Deutsche Biotech Innovativ AG

Germany / Pharmaceutical/Biotechnology
Primary exchange: Düsseldorf, Primärmarkt
Bloomberg: VUA GR
ISIN: DE000A0Z25L1

Initiating Coverage

RATING	**BUY**
PRICE TARGET	**€67.90**
Return Potential	239.5%
Risk Rating	High

SEPSIS BLOCKBUSTER; NEW DRUG DEVELOPMENT FRONTIER OPENED

DBI is a biotech incubator and development platform. Its lead product, Adrecizumab, which accounts for 84% of our valuation, has annual peak sales potential of over €3bn per annum as first mover in a new class of sepsis therapy (adrenomedullin modulators). DBI seeks to raise €20m for clinical trials of sepsis and breast cancer prevention therapies and further preclinical development of a cancer tumour growth inhibitor. DBI plans to exit the sepsis and breast cancer prevention products after phase II trials in 2018/19 and 2022 respectively and the tumour growth inhibitor in 2018 after preclinical trials. The drug candidates are early to mid stage but management credibility is very strong due inter alia to the foundation of B.R.A.H.M.S. AG following a management buyout from Henning Berlin/Marion Merrell Dow and its later sale for ca. €330m to Thermo Fisher. In addition, there is a very close link between the drug candidates and management's decades of experience in blood biomarkers. Both these factors indicate well above average chances of success. G-Protein-coupled receptors (GPCRs) are targeted by six of the top ten drugs in the US, but have so far been largely intractable to therapeutic antibody development. DBI is able to target GPCRs indirectly through peptide hormones, thereby opening up a new frontier in drug development. Based on the existing pipeline alone, our post money valuation is €101.2m or €67.9 per share.

Adrecizumab targets huge unmet medical need in sepsis Globally there are more new sepsis than cancer or heart attack cases every year. 30% are fatal.

Repositioning existing drug for breast cancer prevention DBI's repositioning of an existing NK-1 receptor antagonist drug promises to reduce incidence of breast cancer in patients identified (also by DBI) as high risk.

Anti-tumour therapy DBI has developed a full adrenomedullin antagonist, AB2302, to inhibit the growth of tumours. AB2302 is partnered with a large pharmaceutical company and will likely be co-marketed with an existing therapy. The leading anti-tumour therapy currently has annual sales of over €8bn.

FINANCIAL HISTORY & PROJECTIONS*

	2013	2014	2015E	2016E	2017E	2018E
Revenue (€m)	0.00	0.10	0.16	0.26	0.28	0.29
Y-o-y growth	n.a.	n.a.	57.0%	63.1%	8.2%	5.4%
EBIT (€m)	-0.08	-0.14	-1.49	-0.48	-0.49	17.20
EBIT margin	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net income (€m)	-0.09	-0.15	-1.49	-0.48	-0.49	14.97
EPS (diluted) (€)	-0.11	-0.17	-1.43	-0.32	-0.33	10.04
DPS (€)	0.00	0.00	0.00	0.00	0.00	0.00
FCF (€m)	-0.13	-0.07	-2.15	-5.08	-5.81	11.79
Net gearing	-12.5%	-33.9%	-92.0%	-68.2%	-39.3%	-56.7%
Liquid assets (€m)	0.14	0.48	18.33	13.25	7.44	19.23

* DBI AG only

RISKS

The company's drug candidates are at an early development stage. Preclinical trial results have been promising but there is no guarantee that clinical results will be good enough to attract the desired trade buyers.

COMPANY PROFILE

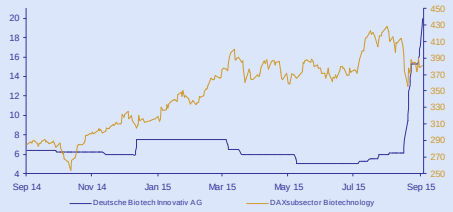
Deutsche Biotech Innovativ AG ("DBI") is a biotechnology company that utilizes innovative blood biomarkers to investigate and clinically develop unique therapies for severe disease without appropriate solutions, such as sepsis and cancer.

MARKET DATA

	As of 07 Sep 2015
Closing Price	€ 20.00
Shares outstanding	0.89m
Market Capitalisation	€ 17.89m
52-week Range	€ 5.00 / 20.00
Avg. Volume (12 Months)	2

Multiples	2014	2015E	2016E
P/E	n.m.	n.m.	n.m.
EV/Sales	174.5	111.1	68.2
EV/EBIT	n.m.	n.m.	n.m.
Div. Yield	0.0%	0.0%	0.0%

STOCK OVERVIEW



COMPANY DATA

	As of 31 Dec 2014
Liquid Assets	€ 0.48m
Current Assets	€ 0.55m
Intangible Assets	€ 0.00m
Total Assets	€ 1.54m
Current Liabilities	€ 0.08m
Shareholders' Equity	€ 1.42m

SHAREHOLDERS

Dr Andreas Bergmann	32.9% (20.4%*)
Dr Metod Miklus	32.9% (20.4%*)
Dr Bernd Wegener	32.9% (20.4%*)
Free Float	1.5% (38.9%*)

*after capital raise

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CONTENTS **PAGE**

INVESTMENT CASE

Expertise in peptide hormones in patients' blood raises probability of drug development success… The development of immunoassays and biomarkers at B.R.A.H.M.S. AG (B.R.A.H.M.S.) was dependent on the successful identification of a peptide hormone relevant to a specific disease in human patients' blood and the development of antibodies as capture molecules in sandwich immunoassays. This was followed by validation of the clinical relevance of the biomarker in the blood samples of patients with certain diseases. DBI's approach to drug development is very similar. Development of new drugs conventionally begins at the preclinical stage with tests on animals. DBI's approach of starting with human patients' blood ensures the clinical relevance of the identified target and maximises the chances of achieving subsequent successful clinical trials.

…and opens up vast but hitherto "not druggable" GPCR target class to DBI G-Protein-coupled receptors (GPCRs) are membrane proteins involved in a broad range of biological processes and diseases, including inflammatory disease, neuroscience indications, cancer, cardiovascular and metabolic diseases. They comprise the single largest class of targets for pharmaceuticals currently on the market. Six of the top ten and 60 of the top 200 best-selling drugs in the US in 2010 targeted GPCRs. However, GPCRs are very unstable once taken out of the cell membrane and are hence difficult to analyse. This has hindered structure-based drug discovery and GPCRs have been largely intractable to therapeutic antibody development or "not druggable". An indirect way of getting at the GPCR is to target the corresponding ligand that exerts its physiological effect by binding the GPCR. Peptide hormones comprise one important class of these ligands. DBI is already using this technique with its lead drug candidate, the humanized antibody Adrecizumab. Adrecizumab acts as a partial antagonist to the peptide hormone Adrenomedullin, thereby modulating its effect on the corresponding GPCR. Management has set a goal of starting work on one new project/active pharmaceutical ingredient (API) each year. DBI's expertise in production and characterisation of specific and selective antibodies for peptide hormones is potentially a rich source of new APIs directed at the immensely valuable GPCR target class.

Very high credibility of DBI's management DBI's management has very high credibility in our view. The current management team established the diagnostics company B.R.A.H.M.S. in 1994 through a management buyout from Henning Berlin/Marion Merrell Dow and later sold this business to Thermo Fisher Scientific in 2009 for ca. €330m. Procalcitonin (PCT), a biomarker for the early identification and therapy monitoring of sepsis, launched by B.R.A.H.M.S. in 1995, is considered the gold standard sepsis diagnostic product. Meanwhile, DBI's current management was involved in the foundation of several biotech firms including InVivo, InVent and Bioassays which were spun off from B.R.A.H.M.S. during the first decade of the current millennium. The DBI management team has contributed €7m of the total €11m so far invested in the company and has undertaken to invest a further €1m of its own money in the current financing round.

Lead drug Adrecizumab offers a unique approach to a huge unmet medical need DBI's lead drug candidate, Adrecizumab, for the treatment of sepsis, has been developed according to the procedure described above. The worldwide incidence of severe sepsis is higher than for either cancer or heart attack with mortality rates of over 30%. However, there are currently no drugs approved for its treatment, despite the investment by Big Pharma in recent decades of USD19bn in development of therapies for the condition. Most of the products for the treatment of sepsis discontinued or withdrawn since the beginning of the millennium followed anti-inflammatory strategies and/or attempted to completely block/neutralise the functioning of their target molecules. The DBI company, AdrenoMed, offers a new approach which is unique in two ways. Firstly, there are no other anti-sepsis

drugs under development which target the vasodilatory peptide hormone, adrenomedullin. Secondly, Adrecizumab does not fully block adrenomedullin's action as a vasodilator, but only inhibits it to a healthy level. Preclinical results released so far have shown this approach to be very promising. Administration of Adrecizumab stabilised the blood pressure of tested animals, whereas a life-threatening drop in blood pressure was observed in the control group. Vascular damage was reduced by two thirds and the test group had a survival rate of 50% after 7 days. The control group's mortality rate over the same period was 100%. In short, Adrecizumab reduced all major symptoms of severe sepsis in animal trials. Adrecizumab now has the potential to become the first in a new class of anti-sepsis drugs. We see peak sales potential of over €3bn.

We see addressable market for DB1RA at €1.7bn… The DBI company, Oncoprevent, is developing a two stage approach towards the prevention of breast cancer. The first stage entails the identification of women at high risk of developing the disease through the use of diagnostic products developed by Sphingotec, a company founded in 2002 by DBI's CSO, Dr Andreas Bergmann. The second stage entails the treatment of these high risk women with a drug to prevent the outbreak of cancer. To this end, Oncoprevent plans to reposition DB1RA, an existing NK-1 receptor antagonist, for breast cancer.

…and annual peak sales for AB2302 at €0.8bn AB2302 is an angiogenesis inhibitor which combats tumour growth. Angiogenesis refers to the process by which new blood vessels form from existing blood vessels. However, without angiogenesis a tumour cannot grow beyond a limited size. As well as acting as a vasodilator, adrenomedullin also stimulates angiogenesis and cancer cell proliferation. The DBI company, AngioBiomed, has developed an antibody, AB2302 which inhibits stimulation of angiogenesis by adrenomedullin. Preclinical results have been very promising. In a trial on mice injected with human tumour cells, the extent of tumour growth in the animals who received AB2302 was only 60% of the control group. We estimate annual peak sales for AB2302 at €0.8bn.

Our post money valuation is €101.2m or €67.9 per share Adding together the present value of our forecast exit proceeds for DBI's four current participations and projected net issue proceeds of €18.8m produces a post money valuation of €101.2m or €67.9 per share. This figure excludes the value of likely future additions to the pipeline.

