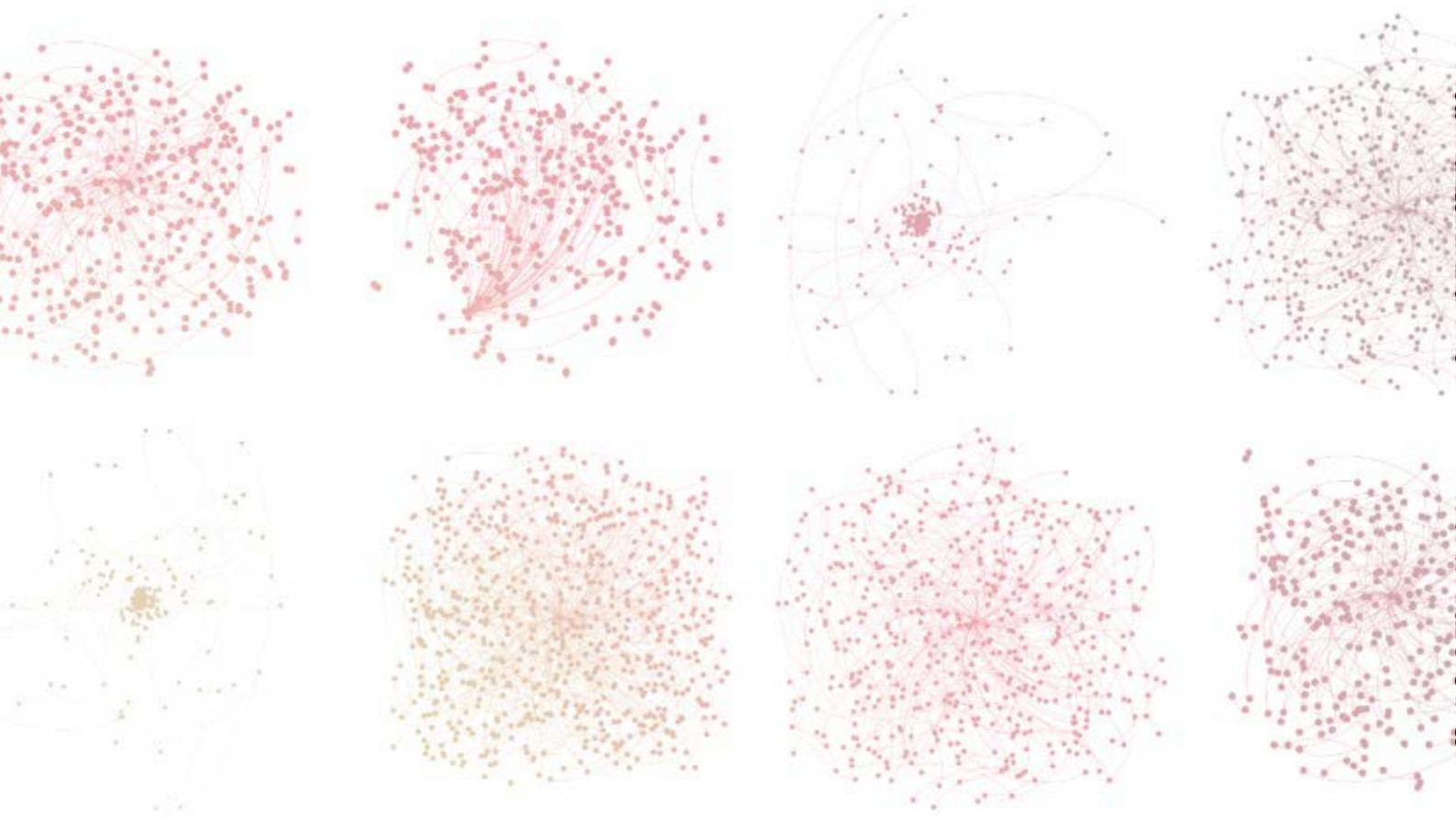


Living Networks

Company management,
The company and Corporate Stories
(from the Annual Report 2017/18)



B·R·A·I·N

BRAIN Group financial highlights

in € million

2017/18

2016/17

2015/16

Consolidated income statement data:

Revenue	27.1	24.1	22.8
Total operating performance	30.5	26.9	26.1
EBITDA	-6.7	-7.7	-12.4
Adjusted EBITDA	-5.4	-4.7	-6.1
Net loss for the reporting period	-8.3	-9.7	-14.9

Consolidated balance sheet data:

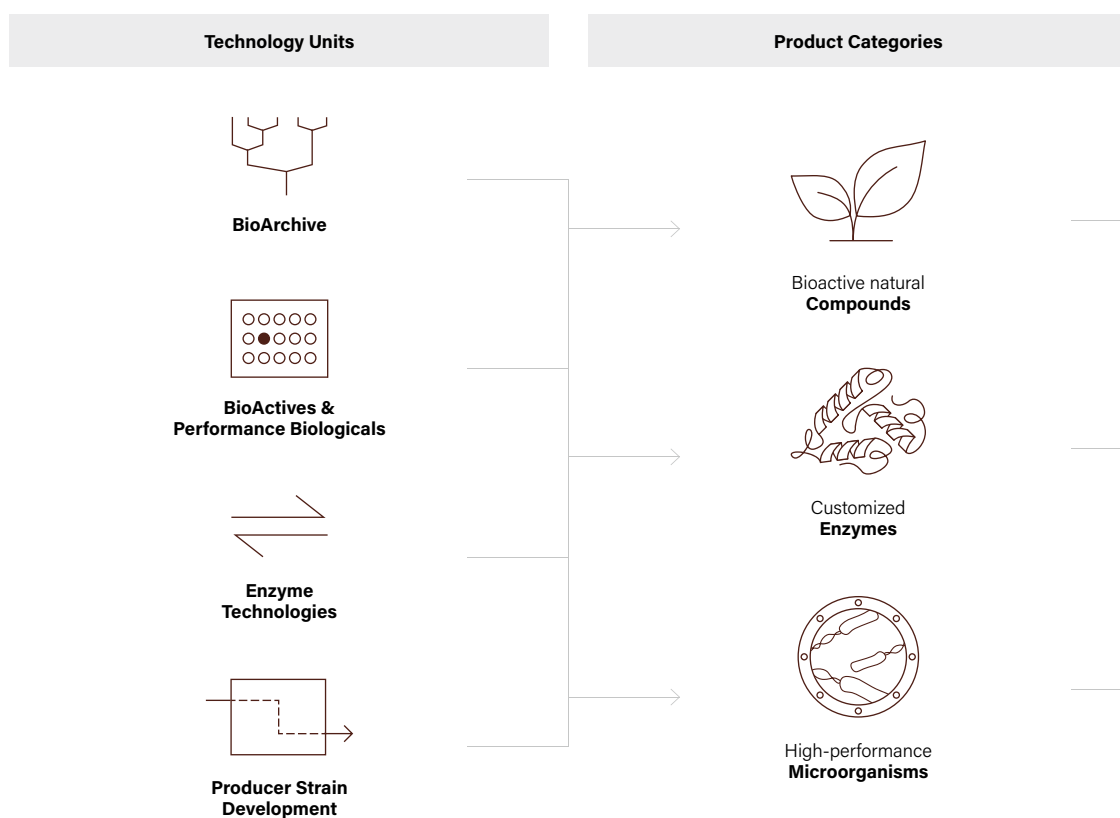
Total equity	30.6	47.4	26.9
Equity ratio (in %)	41 %	69 %	57 %
Total assets	74.5	68.5	47.5

Consolidated cash flow data:

Cash flows from operating activities	-5.4	-5.8	- 8.7
Cash flows from investing activities	-12.6	8.8	-11.2
Cash flows from financing activities	4.7	27.7	25.0

→ Consolidated financial statements

BRAIN BUSINESS MODEL



Mission Statement

BRAIN is a pacesetter in the bioeconomy and a high-tech pioneer in white industrial biotechnology with a focus on bioactive natural compounds, customized enzymes and high-performance microorganisms. Based on natural species diversity and its proprietary BioArchive, the BRAIN Group develops and markets innovations for Nutrition & Health, Skin Care and Industrial BioSolutions through product sales and development cooperations with industrial partners.

THE BRAIN GROUP

B·R·A·I·N

AnalytiCon
discovery

BIOCATALYSTS

WeissBioTech

MONTEIL
PARIS

L.A. SCHMITT

B·R·A·I·N LLC

SolasCure

→ BRAIN Group,
page 52

Business Options



Marketing of
Products



Development of tailor-made
Solutions

Business Units




Nutrition & Health



Skin Care



Industrial BioSolutions



“Underpinned by the certainty that BRAIN’s continued growth can be achieved primarily through product scalable businesses, from the beginning of 2018 we implemented measures to strengthen this segment.”

Dr. Jürgen Eck – member of the founding team and CEO of BRAIN AG









Julian Charrière On The Sidewalk, Installation view: Jeune Art Suisse, Le Commun – Batiment d'art Contemporain, Geneva, Switzerland, 2013

ART AS THE GEO-ARCHEOLOGY OF THE FUTURE

While Julian Charrière's work unites art with various sciences, the issues he addresses transcend rigid scientific and artistic categories. From object sculptures, performance and photography to other genres, his approach and the statements his oeuvre makes incorporate aspects of geology, archeology, cultural history and biology. He derives his artistic statements from the simulation of scientific actions.

His works are often based on fieldwork and the search for materials in remote places. Like a researcher in Humboldt's days, he travels the world in search of impressions, insights and materials that he can transform into a work of art. He climbs icebergs, digs deep into the soil of Ethiopia or collects rock samples. What interests Charrière during this process is the relationship between modern civilization and the ancient world of geology. The first is in many ways dependent on the second. This is an interplay that the artist broaches in many of his works. Often, he takes the perspective of a latter-day observer, thus drafting a "geo-archeology of the future".

The works pictured here from the Metamorphism series show a blend of cultural recollections with a geological shell. At first glance, the rocks presented in showcases appear to be meteorites. In reality, though, they are parts of old computers and smartphones (hard disks, etc.), which the artist has melted with magma in Thyssen-Krupp's blast furnaces to produce petrified data. In this way, he takes present-day information technology back to its geological origin. The objects also reflect the extraction and use of mineral resources and the future of our civilization's technological products.

When working on his On the Sidewalk series, he collected core samples from various places, depths and periods, including cores from geological explorations, architectural buildings, modern roads and old Berlin cobblestones. The artist cut these core samples into four parts, reassembled them individually in each sculpture and fastened them with stainless steel clamps. By recomposing the cores, and the stories they contain, the artist mixes and compresses time and space. Each sculpture acts as an avatar of a vertical geological timeline and emphasizes the idea of history as a human construct.

Julian Charrière comes from Switzerland and currently lives in Berlin. In 2013, he completed a course of study at Ólafur Elíasson's Institute for Spatial Experiments in cooperation with Berlin College of Fine Arts. His works have been represented at numerous international exhibitions, including the main exhibition of the Venice Biennale in 2017.



www.julian-charriere.net

The works shown here were not created on behalf of BRAIN.

© copyright: page 3: Julian Charrière, VG Bild-Kunst, Bonn, Courtesy DITTRICH-SCHLECHTRIEM, Berlin, photo credit: Hans-Georg Gaul
pages 4–5: Julian Charrière, VG Bild-Kunst, Bonn

page 6: Julian Charrière, VG Bild-Kunst, Bonn, Courtesy DITTRICH-SCHLECHTRIEM, Berlin

Solutions inspired by nature

—— A creative spirit and scientific curiosity are an integral part of artistic processes and are essential when it comes to translating biological systems into industrial applications.



Computer-generated
figure of microdiversity in
a biological habitat

—— BRAIN sees its corporate action as part of creative societal processes. The company creates links with art and culture in order to strengthen its own creative potential and beyond this, to present its own goals and visions. The works of Julian Charrière show that art may create close links with the natural sciences.

BRAIN applies the term “bioprospecting” to its field research and quest for materials in remote places.

—— In its everyday research activities, BRAIN constantly recombines the growing and often piecemeal knowledge currently available about new or largely unknown biological relationships and systems. The living network of animate nature gives rise to scientific insights that serve as a basis for inventing new industrial applications. Human creative spirit and scientific curiosity thus become an active part of the **living networks** found in nature and find ways to shape and transform them.



The living network of animate nature gives rise to scientific insights that serve as a basis for inventing new industrial applications.

80 %

of all elements in the periodic table are metals, whereas a handful of soil contains millions of different microorganisms. BRAIN translates the biological relationships into disruptive technologies for urban & green mining.

≈ 2000

different bacteria were collected by BRAIN during bioprospecting in decommissioned mines. The best candidates from among these were selected for the bio-based extraction of metals from waste streams in the BRAIN BioXtractor demonstration plant.



Finely ground gold ore for biological processing with Green Mining technologies.

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01 Company management

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Dr. Jürgen Eck — Chief Executive Officer

Dear shareholders,

As we prepare our 2017/18 Annual Report, we are experiencing a turbulent start to our new 2018/19 financial year, characterized by significant uncertainty in stock markets. Geopolitical tensions and regional economic issues overshadow a global economic situation. Technology stocks, in particular, have come under pressure. Here it is the case that the smaller the trading volume, the greater the resultant price volatility. The BRAIN share has suffered accordingly. At the end of the 2016/17 financial year, its price amounted to € 19.70, before it climbed to above € 27. As of the end of the 2017/18 financial year, the price stood at € 17.70. Further share price reductions were incurred subsequently and equity markets remained volatile.

This leads to the question of how best to manage BRAIN in such troubled times – a company that is a pioneer in the bioeconomy and is investing in the transition from oil-based processes to bio-based industrial production. A look at the past financial year provides some initial answers.

We are convinced that the bioeconomy is gathering further momentum and we are clearly sensing the confidence that the 21st century will enjoy a more sustainable economy. Nonetheless, we have no wish to obscure the fact that last year we fell short of our own target of participating economically in this megatrend. Especially at the start of our financial year, we have had to recognize that the process of transforming BRAIN into a fully integrated bioeconomy company does not always unfold as rapidly as we might wish. For example, new and follow-up partnerships have been delayed repeatedly in the area of our research cooperations with industrial partners.

“Our exceptional research-driven innovative strength continues to form the core of BRAIN’s success. We continue to see ourselves as well positioned with our current development pipeline and resultant product ideas.”

At a very early stage, we took this as an opportunity to hone our strategy. Driven by the certainty that BRAIN’s continued growth is to be attained chiefly through product-scalable business, we implemented measures from the start of 2018 to

accelerate the strengthening of this segment. Forward-looking steps include focusing on our M&A strategy in order to improve our access to various markets. We succeeded in taking such a step in March 2018 with the acquisition of Biocatalysts Ltd, a leading speciality enzymes company. Greater internationalization and the expansion of global marketing opportunities are also of great significance for BRAIN. The forming of the BRAIN LLC subsidiary, based in Rockville, USA, reflects this objective. Thanks to this newly established presence, our business development in North America and our proximity to customers there has improved since March 2018. Furthermore, the product-specific spin-off of a well-advanced BRAIN development program was completed successfully for the first time. In August 2018, SolasCure Ltd, the first such spin-off from BRAIN, was formed. The company develops and markets innovative medical products for the biological treatment of chronic wounds. These products are based on the innovative wound cleansing enzyme Aurase®, a treatment that BRAIN has developed.

Despite all the challenges, we can look back on a year that the BRAIN team handled well and during which we honed our strategy for the Group’s long-term and sustained growth. On our path to becoming a fully integrated bioeconomy company, we achieved our targeted double-digit sales revenue growth, which was driven mainly by expansion in our strategically important BioIndustrial product segment with the successful integration of Biocatalysts Ltd. into the BRAIN Group.

For some years, we have been realizing significant investments in our research and development activities in order to expand our development pipeline and our strategic networks, which we present to you in greater detail in this 2017/18 Annual Report. The establishment of the three business units of Nutrition & Health, Skin Care and Industrial BioSolutions represents one result from our review of our strategy and development pipeline. This step supports us in our focus on R&D work on our most promising application areas within industrial biotechnology. In order to strengthen our market and product orientation, we also ensured in the 2017/18 financial year that a new role on the Management Board of Chief Business Officer (CBO) was created (see page 26).

Our exceptional research-driven innovative strength still forms the core of BRAIN’s success. We continue to see ourselves as well positioned with our current development pipeline and resultant product ideas. In all three product categories – bioactive natural compounds, customized enzymes and high-performance microorganisms – projects are more advanced, with some on the threshold of market launch.

One member active in a smaller market segment of our DOLCE program for natural sugar substitutes and sweetness enhancers has stepped down for reasons relating to its in-house corporate strategy. However, the DOLCE core team consisting of BRAIN AG, the subsidiary

AnalytiCon Discovery GmbH, and Roquette of France anticipates new partnerships for market segments that have not yet been awarded, underpinned by the achievement of a significant milestone at the start of 2018. Our unique screening technologies based on human taste cell lines are deployed in this program. We have also made progress in our Urban & Green Mining programs for the biological extraction of precious metals from waste flows and ores utilizing microorganisms. Based on successfully scaling up to the metric tonne level for precious metal extraction from ores, we announced our partnership with Evonik subsidiary CyPlus GmbH in June 2018. Our continuing development work on the biotechnological conversion of the greenhouse gas CO₂ in preliminary stages of bioplastics also demonstrates our special expertise for disruptive closed-loop circular economy systems.

Recent development projects that are closely market-aligned include the FRESCO program for bioactive natural products with antimicrobial properties for various industry segments. In December 2018 we were able to launch this program with a first partner active in the global beverage industry. New members of the offering include the TRiP²Sensation and TRiP²Taste programs. Their aim is to deploy new cell-based assays to investigate skin reactions and taste perceptions in contact with natural substances. This has high relevance for the manufacturing of healthier foods as well as improved cosmetic and skincare products. We present these and other programs that we expect will generate future business and growth for the BRAIN Group in the section entitled BRAIN Innovations (see page 69).

