Zacks Small-Cap Research

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Protalex, Inc.

(PRTX-OTC)

PRTX: Early-Stage Data Suggests Protalex' PRTX-100 Has Intriguing Profile; Initiating Coverage at Neutral.

Current Recommendation	**Neutral**
Prior Recommendation	N/A
Date of Last Change	09/11/2013
Current Price (09/16/2013)	$3.10
Target Price	**$3.50**

INITIATION

We are initiating coverage of Protalex Inc. with a Neutral rating. Protalex is developing PRTX-100, a highly purified form of Staphylococcal protein A (SpA) as a treatment for rheumatoid arthritis and other autoimmune disorders. In early-stage clinical trials, PRTX-100 has demonstrated encouraging efficacy and safety, with a novel mechanism of action that may be associated with less general immune suppression and a lower incidence of infections and malignancies than current market leading therapies for RA. We find PRTX-100 highly intriguing, with a potential blockbuster profile, although we caution investors that the data is still early-stage and thus rate the shares Neutral until further proof-of-concept is generated. We have performed a DCF analysts based in part on comparable deals in the RA space, and have arrived at a fair value of $3.50.

SUMMARY DATA

52-Week High	**$4.00**
52-Week Low	**$1.30**
One-Year Return (%)	**N/A**
Beta	**0.28**
Average Daily Volume (sh)	**16,053**
Shares Outstanding (mil)	**28**
Market Capitalization ($mil)	**$88**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**0**
Insider Ownership (%)	**N/A**
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	**High**
Type of Stock	**Small-Growth**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue
(In millions of $)

	Q1 (Aug)	Q2 (Nov)	Q3 (Feb)	Q4 (May)	Year (May)
2013	0 A	0 A	0 A	0 A	0 A
2014	0 E	0 E	0 E	0 E	0 E
2015					0 E
2016					0 E

Earnings per Share
(EPS is operating earnings before non-recurring items)

	Q1 (Aug)	Q2 (Nov)	Q3 (Feb)	Q4 (May)	Year (May)
2013	-$0.07 A	-$0.08 A	-$0.09 A	-$0.10 A	-$0.33 A
2014	-$0.10 E	-$0.06 E	-$0.04 E	-$0.05 E	-$0.18 E
2015					-$0.19 E
2016					$0.93 E

WHAT'S NEW

Initiating Coverage

We are initiating coverage of Protalex, Inc. (OTC: PRTX) with a Neutral rating and a $3.50 price target. Protalex is developing PRTX-100, a highly purified form of the bacterial protein Staphylococcal protein A (SpA) as a treatment for rheumatoid arthritis and other autoimmune disorders. We believe the company has significant upside potential provided that the safety and efficacy seen in its early clinical trials of PRTX-100 in rheumatoid arthritis (RA) patients holds up on testing in larger numbers of patients in later-stage studies.

Rheumatoid arthritis is a chronic and progressive autoimmune disorder primarily involving the joints of the extremities. Patients experience pain and tenderness of the joints, morning stiffness, and over time, disability and deformation of the joints due to loss of bone and cartilage. Early stage treatment has historically involved NSAIDs and steroids, but growing realization of the adverse effects of long-term steroid treatment and of the long-term benefits of disease suppression have shifted the paradigm toward early use of disease-modifying anti-rheumatic drugs (DMARDs) such as methotrexate and biologics such as anti-tumor necrosis factor alpha (TNFα) agents. These and other biological treatments provide approximately 40% of treated patients with a 50% reduction in symptoms by American College of Rheumatology (ACR-50) criteria. However, most carry so-called "black box" warnings against immunosuppression-related infections and malignancies, and many involve relatively inconvenient dosing schedules. Additionally, biologics like Enbrel and Humira cost over $25,000 per year. Nevertheless, the U.S. market for biologic therapies for RA exceeded $10 billion in 2012, and many such drugs find applications in the treatment of other autoimmune disorders as well.

By interfering specifically with the proliferation of a subset of B cells, and by the interacting with and down-regulating activated monocytes and macrophages, PRTX-100 potentially offers a more selective and safer treatment for RA. In early clinical trials it induced "low disease activity" by European (DAS-28) and U.S. (CDAI) criteria in 6/29 (21%) patients across dose levels, and a >50% reduction in symptoms in 4 of 5 patients at the highest dose examined. The most common treatment-related adverse events were those typical of cytokine release, and included mild-to-moderate headache, myalgia, fever, and chills. Anti-drug antibodies were observed in most patients on repeated dosing, but while these affected the drug's clearance rate, no effect has been seen on efficacy to date. This is something to keep an eye on in future, longer-term studies. Nevertheless, efficacy appears to persist for many weeks following the last dose in some patients who received at least 4 weekly doses.

A second and ongoing Phase 1b trial (Study-104) of PRTX-100 examines higher doses and the effect of up to 5 drug administrations, as well as the benefit of additional monthly doses. We expect the results of this trial to be available in mid-2014, and to provide additional information regarding the safety and efficacy of PRTX-100, the potential significance of the anti-drug antibody response, and provide additional data regarding the duration of response. Provided that the results of this trial are positive, we expect the company to initiate a Phase 2a trial in early 2015 and out-license PRTX-100 in 2017. Additionally, the company has indicated its intent to file an IND for PRTX-100 in an orphan indication in the fourth quarter of 2013. Our DCF calculation, performed using an analysis of comparable deals in the RA treatment space, suggests a net present value (NPV) for the shares at around $3.50. There is upside to this figure based on orphan indication strategy.

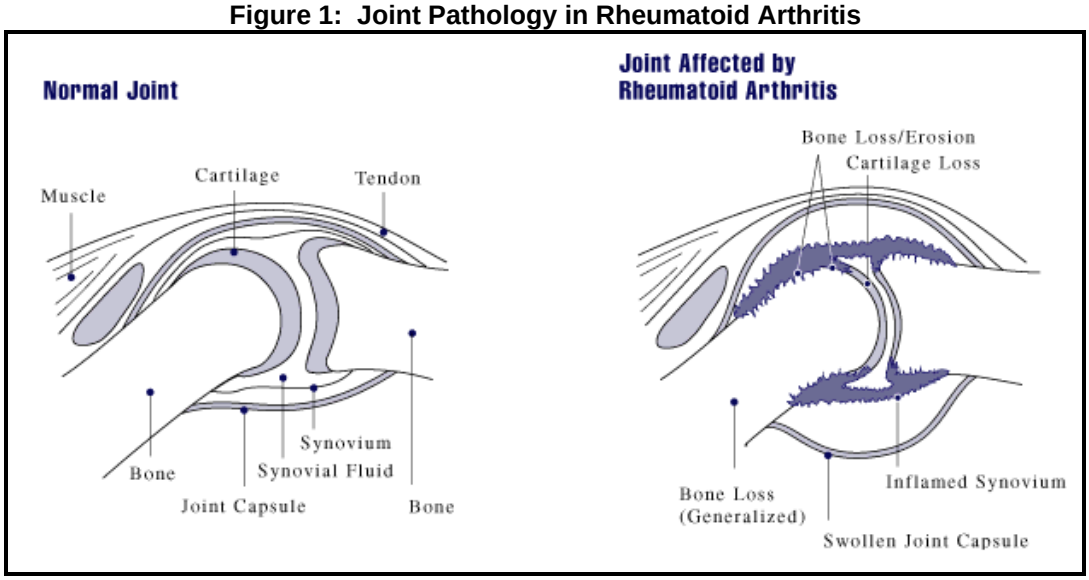
INVESTMENT THESIS

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.

The detailed joint pathology involves an inflammation of the capsule around the joints (synovium) secondary to swelling of synovial cells, excess synovial fluid, and the development of fibrous tissue in the synovium. Joints become swollen, tender and warm, and stiffness limits their movement. As the pathology progresses, the inflammatory activity leads to tendon tethering and erosion, with eventual destruction of the joint surface. This impairs a range of movement and leads to deformity. The disease progresses most rapidly during the first six years. More than a third of patents eventually become unable to work, with 20% not working 2 years after diagnosis.

Figure 1: Joint Pathology in Rheumatoid Arthritis



The detailed cause of the disease is poorly understood, although a strong genetic component has been identified. Onset may occur at any age, with the most common onset of illness being the ages of 25 and 50 years. Women are 2-3 times more likely to be affected with RA than men. According to the Mayo Foundation for Medical Education and Research (2012;87(7):659-673), RA afflicts about 1% of the human population. 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, among which the Disease Activity Score in 28 joints (DAS-28) and the Clinical Disease Activity Index (CDAI) are among the most commonly applied. The DAS-28 assessment is a composite score derived from the number of swollen joints, the number of tender joints, an assessment of general health, and a serum marker such as sedimentation rate (DAS28) or C-reactive protein (DAS28-CRP). The raw data from these assessments is combined to give a single score of disease activity using a mathematical formula. The CDAI is calculated simply as the sum of the number of swollen joints, the number of tender joints, the physician's assessment of global disease activity (on a scale of 1-10) and the patient's assessment of disease activity (also on a scale of 1-10). Cutoff values for qualitative assessments of disease activity with these scales are summarized in Table 1 below.

Table 1: Threshold Values of Commonly Used Instruments for Measuring Disease Activity in RA

Scale	Remission	Low Activity	Moderate Activity	High Activity
Clinical Disease Activity Index (CDAI)	<2.8	2.9 to 10.0	10.1 to 22.0	>22.0
Disease Activity Score in 28 Joint (DAS-28)	<2.6	2.7-3.1	3.2 to 5.1	>5.1

In addition to these static measures of disease activity, the American College of Rheumatology (ACR) has established standard measures of treatment outcome that are widely used in clinical trials. The most common of these, ACR-20, refers to the achievement of a 20% improvement in:

- ✓ Swollen joint count
- ✓ Tender joint count
- ✓ Three of the following measures
  - → Patient global assessment of health
  - → Physician global assessment of health
  - → Pain
  - → Disability
  - → An acute phase reactant (a serum marker such as C-reactive protein)

Analogous definitions apply for the more stringent clinical improvement benchmarks, ACR-50 (a 50% improvement in symptoms) and ACR-70 (a 70% improvement in symptoms).