SWOT ANALYSIS

STRENGTHS

- **DBI's management has high credibility** It is difficult to gainsay management's own claim of 1a credibility for DBI. Current management successfully conducted an MBO of Henning Berlin/Marion Merrell Dow's diagnostics segment in 1994, renamed it B.R.A.H.M.S. and sold it to Thermo Fisher Scientific in 2009. PCT, a biomarker for the early identification of sepsis, launched by B.R.A.H.M.S. in 1995, is considered the gold standard sepsis diagnostic product. Meanwhile DBI's current management was involved in the foundation of several firms including InVivo, InVent and Bioassays which were spun off from B.R.A.H.M.S. during the first decade of the current millennium. The DBI management team has contributed €7m of the total €11m so far invested in the company and has undertaken to invest a further €1m of its own money in the current financing round.
- **Starting point in humans rather than animals raises chances of successful drug development** Development of new drugs conventionally begins at the preclinical stage with tests on animals. During their time at B.R.A.H.M.S. from 1994-2009 and before that at Henning Berlin/Marion Merrell Dow, DBI's management gathered a wealth of experience in the development and clinical validation of peptide hormone-based biomarkers in human blood used in diagnostic products. Based on this experience, DBI's typical approach to developing a new drug is first to identify a biomarker as a relevant target. The next steps are to screen for a suitable antibody and from this derive a suitable drug candidate followed by validation of the target molecule in clinical diagnostic studies of patients' blood bank data. The drug candidate thus identified can then be tested in animals as part of conventional preclinical trials. However, DBI's approach of beginning the drug development process in humans rather than animals ensures the clinical relevance of the identified target and markedly improves the chances of successful clinical trials.
- **Access to bloodbank data through My Life Diagnostics facilitates development of new therapies** My Life Diagnostics' shareholder register includes scientists and leading clinicians in Germany, Italy and U.S. DBI has access to extensive human blood bank data through this network. Data on biomarkers in human blood and urine are much more valuable than similar data derived from animals. This information can be used to develop new therapies.
- **Sepsis business comprehensively patent protected until 2032 at least** DBI's and AdrenoMed's lead drug candidate for the treatment of sepsis, Adrecizumab, was awarded two essential patents in the EU in May 2014. In July 2015 DBI received notice of allowance from the United States Patent and Trademark Office for the key patent which provides comprehensive protection in the treatment of sepsis, shock and systemic inflammatory response syndrome by the drug candidate Adrecizumab. DBI's management believes that its business in sepsis is now comprehensively protected on the most important markets until the year 2032 at least.

WEAKNESSES

- **Not a pure play** DBI currently has four investments and it is likely that this number will increase in future as management identifies opportunities to develop new therapies. Buyers of DBI shares are thus investing in a ready-made portfolio, some parts of which they may consider less attractive than others.

- **Capital bound up for extended period** DBI's management does not envisage its first exit until 2018 (AngioBiomed). An exit from the investment which from the current perspective appears to be DBI's most valuable engagement (AdrenoMed) is not expected until 2018/19.

OPPORTUNITIES

- **Blockbuster potential** The drug candidates Adrecizumab (sepsis) and DB1RA (breast cancer prevention) both have blockbuster potential (sales of over €1bn annually). Treatment of sepsis is a huge unmet medical need with 15 to 19 million new cases worldwide a year of which over 30% are fatal. Adrecizumab has the potential to become first mover in a new class of therapy (adrenomedullin modulators) for the condition. Meanwhile, DBI's approach of repositioning an existing NK-1 receptor antagonist drug (DB1RA) promises to significantly reduce the incidence of cancer in patients (also identified by DBI) as high risk. DBI envisages its antiangionesis therapy, AB2302, being used in combination with existing anti-VEGF therapies. The leading anti-VEGF therapy currently has annual sales of over €8bn. DBI estimates the addressable market for AB2302 at €0.8bn annually.
- **DBI's technology platform brings GPCR target class within reach** DBI's expertise in peptide hormones opens up an indirect way of targeting GPCRs, which have historically been largely intractable to therapeutic antibody development or "not druggable". In 2010 six of the top ten and 60 of the top 200 best-selling drugs in the US in 2010 targeted GPCRs.
- **Knowhow ensures patentability of new drugs** Establishing peptide hormones as drug targets (as opposed to targeting the corresponding GPCR) requires a significant amount of experimental expertise. DBI's knowhow in peptide hormones gives it a technological head-start which ensures the patentability of new drugs.
- **Extensive network facilitates cooperation agreements and early exits** Management's extensive network built up over decades of activity at B.R.A.H.M.S. and Henning Berlin/Marion Merrell Dow has made it easier to find cooperation partners for existing projects such as AB2302 and should also help facilitate the planned early stage exits from AB2302 after preclinical trials and from Adrecizumab and DB1RA after the conclusion of phase II trials.

THREATS

- **Success is not guaranteed** Adrecizumab, DB1RA and AB2302 are at an early to mid development stage. The clinical phase I trial for Adrecizumab is due to start with a CTA (clinical trials application) submission this autumn. For both DB1RA and AB2302 the preclinical phase is expected to continue until 2017. Pre-clinical trial results released so far for all three drug candidates have been promising, but there is no guarantee that future results will continue to be good enough to attract the desired trade buyers.

VALUATION

Our post money valuation is €101.2m or €67.9 per share DBI has indicated that it intends to exit AdrenoMed and Oncoprevent in 2018/19 and 2022 respectively after the completion of phase II trials. The company plans to exit AngioBiomed after preclinical trials in 2018 and exit its share of the urinary tract infection diagnostic JV also in 2018 when the product is expected to achieve CE conformity. We assume that all these businesses will be acquired outright and base our valuation on comparison with peer group acquisition multiples rather than DCF methodology. Summing the present value of forecast exit proceeds for DBI's four current participations and projected net issue proceeds of €18.8m produces a post money valuation of €101.2m or €67.9 per share. This figure excludes the value of likely future additions to the pipeline.

AdrenoMed

Figure 1 shows details of seven transactions involving target companies in the areas of sepsis-induced acute kidney failure, chronic kidney disease, and antibiotics. The first five of the transactions shown in figure 1 were outright acquisitions including the two target companies which had completed phase II with their lead drug candidate (Cerexa and Ilypsa). These two companies also attracted the first and third highest upfront payments as a percentage of size of annual addressable market sales.

Figure 1: Exit potential for Adrecizumab after completion of phase II (peer group comparison)

Target company	Buyer	Year	Transaction value (Upfront)	Phase/Lead drug	Indication	Transaction type	Mkt size (USD bn)	Upfront payment/ addressable market
Cerexa	Forest Labs	2006	USD580m (USD480m)	completed phase II Cephalosporin	antiinfective antibiotic	acquisition	>USD9bn in 2007	5.33%
Protez Pharmaceuticals	Novartis	2008	USD400m (USD100m)	in phase II PZ-601	antiinfective incl. MRSA*	acquisition	USD9bn in 2007	1.11%
Novexel	Astra Zeneca	2009	USD430m (USD350m)	both in phase II NX104 (IV), NX103 (oral)	Antiinfective	acquisition	USD17bn in 2007	2.06%
Ilypsa	Amgen	2007	USD420m (USD420m)	completed phase II ILY101	chronic kidney disease	acquisition	USD13.3bn in 2009 USD19.8bn by 2016	3.16%
Kai Pharmaceuticals	Amgen	2012	USD315m (USD315m)	completed phase IIa KAI-4169	chronic kidney disease	acquisition	USD13.3bn in 2009 USD19.8bn by 2016	2.37%
Reata Biopharmaceuticals	Abbott	2010	USD450m (USD450m)	in phase II Bardoxolone	chronic kidney disease	licensing rights and minority equity investment	USD13.3bn in 2009 USD19.8bn by 2016	3.38%
AM-Pharma	Pfizer	2015	USD600m (USD87.5m)	in phase II recAP**	acute kidney injury related to sepsis	minority plus option to acquire balance of equity	>USD17bn in 2020	0.52%
								Av. upfront payment/ addressable market
AdrenoMed		2018/19	€461M	completed phase II	sepsis	acquisition	USD18bn in 2019	2.56%

* methicillin-resistant Staphylococcus aureus
**recombinant human alkaline phosphatase

Source: DBI Deutsche Biotech Innovativ AG; company press releases

There are 15-19 million new cases of sepsis worldwide every year. 1.8m of these cases are treated in clinics and hospitals in the EU, US and Japan. Pricing of comparable drugs suggests that a sales price of €10k per patient should be achievable for Adrecizumab. If we multiply these two figures we arrive at an addressable market of €18bn. The average percentage of the addressable market paid upfront in the transactions detailed above was 2.56%. Applying this figure to the addressable market of €18bn, we arrive at a valuation of €461m. The companies in figure 1 whose lead drug candidates had completed phase II achieved up front payments above 2.56% of their addressable markets and so this figure is conservative.

Assuming that the planned €20m capital raise is implemented in full, DBI plans to inject €8.7m into AdrenoMed. This would take DBI's stake in AdrenoMed from 26.04% currently to 50% plus one share. DBI plans to exit Adrenomed in 2018/2019. DBI's 50% plus one share stake in our €461m valuation discounted at 25% back from 31/12/2019 less the planned €8.7m investment is €79.3m (see figure 2). The combined business and corporation tax rate

on the sale of participations by companies located in Hennigsdorf is 13%. Our after tax valuation of DBI's 50% plus one share stake in AdrenoMed is €69.1m.

Figure 2: AdrenoMed valuation (€m)

Assumed exit date	31/12/2019
No. years to sale	4.32
Future value before minorities	461.1
Future value after minorities	230.5
Present value after minorities	88.0
Less 100% of €8.7m investment	79.3
Present value tax	10.3
Book value	9.0
After tax value	**69.1**

Source: First Berlin Equity Research estimates

Oncoprevent

There are currently 19.6m women in Germany in the 35-70 age group which is most at risk of developing breast cancer. Risk assessment tools and biomarkers such as those used by DBI consistently show that 5% of these women have an elevated risk of developing the disease. Management tells us that the price point for an annual course of treatment with the cancer prevention drug DB1RA is likely to be €500. The current most widely used cancer prevention drug, Tamoxifen, has been available as a generic since 2002. An annual course of treatment with this product currently costs around €375. DB1RA is effective in preventing both hormone responsive and hormone receptor negative tumours whereas Tamoxifen is only effective against hormone responsive tumours. DBR1A also has fewer side effects than Tamoxifen. In view of these advantages, we think €500 should be readily achievable for an annual course of treatment with DB1RA.

