Zacks Small-Cap Research

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Epirus Biopharmaceuticals, Inc. (EPRS - NASDAQ)

EPRS: Initiating Coverage of Epirus Biopharmaceuticals; An Intriguing Biosimilar Play…

Current Recommendation	**Outperform**
Prior Recommendation	N/A
Date of Last Change	12/18/2014
Current Price (12/XX/14)	$4.79
Target Price	**$8.00**

INITIATION

We are initiating coverage of Epirus Biopharmaceuticals, Inc. (NASDAQ: EPRS) with an Outperform rating and an $8.00 price target. Epirus is a global biopharmaceutical company developing and commercializing biosimilar monoclonal antibodies. A number of top selling biologic drugs are set to come off patent in the next few years. These drugs had total sales of more than $60 billion in 2013. Epirus' strategy for commercial success is predicated on selling directly into certain European markets and forming strategic partnerships in the remaining European markets, the U.S., and other global markets.

The company has launched its lead compound in India, and plans to initiate a Phase 3 trial as part of the European and U.S. approval process in 2015. The company expects to submit regulatory filings for marketing approval in the Europe and the U.S. in 2017.

SUMMARY DATA

52-Week High	**$19.20**
52-Week Low	**$3.93**
One-Year Return (%)	**-56.42**
Beta	**1.53**
Average Daily Volume (sh)	**30,920**
Shares Outstanding (mil)	**13**
Market Capitalization ($mil)	**$61**
Short Interest Ratio (days)	**2.13**
Institutional Ownership (%)	**23**
Insider Ownership (%)	**3**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2013 Estimate	**N/A**
P/E using 2014 Estimate	**N/A**

Risk Level	**Above Average**
Type of Stock	**Small-Growth**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue

(In millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2013	0 A	0 A	0 A	0 A	0 A
2014	0 A	0 A	0 A	0 E	0 E
2015					0.3 E
2016					0.6 E

Earnings per Share

(EPS is operating earnings before non-recurring items)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2013	$A	$A	$A	$A	$A
2014	-$3.83 A	-$3.81 A	-$1.28 A	-$1.05 E	-$6.34 E
2015					-$3.28 E
2016					-$2.57 E

WHAT'S NEW

Initiating Coverage

We are initiating coverage of Epirus Biopharmaceuticals, Inc. (NASDAQ: EPRS) with an Outperform rating and an $8.00 price target. Epirus is a biopharmaceutical company developing, manufacturing, and commercializing biosimilar therapeutics in various jurisdictions worldwide through a tailored approach that takes into account the different regulatory, legal, and commercial barriers in each market.

The company's strategy is centered on launching biosimilar products in the developed markets (U.S., Europe), accessing growth in local production markets through strategic partnerships, and generating initial cash flows through the early launch of products in accessible emerging markets. In addition, Epirus is focused on selecting products that will have minimal competition in the marketplace while also building a pipeline of products with synergistic therapeutic applications.

The company's lead product is BOW015, a biosimilar version of Remicade® (infliximab). Remicade®, marketed by Johnson & Johnson, Merck Schering, and Mitsubishi Tanabe for the treatment of various inflammatory diseases, generated approximately $8.4 billion in global sales in 2013. Epirus has reported positive bioequivalence and efficacy data for BOW015 in both Phase 1 and Phase 3 clinical trials. The Phase 3 trial met its predefined endpoint and demonstrated the comparability of BOW015 to Remicade® as measured by ACR20 response in severe rheumatoid arthritis patients. In addition, the open label portion of the Phase 3 study showed long term safety and comparable efficacy for Remicade® responders who were switched to BOW015.

Epirus has launched BOW015 in India (Infimab™) with partner Ranbaxy Laboratories, Ltd. and continues to work on partnerships for eventual launch in Brazil, China, Europe, and the U.S. In January 2014, Epirus entered into a commercialization partnership with Ranbaxy, whereby Ranbaxy will be responsible for the sale of BOW015 in India, Southeast Asia, and Northern Africa. While sales of Remicade® in these regions was only an estimated $26 million in 2013, we believe pricing has been a major impediment to uptake, and that lower pricing of a biosimilar will lead to greater access and increased total market size for BOW015. Precedent for this strategy lies in the introduction of a biosimilar version of Rituxan®, where the market increased 6-fold following a 40% drop in price.

Additionally, Epirus intends to leverage their development and commercial experience with BOW015 to file and launch in markets globally. For Europe, they expect to initiate an additional Phase 3 trial in 2015 to augment the current data package and move toward approval.

Epirus is positioning itself to build a sustainable and profitable biosimilar business. In order to reach that objective, the company is focusing on markets that meet three important criteria: (1) a clear, precedent-driven regulatory pathway; (2) minimal exposure to potential patent encumbrances; and (3) a commercially viable path. Management has developed distinct strategies to access each of these markets and segmented them into three types: Developed Markets outside of the United States, Local Production Markets, and Accessible Markets.

- In Developed Markets, Epirus intends to commercialize biosimilar products using a licensing or distribution model in conjunction with direct sales. This approach should allow management to book top-line revenue and gradually invest in commercial infrastructure, thereby creating a sustainable, profitable enterprise. Development plans include a second Phase 3 trial for BOW015 in Europe in 2015. If this trial is successful, the company intends to pursue regulatory approval for BOW015 in Europe and the U.S.

- Brazil and China are both considered Local Production Markets, where local authorities mandate or strongly encourage local production as a condition for regulatory and/or commercial acceptance. In these Local Production Markets, Epirus intends to collaborate with local partners to enable in-country production of their products using their SCALE manufacturing platform. SCALE enables turn-key, locally-based manufacturing of biosimilars. The SCALE platform provides a competitive advantage by giving Epirus the ability to accelerate the entry of their biosimilar candidates into many emerging markets. Epirus is currently in discussion with local Brazilian firms to get a manufacturing and distribution agreement in place. The company will meet with Brazilian regulatory authorities to determine if the Phase 3 study for BOW015 conducted in India will suffice for approval. A decision is pending. In China, Epirus has signed a license and collaboration agreement with Livzon Mabpharm, Inc., for the development of five biosimilar products, starting with BOW015. The agreement provides for milestone payments to Epirus and high single-digit percentage royalties on sales in China.

- In Accessible Markets, in which Epirus's current regulatory data are deemed sufficient for approval, management intends to commercialize through partnerships. The company currently has an agreement to commercialize BOW015 in India with Ranbaxy. BOW015 was just recently launched in India in November 2014 as Infimab™. Epirus is also actively pursuing access to additional markets through Ranbaxy and other potential licensing partners.

Epirus' pipeline of biosimilar products includes BOW050, a biosimilar version of Humira® (adalimumab), which is marketed by AbbVie and used to treat inflammatory diseases, and BOW070, a biosimilar version of Actemra® (tocilizumab), which is marketed by Roche and used to treat rheumatoid arthritis. Both BOW050 and BOW070 are in preclinical development with clinical studies set to commence in 2016. As a whole, Remicade®, Humira®, and Actemra® generated $20.5 billion in global sales in 2013.

The present form of the company was created by a merger between publicly-traded Zalicus, Inc. and privately-held Epirus Biopharmaceuticals, Inc. in July 2014. Prior to the merger, Zalicus was a biopharmaceutical company developing drug candidates with a focus on the treatment of pain. The primary goal of the merger was to give Epirus access to the public capital markets to help accelerate the development of its clinical stage products.

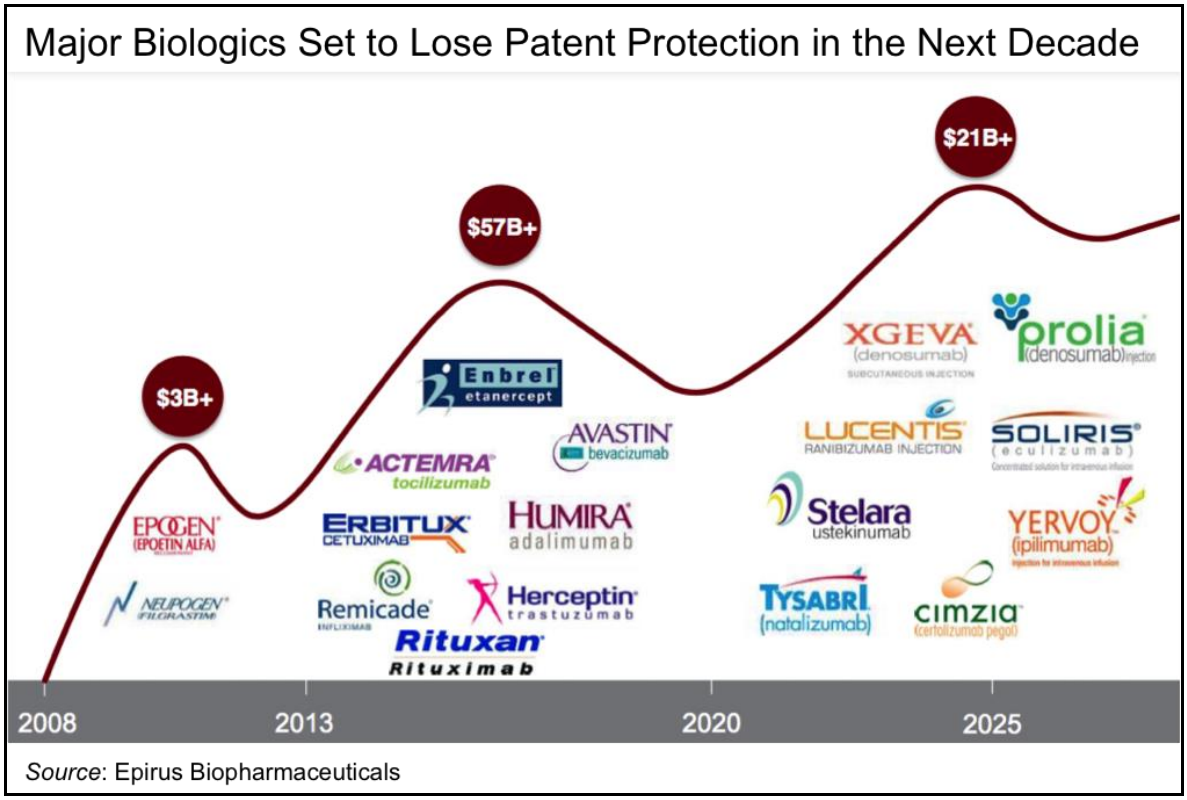
INVESTMENT THESIS

Monoclonal antibodies

Biological therapeutics, or biopharmaceuticals, have been a huge success for the biotechnology industry, both in terms of the number of patients that have been treated and the revenues generated from their sale. Examples of biopharmaceuticals include vaccines, gene therapies, tissues, and recombinant proteins. Monoclonal antibodies are a particular type of recombinant protein and comprise many of the top-selling therapeutics in the world. Humira® (adalimumab), Remicade® (infliximab), and Actemra® (tocilizumab) each generated revenues of $11.0, $8.4, and $1.1 billion, respectively, in 2013. According to EvaluatePharma, revenues generated from the sale of monoclonal antibodies totaled $61.8 billion in 2013 and grew at a compound annual growth rate of 14% from 2010 to 2013.