Current Treatment Options

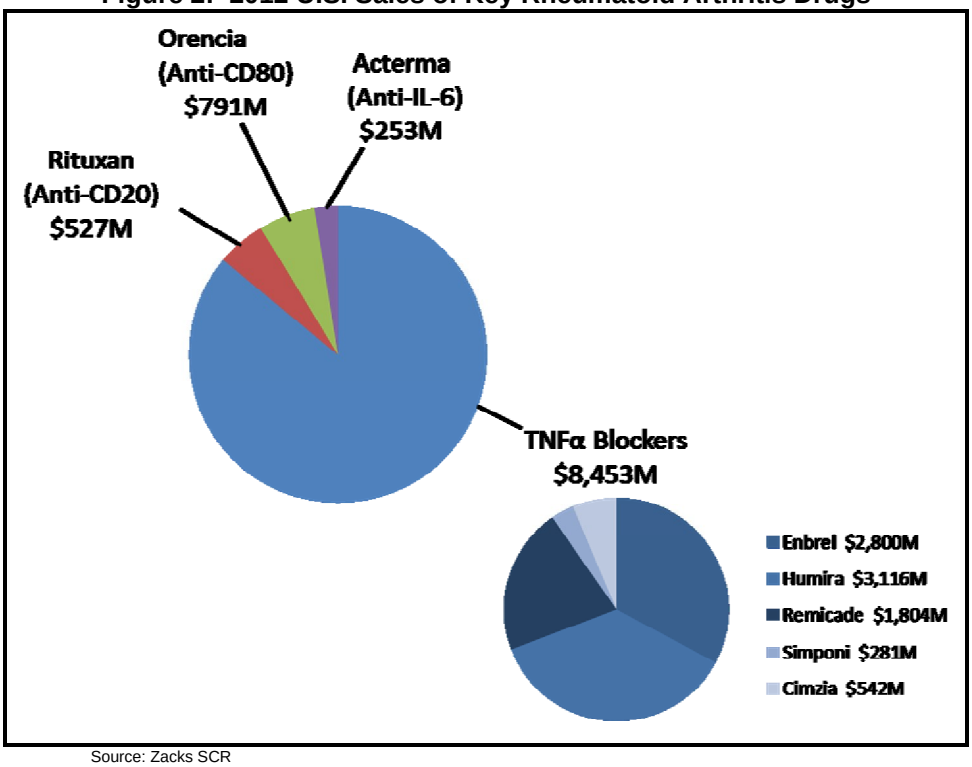
The goals of RA therapy are to control the underlying inflammatory condition, thereby alleviating pain, preventing disability and restoring quality of life to the patient. Recent research has emphasized the importance of early intervention to achieving these goals. A recent policy statement by the European League Against Rheumatism (EULAR) stated that the goal of treatment in all patients is disease remission defined as the absence of signs or symptoms of inflammatory disease activity. In view of the difficulty of achieving this goal, EULAR guidelines acknowledge an alternative target, "Low Disease Activity", which is defined as a CDAI score of 10 or less or DAS28CRP score of 3.1 or less. Data shows that patients who achieve this target have low progression of joint damage.

Historically the first-line of treatment for RA has included non-steroidal anti-inflammatory drugs (NSAIDs) and steroids. NSAIDs treat symptoms of RA and decrease inflammation, but do not alter the course of the disease, and dose is limited by side effects including headache, confusion, increased blood pressure, decreased platelet function and the possibility of renal damage or gastrointestinal bleeding. Diclofenac (75 mg twice a day) and naproxen (500 mg twice daily) are commonly used NSAIDs. Systemic corticosteroids decrease inflammation and slow bone erosion but do not prevent joint destruction. Prednisone at a dose of less than 10 mg per day is common. Long-term adverse effects include weight gain and diabetes. For these reasons, many doctors use steroids only as a rapid-onset bridge to disease-modifying anti-rheumatic drugs (DMARDs), described in the paragraph below.

With more aggressive treatment goals now in place, disease-modifying anti-rheumatic drugs (DMARDs) are increasingly being used earlier in the treatment paradigm. The DMARD class consists of a variety of older, small molecule drugs that share no common mechanism of action, but which have been found empirically to alter the progression of RA. They exert minimal direct, nonspecific anti-inflammatory or analgesic effects and thus are commonly administered with NSAIDs. The appearance of benefit from these drugs is usually delayed for weeks to months. Members of this class include methotrexate (MTX), gold salts, leflunomide, minocycline, penicillamine, hydroxychloroquine (HC), and sulfasalazine among others. Methotrexate appears to have the best ratio of efficacy to adverse effects and is the most widely used. These drugs may be used in combination with each other or with low dose or pulsed steroid therapy. Switching or adding DMARDs will typically be attempted if response is insufficient at 3 months.

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 approved since the mid-1990's, usually in combination with methotrexate. While many of these agents are off-patent, most are still single supplier products due to the complexities of biosimilar development and the absence of an appropriate regulatory pathway for approval in the U.S. until 2011. Estimated RA associated sales for key biologics are outlined in Figure 2, with additional drug details shown in Table 2 and in Table 3.

Figure 2: 2012 U.S. Sales of Key Rheumatoid Arthritis Drugs



Source: Zacks SCR

As can be seem Figure 2 above, the use of biologic therapies is strongly dominated by the TNFα blockers Humira, Enbrel, and Remicade. These drugs provide similar efficacy and adverse event profiles, as expected from their common mechanism of action. The relative market shares of these three 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. More recent market entries, Simponi and Cimzia, allow for self-administration with somewhat longer dosing intervals than Enbrel or Humira.

Other approved drugs include CTLA-4 agonist Orencia, IL-6 antagonist Acterma, and anti-B-cell agent Rituxan. Clinical data shows that Rituxan exhibits lower efficacy in patients who are naïve to biologics and having an inadequate response to methotrexate compared to TNFα agents. Therefore, it is approved only for use in patients with inadequate response to TNFα agents. Clinical trial data suggests that Acterma may also be slightly less efficacious than typical TNFα agents. Among the most important recent advances is the availability of the first highly efficacious oral drug, Xeljanz. Xeljanz is an inhibitor of the enzyme janus kinase 3 (JAK3). The proportion of patients achieving ACR-50 in the Xeljanz clinical trials was similar to and possibly a bit greater than that seen in clinical trials of TNFα blockers.

In addition to the inconvenience of relatively frequent injections, almost all of these drugs carry 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. With the exception of the anti-B cell agent Rituxan (which is less efficacious) and Orencia (which targets T-cell activation), all of these drugs act by blocking the activity of cytokines at the receptor binding or signal transduction level.

All of the TNFα inhibitors' labels warn against severe infections and malignancies associated with their broad immunosuppressive effects, as does the oral agent Xeljanz. TNFα 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. In addition to the TNFα blockers, which prevent TNFα from binding to its receptor, the JAK inhibitor Xeljanz inhibits the functionality of TNFα by inhibiting the downstream signaling cascade that occurs after TNFα binds. The IL-6 blocker Acterma carries similar warnings. The function of IL-6 is to stimulate the liver to produce proteins that support the immune response and to stimulate the growth of antibody producing B cells. The only biological for the treatment of RA that does not carry a black box for increased risk of infection and/or malignancy is Orencia, which acts specifically on the activation of T-cells.

A recent study published in the Annals of the NY Academy of Science (2009 Sep; 1173:837-46) found that 35% of patients on TNFα therapy discontinued treatment within 2 years, with inadequate efficacy and adverse events contributing equally to the rate of discontinuation.

Table 2: Key Biologics for the Treatment of RA

Name	Generic Name	Company	Approval Year	Target	Delivery	Dosing interval (days)
Enbrel	etanercept	Amgen	1998	TNFα	SubQ	3.5
Humira	edalimumab	AbbVie	2002	TNFα	SubQ	14
Remicade	avakine	J&J	1999	TNFα	IV	60
Simponi	golimumab	J&J	2009	TNFα	SubQ	30
Cimzia	certolizumab	UCB	2009	TNFα	SubQ	14 or 28
Acterma	tocilizumab	Roche	2010	IL-6	IV	56
Orencia	Abatacept	Bristol-Myers	2005	CD80	SubQ	7
Rituxan	rituximab	Roche	2006	CD20	IV	180
Xeljanz	tofacitinib	Pfizer	2012	JAK3	Oral	0.5
AIN457	secukinumab	Novartis	2015*	IL-17a	SubQ	30
Baricitinib	baricitinib	Eli Lilly	2016*	JAK1, JAK2	Oral	1
Fostamatinib	fostamatinib	Rigel	2015*	Syk	Oral	0.5 or 1
Sarilumab	sarilumab	Regeneron	2016*	IL-6R	SubQ	7 or 14
Sirukumab	sirukumab	J&J	2018*	IL-6	SubQ	14 or 28

* Zacks SCR estimate

Table 3: Indications and Boxed Warnings for Biologics Used in the Treatment of RA

Name	RA Indications	ACR-50 at 6 Months[a]	Black Box Warning
Enbrel	Treatment of patients w/ moderate to severe RA	39%[b]	Malignancies, infections
Humira	Treatment of patients w/ moderate to severe RA	39%	Malignancies, infections
Remicade	Treatment of patients w/ moderate to severe RA, in combination w/ methotrexate	38%[c]	Malignancies, infections
Simponi	Treatment of patients w/ moderate to severe RA, in combination w/ methotrexate	37%	Malignancies, infections
Cimzia	Treatment of patients w/ moderate to severe RA	30%	Malignancies, infections
Acterma	Pts w/ inadequate response to one or more DMARDs	32%	Malignancies, infections
Orencia	Treatment of patients w/moderate to severe RA	40%[d]	None
Rituxan	Treatment of patients w/ moderate to severe RA and insufficient response to TNFα blockers, in combination w/ methotrexate	26%[e]	Infections, infusion reactions
Xeljanz	Treatment of patients w/ moderate to severe RA and insufficient response to methotrexate	44%	Malignancies, infections
AIN457	Not determined	~45%[e]	Label not yet available
Baricitinib	Not determined	41%	Label not yet available
Fostamatinib	Not determined	NA	Label not yet available
Sarilumab	Not determined	40%	Label not yet available
Sirukumab	Not determined	60%	Label not yet available

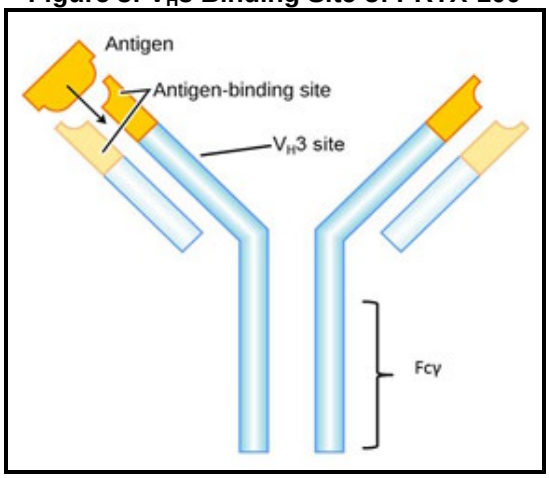
[a] All ACR50 values determined for drug in combination with methotrexate in methotrexate inadequate responders except where noted. [b] ACR50 determined in patients with inadequate response to 1-3 DMARDs.
[c] ACR50 determined after 12 months treatment.
[d] Rituximab is approved only for use in patients who are not responsive to TNFα blockers.
[e] Monotherapy (No methotrexate). ACR-50 estimated as average of ACR-20 and ACR-70 percentages

Overall, we see a need for agents with a more targeted, less broadly immunosuppressive profile that can be dosed at levels that will produce a higher rate of remission without increasing the risk of life threatening infections and malignancies. Within this broader requirement, more convenient dosing is highly desirable, with less frequent dosing being of critical importance for injected products in particular.