Assuming that one third of the high risk women in Germany use DB1RA or a competing product implies an annual market of ca. €150m. We further assume that the markets in the rest of the EU and the USA would be worth €750m each, suggesting a total addressable market of ca. €1.65bn. Similarly to AdrenoMed we have assumed the buyer pays 2.56% of the addressable market or €42.3m.

DBI plans to invest a further €4.4m into Oncoprevent if the planned €20m capital raise is implemented in full. This would take DBI's stake in the company from 25% currently to 95%. DBI has indicated that it intends to exit Oncoprevent in 2022 after the completion of phase II trials. DBI's 95% share of our €42.3m valuation discounted at 25% back from 30/06/2022 less the planned €4.4m investment is €4.3m (see figure 3). Our after tax valuation of the 95% stake in Oncoprevent is €3.8m.

Figure 3: Oncoprevent valuation (€m)

Assumed exit date	30/06/2022
No. years to sale	6.8
Future value before minorities	42.3
Future value after minorities	39.9
Present value after minorities	8.7
Less 100.0% of €4.4m investment	4.3
Present value tax	0.5
Book value	4.6
After tax value	**3.8**

Source: First Berlin Equity Research estimates

AngioBiomed

AngioBiomed and a large pharmaceutical company partner are currently conducting preclinical trials with the cancer tumour growth inhibitor, AB2302. These are expected to continue until 2017 and DBI expects to invest €2.3m. DBI plans to sell AngioBiomed to a Big Pharma company after preclinical proof of concept. DBI envisages AB2302 being used in combination with existing anti-VEGF (vascular endothelial growth factor) therapies. The leading anti-VEGF therapy currently has annual sales of over €8bn. DBI estimates the addressable market for AB2302 at €8bn annually of which it targets a market share at maturity of 10% or €0.8bn. Figure 4 below illustrates recent preclinical-stage transactions involving Immunocore and Bluebird bio.

Immunocore's ImmTAC technology (Immune mobilising monoclonal T-Cell Receptors against cancer) has shown potential to direct a patient's T cells to specifically target cancerous cells, avoiding damage to healthy cells. The July 2014 partnership deal with Eli Lilly stipulated an upfront payment of USD15m and a further USD10m in the event that Eli Lilly accepted a preclinical candidate package to develop and commercialise.

Bluebird bio is developing product candidates targeting B-cell maturation antigen (BCMA). BCMA, also known as tumour necrosis factor receptor superfamily number 17 (TNFRSF17), is implicated in leukemia, lymphomas and multiple myeloma. Under the terms of the June 2015 deal with Celgene, Bluebird bio received a USD25m payment to develop the lead anti-BCMA product candidate through a phase I trial.

Based on these transactions, we believe DBI should be able to generate proceeds of €20m from the sale of AngioBiomed.

Figure 4: Exit potential for AngioBiomed after completion of preclinical phase (peer group comparison)

Target company	Buyer	Year	Transaction value	Phase/Lead drug	Indication	Transaction type
Immunocore	Eli Lilly	2014	USD25m	preclinical ImmTAC	cancer	Partnership
Bluebird bio	Celgene	2015	USD25m	preclinical bb2121	leukemia, lymphomas multiple myeloma	Partnership

Source: company press releases

DBI plans to inject a further €0.8m into AngioBioMed if the planned €20m capital raise is implemented in full. DBI's stake in the company currently stands at 100%. We have assumed that DBI exits AngioBiomed in 2018. DBI's 100% share of our €20m valuation discounted at 25% back from 30/06/2018 less the planned €2.3m investment is €8.4m (see figure 5). Our after tax valuation is €7.3m.

Figure 5: AngioBiomed valuation (€m)

Assumed exit date	30/06/2018
No. years to sale	2.8
Future value after minorities	20.0
Present value after minorities	10.7
Less 100% of €2.3m investment	8.4
Present value tax	1.1
Book value	2.3
After tax value	**7.3**

Source: First Berlin Equity Research estimates

My Life Diagnostics (UTI diagnostic product)

DBI expect that MLDx's diagnostic test will achieve the CE mark (indicating compliance with EU product standards) during 2018. DBI plans to set up a 50/50 joint venture with an industrial partner which would manufacture the diagnostic tests. DBI estimates the size of the EU market for urinary tract infection diagnostic products at €660m of which it targets a 20% market share. Assuming once again that a buyer pays 2.56% of the addressable market sales, this would imply a valuation of €16.9m for 100% of the joint venture.

DBI plans to inject a further €0.5m into My Life Diagnostics if the planned €20m capital raise is implemented in full. This would take its stake in the company from 50% currently to 75%. We assume that DBI exits the urinary tract infection diagnostic product at the end of 2018. DBI's 75% share in 50% of our €17.2m valuation discounted at 25% back from 31/12/2018 less the planned €0.5m investment is €2.5m (see figure 6). Our after tax valuation is €2.2m.

Figure 6: UTI diagnostic product valuation (€m)

Assumed exit date	31/12/2018
No. years to sale	3.3
Future value before minorities	16.9
Future value after minorities	6.3
Present value after minorities	3.0
Less 100.0% of €0.5m investment	2.5
Present value tax	0.3
Book value	0.5
After tax value	**2.2**

Source: First Berlin Equity Research estimates

Adding together the present value of forecast exit proceeds for DBI's four current participations and projected net issue proceeds of €18.8m produces a post money valuation of €101.2m or €67.9 per share. This figure excludes any future additions to the pipeline.

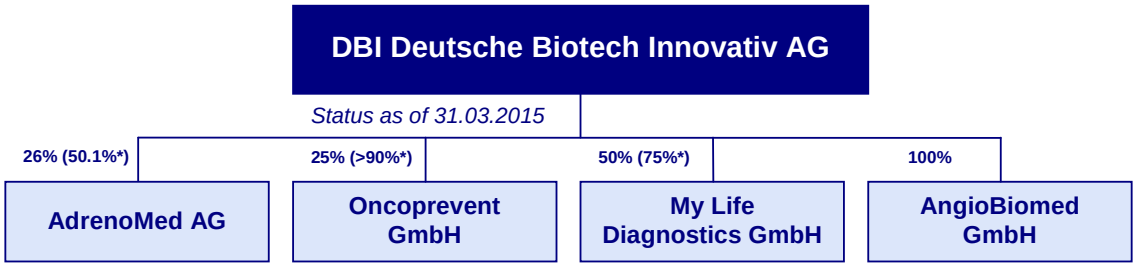
Figure 7: DBI: Sum of the parts valuation (€m)

AdrenoMed	69.1
Oncoprevent	3.8
AngioBiomed	7.3
My Life Diagnostics (UTI diagnostic product)	2.2
Total	82.4
Net issue proceeds	18.8
Post money valuation	**101.2**
Post money share count (m)	1.49
Post money valuation per share (€)	**67.9**

Source: First Berlin Equity Research estimates

COMPANY PROFILE

Figure 8: Structure of DBI Deutsche Biotech Innovativ AG



*after capital raise

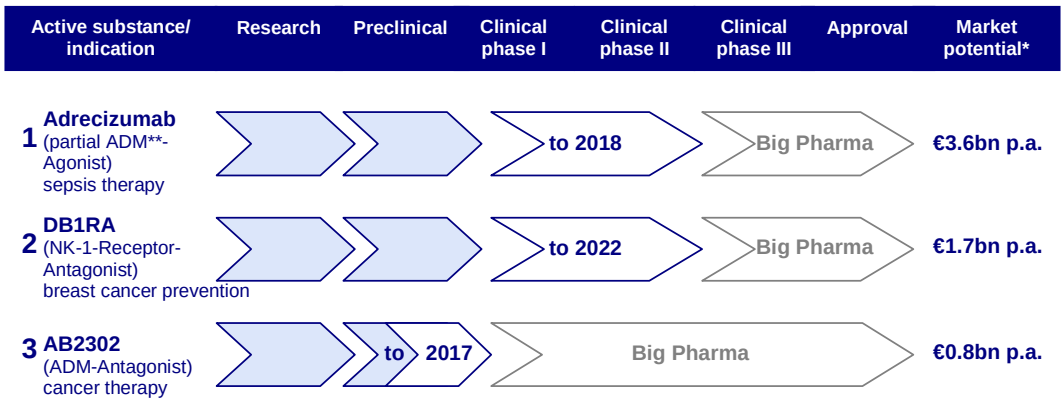
Source: DBI Deutsche Biotech Innovativ AG

Founded in 2009 Deutsche Biotech Innovativ AG was founded under the name Venetus Beteiligungen AG (Venetus) as a project company in Munich in June 2009. Venetus changed its name to Deutsche Biotech Innovativ AG in August 2014, having moved its headquarters to near Berlin as early as 2010.

First investment was 83.6% stake in AdrenoMed in November 2010 Venetus' first investment was a 83.6% stake in AdrenoMed AG, located in Hennigsdorf near Berlin, in December 2010. AdrenoMed AG (AdrenoMed) is developing DBI's lead product, Adrecizumab, a drug for the treatment of sepsis. AdrenoMed was founded by Dr Bernd Wegener, Dr Andreas Bergmann and six other scientists/life sciences managers. Dr Wegener and Dr Bergmann became CEO and CSO (Chief Scientific Officer) respectively of Venetus in December 2010. Over the next four years, Venetus' stake in AdrenoMed declined to 26.0% as a consequence of a succession of financing rounds. DBI's stake is currently 26.0%.

Oncoprevent, AngioBiomed and My Life Diagnostics stakes acquired over past year In December 2014 DBI acquired a 25% stake in Oncoprevent GmbH (Oncoprevent) and in February 2015 100% in AngioBiomed GmbH (AngioBiomed). Oncoprevent aims to reposition an existing drug, DB1RA, for the prevention of breast cancer and uses biomarkers from Sphingotec to identify women at high risk of developing breast cancer. AngioBiomed is developing an anti-angiogenic cancer therapy, AB2302. DBI's most recent acquisition in spring 2015 was 50% in My Life Diagnostics GmbH (MLDx) which is developing a diagnostic product for bladder infections.

