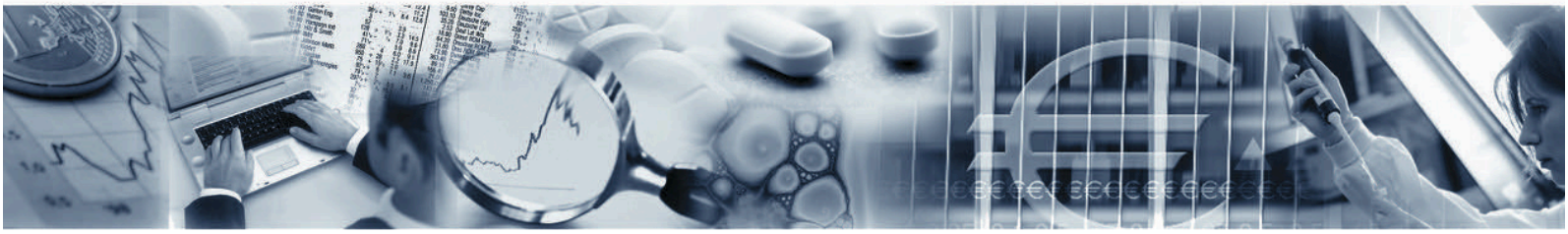

Research Note

Biofrontera AG

How the West will be won

Biofrontera
Experts in dermatology

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Date: 30 October 2015

Name:	**Biofrontera AG**
Country:	**Germany**
Price:	**EUR 2.15**
ISIN Code:	**DE0006046113**
Reuters Code:	**B8F.DE, B8F.L**
Market Cap (EUR m):	**50.7**
EV (EUR m):	**57.4**
Cash & cash eq. (EUR m):	**4.1**
Shares outstanding (m):	**23.57**
Volume:	**18,864**
Free float:	**70%**
52-week Range:	**1.66-3.00**

EUR million (ending 30/6)	2013A	2014A	2015E
Total Income	3.115	3.096	4.000
Net (Loss)/Profit	(8.067)	(10.721)	(12.000)
Net loss per share (cents)	(0.47)	(0.49)	(0.51)
R&D costs	3.186	4.534	8.500
Cash increase/(decrease)	(0.433)	5.575	10.000
Cash and marketable sec.	2.934	8.509	18.500*)

***) incl. capital raise**

Highlights

- Biofrontera AG (B8F.DE, B8F.L) is a biopharmaceutical company specializing in the development of dermatological drugs and medical cosmetics for the care and treatment of skin and inflammatory diseases. Biofrontera's lead product is Ameluz®, a prescription drug approved for use in Europe for the treatment of mild to moderate actinic keratosis (AK) on the face and scalp in conjunction with photodynamic therapy (PDT). Biofrontera is the first small German pharmaceutical company to receive a centralized approval for a drug developed in-house. The Company is looking to further develop Ameluz for use with other medical conditions and is seeking regulatory approval to sell the product in other countries, in particular the US.

- Actinic keratoses are superficial forms of skin cancer, and there is a risk that they can spread to deeper layers of the skin and develop into a squamous cell carcinoma, which represents the second most dangerous form of skin cancer. The growth of actinic keratosis as a market has been steadily increasing in Europe, as patient awareness levels rise. In the US, the AK prevalence is estimated to be 6.5% of the population or 58 million people.

- In December 2011, Ameluz® was approved in Europe for the treatment of AK. This approval has aided the Company's transition from being fully research-oriented towards becoming an integrated pharmaceutical company specializing in dermatology products. Currently, Biofrontera sells Ameluz® via its own sales team to dermatologists in Germany, Spain and the UK. Ameluz is distributed in other EU member states, as well as in Israel and Switzerland, by licensing partners.

- In 2013 the Company secured a strategic investment from Maruho, the largest dermatology company in Japan with revenues in 2013 of over USD 600 million. The

Directors believe that Maruho's support can be beneficial to the Company's future development, in particular as the Company and Maruho progress strategic discussions with regard to potential marketing partnerships in the EU via Biofrontera sales channels and other development projects. Maruho currently is Biofrontera's largest shareholder with a stake of 19.5%.

