November 17, 2014

HEALTHCARE/BIO AND SPECIALTY PHARMACEUTICALS

**Stock Rating:**

## OUTPERFORM

| | |
|---|---|
| 12-18 mo. Price Target | $18.00 |
| PRTO - NASDAQ | $10.10 |

| | |
|---|---|
| 3-5 Yr. EPS Gr. Rate | NA |
| 52-Wk Range | $12.00-$10.00 |
| Shares Outstanding | 15.0M |
| Float | 5.5M |
| Market Capitalization | $151.4M |
| Avg. Daily Trading Volume | NA |
| Dividend/Div Yield | NA/NM |
| Book Value | $2.42 |
| Fiscal Year Ends | Dec |
| 2014E ROE | NA |
| LT Debt | NA |
| Preferred | $123.9M |
| Common Equity | $(109)M |
| Convertible Available | No |

*Trading range is as of 10/22/14 IPO.*

| EPS Diluted | Q1 | Q2 | Q3 | Q4 | Year | Mult. |
|---|---|---|---|---|---|---|
| 2012A | -- | -- | -- | -- | (61.16) | NM |
| 2013A | -- | -- | -- | -- | (3.07) | NM |
| 2014E | (0.65)A | (0.65)A | (0.30) | (0.21) | (1.51) | NM |
| 2015E | (0.23) | (0.27) | (0.31) | (0.35) | (1.16) | NM |
| 2016E | -- | -- | -- | -- | (2.42) | NM |

# Proteon Therapeutics

## Bumping Fistulas with PRT-201; Initiating Outperform, $18 PT

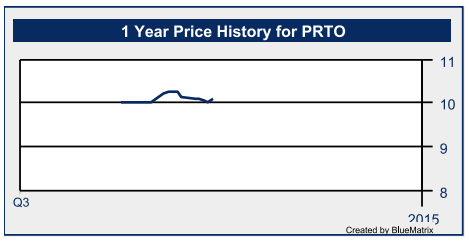
### SUMMARY

Proteon aims to revolutionize vascular access for patients dialysis due to kidney failure. PRT-201 is being studied to demonstrate increased patency (i.e., usable lifespan) and maturation (successful formation) of arteriovenous fistulas (AVFs), which serve as the access point for hemodialysis. AVFs are the bane of physicians due to high rates of failure and complications, which require costly surgical interventions. We believe PRT-201 is likely to demonstrate meaningful improvements in AVF maturation and patency. On the surface, PRT-201 may look like another ill-advised Phase 3 study based on subset or post-hoc Phase 2 data, but we would compel investors to scrutinize the risk/reward setup, which we find attractive. Initiating coverage at Outperform with an $18 PT.

### KEY POINTS

- **The elephant in the room isn't so big once you get to know him.** PRT-201's Phase 2 study included both brachiocephalic upper-arm fistulas and radiocephalic lower-arm fistulas. Understanding why the study reached significance only in the subset of radiocephalic AVF is key to understanding why the planned Phase 3 design isn't arbitrary.
- **Clearly defined mechanism of action and supportive in-vivo data.** Our optimism in PRT-201 is bolstered by its viable mechanism of action of reducing neointimal hyperplasia. This is not a shot-in-the-dark approach, in our view, which would complicate expectations for Phase 3 success based on the Phase 2 data.
- **Unmet need and commercial opportunity: no controversy here.** Maintaining vascular access for as long as possible is crucial for the survival of hemodyalisis patients, who have a limited number of AVF sites available before requiring direct catheterization. If successful, we believe PRT-201 would quickly be adopted and reimbursed.
- Expected upcoming milestones for PRT-201 include: (1) start of the second Phase 3 study in 1H15; (2) top-line data from first Phase 3 trial in 1H17; and (3) FDA approval in mid-2018 based on results from the first pivotal study.
- Our $18 price target is based on a pNPV analysis, assuming 54% chance of success for PRT-201 and peak sales of $302M in 2023.

### Stock Price Performance




### Company Description

Proteon Therapeutics is a development stage biopharmaceutical company focused on therapies for treating patients with renal and vascular diseases.