Figure 9: DBI's product pipeline



* Estimate of addressable market for DBI's active substance
** ADM = peptide hormone Adrenomedullin

Source: DBI Deutsche Biotech Innovativ AG

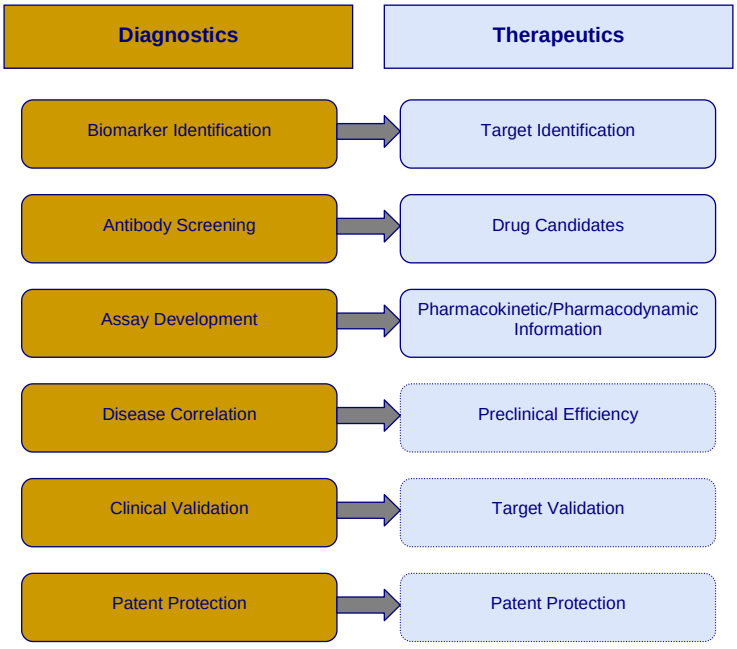
All four companies located in Hennigsdorf – 3km north of Berlin DBI and the four companies in which it is invested are all located in Hennigsdorf, which is well known as a technology centre for innovative biopharmaceutical companies north of Berlin. Dr Bergmann, Dr Miklus (ex-Chief Operating Officer at B.R.A.H.M.S.) and Dr Wegener are direct shareholders (holding shares via respective investment vehicles) in both AdrenoMed and Oncoprevent. In varying combinations these three men also constitute the management boards of AdrenoMed, Oncoprevent, AngioBiomed and My Life Diagnostics.

Current portfolio based partly on proceeds of B.R.A.H.M.S. sale DBI's three largest shareholders Dr Andreas Bergmann, Dr Metod Miklus and Dr Bernd Wegener managed the diagnostic segment of the firm Henning Berlin/Marion Merrell Dow until 1994 when they took it over through a management buyout. The business was named B.R.A.H.M.S. after the first letters of its founders' names but continued its longstanding activities in research, development and marketing of immunoassays based on the identification of antibodies and proteins in patients' blood. In 1995 B.R.A.H.M.S. launched Procalcitonin (PCT), a biomarker for the early identification of sepsis. By 2000 B.R.A.H.M.S. had outgrown its premises at the former Henning Berlin site in Tempelhof and moved to its current location in Hennigsdorf. During the first decade of the current millennium several biotechnology firms were developed by members of B.R.A.H.M.S. management including InVivo, InVent, Bioassays and Sphingotec. The American firm Thermo Fisher Scientific acquired B.R.A.H.M.S. at the end of 2009 for around €330m and its three founders began to invest the proceeds of the sale in the foundation of new, innovative pharmaceutical companies. One of these companies was AdrenoMed which later became DBI's first investment.

CLOSE LINKS BETWEEN DIAGNOSTIC AND THERAPEUTIC PRODUCTS RAISE PROBABILITY OF SUCCESSFUL DRUG DEVELOPMENT

DBI's therapeutic solutions are a natural next step from the expertise in blood biomarkers management has gained through decades of experience at B.R.A.H.M.S. and before that at Henning Berlin/Marion Merrell Dow. Identification of biomarkers relies on the ability of an antibody to recognise and specifically bind to a particular macromolecule.

Figure 10: Synergies between DBI's diagnostic and therapeutic approaches



Source: DBI Deutsche Biotech Innovativ AG

DBI's therapeutic approach to sepsis (Adrecizumab) and its anti-angiogenic cancer therapy (AB2302) are also based on antibodies. The antibodies in these drugs bind to and antagonise (halt or modulate) the action of certain proteins in the body which act to expedite the development of these diseases. Figure 10 above illustrates the synergies between DBI's diagnostic and therapeutic approaches. As we have already pointed out above, in our view DBI's approach of beginning the drug development process with human patients' blood rather than with animals markedly improves the chances of ultimate success.

Expertise in peptide hormones opens up immensely valuable but hitherto undruggable GPCR target class to DBI There are four families of receptors within the human body. The GPCR family is the largest of these and is particularly interesting to DBI because it includes the receptors for peptide hormones.

GPCR-targeting drugs accounted for six of top ten US drugs in 2010 GPCRs are involved in a broad range of biological processes and diseases, including inflammatory disease, neuroscience indications, cancer, cardiovascular and metabolic diseases. They comprise the single largest class of targets for pharmaceuticals currently on the market. Six of the top ten and 60 of the top 200 best-selling drugs in the US in 2010 target GPCRs. These drugs generate multi-billion dollar sales annually and so this target class has huge commercial potential.

Instability of GPCRs has made them an "undruggable" target However, GPCRs are very unstable and lose their highly organised structure and activity when taken out of the cell membrane. This makes them difficult to handle in the lab and hence difficult to analyse. GPCRs have been largely intractable to therapeutic antibody development – "not druggable". The fact that only one GPCR-targeting antibody has been approved to date attests to the technical challenge of obtaining high-quality GPCR antigen for antibody production.

Peptide hormones are important class of GPCR ligand… Another approach would be to target the corresponding ligand that exerts its physiological effect by binding the GPCR. Peptide hormones comprise one important class of these soluble ligands.

…and allow DBI to get round the problem of GPCR "undruggability" DBI is already using this technique with its lead drug candidate, the humanized antibody Adrecizumab. Adrecizumab acts as a partial agonist to the peptide hormone Adrenomedullin, thereby modulating its effect on the corresponding GPCR. Management has set a goal of starting work on one new project/active pharmaceutical ingredient (API) each year. DBI's expertise in producing antibodies for peptide hormones is potentially a rich source of new APIs directed at the immensely valuable GPCR target class.

ADRENOMED

Figure 11: AdrenoMed Management Board and shareholders

Shareholder structure	
DBI Deutsche Biotech Innovativ AG	26.0% (50.0%*)
Dr Bernd Wegener**	16.2% (10.9%*)
Dr Andreas Bergmann**	16.2% (10.9%*)
Dr Metod Miklus**	16.2% (10.9%*)
KfW	9.0% (6.1%*)
ILB (Investitionsbank Brandenburg)/BFB II (Wachstumsfond Brandenburg)	5.0% (3.4%*)
11 other shareholders	11.4% (7.7%*)

**after capital raise; ** direct and indirect shareholdings excluding DBI*

Source: DBI Deutsche Biotech Innovativ AG

Lead drug candidate, Adrecizumab, focuses on the role of Adrenomedullin in sepsis DBI's and AdrenoMed's lead drug candidate for the treatment of sepsis, Adrecizumab, focuses on the role of the peptide hormone Adrenomedullin (ADM) in the condition. ADM was first discovered in 1993 and has been found to play a role in initiating the hyperdynamic response phase (increased cardiac output and dilation of the blood vessels) during the early stages of sepsis. The development of Adrecizumab has its background in the extensive research of B.R.A.H.M.S./AdrenoMed and their personnel into ADM as a biomarker in acute care situations. B.R.A.H.M.S. developed an immunoassay for the midregional prohormone of ADM (MR-proADM) as a surrogate marker for ADM. Sphingotec, founded by DBI's CSO, Andreas Bergmann, in 2002, recently developed a sandwich assay for biologically active ADM.

Sepsis is a huge unmet medical need and the most costly disease treated in hospitals The worldwide incidence of severe sepsis is higher than for either cancer or heart attack with around 15 to 19 million new cases annually. Sepsis and its closely related condition, SIRS (Systemic Inflammatory Response Syndrome) are the main causes of death in intensive care units with mortality rates between 30 and 70%. Sepsis is usually caused by bacterial infections, often acquired in hospital. Infections leading to sepsis typically begin in the lungs, abdomen or urinary tract. The body's response to infection is usually limited to the infected area, but in the case of sepsis the response to infection occurs throughout the whole body. Sepsis occurs when the body releases substances (cytokines) that trigger inflammation which helps the body fight infection. The simultaneous release of ADM is initially beneficial in sepsis but needs to be stabilised at a healthy level. Without this stabilisation, ADM causes excessive dilation of the blood vessels thereby decreasing blood pressure and the flow of blood to vital organs. The heart attempts to compensate for this by pumping harder but eventually weakens with the consequence that the volume of blood which reaches vital organs is reduced further. This drop of blood pressure results in a dangerous shock situation, which may in turn worsen organ malfunction and lead to death.

Continued high mortality rates attest to limited success of standard therapy Sepsis is currently the most costly disease treated in hospitals. Annual direct and indirect costs of the condition to the German and US health systems are currently put at €6.3bn and USD20bn respectively. Standard therapy currently entails treatment of the infection which gives rise to sepsis with antibiotics and/or antifungal drugs. Fluids are administered intravenously to increase the amount of fluid in the bloodstream and thus increase blood pressure while drugs such as dopamine or norepinephrine are used to narrow the blood vessels and increase blood flow to the vital organs unfortunately with deleterious side effects. However standard therapy only meets with limited success as continuing high mortality rates attest.

Big Pharma has invested USD19bn but not produced a currently approved sepsis drug The development of new drugs for sepsis is often regarded as the "graveyard for pharmaceutical companies". Although Big Pharma has invested USD19bn in recent decades, there are currently no approved drugs for the treatment of the condition. Figure 12 below lists products for the treatment of sepsis discontinued or withdrawn since the beginning of the millennium. Most of these products followed anti-inflammatory strategies and/or attempted to completely block/neutralise the functioning of their target molecules.