Enter Protalex' PRTX-100

Protalex, Inc. is focused on the development of PRTX-100, a proprietary, highly purified form of the bacterial protein staphylococcal protein A (SpA), for the treatment of inflammatory and autoimmune disorders, with rheumatoid arthritis (RA) as the lead indication. In addition to RA, for which preliminary evidence of efficacy has been demonstrated in a Phase 1b trial (Study-103), PRTX-100 has potential in several orphan disease indications, including lupus, idiopathic thrombocytopenic purpura (ITP), chronic inflammatory demyelinating polyneuropathy, thrombotic thrombocytopenic purpura (TTP), hemolytic uremic syndrome, hemolytic anemia, and solid organ transplant rejection. Unlike other biologics currently used for the treatment of autoimmune disorders, PRTX-100 can be produced in bacterial cell culture, providing a considerable cost-of-goods advantage in a market that is expected to become increasingly price-competitive.

Figure 3: V_H3 Binding Site of PRTX-100



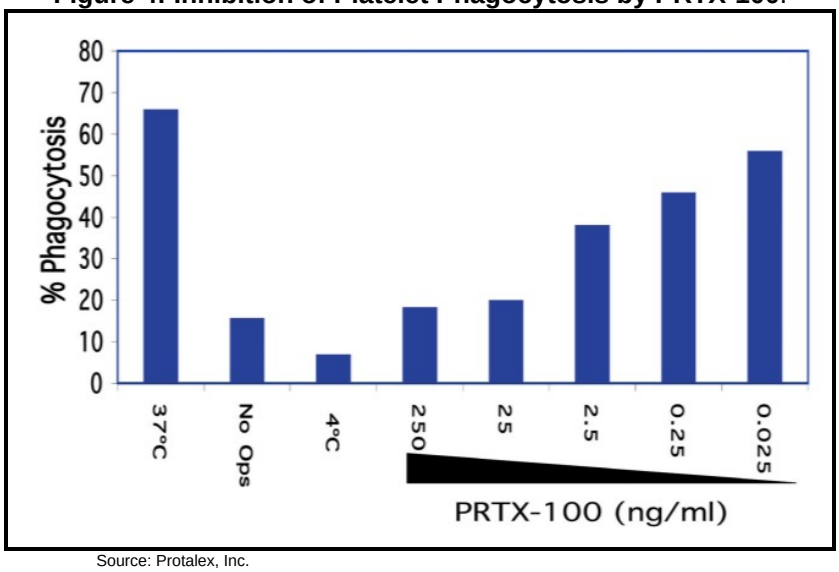
SpA is a bacterial protein produced by *Staphylococcus aureus* (SA), a common causative pathogen in human infections including pneumonia, skin infections, and septicemia. Compared to infections caused by other bacterial pathogens, those caused by SA are unique for their high rate of recurrence, which can be as high as 30%. Recurrent infections by other bacterial pathogens are normally prevented by the development of a protective immune response during the original infection. Research performed in the 1970's traced SA's ability to cause recurrent infections to its production of proteins that interfere with the protective immune response. One of the most important of these is SpA, the active ingredient in PRTX-100.

SpA is a 42 KDalton bacterial membrane protein composed of 5 nearly identical domains. Each of these domains has the ability to interfere with the activity of antibodies and B-cell receptors (BCRs). B-cell receptors are antibody-like proteins displayed on the surface of B-cells. The B-cell receptors found on the surface of each B-cell have the same antigen specificity as the antibodies it produces. SpA interferes with the protective immune response by binding to sites on the antibody or BCR other than the antigen binding sites antibodies normally use to bind pathogens. It binds to the BCR and affects only B-cells which utilize the V_H3 antibody heavy chain, but this represents most if not all of B-cells producing auto-antibodies.

A variety of cells (neutrophils, monocytes, macrophages, B-lymphocytes, NK cells) can bind antibodies via their Fc region, by a class of receptors called Fc receptors. This binding can activate or inhibit these cells depending on the nature of the complex of antibody and bound antigen binding to Fc receptors. Due to its binding of antibodies via the V_H3 region, small immune complexes of SpA and antibody mimic the naturally occurring immune complexes which inhibit activation of cells which contribute to inflammation in rheumatoid arthritis.

An example of the ability of PRTX-100 to modulate immune responses by modulating the activity of immune cells with Fcγ receptors is provided by the dose-dependent inhibition of human monocyte phagocytosis of antibody-coated platelets shown in Figure 4 below. In idiopathic thrombocytopenic purpura, monocytes phagocytize platelets using autoantibodies as adaptor molecules. The antibody binds to the platelet via its antigen-binding site and the monocyte recognizes the platelet-antibody complex via its Fcγ receptor (FcγR). Interference with the Fcγ- FcγR interaction suppresses phagocytosis. Upregulation of Fcγ on monocytes has been associated with excessive TNFα production and resistance to methotrexate therapy in RA.

Figure 4: Inhibition of Platelet Phagocytosis by PRTX-100.



Source: Protalex, Inc.

The other key binding site for PRTX-100, V_H3, is found on the BCRs of about 30% of all B-cells, including B-1 cells, a subtype that has been implicated in autoimmunity (Autoimmun Rev. 2006 Jul; 5(6):403-08). Binding to V_H3 on BCRs causes the B-cells to undergo proliferation followed by apoptosis. This causes a long-lasting depletion of B-cells that produce antibodies with certain antigen specificities. The ability of SpA to interfere with the function of Fcγ combined with its ability to induce depletion of V_H3 clade antibodies serves as the basis for its applications in the treatment of autoimmune disease.

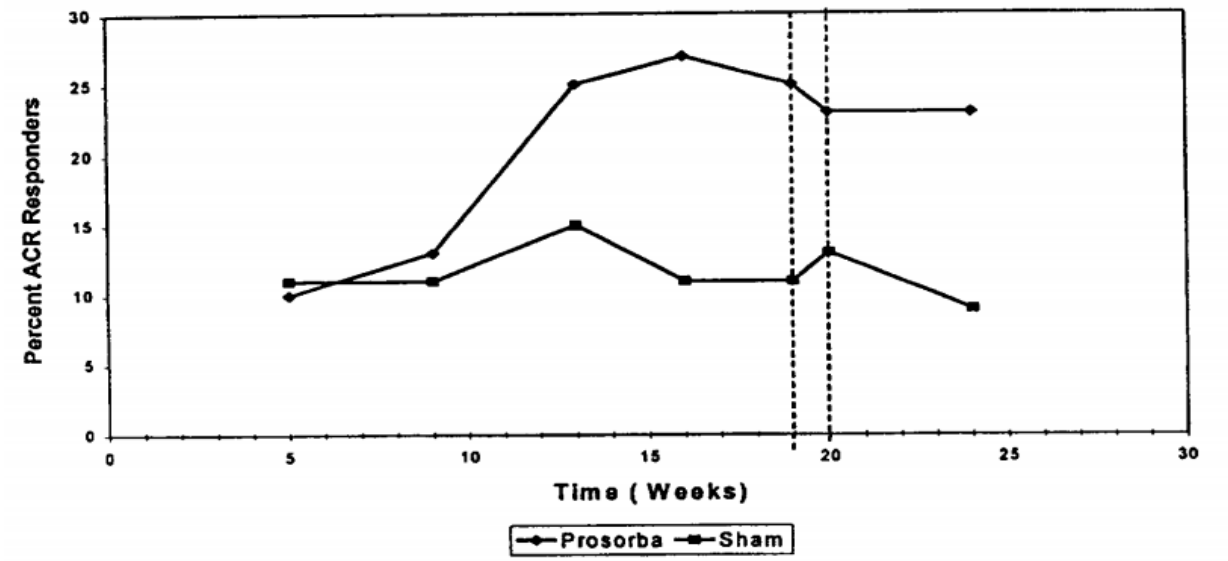
Suggestions of SpA Efficacy From the ProSorba™ Column

Early studies revealing the high binding affinity of SpA for antibodies and the related BCRs led to the development of the Prosorba column as a treatment for RA and ITP. The Prosorba column is a medical device containing highly purified SpA covalently bound to a silica matrix. The device is used in conjunction with a plasmapheresis machine. In this ex vivo treatment, blood is withdrawn from the patient, cells are separated from plasma in the machine, and the plasma is passed through the Prosorba column. The plasma is then recombined with the cells and returned to the patient. The FDA approved the Prosorba medical device (Cypress Biosciences, Inc) for the treatment of ITP in 1987 and for the treatment of RA in 1999. The label for the treatment of RA indicates use in patients with long-standing disease who have failed or are intolerant of disease-modifying anti-rheumatic drugs (DMARDs).

Approval of the Prosorba column for the treatment of RA was based on a single multicenter, randomized, sharm-controlled, double-blind pivotal clinical trial in 109 patients with severe, active RA. Upon enrollment, patients were treated once weekly for 12 weeks with Prosorba. Patients were evaluated for disease activity at regular intervals during treatment and for at least 12 weeks thereafter. The primary efficacy endpoint was the difference between baseline and the average of Week 19 and Week 20 assessments of disease activity. A response to treatment was defined as a 20% improvement in the tender joint count, swollen joint count, and 3 of the 5 remaining criteria (Patient's assessment of pain, patient's global assessment of disease activity, patient's assessment of physical function, physician's global assessment of disease activity, and C-reactive protein level). Baseline characteristics of patients in this trial included an average disease duration of 16 years, having failed on an average of 5.4 prior disease-modifying anti-rheumatic drugs (DMARDs), a mean swollen joint count of 23.9, and a mean tender joint count of 36.5.

As shown in
Figure 5 below, the percentage of responders in the treatment and placebo arm began to separate meaningfully around Week 13. Separation maximized at Week 16, achieved statistical significance against the pre-specified endpoint at Weeks 19-20. The mean and median duration of individual patient response were 37.0 +/- 5.3 and 32 weeks, respectively.

Figure 5: Response Rates in the Prosorba and Sham Treatment Arms of the Prosorba Pivotal Trial



Source: U.S. FDA

The utility of the Prosorba column in the treatment of RA is difficult to explain simply in terms of its ability to remove antibodies from the plasma. The IgG antibody content of the human body is about 50 grams total, with 50% turnover about every 3 weeks (Wang W, et al., Nature Vol. 84, No. 5, Nov 2008). The FDA approval summary states that the antibody absorption capacity of the Prosorba column is about 0.56 grams, suggesting that it would be impossible to have a major impact on total IgG load via once weekly plasmapheresis. Furthermore, the treatment of RA patients by plasma exchange (removal of patient plasma by plasmapheresis and replacement with donor plasma) has shown no significant benefit in the treatment of RA (Rothwell RS, et al, 1980). The observation that 400-1200 ug of SpA per apheresis is found in plasma returned to the donor (ca 10 ug/kg dose) suggests that the efficacy seen in Prosorba column immuno-absorption treatments may be due to exposure to leached SpA (Transfusion 2005 45:274-280).