Our goal is to present compelling cases for our products and solutions – which occasionally prove to be groundbreaking in their impact – to our business customers and partners as well as consumers. Our main focus in the 2018/19 financial year continues to be on the Group's growth, driven by both organic and inorganic growth. For the 2018/19 financial year, we expect a positive business trend with a double-digit increase in total operating performance.

This annual report provides insights into the dynamism and determination with which we are committed to a sustainable bioeconomy. On behalf of my Management Board colleagues, I would like to thank all BRAIN Group staff for their special commitment during the past financial year. The success of BRAIN – which in 2018 celebrated the twenty-fifth anniversary of its founding – is based on their innovative spirit and dedication. Our thanks are also due to our cooperation and business partners and, of course, to you, our shareholders, for your unwavering confidence in our work.



Dr. Jürgen Eck — Chief Executive Officer (CEO)

Dear shareholders,

In the 2017/18 financial year, BRAIN AG advanced its growth strategy, and reached milestones on its path to becoming a leading bioeconomy company.

Along with continuous operating business activities during the past financial year – which were not entirely satisfactory – successfully achieved milestones include, in particular, the acquisition of the majority interest in the UK company Biocatalysts Ltd. The founding of the US branch operations B.R.A.I.N. Biotechnology Research and Information Network LLC as well as the spin-off of a successful development program into SolasCure Ltd., UK, are also noteworthy in this context. The performance to date of BRAIN AG as well as its prospects continue to prompt interest among correspondingly oriented investors, which was evident not least in numerous meetings arranged at equity capital market conferences. The Supervisory Board continued to play a consultative role in these developments in the past financial year.

The following report provides information about the Supervisory Board's work in the 2017/18 financial year, in other words, from 1 October 2017 until 30 September 2018. During this period, we fulfilled all of the tasks and duties incumbent upon us pursuant to the law, the company's bylaws and the rules of business procedure for the Supervisory Board.

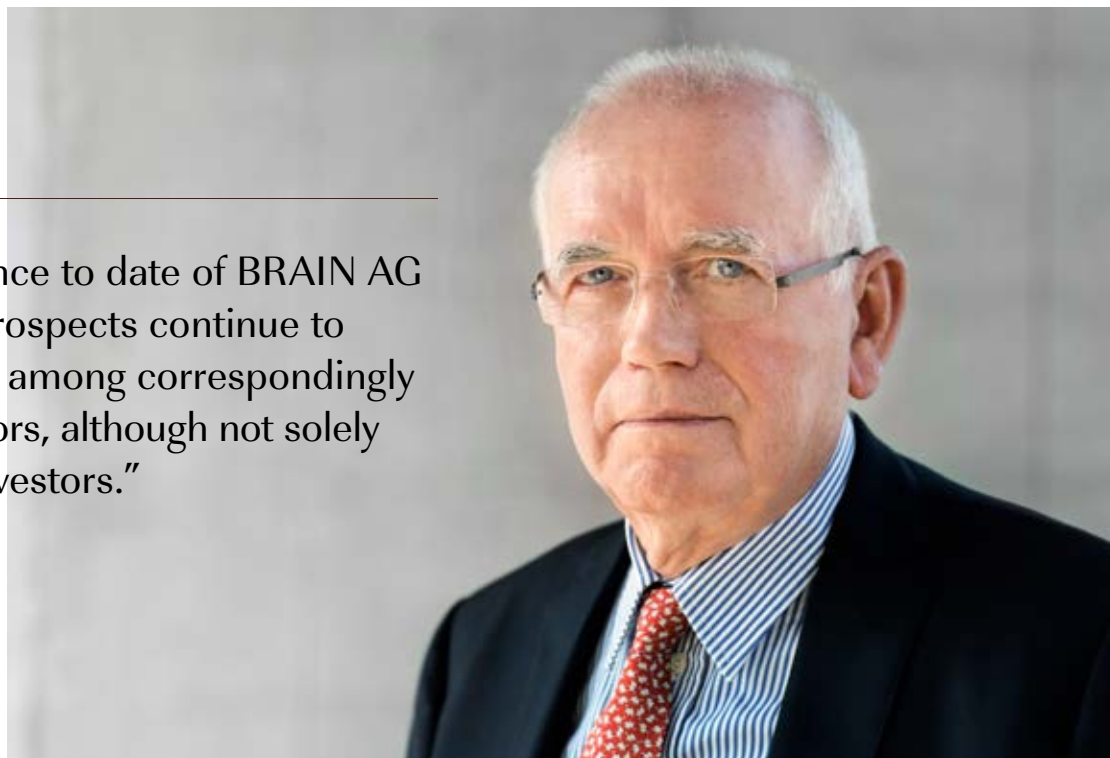
We continuously supervised the Management Board in its management of the business, and consulted on all matters of importance for the company.

In this context, the Supervisory Board was always convinced of the legality, propriety, appropriate nature and economic efficiency of the management of the company.

Collaboration between the Supervisory and Management boards

The Management Board informed the Supervisory Board regularly, promptly and comprehensively in the form of detailed written and verbal reports on all matters relating to strategy, planning, business development, the risk position, risk trends and compliance that are of importance for the company and the Group, and consequently fully met its reporting duties to the Supervisory Board in the relevant period. The Supervisory Board and its committees were involved in all important business transactions and decisions of fundamental significance for the company. Collaboration with the Management Board was characterized in all aspects by responsible and purposeful action.

“The performance to date of BRAIN AG as well as its prospects continue to arouse interest among correspondingly oriented investors, although not solely among such investors.”



Dr. Ludger Müller — Chairman of the Supervisory Board

Personnel matters

The following changes occurred to the composition of the Supervisory Board in the reporting period:

As of the end of the AGM on 8 March 2018, the period of office concluded of Supervisory Board member Prof. Dr. Klaus-Peter Koller, who had had himself be elected to the Supervisory Board in March 2017 for just one further year in light of the requirements of the German Corporate Governance Code (DCGK) concerning the duration of membership on supervisory boards.

On 8 March 2018, the AGM of BRAIN AG appointed Dr. Rainer Marquart to take over the Supervisory Board mandate that was to be reallocated.

No changes occurred to the Management Board during the period under review. In August 2018, however, it was announced that Chief Financial Officer (CFO) Mr. Frank Goebel would step down early from the Management Board, whereby it was agreed that Mr. Goebel would continue to be available on an unrestricted basis until the matter of his succession could be clarified. Consequently, in November 2018 it was announced that Mr. Manfred Bender would be appointed to the Management Board of BRAIN AG as of 1 December 2018, and would assume the role of

Chief Financial Officer (CFO) as of 1 January 2019, while Frank Goebel will leave the company as of the end of the 2018 year. Furthermore, with effect as of 1 January 2019, Mr. Ludger Roedder was appointed as Chief Business Officer (CBO) to the Management Board of BRAIN AG, which consist of three members from January 2019 onwards.

Supervisory Board meetings

In the 2017/18 financial year, a total of seven Supervisory Board meetings were held on a face-to-face basis, seven face-to-face meetings of the committees, as well as eleven telephone conferences of the Supervisory Board and its committees. The Supervisory Board members always had sufficient time in this context to critically engage with the information submitted by the Management Board, and to contribute its own views. As part of the meetings, the information was discussed in detail with the Management Board and examined as to its plausibility. The Supervisory Board issued its approval of specific business transactions as required by law, the company's bylaws, or the rules of business procedure for the Supervisory or Management boards.

The individualized list of meeting attendances presented below provides additional information about the meetings of the Supervisory Board and its committees.

TABLE 01.1
OVERVIEW OF SUPERVISORY BOARD MEETINGS IN THE 2017/18 FINANCIAL YEAR

Name	Meetings attended ¹	Remarks
Dr. Ludger Müller	12/12	
Dr. Martin B. Jäger	13/13	
Dr. Anna C. Eichhorn	10/10	
Dr. Georg Kellinghusen	11/11	
Prof. Dr. Klaus-Peter Koller (until 8 March 2018)	4/4	Unattended meetings excused
Christian Körfggen	3/7	Successor for Prof. Dr. Klaus-Peter Koller
Dr. Rainer Marquart (from 8 March 2018)	5/6	

Moreover, outside the scope of meetings, the Supervisory Board members, especially myself as Supervisory Board Chairman and Committee Chairman as well as the respective Chairs of the Audit Committee, M&A Committee and Innovation Committee, were in regular communication both with each other as well as with the Management Board. This particularly entailed consultations on questions relating to the company's strategy, planning, business development, the risk position, risk management, corporate governance and compliance. The Supervisory Board members were informed about important information at the latest as of the following plenary or committee meetings.

No conflicts of interest arose within the Supervisory Board in the reporting period.

Focus consultation areas in the plenary Supervisory Board

During the 2017/18 financial year, we in the plenary Supervisory Board concerned ourselves especially with the following topics:

- Annual financial statements for the 2016/17 financial year
- Corporate governance report and the corporate governance statement of conformity
- Reaching the corporate targets for the 2017/18 financial year relating to developing the BioIndustrial and BioScience operating segments
- Risk management and internal controlling systems
- Strategy development and adapting the strategy for the company
- Planning and implementation of the AGM on 8 March 2018
- Acquisition strategy of BRAIN AG
- Acquisition of a majority interest in Biocatalysts Ltd, UK
- Introduction of an employee stock ownership program (ESOP) for the members of the Management Board
- Founding of and investment in Solascore Ltd
- Current and future research projects
- Strategic alliances and planned partnerships
- Budget for the 2018/19 financial year and planning for the next five years
- Efficiency audit of the Supervisory Board

The Supervisory Board in all cases passed specific resolutions following intensive review and discussion.

The following topics and resolutions are additionally presented:

The Supervisory Board decided to form two further committees in order to enable the respective committee members to provide focused advice to the company's Management Board in the areas of mergers & acquisitions (M&A) as well as innovation strategy and innovation management.

On 15 January 2018, the Supervisory Board approved the financial statements documents for the 2016/17 financial year and concurred with the Management Board's proposal relating to the application of unappropriated profit, after having previously clarified and discussed in depth the financial statements at its face-to-face meetings.

The company's second public AGM was discussed in advance. In particular, election proposals

¹ including committee meetings; based on relevant meetings within the respective mandate period

for the vacant Supervisory Board seat were discussed, and the presentation of the successor candidate was prepared for the Annual General Meeting.

Following the AGM on 8 March 2018, the constituting meeting of the Supervisory Board with its newly elected member, Dr. Rainer Marquart, was held on the same day.

Finally, the recruitment of additional personnel for the Management Board of BRAIN AG formed part of the Supervisory Board's work.

Committees

The Supervisory Board has currently formed a total of five committees to perform its work efficiently: an Audit Committee, a Nomination Committee, a Personnel Committee, an M&A Committee and a Innovation Committee. Based on their respective rules of business procedure for the committees, these prepare resolutions for the Supervisory Board, as well as topics to be handled by the plenary board. The Supervisory Board's decision-making powers are also transferred to committees where legally permissible. In all cases, the committees' chairs report on the committees' work at the subsequent plenary meeting. The M&A Committee and the Innovation Committee were newly formed in the 2017/18 financial year in order to more effectively support the Supervisory Board in relation to acquisitions and in the area of planning and developing new products and applications.

Audit Committee

The Audit Committee concerns itself especially with supervising financial accounting, the financial accounting process, the efficacy of the internal control system, the risk management system, the internal audit system, the audit of the financial statements, as well as compliance. The Audit Committee submits a substantiated recommendation for the election of the auditor to the Supervisory Board, which comprises of at least two candidates if the audit mandate is to be put out to tender. The Audit Committee supervises the auditor's independence and concerns

itself with services to be rendered additionally by the auditor, the award of the audit mandate to the auditor, the setting of focus audit areas, as well as arranging the auditor's fee.

Pursuant to the German Stock Corporation Act (Sections 107 (4), 100 (5) AktG), the audit committee must include at least one supervisory board member with expertise in the financial accounting or financial auditing areas. The Audit Committee Chairman, Dr. Georg Kellinghusen, meets the statutory conditions pursuant to the German Stock Corporation Act (Sections 107 (4), 100 (5) AktG) and also possesses specialist knowledge and experience as a CFO over a more than thirty-year period, including at four listed companies. His activities focus on controlling, financial matters and financial accounting, among other areas. Moreover, he commands broad knowledge in compliance topics as well as in the investor relations area. Besides the committee chair, the Audit Committee also includes Supervisory Board members Dr. Martin B. Jager and Dr. Ludger Müller.

Furthermore, the Audit Committee has granted its approval that Ernst & Young GmbH as well as management consultancy firms within the group association of Ernst & Young GmbH should render further services besides audit services for the company, having assured itself in this context of the continued independence of Ernst & Young GmbH for the audit mandate.

The Audit Committee held a total of four face-to-face meetings during the 2017/18 financial year.

Nomination Committee

The Nomination Committee held one face-to-face meeting in the 2017/18 financial year, especially to select an appropriate candidate for the Supervisory Board's election proposal to the AGM on 8 March 2018, as well as one telephone conference. Besides the committee chair Dr. Ludger Müller, the committee comprised of Supervisory Board members Dr. Anna C. Eichhorn and, until he stepped down from the Supervisory Board on 8 March 2018, Prof. Dr. Klaus-Peter Koller. With two members, the Nomination Committee continues to be formed in accordance with the rules of business procedure.

Personnel Committee

The Personnel Committee prepares personnel decisions for the Supervisory Board, especially the selection, appointment and recall from office of Management Board members, the conclusion and amendment of service contracts and pension arrangements, the compensation scheme including its implementation as part of the service contracts, target setting for variable compensation, setting and reviewing appropriate total compensation for each Management Board member, and approving the annual compensation report. In addition, the Personnel Committee passes resolutions concerning the representation of the company vis-à-vis Management Board members pursuant to Section 112 AktG, the approval of Management Board members' other business activities pursuant to Section 88 AktG (prohibition of competition), and other ancillary activities, especially assuming supervisory board posts or positions on comparable controlling bodies outside the BRAIN Group. Dr. Ludger Müller is the Chairman of the Personnel Committee. Besides the committee chair Dr. Ludger Müller, the committee includes Supervisory Board members Dr. Martin B. Jager and Mr. Christian Körfgen.

The Personnel Committee held a total of three telephone conferences during the 2017/18 financial year. The Personnel Committee concerned itself with the appointment of a third Management Board member, in addition to the Chief Executive Officer (CEO), Dr. Jürgen Eck, and the Chief Financial Officer (CFO), Mr. Frank Goebel, and prepared for the appointment of a Chief Business Officer (CBO) for the 2018/19 financial year. Mr. Ludger Roedder was been appointed as a member of the Management Board in the role of CBO with effect as of 1 January 2019. Furthermore, the Personnel Committee concerned itself with the new appointment to the CFO role, and the departure of Mr. Goebel. Mr. Manfred Bender was appointed as a member of the Management Board of BRAIN AG with effect as of 1 December 2018, including to the role of CFO as of 1 January 2019.

M&A Committee

The M&A Committee, which held its constituting meeting on 13 December 2017, advises the Management Board on all relevant strategic questions relating to the initiation and implementation of M&A transactions, especially in reviewing the strategic conformity of planned M&A measures, the implementation of acquisitions or disposals of companies or parts of companies, the valuation of target companies or transactions, the structuring and financing of transactions, the transaction-specific selection of suitable advisors, and the planning and implementation of integration scenarios. The M&A Committee prepares the decisions of the Supervisory Board in relation to the initiation and execution of M&A transactions, and prepares recommendations for Supervisory Board resolutions.

The M&A Committee concerned itself in depth with the acquisition of the majority interest in Biocatalysts Ltd, UK, in the 2017/18 financial year, advised the Management Board on the course of negotiations, and discussed with the Management Board further steps relating to the acquisition strategy. Furthermore, the M&A Committee assessed a further potential acquisition, albeit without the transaction being finally agreed. The M&A Committee held four telephone conferences. Besides the committee chair Dr. Martin B. Jager, the committee includes the Supervisory Board members Dr. Ludger Müller, Dr. Georg Kellinghusen and, since 29 March 2018, Dr. Rainer Marquart.

Innovation Committee

The Innovation Committee held its constituting meeting on 13 December 2017, since when it has advised the Management Board on all matters concerning the company's innovation strategy and innovation management, especially in relation to the planning and development of new products and applications, the allocation of individual projects to business segments or subsidiaries, and the initiation and implementation of research and development partnerships. The Innovation Committee prepares the decisions of the Supervisory Board in relation to

innovation strategy and innovation management, and prepares recommendations for Supervisory Board resolutions. The Innovation Committee held two meetings. Besides committee chair Dr. Anna C. Eichhorn, the committee includes Supervisory Board members Dr. Martin B. Jäger and, after Prof. Koller had stepped down from the Supervisory Board, Dr. Rainer Marquart.

Corporate governance and the statement of conformity

At its meeting, the Supervisory Board consulted on several occasions concerning the company's corporate governance, including requirements deriving from the German Corporate Governance Code (DCGK).

The rules of business procedure for the M&A Committee and Innovation Committee were approved on 27 February 2018 and 29 May 2018 respectively.

The Supervisory Board approved the current statement of conformity in December 2018, after the end of the 2017/18 financial year. The Code's recommendations were, and are, complied with, apart from the exceptions explained in the statement of conformity. The full wording of the statement of conformity as well as the Corporate Governance Report prepared by the Management and Supervisory boards of BRAIN AG, and the corporate governance statement, are published on the company's website at www.brain-biotech.de/investor-relations/corporate-governance/.