Figure 12: Products for the treatment of severe sepsis or septic shock discontinued or withdrawn since 2000

Year	Highest Phase	Drug	Product Type	Company
2012	Phase II	CytoFab/AZD9773	Anti TNF-polyclonale ovine Fab	Astra Zeneca/BTG
2012	Phase III	Talactoferrin	Recombinant Protein	Aggenix
2011	Phase III	Resatorvid; TAK-242	TLR4 antagonist	Takeda
2011	Market approval	Xigris	Activated Protein C, anticoagulant	EliLilly
2011	Phase III	Eritoran	TLR 4 antagonist	Eisai
2011	Phase III (PHOENIX)	PHP/Hemoximer	NO scavenger, pyridoxalated hemoglobin polyoxyethylene	Apex Bioscience/ Curacyte
2009	Phase III	Kybernin-P	Antithrombin III	Centron/Aventis Behring -> Now CSL
2006	Phase II	GR 270773	Endotoxin binding lipid emulsion	Sepsicure/GSK
2006	Phase II	E5531	Synthetic endotoxin antagonist (Lipid A analogue)	Eisai
2003	Phase III	Tifacogin	Rec. tissue factor pathway inhibitor, Anticoagulant	Novartis
2002	Phase II	IS 14	Anti CD14 mAB, receptor important for activation of cells by lipopolysaccharide (LPS)	ICOS Corp

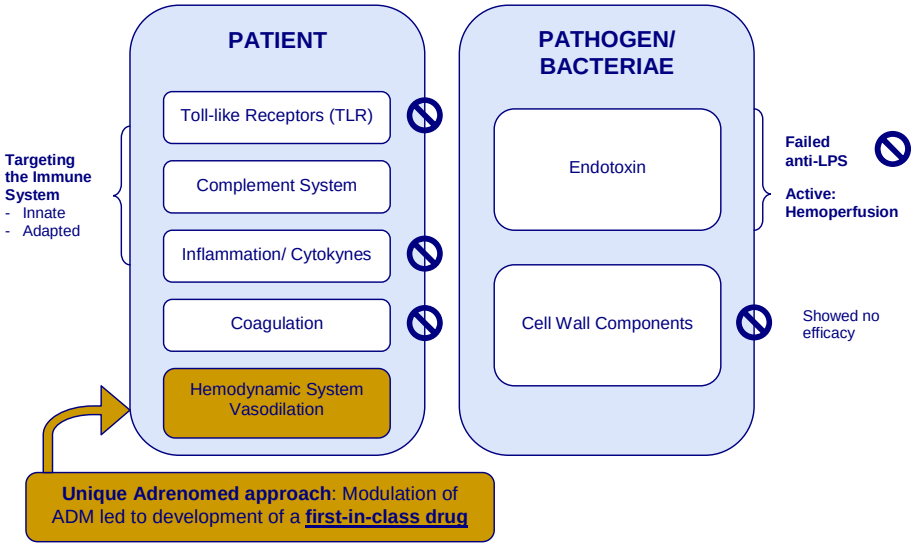
Source: AdrenoMed; DBI

Focus on ADM, partial not full blocking of target molecule differentiate DBI's sepsis approach AdrenoMed's approach is unique in two ways. Firstly there are no other anti-sepsis drugs under development which target ADM. Secondly, Adrecizumab does not fully block ADM's action as a vasodilator, but only inhibits it to a healthy level. Preclinical results released so far have shown this approach to be very promising. As figure 13 overleaf shows, Adrecizumab, now has the potential to become the first in a new class of anti-sepsis drugs.

ADM's role as a vasodilator in sepsis is well known. This prompted AdrenoMed to carry out tests on the modulating activity of various anti-ADM antibodies in vitro and on their ability to reduce mortality in septic mice. These tests showed that an anti-ADM antibody directed against the N-terminus substantially increased the survival of mice whereas other antibodies with similar affinities but different epitope specificities were much less potent. The efficacious antibody, in contrast to an anti-C-terminal antibody, only partially inhibited ADM agonist activity in vitro. The essential role of ADM as the strongest short term predictor of circulatory breakdown and death in sepsis was validated by the DBI team in a prospective clinical diagnostic study in 101 patients.*

** Marino R, Struck J, Maisel AS, Magrini L, Bergmann A, Di Somma S. (2014) Plasma adrenomedullin is associated with short-term mortality and vasopressor requirement in patients admitted with sepsis. Crit Care, Feb 17;18(1):R34. doi: 10.1186/cc13731.*

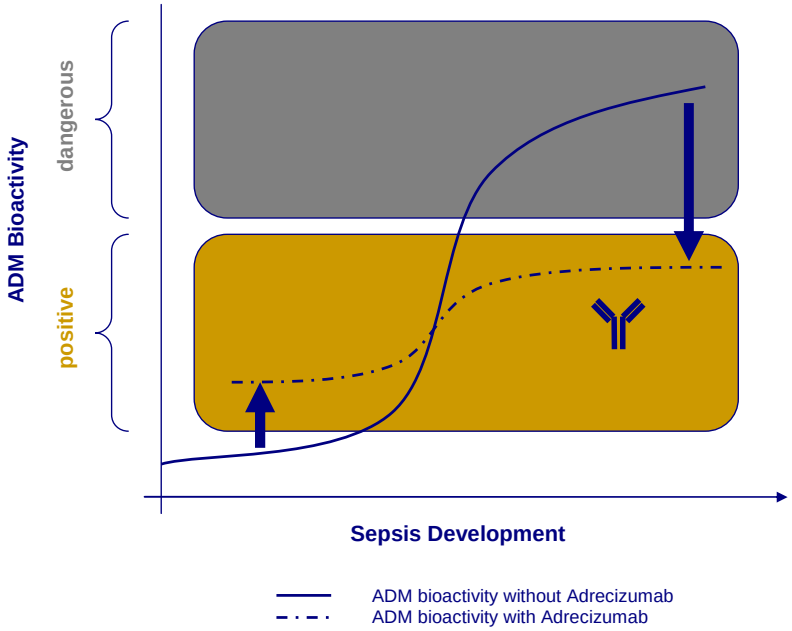
Figure 13: Sepsis therapeutic target categories: mainly anti-inflammatory strategies



Source: AdrenoMed; DBI

In an article published in 2013 entitled “Epitope specificity of anti-Adrenomedullin antibodies determines efficacy of mortality reduction in a cecal ligation and puncture mouse model” the authors and cofounders of AdrenoMed Joachim Struck, Frauke Hein, Siegmund Karasch and Andreas Bergmann commented further on the preclinical drug development results, “The mechanism leading to a substantially improved survival rate of”… “mice when treated with an anti-N-terminal antibody is not completely clear. We hypothesize that binding of the anti-N-terminal antibody to ADM still allows receptor binding, but less efficiently, and thus reduces the functionality of ADM so that excess levels, which have been suggested to become harmful during the progression of sepsis, then get functionally neutralized to a certain limited extent. Partial functional inhibition of ADM, on the other hand, leaves sufficient ADM available, which is required in the early hyperdynamic phase of sepsis and possibly later as well”.

Figure 14: ADM bioactivity in sepsis with and without Adrecizumab



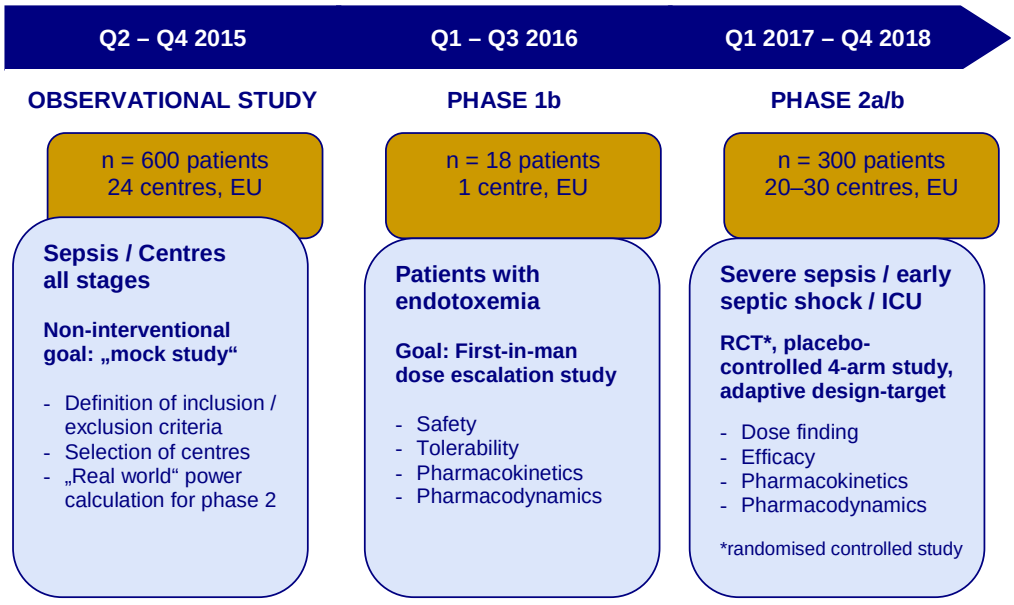
Source: Wagner et al. (2013) Intensive Care Medicine Experimental, 1:3. doi:10.1186/2197-425X-1-3

More specifically, results of preclinical tests in animals showed:

- reduction of blood vessel damage by up to two thirds
- significant improvement in kidney function and fluid balance
- reduction in inflammation by up to a tenth compared with the control group
- stabilisation of circulation
- restoration of organ function, fluid balance and kidney function
- 50% reduction in mortality

Phase I and II trials are scheduled to start in Q4 this year The drug candidate Adrecizumab is a humanized antibody that binds specifically to the ADM of all relevant species (human, non-human primate, rat, mouse dog, pig). It is derived from the anti-ADM antibody directed against the N-terminus described above. Phase I and II trials (see figure 15 below) are scheduled to begin in Q4 of this year, continue until Q4 2018 and are expected to cost €8.7m. The studies will be carried out by the French Key Opinion Leader, Professor Alexandre Mebazaa, of Paris University and will be coordinated by the French CRO, "La Fondation Transplantation European Drug Development Hub" in St Appolinaire near Dijon.

Figure 15: Adrecizumab phase I and II study design



Source: AdrenoMed; DBI

Following completion of phase I and II, DBI envisages selling Adrecizumab to a large pharmaceutical company which would then finance phase III trials. After a 1-2 year approval period, market introduction would then follow in 2022/23. We estimate annual peak sales potential for Adrecizumab at €3.6bn.

ONCOPREVENT

Figure 16: Oncoprevent management and shareholders

Managing Directors:	
Dr Andreas Bergmann	
Dr Metod Miklus	
Shareholder structure	
DBI Deutsche Biotech Innovativ AG	25.0% (95.0%*)
Dr Bernd Wegener**	25.0% (1.7%*)
Dr Andreas Bergmann**	25.0% (1.7%*)
Dr Metod Miklus**	25.0% (1.7%*)

**after capital raise; ** direct and/or indirect shareholdings excluding DBI*

Source: DBI Deutsche Biotech Innovativ AG

Identifying women at high risk of breast cancer, then preventing its outbreak
Between 10% and 30% of women become ill with breast cancer at some point in their lives. There are 75,000 new breast cancer patients every year in Germany and 1.2m worldwide. Oncoprevent is developing a two stage approach towards the prevention of breast cancer. The first stage entails the identification of women at high risk (up to 20x the normal risk level) of developing breast cancer. The second stage entails the treatment of these high risk women with a drug to prevent the outbreak of cancer.