Monoclonal antibodies are large, complex proteins that have great structural complexity, including complex glycosylation (complex carbohydrate branches that are added by the cell during production) patterns that are critical for the function and activity of the molecule. They are composed of four polypeptide chains that are bound together by specific intra- and inter-chain covalent bonds. Their manufacture is further complicated by the fact they can only be produced in living mammalian cells, which introduces additional challenges in manufacturing and production on a commercial scale. Despite these challenges, monoclonal antibodies have proven to be robust medications in a number of different disease areas, including inflammatory diseases and multiple types of cancer.

The FDA approved the first monoclonal antibody in 1986. Since that time, over 30 additional monoclonal antibodies have been approved for a number of different indications. The patents for a number of highly successful monoclonal antibodies are set to expire over the next 10 years, thus representing a significant opportunity for biosimilars, or follow-on biologics, to enter the marketplace.



Source: Epirus Biopharmaceuticals

Biosimilars

Biosimilars are highly similar, though not exact, versions of approved biological drug products, which are referred to as reference products. As opposed to small molecule drugs, which consist of chemically identical active ingredients, biologics are vastly more complex and are comprised of a number of heterogeneous subspecies. Due to this, biosimilars require a different regulatory framework compared to generic versions of small molecule medications.

The European Medical Agency (EMA) first introduced a pathway to review and approve biologic equivalents based on commercially available biologics in 2006. Following the EMA's success, the Biologics Price Competition and Innovation Act (BPCIA) was passed in the U.S. in 2009, and the FDA adopted a similar approach to the EMA in regards to the commercialization of biosimilars. Other countries, including Japan, Canada, and Korea have gradually adopted similar regulatory pathways (Wang *et al*., 2012).

For approval, an application for a biosimilar product will typically reference existing information regarding the structure, safety, and efficacy of a previously approved reference product. Thus, the application emphasizes analytical characterization to demonstrate similarity between the proposed biosimilar and the reference product. In addition, a Phase 1 safety and Phase 3 efficacy study are also performed to support the approval of a biosimilar.

Biosimilars are categorized according to two categories: first generation, less complex biologics; and second generation, more complex biologics, the latter which includes monoclonal antibodies. Both categories of biosimilars are more complex and difficult to characterize, manufacture, and develop than small molecule generics.

The greater complexity in manufacturing biologics is in part due to the requirement to utilize living cells for their production. Small molecule drugs are derived through tightly controlled chemical reactions and generic forms of drugs are chemically identical to the original product. Due to the various molecular modifications that are introduced by cells onto protein products it is not possible to obtain a biosimilar product that is chemically identical to an original biologic. While biosimilars have the same amino acid sequence and shape of the reference product, various post-translational modifications (e.g., glycosylation patterns) are typically not identical, thus a rigorous analytical characterization must be performed to show that a biosimilar has at least a comparable glycosylation pattern along with other important molecular modifications.

Due to the aforementioned, biosimilars require significantly more clinical testing and regulatory review than small molecule generics. In addition to creating challenges for companies pursuing the development of biosimilars, the manufacturing, clinical, and regulatory complexity creates barriers to market entry. This in turn leads to the opportunity to sell biosimilars at relatively higher prices, and with better margins, than small molecule generics.

Biopharmaceuticals are produced through a technically complex series of steps that is summarized below:

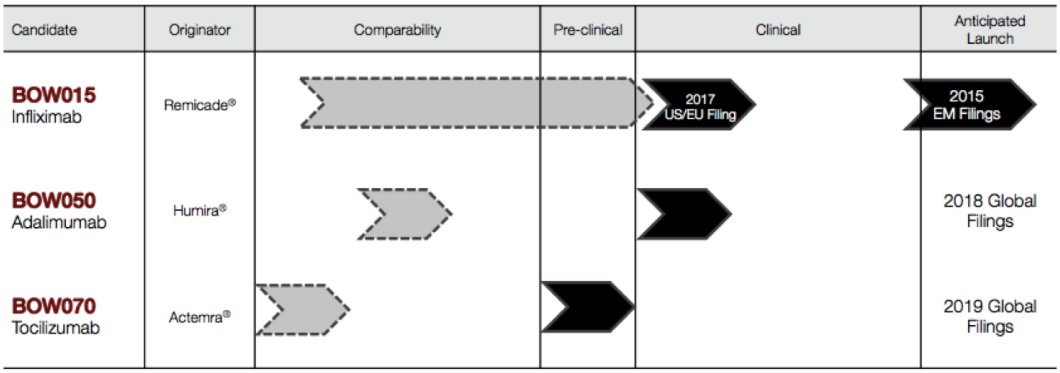
1) Isolate and identify the genetic code of the therapeutic protein.
2) Insert the genetic code into a living cell (bacteria, yeast or cultured mammalian cell).
3) Isolate specific cells that have integrated the genetic code of the therapeutic protein into their genome and produce large quantities of the target protein.
4) Isolate the therapeutic protein from the cells and other nutrients through a series of purification processes.
5) The isolated protein is then packaged into sterile vials for use by doctors and patients.

Companies that produce biosimilars must go through the same series of steps, from isolation of the genetic code for the particular protein of interest, to cell line selection, and final packaging of the drug product. Once the products are produced it is necessary for companies to fully characterize their molecules to show similarity to the reference biologic. Biosimilars must be shown to be comparable to their reference products in terms of structure, purity, safety, and efficacy.

However, as mentioned previously, the goal of biosimilar production is not to create an identical copy of a biopharmaceutical, and in fact this is not possible as even originator biologics are characterized by inherent structural and functional variability. Thus, biosimilars must fall within a range of values across important structural and functional parameters compared to those of the reference drug.

Epirus' Pipeline of Biosimilars

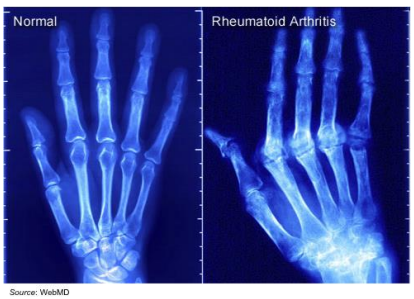
Epirus currently has three biosimilar products at different stages of preclinical and clinical development. The lead product is BOW015, a biosimilar version of Remicade® (infliximab), a monoclonal antibody that is marketed by Johnson & Johnson, Merck Schering, and Mitsubishi Tanabe for the treatment of inflammatory diseases including rheumatoid arthritis, Crohn's Disease, ankylosing spondylitis, psoriatic arthritis, and psoriasis (see full prescribing label). The other pipeline products, BOW050, a biosimilar version of Humira® (adalimumab), and BOW070, a biosimilar version of Actemra® (tocilizumab), are in preclinical development. BOW015 has received marketing and manufacturing approval in India for the treatment of rheumatoid arthritis.



Source: Epirus Biopharmaceuticals

…Rheumatoid Arthritis…

Rheumatoid arthritis (RA) is a chronic, systematic, autoimmune inflammatory disease that manifests as joint pain, stiffness, and swelling. Peripheral joints, including the wrists, hands, shoulders, elbows, hips, knees, and ankles are most commonly affected, with a bilaterally symmetric distribution of relapsing and remitting symptoms. Systemic symptoms include early morning stiffness of the affected joints, generalized afternoon fatigue, anorexia, generalized weakness, and fever.



Source: WebMD

The detailed cause of the disease is poorly understood, although a strong genetic component has been identified. RA may occur at any age, with the most common onset of illness being between the ages of 25 and 50 years. Women are two to three times more likely to be affected with RA than men. RA afflicts between 0.5-1% of the general population (Silman *et al*., 2001) with approximately 1.5 million adults in the U.S. having the disease (Sacks *et al*., 2010). Life expectancy is reduced by 3 to 5 years, predominantly due to the development of systemic disease and treatment-related adverse events, including infections and tumors. Additionally, patients with RA are at 50% increased risk of heart attack and have a 2-fold increased risk of heart failure.

A variety of scales are available for assessing the progression of RA, including the Disease Activity Score in 28 joints (DAS-28), the Clinical Disease Activity Index (CDAI), and the American College of Rheumatology score (ACR). The ACR score is a number indicating how much a person's rheumatoid arthritis has improved, based on guidelines set forth by the American College of Rheumatology. The ACR score represents a percentage, with an ACR50 score meaning that a patient's RA has improved by 50%. To qualify for an ACR50 score, a person with RA must have at least 50% fewer tender joints and at least 50% fewer swollen joints. In addition, the person must show a 50% improvement in at least three of the following five areas: 1) the person's overall assessment of his or her own RA, 2) the physician's global assessment of the person's RA, 3) the person's assessment of his or her own pain, 4) the person's assessment of his or her own physical functioning, and 5) the results of an erythrocyte sedimentation rate or C-reactive protein blood test (both of which test for inflammation).

