BRAIN Biotech AG

Creating a #BiobasedFuture

Investor Relations Presentation 2021

Zwingenberg, September 2021

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BRAIN at a Glance

~ €38m
'19/'20 Revenues

> 28
Years of Experience

~ 320
Employees

> 130
Specialty B2B Products

> 100
Industrial Partnerships

2016
Listed, Frankfurt Prime Standard

Creating Breakthrough Bioproducts & Solutions for Nutrition, Health and Environment

Industrial Biotech (white)

Three Product Platforms

- **Enzymes**
- **Microorganisms**
- **Bioactive Natural Compounds**

From Lab to Production

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Mission & Vision

"Mission is what an organization is or does. Vision is what an organization desires to become"

Mission

Creating Breakthrough Bioproducts and Solutions for Nutrition, Health and the Environment

Vision

We will be the **Industrial/White Biotech Specialists** in finding and exploring high-value niches in our products business and novel solutions in our science business. We will be much more agile than others and will always look to produce products in-house or with partners

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When Should You #Think BRAIN?

in the center of mega-trends

Health & Nutrition

Vegan & Vegetarian Food: Alternative Protein Base
(Precise Fermentation / Microbial Production Hosts)

Healthy & Better Tasting Beverages:
Natural Flavors (like NatBev 1 & 2)

All Natural Preservatives:
Perillic Active from Fermented Orange Oils

Calorie-Free Natural Sweeteners:
Plantbased Sweeteners (Brazzein, Sweet Box)

Healthy Food:
reduction of salt in foods (SALT-1)

Biological Wound Care:
Biological Wound Management (Aurase/SolasCure)

Creating a BiobasedFuture

Genome Engineering:
Novel Non-Cas9 Nucleases

Biological Production:
Enzymes & Large Scale Fermentation

Environment

BioMining:
Sustainable Metal Extraction (Urban Mining)

Biological Production:
Enzymes & Large Scale Fermentation

Making Waste Valuable:
Fermented Food from Side Streams
Microbial CO_2 Usage

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This is BRAIN

BRAIN Biotech AG

Breakthroughts & Services

BioScience

Incubator	Tailor Made Solutions	BioActive Compound Libraries
Breakthrough Discoveries Nutrition/Health/Environm. Big Societal Themes Focused Pipeline Own&Partner Investment	Discovery Characterization Cellular Biology Bioprocess Development Gene/Protein Engineering Strain Development/Opt.	Proprietary Bio-Archive Bioprospecting Discovery Customized Search Third-Party Access
~ €5m-€7m Annual Investment	~ €13m Annual Revenues* Profitable Cost-plus Contract Research, Milestones, Technology & License Fees	

B·R·A·I·N

AnalytiCon discovery
The Natural Product Company

SolasCure
Spin-Out, 41% stake

Products

BioIndustrial

Enzymes	Microorganisms	Bioactives

Nutrition, Healthcare, Environment, Cosmetics
Large Scale Fermentation
Formulating/Blending
Production Scale-up
Cell Factories
Fermented Foods / Precise Fermentation

~ €25m Annual Revenues
~10% adj. EBITDA Margin*

BIOCATALYSTS
exceeding enzyme expectations

WeissBioTech

BIOSUN
FLAVORS & FOOD INGREDIENTS

L.A. SCHMITT
Kosmetik seit 1925

*FY ‘19/’20

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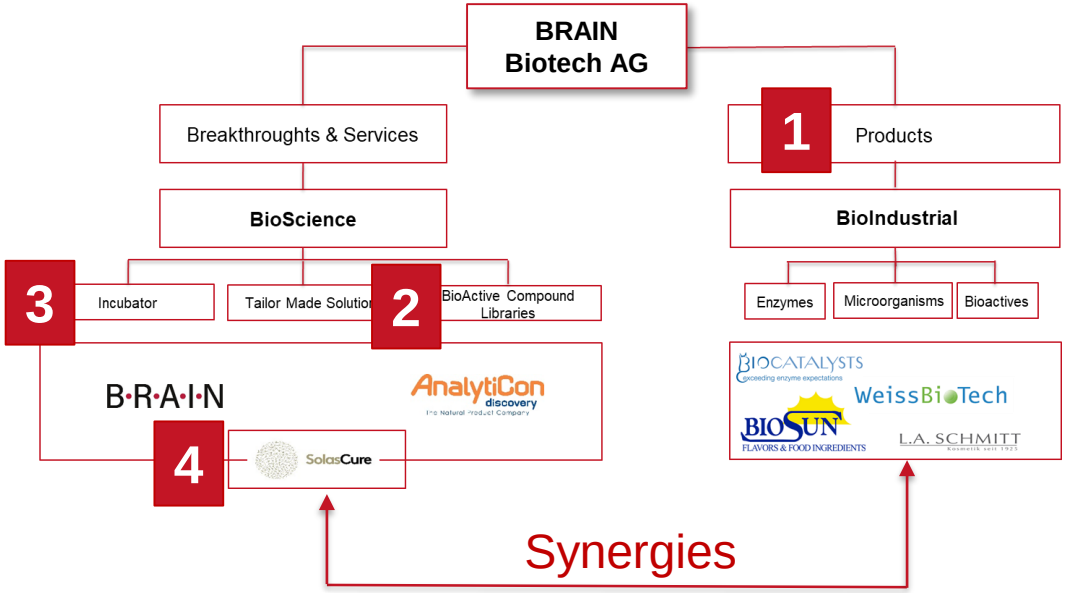
BRAIN Group

Value Creation & Synergies



- Integrated value chain from lab to production
- Industrial Scale-up and application know-how
- In-house strain optimization & development
- Customer strain development & Bio Process
- Variable scientist pool for internal/external projects
- TMS creates strong industrial network
- Utilize TMS knowledge for Incubator Projects and alternative use-cases
- Shared corporate services & financing

1 Products Business

- Focus on high-growth & high-margin niches
- Re-shape from a purchase for resale to an own production model
- Strong target markets with healthy sales and margin growth in F&B, healthcare and environment

2 TMS /Libraries Business

- TMS: longer term contract research programs (average duration 2 years); strong industrial partner network; rich pipeline of possible new projects
- Libraries: main customers from food, pharma & cosmetics industries. Access fees and upside from milestone payments / license income

3 Incubator

- Focus on breakthrough products with a strong societal impact
- Significant value creation from development to launch
- De-risk R&D with partners and public funding
- Dynamic pipeline: mature products marketed, new products will enter

4 SolasCure

- Innovative enzymatic wound care
- Spin-out, 41% participation
- IP for enzyme Aurase owned by BRAIN
- All options open to crystalize value from stake-holding

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Six Strong Reasons to Invest in BRAIN

1. **Mega-trends / UN-SDGs:** our products address the big societal topics – nutrition, health & the environment. We address at least 5 SDGs directly
2. **Incubator products:** big upsides in our breakthrough inventions
3. **BioIndustrial:** BRAIN is very well positioned to capture high-growth and high-margin niches in its products businesses. We will re-shape our BioIndustrial business and move from a purchase for resale model to an own production model, this creates significant margin and therefore value upside
4. **Strong target markets:** solid target markets for our services & products with CAGRs above GDP and strong EBITDA margin levels also allow BRAIN to harvest healthy sales and margin growth
5. **Value accretive M&A:** space for bolt-on acquisition to accelerate growth with the possibility for transformational growth through larger M&A
6. **R&D:** ability to fund research with partners and from governmental grants to de-risks our own R&D effort and preserve valuable cash

Six Major Triggers for strong Revenue and Margin Growth

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BRAIN: At the Heart of UN SUSTAINABLE DEVELOPMENT GOALS

Our Products & Solutions address at least five goals directly

WE SUPPORT

UN GLOBAL COMPACT

Since 2021 we have been committed to the UN Global Compact corporate responsibility initiative and its principles in the areas of human rights, labour, the environment and anti-corruption.

- Natural compounds for food preservation

- Sugar replacement / Sugar taste enhancer
- Salt replacement / Salt taste enhancer
- Natural aromas
- Wound treatment
- Bioactive plant cosmetics

- Green mining

- Green Mining
- Urban Mining

- Biological production
- Improving production efficiencies
- Fermented food from sidestreams
- Microbial CO_2 Usage

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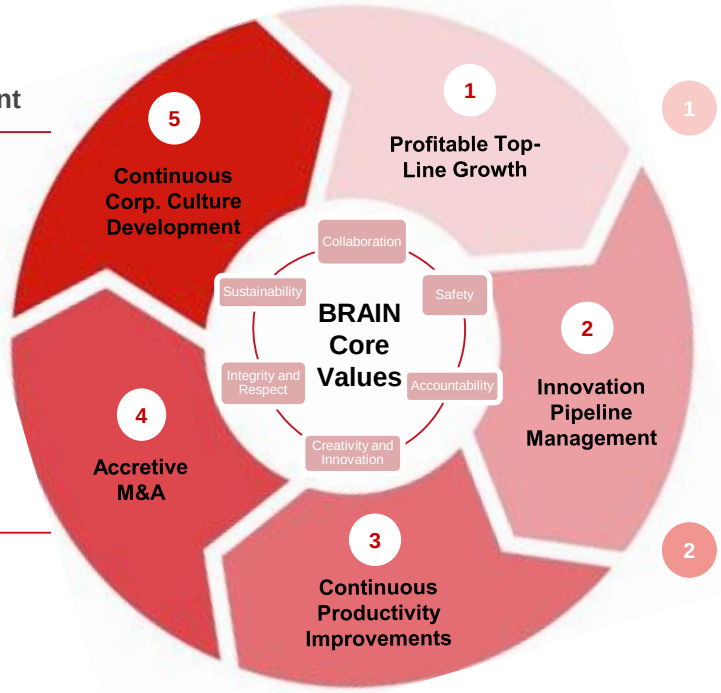
Five Strategic Initiatives Centered Around our Core Values



5 Continuous Corp. Culture Development

- Can do and high ethics culture
- Talent management
- Innovation is our passion
- Teamwork is our basis
- Sustainability as a guiding principal

1 Profitable Top Line Growth

- Excel in specialty niches with high margins
- Selectively grow outside of Europe
- Always look for ways to produce ourselves

4 Accretive M&A

- Successful track record of integrating acquired entities
- Further build with bolt-on acquisitions
- Transformational M&A in adjacencies

2 Innovation Pipeline Management

- Balanced portfolio across markets and technologies
- Breakthrough solutions for big challenges for accelerated growth
- Key customer and application focus

3 Continuous Productivity Improvements

- Strain development
- Focus on working capital efficiencies, cost improvements and free cash flow
- Group revenue synergies
- Bio-Informatics

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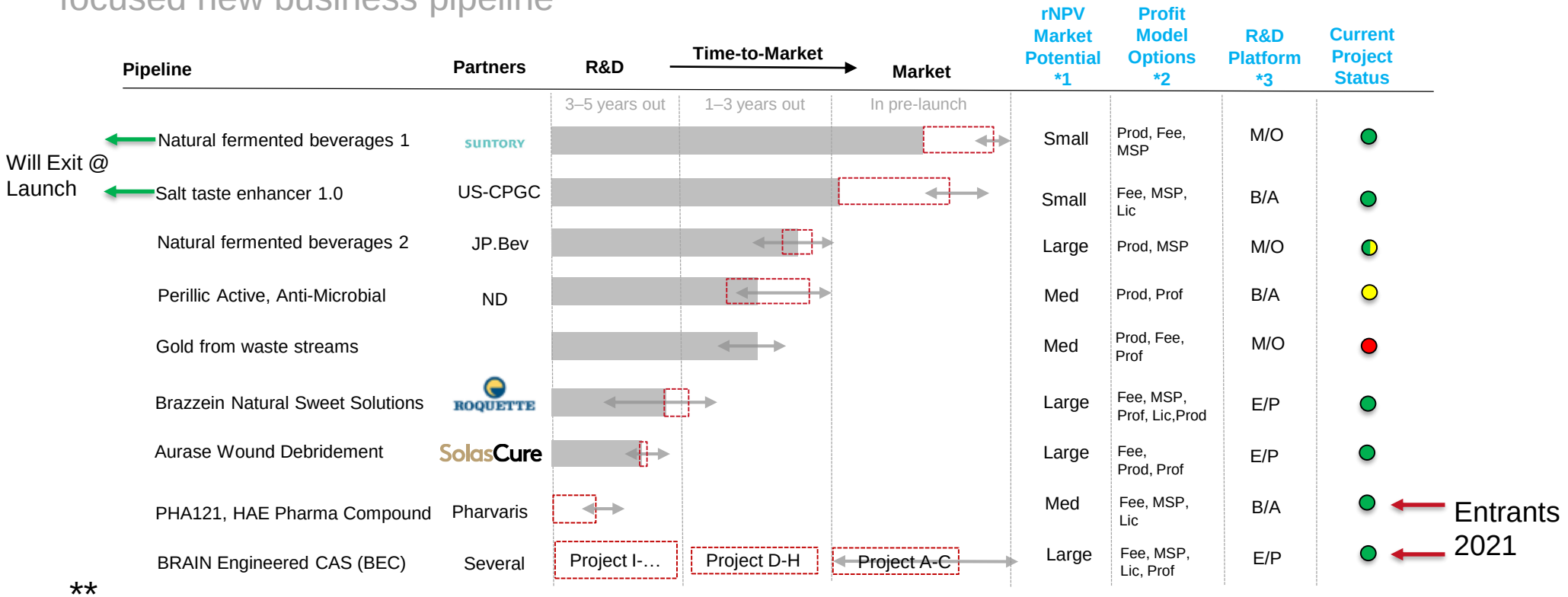
Our Incubator

focused new business pipeline**



**

- Projects Green Metal Mining, Sweet Taste Enhancer and CO_2 moved to TMS business, fully funded programs
- Projects Salt-E, Fresco shelved, searching for partners
- New enzymes now part of BioIndustrial regular product development, see page 13