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# Investment Thesis

We are initiating coverage of Proteon Therapeutics (PRTO) with an Outperform rating and a 12- to 18-month price target of $18. Our bullish investment thesis stems from our belief that PRT-201 is poised to become standard of care during hemodialysis access procedures if Phase 3 clinical studies are successful.

PRT-201 is a liquid formulation of recombinant human elastase applied at the time of arteriovenous fistula (AVF) formation, a surgical procedure to create an access point for hemodialysis machines to draw and return blood from a patient. Currently, AVFs are plagued by failure to mature (the AVF does not form properly and is unsuitable for access) as well as loss of patency (fistula failure after maturation) which requires surgical intervention to repair, or at worse, leading to the abandonment of the fistula.

In a Phase 2 study of PRT-201, the drug showed the ability to improve maturation and maintain patency of AVF, particularly in the subset of radiocephalic fistulas, which account for roughly 40% of current procedures. While the primary endpoint of the study did not reach statistical significance, we believe clinical risk is acceptable given our understanding of AVF pathogenesis and what we believe is a reasonable subset analysis demonstrating statistical significance in radiocephalic fistulas.

**Mixed Phase 2 results add clinical risk, but we believe Phase 3 studies are more likely than not to be successful.** As discussed in detail in the this note, we believe PRTO's analysis of the PRT-201 Phase 2 study in AVF provides a reasonable degree of confidence that the Phase 3 trial design will capture the drug's benefit in a way that can lead to both FDA approval and market uptake. While many biotech investors are used to seeing subgroup analyses employed to take drugs into Phase 3 with highly questionable benefits or safety issues, we think PRTO avoids falling into this trap. Obviously, an unquestionable positive Phase 2 study would have de-risked PRT-201's Phase 3 trials, but we believe the additional risk is accounted for in our valuation.

**PRT-201 has a well-defined mechanism of action, adding comfort that the benefits seen in Phase 2 were due to drug intervention.** The failure of AVFs in clinical practice is due to the formation of interstitial hyperplasia, or scar tissue, at the fistula site which leads to stenosis and the eventual loss of blood flow. The proliferative cells responsible for forming this scar tissue in the vessel lumen migrate from the outer part of the vascular structure. Research has shown that the migration of these cells is driven by a chemo-attractant gradient of elastin fibers. PRT-201 fragments the elastin in the vessel walls, altering the chemo-attractant gradient, which helps maintain the proliferative cells in a quiescent state near the outside of the blood vessel wall.

**Large market opportunity appears straightforward, and supported by our physician checks.** Our review of the hemodialysis market as well as consult calls with vascular surgeons indicates that problems with AVF patency and maturation are the single biggest impediment to patient care. We believe a drug with the ability to meaningfully improve maturation rates would be rapidly adopted by vascular surgeons and that improved patency rates would be extremely attractive to nephrologists and the physicians who care for patients while receiving hemodialysis.

**In sum, we believe PRTO's current market capitalization of ~$150M represents a compelling opportunity for investors.** In our view, the company's current share price does not fully reflect the full potential of PRT-201 to take meaningful share in the sizable hemodialysis access market. While the clinical trial risk associated with Phase 3 is appreciable, we believe PRTO shares represent a significantly favorable risk/reward proposition for investors with appropriate risk and time horizons.

# Overview

Proteon Therapeutics is a late-stage biopharmaceutical company focused on the development of therapies to treat patients with renal and vascular diseases. The company went public on 10/22/14 and is listed on NASDAQ under the ticker PRTO. Proteon's sole asset, PRT-201, is a recombinant human elastase in development for the reduction of vascular access failure in patients with chronic kidney disease preparing for hemodialysis, a procedure which requires surgery to provide vascular access. Proteon's Phase 3 program for PRT-201 consists of two studies enrolling 300 patients each. The first of these Phase 3 studies is currently enrolling patients and we expect the second study to commence enrollment during 1H15. Importantly, we expect data to be available by 1H17, suggesting potential filing by during 3Q17 and approval and launch during 2H18.

# Valuation

Our 12- to 18-month $18 price target for PRTO is derived from a sum-of-the-parts analysis of the company's development pipeline drugs, namely PRT-201.