Looking further into the Prosorba clinical studies, we see that among 109 patients in the pre-market approval trial, there were 31 drop-outs, 16 (31%) for the Prosorba arm and 15 (32%) for the sham arm. Reasons for discontinuation were very similarly distributed in the two treatment arms, with lack of efficacy (9-10%) and adverse events (11-13%) being the most important causes. There were 44 serious adverse events seen in the 109 patients in this trial, and these were evenly divided between the Prosorba (21) and sham treated (21) arms. Many of the adverse events appeared to be associated with the apheresis procedure itself, which is common to the two treatment arms of the trial. In spite of the demonstrated efficacy of this treatment in patients with highly treatment-resistant RA, its market share has consistently been limited to a few million dollars per year. This poor showing undoubtedly reflects the time, cost, and adverse events associated with 12 weekly apheresis treatments, and the approval of Remicade, the first marketed TNF-alpha inhibitor soon after the Prosorba device approval.

The conclusion that can be drawn from Prosorba is leached SpA exposure probably confers meaningful efficacy for the treatment of RA, but that the Prosorba column is neither safe nor cost-effective enough to really garner meaningful use in the real world setting.

Animal Studies of PRTX-100

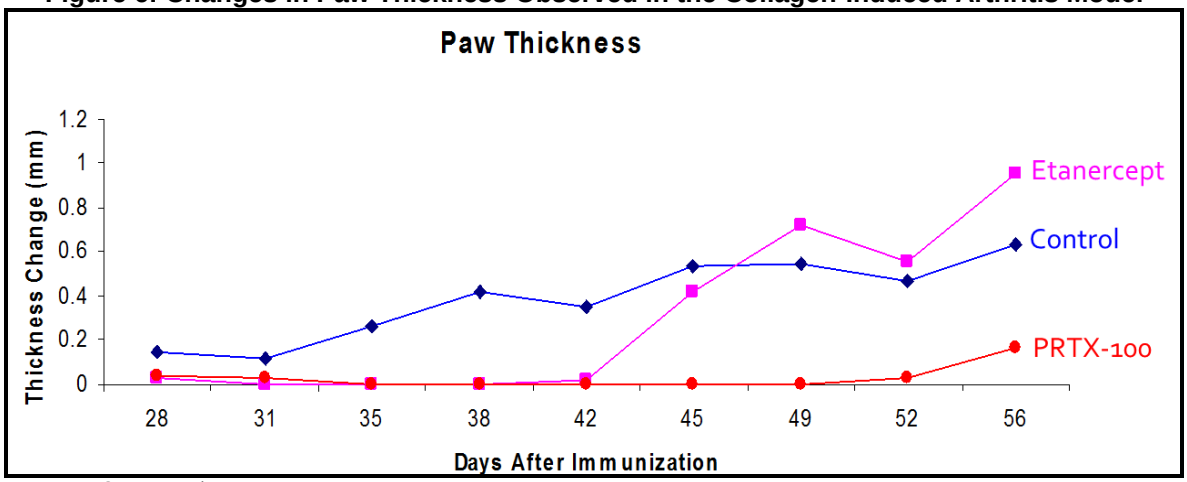
Protalex's lead candidate, PRTX-100, has proven effective in two standard mouse models of autoimmunity:

1. *Collagen-Induced Arthritis* - PRTX-100 has demonstrated reproducible efficacy in this well-established animal model of RA. Mice received two injections of collagen into the footpad in order to stimulate an inflammatory response. One group was treated with various doses of PRTX-100 (3 times weekly), a second group received etanercept (Enbrel, 5x weekly), a leading commercially available treatment for RA at the manufacturer's recommended dose, and the control group was injected with vehicle saline solution. The mice were observed for clinical symptoms, joint size and loss of function.

The results showed that very low doses of PRTX-100 and standard doses of etanercept suppressed clinical symptoms including joint swelling over the first two to three weeks of treatment, and slowed disease progression as compared with the control group. Thereafter, the PRTX-100-treated mice continued to remain disease-free whereas the mice treated with etanercept showed a resumption of joint inflammation and tissue damage. This response to etanercept was expected because the mice developed immune response to it because it is a foreign protein. Of great interest, although mice also develop antibodies to PRTX-100, a foreign protein, they do not eliminate the effect of treatment on activity of collagen-induced arthritis.

Figure 6 below shows the effects of PRTX-100, etanercept, and control on paw thickness 4-8 weeks after footpad collagen injections.

Figure 6: Changes in Paw Thickness Observed in the Collagen-Induced Arthritis Model



Source: Protalex, Inc.

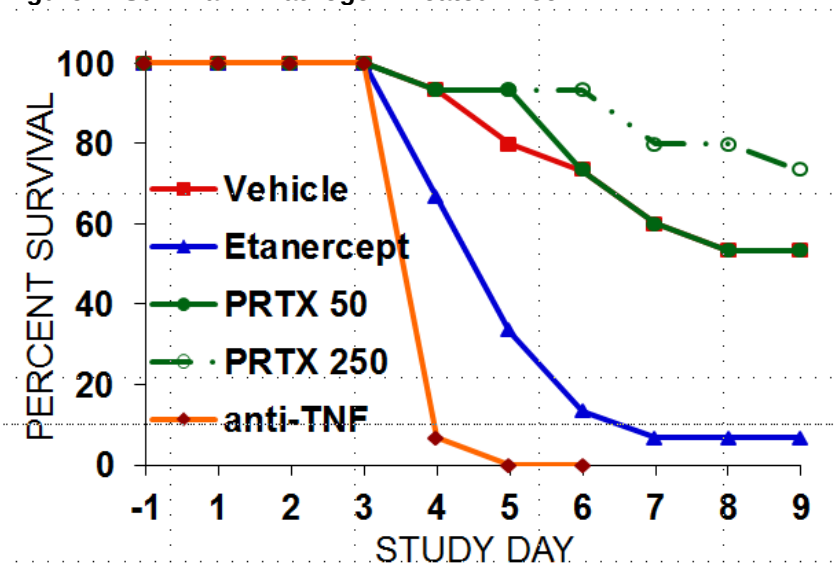
2. *BXSB* Mice – The BXSB mouse model is a inbred murine model of severe autoimmune disease. The gene defect expresses as a series of inter-related progressive systemic autoimmune diseases having the following pattern: thymic atrophy, anti-nuclear antibodies, liver disease, arthritis, kidney disease, and early death. This model is commonly used to evaluate drugs for Lupus and other autoimmune diseases.

   In these studies, normal C57BL and BXSB mice were treated with PRTX-100 acutely either acutely (3 weeks) or chronically (15 weeks) and observed for 15 weeks. Measurements were made of overall effects on physiology and various aspects of immune regulation. The following results were obtained:

   - ✓ Treatment with PRTX-100 normalized age-related weight gain in BXSB mice, eliminating the wasting syndrome that normally begins at about 4 months of age.
   - ✓ Spleen enlargement, or splenomegaly, was significantly reduced in treated animals compared with the controls at almost every time point, demonstrating the ability of PRTX-100 to delay the onset and severity of this disease.
   - ✓ In sacrificed animals, a dose-related reduction in inflammation-related histology was observed in multiple organs and joints of the BXSB animals. Treatment reduced autoimmune damage and the onset of thymic atrophy, liver and joint inflammation, and liver damage.
   - ✓ The production of self-reactive antibodies, normally 100x the values found in normal C57 mice, was reduced in a time- and dose-dependent manner.

3. *Pathogen Challenge Testing* –Most biological drugs currently used in the treatment of RA are broadly immunosuppressive due to their interference with TNF-α signalling. To compare the effect of PRTX-100 on infection resistance to that of currently used drugs, mice treated with vehicle, PRTX-100, etancercept, or anti-TNF agents were challenged with Listeria monocytogenes or Candida albicans as representative bacterial and fungal pathogens, respectively. With both Listeria and Candida, infection severity and mortality was increased in anti-TNF and etanercept-treated animals but not in animals treated with vehicle or PRTX-100.

Figure 7: Survival in Pathogen-Treated Mice



Completed pre-clinical safety studies in animals have shown no drug-related toxicity at doses up to 5-fold the highest currently planned clinical trial dose. These studies were conducted on New Zealand white rabbits and on cynomolgus monkeys. No differences were observed in body weight gain or food consumption, nor in hematology, clinical chemistry, urinalysis, or organ weight data in animals treated with PRTX-100 compared with controls treated with vehicle. These study results were an important component of the company's investigation new drug (IND) application with the U.S. FDA.

Additional studies in monkeys have further characterized the pharmacokinetics, toxicity, and pharmacodynamics of PRTX-100 with up to 12 weekly doses. Overall, these results indicate that PRTX-100 is a potential treatment for RA in humans. The data from these studies has served as a rationale for conducting clinical trials in human patients.

PRTX-100 Clinical Trials

Initial Phase I Trials and Characterization of Safety and Tolerability

The safety and efficacy of PRTX-100 has been examined in four completed Phase 1 clinical trials, and is currently the subject of a fifth Phase 1b trial.

The first of these trials, completed in 2006, examined the safety and tolerability of a single dose of PRTX-100 in healthy volunteers. This study demonstrated that PRTX-100 appeared safe and well-tolerated at the doses administered (up to 0.45 ug/kg). There were no deaths or serious adverse events. The most common adverse events were those typical of cytokine release, and included mild-to-moderate headache, myalgia, fever, and chills. C_{max} was dose proportional but the total exposure (AUC) and clearance was highly variable among individuals. About 30% of patients developed anti-PRTX-100 antibodies, but no IgE antibodies (the type associated with anaphylactic reactions) were detected.

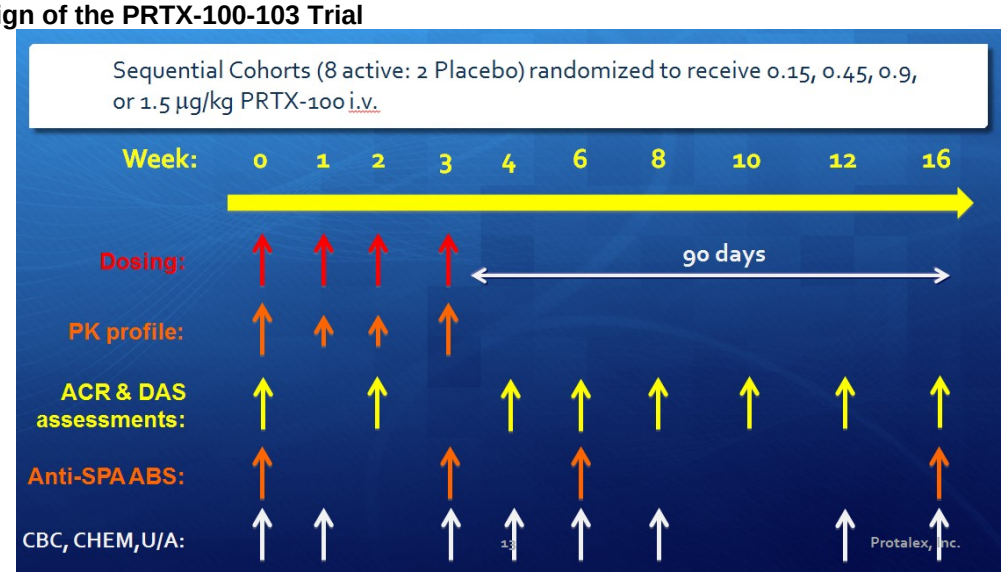
In 2007, a second Phase 1 study was performed to further characterize the safety, pharmacokinetic, and pharmacodynamic profile of a single-dose of PRTX-100 in healthy volunteers at doses in the projected therapeutic range. This trial used a more highly purified form of PRTX-100 having a lower level of Staphylococcal protein impurities. The trial demonstrated that the more highly purified product produced less cytokine release and fewer related AEs.