Progress since CMD '20, update '08/21

- Programs without contractually bound partners are marked red by default
- Contractual, technology or registration hurdles still need attention
- Phase 1 has been successfully completed but contract negotiations for the next development phase are progressing but not yet finalized

1: BRAIN-Group rNPV FCF+TV: Small < €5M, Medium €5M - €15M, Large: €15M+
2: Prod: Product sales. **Fee:** Research fee income. **MSP**: Milestone payments. **Lic**: License/royalty payments **Tec**: Tech fees **Prof**: Entity formation or profit participation
3: B/A: BioActives,E/P: Enzymes and proteins, M/O: Microorganisms/starter cultures
ND: not disclosed

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Microbial CO_2 Usage

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Enzyme Production: Specialists in Industrial Food Processing with high Growth Rates

Customized Novel Enzymes

From the Lab to Production

- Discovery
- Development
- Testing
- Regulation/Compliance
- Commercial Production

Enzymes

- Bio Tech Approach to Production
- Facilitate Reactions
- Solve Process Problems
- Prevent Waste
- Alcohol/Bioethanol, Cereal, Egg, Dairy, Diagnostics, Digestives Aids, Fruit, Meat, Protein, Vegetable
- Continuous new enzyme product pipeline

Brand	Enzyme Class	Application	Affiliate	Growth YOY
Flavorpro TM	Protease/Lipase	Flavour creation	BIOCATALYSTS	
Flavorpro TM	Protease/Lipase	Dairy hydrolysates	BIOCATALYSTS	
Promod TM	Protease	Plant hydrolysates	BIOCATALYSTS	
DELTAZYM TM	alpha-Amylase	Starch Liquefaction	WeissBioTech	
DELTAZYM TM	Glucoamylase	Starch hydrolysis, BioEtOH	WeissBioTech	
NATUZYM TM	Pectinase	Fruit&Vegetable processing	WeissBioTech	
Depol TM	Cellulase/ Pectinase	Fruit&Vegetable processing	BIOCATALYSTS	
Lipomod TM	Lipase	Dairy	BIOCATALYSTS	
DELTAZYM TM	HS alpha-Amylase	Starch Liquefaction	WeissBioTech	

<10 % | 10-20 % | >20 %

We cover the full value chain from lab to production

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We will create Value Upside by Re-Shaping the Supply Model

Moving from a Purchase for Resale Model to own Production & Fermentation

Strong Position Today:

- Biocatalyts & WeissBioTech are strong production assets
- Biocatalysts has an existing profitable fermentation business
- Well established sales channels
- Strong supply channels
- Core competence in customized enzymes
- Main focus formulation & blending

Creating Value Upside:

- Increased **in-house capacity** and production
- **Extend share of wallet** and life-cycle harvesting
- Fermentation enjoys **higher margins** and strong barriers to entry
- **Novel enzymes and fast copies**
- **Efficient production hosts**

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Management & Employee Incentives

Since the IPO BRAIN Biotech AG's board as well as management compensation has been closely linked and aligned with shareholder interests

Executive Board

- fixed salary
- variable component based on individual quantitative & qualitative targets
- stock component, see ESOP

ESOP, Employee Stock Ownership Program

- Since June 2018
- Board, managers and employees
- Incentive and retainer
- Details: see appendix

CoPerBo, Corporate Performance Bonus

- Since FY 2015/16
- Applied for employees at BRAIN Zwingenberg
- Partially share prices based
- Details: see appendix

Specific Incentives at Daughter Companies

- See appendix

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Financial Highlights at a Glance

strong BioIndustrial (ex WBT), sequentially improving BioScience

(in € thousand)	9M 2020/21	9M 2019/20	Growth	Organic Growth	Q3 2020/21	Q3 2019/20	Growth	Organic Growth	Comment
Revenues	27,845	29,554	-5.8%	-11.2%	9,844	9,625	2.3%	-5.5%	
BioScience	7,416	10,476	-29.2%	-29.2%	2,742	3,642	-24.7%	-24.7%	Milestones 655K 9M 20/21 Milestones 1.17Mio 9M 19/20
BioIndustrial	20,566	19,127	7.5%	-0.9%	7,158	6,025	18.8%	6.4%	all solid growth, except WBT
Total operating performance (1)	29,966	30,310	-1.1%	-9.5%	10,167	10,121	0.5%	-16.1%	
Adjusted EBITDA (2)	-2,238	-553	-304.7%	-337.3%	-223	161	-238.7%	-304.9%	(-) EUR 511K ESOP 9M (-) EUR 170K M&A Cost 9M (+) EUR 858K Badwill
EBITDA	-2,061	-907	-127.3%	-241.8%	-495	-38	-1194.7%	-3718.1%	
EBIT	-5,008	-3,511	-42.7%	-72.2%	-1,556	-902	-72.5%	-179.4%	
Net Result	-2,942	-6,108	51.8%	34.8%	-1,902	-1,555	-22.3%	-84.4%	
Operating Cash Flow	-3,000	-5,734	47.7%	41.7%	1,157	-1,593	172.6%	165.1%	
	30.06.2021	30.09.2020							
Cash	7,249	18,943	-61.7%	-64.4%					

	9M 20/21	9M 19/20	Growth	Organic Growth
Number of Employees	289	283	2.1%	0.0%
Material Expense Ratio	44.6%	41.4%	3.2% PP	1.7% PP
Adj. Personnel Expense Ratio	50.7%	45.6%	5.1% PP	7.2% PP

➢ CRISPR investments @ 9M ~€1 million

Major Events 9M '20/'21:

- **BioSun** now consolidated for two quarters, happy with development, growth ~+13%YoY
- **BioIndustrial total** solid double digit growth excl. WBT
- **WBT** remains in restructuring, 9M sales ~ (-) 30%
- **BioScience** sequential growth Q2 on Q1 and Q3 on Q2 but still suffering from very weak Q1 20/21 and high base Q1 19/20, lower milestones, order book keeps improving
- Costs of BioSun purchase/ integration EUR 170K

(1) Revenues + change in inventories + other income + R&D grants
(2) The full reconciliation from adjusted to unadjusted EBITDA can be found in the appendix

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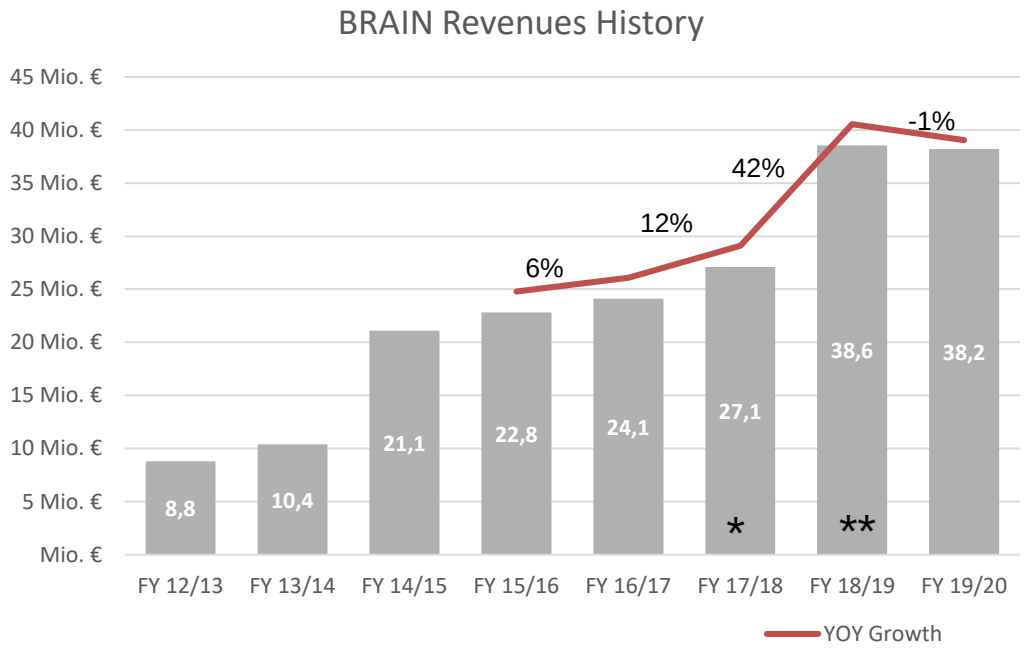
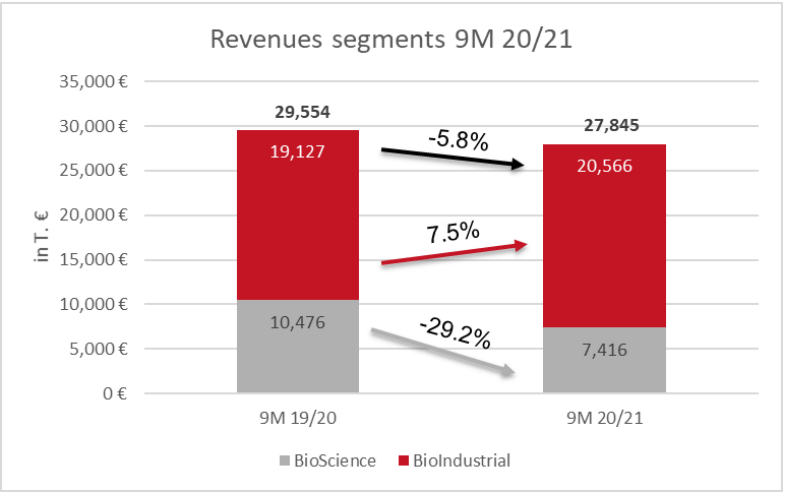
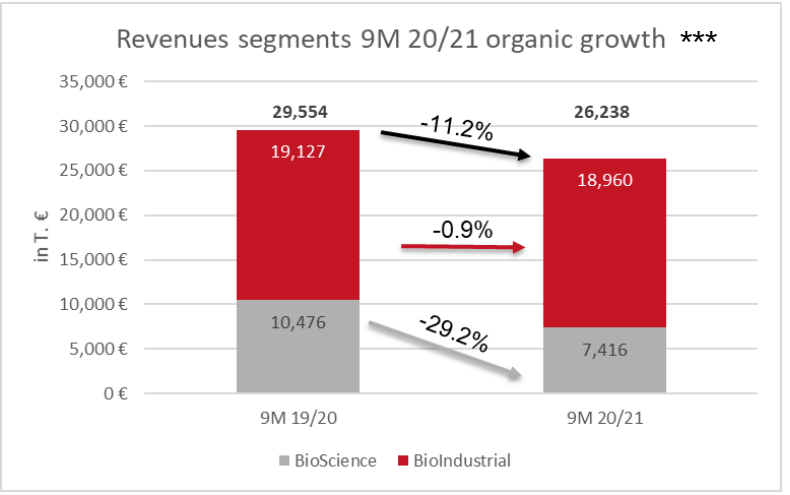
Strong Long-Term Revenue Growth Trajectory







*purchase BioCatalysts Ltd. **divestiture Monteil Cosmetics ***BioSun integration from Q2 20/21