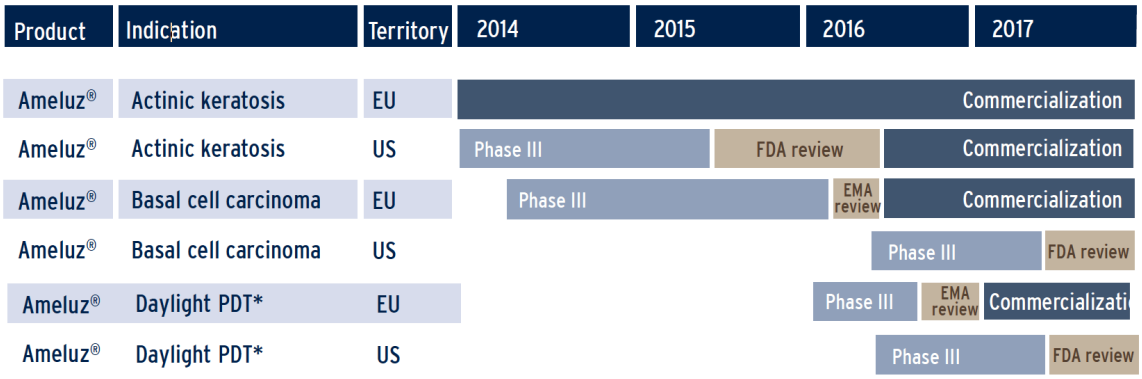
- Recently, the company achieved a major milestone with the acceptance to file of the approval application for Ameluz® by the FDA in the US. Biofrontera also received a 74-day-letter by the FDA late September in which an interim report was announced for 30 March 2016. The approval (PDUFA Date) was announced for 10 May 2016. We feel that with the publication of an earlier approval date (2 months earlier than expected), the FDA does not see specific issues that could prevent an approval.

- There are a number of key milestones to focus on in the next 9 months, which include: expected approval Ameluz® in the US, Phase III results of Ameluz® for Basal Cell Carcinoma (BCC) and approval for BCC in Europe.

- **Based on our NPV valuation, we believe that Biofrontera is substantially undervalued at the current share price of EUR 2.15. Using our valuation model, the Company's current total value is EUR 120-165 million, or EUR 5.00-7.00 per share with the expectation that Ameluz will receive approval in the US for AK as well as positive Phase III results in BCC. This represents a substantial upside from the current share price.**

Pipeline: Focus on Ameluz®

In the coming years Biofrontera aims at the approval of Ameluz® in other geographic regions and for other skin tumors. Several clinical studies are initiated and performed with the goal to approve Ameluz® for basal cell carcinoma (BCC), field therapy of actinic keratosis (AK), and the North American market.



Several Phase III trials with Ameluz® show superior results

In the phase III trials relevant to approval for AK, Ameluz® showed excellent healing rates and demonstrated significant superiority to the approved comparison medication, which Ameluz® was tested against. In the first phase III trial, which involved the drug being combined with an LED lamp, all keratoses were completely removed for more than 87% of patients treated with Ameluz® (all values specified here are ITT, Intent to Treat values). When counting individual keratosis lesions, no fewer than 96% were completely eradicated.

122 Patients, Placebo-controlled, double-blind, multicenter study (DE)

Treatment group (ITT)	Ameluz®		Placebo
	LED narrow band lamp	Broad spectrum lamp	
Patient complete response*	87% (27/31)	53% (26/49)	13% (5/40)
Lesion complete response	96%	70%	22%
Severe erythema**	9.3%	0%	0%
Moderate edema **	32.0%	0%	0%
Moderate induration**	22.2%	0%	0%
Severe pain during illumination***	32.9%	7.1%	1.5%

* Primary endpoint: all of the 4-8 lesions per patient had to be totally cleared
** Application side effects are transient and disappear within one week
*** Results of integrated analysis

In the second phase III trial relevant to approval, the effectiveness of Ameluz® was tested in comparison with the then best approved comparator medication. The results of the trial provided evidence that Ameluz® was significantly superior to the competitor drug available in Europe. Based on the average for all lamps used in the treatment, Ameluz® resulted in complete healing of actinic keratoses in 78% of patients, whereas the already approved rival product at that time achieved a healing rate of only 64%. With LED lamps, the healing rates were as high as 85% for Ameluz® and 68% for the competitor product. The side effect profile was comparable for both preparations.