In 2008, a third Phase 1 trial examined the safety and pharmacokinetics of multiple doses of PRTX-100 in patients with idiopathic thrombocytopenic purpura (ITP). This trial was terminated early due in part to a corporate restructuring. Nonetheless, this trial provided sufficient data regarding the safety and pharmacokinetics to form the basis of an application to perform a Phase 1b multiple dose trial in patients with rheumatoid arthritis.

PRTX-100-103 – Phase 1b Trial in Rheumatoid Arthritis Patients Concurrently Treated with Methotrexate

In 2010-2011 a multi-center Phase 1b clinical trial of PRTX-100 was conducted in South Africa on adult patients with active RA on methotrexate. The RA Study was a proof of concept study to evaluate safety and potential efficacy of PRTX-100 in patients with active RA and was approved to enroll up to 40 patients in four dose escalating cohorts. A total of 37 patients were enrolled in four cohorts ranging from 0.15 µg/kg to 1.50 µg/kg of PRTX-100 or placebo, administered weekly for four weeks. Safety and disease were evaluated over 16 weeks following the first dose. The study design is outlined in Figure 8 below.

Figure 8: Design of the PRTX-100-103 Trial



The goals of this study included:

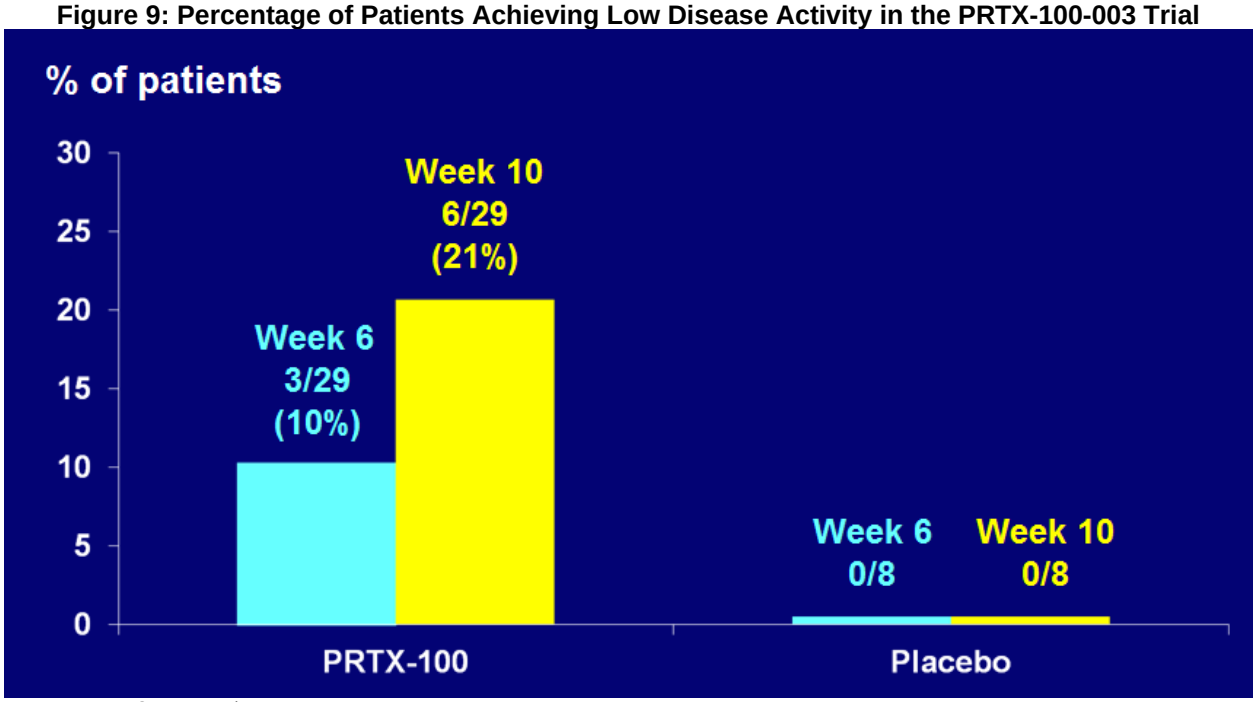
- ⇨ Assessing the immunogenicity of PRTX-100 after ≥3 doses
- ⇨ Perform additional pharmacokinetic (PK) measurements and estimate of PRTX-100 plasma exposure after first and fourth dose
- ⇨ Determine whether a relationship exists between immunogenicity of PRTX-100 and safety and PK
- ⇨ Assess effect of PRTX-100 on measures of disease activity, e.g., DAS28-CRP and CDAI[1]

The primary efficacy endpoint of the trial was the percentage of patients attaining DAS-28-CRP < 3.2. Secondary efficacy endpoints included the absolute and percentage change from baseline of DAS-28-CRP across study time points (through Week 16) and change from baseline in the CDAI score. The trial enrolled patients with a diagnosis of RA for ≥ 6 months, active RA, 8 or more swollen joints, 10 or more tender joints, on stable doses of methotrexate and NSAIDs with no disease-modifying drugs or biological therapies within 4 weeks of beginning the trial.

Patients were treated with varying doses of PRTX-100 once weekly during Weeks 1-4. By Week 6, 3/29 (10%) had achieved DAS-28-CRP < 3.2 (low disease activity) and by Week 10 6/29 (21%) had achieved DAS28-CRP <3.2. No patients in the placebo arm achieved low disease activity by DAS28-CRP criteria.

1 The DAS28 score is a weighted average of swollen joints count, tender joints count, patient global assessment of disease activity, and C-reactive protein level. Values range from 2.0 to 10.0, with scores above 5.1 corresponding to high disease activity, 3.3 to 5.0 corresponding to moderate disease activity, < 3.2 corresponding to inactive disease, and <2.6 to remission. The CDAI or Clinical Disease Activity Index incorporates tender joint count, swollen joint count, physician global assessment and patient global assessment of overall disease activity. Scores range from 0-76, with scores >22 corresponding to high disease activity, 10.1 to 22.0 corresponding to moderate activity, 2.9 to 10.0 low activity, and 2.8 or less to remission.

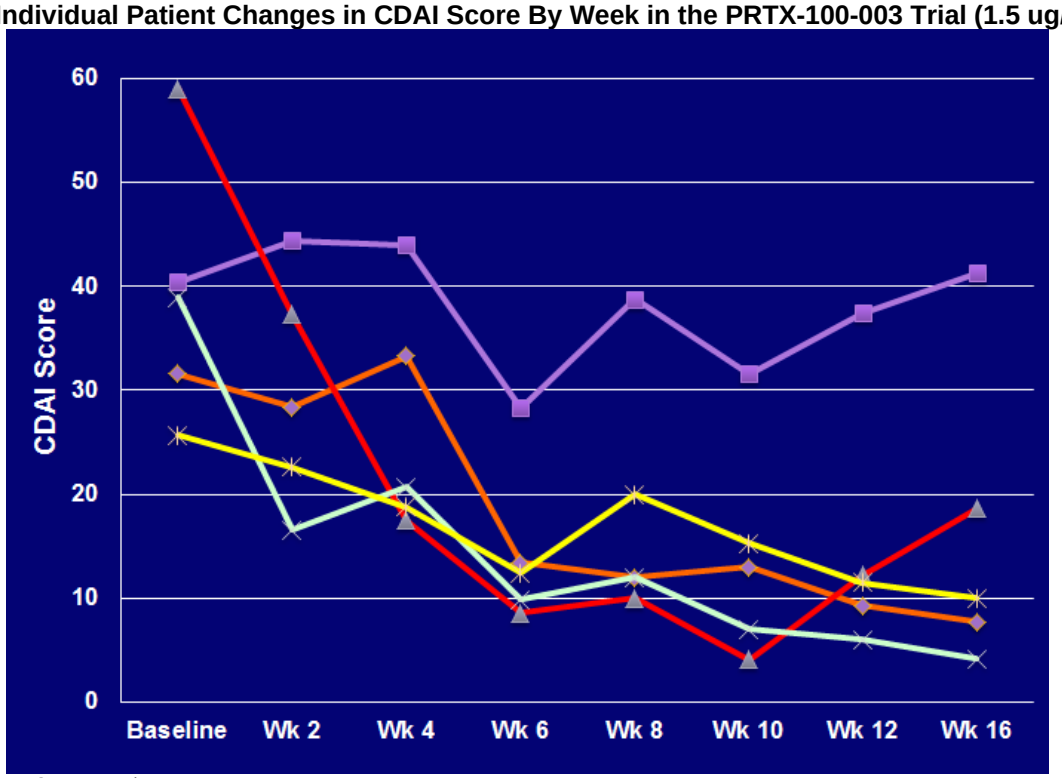
Figure 9: Percentage of Patients Achieving Low Disease Activity in the PRTX-100-003 Trial



Source: Protalex, Inc.

Figure 10 below shows the CDAI scores by Week for the highest dose group (1.5 ug/kg). At Week 10, 4/5 patients (80%) had achieved a reduction in their baseline CDAI score, and one patient achieved a reduction of over 50 points. Three of the four responders had CDAI scores that were flat or still declining at Week 16, 12 weeks after receiving their last dose of PRTX-100. There was a trend toward a dose-dependent increase in the percentage of patients achieving low disease activity by CDAI criteria (score <10) on the last two assessments (Weeks 12 and 16), including 0 patients in the 0.15 ug group, 1 (12.5%) patient in the 0.45 ug group, 2 (25%) in the 0.9 ug group, and 2 (45%) in the 1.5 ug group.