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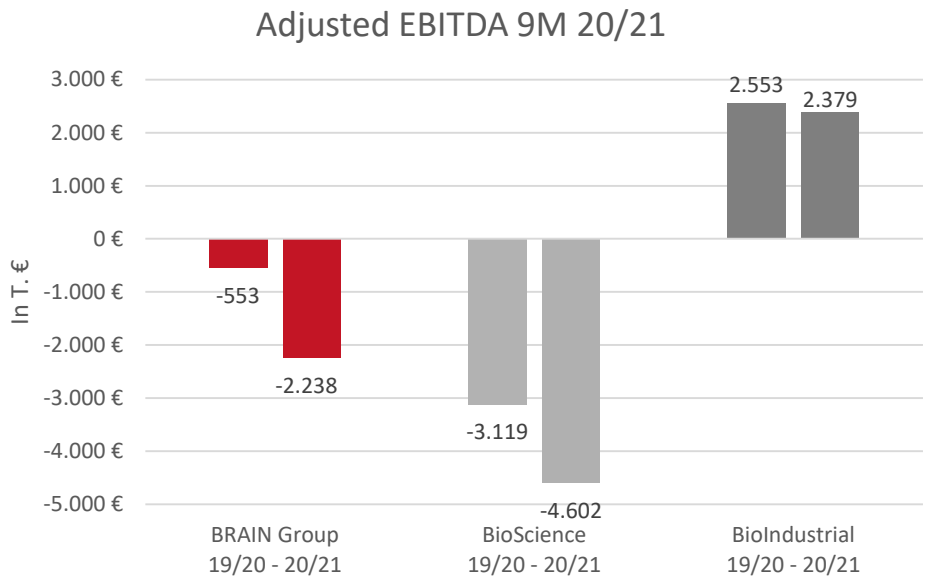
Adjusted EBITDA



- **Group** adj. EBITDA down YoY; driven mainly by the segment BioScience which had a high YoY comparison base (especially in Q1) and lower milestone payments
- **BioScience:** further sequential improvement Q3 on Q2; last year large payments related to two projects in Q1; lower milestone payments 9M; TMS backlog keeps rising
- **BioIndustrial** all group companies strong except ongoing weakness at WeissBioTech

➢ CRISPR investments @ 9M ~€1 million

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Cash & Cash Flow

improving OCF, lower investments as guided, Biocatalysts minority purchase

(in € thousand)	9M 2020/21	9M 2019/20	Growth	Q3 2020/21	Q3 2019/20	Growth	Comment
Gross Cash Flow	-4,061	-4,610	11.9%	-924	-1,145	19.3%	
Operating Cash Flow	-3,000	-5,734	47.7%	1,157	-1,593	172.6%	
Investing Cash Flow	-1,999	-4,548	56.0%	-574	-76	-651.9%	
Financing Cash Flow	-6,826	13,914	-149.1%	-5,291	14,091	-137.5%	purchase BioCats minority €4.5 Mio
Net change in Cash & Cash Equivalents	-11,824	3,632	-425.5%	-4,708	12,422	-137.9%	
	30.06.2021	30.09.2020		31.03.2021			
Cash	7,249	18,943	-61.7%	11,952			
Equity	24,142	26,143	-7.7%				

- EUR 7 million undrawn credit facility available
- Considering all financing options

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Covid-19 Update

TMS backlog increasing, BioIndustrial strong (ex WBT)

Summary:

BRAIN Group: some negative Covid-19 effects materialized on FY ‘20/21. Now positive trend in the business development pipeline.

Current Disruptions: SolasCure is facing around 9 months delays in clinical trials as the relevant test centers have been closed for non Covid-19 patients. Phase 2a clinical trials (in human) started in May. Lower sales volumes of enzyme products to ethanol and beer/wine producers at WeissBioTech.

Future Challenge: travel restrictions and physical distancing make it more challenging to visit customers for new projects (BioScience). Our business development team is working here with creative solutions and trying its best to keep effects on the commercial project pipeline as low as possible. Managing operational challenges and the turnaround at WeissBioTech.

Secure:

- Health aspects
- Supply chain
- Operating business
- Future pipeline

Targets:

- Safety of employees
- Business continuity
- Minimize disruptions
- Fulfill customer contracts

Measures:

- Vaccination @ work
- Covid-19 task force
- Hygiene concept
- Corona quick testing
- Masks on premises
- Air Filters
- Personal safety supplies
- Physical distancing
- Home office
- Strict travel restrictions
- Flex work
- Digitalize workflow

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Current Management Focus

- Prepare organization for future growth and profitability ✔
- Introduce new organizational structure ✔
  - Focus Business Development (Sales) ✔
- Business prioritization in the new business development pipeline ✔
- Performance manage group companies ✔
- Execute bolt-on value enhancing M&A transactions ✔
- Accelerate development on BEC and evaluate own company formation ✔

- Build M&A pipeline ✔
- Enzyme host organism optimization & development ✔
- Secure new public R&D Funding ✔
- Upgrade HR process: performance management & talent development ✔
- Introduce group benchmarking and best-practice transfer
- Create a sustainability report, prepare organization for ESG reporting
- Centralizing of corporate functions over the mid-term

✔ Accomplished
✔ In progress

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Our Targets

Guidance and Mid-Term Targets

This FY Guidance, Unchanged

(excluding CRISPR investments)

- **CRISPR** associated nuclease investments will be detailed and separately reported from FY ‘21/’22
- **Group Sales** EUR 37-40 million
- YoY **EBITDA improvement**
- **BioScience** below previous year as guided
- **BioIndustrial** slower growth than expected due to COVID-19 impacts and operational challenges at WeissBioTech; other BioIndustrial companies performing to or above plan

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- **CRISPR investments** in FY ‘20/’21 ~EUR 1.3-1.7 million

Mid-Term Targets, Unchanged

(issued 09/‘20, 4-5 year targets)

(excluding CRISPR)

Double group revenue from base ‘18/19

- ➢ Double digit topline product CAGR
- ➢ Accretive M&A
- ➢ Contract research “TMS” proportionally reduced (excl. milestones)

Group adj. EBITDA margin 15% (+/- 5PP)

- ➢ Double digit fermentation production volume of customized novel enzymes
- ➢ Mid single digit annual productivity improvements

Proportion of new product sales: ~30% of total revenues

- ➢ Continuous innovation pipeline management

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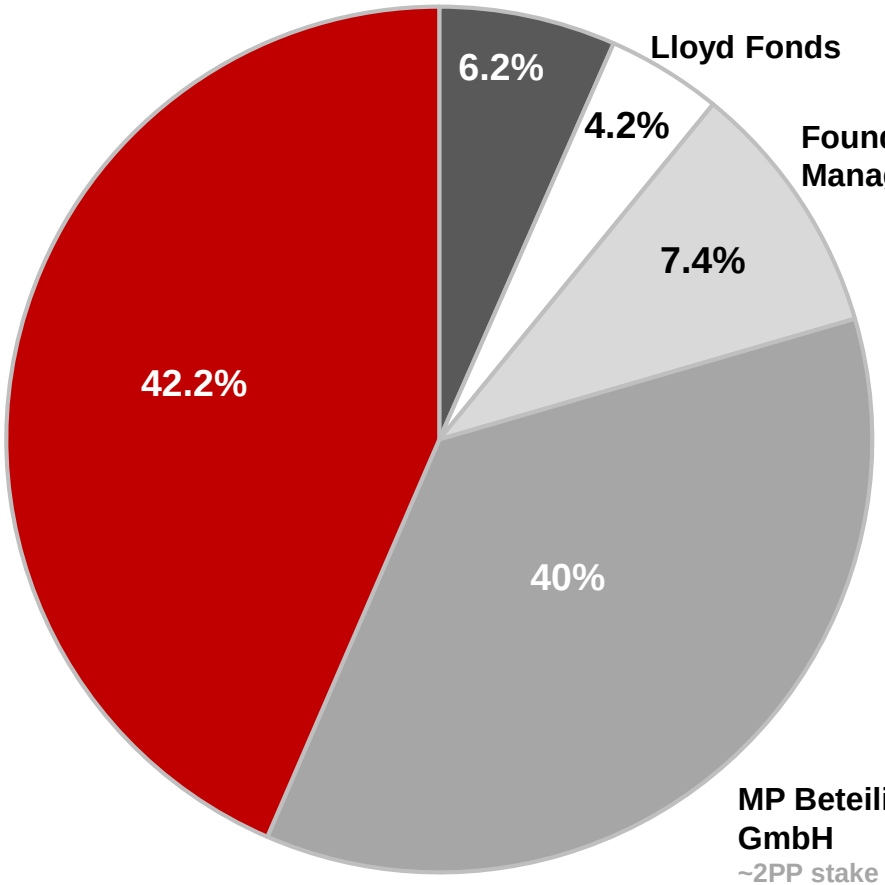
Our Share Ownership*



- Number of shares: 19,861,360
- Free float of ~ 42%
- Strong long-term investor base
- ~ 8,400 shareholders
- WKN 520394 / ISIN DE0005203947
- Symbol BNN
- Prime Standard; Frankfurt/M

*June 30th, 2021

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Financial Calendar

Capital Markets Day 2021
Focus Brain Engineered Cas
September 3rd ,2021

QUARTERLY STATEMENT
Publication of the quarterly statement as of June 30th, 2021 (9M)
August 30th, 2021

FISCAL YEAR STATEMENT
Publication of the annual report as of September 30th, 2021 (12M)
January 17th, 2022

QUARTERLY STATEMENT
Publication of the quarterly statement as of December 31st, 2021 (3M)
February 23rd, 2022

ANNUAL GENERAL MEETING
Annual General Meeting (FY 2020/21)
March 9th, 2022

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Thank you for your attention.

BRAIN Biotech AG
Darmstädter Straße 34−36
64673 Zwingenberg, Germany

+49 (0) 6251-9331-0
www.brain-biotech.com

Your contacts:

***Michael Schneiders**, Head of IR & Sustainability*
+49 (0) 6251-9331-86
MiS@brain-biotech.com

***Martina Schuster**, IR*
+49 (0) 6251-9331-69
MS@brain-biotech.com

@BRAINbiotech

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Strong Sustainability Contributions

BRAIN is empowering the biological transformation of the industry

- Industrial biotechnology is at the heart of the Bioeconomy
- Utilize natural raw materials efficiently
- Improve industrial manufacturing processes to become more sufficient
- Create new biobased products
- Make consumer goods healthier and more effective
- Move away from fossil raw materials towards sustainably produced natural resources
- Safe energy compared to chemical processes
- Significantly less CO_2 emissions
- Focus areas: **nutrition, health and the environment**
- Powered by **our proprietory BioArchive**, driven by our deep R&D and process knowledge

Selected products and solutions

- **Food:** Reduce calorie density in foods by natural sweeteners while maintaining the taste profiles; reduce the salt content in food
- **Good Health:** functional probiotics, replace chemicals in cosmetics by natural compounds; treatment of chronicle wounds
- **Water/Sanitation:** replacing chemicals by biological metal extraction from e-scrap, incinerator bottom ash and other mineralic resources
- **Industry Innovation:** improving production efficiency; reducing CO_2 emissions and using CO_2 as a raw material
- **Responsible consumption:** reducing the perishability off food by bioactive antimicrobials to reduce food waste
- **Sustainable Production:** managing pollution, transforming waste streams into unprecedented value chains

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Trends – Where BRAIN Can Make a Difference

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Corporate Governance

Principles and policies defining BRAIN's responsible operations

- Dual German AG structure consisting of a management board and a fully independent supervisory board
- We comply with all statutory corporate governance regulations as well as the recommendations of the German Corporate Governance Code (DCGK) (exceptions specified and justified in the statement of conformity)
- BRAIN Biotech AG Code of Conduct
- BRAIN's Privacy Statement
- BRAIN's Disclosure Policy
- Quality, Health and Safety Policy
- Financial responsibility: BRAIN's operations produce added value to different stakeholders in the countries we operate
- Financial benefits are shared between, among others, suppliers, personnel, owners and the public sector
- Internal compliance: qualified internal compliance officer, permanent risk assessment, audit committee, internal audit team and risk reporting
- Monthly reporting and audit meetings with the subsidiaries
- Member of the following associations: Bio Deutschland, Dechema, IWBIO, VCI

BRAIN's most important responsibility themes: healthy & natural, product safety, responsible business conduct, workplace safety

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High Barriers to entry

Our novel products & solutions are based on:

