbH is innovatively operating in biotechnology and develops and produces technical enzymes and other additives for applications in bioenergy, biorefinement, as well as in the food and feed industries.

The company has long and substantial experience in the cultivation of fungi using solid-state fermentation as the preferred method. Senzyme GmbH maintains a quality management system and guarantees the effectiveness and quality of all its processes and products. The company always welcomes cooperations with scientific institutions and other companies.

Gierlichsstr. 6, 53840 Troisdorf

Phone: +49 2241 2715 2000
Internet: www.senzyme.de
Founding year: 2000
Number of employees: 45

SeSaM-Biotech GmbH

Quality Enzyme Solutions

Forckenbeckstr. 50, 52074 Aachen

Phone: +49 241 938 569 79
Internet: www.sesam-biotech.com
Founding year: 2008

As an 'all-in-one' protein engineering service provider, SeSaM-Biotech improves industrial enzymes for various industry sectors like the chemical, dish & fabric, feed and food sector.

Our expertise covers a range of enzymes including amylases, lipases, esterases, cellulases, glucose oxidases, laccases, monooxygenases, phytases, proteases, pectinases, polymerases and isomerases which we already have improved towards e.g. higher activity, thermal resistance or many other characteristics. With our cutting-edge technologies for mutagenesis (e.g. SeSaM-Technology, OmniChange), computational modelling of enzymes, and individually adapted screening assays we follow our vision:

To provide our clients with 'Quality Enzyme Solutions' to make their products eco-friendler, more cost effective and more valuable.

Sofinnova Partners

7-11 Boulevard Haussman 75009, Paris
France

Phone: +33 1 76 23 41 00
Internet: www.sofinnovapartners.com
Founding year: 1972
Number of employees: 80

Sofinnova Partners is a leading European venture capital firm in life sciences, specializing in healthcare and sustainability. Based in Paris, London and Milan, the firm brings together an international team of professionals with strong scientific, medical and business expertise. The firm's multi-fund platform of investment strategies is comprised of specialist teams focusing on biopharma, medtech, industrial biotech, and digital medicine.

Founded in 1972, Sofinnova Partners has a 50-year history of building and backing over 500 companies, creating market leaders around the globe. Today, Sofinnova Partners has over € 2.5 billion under management.

Sophie's BioNutrients B. V.

Bronland 10-D, 6708 WH Wageningen
the Netherlands

Phone: +31 63 8070887
Internet: www.sophiesbionutrients.com
Founding year: 2022
Number of employees: 5

Sophie's BioNutrients, a B2B food technology company, is on a mission to unleash the limitless possibilities of nature, restore the planet and eliminate food allergies. It aims to achieve this by creating plant-based, protein-rich alternatives to meat and seafood using microalgae, the mother of all animal and plant life. Sophie's BioNutrients is a Foodtech 500 start-up and winner of the MassChallenge 2021.

Stahl Holdings B. V.

Sluisweg 10, 5145 PE Waalwijk
the Netherlands

Phone: +31 416 689111
Internet: www.stahl.com
Founding year: 2006
Number of employees: 1,800

Stahl is driving the responsible chemistry in leather solutions and high-performance coatings. Our products enable sustainable living by adding functionality, durability and comfort to many different materials used in everyday life. Through our continuous focus on innovation and improving the environmental footprint, our unique service model and premium solutions add value to various industries.

At Stahl, we see our responsibility to participate in sustainable development as a duty to society and the environment, but also as an opportunity to do well by doing good. By embracing sustainable development, we aim to deliver value for all stakeholders, including our employees, customers, suppliers, partners, and society at large.

SynergyCom SOOO*

SynergyCom SOOO is focused on sustainable and cost-effective hydrolysis lignin valorization. SynergyCom SOOO produces lignin-based chemicals for various industries, including oil and gas, environmental, construction, agricultural, mining, and several others.

Businesses across many industries are beginning to see benefits in utilizing intrinsic advantages of SynergyCom's hydrolysis lignin in its purified form as well as in its chemically modified forms enriched with high concentration of functional groups. SynergyCom SOOO pays a lot of attention to research and innovation aimed at creating environmentally friendly technologies and new lignin-based products.