Oncoprevent identifies women at high risk of developing breast cancer through risk assessment tools and also through use of the biomarkers, proneurotensin (pro-NT) and proenkephalin (pro-ENK)

Risk factors in the development of the disease include age, time of first menstruation or menopause, density of breast tissue and genetic changes (mutation of the breast cancer gene). Other factors include choice of hormone replacement therapy treatment, Body Mass Index (BMI) and smoking. Lifestyle decisions such as levels of physical activity, eating habits and alcohol consumption also influence breast cancer risk. Using these factors, individual risk coefficients for breast cancer can be calculated.

Biomarker immunoassays developed by Sphingotec (founder Andreas Bergmann)
Immunoassays for the breast cancer biomarkers pro-NT and pro-ENK were developed by Sphingotec GmbH which was founded in 2002 by Dr Andreas Bergmann, one of Oncoprevent's two Managing Directors (the other is Dr Metod Miklus). The products have been available at German general practitioners and gynaecologists for the past two years and will soon be available in the US.

Neurotensin is a hormone peptide composed of 13 amino acids, which is essentially formed in the N cells of the small intestine. The release of this hormone into the body's circulation by the small intestine is primarily influenced by animal fats and sugar. It also acts as a satiety hormone. Neurotensin also stimulates the growth of breast tumour cells and has a directly anti-apoptotic effect on breast cancer cells. Neurotensin is overexpressed in malignant breast cancer cells. As neurotensin is unstable in vivo and in vitro, its direct determination is not suitable for laboratory testing. Proneurotensin 1-117 (pro-NT), however, is a stable fragment of the neurotensin precursor molecule and is formed in the same ratio as neurotensin. This means it is useable as a surrogate marker for neurotensin.

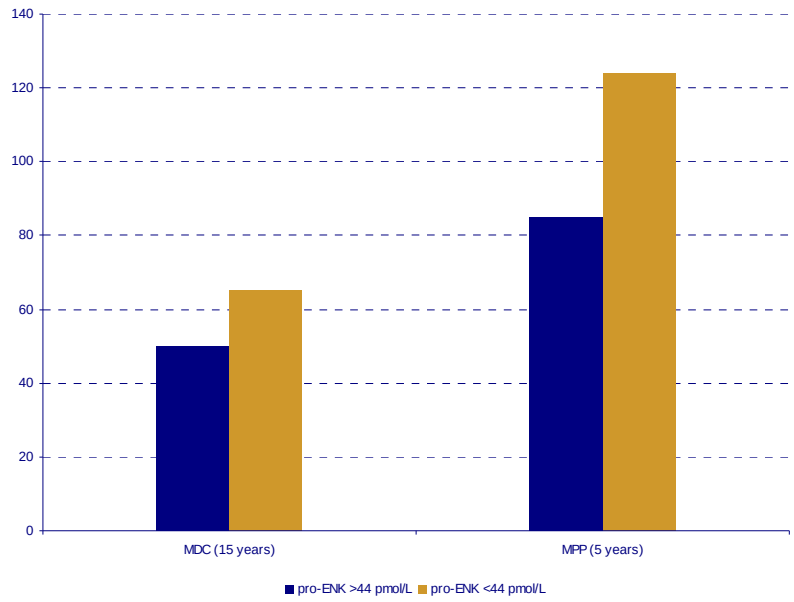
Studies show connection between breast cancer risk and pro-NT, pro-ENK levels
Results of the Malmö Diet and Cancer Study (MDC*) of 2012 clearly prove the correlation between the concentration of pro-NT in the blood and the risk of developing breast cancer.

** Melander et al JAMA. 2012;308(14):1469-1475*

The results demonstrated that increased pro-NT concentration is associated with an almost threefold higher risk in developing breast cancer over the following 10-15 years. These results were confirmed in 2014 by a further study conducted by the Malmö Prevention Project Study (MPP*).

Enkephalin is expressed in cancerous cells and stimulates apoptosis (programmed cell death or PCD). Enkephalin levels can be used as a marker for detection of cancer. A reduced level of apoptosis results in uncontrolled cell proliferation, which is a hallmark of cancer. As enkephalin helps the body to find diseased cells and fight them, it is imperative that enkephalin levels are not too low. Pro-ENK is a stable mid-regional fragment of proenkephalin, a surrogate marker for the unstable enkephalin. Both the MDC and the MPP also confirmed that there is a significant correlation between lowered pro-ENK and the development of breast cancer.

Figure 17: Breast cancer events per 1,000 women in the healthy population



Source: MDC;MPP

Breast cancer prevention based on the substance P/neurokinin-1 receptor system
Oncoprevent's approach to preventing the outbreak of cancer in high risk women is based on the substance P(SP)/neurokinin(NK)-1 receptor system. A study by Munoz et al.** found NK-1 receptors and SP in all human breast cancer samples examined. Substance P is a peptide composed of a chain of 11 amino acids.

Oncoprevent to reposition existing NK-1 receptor antagonist drug for breast cancer
It is known that activation of the NK-1 receptor by SP induces cell division in tumour cells and also prevents their death, thereby stimulating tumour cell proliferation

**Melander et al. (2014) Measurement of plasma proneurotensin warrants further investigation as a blood-based marker for early breast cancer detection. Cancer Epidemiol Biomarkers Prev, 23(8); 1672–6. doi: 10.1158/1055-9965.EPI-13-1200*

***Miguel Muñoz and Rafael Coveñas (2014) Involvement of substance P and the NK-1 receptor in pancreatic cancer. World J Gastroenterol. 20(9): 2321–2334. doi: 10.3748/wjg.v20.i9.2321*

It is also known that NK1-receptor antagonists exert anti-tumour action and could be candidates as a new drug for the treatment of breast cancer. An NK-1 receptor antagonist drug is already available on the market but has not been approved for breast cancer prevention. Oncoprevent refers to this drug as DB1RA and plans to reposition it for breast cancer prevention. The phase I trial of DB1RA for the breast cancer indication is scheduled to begin in Q1 2018 and conclude the same year and is expected to cost ca. €4.4m including finalisation of preclinical development and the cost of the clinical trial application for the phase II trial. DBI envisages selling the product after completion of the phase II trial in 2022. The buyer would then finance the phase III trial. After a 1-2 year approval period, market introduction would follow in 2028/29.

Competing therapeutic approaches The SERM (selective estrogen receptor modulator) drugs, Tamoxifen and Raloxifene (both now off-patent), are currently approved in the USA for chemoprevention (reversal, suppression, or prevention of the development of cancer) of breast cancer. In Europe these drugs are on clinicians' guidelines but are not approved by the regulatory authorities. Aromatase inhibitors such as Exemestane and Anastrazole have been the object of large multicentre tests in recent years and also feature in clinicians' guidelines but have not achieved approval.

Both classes of drug are only effective on hormone-responsive tumours which constitute around 80% of cases of breast cancer. 20% of all breast cancer cases are triple negative tumours (TNBC) which are not preventable by existing drugs. TNBC is the most aggressive form of breast cancer and cannot be treated by targeted therapy but only by chemotherapy.

DB1RA can be used to prevent TNBC and has more favourable side effect profile Unlike existing drugs, DB1RA can be used to prevent TNBC and has fewer side effects. The long term use of Tamoxifen is associated with numerous side effects including menopausal complaints such as hot flushes, but also heightened risk of stroke, thrombosis, pulmonary embolism and uterine cancer. Side effects from the use of aromatase inhibitors are less severe (they include bone and joint pain). Aromatase inhibitors also achieve a higher reduction in breast cancer incidence than the SERM drugs, although to date no studies have been carried out which directly compare their respective performance. Use of DB1RA is expected to have very few side effects.

ANGIOBIOMED

Figure 18: AngioBiomed management and shareholders

Managing Directors:	
Dr Andreas Bergmann	
Dr Metod Miklus	
Shareholder structure	
DBI Deutsche Biotech Innovativ AG	100.0%

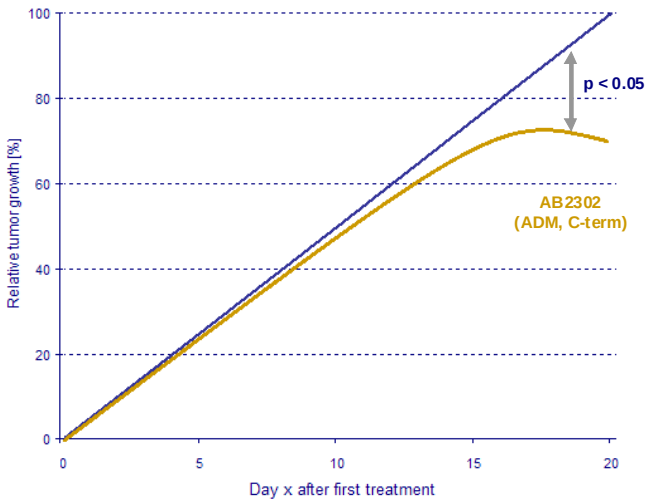
Source: DBI Deutsche Biotech Innovativ AG

AB2302 is an angiogenesis inhibitor which combats tumour growth Angiogenesis refers to the process by which new blood vessels form from existing blood vessels. However, it is also essential to tumour growth as tumours are dependent on parallel growth in the capillary network for their supply of oxygen and nutrients. Without angiogenesis a tumour cannot grow beyond a limited size. Angiogenesis is stimulated by angiogenic proteins including several growth factors.

Research into angiogenesis inhibitors is currently on the cutting edge of cancer research. Avastin, the first therapy targeted at angiogenesis in cancer was approved by the FDA in 2004 for combination use with standard chemotherapy for metastatic colon cancer. Avastin is a VEGF (vascular endothelial growth factor) antibody. However, recent studies on VEGF inhibitors have shown that although they can reduce the growth of primary tumours, they also promote invasiveness and metastasis of tumours.

Preclinical trials in mice showed 40% reduction in tumour growth AngioBiomed in cooperation with a large pharmaceutical company partner, has developed an angiogenesis inhibitor, the adrenomedullin antibody, AB2302. Adrenomedullin (ADM) is a multifunctional peptide whose properties include vasodilation (as we have already seen) and stimulation of angiogenesis. AB2302 inhibits stimulation of angiogenesis by ADM. Preclinical results have been very promising. In a trial on mice injected with human tumour cells (see figure 19 below) the extent of tumour growth in the animals who received AB2302 was only 60% of the control group.

Figure 19: Tumour growth in mice receiving AB2302 and control group



Source: AngioBiomed; DBI

DBI plans to exit AngioBiomed in 2017/18 AngioBiomed and its partner are currently conducting preclinical trials with AB2302. These are scheduled to continue until 2017 and DBI expects to invest €2.3m. DBI plans to sell AngioBiomed to a Big Pharma company after preclinical proof of concept. Following consultation with the regulators, the buyer would then conduct clinical trials between during 2020-2025. After the approval process, market introduction would take place in 2027/28.