…Current Treatment Options for RA…

Non-steroidal anti-inflammatory drugs (NSAIDs) and steroids are typical first-line treatments for RA. Additionally, disease-modifying anti-rheumatic drugs (DMARDs) are utilized in those patients that do not respond to therapy with NSAIDs. Patients with negative prognostic features or failing to achieve minimal disease activity at 6-12 months will typically receive step-up therapy involving one of several biologic agents, usually in combination with methotrexate.

The use of biologic therapies is strongly dominated by the tumor necrosis alpha (TNF-α) blockers Humira®, Remicade®, and Enbrel®, with Cimzia® and Simponi® as additional TNF-α targeting options. These drugs all provide similar efficacy and adverse event profiles, as expected from their common mechanism of action, and each of these compounds is approved for the treatment of multiple inflammatory conditions. Humira® is the market leader, with $11 billion in 2013 worldwide revenues, followed by Remicade® with $8.4 billion and Enbrel® with $8.3 billion. Sales of Cimzia® and Simponi® resulted in $750 million and $500 million in 2013 revenues, respectively. The relative market shares of the three top products correlates roughly with their convenience of administration, with market leader Humira® self-administered (subcutaneous dosing) at 2 week intervals, followed by Enbrel® which is self-administered every week, and Remicade® which is infused in a doctor's office at 2 month intervals. The more recent market entries Simponi® and Cimzia® allow for self-administration with somewhat longer dosing intervals than Enbrel® or Humira®.

One downside to TNF-α targeted therapy is that all of these drugs carry bolded boxed ("Black Box") warnings of the potential for serious adverse effects, including death. This is likely associated with the broad immunosuppressive profile of most of these agents, as TNF-α is a broadly pro-inflammatory cytokine that recruits leukocytes to the site of infection or injury, activates neutrophils, and stimulates the liver to produce proteins that increase the effectiveness of the immune response.

…Remicade®…

Remicade® is a chimeric IgG1 monoclonal antibody that is targeted against TNF-α. Remicade® works by binding to and neutralizing the activity of TNF-α, thereby preventing TNF-α from docking with its receptor and initiating an inflammatory response. The drug has been approved by the U.S. Food and Drug Administration (FDA) (see approval history here) for the treatment of rheumatoid arthritis, psoriasis, ankylosing spondylitis, Crohn's disease, and ulcerative colitis.

The typical dosing regimen for Remicade® is 3 mg/kg body weight for treating RA and 5 mg/kg for treating all other indications. The drug is given at 0, 2, and 6 weeks, and then every 6-8 weeks after that. Remicade® is administered by intravenous infusion and must be dosed at a clinic or a hospital. One of the most common reasons for discontinuation of Remicade® treatment is for infusion-related reactions, such as dyspnea, flushing, headache, and rash. In Phase 3 clinical trials, approximately 18% of Remicade®-treated patients experienced an infusion reaction compared to 5% of placebo-treated patients. Approximately 3% of Remicade®-treated patients discontinued use due to infusion reactions.

Other side effects reported in Remicade® clinical trials include upper respiratory tract infection, headache, and gastrointestinal ailments (stomach pain/nausea). Serious side effects have been reported with the use of TNF-α blocking therapies, including an increased risk for lymphoma, hepatosplenic T-cell lymphoma, melanoma, hepatotoxicity, and hematologic abnormalities. For this reason, almost all TNF-α blocking therapies carry bolded boxed ("Black Box") warnings of the potential for serious adverse effects, including death.

Clinical efficacy of Remicade® in treating RA was shown in two multicenter, randomized, double-blind, pivotal trials: ATTRACT (Study RA I) and ASPIRE (Study RA II). In both trials, a greater percentage of patients reached a major clinical response (ACR20/ACR50/ACR70) than placebo-treated patients, as shown in the following table.

	Study RA I					Study RA II		
		REMICADE + MTX					REMICADE + MTX	
		3 mg/kg		10 mg/kg			3 mg/kg	6 mg/kg
Response	Placebo + MTX (n=88)	q 8 wks (n=86)	q 4 wks (n=86)	q 8 wks (n=87)	q 4 wks (n=81)	Placebo + MTX (n=274)	q 8 wks (n=351)	q 8 wks (n=355)
ACR 20								
Week 30	20%	50%[a]	50%[a]	52%[a]	58%[a]	N/A	N/A	N/A
Week 54	17%	42%[a]	48%[a]	59%[a]	59%[a]	54%	62%[c]	66%[a]
ACR 50								
Week 30	5%	27%[a]	29%[a]	31%[a]	26%[a]	N/A	N/A	N/A
Week 54	9%	21%[c]	34%[a]	40%[a]	38%[a]	32%	46%[a]	50%[a]
ACR 70								
Week 30	0%	8%[b]	11%[b]	18%[a]	11%[a]	N/A	N/A	N/A
Week 54	2%	11%[c]	18%[a]	26%[a]	19%[a]	21%	33%[b]	37%[a]
Major clinical response[#]	0%	7%[c]	8%[b]	15%[a]	6%[c]	8%	12%	17%[a]

A major clinical response was defined as a 70% ACR response for 6 consecutive months (consecutive visits spanning at least 26 weeks) through week 102 for Study RA I and week 54 for Study RA II.
[a] $P \leq 0.001$
[b] $P < 0.01$
[c] $P < 0.05$

Source: Remicade® prescribing information; MTX = methotrexate

…BOW015…

Epirus has performed an extensive amount of bioanalytical and physicochemical comparisons between BOW015 and Remicade®. This includes data from both a Phase 1 clinical trial performed in the United Kingdom and a Phase 3 double blind comparator study conducted in India. The manufacturing processes for BOW015 were designed to ensure that the final BOW015 drug product is biocomparable to Remicade®. To support this, a full data package demonstrating biosimilarity between BOW015 and Remicade® has been produced and includes the physicochemical, biochemical, and biological properties of the two products.

Critical Quality Attributes (CQAs) are the physical, chemical, biological, and microbiological properties or characteristics that need to be within a certain range to show comparability between a biosimilar and a reference product. The CQAs for infliximab are known based on the mechanism of action, clinical experience, impact/risk assessment of production processes and the assessed ranges of specific attribute data generated by analysis of multiple lots of product. The CQAs are supported by Annex I of the Summary of Product Characteristics of the Remicade® European Public Assessment Report. Epirus has completed a full side-by-side characterization of BOW015 and Remicade®, including all CQAs for infliximab, which includes all known attributes that have the potential to impact safety, potency, and efficacy.

The assays utilized to assess biosimilarity include the following:

- Physicochemical: These are assays that measure the physical and chemical structure of the molecule and include primary sequencing of the antibody and glycoprofiling.
- In vitro biochemical: These assays measure the interaction of the molecule with other molecules. For infliximab, the assay measures the binding between the drug product and tumor necrosis factor alpha (TNF-α).
- In vitro biological: These assays measure the interaction of the drug product with biological media (e.g., cellular or animal test systems).

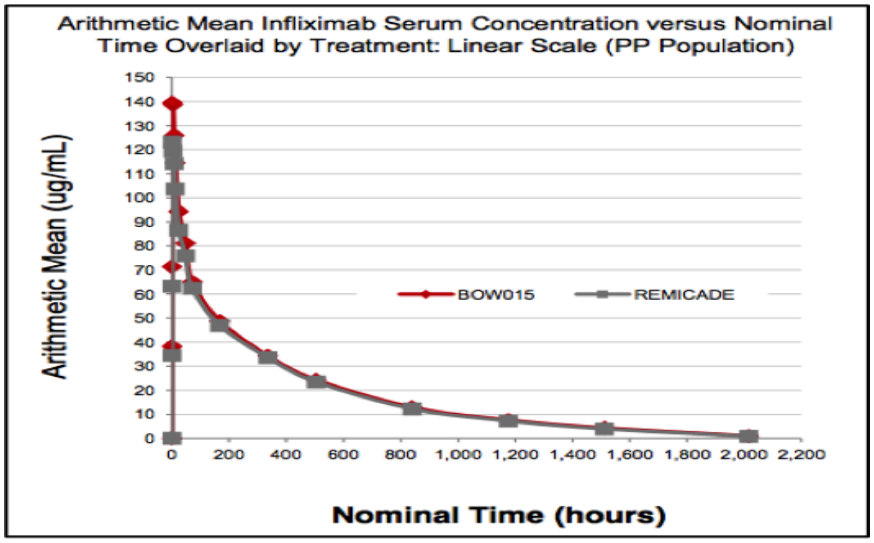
Epirus has completed the assessment of CQAs and demonstrated comparability between BOW015 and Remicade®. Minor differences between the two products have been noted; however, they are all in non-critical quality attributes and have not demonstrated an adverse effect on the biology or efficacy of BOW015 in either *in vitro* or human clinical studies.

…Phase 1 Study…

A Phase 1 bioequivalence study was conducted in the United Kingdom in 2012 with the primary objective of the study being a comparison of the pharmacokinetics of Remicade® and BOW015 administered by intravenous infusion. The secondary objectives of the study were to assess the safety and tolerability as well as the immunogenicity of BOW015 compared to Remicade®. The drugs were considered to be similar if at various time points the concentrations of the drugs were within the specified statistical parameters of 80-125%. The study design and criteria for success were based on standard bioequivalence requirements.

The study enrolled 84 healthy volunteers who were randomized 1:1 to receive either BOW015 or Remicade® via intravenous infusion at a dose of 5 mg/kg with a 12-week follow up period. The study was powered to detect bioequivalence at 90% confidence interval of BOW015 to Remicade®. Of the 84 subjects enrolled, 43 evaluable subjects received BOW015 and 41 subjects received Remicade®.

The following graph shows the serum concentration of both BOW015 and Remicade® after a single intravenous infusion of drug product. The pre-defined pharmacokinetic values for the maximum serum concentration as well as the pattern of elimination were similar between the two drugs. In addition, no differences were seen in immunogenicity test results between the two treatment groups nor were there any differences in safety or tolerability between the two groups.