- **570 patient, Three-arm study with Ameluz®, Metvix®, Placebo, 3:3:1**
- **Multinational (CH, AT, DE), placebo controlled, observer-blinded study**
- **Ameluz® was significantly superior ($p<0.05$) to Metvix® on the primary endpoint**
- **54% of the Ameluz®* patients required only one PDT with LED lamps**

Clinical end point (ITT)	Ameluz®		Metvix®		Placebo	
Complete patient clearance** (all lamps)	78%		64%		17%	
Complete lesion clearance (all lamps)	90%		83%		37%	
Complete patient clearance with narrow/broad spectrum lamps	narrow 85%	broad 71%	narrow 68%	broad 61%	narrow 13%	broad 22%
Complete patient clearance after 1st PDT (all lamps)	48%		37%		4%	

* Development name: BF-200 ALA
** Clinical endpoint: average of all lamps

Since approval in the USA will cover a combination of medication and lamp therapy, Biofrontera Group has its own PDT lamp, BF-RhodoLED®, developed and CE-certified in the EU. In preparation for the US approval, a phase III study with the combination of Ameluz® and BF-RhodoLED® was carried out and completed. This placebo controlled multicenter study enrolled 87 patients and was the first Phase III study when field therapy was applied. Ameluz® will be only PDT product that has the recommended guideline therapy in the label. With this combination, 91% of patients were completely cured of keratoses. When counting individual lesions, no fewer than 94% were completely eradicated.

Clinical end point (ITT)	Ameluz®	Placebo
Complete patient clearance	91% (50/55)	22% (7/32)
Complete lesion clearance	94%	33%
Complete patient clearance after 1st PDT	62%	9%
Complete lesion clearance after 1st PDT	84%	22%

The overall advantages of Ameluz® in terms of effectiveness, handling, user friendliness and cosmetic results, as well as the clear superiority of PDT in the treatment of actinic keratoses, will encourage dermatologists to focus on this treatment option in the future. This will be helped by the expansion of the range of indications to include basal cell carcinoma, which the company is currently striving to achieve, as the vast majority of PDT treatments are for this indication, particularly in Great Britain and Spain.

Biofrontera is currently carrying out a phase III study for the extension of the European approval to include the indication basal cell carcinoma. BCCs are the most common invasive tumors that affect humans and account for approximately 80% of all invasive white skin cancers. About 30% of all Caucasians develop at least one BCC in their lifetime, and cases are increasing rapidly worldwide due to increased exposure to UV light. Surgical removal is the most frequent treatment in Germany but can lead to clearly visible scarring, whereas treatment with

photodynamic therapy, which is an alternative particularly in the treatment of thin BCCs, produces excellent cosmetic results. In the clinical trial, Biofrontera Group will compare Ameluz® with the competitor product approved for BCC, Metvix®. It has already been demonstrated in the approval studies for the treatment of actinic keratosis that the overall healing rates for patients treated with Ameluz® were significantly higher than those for Metvix®-patients. Patient recruitment for this study was going more slowly than originally planned, but was finally completed in May 2015. Thus the clinical part of the study would end in November 2015 and data should be available by the end of the year. The application for the label extension could be submitted to the EMA by the end Q1 2016 and approval would be expected in summer 2016.

Biofrontera Group anticipates that Ameluz® in combination with BF-RhodoLED® will compete in the United States with currently marketed Levulan® Kerastick in combination with the lamp BLU-U®, manufactured and distributed in the United States by Dusa Pharmaceuticals, Inc, a Sun Pharma (India) company. In Europe Ameluz® is sold independently from a light source. Its major competitor is Metvix®, a drug owned and distributed by Galderma. Comparisons with both Metvix® (see page 6) and also Levulan show that Ameluz® has superior efficacy (see also below).