- **Proprietary BioArchive with >450 person years to reproduce**
- Extensive patent portfolio, around 175 patents granted and around 40 patent families
- Trade secrets
- Broad and deep technology know-how in enzymes, microorganisms and bioactive natural compounds
- Ability to express target compounds in bacteria, yeast or fungi
- Full process capabilities from the lab to production
- Strong industry partner network with over 100 partner collaborations successfully completed
- Strategic alliances for new business development
- Strong scientific and university network
- State-of-the-art technology portfolio
- Our people: first class scientists and process specialists

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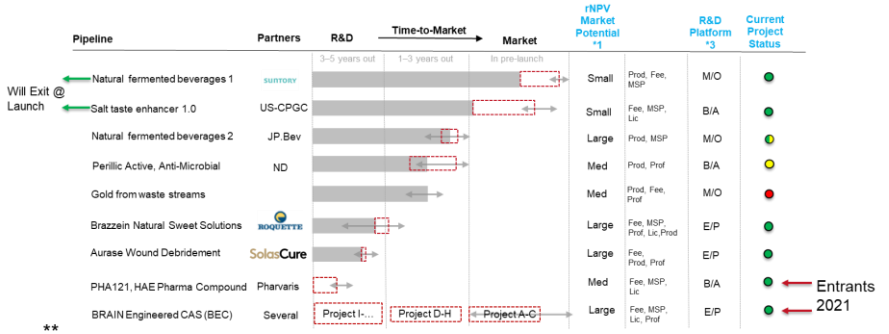
NBD Deep Dive, The Pipeline

Large Market Potential



Natural Beverage 2

- Partners: Japanese Beverage Company
- Scope: undisclosed, confidentially agreement
- Exclusive to partner
- Technology Platform: microorganism
- Research Business Model: milestone payments
- Commercial Model: starter cultures, production, license fee, JV an option/profit share

Dolce Natural Sweet Solution

- Partners: BRAIN, AnalytiCon Discovery, Roquette
- Scope: program for the discovery, development, approval and commercialization of new natural sweet solution
- Members get first-hand access to desired application and access to our SweetBox and Human Tounge Cell technology derived sweetener and sweet taste enhancer candidates
- Technology Platform: BioActive and process development
- Research Business Model: tech access fee, annual membership fee, success fees
- Commercial Model: currently in negotiations

Aurase

- Partners: Spin-off SolasCure
- Scope: innovative wound debridement agent for the cleaning of chronic wounds
- Exclusive development through SolasCure, IP at BRAIN
- Technology Platform: enzyme/proteins
- Research Business Model: fees, technology transfer
- Commercial Model: spin-off, exit optionality, production through BRAIN (independent from owner)

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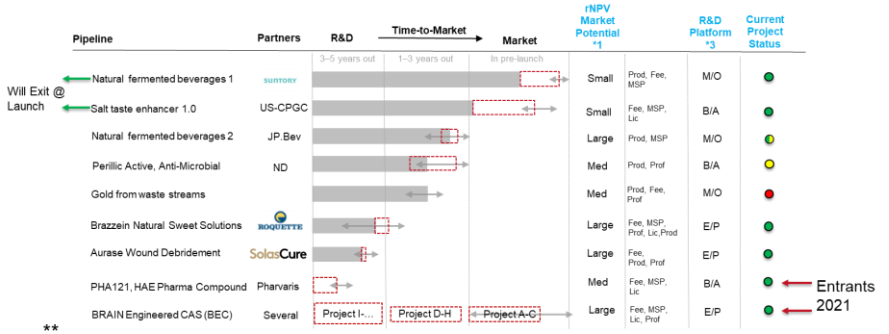
NBD Deep Dive, The Pipeline

Large Market Potential



BRAIN CRISPR Non-Cas9 Associated Nuclease

- **Genome Editing:** directed and precise change or use of a chromosomal target in a given organism
- **CRISPR =** clustered regularly interspaced short palindromic repeats
- **CAS =** CRISPR associated sequence
- **CRISPR-Cas** systems have enabled genome editing in multiple species and provided genetic tools with speed as well as simplicity that were previously unavailable
- **Editing** requires only two components (1. Cas nuclease 2. programmable guide RNA), and can be multiplexed for simultaneous modification of multiple sites in a single transformation event
- Novel BRAIN CRISPR Cas system developed using metagenomics sequencing and protein engineering
- Non-Cas9 type genome editing nuclease
- Scarless gene modification at the single nucleotide level
- In-house designed application tools and strategies
- Development of customized screening cells for target identification / validation or bioactive product development / identification
- State of the art technology for the development of high performance producer strains
- Business Model: all option are still being evaluated
- **If next development steps are successful could have very large potential**

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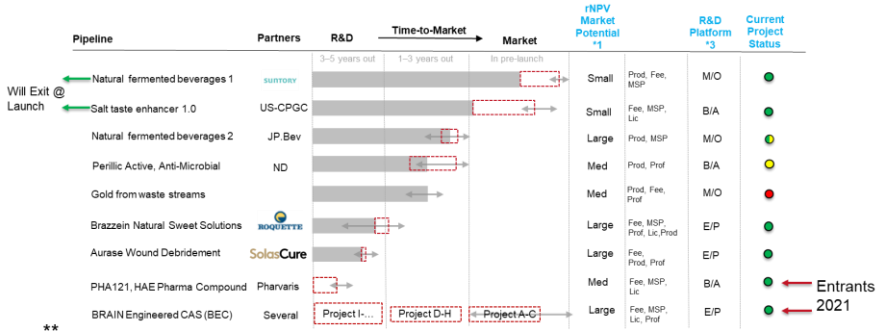
NBD Deep Dive, The Pipeline

Medium Market Potential



Pharvaris N.V.*

- Is a clinical-stage discovery and development company, founded in 2015 (CH)
- IPO at the NASDAQ (phvs) on February 9th
- Focus: treatment of hereditary angioedema (HAE)
- **HAE:** medical disorder caused by gene mutation, which results in recurrent attacks of severe swelling (every 2-4 weeks without treatment), swelling caused by excess level of bradykinin
- **New Treatment:** novel oral bradykinin B2-receptor antagonists (PHA121)
- **Phase 2** clinical development: for on-demand HAE treatment: PHVS416 a softgel capsule formulation containing PHA121
- **Preclinical**: PHVS416 softgel capsule prophylaxis HAE and PHVS719 XR tablet prophylaxis HAE, FDA acceptance of IND application granted on April, 21st
- Commercial Model: JV/profit share
- Milestone payments based on clinical development, regulatory events and sales development (up to EUR 11.4 million)
- Tiered Royalty Agreement: low to medium-single digit on direct and/or indirect net sales

*Source: Pharvaris corporate presentation

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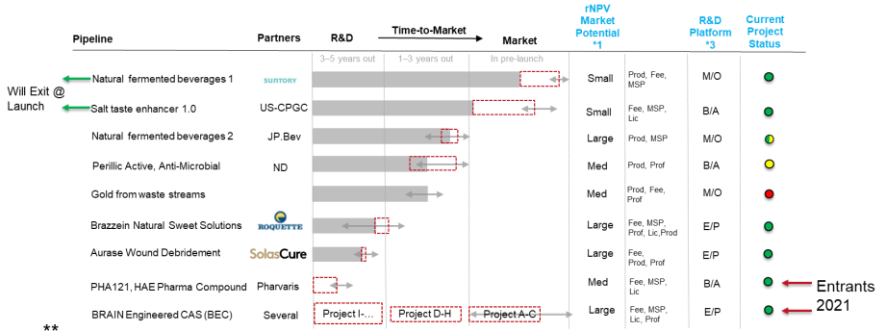
NBD Deep Dive, The Pipeline

Medium Market Potential



Perillic Active

- Partners: US distribution partner contracted (non-disclosed); toll manufacturing
- Scope: nature based anti-microbial for food, feed, drinks and cosmetic applications, generated from industrial side streams
- Exclusive development with partners
- Technology Platform: BioActive
- Research Business Model: fee
- Commercial Model: JV/profit share

Gold from Waste Streams / Urban Mining

- Partners: partner search actively running; LOI in place; non-exclusive partnerships
- Scope: CO_2 efficient biological process for gold extraction from low-grade waste streams, today these valuable waste streams are deposited
- Technology Platform: microorganisms
- Research Business Model: own development, partially public funding
- Commercial Model: flexible, dependent on partner and options for BRAIN (options: royalty, license, JV or franchise system)

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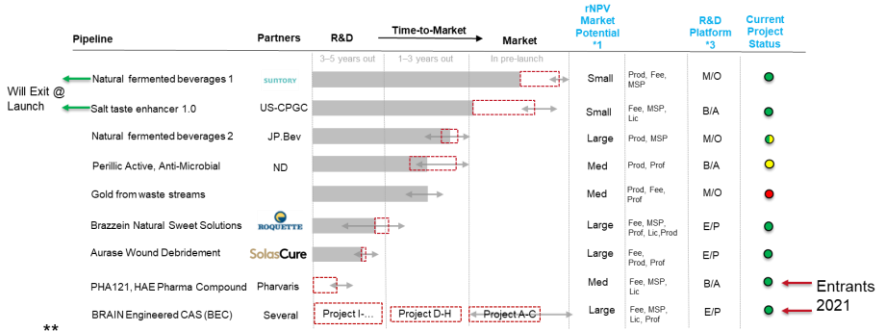
NBD Deep Dive, The Pipeline

Small Market Potential



Natural Beverage 1

- Partners: Suntory
- Scope: nature based low calorie drink innovation through fermentation
- Exclusive to Suntory, in a certain field
- Technology Platform: microorganism/starter cultures
- Research Business Model: milestone payments
- Commercial Model: starter cultures, license fee, royalties

Salt Taste Enhancer 1.0

- Partners: US-Consumer Packed Goods Company
- Scope: salt reducing taste enhancement via taste modulation
- Exclusive development with partner for one identified molecule
- Technology Platform: BioActive
- Research Business Model: fee, milestone payment (research phase finalized)
- Commercial Model: royalties

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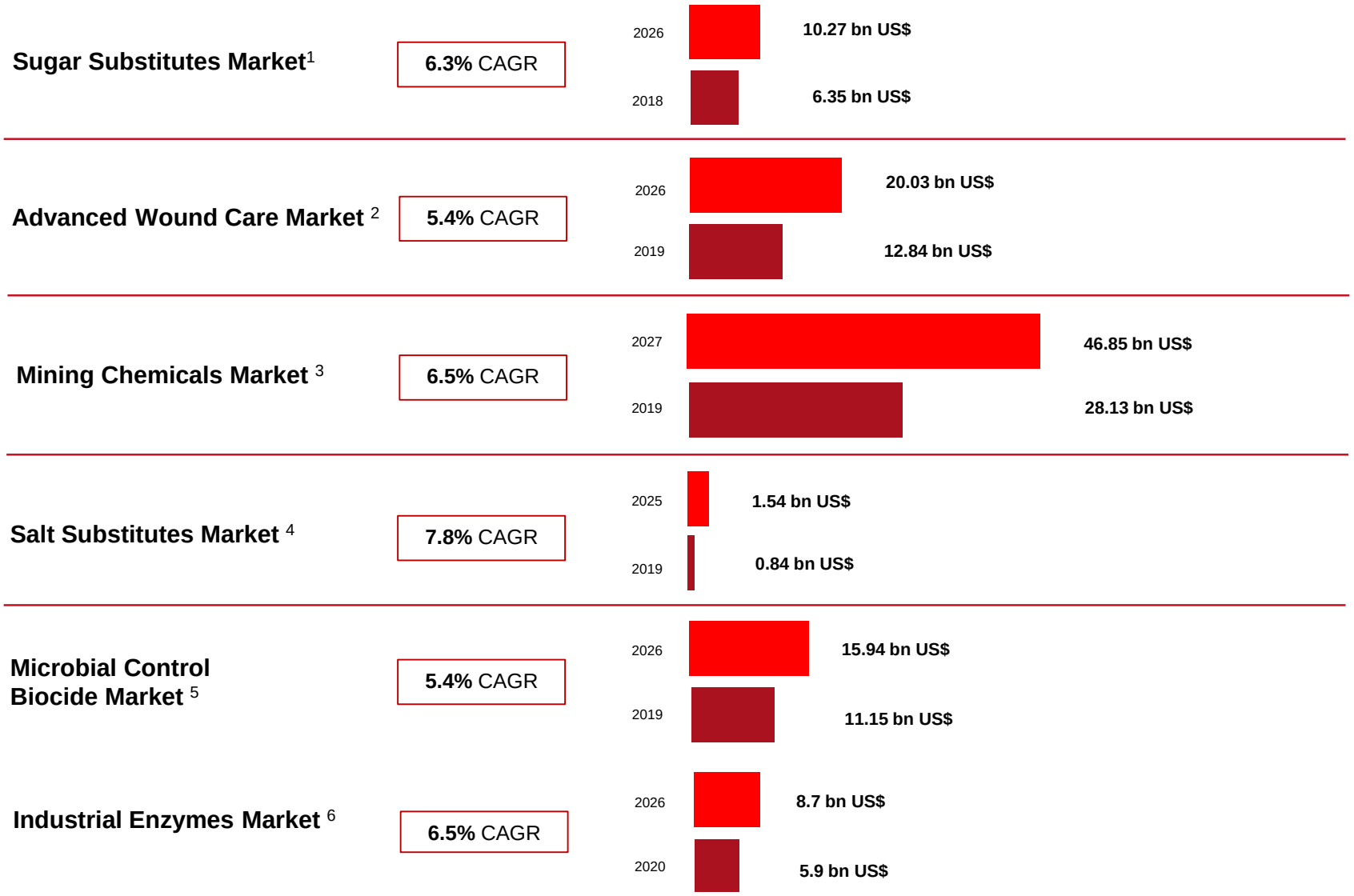
NBD Deep Dive, The Markets I