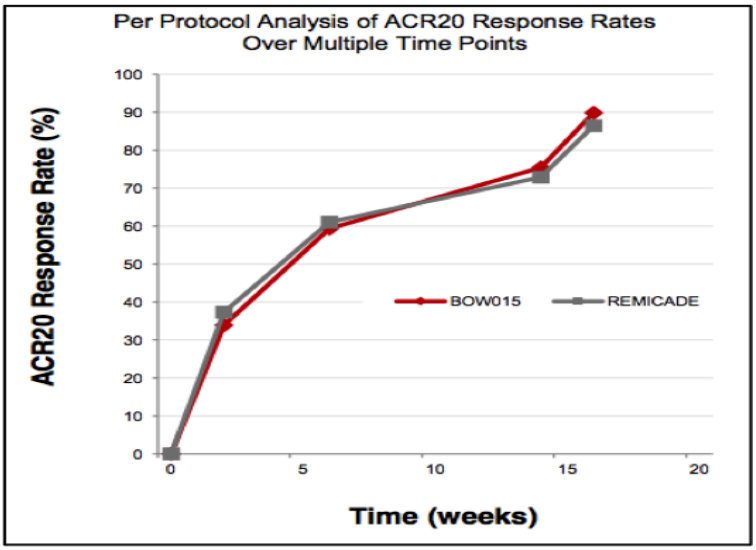
Source: Epirus Biopharmaceuticals

…Phase 3 Study…

Epirus conducted a randomized, double-blind, active comparator Phase 3 clinical trial in India to test the efficacy and safety of BOW015 in patients with severe, active rheumatoid arthritis on stable doses of methotrexate. The study subjects were randomized 2:1 to receive either BOW015 (n = 126) or Remicade® (n = 63) during the first 16 weeks of the study. The primary endpoint of the study was equivalence of both arms on the standardized American College of Rheumatology 20% improvement (ACR20) scoring system. This is a composite scoring system that includes objective laboratory measures as well as physician and patient assessments of well-being. Secondary endpoints were ACR50 and ACR70 scores as well as various components of the ACR20 scoring system.

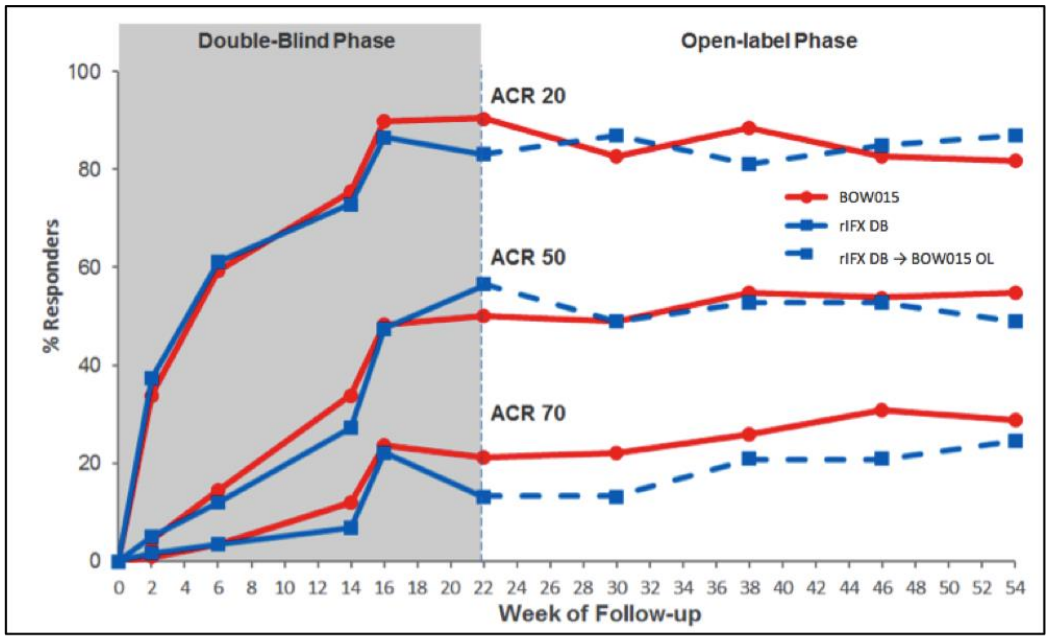
Both BOW015 and Remicade® were administered at a dose of 3 mg/kg given as an intravenous infusion at week 0, followed with similar doses at weeks 2, 6, and 14. Subjects were assessed at week 16 and responders were able to enter an open-label phase. In the open-label phase, subjects continued to receive BOW015 at a dose of 3 mg/kg given as an intravenous infusion at weeks 22, 30, 38, and 46 and were followed up at weeks 54 and 58. Non-responders at week 16 entered a follow-up phase for immunogenicity, PK, and safety for an additional 3 months.

The 16-week data shows that 89.8% of BOW015 treated patients achieved ACR20 compared to an 86.4% ACR20 response rate in those patients treated with Remicade®. The outcome met the pre-specified statistical endpoint and was within the 15% equivalence margin at a 95% confidence interval. There were no differences in safety, immunogenicity, or the secondary endpoints between the two treatment groups. The ACR20 response rates for weeks 0-16 are shown below, showing a high degree of similarity in response to BOW015 compared to Remicade®.



Source: Epirus Biopharmaceuticals

During the open-label portion of the study, those who had received Remicade® during the initial 16-week portion of the trial were switched to BOW015. Importantly, 58-week data shows that the durability of the response was seen with BOW015 alone and after switching from Remicade®. BOW015 was safe and well-tolerated through 58 weeks both when dosed alone or after switching from Remicade®, and there was consistent immunogenicity in patients dosed with only BOW015 compared to those switched from Remicade® to BOW015. We think these strong results will be instrumental in helping Epirus and its partners gain market share as BOW015 is commercialized.



Source: Epirus Biopharmaceuticals

SCALE™ Manufacturing Platform

Up until now, the manufacture of biologics (including monoclonal antibodies) has involved an enormous investment in facilities that required large, expensive stainless steel pieces of equipment that could only be utilized for one product at a time before needing to be thoroughly cleaned, retested, and revalidated. This has resulted in a significant amount of time where the facility was not producing product. However, there is a new trend in the use of single-use technologies for the manufacture of biologics. There are a number of advantages to single-use technologies including:

- Lower capital costs, as there is no need for a specialized manufacturing facility.
- Lower utility costs due to reduced sterilization procedures.
- All parts utilized in the manufacturing process are single-use only, thus there is no risk for cross-contamination and no need to shut down the facility for cleaning and re-validation.
- Ability to scale the amount of product produced based on demand.

Epirus' SCALE™ manufacturing platform utilizes single-use bioreactors as a means of manufacturing biologic products in local production markets in the most affordable means possible, while still keeping compliance with Good Laboratory Practice (GLP) and current Good Manufacturing Process (cGMP) requirements. A SCALE™ facility can be constructed for approximately $20 million to $40 million and is capable of producing up to 150 kg of product per year. In addition, multiple products can be produced in a SCALE™ facility simultaneously. In addition, when demand begins to exceed the output capabilities of a single bioreactor additional equipment can be installed to expand production capabilities.

Importantly, SCALE™ offers a flexible manufacturing solution for the company's partners in emerging markets. All aspects of biosimilar manufacturing can be conducted inside a "POD," a single modular manufacturing unit. Placed inside a warehouse, a POD needs only air, water, and power to be fully functional. The PODs are designed to be compliant with GLP and cGMP requirements with staffing at SCALE™ manufacturing sites kept to a minimum. The PODs and the single use biomanufacturing control systems are internet-enabled allowing for full-time monitoring of systems from anywhere in the world. SCALE™ also includes integrated and comprehensive quality systems, documentation management, training, and supply chain. The entire process is further enabled to allow technology transfer to partners in target countries.

Commercialization Strategy

Epirus has designated three potential markets for selling its products:

- ✓ ***Developed Markets***: In Europe and the U.S. there will need to be additional clinical work performed and a separate regulatory approval referencing an already approved product package.

- ✓ ***Local Production Markets***: These markets require local production of product, thus it is necessary to partner with established companies in each country that are familiar with the regulatory and commercial landscape. These countries include Brazil and China. While China requires clinical trials to be conducted in the local population, it is unclear whether Brazil will accept the Indian regulatory package for approval of BOW015.

- ✓ ***Accessible Markets***: BOW015 has received manufacturing and marketing approval in India and there are a number of countries that will accept the Indian regulatory package. These countries are located in northern Africa, southeastern Asia, and Central and South America (not including Brazil). In addition to accepting the Indian regulatory package, these countries do not require local production of product, thus Epirus can use BOW015 produced in India to greatly leverage initial market penetration and scale.

…Opportunity in Developed Markets…

Europe has had biosimilar regulatory guidelines in place since 2004 and there have been approximately 20 biosimilar products approved for sale in Europe. Epirus very recently completed a meeting with European regulators to discuss the design of a Phase 3 trial. There were three important outcomes to that meeting: 1) the molecular characterization performed thus far for BOW015 was deemed sufficient; 2) some additional technical work will likely be sufficient in regards to the BOW015 cell line; 3) A 30 week study will be considered sufficient to support a regulatory filing. In addition, the Phase 3 trial that will be conducted in Europe will be sufficient to support a regulatory filing in the U.S., and Epirus has already begun to receive interest from potential partners for selling BOW015 in the U.S.

The successful Phase 3 trial conducted in India significantly decreases the risk associated with the European Phase 3 trial, and we do not believe there will be any unforeseen issues that would result in a delay or inability to gain approval in Europe. We expect a regulatory filing in 2017 and launch of BOW015 in 2018.

…Size of market in Europe…

Europe is clearly the best opportunity for Epirus, but unfortunately the competition in Europe is quite fierce, with Epirus most likely to be the third or fourth Remicade® biosimilar to market. Total sales of Remicade® were $2 billion in 2012. A vial of Remicade® costs anywhere from $750-$1200 AWP, depending on the country, thus for our model we have assumed a cost of $1,000 per vial. We estimate that each patient requires on average 2.8 vials for each treatment, with 8 treatments per year. Thus, a patient is currently charged $22,400 per year for Remicade treatment®. This equates to approximately 90,000 patients currently being treated with Remicade®.