We value PRTO using a sum-of-parts probability-adjusted net present value (pNPV) approach, calculating anticipated profits from PRT-201 discounted at 10.5% through 2031 with no terminal value. We then adjust for clinical and regulatory risk by assigning an estimated probability of success.

We currently assign a 54% probability of approval for PRT-201. Although we are optimistic that the Phase 3 studies will be positive, we account for the added risk associated with the Phase 2 subgroup analyses by assuming a lower chance of Phase 3 success compared to other drugs in pivotal trials. We do not include the company's current cash in our valuation as we expect these funds to be fully utilized to support development of PRT-201.

**Exhibit 1: PRTO Probability-Adjusted NPV Valuation Analysis**

| Drug/Indication | Expected Launch | Peak Sales Estimate ($MM) | Est. Probability of Success | P-Adj NPV ($MM) | P-Adj Value / Share |
|---|---|---|---|---|---|
| PRT-201 Radiocephalic AVF (US) | 2017 | $302 | 54% | $274 | $18 |
| **Pipeline Value** | | | | **$274** | **$18** |
| Net Cash (Year-End 2014) | | | | $76 | $5 |
| **Total Equity Value** | | | | **$274** | **$18** |
| Diluted Shares Outstanding Used for Valuation (MM) | | | | | 15.0 |

Source: Company data, Oppenheimer & Co. Inc. estimates

Potential sources of upside to our valuation stem from several areas, including: (1) higher penetration in radiocephalic AVF; (2) off-label utilization in brachiocephalic AVF, which we do not include in our estimates; (3) higher pricing than our estimate of $10,500 per treatment procedure; (3) European market opportunity which we do not yet include since the company is still considering different options for addressing the ex-US market.

Important risks to our price target are described in the following section.

# Key Risks to Our Investment Thesis

**Clinical Risk.** We would expect a material decline in PRTO shares in the event of unsuccessful US phase 3 programs for PRT-201. In our view, the key risks to the PRT-201 Phase 3 program are: (1) Phase 2 results are not reproducible in Radiocephalic AVF population; and (2) PRT-201 is unable to demonstrate statistically significant efficacy in key endpoints (unassisted maturation, use of hemodialysis, and patency maintenance).

**Regulatory Risk**. The regulatory process to attain approval of drugs is complex, requiring collection and production of extensive sets of data from expensive and time-consuming studies. Decisions on approval are at the discretion of the respective regulatory agencies, which can be unpredictable. Following potential approvals of drugs, the regulatory agencies retain the power and ability to remove these drugs from the market if deemed to present sufficient danger. With regards to PRT-201, our estimates assume the drug launching in 2H18 based on a regulatory filing of a single pivotal study demonstrating efficacy in AVF. If the first Phase 3 study is positive, but the p-value associated with the primary endpoint isn't strong enough to support registration on a single pivotal, PRTO will need to wait for data from the second trial before seeking approval. In this scenario, the drug would then be launched roughly one year later than our current estimates.

**Commercialization Risk**. Proteon's future results depend significantly on the company's ability to successfully commercialize PRT-201 in a timely manner. Additionally, sales of PRT-201 will likely be affected by broader awareness of the products and implementation into surgical practices. Moreover, for PRT-201, the market is unestablished as this is a novel, first-in-class product for which market awareness would need to be created *de novo*.

**Intellectual Property Risk.** There is inherent uncertainty in both the interpretation of patent claims and the application of patent law, regardless of the apparent strength of Proteon's patent portfolio for the PRT-201. Upon expiration of patents, Proteon may be unable to prevent third parties from genericizing these products. Furthermore, competitors may challenge the scope/validity of the patents, or simply find ways to circumvent the patents.

**Manufacturing Risk.** Any disruption or contaminant problems could result in delays to clinical studies or future commercialization until such problems are resolved. Moreover, upon commercialization, any impact on the company's supply of drug product could adversely affect revenue.

**Competitive Risk.** In addition to the commercialization risk discussed above, we note that other biotechnology companies with greater resources may pursue development of competing products, the potential approval/commercialization of which could negatively impact PRT-201 market share and revenue.