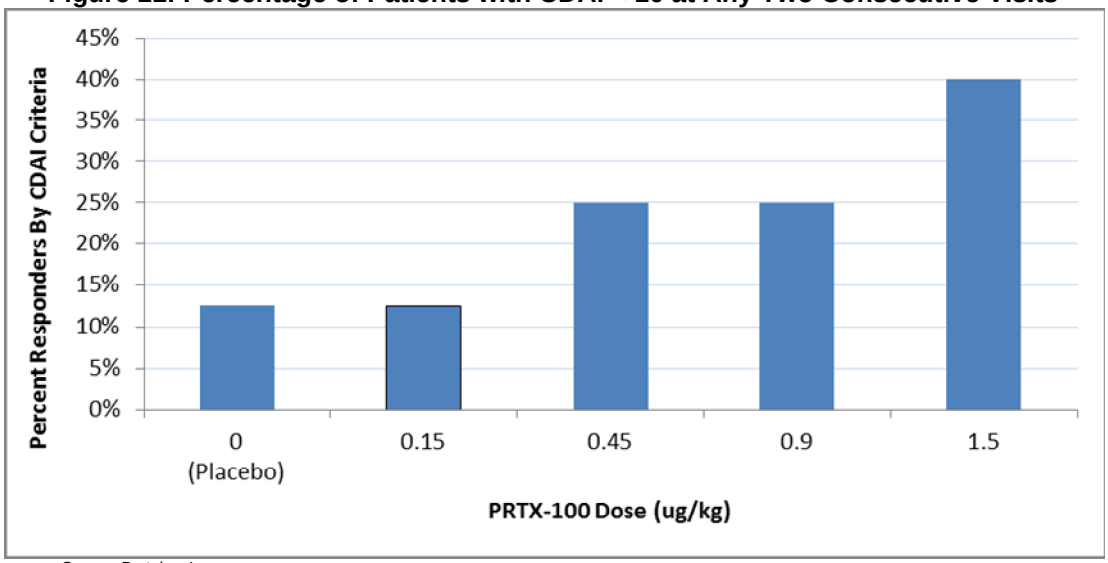
Figure 10: Individual Patient Changes in CDAI Score By Week in the PRTX-100-003 Trial (1.5 ug/kg Group)



Source: Protalex, Inc.

Figure 11 below shows the percentage of patients at each dose level achieving low disease activity by CDAI criteria at any two consecutive visits. Although the sample size is very small, the data are suggestive of a dose response relationship, with the possibility of higher response rates at doses greater than those observed in this study.

Figure 11: Percentage of Patients with CDAI < 10 at Any Two Consecutive Visits



Source: Protalex, Inc.

Treatment-related adverse events included acute nausea (17%), muscle spasms (10%), dizziness (17%), flushing (7%), fatigue (7%), RA flare (14%), and headache (28%). Infusion reactions (3, 10%) were mild-to-moderate, occurred within 5 minutes of dosing, and resolved without treatment within 5 minutes without observation of wheezing or hypotension. Two of the three patients experiencing an infusion reaction elected to continue participating in the trial and did not experience repeat infusion reactions on further dosing. There were no SAEs considered related to study drug, and no SAEs in the highest dose group. Anti-drug antibody (ADA) development was observed in 21 of 24 active dosed patients by Week 3; no patient had ADAs at baseline. No IgE antibody against SpA (the type associated with anaphylactic reactions) was observed in any patient.

Patients with ADA development showed increased plasma clearance of PRTX-100 by the fourth dose. The relationship between PRTX-100 and total plasma exposure (AUC) was linear, but inter-patient variability was high, with much of this variability being associated with ADA development. There was no obvious relationship between efficacy and antibody titer or between efficacy and the ratio of drug dose to antibody titer. No relationship between ADAs and AEs was apparent.

The half-life of the drug in serum on Day 1 averaged 8.4 hours at the 0.9 ug/kg dose and 15.2 hours at the 1.50 ug/kg dose. The observation of substantial effects on the efficacy endpoints at time points up to 12 weeks after the final dose demonstrates a pharmacodynamics effect that continues well beyond the time needed for clearance of the drug from circulation.

Overall, the results of this trial can be summarized as below:

- ✓ The safety and tolerability of four doses of PRTX-100 up to 1.5 ug/kg was established
- ✓ The data suggest an effect of disease activity, even in patients with ADAs
- ✓ Clearance and exposure (AUC) varied widely among patients
- ✓ The efficacy signal appears to persist for a period of weeks after the last administered dose

PRTX-100-104 - An Ongoing Phase 1b Trial in RA Patients Examining Higher Doses of PRTX-100

Based on the safety and tolerability results seen in the PRTX-100-103 study, Protalex initiated a second Phase 1b trial in November 2012. This trial is being conducted in the United States, and examines the safety and tolerability of PRTX-100 in combination with methotrexate or leflunomide in adults with active RA. Similar to the PRTX-100-103 Study, the primary objective of this study was to assess the safety and tolerability of intravenous PRTX-100 administered weekly over five weeks in patients with active RA on methotrexate therapy. The secondary objectives included determining the effects of PRTX-100 on measures of disease activity, assessing the immunogenicity and evaluating the PK parameters after repeated doses, and determining possible relationships between the immunogenicity of PRTX-100 and safety, PK and efficacy parameters.

The PRTX-100-104 trial involves a Multiple Ascending Dose Phase followed by a Cohort Expansion Phase. The Multiple Ascending Dose Phase was originally planned to examine the safety and efficacy of 1.5, 3.0, 6.0, 12.0 or 18.0 ug/kg PRTX-100 administered once weekly for five weeks in RA patients. Each Cohort would include 6 subjects on active treatment and 2 treated with placebo. The Multiple Ascending Dose Stage would be followed by a Cohort Expansion Phase designed to allow expansion of the number of patients in those cohorts of highest interest. The dose escalation stage began enrolling patients in November 2012.

In July 2013 the company announced that the Data Safety Monitoring Committee (DSMC) had completed its evaluation of the blinded safety data from Cohorts 1-4. In August 2013, the company announce some modifications to the study, dropping the 5th cohort (18.0 ug/kg) and expanding the size of the 2nd, 3rd, and 4th cohorts so that each group enrolled 12 patients (9 on active drug and 3 on placebo). The company further announced that it would modify the dose schedule used in the prior ascending dose cohorts by incorporating additional monthly doses, up to a cumulative dose of 60 ug/kg, to study the maintenance effect of the drug. While the company stated that no dose-limiting toxicities were observed, we believe that the decision to drop the 18 ug/kg dose indicates that the company has identified what it believes to be the maximum desirable dose. Conversion of the 5th cohort to include additional maintenance doses will help provide a better understanding of the pharmcodynamics for the initiation of a phase 2a study in 2015.

Next Steps and Upcoming Catalysts

Completion of the fourth dose-escalation cohort at 12.0 ug/kg noted above of the PRTX-100-104 trial took place in May 2013 following safety review of the lower dose cohorts. The trial was recently expanded and extended in August 2013. The company has stated that top-line results will be available in the first quarter of 2014.

We will be looking for additional information on the following questions in this next data release:

- ⇨ Confirmation of the safety and efficacy seen in PRTX-100-103 and earlier trials
- ⇨ Whether increased efficacy can be achieved at higher doses without unacceptable toxicity
- ⇨ A better understanding of the pharmacodynamic profile of PRTX-100, exposure-efficacy relationships, and confirmation that antibody formation will not interfere with efficacy

Provided that the data from this study is positive, we expect to see initiation of a Phase 2 trial in late 2014, with full data available in early 2016. This could potentially lead to the initiation of a pivotal Phase 3 trial in 2016, registration data in 2018, a new drug application (NDA) in 2019, and a PDUFA FDA action date in 2020.

Other disclosures of upcoming catalyst from management include the filing of an IND in an orphan indication in the fourth quarter of 2014 and the announcement of a global development strategy in the second quarter of 2014. We note this presents upside to our existing financial model.

Intellectual Property

In the U.S., use of PRTX-100 in the treatment of autoimmune disease is protected by several granted patents and pending applications. The age of some of these applications and patents is of some concern, as all are continuations in part of a filing from 2002. These will expire in 2022-2023, except that a single patent chosen by the Applicant will be eligible for a Hatch Waxman extension of 5 years. Based on our projected approval date in 2019, we expect PRTX-100 to have approximately 8 years of remaining exclusivity at the time of its approval, which may reduce its attractiveness to a licensor. By our calculations, the average remaining exclusivity for an in-licensed drug at the time of approval is about 13-14 years, with the later years associated with higher product sales.

In Europe, new medicinal products approved via the Centralized Procedure are eligible for 10 years data exclusivity. We believe this data protection rule provides longer-lasting protection against generic competition than the company's published European patents.

Patent or Application No.	Claims
US8168189	Methods for the treatment of psoriasis or scleroderma, comprising administration of an effective amount of monomeric protein A
US7807170	A method for reducing an acute inflammatory response or inflammation mediated at least in part by an antibody, comprising administration of an effective amount of monomeric protein A. The subordinate claims specifically call out myasthenia gravis, ulcerative colitis, Crohn's disease, psoriatic arthritis, and pemphigus vulgaris
US7425331	A method for treatment of idiopathic thrombocytopenia or autoimmune thrombocytopenic purpura comprised of treatment with monomeric protein A
US7211258	A method for decreasing inflammation associated with RA, juvenile RA, or systemic lupus erythematosis (SLE), comprised of administration of an effective amount of monomeric protein A
20120294895	A method for the treatment of immune dysfunction, comprising administration of an effective amount of monomeric protein A. Multiple sclerosis is specifically called out in the subordinate claims.
20110064762	Methods for the treatment of immune dysfunction, comprising of administration of an effective amount of protein A. A wide range of orphan indications is called out in the subordinate claims, including severe combined immunodeficiency, primary T cell deficiency, ataxia telangiectasia, and others
20070129285	A method for modulating immune response in a subject, comprising administration of an effective amount of a lymphocyte differentiation factor

The company has stated that it has developed proprietary purification methods that it intends to maintain as a trade secret. We infer that the company is doing this to add a second layer or intellectual property protection and market exclusivity to the drug beyond U.S. or EU patent expiration. However, with the exception of antibodies and other extensively post-translationally modified protein products, we are not aware of examples in which manufacturing patents have provided market exclusivity for highly profitable drugs.

We note however that regulatory barriers to entry can be moderately high for those seeking to market "biogeneric" versions of approved products. The lowest regulatory barriers are for pre-1997 biological drugs that were approved under the auspices of the Food, Drug, and Cosmetic Act. The Hatch-Waxman amendment to the FD&C act permits generic companies to apply for approval based solely on the demonstration of chemical similarity and similar pharmacokinetic properties (Abbreviated New Drug Application or ANDA).

Since 1997 all new biological drugs have been approved under the auspices of the Public Health Services Act. This act does not provide an ANDA route to approval, but instead gives the FDA broad discretion to decide how much clinical data to require of those seeking approval of biosimilar products. We note that Sandoz biosimilar human growth factor product Omnitrope[2] was approved by the FDA based on a single pivotal clinical trial involving only 89 children, but also note that the pivotal trials leading to approval of the reference growth hormone product Genotropin enrolled only 169. More representative examples might be biosimilar Epogens in development by Hospira and Sandoz for chronic use in kidney failure patients. Each of these development programs involve trials that plan to recruit over 1900 patients.