By the time BOW015 makes it to market in Europe, which we estimate will happen in 2018, we estimate infliximab biosimilars will be selling at a 40% discount to the current branded price, with the price eventually settling at approximately a 65% discount to the current AWP price. The patient population will not grow more than 2-3% per year, and with the intense competition we forecast Epirus to achieve a maximum market share of 13%.

Epirus has indicated a mixed sales approach, where the company will utilize a direct sales force for the countries of Belgium, Luxembourg, Netherlands, Switzerland, Norway, Finland, and Sweden and sign a partnership deal for the rest of Europe. We estimate that Epirus could garner 15% of BOW015 sales in Europe through the company's sales force, with a partner responsible for the other 85% of BOW015 European sales. The company has yet to sign a partnership deal so for now we are estimating a 15% royalty on partner revenues. We apply a 13% discount rate to future cash flows, and based on the preceding assumptions we arrive at a net present value for BOW015 in Europe of $72 million.

…Size of market in U.S.…

While the U.S. market is likely to be the largest overall for biosimilar products, it may not be the largest opportunity for Epirus as there is going to be immense competition from a host of larger pharmaceutical companies. One difference between the U.S. and Europe is that Remicade® does not go off patent in the U.S. until 2018 (compared to 2015 in Europe), the same year that BOW015 is expected to launch. Sales of Remicade® in the U.S. were approximately $4 billion in 2013. A vial of Remicade® costs approximately $1500 AWP. We estimate that each patient requires on average 2.8 vials for each treatment, with 8 treatments per year. Thus, a patient is currently charged $33,600 per year for Remicade treatment®. This equates to approximately 120,000 patients currently being treated with Remicade®.

When BOW015 enters the market in the U.S., which we estimate will happen in 2018, we estimate infliximab biosimilars will be selling at a 50% discount to the current branded price, with the price eventually settling at approximately a 67% discount to the current AWP price. The patient population will not grow more than 2-3% per year, and with the intense competition we forecast Epirus to achieve a maximum market share of 10%.

Epirus has already indicated interest from potential partners for bringing BOW015 to market in the U.S. With no deal signed yet, we are estimating a 15% royalty rate on partner revenues. We apply a 13% discount rate to future cash flows, and based on the preceding assumptions we arrive at a net present value for BOW015 in the U.S. of $41 million.

…Opportunity in local production markets…

The two local production markets that Epirus plans to target first are Brazil and China. The Brazilian Ministry of Health initiated the Productive Development Policy (PDP) to establish a formalized pathway to access the public healthcare market, as the Brazilian government directly purchases a significant portion of all biopharmaceutical products. In order to gain full access to the public markets, a company must fully transfer the product and manufacturing technology to a Brazilian partner company. Epirus is currently in the process of selecting the optimal Brazilian partners.

Epirus is planning to meet with Brazilian regulators to discuss whether the regulatory filing from India will be sufficient to gain approval in Brazil or if additional studies will be required. If the outcome of the meeting is positive, Epirus is likely to sign a partnership agreement soon thereafter and could be in a position to have BOW015 on the market by 2016.

The Chinese government encourages local production of biopharmaceuticals and requires that clinical testing be performed in the local population before a compound can be approved. Due to this we do not forecast BOW015 being approved for sale in China until after 2018.

On September 25, 2014, Epirus announced they had signed a royalty-bearing, multiple-product collaboration agreement with Livzon Mabpharm Inc., a Chinese biotechnology company focused on the development, manufacture, and sale of antibody-based drugs. Livzon was a major investor in Epirus' $36 million private financing round in April 2014, prior to Epirus becoming a public company. Under terms of the agreement, Epirus and Livzon will develop, manufacture, and commercialize up to five biosimilar products, with the first product being BOW015. Epirus will transfer the SCALE™ manufacturing platform to Livzon, with Livzon then being responsible for any additional development work necessary for approval of BOW015 in China.

…Size of market in Brazil and China…

Remicade® sales totaled approximately $360 million in the local production markets in 2012, which includes Brazil, China, Russia, Turkey, and Saudi Arabia. We estimate that sales in Brazil and China were each responsible for 30% of those revenues. We estimate a vial in these markets cost $600 AWP with each patient receiving an average of 2.8 vials per treatment for a total of 8 treatments per year. This equates to $13,440 per patient per year, and gives an estimated 8,100 Remicade® patients in both Brazil and China.

We believe that BOW015 will initially be sold at a 30% discount to the approximately $600 AWP branded price in both countries, and as more competitors enter the market this price will fall to approximately 50% of the branded price. We estimate the number of potential patients will double by 2019 to approximately 16,000 in each country. As there will be more competition in these markets, we estimate that Epirus will have peak market share of 20% in Brazil and 15% in China. The agreement Epirus signed with Livzon calls for a royalty in the "high single digits" that we are estimating to be 8%. Epirus has yet to sign a partnership agreement in Brazil, thus we using a 12% royalty rate, a value half-way between the two signed deals (16% with Ranbaxy and 8% with Livzon). We apply a 13% discount rate to the future cash flows, and utilizing the aforementioned variables we arrive at a net present value for BOW015 in Brazil of $10 million and in China of $4 million.

…Opportunity in accessible markets…

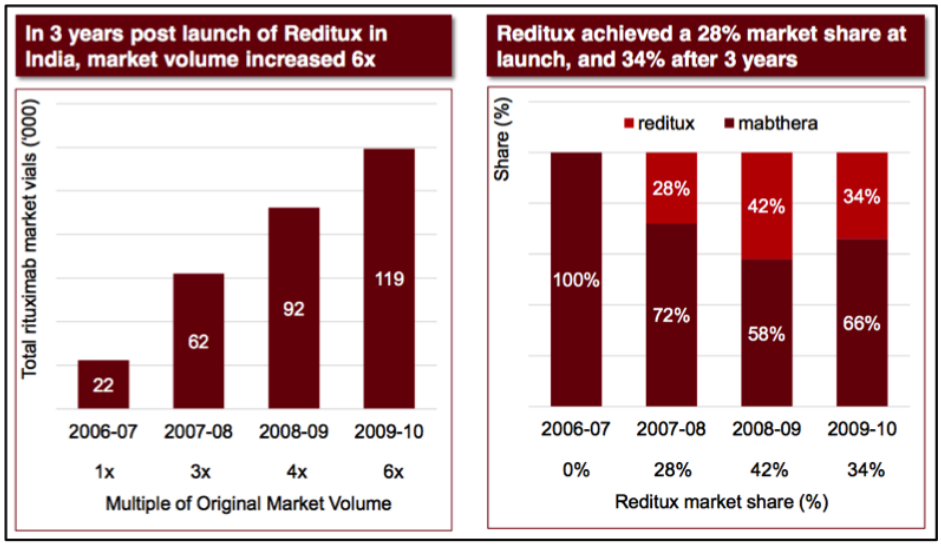
The Phase 3 study referenced above was conducted in India and based upon the interim 16-week analysis Epirus was granted marketing and commercialization approval for BOW015 for the treatment of RA in India. In January 2014, Epirus entered into a license agreement with Ranbaxy, whereby Ranbaxy agreed to distribute and sell BOW015 in India under the marketing authorization granted in March 2014 as well as in other countries in Asia and North Africa. Epirus' manufacturing partner, Reliance Life Sciences, Ltd. (RLS), holds the marketing authorization in India. Under the terms of agreement with Ranbaxy, Epirus is responsible for supplying BOW015 to Ranbaxy, through RLS, for sale in India. On December 2, 2014, Epirus announced the launch of Infimab™ (BOW015) in India, which was earlier than the originally anticipated launch during the first quarter of 2015.

Ranbaxy paid Epirus an up-front payment of $0.5 million, with additional payments required based upon the achievement of certain regulatory and commercialization milestones of up to $1 million in aggregate. In addition, milestone payments of up to $10 million are required upon the achievement of certain pre-specified levels of aggregate gross sales of BOW015, with Ranbaxy paying Epirus a net royalty in the mid-teens. The agreement is in place for 20 years.

…Size of market in accessible markets…

There were approximately $26 million in Remicade® sales in the accessible markets in 2012. Remicade® is sold in 100 mg vials, and we estimate that a vial in these markets cost $600 (AWP) with each patient receiving an average of 2.5 vials per treatment for a total of 8 treatments per year. This equates to $12,000 per patient per year, and allows us to back-calculate an estimated 2,200 Remicade® patients in this market.

Epirus' strategy in the accessible markets is predicated on market expansion. As an example, Reditux®, a non-comparable biologic version of rituximab, was launched in India in 2007. Following the launch, and a subsequent 40% drop in price, the market expanded 6-fold, with Reditux® taking 34% of the expanded market.



Source: Epirus Biopharmaceuticals

We believe that BOW015 will initially be sold at a 30% discount to the $600 AWP price for branded Remicade®, and as more competitors enter the market this price will fall to approximately 50% of the AWP branded price. The number of patients should rise quite significantly as the price of treatment falls and access to treatment improves, thus we forecast the number of treated patients to rise to approximately 10,000 by 2019. Epirus is poised to gain a large share of the market in these countries, and we forecast they will attain 30% peak market share. We estimate a 16% royalty rate and with peak sales of approximately $34 million, this equates to approximately $5.5 million in royalty income. We apply a 13% discount rate to the future cash flows, giving BOW015 in the accessible markets a net present value of $13 million.

Epirus' pipeline

In addition to BOW015, Epirus is also in the preclinical development stage with BOW070, a biosimilar version of tocilizumab (Actemra®), and BOW050, a biosimilar version of adalimumab (Humira®). In addition, Epirus has Z944, an oral T-type calcium channel modulator that was acquired through the merger with Zalicus.