[1] Fortune Business Insights; 05/2020, [2] Industry Research; 08/2020 [3] Coherent Market Insights; 08/2020 [4] Industry statsreport BMRC; 01/2020 [5] Global Market Insights, 07/2020 [6] Markets and Markets, PR Newswire, 04/2020

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Service Business Deep Dive

Programs with industry partners

- BRAIN Biotech AG has a long track record with dedicated contract R&D programs
- Monetization: tech-access, fees and milestone payments, royalties or entity formation/profit participation
- **Non-cyclical service contract business with secular growth**

Tailor Made Solutions (TMS)

Novel natural products & solutions for the industry

- Partnered projects with the industry
- Active NBD sales approach
- Cost-plus contracts, milestones & license fees
- Cross selling of IP to non-exclusive areas
- Strong industry network with over 100 collaborations completed
- Deep and broad knowledge in enzymes, microorganisms and bioactive natural compounds
- Focus areas: nutrition, health and the environment
- From lab to production
- Multi-year contracts

Libraries Business

BioArchive – industry leading collection of natural resources and metagenome libraries

- MetXtraTM: unique in silico enzyme selection (Biocatalysts)
- ABEL®: Activity-Based Expression Libraries (BRAIN Zwingenberg)
- LIL®: Large Insert Libraries (BRAIN Zwingenberg)
- METAGENOME®: substantial metagenome libraries (BRAIN Zwingenberg)
- CompActives®: easily scalable compounds for bioactivity screenings (BRAIN Zwingenberg)
- MEGx: world's most sustainable collection of purified natural products, isolated from plants (MEGxp) and microorganisms (MEGxm) (AnalytiCon Discovery)

Strong link & interaction

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Partnerships „BRAIN Inside“

More than 100 exclusive partner collaborations successfully completed

	Speciality Enzymes	High-performance Microorganisms	Bioactive Natural Compounds
Industrial Partner*	BASF, Henkel, FUCHS, SÜDZUCKER, EVONIK, DSM, GENENCOR, Ciba, AB Enzymes, CLARIANT, DUPONT	EVONIK, SÜDZUCKER, DSM, SUNTORY, Bayer HealthCare Bayer Schering Pharma, CyPlus, blucon, RWE, DUPONT, SANDOZ, MADAUS, EMSCHER GENOSSENSCHAFT, BIOETON, Enzymical, SCHERING, ROQUETTE, Heraeus	DSM, ROQUETTE, DIANA, BASF, EVONIK, SÜDZUCKER, Ciba, General Mills, nutrinova, WildeGroup, CLARIANT, Celanese, symrise, cognis, MERCK

*confidential partnerships not disclosed

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Partnerships „BRAIN Inside“

Novel Solutions with high value added for our partners

	Speciality Enzymes		High-performance Microorganisms	Bioactive Compounds
Product range				Beiersdorf Eucerin
BRAIN inside	Low temperature detergent enzymes	Flavorpro™ 786P Flavor creation in cheese processing	Optimisation of microbial strain for Isomalt production	Skin anti-irritant Symsitive 1609
Industrial partner	Henkel	BIOCATALYSTS exceeding enzyme expectations	SÜDZUCKER	symrise
	#3 detergent business globally	BRAIN subsidiary	#1 European sugar company	#4 ingredients supplier globally

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Enzyme Production, Expression Hosts

For expression hosts, a wide variety of protein expression systems are available

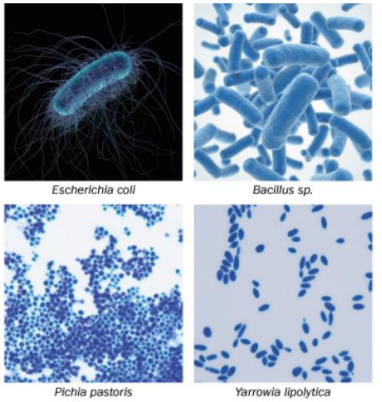
Enzymes can be expressed in cell cultures of bacteria or yeasts.

Factors for choosing an expression system

- Protein quality
- Functionality
- Regulatory
- Production speed and yield

Biocatalysts and WeissBioTech

- Use either bacteria or yeasts for the recombinant production of the enzyme being manufactured
- Have the ability to perform the fermentation process over a range from 250mL to 10m3 scale
- This makes it possible to efficiently optimize the production yield



Ongoing development & optimization of our expression hosts is key for the cost competitiveness of our products. In-licensing is also under consideration.

*source: Biocatalysts

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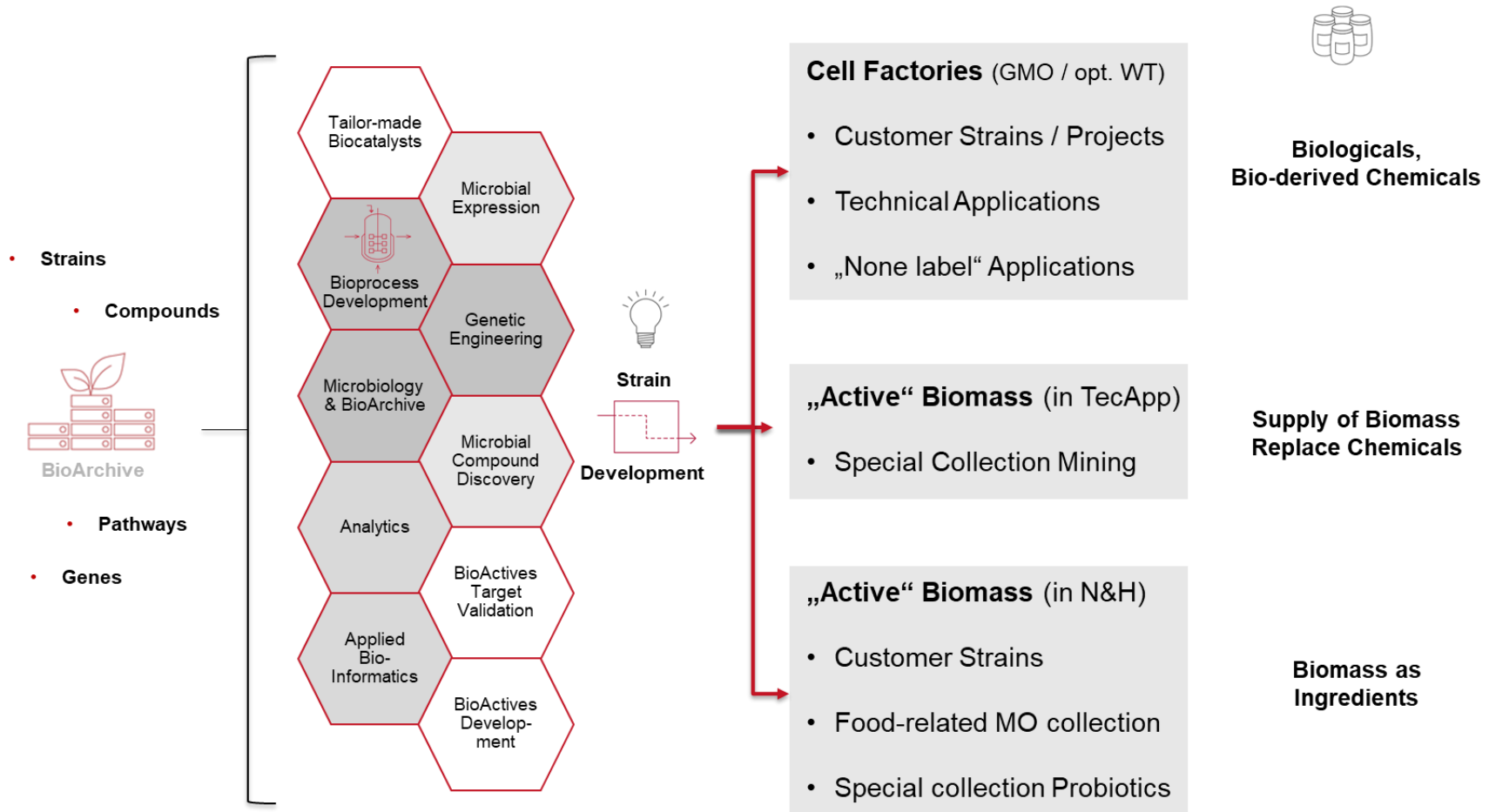
Enzyme Production, Expression Hosts

Strain Development: Setting the Scene



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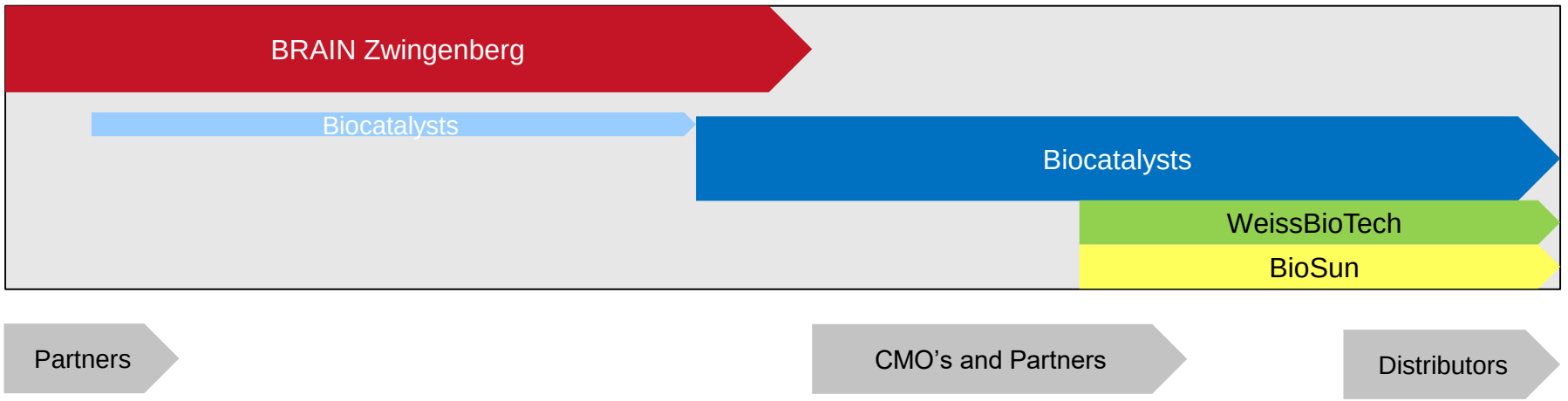
We Cover the Entire Enzymes Value Chain

All steps are underpinned by strong customer application knowledge



Bolt-on M&A can further help strengthen our offering

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SolasCure Ltd.