Additionally, we note that new protection could arise from secondary patents claiming optimized dosing regimens, given the unusual pharmacodynamics of PRTX-100, which appear to be poorly predictable from simple considerations of the protein's half-life in serum. We have no knowledge, however, of whether the company has unpublished or planned patent applications of this type. As such, our financial model takes the most conservative approach to market exclusivity.

Overall, we believe that the intellectual property and regulatory barriers are likely high enough and of sufficient duration not to pose a barrier to partnering the product. We have reduced the size of our estimated upfront and milestone payments in our DCF model, however, to account for licensor concerns that these issues could limit upside potential.

PRTX-100 Sales and Commercial Potential

PRTX-100 has been examined in only a small number of patients. The data thus far do not permit an unambiguous assessment of its competitive profile, but are compatible with an efficacy similar to or exceeding that of currently employed RA biologics that provide ACR-50 rates of 40-50% in patients with an incomplete response to MTX. This is accomplished with what appears to be a less immunosuppressive mechanism of action, suggesting the possibility that PRTX-100 might obtain a label without a black box warning for infections and malignancies as found for most other RA biologics. Depending on the exact profile revealed in later stage studies, we believe the market share for PRTX could vary widely, up to an upper limit of around $4 billion per annum worldwide. This market share is also dependent on pricing strategy, as a much lower cost-of-goods than other biologic therapies for RA could be used to advantage in a cost-sensitive managed-care market, or to treat RA in the less-developed world.

Table 4 below highlights some of the major drugs and players in the rheumatoid arthritis market. Investors can see this is an enormous market dominated by 4-5 of the largest pharmaceutical companies in the world. Protalex is potentially developing a major competitive challenge to these market leaders with PRTX-100, a product thought to offer similar efficacy and dosing with meaningfully improved safety and tolerability.

[2] We note that Omnitrope and its reference compound Genotropin were both approved under the FD&C Act, but because Sandoz filed the application as a 505(b)(s) application and not as an ANDA, we believe it is representative of the FDA's requirements when acting on its own discretion and not under statutory mandate.

Table 4: Major Players in the RA Market

Name	Company	Launch Year (RA)	Other Approved Indications	2012 US RA Sales[a]	2012 Total US Sales
Enbrel	Amgen	1998	Psoriasis, ankylosing spondylitis, psoriatic arthritis, juvenile RA	$2,800	$3,967
Humira	AbbVie	2002	Psoriasis, ankylosing spondylitis, psoriatic arthritis, juvenile RA, Crohn's disease, ulcerative colitis	$3,116	$4,377
Remicade	J&J	1999	Psoriasis, ankylosing spondylitis, psoriatic arthritis, Crohn's disease, ulcerative colitis	$1,804	$3,583
Simponi	J&J	2009	Ankylosing spondylitis, psoriatic arthritis, ulcerative colitis	$281	$292
Cimzia	UCB	2009	Crohn's disease	$542	$599
Acterma	Roche	2010	Juvenile RA	$253	$253
Orencia	Bristol-Myers	2005	Juvenile RA	$791	$791
Xeljanz	Pfizer	2012	NA	$0.0[b]	$0

[a] Estimate. Includes juvenile RA sales [b] Approved in December 2012

An analysis of other drugs in the RA space originating in small biotech reveals an array of licensing outcomes, ranging from approval in the preclinical stage to mid-stream Phase 2b. We anticipate that Protalex will initiate a dose-ranging Phase 2a trial in late 2014 and that data from the trial will be available in 2016. This suggests the potential for a partnership based on Phase 2a data shortly thereafter. Terms of representative recent deals in RA are listed in
Table 5 below.

Table 5: Representative Deal Terms in RA

Drug Licensee Licensor & Date	Development Stage at Time of Deal	Upfront Payment	Milestones	Royalties
MOR103 **Morphosys (MOR:GR)** **GlaxoSmithKline (GSK)** **June 2013**	Completed 96 patient Phase 2 trial in RA	$29.5M	Commercial-and sales-based up to $550M	Double digit
ASP015K **Astellas (4503:JP)** **Johnson and Johnson (JNJ)** **October 2012**	Completed a small Phase 2 trial in psoriasis, Phase 2b in RA ongoing at time of deal	$65M	Up to $880M	Double digit
PRT062607 **Portola (PTLA)** **Biogen IDEC (BIIB)** **October 2011**	In Phase 1 development. Oral drug with target validation provided by Phase 2 trials of Rigel's (RIGL) fostamatinib	$36M plus $9M equity stake. PTLA to participate in R&D costs (25%)	Up to $508M in regulatory and developmental milestones	Not disclosed
BT-061 **Biotest (BIO:GR)** **AbbVie (ABV)** **June 2011**	Completed two Phase 2 trials in RA totaling 105 patients. Phase 2b ongoing. Completed Phase 2a in psoriasis	$85M	Regulatory and commercial milestones up to $395M	Undisclosed
ALD518 **Alder BioPharmaceuticals (Private)** **November 2009**	Still in Phase 2 with undisclosed results. Target validation provided by Phase 3 results of Acterma	$85M	Development and regulatory milestones up to $764M, sales milestone up to $200M	Undisclosed

For the purposes of our model, we assume a licensing deal occurring in 2016 after a successful Phase 2 trial consisting of 100 to 140 patients. We estimate a somewhat less lucrative terms than the average in
Table based on the potentially weaker IP position of PRTX-100 relative to the comparators, which were protected by composition of matter patents expected to run for 10 or more years post approval. We also note the lack of late phase clinical validation of the target relative to PRT062607 and ALD518 (noted above), and the lack of availability of clinical data in other indications relative to BT-061 and ASP065K.

MANAGEMENT PROFILES

Executives

Arnold P. Kling. Mr. Kling has served as president and director since November 2009. For the past 12 years, Mr. Kling has been the senior managing partner for a group of private equity investment funds that invest and manage early stage companies whose technologies have the potential to disrupt their targeted markets. From 1993 to 1995 he was a senior executive and general counsel of a Nasdaq listed licensing and multimedia company. From 1990 through 1993, Mr. Kling was an associate and partner in the corporate and financial services department of Tannenbaum, Helpern, Syracuse & Hirschtritt LLP, a mid-size New York law firm. Mr. Kling received a Bachelor of Science degree from New York University in International Business in 1980 and a Juris Doctor degree from Benjamin Cardozo School of Law in 1983.

Kirk M. Warshaw. Mr. Warshaw has served as chief financial officer, secretary and director since November 2009. Mr. Warshaw is a financial professional who, since 1990, has provided clients in various industries with advice on accounting, corporate finance, and general business matters. Prior to starting his own consulting firm, from 1983 to 1990, he held the various titles of controller, Chief Financial Officer, President, and chief executive officer at three separate financial institutions in New Jersey. From 1980 through 1983, Mr. Warshaw was a Senior Accountant at the public accounting firm of Deloitte, Haskins & Sells. Mr. Warshaw is a 1980 graduate of Lehigh University and has been a CPA in New Jersey since 1982.

John E. Doherty. Mr. Doherty is a co-founder and has served as a director and a member of the Scientific Advisory Board since November 2009. From September 2005 to present he has been a private investor. Prior to that, from September 1999 to September 2005 he was a member of our Board, and also our President and Chief Executive Officer from September 1999 to December 2002.

Scientific Advisory Board

Edward Bernton, M.D., has served as Chairman of the SAB, as well as Chief Scientific Officer since 2009. He has a background in pharmacology, clinical immunology, and experimental medicine. Prior to his role at Protalex, he was Senior Director, Clinical Development, at Emergent Biosolutions (NYSE: EBS), a biopharmaceutical company focused on the development, manufacturing and commercialization of vaccines and therapeutic antibodies. He also served as Protalex's medical director and worked as a consultant in clinical pharmacology and early-phase drug development prior to December 2009. His medical subspecialties include internal medicine, allergy/immunology, and diagnostic laboratory immunology. He served five years as Scientific Director for PAREXEL International Corporation's (Nasdaq: PRXL) Clinical Pharmacology in North America. He has served as protocol author or investigator on over 30 Phase I clinical trials including many first-in-man studies for novel small molecules, biopharmaceutics, and vaccines. Other past experience includes, serving three years as a regulatory and product development consultant at Quintiles, a bio and pharmaceutical services provider offering clinical, commercial, consulting and capital solutions, and serving three years as Chief Medical Officer or VP at various Biotech start-ups. Dr. Bernton served 20 years in the US Army Medical Corp and his duties included 12 years of research in pharmacology, immunology, infectious diseases, and vaccinology while at Walter Reed Army Institute of Research.

James W. Dowe III, serves as Vice Chairman of the SAB. His corporate experience ranges from being an active investor, CEO and/or Chairman of startups to public companies. His primary focus has been in biotechnology, computer software and investment management companies. Mr. Dowe started his career at the White Sands Missile Range as a mathematician and a programmer, and later he joined the Dikewood Corporation in New Mexico as a mathematician and analyst. Subsequently, he became the Associate Director of the Computing Center at the University of New Mexico. In 1980, Mr. Dowe founded and later became the CEO and Chairman of Excalibur Technologies Corporation. Mr. Dowe was co-founder and a director of AZUR Environmental, a private company (acquired by Strategic Diagnostics Inc. (Nasdaq: SDIX)) with an expertise in providing cost-effective reliable solutions for monitoring water quality throughout the world. Mr. Dowe graduated from New Mexico State University with a Bachelor of Science degree in 1965 and served as an U.S. Naval officer during the Vietnam War.

William E. Gannon, Jr., M.D., serves as Chief Medical Officer . He also serves as Chief Scientific Officer & Medical Director for Capital City Technical Consulting (CCTC) in Washington, DC. In addition to receiving his medical training and clinical work at Ross University, Case Western Reserve and George Washington University, Dr. Gannon obtained an M.B.A. in 1988. Dr. Gannon has held positions in multinational Clinical Research Organizations, medical device, biotech and pharmaceutical firms. In his most recent position prior to CCTC, Inc., Dr, Gannon served as Vice President – Clinical & Medical Affairs in biotechnology arena. Dr. Gannon's primary focus has been on oncology therapeutic and diagnostic applications, but possesses a broad range of experience across therapeutic categories. Dr. Gannon has managed clinical trials and operations as well as the design, corporate and regulatory strategies, regulatory submissions and execution of Phase I through Phase IV clinical trials in the U.S., Europe and Asia. Additionally, Dr. Gannon is involved in philanthropy in the Washington, DC area and currently serves on the Board of Directors for The Mautner Project – The National Lesbian Health organization University in 1988.

VALUATION & RECOMMENDATION

Hold For Now

Protalex is developing PRTX-100, a novel treatment for rheumatoid arthritis and other autoimmune disorders that will potentially offer a better risk/benefit ratio and reduced frequency of dosing compared to other biologics in the $12 billion U.S. rheumatoid arthritis market. We see a meaningful opportunity for such a product, given the modest efficacy and poor safety and tolerability of existing therapies that leads to high discontinuation rates and frequent switching or drug holidays among patients. Treatment guidelines for RA now stress the growing consensus that maximal reduction of disease activity should be pursued early in the treatment paradigm in order to limit long-term disability progression. We believe physicians and patients would look favorably on a new mechanism of action that proved as effective as expensive biologic medications, but without the high risk of infection or malignancies.