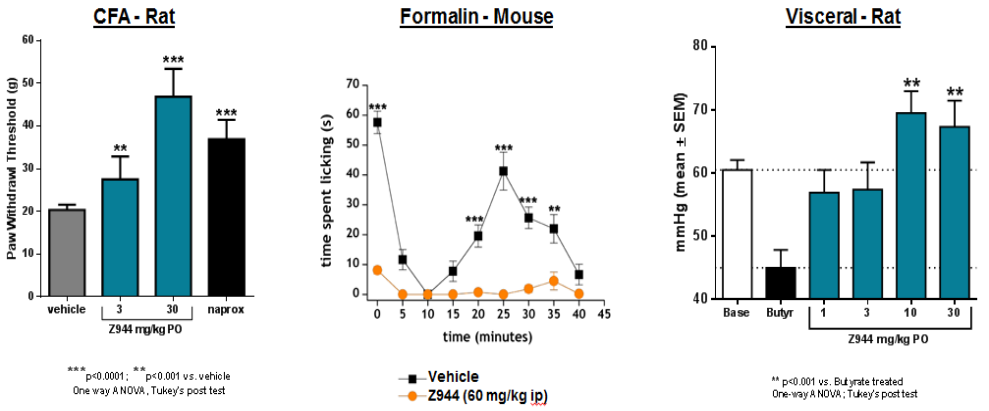
- Tocilizumab (Actemra®): This is a humanized monoclonal antibody that acts as an immunosuppressive drug by binding to interleukin-6 (IL-6). It is approved for the treatment of rheumatoid arthritis and systemic juvenile idiopathic rheumatoid arthritis. Global revenues for Actemra® totaled $1.1 billion in 2013 at Roche. The EU and US patents for Actemra® expire in 2019, and Epirus is planning to initiate preclinical studies in 2016.

- Adalimumab (Humira®): This is a fully human IgG1 monoclonal antibody that binds to TNF-α. Like Remicade®, adalimumab was first approved for the treatment of rheumatoid arthritis, and has since been approved for the treatment of additional inflammatory conditions such as psoriatic arthritis, Crohn's disease, ulcerative colitis, and ankylosing spondylitis. The EU patent for Humira® expires in 2018, and Epirus is planning to initiate preclinical studies in 2016.

- Z944: This is a novel, oral, T-type calcium channel modulator that is being developed for the treatment of pain. The molecule has demonstrated efficacy in multiple preclinical pain models and in a Phase 1b experimental model of pain. Epirus gained this compound through the merger with Zalicus, Inc. Epirus management has stated that the drug does not fit with the new company's business model of developing biosimilars. As such, we are modeling for a disposition of this asset. We discuss Z944 in brief below.

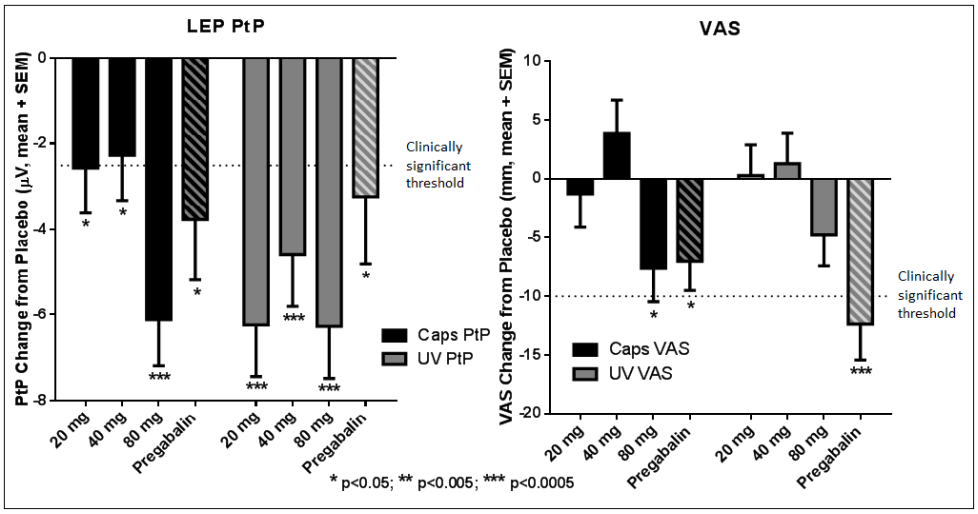
…Looking To Monetize Z944…

In February 2012, Zalicus published a paper in Science Translational Medicine identifying Z944 as a potential therapy for seizure and generalized epilepsy. In May 2013, Zalicus presented Poster #383 at the American Pain Society highlighting the mechanism of action for Z944 and its potential utility in various nonclinical models of acute and inflammatory pain. The following graphs contain some of this data showing how Z944 compared well to naproxen in a rat Complete Freund's Adjuvant (CFA) model, mouse formalin model, and in a rat model of visceral pain.



Zalicus also obtained some interesting data from a Phase 1b study of Z944. Firstly, Zalicus saw dose proportional pharmacokinetics with similar exposure to preclinical doses where efficacy was achieved. The data showed rapid absorption and a pharmacokinetic profile that supports twice daily dosing. The drug was also well tolerated, but the company did identify a maximum tolerated dose. In fact, when doses got too high there were limiting CNS side effects. This is in contrast to another compound that Zalicus attempted to develop, Z160, which had very limited side effects and incredible tolerability. It's important to note companies developing these types of therapies *want* to see dose-limiting CNS side effects. That confirms the drug is hitting the target organ.

The Phase 1b study utilized a state-of-the-art experimental clinical model measuring Laser-Evoked Potentials (LEP) following administration of capsaicin or exposure to UV light. The trial was designed to efficiently provide objective and subjective data on a drug's ability to modulate neuropathic pain signaling. This provided management with a better sense of the efficacy signal than with Z160. The data showed that Z944 reduced peak-to-peak amplitudes in both neuropathic (capsaicin) and inflammatory (UV) pain models (see graphs below taken from the company's investor presentation). The drug also reduced subjective VAS pain scores for both models, with the highest dose of 80 mg comparing well to preclinical data on Pfizer's Lyrica (pregabalin).



Zalicus' goal was always to sell Z944 to another pharmaceutical company interested in taking the compound into Phase 2 studies. Based on the data we've presented above, and the potential for Z944 to offer "Lyrica-like" efficacy with improved side-effects and dosing, we find it possible that Epirus could sell Z944 for up to $10 million in cash. This may be low to some investors, but given that Z944 is no longer a core asset we think netting $10 million would be a fair price and very attractive to Epirus management.

Financial Position & Capital Structure

Epirus Biopharma had cash and cash equivalents of $23.7 as of the end of the third quarter 2014. On September 30, 2014, the company entered into a loan and security agreement with Hercules Technology Growth Capital, Inc., whereby Hercules will supply Epirus with access to two term loans with an aggregate principal amount of $15.0 million. The first term loan, of $7.5 million, was funded on October 1, 2014. The second term loan can be drawn by Epirus anytime up until May 30, 2015.

We anticipate the cash on hand is enough to fund operations through the third quarter of 2015. This should enable the company to commence the Phase 3 study of BOW015 in Europe. However, additional funds will need to be raised in order to advance BOW050 and BOW070 into the clinic.

An additional asset that Epirus has is Canadian net operating loss (NOL) carry-forwards that were acquired through the merger with Zalicus. These totaled approximately $105 million, according to Zalicus' 2013 10-K. The Canadian NOLs were acquired by Zalicus through the acquisition of Neuromed.

Epirus currently has approximately 12.9 million shares outstanding, and when totaling in the outstanding warrants and stock options the company has 17.4 million shares on a fully diluted basis.

Potential risks to our thesis

- ⇨ Market expansion in India does not occur: While the example referenced earlier in regards to market expansion after the introduction of a non-comparable biologic version of rituximab is encouraging, it does not guarantee that the same situation will occur upon the introduction of a biosimilar version of Remicade®. Were this to not occur it would adversely affect our valuation for the Indian market.

- ⇨ Brazil does not accept Indian regulatory package: Epirus will be meeting with Brazilian regulators to determine if the Indian regulatory filing will be acceptable for granting approval to BOW015 in Brazil. Were the Indian filing not be deemed sufficient that could mean additional clinical testing would be necessary to gain marketing approval, which in turn would likely increase the time to market as well as the expense necessary to gain access to the Brazilian market.

- ⇨ Partnership deals do not include terms as favorable as our assumptions: As of now Epirus has signed partnership deals in the accessible markets and China. We have built assumptions into our valuation model that assume a 12% royalty rate for the Brazilian market and a 15% royalty rate for both the European and U.S. markets. If Epirus is not able to command similar terms in future partnership deals for these markets it would adversely affect our valuation.

- ⇨ Not able to gain market share in developed markets: Biosimilar competition will be quite intense in Europe and the U.S., as the cost of drugs in these regions is much higher than in other parts of the world. In addition, there is wide access to medications thus there is a large established market for most biologic therapeutics. For this reason, a number of larger pharmaceutical companies have announced biosimilar programs, with many having products farther along in development than Epirus. The company has sought to mitigate this risk by focusing on products with fewer known competitors in development, however overall competition will still be fierce and gaining appreciable market share will be a challenge.

MANAGEMENT PROFILES

Amit Munshi – President and Chief Executive Officer
Mr. Munshi is the former CEO of Percivia LLC and also was a co-founder, and the chief business officer, at Kythera Biopharmaceuticals (NASDAQ: KYTH). Previously, he held leadership positions at Amgen (NASDAQ: AMGN), including General Manager of European Nephrology. Mr. Munshi has more than 24 years of pharmaceutical and biotechnology experience both in the United States and internationally, including general management, product development, licensing, and business development.

Tom Shea – Chief Financial Offier
Mr. Shea was formerly the CFO of Euthymics, Neurovance and EBI Life Sciences, three affiliated companies developing neurological and pain drug candidates. Previously, Tom was the CFO of Tolerx, an autoimmune company, for six years and Cubist Pharmaceuticals (NASDAQ: CBST), an acute care company, for ten years. At Cubist, Tom was an integral part of the team to lead Cubist to a public company listing.

Kim Seth, PhD – Senior Vice President, Head of Corporate Development & Strategy
Dr. Seth is a former Executive Director at Pfizer (NYSE: PFE), where he held both global operational and strategy roles. At Pfizer, he helped lead the design and execution of the R&D operational turnaround and strategic efforts to enter and expand into new markets, e.g. cancer immunotherapy. He joined Epirus in February 2014 with over 15 years experience across a range of biomedical and commercial settings. Prior to Pfizer, Kim was Vice President at Goldman Sachs & Co. (NYSE: GS), covering global Specialty and Large Cap Pharma, and led M&A and licensing efforts at Epix Pharmaceuticals (formerly NASDAQ: EPIX). Dr. Seth holds a Ph.D. in Neurobiology and an AB *cum laude* in Economics, both from Harvard University.