**Liquidity and Small Capitalization Risk.** Proteon is a small capitalization (<$500M) unprofitable biopharmaceutical company. The company may require additional capital to reach profitability, and an inability to raise capital on favorable terms or at all may significantly impact the company's valuation. Proteon stock may also exhibit volatility due to events not directly related to its operations. Additionally, the stock's liquidity may limit some investors' ability to acquire and sell shares in a timely fashion.

# Upcoming Catalysts

Expected upcoming milestones for PRTO are listed in Exhibit 2 below. The most important catalyst for PRTO, in our view, is the release of top-line data from the first Phase 3 study of PRT-201, which we expect to be available in the first half of 2017. The strength of these results will determine whether the company can seek approval based on the single Phase 3 study, or if it must wait for data from the second trial as a supportive study. The timing of approval and launch will depend on this outcome. We model approval in 2H18 based on the filing of a single pivotal trial because if efficacy in radiocephalic AVF matches the subgroup analysis in Phase 2 we would expect the resulting p-value to support an immediate filing without needing to wait for data from the supporting study.

**Exhibit 2: PRTO Potential Upcoming Milestones**

| Expected Date | Event Description |
|---|---|
| 1H15 | Initiate second Phase 3 trial for PRT-201 in radiocephalic AVF |
| 2Q15 | Publication of long-term registry data from Phase 2 PRT-201 AVR study |
| Mid-15 | Follow-up data from Phase 1 PAD study of PRT-201 |
| 2016/2017 | Potential business development relating to ex-US rights of PRT-201 |
| 1H17 | Potential release of top-line data from first Phase 3 PRT-201 study |
| 3Q17 | Potential filing for U.S. approval of PRT-201 based on first Phase 3 study |
| 1H18 | Potential release of top-line data from second Phase 3 PRT-201 study |
| Mid-18 | Potential approval of PRT-201 in Radiocephalic AVF placements (on first study) |
| 2H18 | Anticipate launch of PRT-201 in U.S. if approved on results of first study |
| 2H19 | Anticipate launch of PRT-201 in U.S. if results of both Phase 3 studies are required |

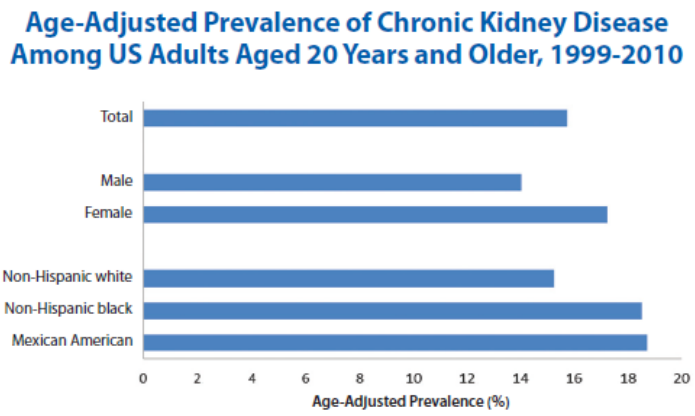
Source: Company Documents and Oppenheimer & Co.

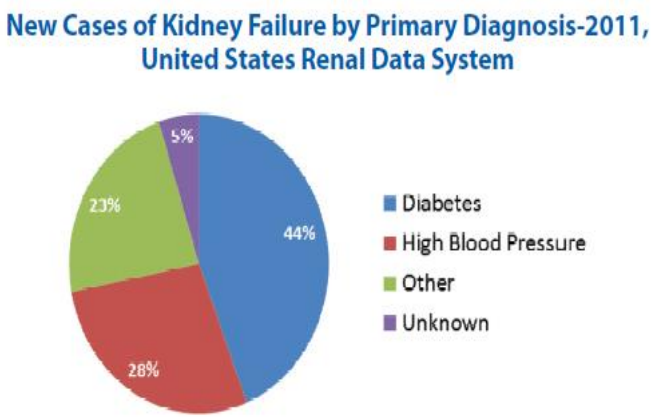
Additional potential PRT-201 related milestones for 2015 and 2016 include the publication of long-term registry data from the Phase 2 PRT-201 AVF trial as well as an update on European plans for PRT-201, which could include seeking a development/commercial partner. While PRTO expects to report follow-up data from a Phase 1 study of PRT-201 in peripheral artery disease (PAD), we expect this program to be less of a priority until at least the first Phase 3 trial in AVF is completed.