Revolutionizing Chronic Wound Care through Biomimicry

For BRAIN:

- Discovering a unique technology and spinning it out in 2017 as a separate company
- 41% shareholding of BRAIN Biotech AG, at equity consolidated
- Created a targeted team at SolasCure Ltd.
- Share the commercialization financing burden with new investors
- Allows monetization at exit (e.g. IPO, Strategic Investor, PE)
- Aurase® IP stays with BRAIN Biotech AG, (patent estate, WO 2010/099955)

The Market:

- Chronic wounds effect about 40mln people and consume about 10% of health care expenditures
- Advanced wound care market CAGR expected at 6,5% '18-26* (aging, diabetes and obesity are the main growth drivers)
- Alternative to ineffective and painful surgical or autolytic debridement
- Current target market size ~€600mln

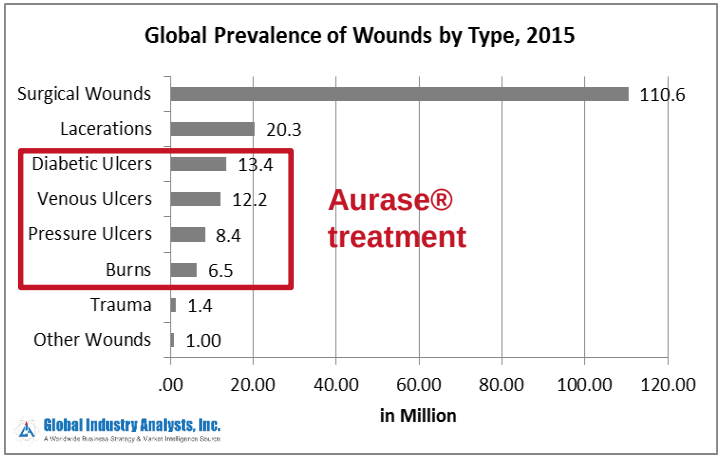
The Product:

- Aurase® is a hydrogel containing a safe, active, highly specific enzyme
- The enzyme has been isolated and cloned from medical maggots (green bottle fly)
- Currently phase 2 of clinical trials
- Aurase® to be produced in a GMP biotechnological process
- Santyl® of S&N is currently the market leading drug for non-surgical wound debridement

*allied market research '19

Latest Funding, Q1

- GBP 3 Mio in total
- New investor attracted: Seneca Partners (VC) with Seneca Growth Capital VCT
- BRAIN participated below pro-rata stake
- Pre-Money valuation +20% versus last capital injection
- BRAIN invested GBP 0.5 Mio
- New partner attracted
- ➢ Valuation keeps rising despite Covid-19 related delays



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BRAIN BioArchive – Nature‘s Toolbox

~ 53,000	**~ 13,000**	**54**
Characterized Microorganisms	Plant fractions available for isolation campaigns	Metagenome libraries
450	**~ 13,000**	**231**
Habitat collections and environmental samples	Plant fractions available for isolation campaings	Giga-bp DNA ready to screen
464	**~ 50,000**	**~ 300 Mio.**
Gene libraries available for screening	Natural and naturally inspired compounds	Reusable ready-to-screen Metagenome clones

High Value:

- ✔ >450 person years to reproduce
- ✔ ~175 patents
- ✔ ~40 patent families
- ✔ Powering TMS, NBD & product sales

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BRAIN BioArchive – Nature´s Toolbox

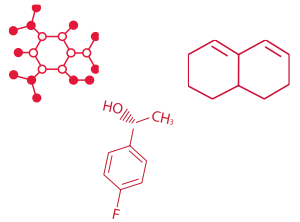
A proprietary In-House Screening Resource

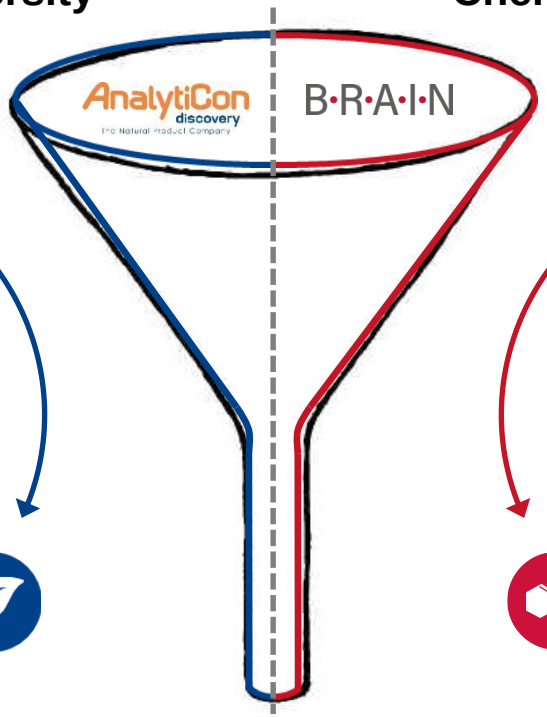
Biomaterial source

Biodiversity

Compound source

Chemical/Synthetic space





Chemodiversity profiling

Cultivation and/or extraction

Fractionation or isolation

Structure elucidation

High quality

Rationally selected

Good access (resupply & costs)

In silico tox (pre-)evaluation

>12,000 naturals compounds

>14,000 enriched fractions

> 30,000 (semi-)synthetic compounds

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R&D / Technology Platforms – Industrial Biotechnology Toolkit

Bio-based resources
BioArchive – industry leading collection of natural resources and metagenome libraries
• MetXtraTM: unique in silico enzyme selection (Biocatalysts)
• ABEL®: Activity-Based Expression Libraries (BRAIN Zwingenberg)
• LIL®: Large Insert Libraries (BRAIN Zwingenberg)
• METAGENOME®: substantial metagenome libraries (BRAIN Zwingenberg)
• CompActives®: easily scalable compounds for bioactivity screenings (BRAIN Zwingenberg)
• MEGx: world's most sustainable collection of purified natural products, isolated from plants (MEGxp) and microorganisms (MEGxm) (AnalytiCon Discovery

Product development
Microbial expression – large set of pro- and eukaryotic expression strains, termed chassis, for the economic production of enzymes and biocatalysts
Microbial strain development – tailor-made designer strains based on conventional methodologies, plus engineering novel synthetic pathways and artificial operons for high-value industrial production
Gene and protein engineering – expression of genes and gene clusters for rationally redesigned production strains, including synthetic biology application, for customized enzymes and biocatalysts with optimized properties

Candidate discovery
High-throughput isolation – extraction and purification of natural products from variable biological resources (AnalytiCon Discovery)
Compound discovery – activity- and sequence-based screenings for application-driven research incl. biochemical and human cell-based assays
• screenline®: human cell-based receptor cell lines (BRAIN)
Structure elucidation – determination of molecular structure of (novel) natural compounds
Sample provision – rapid production of selected enzyme samples for customer testing
• Research Grade Sample (RGS): small volume enzyme sample production platform (Biocatalysts)
• Design for Manufacture (DFM): selection principles of enzyme candidates to maximise the probability for high expression in vivo and production scale-up (Biocatalysts)

Production scale-up
Process development – establishment of up- and downstream processes for efficient and cost-effective microbial production
Process optimization – identification of optimal parameters for superior production results
Product blending & formulation – superior knowhow for blending enzymes

Data evaluation
Analytics – state of the art equipment up to implementation of quality and stability control; covering proteins, metabolites and synthetic compounds
Bioinformatics – top-modern bioinformatic technologies for read-out of Next Generation Sequencing (NGS) results, Design of Experiments (DOE), big data analysis

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HR: People – Our Core Capital*

BRAIN is a Knowledge Driven Enterprise
Innovation is our Passion & Teamwork our Basis

- Strong corporate culture
- Technology campus
- Global scientific and university network
- BRAIN alumni platform

~39
years average age

9
years average tenure

54%
female employees

8
trainees

55%
Academics

~ 7%
Average fluctuation since ‘04

23%
PhDs

strong support for PhD and master theses

=
equal pay policy

* numbers refer to BRAIN Biotech AG

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Detailed Management & Employee Incentives

✔ **Since the IPO BRAIN Biotech AG's board as well as management compensation has been linked and aligned with shareholder interests**

Executive Board
(Fix + performance based bonus)

variable component based on individual quantitative & qualitative targets
stock component, see ESOP

CoPerBo

Corporate Performance Bonus

- ❖ Since FY 2015/16
- ❖ For all employees without personal targets
- ❖ Annual bonus based on basic salary
- ❖ Three factors, 1/3 each
  - Total operation performance BioScience
  - Adj. EBITDA BioScience
  - Absolute share price performance in FY
- ❖ Payout range between 0-30% of basic salary

ESOP

Employee Stock Ownership Program

- ❖ Since June 2018
- ❖ Board, managers and employees
- ❖ Incentive and retainer
- ❖ 1 Option = 1 Share at exercise price
- ❖ Strike price €20,67 and €10.64 from ESOP 2017 and 2018
- ❖ Beneficiary needs to still be employed
- ❖ Earliest exercise day, 4 years after grant
- ❖ Caps partially in place
- ❖ Monte Carlo model applied for fair value calculation
- ❖ 437,600 options outstanding as of Sept.30th 2019

Specific Incentives at Daughter Companies

- ❖ Growth equity program Biocatalysts Ltd.
  - Incentivize and retain managers
  - Share program without voting or dividend rights
  - Put option based on reporting Sept. 30th, 2022
  - Growth incentive with pre-defined EBITDA multiples
  - Cash settled, €17.07 value/share as of September 30th, 2019
- ❖ Employee share scheme, AnalytiCon Discovery
  - Put options for employees and management until February 2020
  - Remuneration in 3 tranches
  - Ownership now at 100%

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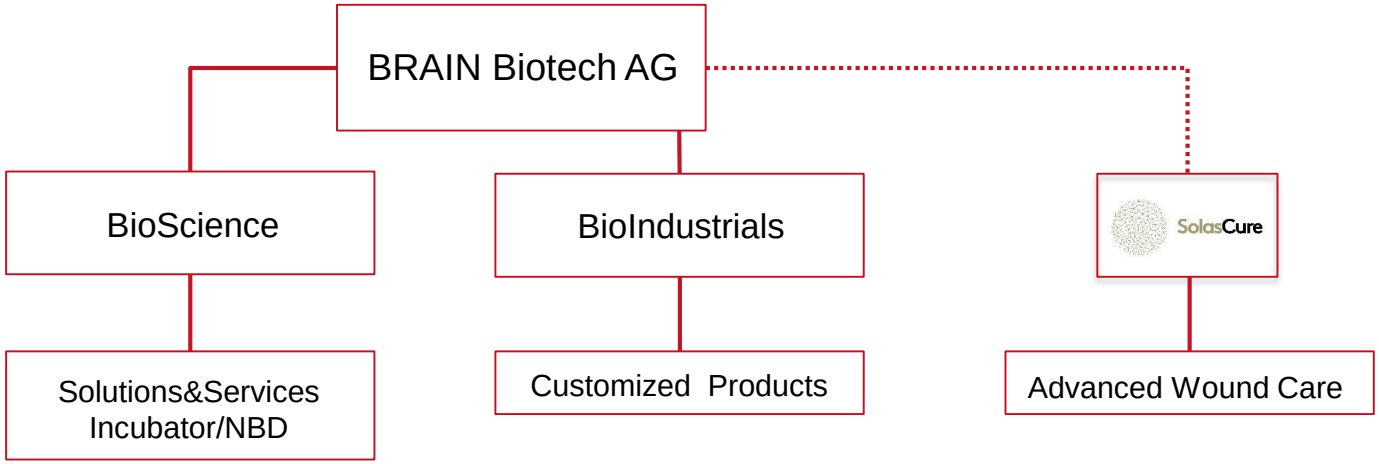
Peers by Business Activity



Brightseed
C-LEcta
Codexis
Dyadic
Evotec
MorphoSys

Amyris
Christian Hansen
Corbion
Ingredion/Pure Circle
Evolva
Kerry Group
Novozymes
Symrise
Treatt

Smith&Nephew
(Santyl)

CRISPR-Cas
Benson Hill Inc. (SPAC)
CARIBOU Biosciences
Egenesis
GINKGO Bioworks (SPAC)
INSCRIPTA
Metagenomi
OXGENE