Regarding the provisions of Section 111 (5) of the German Stock Corporation Act (AktG), the Supervisory Board has set itself the target of taking women into appropriate account in its future composition. At its meeting on 28 September 2017, the Supervisory Board of BRAIN AG reconfirmed its objective that the Supervisory Board should include one woman, corresponding to a 17% ratio. This corresponds to the status quo, as one woman, Dr. Anna C. Eichhorn, is a member of the Supervisory Board. The target included a deadline of 30 June 2022. Also on 28 September 2017, the Supervisory Board passed a resolution to leave unchanged the target ratio for

women on the Management Board of BRAIN AG of 0% until 30 June 2022.

Audit of the separate and consolidated annual financial statements

Auditor

The Annual General Meeting on 8 March 2018 determined that Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft (EY), Stuttgart, should be the auditor for the financial year ending 30 September 2018. This appointment also includes appointing the auditor for the consolidated financial statements for the financial year ending 30 September 2018. Helge-Thomas Grathwol, Diplom-Kaufmann, Wirtschaftsprüfer, Certified Public Accountant (CPA), signs as auditor responsible for the audit, since the financial year 2016/17, and Michael Hällmeyer, Diplom-Kaufmann, Wirtschaftsprüfer, as auditor, as well since the financial year 2016/17. EY audited the separate annual financial statements for the financial year from 1 October 2017 to 30 September 2018, prepared according to the financial accounting regulations of the German Commercial Code (HGB), as well as the management report for BRAIN AG. The auditor EY awarded an unqualified audit certificate. Pursuant to Section 315e of the German Commercial Code (HGB), the consolidated financial statements of BRAIN AG for the financial year from 1 October 2017 to 30 September 2018 and the Group management report were prepared on the basis of International Financial Reporting Standards (IFRS), as applicable in the European Union. Both the consolidated financial statements and the Group management report were also awarded an unqualified audit certificate. Moreover, the auditor found that the Management Board has set up an appropriate information and supervision system that is suitable in its design and utilization to identify developments at an early juncture that jeopardize the company as a going concern.

Review by the Supervisory Board

The documents for the financial statements and the audit reports were discussed extensively at the Audit Committee meeting on 12 December 2018 and at the Supervisory Board meeting on 13 December 2018. The auditor EY reported on the main results of its audit. It also provided information about its findings on internal control and risk management in relation to the financial accounting process, and was available to respond to additional queries and to provide further information. The review of the separate and consolidated financial statements by the Audit Committee was reported upon in detail by its chair at the plenary meeting. Following in-depth review and discussion of the separate financial statements, the consolidated financial statements and the management report, the Supervisory Board raised no objections against the submitted documents. The Supervisory Board consequently concurred with the Audit Committee's recommendation and approved the result of the audit by the auditor. By way of resolution on 13 December 2018, the Supervisory Board then approved the separate and consolidated annual financial statements of BRAIN AG for the 2017/18 financial year. The separate annual financial statements of BRAIN AG have been adopted as a consequence.

Report on the review of the dependent companies report pursuant to Section 314 of the German Stock Corporation Act (AktG)

Moreover, the Supervisory Board reviewed the report prepared by the Management Board on relationships with affiliates pursuant to Section 312 (1) of the German Stock Corporation Act (AktG) for the period of dependency between 1 October 2017 and 30 September 2018 ("dependent companies report") and discussed it extensively with the Management Board as well as with the auditor that additionally audits the dependent companies report.

The auditor reported in detail on the main points of its audit. In this context, the Supervisory Board concerned itself in depth with the report on the audit of the dependent companies report by the auditor. The discussion led to no grounds for reservations.

The auditor issued the following audit opinion relating to the dependent companies report:

"In accordance with the audit and appraisal incumbent upon us, we confirm that

1. the actual disclosures presented in the report are correct,
2. for the legal transactions listed in the report the consideration rendered by the company was not inappropriately high."

Following the conclusive result of the extensive review of the dependent companies report by the Supervisory Board, the Supervisory Board states that no reservations are to be expressed (Section 314 (3) AktG) against the Management Board statement that follows the report concerning relationships with affiliates (concluding statement pursuant to Section 312 (3) Clause 1 AktG).

Thank you from the Supervisory Board

The Supervisory Board would like to thank the members of the Management Board as well as all employees of the BRAIN Group for their commitment and outstanding personal contribution during the 2017/18 financial year. We look forward to continuing the past years' growth and success story with them.

Zwingenberg, 13 December 2018



BRAIN AG, The Supervisory Board

Dr. Ludger Müller — Supervisory Board Chairman

Members of the Supervisory Board and Supervisory Board committees

	Further board mandates in 2017/18
<p>Dr. Ludger Müller Chairman</p> <p>Member since 17 March 2011. Appointed until the AGM 2018/19.</p>	<ul style="list-style-type: none"> Managing Director of KEIPER Brasilien Beteiligungs-GmbH and KEIPER Lateinamerika Beteiligungs-GmbH TU Kaiserslautern, University Council Chairman
<p>Dr. Martin B. Jager Deputy Chairman</p> <p>Member since 9 March 2017. Appointed until the AGM 2020/21.</p>	<ul style="list-style-type: none"> until June 2018, member of the Management Board of Herbstreith & Fox Gruppe, Neuenbürg since July 2018 Managing Director and shareholder of InnoVest Nutrition GmbH, Kaiserslautern EIT Food iVZW, Belgium, Supervisory Board member
<p>Dr. Anna C. Eichhorn Supervisory Board member</p> <p>Member since 9 March 2017. Appointed until the AGM 2020/21.</p>	<ul style="list-style-type: none"> CEO of humatrix AG, Pfungstadt Management Board member (Deputy Chairwoman) of the Initiative gesundheitswirtschaft-rhein-main e. V. Member of the Supervisory Board of the Frankfurter Innovationszentrums Biotechnologie (FIZ) Member of the Management Board of House of Pharma & Healthcare e. V.
<p>Dr. Georg Kellinghusen Supervisory Board member</p> <p>Member since 9 March 2017. Appointed until the AGM 2019/20.</p>	<ul style="list-style-type: none"> Member of the Bavaria Advisory Board of Deutsche Bank AG, Frankfurt am Main Member of the Advisory Board of NWB Verlag GmbH & Co. KG, Herne Member of the Advisory Board of Advyce GmbH, Munich
<p>Prof. Dr. Klaus-Peter Koller Supervisory Board member</p> <p>Member since 21 May 2001. Appointed until the AGM 2017/18. (stepped down as of the AGM on 8 March 2018)</p>	<ul style="list-style-type: none"> Member of the Advisory Council and Honorary Member of the German Association for General and Applied Microbiology (VAAM) Member of the Consultant Board for the Subsidy Program of the German Federal Ministry of Education and Research (BMBF) "Validating the Technological and Social Innovation Potential of Scientific Research" (VIP+) Member of the Joint Board of Trustees of the Max Planck Institute for Biophysical Chemistry/ Dynamics and Self-Organization, Göttingen
<p>Christian Körfgen Supervisory Board member</p> <p>Member since 1 January 2016. Appointed until the AGM 2018/19.</p>	<ul style="list-style-type: none"> Putsch GmbH & Co. KG, Advisory Board member, and member of the advisory boards of affiliates of Putsch GmbH & Co. KG
<p>Dr. Rainer Marquart Supervisory Board member</p> <p>Member since 8 March 2018. Appointed until the AGM 2021/22.</p>	<ul style="list-style-type: none"> Leverton GmbH, Berlin, Advisory Board Chairman FLYTXT B.V., Nieuwegein/Netherlands, member of the Board of Directors Onefootball GmbH, Berlin, member of the Advisory Board The Ark Pte. Ltd., Singapore, member of the Board of Directors

Audit Committee

Dr. Georg Kellinghusen, Chairman, independent

Dr. Ludger Müller, Member, not independent

Dr. Martin B. Jager, Member, independent

Nomination Committee

Dr. Ludger Müller, Chairman

Dr. Anna C. Eichhorn, Member

Prof. Dr. Klaus-Peter Koller, Member until 8 March 2018

Personnel Committee

Dr. Ludger Müller, Chairman

Dr. Martin B. Jager, Member

Christian Körfgen, Member

M&A Committee

Dr. Martin B. Jager, Chairman

Dr. Ludger Müller, Member

Dr. Georg Kellinghusen, Member

Dr. Rainer Marquart, Member since 29 May 2018

Innovation Committee

Dr. Anna C. Eichhorn, Chairwoman

Dr. Martin B. Jager, Member

Prof. Dr. Klaus-Peter Koller, Member until 8 March 2018

Dr. Rainer Marquart, Member since 29 May 2018

Senior Management

BRAIN has an experienced management team, some of whose members have worked for the company for more than 20 years.

Business Units



Dr. Martin Langer
Member of the Management Board,
authorised signatory
Head Business Unit Industrial BioSolutions
with the company since: March 1995



Dr. Michael Waidelich
Head Business Unit Skin Care
with the company since: January 2019



Dr. Wolfgang Ahle
New Business Development Enzymes
with the company since: September 2008



Dr. Patrick Lorenz
New Business Development Nutrition & Health
with the company since: January 2019



Dr. Bela Kelety
New Business Development Industrial BioSolutions
with the company since: October 2010

Management Board member Ludger Roedder (CBO) bears responsibility for the Nutrition & Health business unit.

Technology Units



Dr. Michael Krohn
Member of the Management Board,
authorised signatory
Head Technology Unit BioActives &
Performance Biologicals
with the company since: September 1997



Dr. Guido Meurer
Member of the Management Board,
authorised signatory
Head Technology Unit Producer Strain Development
with the company since: April 2000



Dr. Alexander Pelzer
Head Technology Unit Enzymes & Biocatalysts
with the company since: May 2014

Corporate Units



Dr.-Ing. Ute Dechert
Head Corporate Unit Organisation & Processes,
authorised signatory
with the company since: April 1996



Lukas Linnig
Head Corporate Unit Finance & Controlling,
authorised signatory
with the company since: April 2017

BRAIN Management Board interview



Dr. Jürgen Eck
Chief Executive Officer
(CEO)

Ludger Roedder
Chief Business Officer
(CBO)

Manfred Bender
Chief Financial Officer
(CFO)

“The establishment of the three business units Nutrition & Health, Skin Care and Industrial BioSolutions serves to focus on our product business.”

Dr. Jürgen Eck — Chief Executive Officer

Dr. Jürgen Eck (CEO) is a co-founder and since July 2015 Chief Executive Officer of BRAIN AG. Ludger Roedder assumed the newly established position of Chief Business Officer (CBO) as of 1 January 2019. Manfred Bender has been Chief Financial Officer (CFO) since 1 January 2019.

Mr. Eck, over the past year, BRAIN's management has set up three new business units. What are the reasons for this?

JÜRGEN ECK

The establishment of the three business units Nutrition & Health, Skin Care and Industrial BioSolutions represents a consistent further development of our growth strategy, and serves to focus on our product business and our most important markets. We have technology units that focus their R&D expertise on innovation for our three product categories of enzymes, natural products and microorganisms. With the product ideas generated by these units we are addressing three major market segments, and for each of these we have established an independent business unit.

What is the difference between this and the past?

JÜRGEN ECK

The technology units already existed previously. By establishing dedicated business units, we have significantly strengthened our position on the business side. The related background is that we are concentrating on our product-scalable business options – we aim to increase our own product sales by having the BRAIN Group realize direct B2B transactions. We're also focusing on product development together with industrial partners, with subsequent marketing through licensing agreements and other contractual models. We're continuing with our R&D cooperation partnerships to develop customer-

specific solutions for industrial partners, although our focus is on our product business. This is why strengthening the business side is important. The expansion of the Management Board to include a new Chief Business Officer (CBO) goes hand-in-hand with this.

Has BRAIN's market focus narrowed?

JÜRGEN ECK

With our product categories, we're still in a position to develop bio-based offerings for many different market segments – ranging from food and bioplastics through to mining. The creation of the three business units has enabled us to sharpen our market focus, and consequently also simplify BRAIN's external profile. For example, our Urban & Green Mining programs and the recycling of carbon dioxide are now aggregated within our Industrial BioSolutions business unit. And our active ingredients for cosmetics form part of our Skin Care unit.

Mr. Roedder, you have been BRAIN's CBO since 1 January 2019. What did your past work concentrate on, and what are you focusing on now at BRAIN?

LUDGER ROEDDER

My expertise and interests form a perfect fit with BRAIN's orientation, in terms of both what it does and its strategy. My most recent position was as Global Business Director at an industrial company with overall responsibility for business development in the food ingredients area, including its enzyme business. I can leverage this experience to specifically expand BRAIN's product-scalable business. In addition to my function as CBO, I've therefore also assumed management of the Nutrition & Health business unit. Additionally, in recent years I've worked mainly in the USA, which is helpful for the company's further internationalization.

“My expertise and interests form a perfect fit with BRAIN’s orientation – in terms of both what it does and its strategy.”

Ludger Roedder – Chief Business Officer

What are the core tasks of the BRAIN business units you manage?

LUDGER ROEDDER

The business units’ task is to analyze rapidly changing market demand and new technology trends, in order to make contact with potential customers and partners, and do business with them. I see myself as a team player and as a catalyst in this regard.

Mr. Bender, you have been BRAIN’s CFO since 1 January 2019. What do you like about this role?

MANFRED BENDER

BRAIN enjoys an excellent reputation, an attractive R&D pipeline and a strong innovation culture, and it operates in the exciting environment of the growing bioeconomy. I’m very attracted by the fact that as Chief Financial Officer I can help shape this development. Actively accompanying BRAIN on its path to becoming a fully integrated player in the bioeconomy forms a closely related challenge.

What is your focus at BRAIN and what is your related background experience?

MANFRED BENDER

My last position was as CEO of a successful TecDax company, where I was also responsible for finance, M&A and investor relations. At BRAIN, I’m also focusing on implementing the growth strategy. An important aspect here is our ongoing M&A activities to expand our global B2B market access. In addition, I’m responsible for management of the company’s investments in other companies and, together with my Management Board colleagues, for the controlling of the subsidiaries.

Are you satisfied with developments during the last business year?

JÜRGEN ECK

On our path to becoming an integrated bioeconomy company, we have achieved the double-digit sales growth we were aiming for. The Group’s growth was driven by our strategically important BioIndustrial product segment, including the successful acquisition of Biocatalysts Ltd. In view of the challenges we faced, particularly at the start of the year, these growth successes were made possible by rapid decisions and the early introduction of growth-based measures. As already mentioned, the integration of Biocatalysts’ specialty enzyme business forms an important pillar in this context. I would like to take this opportunity to thank Frank Goebel once again for his excellent work until his departure as CFO, and for having very successfully looked after our M&A strategy, among his other responsibilities.

My praise and thanks are of course also due to our entire team for having met ever-changing challenges. This spirit is reflected in our excellent research, and in all of our other corporate divisions – and it forms the most important pillar of our continued success.

“BRAIN enjoys an excellent reputation, an attractive R&D pipeline and a strong culture of innovation.”

Manfred Bender – Chief Financial Officer

Product Categories



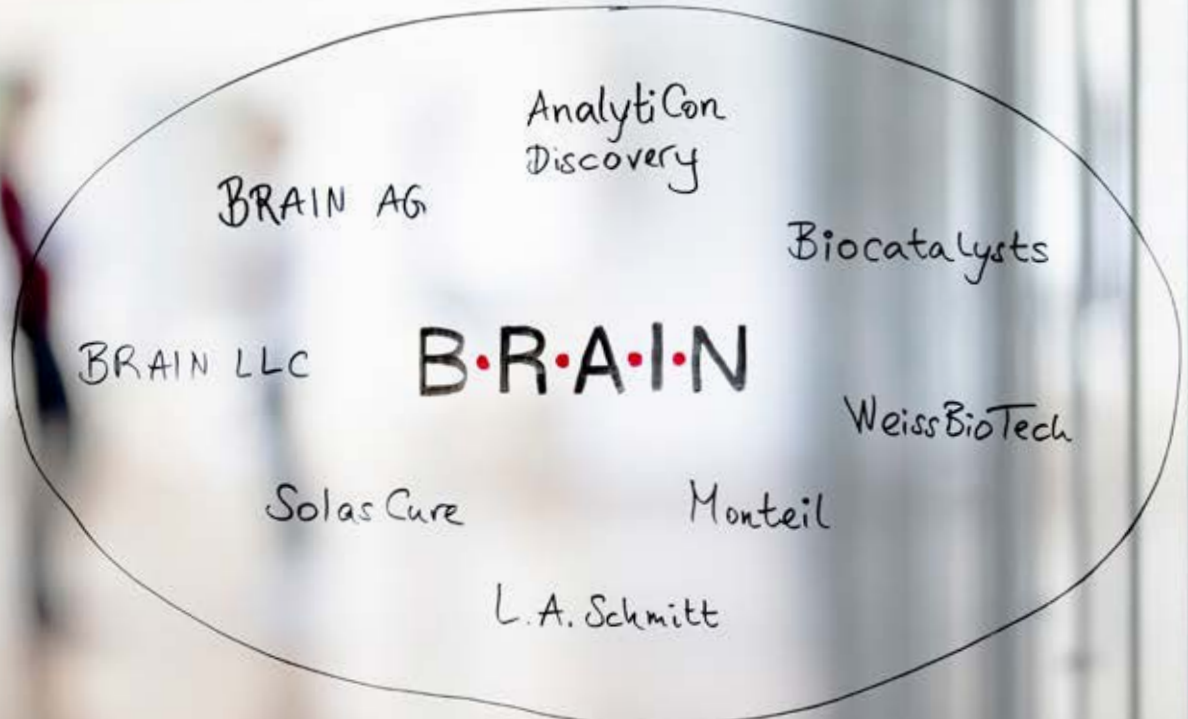
Bioactive natural
Compounds



Customized
Enzymes



High-performance
Microorganisms



Business Units



Nutrition & Health



Skin Care



Industrial
BioSolutions

BRAIN Group

Pioneers in industrial biotechnology



— Strengthening BRAIN by integrating other companies that have specific research skills and access to attractive markets is a key part of BRAIN's industrialization and growth strategy. This harnesses synergies for product business, pools skills, generates new ideas for possible innovations and expands access to specialties markets.