Michael Wyand, DVM, PhD – Senior Vice President of Clinical, Regulatory, and Manufacturing
Dr. Wyand is a former Senior Vice President of Research Development at BioAssets (sold to Cephalon Inc.) and also was Vice President of Preclinical Development at Genzyme Transgenics Corp. Previously, he held the leadership position of Senior Vice President of Operations & Research and Development at Therion Biologics where he developed and operationalized the GMP vaccine production facility.

Rob Ticktin – Senior Vice President and General Counsel
Mr. Ticktin was formerly Associate General Counsel at Amgen (NASDAQ: AMGN) for 10 years where he held various positions in the legal department, including leading legal support for mergers & acquisitions, licensing, alliance management, international operations and, most recently, global production activities. He commenced his legal career in New York City at global law firms, Simpson Thacher & Bartlett and Latham & Watkins, as a corporate and securities attorney. Rob has more than 20 years of sophisticated transactional and general corporate law experience.

Nick Plumeridge – Senior Vice President of Global Business Development and Licensing
Mr. Plumeridge is a former Vice President of Business Development at Takeda Pharmaceutical Asia Pacific Limited (TSE: 4502.T) and Invida Holdings Private Limited (now Menarini Asia-Pacific). He has more than 15 years of experience in emerging markets including China, Southeast Asia, Korea and Latin America. Nick also has more than 25 years of global enterprise experience in sales management and marketing and has closed more than 30 deals, including the acquisition of Valeant Asia Pacific by Invida and the acquisition of Nycomed by Takeda.

VALUATION AND RECOMMENDATION

We are initiating coverage of Epirus Biopharmaceuticals, Inc. (EPRS) with an Outperform rating and a price target of $8.00 per share.

Epirus is a global biopharmaceutical company developing a series of biosimilar products. The company's lead product is BOW015, a biosimilar version of Remicade®, a chimeric monoclonal antibody that binds to tumor necrosis factor alpha (TNF-α) and is currently approved for the treatment of a number of inflammatory diseases. Epirus has gained marketing and commercialization approval for the sale of BOW015 in India based on a Phase 3 study that showed comparability to Remicade® with no immunogenicity issues and similar efficacy even for patients who started treatment on Remicade® and switched to BOW015. In addition to BOW015, the company also has BOW050 and BOW070, biosimilar versions Humira® and Actemra®, respectively.

Epirus strategy

Epirus is focused on delivering biosimilar therapeutics to various markets around the world by successfully navigating the different regulatory, legal, and commercial barriers that exist in each of those regions. The company has divided the various markets into the following categories:

- ✓ ***Developed Markets***: In Europe and the U.S. there will need to be additional clinical work performed and a separate regulatory approval referencing an already approved product package.
- ✓ ***Local Production Markets***: These markets require local production of product, thus it is necessary to partner with established companies in each country that are familiar with the regulatory and commercial landscape. These countries include Brazil and China. While China requires clinical trials to be conducted in the local population, it is unclear whether Brazil will accept the Indian regulatory package for approval of BOW015.
- ✓ ***Accessible Markets***: BOW015 has received manufacturing and marketing approval in India and there are a number of countries that will accept the Indian regulatory package. These countries are located in northern Africa, southeastern Asia, and Central and South America (not including Brazil). In addition to accepting the Indian regulatory package, these countries do not require local production of product, thus Epirus can use BOW015 produced in India to greatly leverage initial market penetration and scale.

	US	EUROPE & JAPAN	LOCAL PRODUCTION MARKETS (Brazil, China, Russia)	ACCESSIBLE MARKETS (SE Asia, LATAM, India)
Regulatory Clarity / Precedence	Initial guidance with precedent approval pending	Existing frameworks, multiple approved products Strong government support for product approval May require local patients, presence – e.g., China, Japan, Brazil		
Legal Challenges / Encumbrances	Lingering IP encumbrances likely	Minimal challenges, no challenges to physician prescribing	Freedom to operate, no challenges to physician prescribing	
Commercial viability / tractability	Switching at Physician / patient level	Partly tender driven, physician driven	Tender driven market	Market Expansion

Source: Epirus Biopharmaceuticals

…Epirus products face less competition than other biosimilars…

One of the strategies that Epirus is focused on has to do with selecting products that will have minimal competition in the marketplace while also building a pipeline of products with synergistic therapeutic applications. This is exemplified by the company focusing on developing biosimilar versions of Remicade®, Humira®, and Actemra®. As the following two charts show, biosimilar versions of Remicade®, Humira®, and Actemra® will have fewer competitors (<5 for Remicade® and Actemra® biosimilars; approximately 10 for Humira® biosimilars) than other products (>20 for Herceptin®, Enbrel®, and Rituxan® biosimilars).

Top Selling Biologic Drugs					
Innovator	**Company**	**Indication**	**Global Sales 2013**	**Forecasted Sales 2020**	**Approximate # of Biosimilar Competitors**
Humira (adalimumab)	AbbVie	RA, CD, UC, PsO, PsA, AS	$10.7B	$12.7B	10
Remicade (infliximab)	Janssen	RA, CD, UC, PsO, PsA, AS	$8.4B	$8.8B	<5
Rituxan (rituximab)	Genentech / Biogen	NHL, CLL, RA, GPA, MPA	$7.5B	$5.5B	30
Enbrel (etanercept)	Amgen	RA, PsO, psA, AS	$8.3B	$8.0B	25
Lantus (insulin glargine)	Sanofi	Type 2 Diabetes	$7.6B	$5.7B	<5
Avastin (bevacizumab)	Genentech	mCRC, NSCLC, mRCC, GBM	$6.7B	$6.3B	15
Herceptin (trastuzumab)	Genentech	Breast Cancer, Metastatic Gastric / GEJ Cancer	$6.6B	$5.3B	20
Neulasta (pegfilgrastim)	Amgen	Neutropenia related to cancer chemotherapy	$4.4B	$3.5B	5
Lucentis (ranibizumab)	Genentech	wAMD, macular edema following RVO, DME	$4.2B	$3.9B	<5
Actemra (tocilizumab)	Genentech	RA	$1.1B	$2.2B	<5

Source: Epirus Biopharmaceuticals

Innovator	Company	Forecasted Sales 2020	Patent Expiry *(EU, US)*	Biosimilar Competition *(molecule, company, phase)*
Remicade INFLIXIMAB	Janssen	$8.8B	2015, 2018	Remsima / Inflectra, Celltrion / Hospira, Marketed (Japan, Korea, parts of EU, other emerging markets)
				BOW015 / Infimab, EPIRUS, Marketed (India) / Phase 3 (ROW)
				GS071, Nichi Iko, Phase 3
				SB2, Samsung Bioepis, Phase 3
				PF-06438179, Pfizer, Phase 3
HUMIRA adalimumab	AbbVie	$12.7B	2018, 2016	BI 695501, BI, Phase 3
				GP 2017, Sandoz, Phase 3
				ABP 501, Amgen, Phase 3
				SB5, Samsung Bioepis, Phase 3
				Therapeutics Proteins International, Phase 3
				ONS-3010, Oncobiologics, Phase 1
				FKB327, Kyowa Hakko Kirin, Phase 1
				PF-06410293, Pfizer, Phase 1
				CHS 1420, Coherus, Phase 1
				M923, Momenta / Baxter, Phase 1
				BOW050, EPIRUS, Pre-Clinical
ACTEMRA tocilizumab	Roche	$2.2B	2019, 2019	**BOW070**, EPIRUS, Pre-Clinical

Source: Epirus Biopharmaceuticals

While some may argue that developing multiple products for the same indication is unwise as it may result in one product taking market share from another, we do not feel this will be the case for Epirus. The main reason for this has to do with the nature of biological therapeutics, particularly in the case of treating rheumatoid arthritis. A 2006 survey reported that 94% of rheumatologists surveyed reported that they had switched an RA patient from one TNF inhibitor to another due to inadequate response or side effects (Kamal *et al*., 2006). Since approximately 30% of RA patients do not respond to initial therapy, there is a large contingent of patients that will need to try multiple treatment options before identifying one that works for them. Thus, by offering a range of therapeutic options for RA the company is more likely to retain those patients who have already tried biosimilar therapy, thus helping to maintain overall market share.

Commercialization Opportunity

Our valuation is focused on BOW015 as it has already been launched in India and one more Phase 3 study needs to be completed along with an additional PK/PD study to run in parallel with the Phase 3 study before the drug can be approved in developed markets.

…Size of market in accessible markets…

There were approximately $26 million in Remicade® sales in the accessible markets in 2012. Remicade® is sold in 100 mg vials, and we estimate that a vial in these markets cost $600 (AWP) with each patient receiving an average of 2.5 vials per treatment for a total of 8 treatments per year. This equates to $12,000 per patient per year, and allows us to back-calculate an estimated 2,200 Remicade® patients in this market.

We believe that BOW015 will initially be sold at a 30% discount to the $600 AWP price for branded Remicade®, and as more competitors enter the market this price will fall to approximately 50% of the AWP branded price. The number of patients should rise quite significantly as the price of treatment falls and access to treatment improves, thus we forecast the number of treated patients to rise to approximately 10,000 by 2019. Epirus is poised to gain a large share of the market in these countries, and we forecast they will attain 30% peak market share. We estimate a 16% royalty rate and with peak sales of approximately $34 million, this equates to approximately $5.5 million in royalty income. We apply a 13% discount rate to the future cash flows, giving BOW015 in the accessible markets a net present value of $13 million.

…Size of market in Brazil and China…

Remicade® sales totaled approximately $360 million in the local production markets in 2012, which includes Brazil, China, Russia, Turkey, and Saudi Arabia. We estimate that sales in Brazil and China were each responsible for 30% of those revenues. We estimate a vial in these markets cost $600 AWP with each patient receiving an average of 2.8 vials per treatment for a total of 8 treatments per year. This equates to $13,440 per patient per year, and gives an estimated 8,100 Remicade® patients in both Brazil and China.