	Ameluz®*	Levulan®**
Efficacy (3 months after last of 1 or 2 PDTs)	~ 90%	~ 65%
Efficacy scalp	~ 82%	~ 50%
P_{12m}*CR	~ 60%	~ 31%
Lamp	red light	blue light
Application	gel ***	liquid
Incubation time	3 hr	14-18 hr
Illumination time	10 mins	16 mins
Skin rejuvenation	Described in label	Not covered by label
Treatment area	field	lesion
Est. revenue in USA (2016)		USD 160 MM****

* all Ameluz® data are with LED lamps only
** all Levulan® data are with BLU-U only
*** enhanced penetration and easier application
**** forecast based on Dusa Pharmaceuticals financial reports

Photodynamic therapy: Fast growing skin cancer treatment

The treatment of actinic keratosis with Ameluz® is based on photodynamic therapy (PDT). In a PDT, the respective lesion is treated by applying a drug topically to the relevant parts of the skin, which then delivers the active substance (ALA = aminolevulinic acid) into the cells, where it is metabolized into a molecule ring that can absorb energy from light at certain wavelengths. By shining light onto the skin the reaction is triggered and will selectively kill tumorous cells. The international treatment directives list PDT as gold standard for the removal of actinic keratosis, particularly for patients with large areas of keratoses. Biofrontera Group offers a drug with such an active substance, Ameluz®, as well as an optimal light source called BF-RhodoLED®.

Source: Biofrontera

BF-RhodoLED® is the corresponding lamp designed for PDT, which uses LEDs emitting red light at the required wavelength of approx. 635 nm. Light at this wavelength is ideally suited for PDT illumination with drugs containing ALA or methyl ALA. It is red but is still outside the warming infrared range. The BF-RhodoLED® lamp combines a controlled and consistent emission of light at the required wavelength. It makes it possible to counteract the pain experienced by patients during the exposure by adjusting the light intensity and increasing the period of exposure, or by increasing ventilation of the relevant area of skin.

The availability of topical PDT therapies for the treatment of AK and BCC has now become well established with the availability of DUSA's (now SUN Pharma's) Levulan® (only in the US) and Galderma's Metvix® (only in Europe). Levulan® is FDA approved for the treatment of minimally to moderately thick AK of the face or scalp.

Milestones: Right on Track

There are a number of key milestones to focus on in the next 6-12 months. Each of these milestones can potentially trigger the share price of Biofrontera.

2015/2016

- July 2015: NDA submission Ameluz® for AK in the USA ☑
- September 2015: Acceptance to file Ameluz® ☑
- October 2015: 74 day letter from FDA ☑
- 30 March 2016: Mid-term review
- 10 May 2016: Final review and expected approval of Ameluz® in the US
- 2015Q4/2016Q1: Finalize detailed strategy for US launch of Ameluz®
- 2015Q4: Approval of Ameluz® in Israel and Switzerland
- 2015Q4: BCC phase III study results
- September 2016: Launch Ameluz® for AK in the US
- Summer 2016: Approval for BCC in Europe
- Q4 2016: Approval for daylight PDT in Europe

Analyst: Marcel Wijma MSc

Marcel Wijma, Chief Research Officer and managing partner, has a longstanding history in financial biotech research. After selling Van Leeuwenhoeck Research (VLR) to SNS Securities in 2006, he established an award winning analyst team in biotech/life sciences at SNS Securities. In 2009, Marcel was awarded by Financial Times/Starmine as being one of the Top-3 biotech analysts in Europe. Later that year, Marcel purchased VLR from SNS Securities after which the company was reconstituted. At VLR, he leads the professional VLR research organisation, which is augmented by selected external financial researchers with a specialisation in Life Sciences. Mr. Wijma has a Masters degree in Financial Economics from Erasmus University in Rotterdam.

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