Activities in the fiscal year 2017/18:

- Establishment of BRAIN LLC, the company's US branch
- Acquisition of majority share in Biocatalysts Ltd., UK
- Spin-off of SolasCure Ltd. in UK

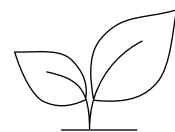
— Since 2009, six subsidiaries have been integrated into the parent company B.R.A.I.N. Biotechnology Research and Information Network AG (BRAIN AG for short) to expand the Nutrition & Health and Skin Care business units. There was another spin-off for future skincare product business. So far, BRAIN AG has exclusively handled the development programs of the Industrial BioSolutions business unit.

3

other companies have strengthened BRAIN's international product business since the fiscal year 2017/18.



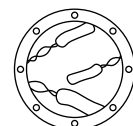
All companies in the BRAIN Group act as independent entities in the fields of research and development, process development and production, or as suppliers in specialty markets.



Bioactive natural
Compounds



Customized
Enzymes

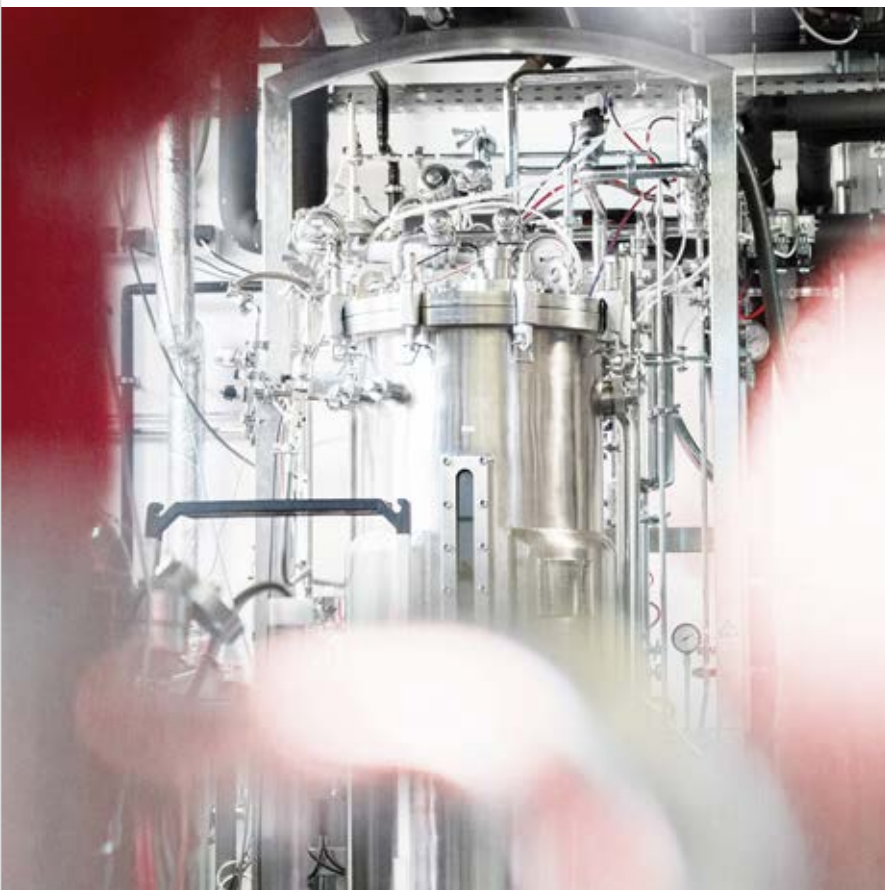


High-performance
Microorganisms

Engineering Biology

— **BRAIN** researches into and develops bioactive natural compounds, customized enzymes and high-performance microorganisms for partners in the BRAIN Group and for external industrial enterprises.

→ www.brain-biotech.de/en



2,500

square meters of labs, production and office facilities – the size of BRAIN AG’s technology campus in Zwingenberg

53,000

BRAIN’s BioArchives offer access to some 53,000 characterized microorganisms.



BRAIN AG in Zwingenberg, Germany is the head office of the BRAIN Group and the location that manages the strategic and administrative resources required for steering research and business activities. Its 125 employees mainly focus on scientific research and development for the three business units Nutrition & Health, Skin Care and Industrial BioSolutions. BRAIN was established in 1993 by bioeconomy visionaries at Technische Universität Darmstadt (TU). In 1996 it moved into the current premises in Zwingenberg, which were extended in 2010. In 2008, the company was transformed into a stock corporation and went public in 2016. BRAIN has cutting-edge laboratories and technologies for scaling up to cubic meter scale.

The Natural Product Company

— **AnalytiCon Discovery** offers comprehensive excellence for the research and development of natural products for new pharmaceuticals, cosmetics and foodstuffs.

→ www.ac-discovery.com

1-1.5

grams of sample are all researchers at AnalytiCon Discovery need to analyze whether plants or microorganisms contain secondary substances that are of interest for industrial applications.



AnalytiCon Discovery GmbH has unique resources for discovering and developing actives based on natural products, and cooperates worldwide with companies in the pharmaceutical, food and cosmetics industry. It is a global market leader, with libraries of natural ingredients with fully categorized structures and access to some 15 % of all known secondary substances and thousands of structures that have not yet been published. AnalytiCon Discovery GmbH was founded in 2000, has been a member of the BRAIN Group since 2013 and currently employs 65 people. The predecessor company was set up by doctoral students of Technische Universität (TU) Berlin in 1985.

Exceeding Enzyme Expectations

— **Biocatalysts** is one of the world's leading developers and producers of custom-tailored specialty enzymes for a wide variety of industrial sectors such as foods and fine chemicals.

→ www.biocatalysts.com

> 70

products that can be directly purchased are currently offered by Biocatalysts in its established specialty enzymes portfolio, with a focus on seven industrial fields of application.

335 m

The MetXtra™ bio-information technology platform offers Biocatalysts customers rapid access to data on some 335 million novel enzymes based on metagenome libraries. Ninety-eight percent of the metagenome sequences are part of Biocatalysts' intellectual property.



Biocatalysts Ltd. focuses on developing, producing, obtaining approvals for and distributing specialty enzymes. The company offers the rapid, cost-efficient and customized development of novel enzymes, and has at its disposal the MetXtra™ metagenome library, which allows the rapid identification of tailored enzymatic solutions for customers around the world. Biocatalysts has state-of-the-art enzyme production facilities and international sales structures. It also offers its customers (among them eight of the world's ten largest food producers) a portfolio for the direct purchasing of enzymes in defined fields of application. Biocatalysts was set up in 1983, has been a member of the BRAIN Group since 2018 and currently employs 65 people.

Your partner in white biotechnology

— **WeissBioTech** is an expert when it comes to enzymes, yeasts, natural preservatives and other products obtained by fermentation for the food industry and other sectors.

→ www.weissbiotech.com

27

sales offices that market WeissBioTech products can be found around the globe, including North, Central and South America as well as China, India, Iran, South Africa and Europe.



WeissBioTech GmbH is a leading supplier of bio-based active products for the food industry. It supplies both large multinationals and medium-sized manufacturers of drinking water, fruit juices, beer and wine. The customer base also includes industries that process starch and bioethanol. The company's highly developed technical service, sound knowledge of enzyme technologies and global sales network are cornerstones that underpin its first-class position on the market. Enzymes from WeissBioTech are tailored to customers' wishes and marketed under trademarks such as NATUZYM® and DELTAZYM®. WeissBioTech was founded in 2002, has been a member of the BRAIN Group since 2014 and currently employs 25 people.

Timeless Beauty. Ever now.

— **MONTEIL** is an experienced partner to beauty establishments and is highly regarded by cosmetics retailers. Its innovative products are represented on markets in over 30 countries around the globe.

→ www.monteil.com

> 80

The range offered by MONTEIL includes more than 80 products in the anti-aging, special care and fragrance product lines.



With its cutting-edge technology, MONTEIL, a branded company established in 1936, is one of the leading anti-aging skincare specialists. MONTEIL cosmetics are developed at the highest scientific level and continually provide new impetus for the international cosmetics market. The company focuses on natural bioactive ingredients that are offered in a high-quality and optimally adjusted concentration. MONTEIL sees itself as a competent contact for customers with and on behalf of whom it develops treatment concepts for almost all skin types, based on a broad product range. **MONTEIL Cosmetics International GmbH** has been a member of the BRAIN Group since 2011 and currently employs 15 people.

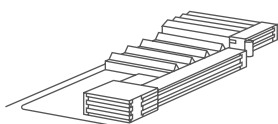
Cosmetics since 1925

— **L.A. Schmitt** unites experience and passion for manufacturing cosmetic products that meet the demanding wishes and specifications of customers.

→ www.schmitt-cosmetics.com

1925

The Leipzig-based company L.A. Schmitt develops and produces high-end cosmetics and wellness products.



The highly-reputed company **L. A. Schmitt GmbH**, which looks back on a long tradition, develops and produces cosmetics and wellness products in line with customers' wishes and specifications. The company manufactures its own product lines and offerings for trading companies and for wellness and cosmetics brands. Regular new developments feed the latest scientific findings into the company's portfolio. Its business activities center on individual client liaison, sound knowledge and a high degree of flexibility for partners and customers. L. A. Schmitt GmbH has been a member of the BRAIN Group since 2009 and currently employs 20 people.

Presence in the target market of North America

— Via sales agencies and branches, the BRAIN Group is driving the internationalization of its business and creating shorter access routes to customers in its key markets.

→ www.brain-biotech.de/en



205 bn

According to BIO, the association of the biotechnology industry, 1.7 million employees were working in the U.S. bio-economy in 2016, and earned US\$ 205 billion, more than half of the globally generated bio-based value added.



BRAIN Group companies with direct product business are represented via sales agencies in key target markets around the world. Group companies have also set up their own branches in the USA in order to directly strengthen business development in North America, one of the key markets for innovations in industrial biotechnology. **BRAIN LLC** took the lead in 2018 and has since been a member of the BRAIN Group. It shares its offices in Rockville, Maryland, near Washington, D.C., with AnalytiCon Discovery LLC, which has been located there since 2011. The US branch Biocatalysts Inc. has been based in Chicago, Illinois since 2011.

Revolutionising Wound Care

— **SolasCure** focuses on developing, certifying and marketing novel medical products based on the wound-cleaning enzyme Aurase®, discovered by BRAIN.

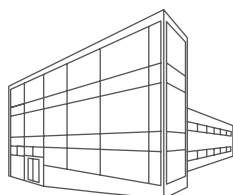
→ www.solascure.com

20 bn

The global market for wound treatment products and bandages is expected to grow to a sales volume of more than US\$ 20 billion per year by 2020.

40 m

There are over 40 million wound patients around the globe. About one third of patients in Germany develop chronic wounds.



SolasCure Ltd. is a spin-off jointly established in 2018 by BRAIN and Dr. Sam Bakri, who is the company's Executive Chairman and an entrepreneur with extensive experience in the healthcare sector. Professor Keith Harding (CBE), founder of the Welsh Wound Innovation Centre and a proven expert in the field of wound bed preparation, is Chair of SolasCure's Medical Advisory Council. BRAIN AG has transferred patents for the commercialization of future Aurase®-based products to the company, and will also provide the novel enzymatic active ingredient for the treatment of chronic wounds for customers in the healthcare sector.

Facts & figures

1993

was the year in which BRAIN was founded. It went public in 2016 and celebrated its 25th anniversary in 2018.

> 300

colleagues are currently employed within the BRAIN Group in Europe and North America.

30.5

million euros – the total operating performance of the BRAIN Group in fiscal 2017/18

64 %

was the share of the product-related BioIndustrial business segment in the total operating performance of the BRAIN Group in fiscal 2017/18.

→ www.brain-biotech.de/en

02

The company



02 The company

41

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The bioeconomy – the biological transformation of industry

Industrial biotechnology is a driver of innovation in the transition from a petroleum-based industry to a knowledge-based bioeconomy. Biotechnologies enable the efficient harnessing of natural resources, improved industrial production processes and new product worlds. The bioeconomy aims at environmentally compatible, low-CO₂ value creation, and better supplies of sustainably produced goods for the world's population.

Biotechnology as a driver of innovation

Challenges such as global population growth, climate change and increasing resource shortages have prompted society, policymakers and the business world to reassess the existing paradigm, and move towards a sustainable bioeconomy. The bioeconomy refers to the gradual biologization of industrial processes, products and sectors – based on scientific and engineering knowledge – in order to achieve progress in environmental protection, greater product and supply security for consumers, improved raw material efficiency and the establishment of the principles of a closed-loop economy in the value chain.

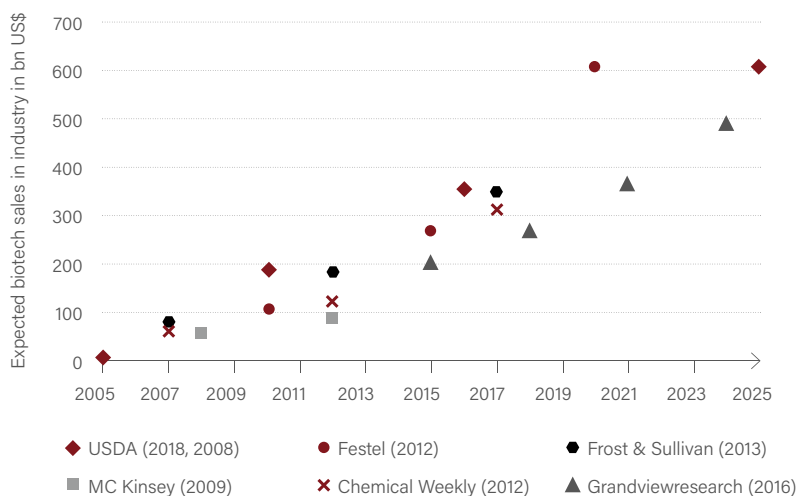
Industrial biotechnology is the pioneer and innovation engine of this evolutionary transformation of the economic system and of society. It offers alternatives for established, disadvantageous processes and products, and helps tackle current problems such as the proliferation of widespread diseases caused by malnutrition or high CO₂ levels. In addition, as a future technology, it enables completely new approaches and solutions that seemed unthinkable just a few years ago. It opens up previously unknown value creation paths and produces disruptive product ideas for a modern bioeconomy.

As a cross-sector technology, industrial biotechnology integrates various disciplines from the life, natural and engineering sciences, as well as areas of medicine, mechanical engineering and materials sciences. This integrative strength enables very diverse target markets in the consumer goods, chemicals, energy and raw materials industries to be addressed.

In recent years, a variety of programs have been launched to strengthen the bioeconomy. In 2012, the European Commission launched its European Bioeconomy Strategy, and in October 2018 presented an updated version entitled "A Sustainable Bioeconomy for Europe." As a pioneer in bioeconomy strategy, Germany has already been pursuing its own "National Bioeconomy Research Strategy 2030" since 2010, and has established several state-supported innovation alliances since 2011 to accelerate structural change. BRAIN coordinates two such alliances – "ZeroCarbon Footprint" (ZeroCarbFP) aimed at converting carbon residue from residual and waste materials flows into industrial materials, and the "Natural Life Excellence Network 2020" (NatLiFE 2020) for bioactive compounds for foodstuffs and cosmetics. The German government has committed itself to promoting a "transition to an economy based on

→ BRAIN networks, page 77

FIGURE 02.1 BIOECONOMY – OUTGROWING CHEMICAL INDUSTRIES¹



- In 2016 global industrial biotechnology sales were 355 bn US\$.
- Experts expect the revenues of biotech-based chemicals to grow from some 140 bn US\$ in 2010 to around 610 bn US\$ in 2025.
- This revenue increase represents a Compound Annual Growth Rate (CAGR 2010–25) of ca 11%.
- Industrial biotech sales are expected to outgrow the overall chemical markets – which are expected to grow at 4.1% (CAGR 2015–20)

renewable resources with the help of the bioeconomy” and to establishing an interministerial agenda entitled “From Biology to Innovation”.

The second Global Bioeconomy Summit, which was held in April 2018 – and which was first held in 2015 in Berlin – underscores the topic’s international importance and Germany’s pioneering role in relation to it. More than 50 countries have now launched research and development initiatives for the bioeconomy. In large parts of the world, the bioeconomy is now regarded as one of the most important growth topics for the 21st century. In addition to digitalization, the transformation to a bioeconomy represents a megatrend for the coming decades. Bio-based business offers the opportunity for a new cycle entailing groundbreaking innovations, stronger economic growth and a comprehensive improvement of many people’s quality of life.

Strategies and outlook

Figure 02.1

Sales generated with biotechnology solutions are growing at above-average, double-digit rates in the globally positioned chemicals industry. The US biotechnology sector – which has ranked over many years as one of the top performing industrial sectors in the USA – employed 1.7 million individuals in bio-based businesses, according to a survey conducted by the Biotechnology Innovation Organization (BIO). At more than US\$ 205 billion, these businesses generated around 58% of global bio-based value added, which totals around US\$ 355 billion (USDA: “Indicators of the US Biobased Economy”, March 2018).

According to a study conducted by IDEA Consult for EuropaBio in 2016, the value-creation effects of industrial biotechnology in Europe amounted to € 31.6 billion (“Jobs and Growth generated by Industrial Biotechnology in Europe”). The updated EU bioeconomy strategy of 2018 notes that in Europe around 8.2 percent of employees currently work in the European bioeconomy. The sustained positive trend was recently confirmed by the Federation of German Industries (BDI) in its September 2018 position paper entitled “Making Germany fit for the future with a bio-based economy”. At the same time, the BDI called for further improvements to framework conditions, particularly in relation to industrial biotechnology.