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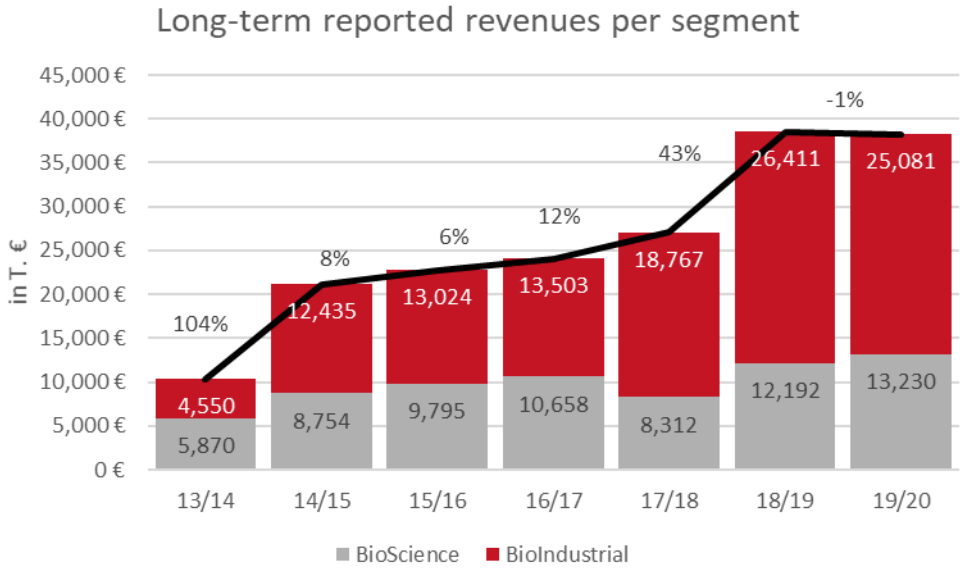
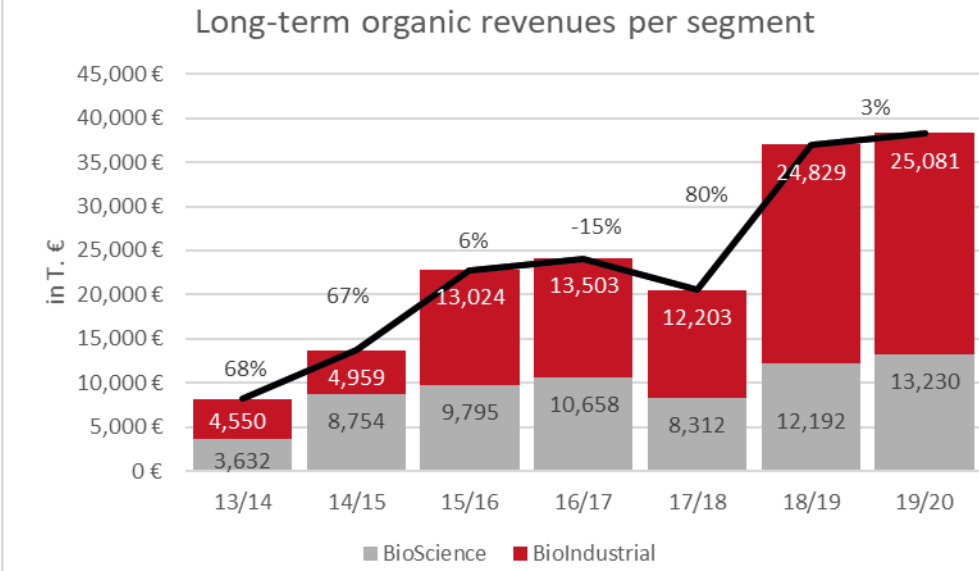
Detailed Financials – Organic vs. Reported





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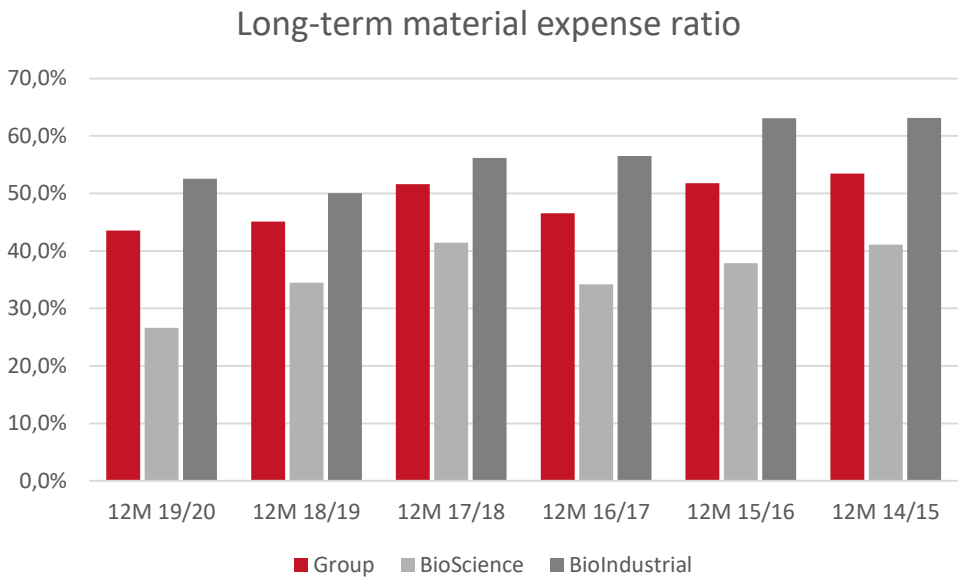
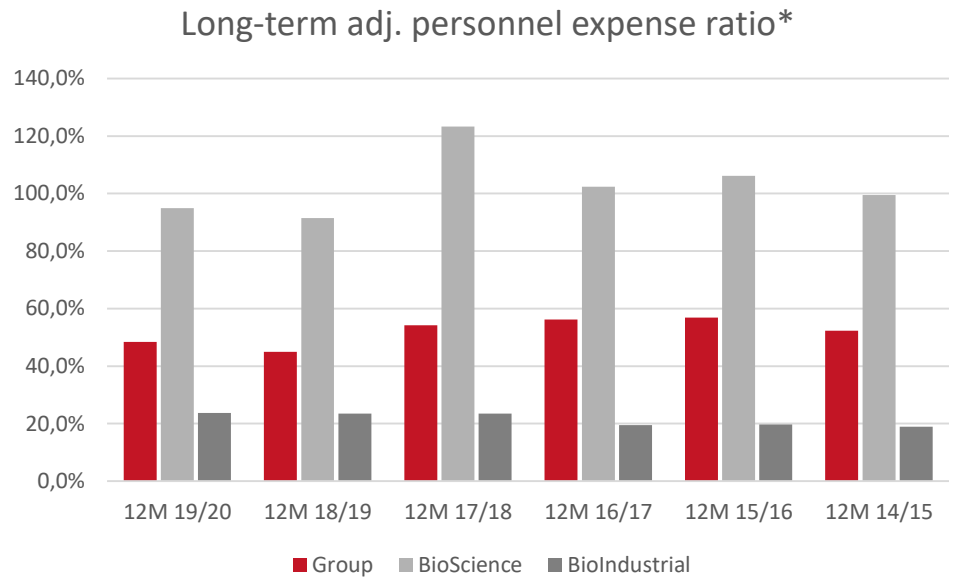
Detailed Financials – Cost Ratios





*adj. for ESOP and employee share scheme, AnalytiCon Discovery

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Detailed Financials – Adjusted vs. Reported

For a like-for-like comparison BRAIN Biotech AG adjusts its EBITDA for its employee stock ownership program, performance based numeration in daughter companies, acquisition & integration costs

(in € thousand)	9M 20/21	9M 19/20
EBITDA	-2,061	-907
Gain on bargain purchase	858	0
Share-based employee compensation	-511	-354
Acquisition and integration costs incurred in the expansion of the BRAIN Group	-170	0
Board Changes & Corona Bonus	0	0
Adjusted EBITDA	-2,238	-553

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Detailed Financials – Financial Debt vs. Financial Liabilities

For or a detailed analysis of our EV calculation, our financial liabilities include:

€thousands	Sept 30th, 2020	Comment
Liabilities from put option rights	12,052	Biocatalysts Ltd. Call/Put options '23/'24, earlier exercise possible, currently 65.5% ownership
Liabilities from exercised put option rights	838	AnalytiCon Discovery
Contribution by silent partners	4,500	€1.5mln Hessen Kapital I GmbH, €3,0mln Hessen Kapital II GmbH, Hybrid Instruments (silent participation)
Sum I	17,390	
Loans	5,474	€5,665mln secured by BRAIN AG, Biocatalysts & L.A. Schmitt land charges
Finance Lease Liabilities	7,614	mostly IFRS 16
Derivatives	112	
Other	9	
Sum II	13,209	
Total	30,599	
Cash, 12M	18,943	

Note:

- Stake in Biocatalysts increased by 16.7% in Q3
- Biocatalysts stake now at 82.2%
- Liabilities from put option rights decreased to €9.8m in Q2
- Liability details will be updated with the 12M reporting

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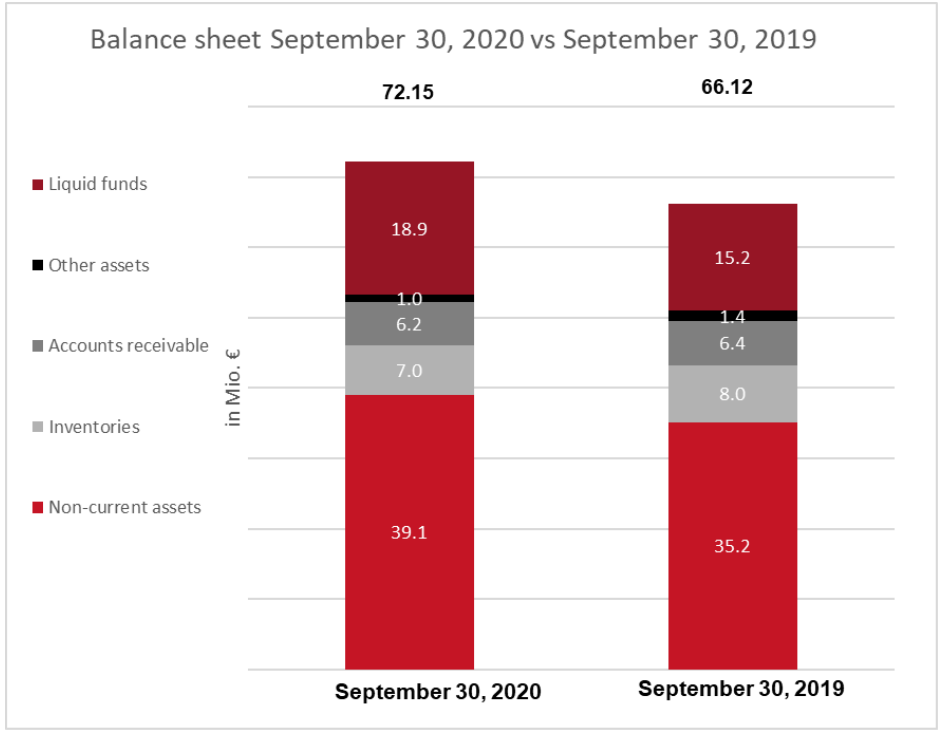
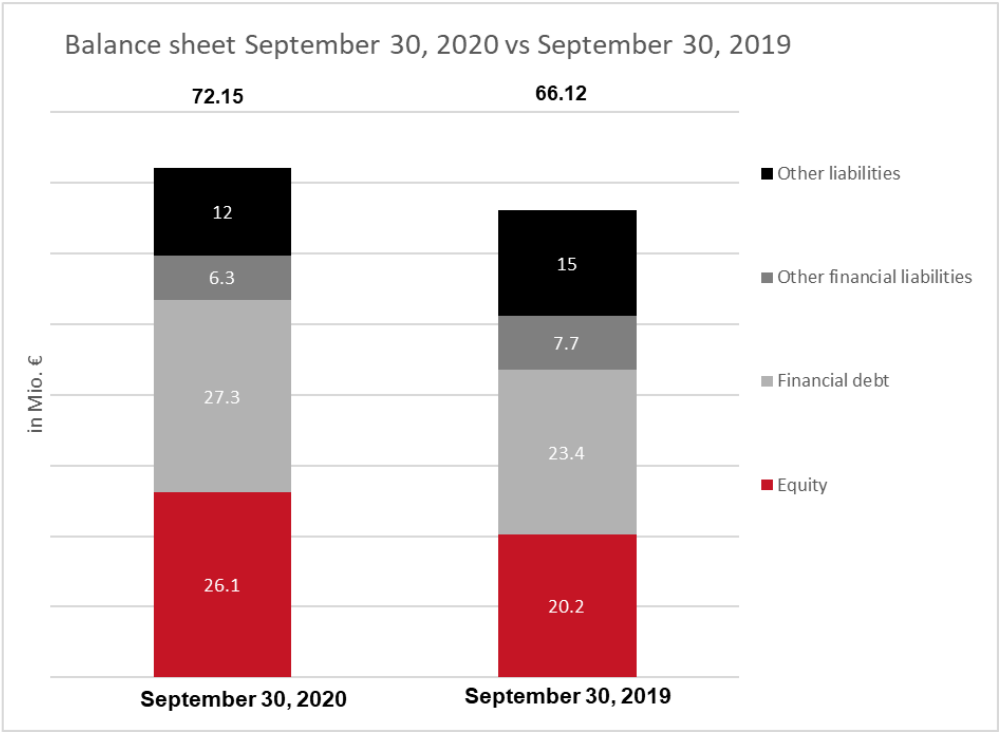
Detailed Financials – Balance Sheet