# CKD/ESRD and Hemodialysis Overview

Chronic kidney disease (CKD) is a term used to describe abnormal kidney function or structure and often occurs in tandem with other conditions such as cardiovascular disease or diabetes. It is estimated that ~10% of adults in the US, or more than 20 million people, may have CKD with varying degrees of severity.

**Exhibit 3: CKD Epidemiology by Primary Diagnosis and Demographics**




Source: CDC.gov

The severity of CKD is determined by the estimated glomerular filtration rate (eGFR). GFR describes the flow rate of filtered fluid through the kidney and is measured by the quantity of substance in the urine that originated from a measurable amount of blood. Please see **Exhibit 4** for additional details relating to CKD stratification. We note that patients with stage 5 CKD are considered to have end-stage renal disease (ESRD).

**Exhibit 4: Description of CKD Severity by Stage**

| Stage | Estimated GFR (mL/min/1.73 m²) | Comment |
|---|---|---|
| 1 | ≥90 | Normal GFR w/ proteinuria |
| 2 | 60–89 | Age-related decline in GFR w/proteinuria |
| 3A<br>3B* | 30–59 | Low risk of progression to kidney failure |
| 4 | 15–29 | High risk of progression to kidney failure |
| 5<br>5D<br>5T | <15 | Kidney failure |

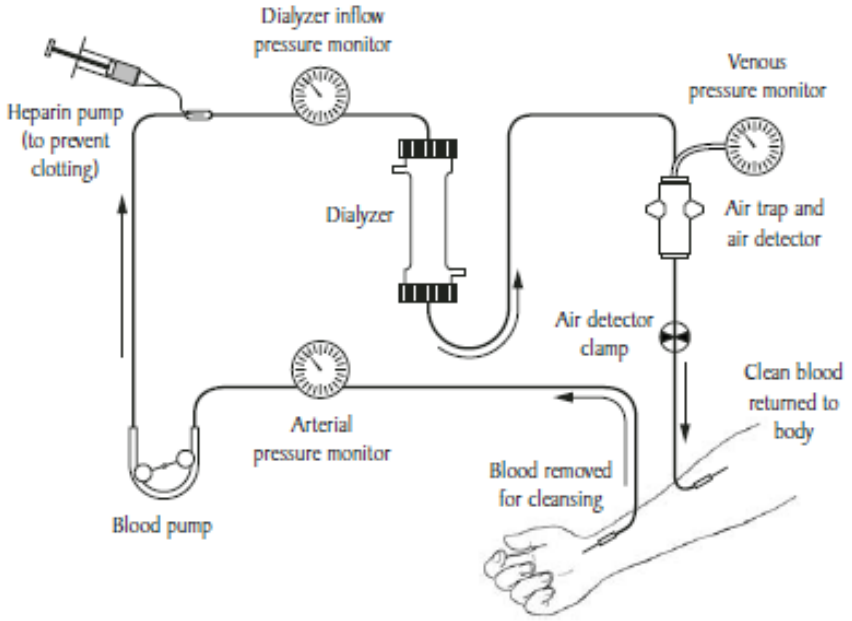
Source: ASN.org

We estimate that over ~110,000 patients with Stage 5 CKD begin treatment for ESRD annually via some form of renal replacement therapy, namely hemodialysis and peritoneal dialysis. Peritoneal dialysis involves using a cavity in the abdomen as a membrane

through which fluids are exchanged from the blood. Hemodialysis is the most common form of treatment for ESRD and is performed by inserting a bore needle that is attached to a hemodialysis machine into the patient, through a catheter, fistula or graft. We highlight that, in 2011, there were ~395,000 patients on hemodialysis, according to the US Renal Data System Annual Report. We note a similar population in Europe of ~316,000 patients and ~295,000 patients in Japan. Generally, the only cure for ESRD is a kidney transplant.