¹ German Bioeconomy-Council (December 2016); Roland Berger, Grandviewresearch (2016); USDA (March 2018)

Expectations about future market opportunities are correspondingly high. The EU Commission expects the European bio-based economy to create a million new jobs by 2030. Other economic experts expect sales of bio-based “green” chemicals to expand from about US\$ 144 billion to US\$ 610 billion over the 2010–2025 period. This corresponds to a compound annual growth rate (CAGR) of about 11 percent – well above the range of expectations for the market growth rates for all chemical products. Sector specialists anticipate that one in every five euros of sales generated by the chemicals industry in 2020 will derive from biotechnology processes and products.

Impact investing

Global financial markets also see the bioeconomy as a megatrend, prompting corresponding capital reallocations. Private and institutional investors have been focusing increasingly on socially responsible asset types, otherwise termed SRIs (Sustainable and Responsible Investments) or “impact investing” – in reference to their intended sustainable impact. In turn, the securities of companies that fail to make corresponding efforts encounter restricted demand, or are eliminated from investment portfolios. Sustainable impact investments are registering continuous growth, and totaled US\$ 8.7 trillion in the USA at the start of 2016, according to the Forum for Sustainable and Re-sponsible Investment (US SIF).

Europe also provides many examples of this trend. At the end of 2017, the World Bank announced that it would no longer invest in oil production projects or coal mining from 2019 onwards – it would do so in the future only in exceptional cases in order to avert societal problems in poorer countries. Norway’s parliament decided in mid-2015 to withdraw its sovereign fund – one of the largest and most successful funds of its kind with a volume in excess of € 800 billion – from investing in companies where climate-damaging carbon business generates more than 30 percent of business. Germany’s Allianz insurance group has also realized this strategic turnaround, having withdrawn from providing individual insurance for coal-fired power plants and coal mining projects since May 2018. Allianz aims to have gradually fully exited the coal business by 2040.

BRAIN and the bioeconomy

BRAIN is the first bioeconomy company to IPO in Germany. BRAIN AG issued new shares in the Prime Standard of the Frankfurt Stock Exchange on 9 February 2016 in order to strengthen the company’s own growth and the biologization of value chains.

The BRAIN Group’s unique selling points include access to nature’s comprehensive “toolbox” in the form of the company’s own BioArchive and an extensive technology portfolio for converting natural resources into industrial applications.

Strategy and business model

Industrialization and growth strategy

BRAIN has been a pacesetter and pioneer in the industrial biotechnology and bioeconomy areas since it was founded in 1993. During the first 15 years of its operations, BRAIN developed itself into a preferred research and development cooperation partner for companies in the industrial sectors of chemicals, nutrition and animal feed, as well as cosmetics. The company continuously expanded its BioArchive as part of these R&D partnerships, and established its first propriety technologies to locate new product candidates.

In parallel to its R&D cooperation business, since 2008 BRAIN has been pursuing an industrialization and growth strategy with its own pipeline projects along the value chain, in order to participate more directly in market innovation successes. The aim is to establish the BRAIN Group as a fully integrated bioeconomy company with its own research and development, as well as its own production capacities and related business, marketing and sales structures. Accordingly, BRAIN has been investing in expanding a development pipeline with its own product candidates since 2008. Acquisitions of companies with special R&D expertise or attractive market access form part of the growth strategy.

BRAIN focuses on the product categories of natural compounds, enzymes and microorganisms, and in the 2017/18 financial year established corresponding business units for the Nutrition & Health, Skin Care and Industrial BioSolutions application areas.

The company prioritizes realizing product-scalable business options in order to implement its growth strategy. These are based on direct B2B sales of BRAIN Group offerings as well as products developed together with industrial partners, along with subsequent licensed marketing. Customer-specific solutions developed on the basis of R&D performance payments in the context of R&D cooperation partnerships comprise a further business option. The BRAIN Group manages its product-scalable business through its BioIndustrial operating segment, and its R&D cooperations through its BioScience segment.

Product marketing

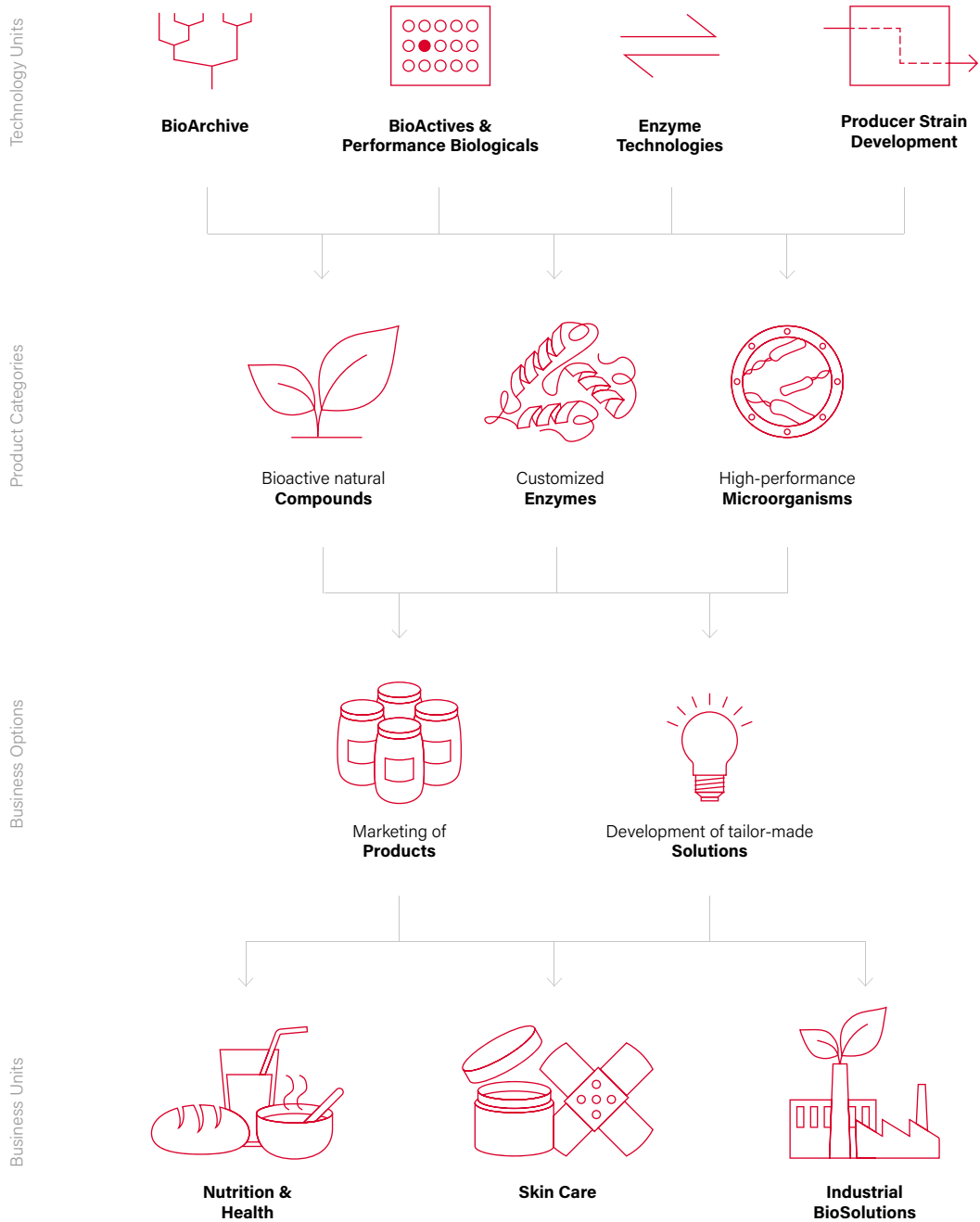


→ New product development,
page 48

The BRAIN Group achieves market access to specialty markets through direct B2B transactions. At present, enzymes are being developed and marketed by BRAIN AG, Weiss-BioTech GmbH, and Biocatalysts Ltd, which was newly added to the Group in the 2017/18 financial year. The subsidiaries Monteil and L. A. Schmitt offer customers cosmetics and skin care products with innovative bioactive active ingredients. New BRAIN Group offerings arise from the successful implementation of projects from the new product development pipeline.

Scalable product sales can also be achieved through development projects conducted together with industry partners. These projects are linked to new product development projects or are dedicated to the partners' independent objectives. In order to address markets that BRAIN taps together with industrial partners along the value chain, the company implements license agreements or specific contract models for joint product marketing. Along with offering B2B merchandise, scalable product sales include the marketing of technologies or biotechnology system solutions.

FIGURE 02.2 BRAIN BUSINESS MODEL





Customer-specific solution development

The development of customer-specific solutions for industrial partners on the basis of milestone payments and other research performance compensation – agreed in advance and based mostly on exclusive research and development partnerships – forms a further business option for BRAIN. Furthermore, such R&D work is essential for the development of research expertise aligned to market and customer demand. This business option can be scaled to only a limited extent.

New product development

As part of its industrialization and growth strategy, BRAIN has been establishing an attractive development pipeline with R&D projects for its own product candidates since 2008. These new product development activities are in various stages of development. Marketing programs are currently being prepared or implemented for some projects.

The DOLCE program was launched in August 2016. As part of it, BRAIN AG and its Group company AnalytiCon Discovery GmbH, together with French industrial partner Roquette, are developing natural sweeteners and sweetness enhancers for globally active food and beverage groups. New skin care product offerings based on BRAIN’s product development, the Aurase® wound cleansing enzyme, are being prepared through SolasCure Ltd, a company spun off in 2018. The BRAIN innovation section presents selected projects from the BRAIN development pipeline.

In a “steady state” for new product development, the company aims for a relatively constant volume in its development pipeline. New projects for innovative project ideas are launched as soon as new market potentials are identified or established development projects transition to the marketing phase. New projects are tested in terms of technical and commercial feasibility in order to optimize the development pipeline’s likelihood of success.

→ BRAIN innovations, page 69

FIGURE 02.3 BRAND ESSENCE

The BRAIN Group stands for:

COMPETENCE

“BRAIN disrupts”

BRAIN develops, based on its proprietary BioArchive and protected high-tech portfolio, sustainable disruptive innovations for diverse market segments of the bioeconomy.

RELIABILITY

“BRAIN delivers”

BRAIN markets natural compounds, enzymes, and microorganisms and reliably delivers results in strategic partnerships in the field of industrial biotechnology.

EXCEPTIONALITY

“BRAIN innovates”

BRAIN maintains a unique culture of innovation and a global network, in which highly qualified experts collaborate for new product ideas and market offers in an interdisciplinary environment.

Expertise and product categories

Unique selling points

The BRAIN Group stands for competence, reliability and exceptional quality. BRAIN staff are dedicated to the identification, research, utilization and marketing of natural biological substances and processes for industrial use. The BRAIN Group combines various areas of industrial biotechnology expertise. R&D activities focus on sustainability, efficiency and economic viability, as well as efficacy and added quality.

Key success factors for BRAIN product and process innovations include more than 25 years' experience with the topics of sustainability and biodiversity, and a pronounced innovation culture within the Group. BRAIN started to establish its competences and resources long before the bioeconomy became a prominent economic and social idea. Researchers and developers at BRAIN have subsequently established a series of USPs augmented by the subsidiaries' special expertise areas.

BioArchive

The BRAIN Group's proprietary BioArchive – including AnalytiCon Discovery's extensive natural product libraries – offers access to an immense variety of new biological solutions for sustainable industrial processes and ingredients. The BioArchive encompasses more than 53,000 comprehensively characterized cultivable microorganisms, more than 50,000 characterized natural compounds and fractions consisting of edible plant material, a large number of highly specialized metagenome libraries as well as many new enzyme libraries and complete metabolic paths comprising previously uncultivable organisms. The company is continuously expanding this unique, dynamic "toolbox of nature".

Technology portfolio

BRAIN has a broadly protected high-tech portfolio that ensures the targeted discovery, decoding and further development of natural resources and their sustainable availability, and offers extensive know-how and high-end technology platforms to meet new scientific and technological challenges. The company harnesses state-of-the-art technology and specialist expertise such as high-throughput sequencing, metagenome and big data analysis, protein engineering, genome editing, digital 3D modeling and test simulation, cell-based test systems, high-speed screening and AI-assisted process optimization. The high-tech portfolio is broadly secured with more than 350 patents and patent applications for materials and technologies in around 50 patent families. The patent protection encompasses technology and product innovations in all BRAIN product categories.

 Figure 02.3



BRAIN product categories

Based on natural biodiversity and the company's own BioArchive, BRAIN focuses on three product categories for highly differing applications – bioactive natural compounds, customized enzymes and high-performance microorganisms.

Bioactive natural compounds



BRAIN identifies and develops bioactive natural compounds, so-called BioActives, for product developments in the food, animal feed, skin care, cosmetics and chemical industries. Its focus is on the optimized biological effect of natural compounds and the improvement of formulations for customized applications. The product range includes sugar substitutes and taste modulators for healthier nutrition as well as natural-based active ingredients for cosmetics, BioActives for food preservation as well as for the stabilization of paints, lacquers, and various household products.

Customized enzymes



BRAIN identifies and develops new and optimized enzymes and biocatalysts that meet complex process and application requirements for very varied product classes, and as starter cultures enable innovative technical production processes to be established. These include enzymes for the production of food and beverages, wound care preparations or lubricants as well as for starch and bioethanol production. Research work in the new product development area focuses on serving high-margin markets for special enzymes.

High-performance microorganisms



BRAIN identifies and develops high-performance microorganisms as functional biomass for optimized industrial production processes. They serve as so-called BioSubstitutes to establish bioprocesses in chemical processes or to produce bioactive natural compounds and enzymes for specialty markets. Application areas also include the recycling of the climate gas CO₂ as an industrial raw material for bioplastics, as well as urban and green mining for the extraction of precious metals and rare earth metals from waste flows and ores.

Markets and business units

Markets addressed by BRAIN

BRAIN translates its expertise in relation to biological systems into industrial applications for the market segments of Nutrition & Health, Skin Care and Industrial BioSolutions. To strengthen its market and product orientation, BRAIN established the corresponding business units Nutrition & Health, Skin Care and Industrial BioSolutions in the 2017/18 financial year. The focus on the most relevant application areas for R&D work serves to strengthen the product business and to address central and promising markets for the BRAIN Group.

Nutrition & Health

The Nutrition & Health business unit focuses on healthier nutrition and improved animal welfare, and currently addresses the following market segments:

- **Food & Beverages:** natural compounds for calorie reduction and other beneficial properties of foods and beverages, as well as related improved processing
- **Feed:** bio-based feed additives for farm animals
- **Pet Food:** bio-based feed additives for pets
- **Pharmaceuticals:** bioactive agents for new drug formulations (realized by AnalytiCon Discovery GmbH)



Skin Care

The Skin Care business unit identifies natural active ingredients for skin and wound care. It addresses the following market segments at present:

- **Personal Care:** bio-based aluminum-free antiperspirants and deodorants
- **Cosmetics:** natural compounds for gentle skin care and cosmetics, as well as product stability
- **Wound Care:** biological wound treatment based on the Aurase® enzyme (realized by SolasCure Ltd.)



Industrial BioSolutions

The Industrial BioSolutions business unit utilizes natural resources to optimize industrial processes and currently addresses the following market segments:

- **Green Mining:** bio-based extraction of valuable metals from ores
- **Urban Mining:** bio-based extraction of valuable metals from waste flows
- **CO₂-based Intermediates:** bioplastics based on carbon dioxide



BRAIN Group

→ BRAIN Group, page 29

The BRAIN Group unites first-class research and development work, specific production know-how and access to attractive markets under one roof. All of the subsidiaries within the BRAIN Group act as independent entities in the fields of research and development, process development and production, or as service providers in specific markets. Beyond this, product-specific spin-offs of advanced BRAIN development programs support value-added marketing with the involvement of external expertise in specialist areas and of capital providers.

B·R·A·I·N



Chief Executive Officer (CEO):
Dr. Jürgen Eck

BRAIN AG

Head Office: **Zwingenberg, Germany** — company founded in **1993**

B.R.A.I.N. Biotechnology Research and Information Network AG, or BRAIN AG for short, is the parent company and head office of the international BRAIN Group. Ever since its inception in 1993, BRAIN has been a driver and high-tech pioneer in the fields of industrial biotechnology and the bioeconomy. As part of its growth and industrialization strategy, BRAIN AG has been listed in the Prime Standard of the Frankfurt Stock Exchange since February 2016.

www.brain-biotech.de



Managing Director:
Dr. Lutz Müller-Kührt

AnalytiCon Discovery GmbH

Head Office: **Potsdam, Germany** — member of the BRAIN Group since **2013** — share held by BRAIN AG: **59.00 %**

AnalytiCon Discovery GmbH, a company established in 2000, is a global market leader in the field of natural ingredient libraries with completely clarified structures. With its position on the Potsdam Biotech Campus, the company offers services for each phase of the supply chain for discoveries and developments of active ingredients based on natural substances.

www.ac-discovery.com



Managing Directors:
Stuart West,
Roderick Clive Sears-Black

Biocatalysts Ltd.