We believe that BOW015 will initially be sold at a 30% discount to the approximately $600 AWP branded price in both countries, and as more competitors enter the market this price will fall to approximately 50% of the branded price. We estimate the number of potential patients will double by 2019 to approximately 16,000 in each country. As there will be more competition in these markets, we estimate that Epirus will have peak market share of 20% in Brazil and 15% in China. The agreement Epirus signed with Livzon calls for a royalty in the “high single digits” that we are estimating to be 8%. Epirus has yet to sign a partnership agreement in Brazil, thus we using a 12% royalty rate, a value half-way between the two signed deals (16% with Ranbaxy and 8% with Livzon). We apply a 13% discount rate to the future cash flows, and utilizing the aforementioned variables we arrive at a net present value for BOW015 in Brazil of $10 million and in China of $4 million.

…Size of market in Europe…

Europe is clearly the best opportunity for Epirus, but unfortunately the competition in Europe is quite fierce, with Epirus most likely to be the third or fourth Remicade® biosimilar to market. Total sales of Remicade® were $2 billion in 2012. A vial of Remicade® costs anywhere from $750-$1200 AWP, depending on the country, thus for our model we have assumed a cost of $1,000 per vial. We estimate that each patient requires on average 2.8 vials for each treatment, with 8 treatments per year. Thus, a patient is currently charged $22,400 per year for Remicade treatment®. This equates to approximately 90,000 patients currently being treated with Remicade®.

By the time BOW015 makes it to market in Europe, which we estimate will happen in 2018, we estimate infliximab biosimilars will be selling at a 40% discount to the current branded price, with the price eventually settling at approximately a 65% discount to the current AWP price. The patient population will not grow more than 2-3% per year, and with the intense competition we forecast Epirus to achieve a maximum market share of 13%.

Epirus has indicated a mixed sales approach, where the company will utilize a direct sales force for the countries of Belgium, Luxembourg, Netherlands, Switzerland, Norway, Finland, and Sweden and sign a partnership deal for the rest of Europe. We estimate that Epirus could garner 15% of BOW015 sales in Europe through the company's sales force, with a partner responsible for the other 85% of BOW015 European sales. The company has yet to sign a partnership deal so for now we are estimating a 15% royalty on partner revenues. We apply a 13% discount rate to future cash flows, and based on the preceding assumptions we arrive at a net present value for BOW015 in Europe of $72 million.

…Size of market in U.S.…

While the U.S. market is likely to be the largest overall for biosimilar products, it may not be the largest opportunity for Epirus as there is going to be immense competition from a host of larger pharmaceutical companies. One difference between the U.S. and Europe is that Remicade® does not go off patent in the U.S. until 2018 (compared to 2015 in Europe), the same year that BOW015 is expected to launch. Sales of Remicade® in the U.S. were approximately $4 billion in 2013. A vial of Remicade® costs approximately $1500 AWP. We estimate that each patient requires on average 2.8 vials for each treatment, with 8 treatments per year. Thus, a patient is currently charged $33,600 per year for Remicade treatment®. This equates to approximately 120,000 patients currently being treated with Remicade®.

When BOW015 enters the market in the U.S., which we estimate will happen in 2018, we estimate infliximab biosimilars will be selling at a 50% discount to the current branded price, with the price eventually settling at approximately a 67% discount to the current AWP price. The patient population will not grow more than 2-3% per year, and with the intense competition we forecast Epirus to achieve a maximum market share of 10%.

Epirus has already indicated interest from potential partners for bringing BOW015 to market in the U.S. With no deal signed yet, we are estimating a 15% royalty rate on partner revenues. We apply a 13% discount rate to future cash flows, and based on the preceding assumptions we arrive at a net present value for BOW015 in the U.S. of $23 million.

Sum-of-parts valuation

In addition to BOW015, our sum-of-parts valuation takes into account the following additional assets: BOW050, BOW070, Z944, and available cash minus long term debt. Our calculations give us a net present value for the company of $140 million, and when divided by the fully diluted share count of 17.4 million shares gives us a current value of approximately $8.00 per share.

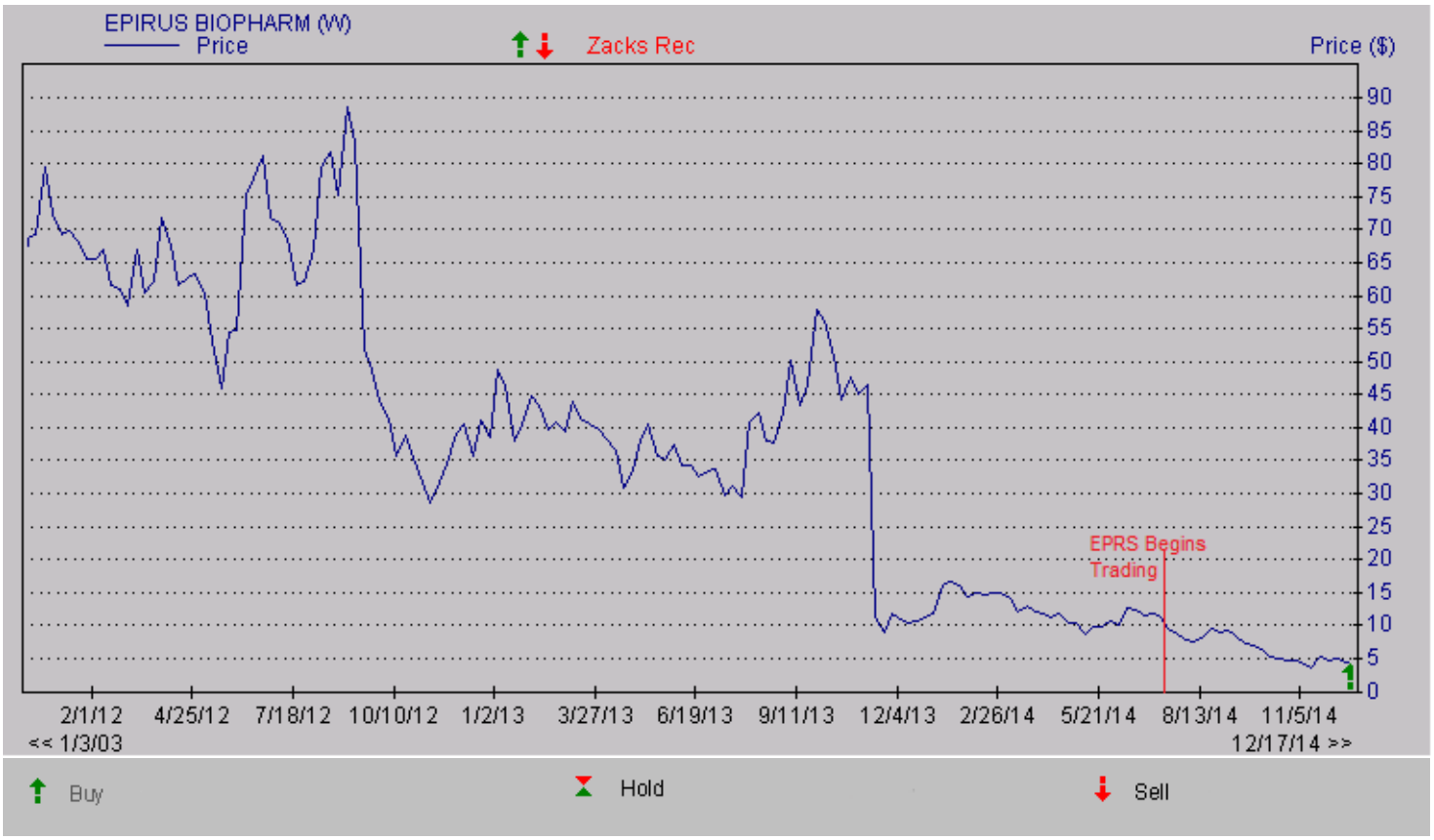
PROJECTED FINANCIALS

Epirus Biopharmaceuticals, Inc.
Income Statement

Epirus Biopharmaceuticals, Inc.	2013 A	Q1 A	Q2 A	Q3 A	Q4 E	2014 E	FY 2015 E	FY 2016 E
BOW015 Royalties	-	$0.0	$0.0	$0.0	$0.0	$0.0	$0.3	$0.6
YOY Growth	-	-	-	-	-	-	-	-
BOW050 Royalties	-	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
YOY Growth								
BOW030 Royalties	-	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
YOY Growth								
Total Revenues	**-**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.3**	**$0.6**
YOY Growth	-	-	-	-	-	-	-	-
CoGS	-	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Product Gross Margin		-	-	-	-	-	-	-
R&D	-	$3.5	$2.6	$5.4	$6.0	$17.5	$20.0	$22.0
SG&A	-	$2.7	$6.4	$8.5	$7.5	$25.1	$27.0	$28.0
Operating Income	**-**	**($6.2)**	**($8.9)**	**($13.9)**	**($13.5)**	**($42.6)**	**($46.7)**	**($49.4)**
Operating Margin		-	-	-	-	-	-	-
Interest & Other Income	-	($1.3)	($1.0)	($0.0)	($0.1)	($2.4)	($2.5)	($2.0)
Pre-Tax Income	-	($7.5)	($9.9)	($14.0)	($13.6)	($45.0)	($49.2)	($51.4)
Taxes & Other	-	$0	$0	$0	$0	$0	$0	$0
Tax Rate		*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	-	($7.6)	($9.9)	($13.9)	($13.6)	($45.0)	($49.2)	($51.4)
Net Margin		-	-	-	-	-	-	-
Reported EPS	**-**	**($3.83)**	**($3.81)**	**($1.28)**	**($1.05)**	**($6.34)**	**($3.28)**	**($2.57)**
YOY Growth		-	-	-	-	-	-	-
Basic Shares Outstanding	-	2.0	2.6	10.8	13.0	7.1	15.0	20.0

Source: Zacks Investment Research, Inc. *Jason Napodano, CFA*

HISTORICAL ZACKS RECOMMENDATIONS



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