SYNERGY HORIZON

Rumyantseva 7, 220034 Minsk
Belarus
Phone: +375 2340 35656
Internet: www.synergysorb.ru/en
Founding year: 2011
Number of employees: 88

The Oater

The Oater is a compact IoT oat milk machine for retailers. It is embedded into a holistic eco-system consisting of a smart platform & frequent ingredient deliveries. The business model is "oat milk as a service".

Businesses only pay a flat litre price and benefit from:

- better oat milk (fresher, tastier, customizable) as this brings customers to their shop
- reduced purchasing costs
- shifting to a sustainable business model and gaining market share in one of the fastest growing food markets

OATER

Sandkaulstr. 117, 52062 Aachen
Phone: +49 6224 9870 049
Internet: www.oater.de
Founding year: 2021
Number of employees: 7

the better green TEC GmbH

We design and build pioneering full upgrading plants for slurry, manure, digestate substrates and other agricultural residues!

These residual materials are turned into "recyclables" that are processed into valuable, low-emission, green products of certified industrial quality (upcycling). A good selling price is certain with these "recyclables".

THE BETTER GREEN

Hauptstr. 41, 42799 Leichlingen
Phone: +49 176 11395067
Internet: www.the-better-green.com
Number of employees: 6

Ucaneo Biotech GmbH

At Ucaneo we develop the world's first cell-free Direct Air Capture technology leveraging a biocatalytic membrane to remove CO_2 from the air. Climate change is a global problem and needs to be tackled at scale. Therefore, we set the goal to capture 0.5 GT of CO_2 from the air by 2035 – roughly the same weight as all humans on earth combined!

UCANEO

Torstraße 110, 10119 Berlin
Phone: +49 178 6997536
Internet: www.ucaneo.com
Founding year: 2022
Number of employees: 6

*Collaboration currently resting

Ulrich Windmöller Innovation GmbH & Co. KG

UWI is a young, high-innovative company for research and development of new technologies and processes in the field of chemical and biocatalytic modification of vegetable oils. These oils which are used as bio-based raw materials in the production of polyurethanes (PU) can replace a large amount of the crude oil-based polyols.

The startup, founded by Ulrich Windmöller in 2018, is working on this project in the new, well equipped laboratory with motivated employees at Detmold with the aim of supplying the polyurethane industry with tailor-made polyols based on local vegetable oils. These polyols can be the basis for a variety of PU-products.

Charles-Lindbergh-Ring 1, 32756 Detmold

Phone: +49 5231 6022570
Internet: www.uw-innovation.de
Founding year: 2018
Number of employees: 6

Uniper Kraftwerke GmbH

Uniper is a leading international energy company, has around 11,500 employees, and operates in more than 40 countries. The company plans for its power generation business in Europe to be carbon-neutral by 2035. Uniper's roughly 33 GW of installed generation capacity make it one of the world's largest electricity producers.

The company's core activities include power generation in Europe, global energy trading and a broad gas portfolio, which makes Uniper one of Europe's leading gas companies. In addition, Uniper is a reliable partner for communities, municipal utilities, and industrial enterprises for planning and implementing innovative, lower-carbon solutions on their decarbonization journey. Uniper is a hydrogen pioneer, is active worldwide along the entire hydrogen value chain, and is conducting projects to make hydrogen a mainstay of the energy supply.

Holzstr. 6, 40221 Düsseldorf

Phone: +49 211 7327 0
Internet: www.uniper.energy
Founding year: 2016
Number of employees: 11,500

Verband der Chemischen Industrie e. V. – NRW

The "Verband der Chemischen Industrie e. V. NRW" (the Chemical Industry Association in North Rhine-Westphalia) represents the politico-economic interests of more than 500 NRW chemical companies and NRW subsidiaries of foreign enterprises in contacts with politicians, public authorities, other industries, the world of science, and the media.

VCI NRW represents about 30 % of the entire German chemical industry, an industry that realised sales of € 50 billion in 2018 and employed some 110,000 staff. A main focus of the last years was the interlinking of industry and science especially in the area of biotechnology. The association's policies are shaped by a presidential council which works in an honorary capacity and the VCI NRW executive management.

Völklinger Str. 4, 40219 Düsseldorf

Phone: +49 211 67931 43
Internet: www.nrw.vci.de
Founding year: 1945
Number of employees: 6

Flemish Institute for Technological Research, VITO

Within the "Sustainable Chemistry" research theme, VITO focuses on new value chains from renewable and circular resources - like CO_2 and biomass - and on process transformation. Key is the integration of conversion with separation processes to improve overall efficiency and sustainability. In this domain VITO has unique expertise and equipment in membrane-assisted intensification of enzymatic and fermentation processes, complemented with membrane development.