Head Office: **Cardiff, UK** — member of the BRAIN Group since **2018** — share held by BRAIN AG (indirectly): **65.55 %**

Biocatalysts Ltd., which was set up in 1983, is one of Europe's leading providers of specialty enzymes, with a range that encompasses enzyme development and both small-scale and bulk enzyme production (kilo to multi-tonnes), as well as global sales to various industrial sectors such as foods and fine chemicals. The company has had a U.S. branch in Chicago, IL since 2011 (Biocatalysts Inc.).

www.biocatalysts.com

WeissBioTech



Managing Director:
Hans de Bie

WeissBioTech GmbH

Head Office: **Ascheberg, Germany** — member of the BRAIN Group since **2014** — share held by BRAIN AG: **50.60 %**
WeissBioTech GmbH was established in 2002 and is one of the leading providers of enzymes, yeasts, natural preservatives and other products manufactured by fermentation for the food industry and other market segments. To consolidate its market position, the company set up a downstream plant at the WeissBioTech France SARL branch in France in 2010.

www.weissbiotech.com

MONTEIL PARIS



Managing Director:
Thomas Kessler

MONTEIL Cosmetics International GmbH

Head Office: **Düsseldorf, Germany** — member of the BRAIN Group since **2011** — share held by BRAIN AG: **68.30 %**
The branded company MONTEIL, founded in 1936, is an experienced partner to beauty establishments and is highly regarded by cosmetics retailers. It is represented in over 30 countries around the globe. With its cutting-edge technology, MONTEIL is one of the leading anti-aging skincare specialists. The Wilde Cosmetics GmbH is a minority shareholder of MONTEIL as a specialist in hand and nail care.

www.monteil.com

L.A. SCHMITT



Managing Director:
Ivo Peschke

L. A. Schmitt GmbH

Head Office: **Ludwigsstadt, Germany** — member of the BRAIN Group since **2009** — share held by BRAIN AG: **100 %**
L. A. Schmitt GmbH, established in Leipzig in 1925, develops and produces its own product lines, products for retail companies and for high-end wellness and cosmetics markets. Regular new developments feed the latest scientific findings into the company's product lines.

www.schmitt-cosmetics.com

B·R·A·I·N LLC



Managing Director:
Dr. Jürgen Eck

BRAIN LLC

Head Office: **Rockville, MD, USA** — member of the BRAIN Group since **2018** — share held by BRAIN AG: **100 %**
B.R.A.I.N. Biotechnology Research and Information Network LLC, or BRAIN LLC for short, focuses on addressing key markets for the BRAIN Group in North America and on internationalizing BRAIN's business. The company's US office improves customer proximity, steps up business development and strengthens connections in international research cooperation arrangements.

www.brain-biotech.com

SolasCure



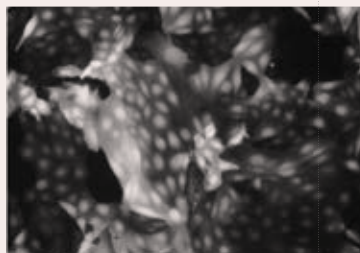
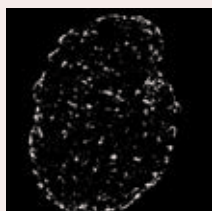
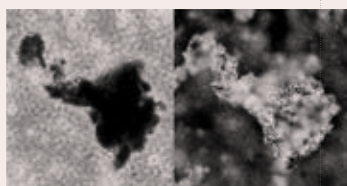
Executive Chairman:
Dr. Sam Bakri

SolasCure Ltd.

Head Office: **Cardiff, UK** — member of the BRAIN network since: **2018**
SolasCure Ltd., established in 2018 with the participation of BRAIN AG, is an independent company that focuses on the development, CE certification and marketing of medical products based on the novel wound-cleaning enzyme Aurase® discovered by BRAIN for the biological conditioning of chronic wounds. BRAIN AG holds a substantial economic share of SolasCure Ltd., but none of the shareholders have a majority vote in the company.

www.solascure.com

Highlights of the 2017/2018 business year



2017

2018

October / November

December

January

26 October 2017

Research project involving BRAIN paves the way for low-impact copper production through bio-leaching

A research team involving scientists from BRAIN has succeeded in extracting nearly the entire copper content from local shale deposits harnessing micro-organisms in combination with a bio-leaching process. The results underscore the significance of Green Mining and Urban Mining for recovering metals from ores and waste streams.

28 November 2017

BRAIN AG's Annual Report honored by the German Designers' Club (DDC)

The first annual report published by BRAIN has been honored with a silver medal in the "Good Design 18" competition run by the German Designers' Club (DDC).

12 December 2017

BRAIN AG and Mannheim University develop 3D skin models for health care and cosmetics

The M²Aind (Multimodal Analytics and Intelligent Sensorics for the Health Industries) research project is a public-private partnership project of which BRAIN has been an active partner from the start. Joint projects of BRAIN and Mannheim University of Applied Sciences (MUAS) include the development of a 3D skin model to aid understanding of skin physiology with the aim of providing new insights for health care and cosmetic applications.

15 December 2017

BRAIN achieves clear improvement in revenues and earnings in the 2016/17 financial year

BRAIN announced several key figures for the financial year 2016/17. Accordingly, the BRAIN Group increased its revenues by 5.8% to € 24.1 million in the period under review. Total operating performance grew by 3% to € 26.9 million.

18 December 2017

BRAIN granted patent protection for the development of biological antiperspirants

BRAIN has been granted US patent protection for novel screening systems which help find biological compounds that reduce perspiration. The systems are based on a key molecule discovered at BRAIN that paves the way for the systematic screening of the relevant natural compounds.

11 January 2018

BRAIN publishes annual report for financial year 2016/17

The 2016/17 financial year was the first full reporting cycle as a listed company, following BRAIN's IPO in February 2016. Accordingly, the BRAIN Group increased its revenues in the reporting period from € 22.8 million to € 24.1 million. Total operating performance grew by 3.0% year-on-year, from € 26.1 million to € 26.9 million.



BIOCATALYSTS



February

March

May

22 February 2018

BRAIN AG expands patent protection to Europe for unique taste cell technology

BRAIN has been granted patent protection by the European Patent Office (EPO) for novel taste cell technologies. BRAIN holds the right to use the highly innovative screening technologies for novel natural taste modulators described in the patent in the notable markets of Europe and the United States.

22 February 2018

BRAIN receives “innovator of the year” award from brand eins

Following the third annual survey by brand eins among more than 25,000 experts, BRAIN has been nominated as one of Germany's leading innovators.

6 March 2018

BRAIN AG establishes US subsidiary to strengthen business development in North America

The newly founded BRAIN LLC is based in Rockville, Maryland, near Washington DC. This strategic step is intended to accelerate the internationalization of BRAIN's business operations, improve customer relations and intensify the Group's business development with a US presence.

7 March 2018

BRAIN, AnalytiCon Discovery and Roquette reach major milestone in DOLCE program

As a result of joint efforts, the DOLCE core team partners have identified and characterized the first natural-based sucrose sweet taste enhancers and natural-based high intensity sweeteners ahead of schedule.

8 March 2018

BRAIN AG successfully concludes second Annual General Meeting as a stock listed company

The past 2016/17 financial year was the first full BRAIN annual cycle reported on at the Annual General Meeting since its IPO in February 2016. All agenda items were resolved by a large majority of the participating shareholders.

17 March 2018

BRAIN AG acquires majority stake in leading speciality enzyme producer Biocatalysts Ltd.

BRAIN now holds the majority stake in Biocatalysts Ltd., based in Cardiff, UK. This strengthens BRAIN's BioIndustrial segment, expanding access to specialty enzyme markets and cutting-edge enzyme production facilities. The strategic partnership will widen the commercial opportunities.

30 May 2018

BRAIN AG expects double-digit revenue growth in fiscal year 2017/18 despite weak first half year

BRAIN published its financial results for the first half of fiscal year 2017/18. Accordingly, BRAIN Group's total operating performance for the reporting period amounted to € 12.3 million, representing a year-on-year shortfall of approximately 7.2%.



June

August

September

6 June 2018

BRAIN AG Annual Report presented with European Design Award

The company's second annual report has now also been presented with this year's European Design Award, a renowned international accolade recognising creative excellence.

20 June 2018

BRAIN AG and CyPlus GmbH develop disruptive technologies for biological processing of precious metal ores

BRAIN and CyPlus aim to develop a range of products for the mining industry, as part of a collaboration arrangement in the area of biological ore processing. Precious metal extraction (gold and silver) from the ores is based on naturally occurring and enhanced microorganisms from the BRAIN BioArchives.

22 August 2018

BRAIN AG announces the creation of SolasCure Ltd. to continue development of Aurase®

SolasCure Ltd. based in Cardiff, Wales, UK, will be responsible for the development, CE certification and marketing of medical products based on Aurase®, a new enzymatic active ingredient developed by BRAIN for the biological cleaning of chronic wounds.

31 August 2018

BRAIN AG reports growth for the first nine months of the 2017/18 financial year

BRAIN Group's total operating performance for the reporting period represented a year-on-year growth of approximately 5%. Group revenues for the reporting period increased from € 17.9 million to € 18.1 million.

18 September 2018

BRAIN AG announces strategic research collaboration with BluCon Biotech GmbH

BRAIN AG announces the start of a strategic research and development collaboration with BluCon Biotech GmbH. The objective of the joint research efforts is the identification and development of special microbial production strains. The collaboration will run for several months.

25 September 2018

BRAIN BioXtractor short-listed twice for the 2018 Global Game Changers Awards

BRAIN's BioXtractor, a mobile tech-scale operation unit for the biological extraction of precious metals, was honored as a finalist in two categories of the Awards, "Corporates for Good" and "Circular Breakthrough".

21 September 2018

Scientists at BRAIN AG receive top award for developing novel bioactive antiperspirants for cosmetics and skin care

A senior researcher of BRAIN has received the top award in the Applied Research category at the 30th IFSCC Congress. The research team at BRAIN, together with scientific partners, has developed a new concept for sweat reduction based on directly targeting primary fluid secretion in human sweat glands.

Press review

Natural ingredients for wholesome food – the quest for the 'healthy' cookie

Deutschlandfunk, Forschung aktuell, 24 September 2018

Protein as a treatment for bad wounds

Frankfurter Allgemeine Zeitung, 23 August 2018

Using bacteria to gain gold

Frankfurter Allgemeine Zeitung, 22 June 2018

BRAIN and CyPlus advance green mining

International Mining, 20 June 2018

BRAIN finds substitute for stevia

Platow Börse, 16 May 2018

BRAIN AG retains future value

Darmstädter Echo, 02 June 2018

BRAIN among the most innovative companies

brand eins, February/April 2018

DOLCE “major milestone” in sweetener development

Foodnavigator, 09 March 2018

“White” Biotech BRAIN makes alchemists’ dream come true

Die Welt, 27 February 2018

BRAIN integrates specialty enzymes company

Transkript, 17 March 2018

Full steam ahead for sequencing

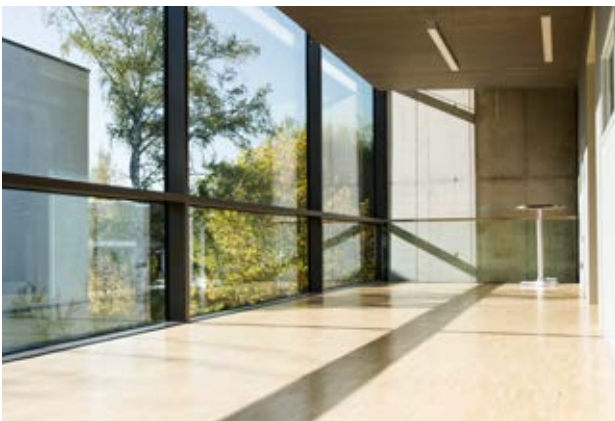
LABO online, 7–8 / 2017

Bio to replace aluminium in deodorants: US patent for Brain

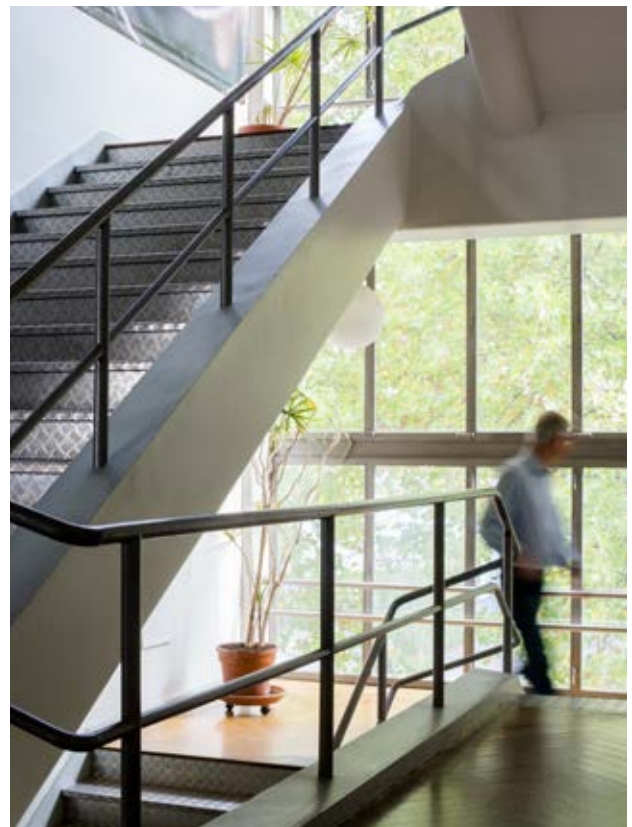
Bergsträßer Anzeiger, 19 December 2017

Great demand for BRAIN shares among institutional investors

Frankfurter Allgemeine Zeitung, 5 October 2017



The light-filled technology campus and the openly designed outdoor spaces create a working environment that buzzes with innovation and encourages creativity. This promotes staff identification with the company's visions.



Lively corporate culture

Technology campus

In 1996, three years after the company's inception, BRAIN bought a technology campus for its head office consisting of laboratories, production and office facilities in Zwingenberg, a town in Hesse's Bergstrasse region. The core of the campus is the Bauhaus building, classed as a historic monument. Further generously dimensioned areas were added in 2010. The new glass building, which serves as the lobby, with access passages and exhibition rooms, builds an optical bridge between the complex of listed buildings and a hall that houses further offices, lab space and production units.

The light-filled 2,500 square metre technology campus, with rooms that offer individual privacy, and the openly designed outdoor spaces create a working environment that buzzes with innovation and encourages creativity. This promotes staff identification with the corporate vision of a bioeconomy.

Guided by the Bauhaus philosophy

The headquarters of the BRAIN Group is one of the few remaining examples of industrial Bauhaus architecture. The building once housed Deutsche Milchwerke AG, and was also known as the Fissan factory due to its brand name. Back in the 1930s, successful biotechnological research and development activities were therefore already being carried out in Zwingenberg, and there was already a successful product portfolio. After taking over the complex, BRAIN revitalised the building in meticulous detail in 1996, and in 1998 won the prestigious Josef Maria Olbrich prize awarded by the Association of German Architects (BDA).

An aesthetic appearance, a high degree of functionality and innovative approaches were the hallmark of the Bauhaus era and the basis for its success. Until today, BRAIN takes guidance from some aspects of the Bauhaus philosophy. Interdisciplinary work within a team is marked by open discussions, mutual support and a joint approach both to scientific and administrative work. BRAIN considers it important to initiate and support an eye for functional aesthetics in everyday work.

Cultural involvement as part of the company profile

BRAIN sees its activities as being part of creative societal processes. The company consciously links up with art and culture to strengthen its own creative power and beyond this, to contribute its own aims and visions to public discourse. BRAIN's cultural activities constitute a targeted form of involvement in a dialogue that broadens horizons.

This is also the rationale behind BRAIN's recurring participation in the Kunst privat! art initiative launched by the Hessian Ministry of Economics, Energy, Transport and Regional Development. As part of this initiative, the works of young artists with relevance to the company's activities are exhibited and made accessible to the public. Other individual events are also

offered, such as the studio workshop at Horex Museum in Bad Homburg v.d.H. in June 2018 that ran alongside Tim Hölscher's art exhibition. In 2016, Hölscher created the 'Road to the stock exchange' series using a pinhole camera as a tribute to BRAIN's IPO.

Selected art exhibits remain on show at BRAIN's premises for a longer period, and accompany BRAIN staff throughout their working day. BRAIN thus offers a constant platform for a productive exchange between science and art.

Award-winning corporate communications

BRAIN considers communication, information and design to be key components of its activities. Alongside lavishly designed annual reports, BRAIN also publishes the regular periodical BLICKWINKEL. This periodical serves to provide information on company-specific themes and trends, and places them in relation to economic, scientific and social affairs. The design of this medium consciously distinguishes itself from other publications in this sector. The artwork in particular is unconventionally designed. Each issue is individually illustrated. Exclusively created photographs underline the aesthetic side to the company's biotechnological research for the bioeconomy.

BRAIN has received numerous awards for its unusual activities related to art, culture and communication. BRAIN's first annual report after going public in 2016 received four awards for outstanding services in design and communication; a Red Dot Design award, an iF Design and BCM Award 2017 and an award from the Deutscher Designer Club (DDC) 2017. The second BRAIN annual report for fiscal 2016/17 also won a European Design Award in 2018. Beyond this, BRAIN received the coveted WERKBUND Label 2016 for groundbreaking, innovative activities that are of importance to society, or stand for good design.

BRAIN began expanding its internet site in late 2017. A dedicated internet site has been set up for the BLICKWINKEL periodical. All issues from business year 2015/2016 can now be called up at www.brain-biotech.de/blickwinkel.

A BRAIN Twitter account (@BRAINbiotech) was also set up and successfully positioned in 2017, followed by a BRAIN LinkedIn account (@BRAIN AG) in 2018. Preparations are currently underway to relaunch the company website.