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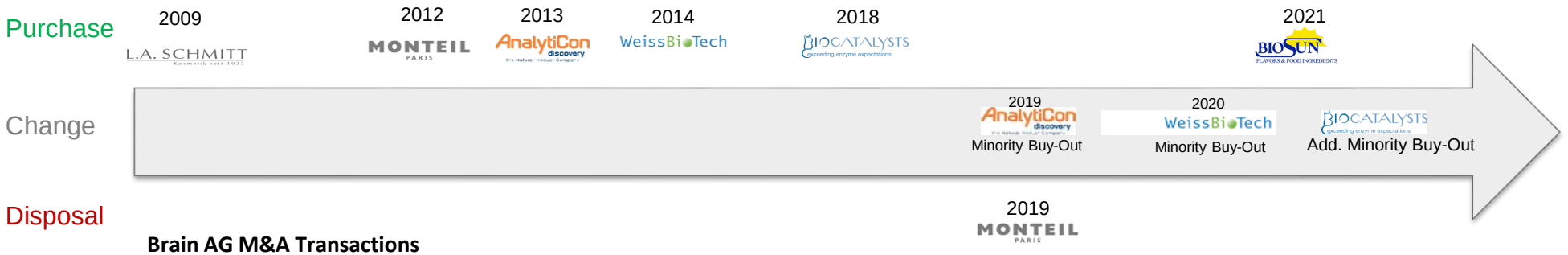
M&A Criteria & History

Qualitative mid-term M&A criteria

- B2B only
- Clearly focused on the product business
- Niche applications and producers
- Europe focused, US might be an option

Quantitative mid-term M&A criteria

- Bolt-on character
- Profitable or at least break-even
- Value accretive within 1-2 years post synergies
- Realize economies of scale



Brain AG M&A Transactions

Purchases

Target	Time	Description	Comment
L.A.Schmitt	2009	B2B cosmetics	
Monteil Cosmetics	2012	B2C cosmetics	
AnalytiCon Discovery	2013	Library, TMS, R&D	
WeissBioTech	2014	enzyme design & production	
Biocatalysts	2018	enzyme design & production	65.55% owned, put/call options in place
BioSun	2020	distributor, formulator and blender	
Biocatalysts	2021	enzyme design & production	stake increased to 82.2%, put/call options in place

Disposals

Asset	Time		Comment
Monteil Cosmetics	2019	B2C cosmetics	refocus of Brain on the B2B segment

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Management CV – Executive Board

Adriaan Moelker (CEO)

- Master of Business Administration
- Year of birth 1964
- Joined BRAIN in 2020
- 20+ y of professional experience in industrial biotechnology innovation
- Successful in terms of innovation & revenue
- Extensive global experience in all key industrial enzyme segments

Lukas Linnig (CFO)

- B.S. in Economics, CFA
- Year of birth: 1993
- Joined BRAIN in 2015
- 7+ y leadership experience in finance, controlling and legal
- Successful in implementing finance controlling systems
- Prior to BRAIN: VC and consulting
- Advisor during the IPO

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Management CV – Selected Senior Management

Dr.-Ing. Ute Dechert
(VP HR & Processes)

- Doctor of Engineering (Biochemistry)
- Joined BRAIN in 1996
- 20+ y of professional experience in project management, grant management, HR, organization & processes
- Active ASIIN e.V., Bergstrasse HR Network, University of Esslingen, Provdis University

Dr. Michael Krohn
(EVP, Head of R&D)

- PhD Molecular Biology
- Joined BRAIN in 1997
- 20+ y of leadership experience in BioActives, functional ingredients, contract research, business development
- Coordination NatLifE 2020
- Since 2013 member of the BRAIN Biotech AG executive committee

Dr. Martin Langer
(EVP, Head of Business Development)

- PhD, Molecular Biologist & Biochemist
- Joined BRAIN in 1995
- 25+ y of professional experience in business development, marketing, communication and VC
- Since 2013 member of the BRAIN Biotech AG executive committee

Analyst Coverage

Bank	Analyst	Target Price	Recommendation
Baader	Markus Mayer	20.50 €	Buy
	Falko Friedrichs	12.00 €	Buy
DZ BANK	Peter Spengler	10.00 €	Hold
FMR Frankfurt Main Research AG	Dr. Mohamad Vaseghi	15.00 €	Buy
Kepler Cheuvreux	Paul de Fromment Damien Choplain	12.50 €	Buy
M.M. Warburg & Co Bank	Dr. Christian Ehmann	22.00 €	Buy
Pareto Securities AS	Dennis Berzhanin	10.50 €	Buy

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Glossary I

Aurase®	Enzymatic agent as part of an innovative gel-based medical device for the biotherapeutic treatment of chronic wounds
Bioactive natural compounds	Used to develop products for the food, beverages, skin care, cosmetics and chemical industries
Bio-based	Bio-based products are goods manufactured from renewable raw materials
Biocatalysts	Enzymes that act as catalysts to accelerate (bio)chemical reactions
Biocatalysts Ltd. and Biocatalysts Inc	BRAIN subsidiaries based in UK (headquarters in Cardiff, Wales) and subsidiary in US (Illinois); global distributor network e.g. Korea, Australia, New Zealand. Key player in the specialty enzyme business
Bioeconomy	Concept for a biobased economy; mega-trend that encompasses the transformation from industries based on fossil raw materials to a more sustainable form of economic activity that mainly utilizes biological resources and processes
BioIndustrial	One of BRAIN's two business segments: development and marketing of the company's own products along the value chain
Biologization of industry	Application of biological processes in an industrial setting with the aim of creating a more sustainable economy
Biorefinery	Technology for the sustainable processing of biomass into marketable products (e.g. food, feed, materials, chemicals) and energy (fuels, electricity, heat). Integrated biorefineries combine various such technologies with the aim of greater flexibility and cost reduction. Integrated biorefineries facilitate the use of byproducts and waste, and enable the production of high-quality products (e.g. fine chemicals) combined with low-quality products (e.g. bioenergy).
BioScience	One of BRAIN's two business segments: cooperation business established with globally operating industrial partners
Biotechnology	Application-oriented sub-sector of biology; includes insights and methods from microbiology, genetics, biochemistry, technical chemistry and process engineering; utilizes biological processes e.g. for industrial applications

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Glossary II

BEC	**B**RAIN **E**ngineered **C**as: BRAIN‘s proprietory non-Cas9 genome editing nuclease
BioXtractor	BRAIN demonstration plant for next-generation metal extraction in the areas of green and urban mining based on microorganisms
BRAIN Bioarchive	In-house collection consisting of around 53,000 comprehensively characterized microorganisms (including “chassis microorganism” strains for the development of production organisms) and the BRAIN libraries: an enzyme library, a metagenome library and a substance library with numerous isolated natural compounds (see also BRAIN libraries)
BRAIN Libraries	BRAIN Group collections of enzymes, DNA sequences or natural substances Enzyme library: up to 500 isolated and pre-characterized enzymes and DNA coding for enzymes introduced into expression vectors Metagenome library: screenable DNA library with metagenomes from different habitats; collection serves to identify previously uncharacterized enzymes and metabolic pathways Substance library: collection of natural substances with sub-libraries of specific, well-characterized groups of substances
Bulk enzymes markets	Volume-driven mass markets for enzymes sold in large volumes. This stands in contrast with the high-margin business with specialty enzymes
Business-to-Business (B2B)	Form of the market in which the supply and rendering of services is realized by companies to companies (= business relations between at least two companies)
Circular economy	Term derived from the fusion of the two concepts of the “bio-economy” and the “circular economy”; circular bio-economy focuses on the sustainable, resource-efficient utilization of biomass in integrated production chains (e.g. biorefineries) while BRAIN demonstration plant for next-generation metal extraction in the areas of green and urban mining based on microorganisms simultaneously utilizing residual and waste materials; the sequential use (cascade use) of biomass resources for different purposes ensures value optimization.
Clone	Genetically identical organisms, created by natural division or reproduction, or artificially created
Circular economy	Concept for the complete recovery of raw materials utilized, beyond a commodity’s life cycle, through to new production processes; component of the bioeconomy

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Glossary III

Compliance	Alignment of companies with laws and directives, as well as voluntary codes
Development pipeline	Total number of BRAIN Group development projects for New Business/Product Development
Development projects	R&D projects of the BRAIN Group for New Business/Product Development
DNA	Deoxyribonucleic acid: biomolecule that carries genetic information (genes)
DOLCE	Strategic partnership initiated by BRAIN for the development of natural sweeteners and sweet taste enhancers
Enzymes	Proteins that accelerate biochemical reactions in their function as biocatalysts; play an important role in the development of biobased products; BRAIN identifies and develops optimized enzymes and biocatalysts for complex process and application requirements
FRESCO	BRAIN development program for freshness and product stability utilizing natural bioactive substances; suitable for the food and feed industry, for medical products, paints, cleaning agents and other household products
Giga-bp DNA	Length of a DNA sequence, indicated by the number of base pairs (1 Giga bp = 1,000,000,000 base pairs); common metagenomics measure
GRAS status	Generally Regarded as Safe status: declaration of safety for the use of substances (e.g. microorganisms) to manufacture foodstuffs; GRAS organisms can be utilized without restriction in biotechnological production
Green mining	Sustainable mining, e.g. ore treatment to extract gold, silver or copper using microorganisms rather than chemicals
Habitat	An organism’s natural environment
High-performance microorganisms	Biotechnologically optimized microorganisms that serve as microbial “cell factories”

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Glossary IV

HTC technology	Human Tongue Cell Technology; in vitro test system based on human tongue cells, established and patented by BRAIN to test substances for their sweetening power
Industrial biotechnology	Also known as white biotechnology; drives innovation for a paradigm shift away from petroleum-based towards biological processes and bioeconomy products
Metagenome	All the genomic information present in all the microorganisms of a specific community
Metagenomics	Genomic analysis of a community of organisms by gene sequencing; genetic material is extracted, sequenced and analyzed directly from environmental samples, which saves the previous cultivation of microorganisms
Microorganism	Microscopically small unicellular or multicellular organisms, e.g. bacteria, algae, fungi or viruses
New Business Development (NBD)	Systematic further development of existing and development of new business opportunities including e.g. R&D and marketing activities
New Product Development (NPD)	R&D activities that aim to develop product candidates for the BRAIN Group's own market offerings
Peptides	Linear, sometimes ring-shaped chain of molecules consisting of two or more amino acids; long polypeptide chains are called proteins.
Product sales	Sales of products in the fso known as white biotechnology; drives innovation for a paradigm shift away from petroleum-based towards biological processes and bioeconomy productsorm of merchandise, technologies or biotechnological system solutions; can be achieved via the BRAIN Group's direct B2B business or through joint product developments with industrial partners and corresponding licensing agreements; scalable-product business option offered by the BRAIN Group (see also R&D cooperation partnerships)
R&D	Research and development
SALT-E	BRAIN development program for healthier foods through salt reduction
SDG-UN	United Nations Sustainable Development Goals

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Glossary V

Specialty chemicals	Specific chemical products with a broad range of activities on which a large number of other industrial sectors depend
Synthetic Biology	Area of biology in which organisms are modified to develop new, useful abilities
Specialty enzymes market	Markets for high-margin specialty enzymes business
Stage-gate process	Standardized process model for developing product innovations with the aim of assuring process quality
Tailor-Made-Solutions TMS	Dedicated contract R&D programs for the development of tailor-made solutions for industry
Urban mining	Sustainable extraction of valuable substances from secondary raw materials and waste flows in order to retain them in value chains in the long term
White Biotechnology	Includes the application of modern biotechnology in industrial production processes. Chemical starting materials are converted by enzymes and cells into products suitable for further processing. Also known as industrial biotechnology

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