DBI envisages AB2302, being used in combination with existing anti-VEGF therapies. The leading anti-VEGF therapy currently has annual sales of over €8bn. DBI estimates the addressable market for AB2302 at €8bn annually of which it targets a market share at maturity of 10% or €0.8bn.

MY LIFE DIAGNOSTICS

Figure 20: My Life Diagnostics management and shareholders

Managing Director:	
Dr Metod Miklus	
Shareholder structure	
DBI Deutsche Biotech Innovativ AG	50.0% (75.0%*)
Prof Alan Maisel, San Diego, USA	20.0% (10%*)
Prof Salavatore Di Somma, Rome, Italy	15.0% (7.5%*)
Prof Prasad Deverajan, Cincinnatti; USA	5.0% (2.5%*)
Prof Frank Peacock, Houston, USA	5.0% (2.5%*)
ASIO Biomedical Consulting GmbH	5.0% (2.5%*)
(=Dr Frauke Hein), Berlin, Germany	

**after capital raise*

Source: DBI Deutsche Biotech Innovativ AG

My Life Diagnostics has access to human blood bank data, acts as "think tank"… My Life Diagnostics (MLDx) acts as the "think tank" for DBI and also houses innovative diagnostic projects - the first of which is a diagnostic for urinary tract infections in hospital emergency rooms. MLDx's role in the development of new products makes clear the synergetic relationship at DBI between development of diagnostic and therapeutic products. The minority shareholders in MLDx shown in figure 20 above are scientists and leading clinicians in Germany, Italy and U.S. DBI has access to extensive human blood bank data through this network. Data on biomarkers in human blood can be used to develop new therapies.

…and has also developed innovative diagnostic product for urinary tract infections DBI/MLDx's interest in diagnosis of urinary tract infections closely relates to the company's activities in sepsis. Urinary tract infections are the second most frequent cause of sepsis after pneumonia. Every second women and every third man either has a urinary tract infection on arrival in hospital or develops one during the course of their hospital stay. Patients are frequently admitted to hospital after suffering a heart attack. They recover from the heart attack but later die of sepsis triggered by a urinary tract infection.

The biggest disadvantage of current tools for the diagnosis of urinary tract infections is that results obtained from conventional microbiological analysis of urine and antibiotic susceptibility are only available after 2-3 days. This means that the infection can develop further before the doctor is able to identify an antibiotic suited to the patient's resistance profile. MLDx has access to a patented automated in vitro colorimetric test for rapid bacterial counting. In trials the new test was able to detect in a few hours the presence or absence of bacteria and their sensitivity to some of the most commonly used antibiotics in urinary tract infections.

Joint venture with industrial partner envisaged DBI expect that MLDx's diagnostic test will achieve the CE mark (indicating compliance with EU product standards) during 2018. DBI plans to set up a 50/50 joint venture with an industrial partner which would manufacture the diagnostic tests. DBI estimates the size of the market for urinary tract infection diagnostic products at €660m of which it targets a 20% market share.

FINANCIAL POSITION

DBI has spent ca. €10m on R&D since its inception in 2009. Allocation by investment of the proceeds of the planned up to €20m equity capital raise is shown in figure 21 below. At the end of 2014 DBI had a cash position of €481k and no debt on its balance sheet. We expect the company to remain debt free during our forecast period (out to 2018).

Figure 21: Capital requirement and allocation by company

Company	2015	2016		2017		2018		2019	Sum
	H2	H1	H2	H1	H2	H1	H2	H1	
DBI	70	220	260	220	260	220	260	220	**1,730**
AdrenoMed		1,080	1,110	470	1,710	2,000	1,860	470	**8,700**
Oncoprevent	30	230	440	650	1,230	470	550	840	**4,440**
AngioBiomed	420	590	580	670					**2,260**
My Life Diagnostics	50	70	60	70	65	70	70	45	**500**
Financing costs	1,200								**1,200**
Strategic reserve	150	150	150	150	150	150	150	120	**1,170**
Sum	**1,920**	**2,340**	**2,600**	**2,230**	**3,415**	**2,910**	**2,890**	**1,695**	**20,000**
Cumulated	**1,920**	**4,260**	**6,860**	**9,090**	**12,505**	**15,415**	**18,305**	**20,000**	

Source: DBI Deutsche Biotech Innovativ AG

MANAGEMENT

CEO - Dr Bernd Wegener

Dr Wegener, born in 1947 graduated in vetinary science and has held various management positions at Boehringer Ingelheim KG, the Degussa Group, Marion Merrell Dow GmbH and Henning Berlin GmbH. As Managing Director and shareholder he founded the biotechnology company, B.R.A.H.M.S. AG through a management buyout. From 2000 to mid-2014 he was Chairman of the Management Board and since July 2014 has been a Member of the Management Board of the Federal Pharmaceutical Association. He is also a member of various professional and regulatory bodies.

CSO - Dr Andreas Bergmann

Dr Bergmann, born in 1961 graduated in biochemistry and has worked for over 20 years in management positions at various biotechnology firms. From 2001 to 2010 he was Chief Research Officer at B.R.A.H.M.S. AG and since 2010 has been a Member of the Management Board of the “Waltraut Bergmann Foundation for Cancer Research”.

SUPERVISORY BOARD

Renke Lührs

Mr Lührs, born 1960, is a lawyer and partner of the international legal firm Buse Heberer Fromm and advises German and international clients in securities, company and capital markets law as well as in company acquisitions and disposals. After qualifying as a lawyer in 1991, he worked as the manager of the legal department of a listed investment company. From 2001 to 2010 he worked for a legal firm specialised in company law. He has many years of experience as a member of supervisory boards of listed and non-listed companies.

Eran Davidson

Mr Davidson, born in Israel in 1959, moved with his family to Berlin in 2005 to start the Venture Capital Fund Hasso Plattner Ventures. Mr Davidson’s experience in Venture Capital early-stage investments goes back to 1996 when he joined the Israeli venture fund Inven tech as Vice President. Later Mr Davidson joined another Israeli fund, Eurofund 2000, as Managing Partner. From 2002 to 2005 Mr Davidson served as CEO of ProSeed Capital Fund in Tel Aviv, leading the acquisition of Technion Technological Incubator, building a consortium of international VC’s and, together with the Technion Institute, taking it to the position of top-ranked Israeli Private Incubator. Mr Davidson has also been President and Managing Partner of HPV as well as Co-Founder and Vice Chairman of Hasso Plattner Ventures Africa. Eran holds an LLB from Tel Aviv University and a MBA from Boston University, Beer Sheba.

Uwe Wolff

Uwe Wolff, born 1962, studied law at the University of Freiburg/Breisgau, but gave up his studies in favour of journalism (Badische Zeitung and Sudkurier) and worked as a reporter for “Abendpost/Nachtausgabe” (Frankfurt), for the “Abendzeitung” (Munich/Nuremberg) and for the “EXPRESS” (Cologne). In 1991 Mr Wolff moved to New York for the publishing house Hubert Burda Media to set up the US-office for the news journal “FOCUS” reporting from North, Central, and South America, but also from Africa.
Uwe Wolff is the author of two books: “In the Name of the Public – Litigation-PR as a Strategic Instrument in Legal Disputes” and “The Media Game – Publicity Work for Lawyers”. He regularly holds lectures on both topics in front of solicitors’ and trade associations, political organisations and the unions.

SHAREHOLDERS & STOCK INFORMATION

Stock Information	
ISIN	DE000A0Z2L 1
WKN	A0Z25L
Bloomberg ticker	VUA GR
No. of issued shares	894,600
Stock exchange	Düsseldorf
Transparency standard	Primärmarkt
Country	Germany
Sector	Pharmaceuticals
Subsector	Biotechnology

Source: Börse Düsseldorf, First Berlin Equity Research

	Shareholder Structure	
	Before Capital Raise	After Capital Raise
Dr Andreas Bergmann*	32.85%	20.38%
Dr Metod Miklus*	32.85%	20.38%
Dr Bernd Wegener*	32.85%	20.38%
Free Float	1.45%	38.87%

** direct and indirect shareholdings*

Source: Deutsche Biotech Innovativ AG

GLOSSARY*

Adrenomedullin
Adrenomedullin (ADM) is a peptide hormone. It acts as a vasodilator and some have cited it as the most potent endogenous vasodilatory peptide found in the body. In addition, ADM acts as a potent angiogenic factor.

Amino acids
Amino acids are biologically important organic compounds composed of amine (-NH2) and carboxylic acid (-COOH) functional groups, along with a side-chain specific to each amino acid. The key elements of an amino acid are carbon, hydrogen, oxygen, and nitrogen, though other elements are found in the side-chains of certain amino acids. Amino acids are the structural units (monomers) that make up proteins. They join together to form short polymer chains called peptides or longer chains called either polypeptides or proteins.

Angiogenesis
Angiogenesis is the physiological process through which new blood vessels form from pre-existing vessels. Angiogenesis is a normal and vital process in growth and development, as well as in wound healing and in the formation of granulation tissue. However, it is also a fundamental step in the transition of tumours from a benign state to a malignant one, leading to the use of angiogenesis inhibitors in the treatment of cancer.

Antibody
An antibody, also known as an immunoglobulin, is a large, Y-shape protein produced by plasma cells that is used by the immune system to identify and neutralize pathogens such as bacteria and viruses. The antibody recognizes a unique molecule of the harmful agent, called an antigen, via the variable region. Each tip of the "Y" of an antibody contains a paratope that is specific for one particular epitope (similarly analogous to a key) on an antigen, allowing these two structures to bind together with precision. Using this binding mechanism, an antibody can tag a microbe or an infected cell for attack by other parts of the immune system, or can neutralize its target directly (for example, by blocking a part of a microbe that is essential for its invasion and survival).

Apoptosis
Apoptosis is the process of programmed cell death (PCD) that occurs in multi-cellular organisms. Research in and around apoptosis has increased substantially since the early 1990s. In addition to its importance as a biological phenomenon, defective apoptotic processes have been implicated in a wide variety of diseases. Excessive apoptosis causes atrophy, whereas an insufficient amount results in uncontrolled cell proliferation (cancer).