BRAIN Twitter account:
@BRAINbiotech



BRAIN LinkedIn account:
@BRAIN AG



BLICKWINKEL #1 Naturals

The plant kingdom contains an inexhaustible reservoir of natural substances that are essential for these organisms. While these substances are useful for the plants themselves, they can be put to equally versatile use for sustainable industrial processes and products such as foods, cosmetics, medications, preservatives and cleaning agents. In this issue we provide some insight into the market segments where we undertake research using bioactive natural substances, and into the specific know-how that leads to success.



You can now find all issues of the quarterly magazine BLICKWINKEL online at: www.brain-biotech.de/en/blickwinkel.



BLICKWINKEL #2 Care

In this issue, we focus on a story that has connected humanity with insects and diseases for hundreds of years: the larvae of the common green bottle fly that are capable of promoting wound healing. BRAIN has explored the mechanisms behind this healing effect and developed wound treatment products based on the Aurase® enzyme. We have successfully decoded the medical links between bottle fly larvae and wound healing, and transferred this new knowledge to non-invasive wound treatment products.



BLICKWINKEL #3 Structure

Scientists at BRAIN are constantly searching for new structures, for example by decoding biological relationships in the skin. In this issue, we explain these special and indeed sometimes unique areas of expertise that distinguish BRAIN's approach. By gaining an ever deeper understanding of the biological structures and systems that exist in our skin or in the taste buds on the human tongue, BRAIN scientists succeed in developing ever more precise cell-based assays for reproducing sensory reactions.

Staff culture

“Research at BRAIN is distinguished by interdisciplinary team work with mutual support and constructive controversial discussions. We promote a highly innovative corporate culture that we practice in our everyday work.”

Dr.-Ing. Ute Dechert — Unit Head Organisation & Processes

BRAIN practices an unusual culture of innovation and maintains a global network in which highly qualified scientists, engineers, technicians and managers of supporting work areas collaborate on an interdisciplinary basis to develop new product ideas and market offers. Its scientific curiosity and entrepreneurial thinking stamp BRAIN as an interdisciplinary and cross-sectoral think tank. Work within the organism that is BRAIN is characterised by a focus on dialogue and teamwork. Constructive discourse, and the heated debates that arise from it, support the rapid and reliable transfer of an idea through

to scientific validation and on to marketing. This culture that everyone at BRAIN lives and breathes, and the diversity of the people, expertise and talents that exist within the company, combine to foster a wealth of ideas.

The constellation of the BRAIN Group makes it possible to discuss and realise completely closed value chains. The aim is not to assimilate the Group's companies. Rather, all companies within the BRAIN Group act as independent entities, with their own skills, strengths and cultures. BRAIN sees itself as the core that drives innovation and maintains an open and creative dialogue with its partners. Barrier-free thinking and the broadening of mental horizons are practised as a strategy for creative problem-solving in the Group. This facilitates differentiated thought patterns and modes of perception, and enables rapid clarification processes and the targeted realisation of solutions.

Staff in the BRAIN Group

At the end of the business year in September 2018, a total of 308 colleagues were employed by the BRAIN Group, 125 of them at BRAIN AG, 65 at AnalytiCon Discovery GmbH, 63 at Biocatalysts, 18 at WeissBioTech, 1 at BRAIN LLC, 21 at L.A. Schmitt and 15 at MONTEIL.²

Networking and promoting education

BRAIN maintains informal and official networks with famous scientists and research institutions around the world, and takes part in public basic and development research and a number of forums in order to contribute its own expertise and experience to the bioeconomy and to learn from its interactions with others.

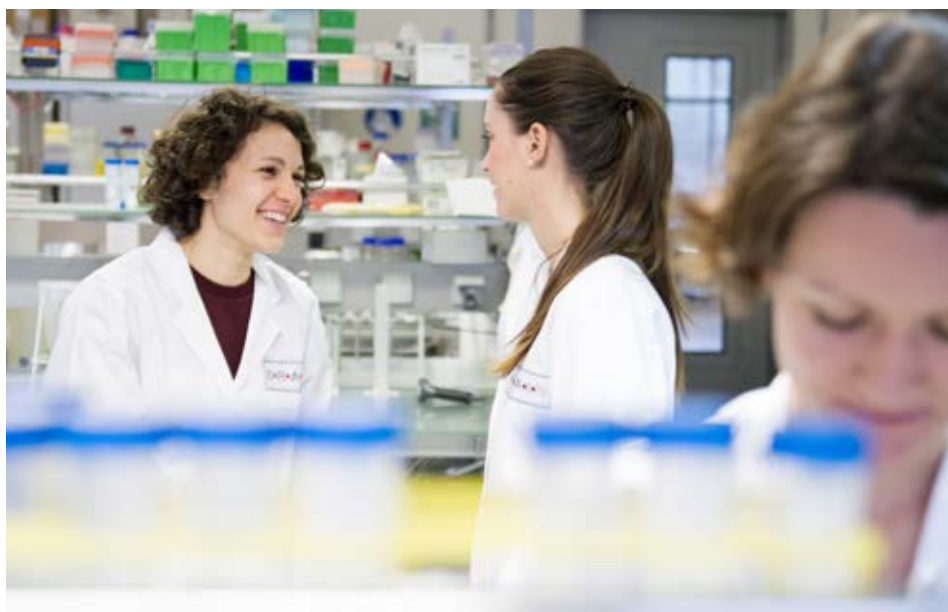
In this environment, BRAIN also offers space for students to work on independent research projects with a strong practical bent. For this purpose, it maintains longstanding cooperation arrangements with several universities.

→ BRAIN networks, page 77

² All statements made here reflect the status in September 2018, including Management Board members, trainees and volunteers.

Training at BRAIN

It has also set up training partnerships with companies in the Rhine-Main-Neckar metropolitan region. This is BRAIN's contribution to training young people, an unbroken tradition since 1996. Since 2016, the company has offered an independent course of training for office management assistants. Since 2018, BRAIN has also been an independent training company for biology laboratory technicians, an area in which it cooperates with Merck KGaA, Darmstadt. In the summer of 2018, two trainee biology laboratory technicians began their course of training at BRAIN.



BRAIN alumni platform

BRAIN's alumni platform unites trainees, students and present and former staff to promote a personal and professional exchange. The first BRAIN alumni meeting took place in 2011 and was attended by 65 former students, mentors and university lecturers at the Zwingenberg campus. As part of BRAIN's 25th company anniversary, some 85 former employees got together in Zwingenberg in July 2018 to share their scientific, professional and private experiences. These interactions are a valuable resource for developing new scientific ideas and concepts.

The BRAIN share and the capital market

- BRAIN AG is a growth company from the up-and-coming area of the bioeconomy and industrial biotechnology, and remains the only company of its type in the German equity market.
- At the end of the first trading day in the financial year under review, on 2 October 2017, the BRAIN share traded at € 21.16* (previous year's close on 29 September 2017: € 19.70) and marked its high for the year in the 2017/18 reporting period of € 27.50 on 29 January 2018.
- Given the closing price of € 17.70 on the last trading day of the financial year (28 September 2018), the share price appreciation compared with the previous year's close of € 19.70 amounts to more than 10%.

The BRAIN share and the capital market

The capital market environment in the 2017/18 financial year proved to be volatile on the whole, with a slight downtrend. Constant setbacks were suffered as a consequence of trade policies, such as the introduction or the raising of US trade tariffs on various products – which also partly affected the EU – and in the context of the related China crisis. Never-ending reporting on the diesel emissions scandal in the German automotive industry, events reflecting a deterioration of relations with Turkey and North Korea, and the Syria conflict also left their mark on Germany's benchmark equity index. On 29 September 2017, the DAX traded at 12,829 points. It reached its high for the subsequent financial year of 13,560 points on 23 January 2018. It touched its low for the year at 11,787 points on 26 March 2018 (period between 2 October 2017 and 28 September 2018). Since then it has traded mainly sideways, albeit with considerable fluctuations. At the end of BRAIN's financial year, on 28 September 2018, the benchmark index stood at 12,247 points. The DAX thereby reported a decrease of 5% over the course of the financial year. The performance of the SDAX small cap index, which is more relevant to BRAIN, reported a more or less sideways movement in the financial year under review, and closed at the end of the financial year (as of 28 September 2018) at an almost unchanged 11,864 points, near the 12,000-point level. The highs and lows were recorded at 12,737 points in June 2018 and at 11,592 points in November 2017 respectively.

* In each case based on the XETRA closing price.

Performance of the BRAIN share

BRAIN AG is a growth company from the up-and-coming area of the bioeconomy and industrial biotechnology, and remains the only company of its type in the German equity market. Along with general economic and political trends, the performance of the BRAIN share is thereby primarily dependent on the company's growth successes and prospects. This is also underscored by the positive trend in the BRAIN share price during the first four months of the financial year elapsed. At the end of the first trading day in the financial year under review, on 2 October 2017, the BRAIN share traded at € 21.16* (previous year's close on 29 September 2017: € 19.70) and marked its high for the year in the 2017/18 reporting period of € 27.50 on 29 January 2018. Following the announcement as of 28 February 2018 concerning a weak first financial quarter, the share subsequently relinquished most of these price gains by early June, falling back to around the € 20 level. The share then recovered and traded in a range around € 22 between mid-June and the end of August 2018, supported by positive newsflow from the company. On 30 August 2018, the company reported on a modification to its business model in DOLCE, and the exit of a Non-exclusive Member in the "Morning Food & Snacks" categories. In an initial step, the share then traded down to around € 19.70, before stabilizing by 6 September 2018. On 6 September 2018, in the context of weak overall market and given significant share price losses in the USA, the share price registered a further depreciation to € 17.00, which also represented its low for the financial year. Given the closing price of € 17.70 on the last trading day of the financial year (28 September 2018), the share price appreciation compared with the previous year's close of € 19.70 amounts to more than 10%. The BRAIN share thereby underperformed the DAX index and an almost unchanged SDAX index, and slightly outperformed the DAXsubsector Chemicals, Specialty Performance Index, which reported a decrease of around 12% over the same period.

Further growth and continuation of the industrialization strategy

On 17 March 2018, the company announced in an ad hoc release the arrangement of the acquisition of Cardiff-based company Biocatalysts. Biocatalysts is successfully active in the special enzymes market, and has reported double-digit growth during the past two financial years. The company generated sales revenue of £ 9.55 million in the 2016/17 financial year (equivalent to € 10.9 million). BRAIN has acquired a 65.6% indirect interest in the company. The remaining shares are held by the Biocatalysts management as well as a strategic investor. Put-call options on the management's shares exist.

The reception of the acquisition by the stock market was largely positive. The share price rose by around 1.7% directly after the announcement.

* In each case based on the XETRA closing price.

FIGURE 02.4 BRAIN SHARE PRICE PERFORMANCE (INDEXED)

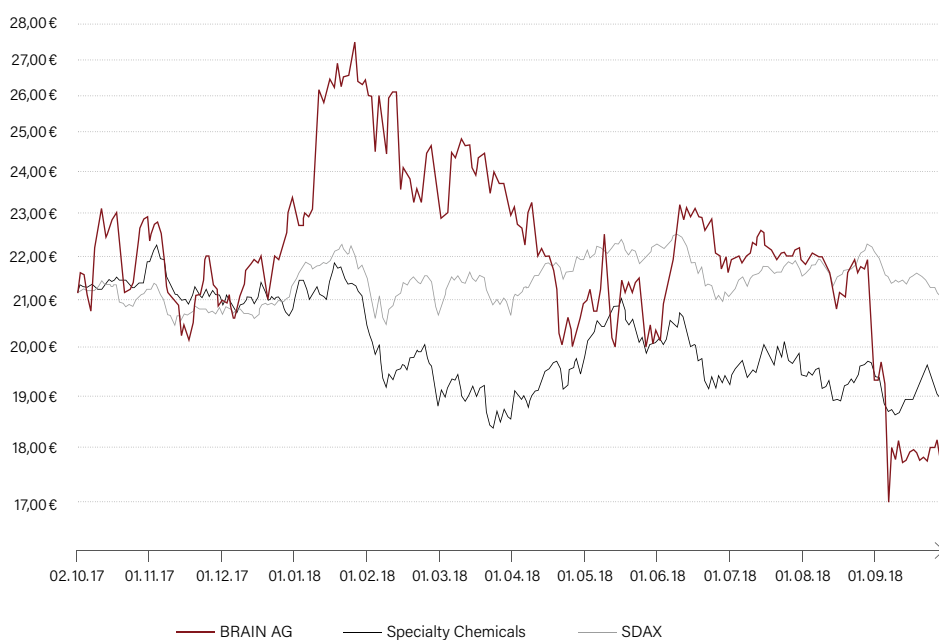


TABLE 02.1 KEY SHARE DATA

Share class	No-par-value registered shares
Stock exchanges	XETRA, Frankfurt, Berlin, Düsseldorf, Munich, Stuttgart, Tradegate
Transparency level	Prime Standard
Number of shares	18,055,782
Share capital	€ 18,055,782
ISIN	DE0005203947
WKN	520394
Ticker symbol	BNN
Specialist	ODDO SEYDLER Bank AG
Designated Sponsor	ODDO SEYDLER Bank AG
Paying agent	Bankhaus Gebr. Martin
Share price on 28.09.2018^{1,2}	€ 17.70
52-week high²	€ 27.50
52-week low²	€ 17.00
Market capitalization on 28.09.2018^{1,2}	€ 319.59 million
Average daily trading volume (52 weeks as of 28.09.2018¹)	22,438 shares/day

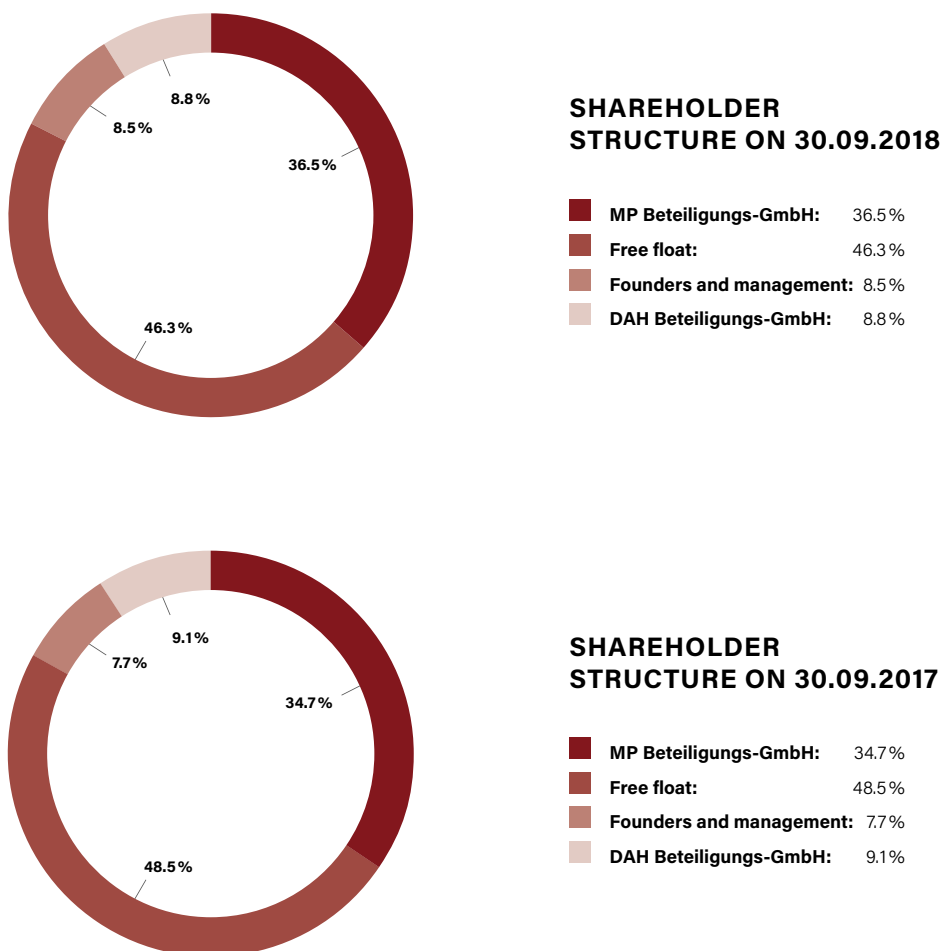
¹ Last trading day of the 2017/18 financial year.

² In each case based on the XETRA closing price.

Shareholder structure

The number of shares in issue of BRAIN AG in the 2017/18 financial year was unchanged at 18,055,782 shares. The free float stood at 46.3% as of 30 September 2018. The shareholder structure of BRAIN AG as of 30 September 2018 (and as of the previous year's reporting date) is as follows:

FIGURE 02.4 SHAREHOLDER STRUCTURE



Analysts

Estimates and recommendations relating to BRAIN AG are published by the following research houses:

Company	Analyst
Baader Helvea Equity Research	Markus Mayer, Laura López Pineda
Deutsche Bank AG	Falko Friedrichs, Gunnar Romer
EQUITS	Thomas Schiessle
ODDO BHF-Bank	Igor Kim

Financial communication

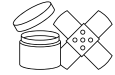
BRAIN AG is listed on the Frankfurt Stock Exchange in the Prime Standard segment of the Regulated Market, the stock exchange segment entailing the highest transparency requirements. Along with corresponding mandatory publications including quarterly statements and the half-year financial report, BRAIN informed investors, analysts and other interested capital market participants in two ad hoc announcements, 23 press announcements and 16 investor relations announcements, as well as through telephone conferences and numerous individual meetings, about the company's further development and about the bioeconomy's global growth potential. As part of roadshows, especially in January and September 2018, company representatives met with investors in Boston, New York, Frankfurt, London, Lyon, Munich, Paris, Lugano, Milan and Zürich. The focus here was on presenting the company and its future prospects to interested new investors. Company representatives were also consistently available at relevant conferences such as the ODDO-BHF Finance Conference in January in Lyon, the DGAP Spring Conference in Frankfurt/Main, the Baader Investment Conference in Munich, as well as the Equity Capital Forum in Frankfurt/Main. Financial announcements and publications as well as all other publications of relevance to the capital market are permanently available on the company's website at www.brain-biotech.de/investor-relations/.