VITO develops efficient Carbon Capture and Utilization technologies and has acquired a high pressure fermentor with extensive online process monitoring and control and high operational flexibility. It constitutes a unique high-tech research platform for fundamental and applied gas fermentation studies to the benefit of researchers and companies. In addition to direct C1 gas bioconversions, VITO also investigates hybrid approaches, combining for instance electrochemical reduction of CO_2 into methanol with methanol fermentation.

Boeretang 200, 2400 Mol
Belgium

Internet: www.vito.be
Founding year: 1990
Number of employees: 947

Wageningen University and Research

To explore the potential of nature to improve the quality of life.

Wageningen University and Research is a joint venture between the Wageningen University, which focuses on education and fundamental research, and Wageningen Research which conducts applied research directly for industry. In CLIB, the WUR is represented by five academic chair groups: Bioprocess Engineering, Microbiology, Systems and Synthetic Biology, Environmental Technology and Biobased Commodity Chemistry, and by the applied research centre Food & Biobased Research (WFBR).

The groups study microbial processes intra-cellular, cellular, inter-cellular, reactor, and environmental scale with a strong link to the chemical industry. The generated knowledge at the University is translated into application, by WFBR, for production and biorefinery of pharmaceuticals, healthy food ingredients, bulk chemicals, and biofuels.

Droevendaalsesteeg 4, 6708 PB Wageningen
the Netherlands
Phone: +31 317 480100
Internet: www.wageningenur.nl
Number of employees: 8,254

Wesselmann Energie & Filtration GmbH

The company Wesselmann Energie & Filtration GmbH is engaged in the development and production of energy-related systems and filtration. Our main focus is on heat recovery systems and filtration systems for the food industry and agricultural sector. After successful development, we offer a novel ultra- or nanofiltration with an oscillating vibration drive for difficult-to-filter media.

The main topics we specialize in are biotechnology, food technology, and recycling. Our customers come from the food industry, agriculture, and general industry. We provide an economically and ecologically interesting technology to extract substrates from previously unused biomass or reduce waste streams.

Zür Mühle 2, 49688 Lastrup

Internet: wesselmann-eng.de
Founding year: 2020
Number of employees: 8

YNCORIS GmbH & Co. KG

YNCORIS places particular emphasis on the engineering of individual plants - from process development and conceptual design to basic and detailed engineering, regardless of whether we just carry out sub-services or take over the general planning for every stage. YNCORIS does not supply one-size-fits-all solutions. Instead, we adopt a flexible approach and gear ourselves towards the specific requirements of the current project stage - step-by-step. Thanks to a broad range of diverse engineering fields and an extensive selection of methods, we can guarantee the highest degree of flexibility with regard to content.

The Chemiepark Knapsack near Cologne in Germany also offers companies a scale-up platform and access to know-how for bio-based production and integration into existing value chains. The innovative capacity of the Chemiepark Knapsack, solid infrastructure, plug&play services, as well as less bureaucracy and red tape all offer huge benefits for your company to commercialize your product.

Industriestr. 300, 50354 Huerth (Cologne)

Phone: +49 2233 48 6343
Internet: www.yncoris.com
Founding year: 1997
Number of employees: 1,160

Zentis GmbH & Co. KG

For over 125 years, Zentis has been an indispensable source of inspiration for natural and enjoyable nutrition. Unparalleled expertise in refining natural raw materials such as fruits, vegetables and grains, outstanding innovative strength and a consistent quality policy have made Zentis one of Europe's leading fruit processors and an indispensable partner for the processing industry and retailers. Zentis preparations refine dairy products, milk alternatives and baked goods. Zentis also produces fruity spreads and marzipan specialties.

Founded in 1893 in Aachen, the family-owned company is internationally positioned and has approximately 2,000 employees worldwide (1,100 in Aachen). In addition to 2 production sites in Germany, Zentis has plants in Poland, Hungary and the United States.

Jülicher Str. 177, 52070 Aachen

Phone: +49 241 4760 0
Internet: www.zentis.de
Founding year: 1893
Number of employees: 1,100

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