Biomarkers
The International Programme on Chemical Safety, led by the World Health Organization (WHO) and in coordination with the United Nations and the International Labor Organization, has defined a biomarker as "any substance, structure, or process that can be measured in the body or its products and influence or predict the incidence of outcome or disease"

C-terminus and N-terminus
Each amino acid has a carboxyl group and an amine group. Amino acids link to one another to form a chain by a dehydration reaction which joins the amine group of one amino acid to the carboxyl group of the next. Thus, polypeptide chains have an end with an unbound carboxyl group, the C-terminus, and an end with an unbound amine group, the N-terminus. Proteins are naturally synthesized starting from the N-terminus and ending at the C-terminus.

Cecal ligation and puncture method
Experimental sepsis can be induced in mice using the cecal ligation and puncture (CLP) method. The CLP model consists of the perforation of the cecum (intraperitoneal pouch) allowing the release of fecal material into the peritoneal cavity to generate an exacerbated immune response induced by polymicrobial infection. This model fulfills the human condition that is clinically relevant.

Epitope
An epitope is the part of an antigen that is recognized by the immune system, specifically by antibodies, B cells, or T cells. For example, the epitope is the specific piece of the antigen that an antibody binds to. The strength with which an antibody molecule binds an epitope is called its affinity.

Hormone
A hormone is any member of a class of signalling molecules produced by glands in multicellular organisms that are transported by the circulatory system to target distant organs to regulate physiology and behaviour. Hormones have diverse chemical structures including amino acid derivatives, peptides, and proteins. The glands that secrete hormones comprise the endocrine signalling system.

Monoclonal antibodies (-mabs)
Monoclonal antibodies are monospecific antibodies that are made by identical immune cells that are all clones of a unique parent cell, in contrast to polyclonal antibodies which are made from several different immune cells. Monoclonal antibodies have monovalent affinity, in that they bind to the same epitope. Given almost any substance, it is possible to produce monoclonal antibodies that specifically bind to that substance. They can then serve to detect or purify that substance. When used as medications, the non-proprietary drug name ends in -mab, and many immunotherapy specialists use the word mab anacronymically.

Sepsis**
Sepsis is a whole-body inflammatory response to an infection. Common signs and symptoms include fever, increased heart rate, increased breathing rate, and confusion. Insufficient blood flow may be evident by low blood pressure, high blood lactate, or low urine output. Septic shock is low blood pressure due to sepsis that does not improve after reasonable amounts of intravenous fluids are given. Common locations for the primary infection include: lungs, brain, urinary tract, skin, and abdominal organs. Sepsis is usually treated with intravenous fluids and antibiotics. This is often done in an intensive care unit. If fluid replacement is not enough to maintain blood pressure, medications that raise blood pressure can be used. Mechanical ventilation and dialysis may be needed to support the function of the lungs and kidneys, respectively.

Receptor
A receptor is a protein molecule usually found embedded within the plasma membrane surface of a cell that receives chemical signals from outside the cell. These signals cause some form of cellular/tissue response, e.g. a change in the electrical activity of the cell. In this sense, a receptor is a protein molecule that recognises and responds to endogenous chemical signals. A molecule that binds to a receptor is called a ligand, and can be a peptide (short protein) or another small molecule such as a neurotransmitter, hormone, pharmaceutical drug, toxin, or parts of the outside of a virus or microbe. The endogenously designated molecule for a particular receptor is referred to as its endogenous ligand. While numerous receptors are found in most cells, each receptor will only bind with ligands of a particular structure, much like how locks will only accept specifically shaped keys. When a ligand binds to its corresponding receptor, it activates or inhibits the receptor’s associated biochemical pathway.

VEGF

Vascular endothelial growth factor (VEGF) is a signal protein produced by cells that stimulates vasculogenesis and angiogenesis. It is part of the system that restores the oxygen supply to tissues when blood circulation is inadequate. Anti-VEGF therapies are important in the treatment of certain cancers and in age-related macular degeneration. They can involve monoclonal antibodies such as Bevacizumab (Avastin) and antibody derivatives such as Ranibizumab (Lucentis).

** Source: Wikipedia*

*** Source: Toscano MG, Ganea D, Gamero AM; Journal of Visualised Experiments, 2011*

INCOME STATEMENT

All figures in EUR '000	2013A	2014A	2015E	2016E	2017E	2018E
Sales	**0**	**100**	**157**	**256**	**277**	**292**
Other operating income	85	4	0	0	0	0
Wages and salaries	-10	-77	-212	-346	-358	-367
Social security and pension payments	-3	-20	-55	-90	-93	-95
Depreciation and amortisation	0	0	-4	-10	-15	-20
Other operating expenses	-153	-149	-1,378	-290	-301	-308
Profit on disposal of AngioBiomed	0	0	0	0	0	17,700
Operating income (EBIT)	**-81**	**-142**	**-1,492**	**-480**	**-490**	**17,201**
Net financial result	-2	0	1	2	1	1
Pre-tax income (EBT)	**-83**	**-142**	**-1,491**	**-478**	**-489**	**17,202**
Taxes	-2	-3	0	0	0	-2,236
Net income / loss	**-85**	**-145**	**-1,491**	**-478**	**-489**	**14,966**
Diluted EPS	**-0.11**	**-0.17**	**-1.43**	**-0.32**	**-0.33**	**10.04**
EBITDA	**-81**	**-142**	**-1,488**	**-470**	**-475**	**17,221**
Ratios						
EBIT-Margin	n.m.	-142.5%	-950.3%	-187.5%	-176.9%	5890.8%
EBITDA margin	n.m.	-142.0%	-947.8%	-183.6%	-171.5%	5897.6%
Net Margin	n.m.	-145.5%	-949.7%	-186.9%	-176.5%	5125.3%
Expenses as % of Revenues						
Wages and salaries	n.m.	-77.0%	-135.0%	-135.1%	-129.3%	-125.8%
Social security and pension payments	n.m.	-20.0%	-35.1%	-35.1%	-33.6%	-32.7%
Other operating expenses	n.m.	-149.0%	-877.7%	-113.4%	-108.6%	-105.6%
Y-Y Growth						
Revenues	n.m.	n.m.	57.0%	63.1%	8.2%	5.4%
Operating income	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Net income/ loss	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.

BALANCE SHEET

All figures in EUR '000	2013A	2014A	2015E	2016E	2017E	2018E
Assets						
Current Assets, Total	**291**	**545**	**18,410**	**13,380**	**7,578**	**19,376**
Cash and Cash Equivalents	145	481	18,331	13,252	7,440	19,230
Receivables	0	13	20	33	36	38
Receivables from affiliated companies	73	39	39	64	69	73
Other Current Assets	73	12	19	31	33	35
Non-Current Assets, Total	**984**	**993**	**1,679**	**6,309**	**11,639**	**14,819**
Property, Plant & Equipment	0	1	20	50	75	100
Participations	984	992	1,659	6,259	11,564	14,719
Total Assets	**1,275**	**1,538**	**20,089**	**19,689**	**19,217**	**34,195**
Shareholders' Equity & Debt						
Current Liabilities, Total	**106**	**84**	**126**	**205**	**222**	**234**
Accounts Payable	46	12	19	31	33	35
Payables to affiliated companies	0	8	13	20	22	23
Shareholder loans	0	0	0	0	0	0
Other current liabilities	60	64	94	154	166	175
Longterm Liabilities, Total	**13**	**36**	**31**	**51**	**55**	**58**
Tax provisions	2	0	0	0	0	0
Other provisions	11	36	31	51	55	58
Shareholders Equity, Total	**1,156**	**1,418**	**19,932**	**19,433**	**18,940**	**33,903**
Share Capital	413	447	1,491	1,491	1,491	1,491
Share premium account	1,138	1,511	20,467	20,467	20,467	20,467
Profit/(losses) carried forward	-310	-395	-540	-2,026	-2,525	-3,018
Profit/(loss) for the year	-85	-145	-1,486	-498	-493	14,963
Total Consolidated Equity and Debt	**1,275**	**1,538**	**20,089**	**19,689**	**19,217**	**34,195**
Ratios						
Current ratio (x)	2.7	6.5	146.6	65.3	34.2	82.9
Quick ratio (x)	2.7	6.5	146.6	65.3	34.2	82.9
Net gearing	-12.5%	-33.9%	-92.0%	-68.2%	-39.3%	-56.7%
Net cash	145	481	18,331	13,252	7,440	19,230
Return on Equity (ROE)	-8.1%	-11.3%	-14.0%	-2.4%	-2.5%	56.6%

CASH FLOW STATEMENT

All figures in EUR '000	2013A	2014A	2015E	2016E	2017E	2018E
Net profit	**-85**	**-145**	**-1,491**	**-478**	**-489**	**14,966**
Profit on disposal of AngioBiomed	0	0	0	0	0	-17,700
Depreciation and amortization	0	0	4	10	15	20
Change in provisions	3	22	0	0	0	0
Profit on asset sales	-85	0	0	0	0	0
Change in working capital	38	-93	27	30	6	4
Operating Cashflow	**-130**	**-216**	**-1,460**	**-439**	**-468**	**-2,710**
CAPEX	0	143	-690	-4,640	-5,345	-5,500
Proceeds on disposal of AngioBiomed	0	0	0	0	0	20,000
Free cashflow	**-130**	**-73**	**-2,150**	**-5,079**	**-5,813**	**11,790**
Debt Financing, net	**-205**	**0**	**0**	**0**	**0**	**0**
Equity Financing, net	**300**	**409**	**20,000**	**0**	**0**	**0**
Other Changes in Cash	**0**	**0**	**0**	**0**	**0**	**0**
Net Cash Flows	**-34**	**336**	**17,850**	**-5,079**	**-5,813**	**11,790**
Cash, start of the year	179	145	481	18,331	13,252	7,440
Cash, end of the year	**145**	**481**	**18,331**	**13,252**	**7,440**	**19,230**
EBITDA/share	**-0.10**	**-0.17**	**-1.43**	**-0.32**	**-0.32**	**11.55**
Y-Y Growth						
Operating Cashflow	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Free cashflow	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
EBITDA/share	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.

FIRST BERLIN RECOMMENDATION & PRICE TARGET HISTORY

Report No.:	Date of publication	Previous day closing price	Recommendation	Price target
Initial Report	8 September 2015	€20.00	Buy	€67.90

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STRONG BUY: Expected return greater than 50% and a high level of confidence in management's financial guidance
BUY: Expected return greater than 25%
ADD: Expected return between 0% and 25%
REDUCE: Expected negative return between 0% and -15%
SELL: Expected negative return greater than -15%

Our risk ratings are Low, Medium, High and Speculative and are determined by ten factors: corporate governance, quality of earnings, management strength, balance sheet and financing risk, competitive position, standard of financial disclosure, regulatory and political uncertainty, company size, free float and other company specific risks. These risk factors are incorporated into our valuation models and are therefore reflected in our price targets. Our models are available upon request to First Berlin clients.

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