Annual General Meeting

The second public Ordinary AGM of BRAIN AG was held on 8 March 2018 in Zwingenberg. A total of 74.89% of the share capital of BRAIN AG, which is divided into 18,055,782 shares, was represented there. The participating shareholders accepted all agenda items with mostly large majorities. Only agenda item 6 relating to "Authorized Capital" was questioned critically by some institutional investors, but was also accepted, by 76.92% of the capital present. The voting results can be viewed on the Internet at www.brain-biotech.de/investor-relations/hauptversammlungen/hauptversammlung-gj-2016-17. Votes were held concerning, inter alia, the respective discharge of the members of the Management and Supervisory boards for the 2016/17 financial year, the election of the auditor, the election of a Supervisory Board member and the creation of new authorized capital.



BRAIN innovations



Biological wound management

Aurase® is an enzymatic active ingredient developed by BRAIN for the treatment of open wounds. The active mechanism was inspired by the common green bottle fly.



2010/099955

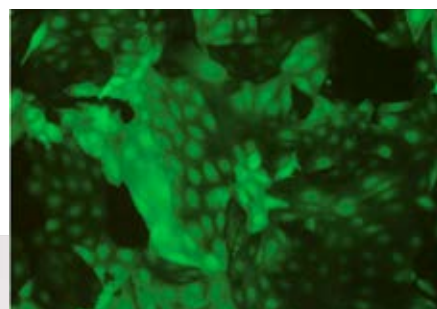
Extensive patent coverage is already in place for the commercial use of the Aurase® enzyme in 20 countries across all continents.

The number of patients with chronic wounds is on the increase due to demographic change and diet-related diseases. It is an established fact that the larvae of the common green bottle fly promote wound healing. Scientists at BRAIN decoded the mechanisms behind this healing effect and developed the Aurase® enzyme for new wound treatment products, as a less invasive alternative to potentially very unpleasant forms of treatment such as surgical debridement or maggot therapy. BRAIN is able to produce the biological active ingredient in an ultrapure form. SolasCure Ltd., a company established with BRAIN's participation, is currently preparing the certification and marketing for Aurase®.



Natural compounds for reducing perspiration

BRAIN technologies enable the development of biological deodorants and aluminium-free antiperspirants.



10 l

One individual's sweat glands can produce up to 10 liters of sweat per day.



Natural active ingredients that protect against perspiration and body odor are in great demand. These are also sought after as alternatives to products that contain aluminium and pose health risks if used in excess. Together with scientific partners, BRAIN has developed a new concept based on directly influencing primary fluid secretion in human sweat glands using natural compounds. This scientific achievement received the top award in the "Applied Research" category at the IFSCC Congress 2018, the world's major forum for insights into cosmetic science and skin biology. In the **TriP²Taste** and **TriP²Sensation** programs, BRAIN also offers unique cell-based assay systems for novel skin care products.

Calorie-free sweeteners

The **DOLCE** program is developing the next generation of natural sweeteners for healthier foods.



61 bn

The global sugar market comprises the production of approx. 185 million tons¹ and added value of more than US\$ 61 billion.²

1%

Natural sweeteners currently hold only one percent of the market.³

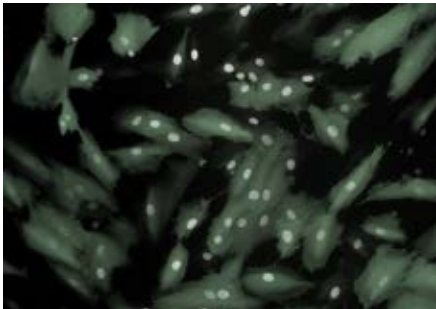
Excessive sugar consumption is a cause of illness and poses an enormous burden for health care systems. With this in mind, BRAIN launched the DOLCE program together with AnalytiCon Discovery and the French Roquette company. The core team offers food manufacturers and beverage companies the opportunity to join the programme. In early 2018, the partnership reached a key milestone by identifying and characterizing a series of highly intensive natural sweeteners and sweetness enhancers.

1 USDA 2017
 2 Finanzen.net 01/2018
 3 nutraceuticalsworld.com 2017



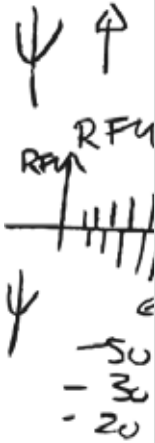
Healthy food without aftertaste

BRAIN has unique assay systems for identifying plant-based taste modulators.



5

The World Health Organization (WHO) recommends a maximum daily salt intake of 5 grams for adults.



25

Humans have about 25 bitter taste receptors, a comparatively high number. However, we have only three receptors in all for sweet tastes and umami.



Preparing healthy food is a broad field of application. Using special cell-based assay systems, BRAIN scientists in the **SALT-E** programme also devote their attention to reducing salt and fat, which can both lead to health problems if consumed in excess. Any compromises in terms of taste habits, some of which have evolutionary reasons, are to be ruled out. A bitter taste is a key issue in this connection, since it is often activated together with other taste receptors. Natural plant-based substances make it possible to develop alternative flavor carriers and mask bitter tastes.



Sustainable metal extraction in the circular economy

Microorganisms from BRAIN's BioArchives can extract precious metals from ores and waste streams with low impact and without the need for chemicals.

→ www.brain-biotech.de/bioxtractor



250

One ton of computer boards may contain up to 250 grams of gold and one kilogram of silver.



5%

of the gold produced is extracted using biological processes, but this has to be followed by chemical treatment. That is not necessary using bio-based technologies from BRAIN.

Global demand for mineral resources is constantly growing, as is the dependence of regions like Europe on precious metal and technology metal imports. At the same time, ore content in mines is decreasing, while environmental protection requirements in this sector of industry are becoming more and more stringent. Classical recycling technologies find it hard to deliver when it comes to recovering specific metal fractions from waste streams. BRAIN has developed highly efficient technologies based on special microorganisms for green and urban mining. For urban mining, these technologies have already been transferred from lab scale to demonstration scale in BRAIN's BioXtractor. For green mining applications together with CyPlus GmbH, the process has been successfully scaled up to the metric ton level.

Bio-based freshness and product stability



Nutrition & Health



Skin Care



Industrial BioSolutions

Edible plants also provide actives that combat harmful organisms. BRAIN's **FRESCO** program identifies the best candidates.

220,000

bioactive natural ingredients of plant origin have been identified and structurally categorised so far that have potential for industrial applications.

Foodstuffs are subject to stringent freshness and quality criteria. Other market segments are just as sensitive in terms of hygiene and cleanliness. Innumerable products have to be protected from infestation by bacteria, viruses or fungi. Consumers are increasingly expecting this to be achieved by means of natural and sustainably produced active ingredients. BRAIN develops the corresponding bioactive substances that can also be used for medical products and paints and for preservatives, cleaning and other household products, apart from their uses in the food and feed industries. BRAIN **PerillicActive** is a forerunner of the extensive FRESCO program and offers natural freshness based on fermented orange oil.

Facts & figures

660 bn

Market analysts expect sales in biotechnologically produced chemicals to rise from around US\$ 144 billion in 2010 to US\$ 660 billion in 2025.¹

11 %

It is expected that sales in industrial biotechnology will grow by about 11% per year from 2010 to 2025 (CAGR 2010 – 25), far exceeding the anticipated growth of about 4.1% in all chemical markets taken together (CAGR 2015 – 20).¹

355 bn

Global sales in industrial biotechnology amounted to US\$ 335 billion in 2016.²

1 m

The European Commission expects Europe's bio-based economy to create up to one million new jobs by 2030.³

> 350

BRAIN has unique product solutions and technology platforms that are protected by more than 350 patents and patent applications in some 50 patent families.

308

At the end of fiscal 2017/2018, the BRAIN Group employed a total of 308 colleagues including Management Board members, trainees and volunteers.

→ www.brain-biotech.de/en

¹ German Bioeconomy Council (December 2016); Roland Berger, Grandviewresearch (2016)

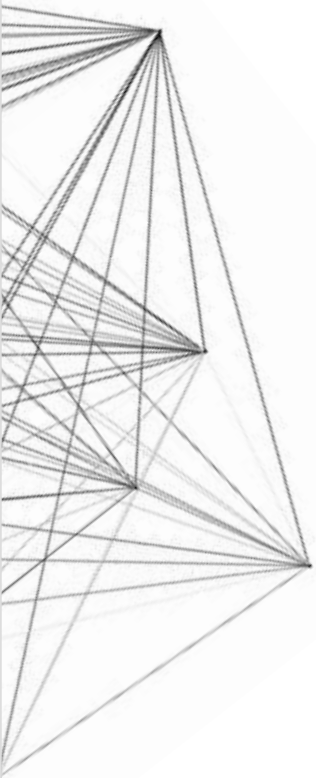
² USDA (March 2018)

³ European Commission (2018)



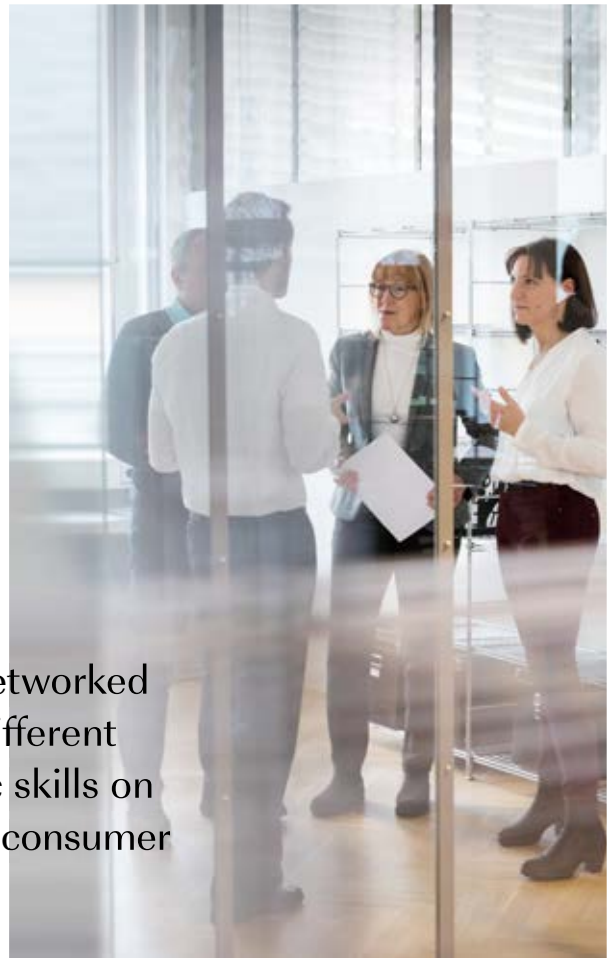
BRAIN networks

Networks dynamize value added



— Technology-driven innovation cycles are becoming shorter and shorter. This is concurrent with rapidly changing consumer wishes. Sustainable production and the goal of keeping raw materials within value chains for as long as possible and creating closed-loop material cycles have become key factors for corporate strategy planning. Research, process development, production and marketing are becoming more closely dovetailed, and development partnerships across regions and disciplines are gaining importance. More than ever, successful corporate action calls for dynamic networks that develop ideas quickly and efficiently and can bring products to market.

— The bioeconomy involves a transition towards new bio-based products that offer both economic and environmental benefits and are accepted by society. Rapidly evolving biotechnologies have become a driver of innovation in a wide variety of industries. Innovations no longer follow linear value chains to the markets. Instead, new networks are arising to generate value added, and BRAIN embodies a key nexus in this context.



“We are witnessing an increasingly networked and cooperative interplay between different technology approaches and scientific skills on the one side and large ingredient and consumer goods industries on the other.”

Dr. Jürgen Eck — CEO, BRAIN AG



> 100

BRAIN has entered into over 100 exclusive research cooperation arrangements with industrial partners.

> 50

BRAIN currently cooperates with more than 50 partners in different academic networks.

Innovations emerge from strategic alliances

— Scientific and technical challenges can best be tackled by interdisciplinary teams, as is shown by the **NatLifE 2020** and **ZeroCarbFP** alliances which BRAIN coordinates.



8

Eight strategic alliances supported by BMBF have meanwhile been established as part of the German Industrial Biotechnology Innovation Initiative.

NatLifE2020



The **Natural Life Excellence Network 2020** that is supported by the German Federal Ministry of Education and Research (BMBF) has been working since 2013 to develop sustainable production processes and new test systems for innovative bioactive ingredients, proteins and small molecules for the food and cosmetics industries. Both NatLifE 2020 and ZeroCarbFP are subdivided into a research, a development and a pilot phase of three years each.

2.4 bn

The Industrial Biotechnology Innovation Initiative started working in 2011 as the first BMBF promotion measure within the BioEconomy 2030 National Research Strategy, with an overall volume of € 2.4 billion.



The **ZeroCarbonFootPrint** alliance supported by BMBF aims to transform residual and waste streams into new valuable materials that can be put to industrial use. These are bio-based additives for manufacturing high-tech oils or functional biomass for sustainable ore processing and metal recycling processes. The aim is to establish intelligent material cycles that keep the utilized resources within value chains after their primary use.

“Secondary and waste streams such as flue gas or waste incineration ash contain masses of carbon. The ZeroCarbFP alliance aims to harness new technologies for transforming these resources into new industrial building blocks.”

Dr. Guido Meurer — Unit Head Producer Strain Development



Networks are part of BRAIN's DNA

— The networking and open innovation concept that is widely practised within academic research is literally part of the DNA of BRAIN, which began life as a university student start-up.



6

Since 2008, BRAIN employees have undergone continuing professional development in a total of six different courses of study or this is still ongoing.

A key component of the work performed by BRAIN scientists is to exchange the latest insights into highly specialized subject areas with scientists at international research institutes. In some cases, the industrial applications of these findings will only transpire in the distant future. Based on initiatives like these that are also fostered within BRAIN's alumni network, specific cooperation arrangements emerge, such as BRAIN's ongoing research cooperation with Mannheim University in the **M²Aind** project for new high-resolution real-time screening technologies for three-dimensional skin spheroids.

BRAIN is regularly represented at international trade shows and conferences to maintain industrial networks, explore the market and customer needs, and to present its own product and cooperation offerings. BRAIN's excellent reputation in the fields of bioeconomy and industrial biotechnology also leads to valuable invitations to discussion forums such as the **German Biotech Days (DBT)** and the **Global Bioeconomy Summit** in Berlin in April 2018.



BRAIN is involved in a large number of projects that aim to promote young professionals. For instance, BRAIN is a partner of the one-week **"Biotechnology inventor lab"**, which is initiated by the Zentrum für Chemie e.V. and supported by Goethe Universität Frankfurt, the German Chemical Industry Association (VCI) and the Government of the Federal State of Hesse. Students in MINT research projects are supported in **regional talent networks**. School classes and groups of students often visit BRAIN to learn about the company's research through technical presentations and guided visits to the labs, and to receive career guidance in the field of biotechnology. Added to this are presentations at graduate school events and workshops for doctoral students for the purpose of academic training.

2

young women commenced training in BRAIN's first biology laboratory technician course in 2018. Since 2016, the company has offered an independent course of training for office management assistants.

15

Since 2005, 15 young people have received commercial training in various training associations and more than 15 others have undergone company assignments at BRAIN under a partnership with Merck KGaA since 1999.



Facts & figures

11

partners from industrial enterprises, medium-sized companies and academic research are currently working together in the ZeroCarbFP alliance coordinated by BRAIN.

22

alliance partners are currently cooperating in the NatLife 2020 alliance coordinated by BRAIN.

> 150

Since 1996, BRAIN has mentored more than 150 student dissertations and internships.

20

Students of various natural science disciplines have been involved and promoted for more than 20 years.

50 %

of the workforce have been with BRAIN in Zwingenberg for more than eight years.

> 60

different types of qualification are held by BRAIN employees.

→ www.brain-biotech.de/en

06

Further information

Contact and imprint

The following contact person is available to respond to your queries:

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Financial calendar

28 February 2019 **Publication of the quarterly report for the period ending 31 December 2018 (3M)**

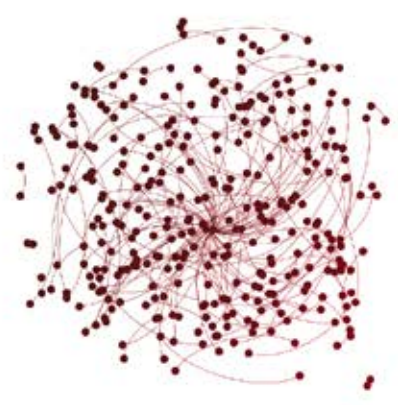
07 March 2019 **Annual General Meeting, Zwingenberg**

31 May 2019 **Publication of the interim report for the period ending 31 March 2019 (6M)**

30 August 2019 **Publication of the quarterly report for the period ending 30 June 2019 (9M)**

Disclaimer

This report might contain certain forward-looking statements that are based on current assumptions and forecasts made by the management of the BRAIN Group and other currently available information. Various known and unknown risks and uncertainties as well as other factors can cause the company's actual results, financial position, development or performance to diverge significantly from the estimates provided here. BRAIN AG does not intend and assumes no obligation of any kind to update such forward-looking statements and adapt them to future events or developments. The report can include information that does not form part of accounting regulations. Such information is to be regarded as a supplement to, but not a substitute for, information prepared according to IFRS. Due to rounding, it is possible that some figures in this and other documents do not add up precisely to the stated sum, and that stated percentages do not reflect the absolute figures to which they relate. This document is a translation of a document prepared originally in German. Where differences occur, preference shall be given to the original German version.



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