Yet, despite the enormous market potential for PRTX-100, the lack of significant human proof-of-concept or long-term safety data makes it difficult for us to project peak sales. Above we noted that PRTX-100 could have peak sales ranging from $250 to $500 million, putting the drug on comparable footing with Cimzia (UCB Pharma), Acterma (Roche), or Simponi (J&J), up to potentially $2 to 3 billion, putting the drug on equal footing with blockbusters Enbrel (Amgen / Pfizer), Humira (AbbVie), or Remicade (J&J). The recent success of Xeljanz (Pfizer), estimated to be a $3 billion drug worldwide in RA, provides good evidence that both physicians and patients are eager to move to new mechanisms with improved dosing and/or tolerability.

In addition to the considerable uncertainties associated with any early stage drug development program, Protalex' cash position is a concern. Cash and cash equivalents stood at $1.7 million as of February 28, 2013. We estimate burn for the three-months ending May 31, 2013 was around $1.5 million. However, on May 13, 2013, the company raised gross proceeds of $2.0 million through a secured promissory note to Niobe Ventures, LLC. The secured note bears interest at a rate of 3% per annum and matures on May 13, 2015. We note that the company has previously issued secured notes to Niobe in the sum of $6.0 million over the past twelve months. Cash as of May 31, 2013 stood at $2.45 million, with current and long-term debt in the area of $9 million.

Management seems confident they can continue to drip-finance the company for the foreseeable future. For example, the company raised $1.0 million pursuant to an incremental loan from Niobe on August 27, 2013. The note bears interest at a rate of 3% per annum and matures on August 27, 2015. Although we tend to agree given the relationship with Niobe over the past several years, we are concerned that new investors will shy away from establishing a position in the stock ahead of a long-term financing. Drip-financings make it difficult to forecast the balance sheet much beyond the next few quarters.

Thus, the two biggest wildcards in our valuation are: 1) peak sales of PRTX-100 and 2) fully-diluted share count. However, for the sake of our model we have made the following assumptions to value Protalex:

- ⇨ We estimate a $50 million upfront payment in 2016, $500 million in potential milestones, split evenly between development, regulatory, sales, and expanded indications, along with a tiered mid-to-high teens royalty on worldwide sales from the commercialization partner.

- ⇨ We assume approval in 2020 with a 6% market penetration by 2023 among RA patients with an insufficient response to DMARDs, giving 2023 sales of over $1.5 billion.

- ⇨ We assume that the company's debt of $9.0M will be paid for by equity sales, that an additional $10 million will be required to carry the company to a licensing deal in 2016, and that these funds will be obtained by equity sales at the most recent transaction price of $2.50 per share (90 day closing price average).

Based on an NPV of $155 million, we place the value of the shares at $3.50.

PROJECTED FINANCIALS

Protalex, Inc.
Income Statement

Protalex, Inc.	FY 2012	FY 2013	Aug-13	Nov-13	Feb-14	May-14	FY 2014	FY 2015	FY 2016
PRTX-100 Sales / Royalties	$0	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-	-	-	-	-
Licensing / Collaborative	$0	$0	$0	$0	$0	$0	$0	$0	$50.0
YOY Growth	-	-	-	-	-	-	-	-	-
Total Revenues	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$50.0**
YOY Growth	*100.0%*	-	-	-	-	-	-	-	-
CoGS	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Product Gross Margin	-	-					-	-	-
R&D	$1.9	$3.8	$1.4	$1.0	$1.0	$1.1	$4.5	$5.0	$5.0
% R&D	-	-					-	-	-
SG&A	$1.6	$1.8	$0.5	$0.5	$0.5	$0.5	$2.0	$2.2	$2.5
% SG&A	-	-					-	-	-
Depreciation & Amortization	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Operating Income	**($3.5)**	**($5.6)**	**($1.9)**	**($1.5)**	**($1.5)**	**($1.6)**	**($6.5)**	**($7.2)**	**$42.5**
Operating Margin	-	-					-	-	-
Interest & Other Income	($0.9)	($0.7)	($0.1)	($0.1)	($0.1)	($0.1)	($0.3)	($0.4)	($0.6)
Pre-Tax Income	($4.4)	($6.3)	($2.0)	($1.6)	($1.6)	($1.7)	($6.8)	($7.6)	$41.9
Taxes & Other	$0	$0	$0	$0	$0	$0	$0	$0	$0
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	($4.4)	($6.3)	($2.0)	($1.6)	($1.6)	($1.7)	($6.8)	($7.6)	$41.9
Net Margin	-	-					-	-	-
Reported EPS	**($0.23)**	**($0.33)**	**($0.10)**	**($0.06)**	**($0.04)**	**($0.05)**	**($0.18)**	**($0.19)**	**$0.93**
YOY Growth	-	-					-	-	-
Basic Shares Outstanding	18.9	18.9	19.0	28.3	36.3	37.5	37.5	40.0	45.0

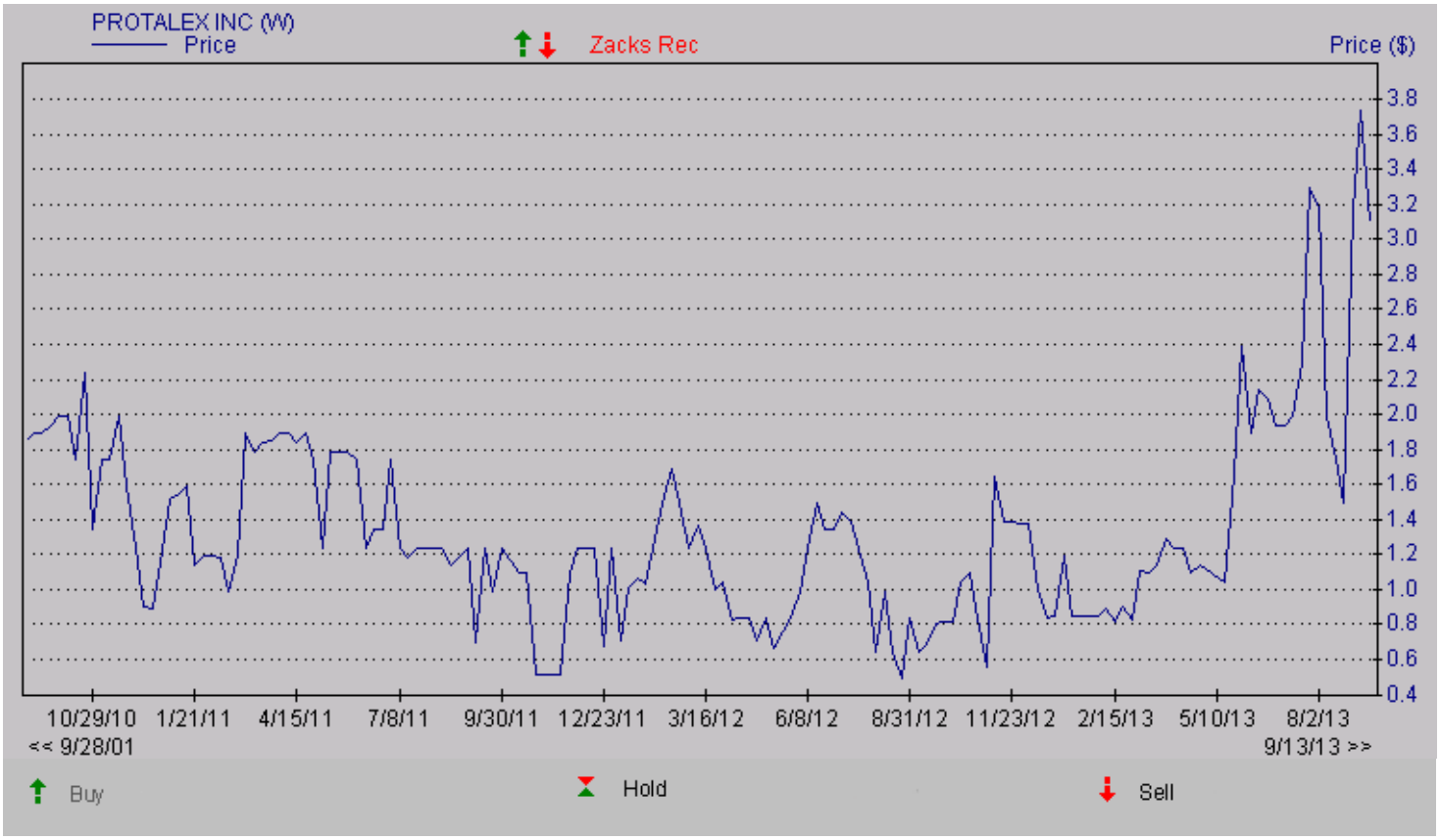
Source: Zacks Investment Research, Inc. *Jason Napodano, CFA*

Protalex, Inc.
Balance Sheet

PROTALEX, INC.
(A Development Stage Company)
BALANCE SHEETS

	May 31, 2013	May 31, 2012
CURRENT ASSETS:		
Cash and cash equivalents	$ 2,457,046	$ 190,395
Prepaid expenses	42,320	42,679
Total current assets	2,499,366	233,074
OTHER ASSETS:		
Intellectual technology property, net of accumulated amortization of $13,068 and $12,048 as of May 31, 2013 and May 31, 2012, respectively	6,467	7,487
Total other assets	6,467	7,487
Total Assets	$ 2,505,833	$ 240,561
LIABILITIES AND STOCKHOLDERS' EQUITY (DEFICIT)		
CURRENT LIABILITIES:		
Accounts payable	$ 671,738	$ 182,861
Accrued expenses	62,517	576,733
Current portion – long term debt– related party	4,210,833	1,594,498
Total current liabilities	4,945,088	2,354,092
LONG TERM LIABILITIES:		
Senior Secured Note – related party	6,000,000	1,000,000
Senior Secured Note Accrued Interest – related party	57,616	10,083
Total liabilities	11,002,704	3,364,175
STOCKHOLDERS' EQUITY (DEFICIT)		
Preferred stock, par value $0.00001, 1,000,000 shares authorized; none issued and outstanding	0	0
Common stock, par value $0.00001, 100,000,000 shares authorized; 18,926,615 and 18,926,615 shares issued and outstanding, respectively	189	189
Additional paid in capital	53,237,993	52,331,016
Deficit accumulated during the development stage	(61,735,053)	(55,454,819)
Total stockholders' equity (deficit)	(8,496,871)	(3,123,614)
Total liabilities and stockholders' equity (deficit)	$ 2,505,833	$ 240,561

HISTORICAL ZACKS RECOMMENDATIONS



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