By way of background, in a patient undergoing hemodialysis, the machine removes waste and excess fluid normally excreted by the kidney, returning cleansed blood to the patient via the same vein from which it is drawn. Please see **Exhibit 5** below for diagram overview of hemodialysis.

**Exhibit 5: Overview of Hemodialysis Process**



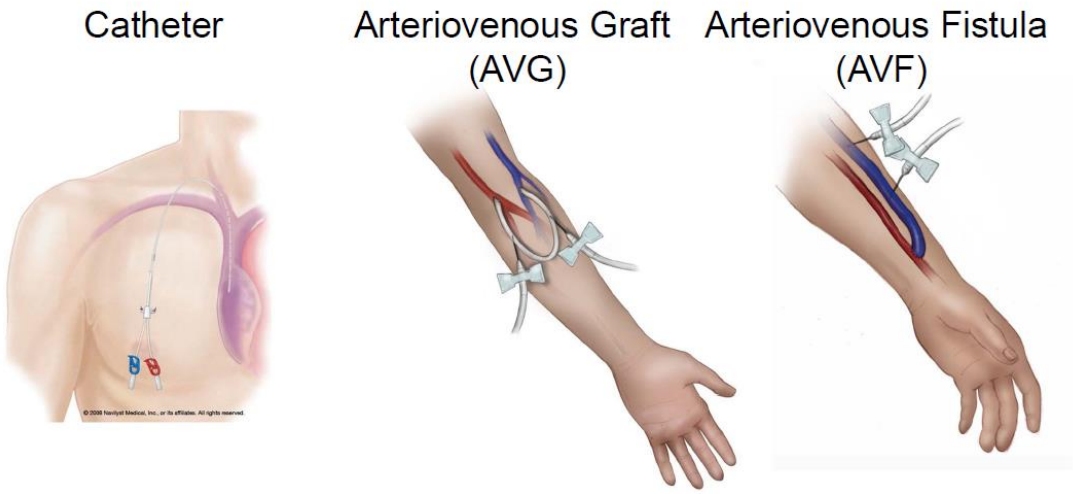

Source: NIH / NIDDK

In order for the dialysis machine to process the large volume of blood effectively, the patient must have a suitable vein with blood flow of at least 500mL/minute, which is considered sufficient to complete the treatment within four hours.

There are three types of vascular access: arteriovenous fistula (AVF), arteriovenous graft (AVG) or transcatheter (TC). We highlight that AVFs are considered to be the preferred form of vascular access given that it has the lowest complication rates associated with thrombosis and infection. Please see **Exhibit 6** for illustrations relating to the three forms of vascular access described above.

However, we note that blood flow from the arm is typically ~ 50mL/minute and therefore requires a patient to undergo surgery to increase blood flow. Specifically, to attain this type of vascular access, a surgeon establishes a direct connection between the patient's vein and artery to create a circuit of sufficient diameter to allow for increased blood flow. The process of increasing blood flow following the surgical procedure is progressive as the internal diameter of the vein expands slowly over the course of a few weeks. Eventually the lumen diameter will exceed 4 millimeters, at which point the blood flow would be over 600mL/minute, if successful.

**Exhibit 6: Illustration of Primary Types of Vascular Access**




Source: Company Documents

AVGs were once the most common form of venous access. However, they do not remain viable for as long as AVFs (lower patency) and have higher rates of infection and thus fell out of favor. We note that AVGs are used in situations where AVFs are unsuitable owing to vascular access or if a patient needs to commence hemodialysis in a shorter timeframe (as little as 2-3 weeks) than what would be allowed by an AVF.

To create an AVF, a surgeon transects a vein in the arm and sutures it to an artery side-by-side. There are currently three basic types of arteriovenous fistulas (AVFs):

1. **Radiocephalic AVF (radial artery to cephalic vein) –**the most preferred type of AVF and is also the easiest to create and typically occurs near the patient's wrist. While the radial-cephalic has a lower blood flow than the other two AVF options, the use of radial-cephalic fistula as the first access preserves the upper arm vessels for later attempts, if necessary.

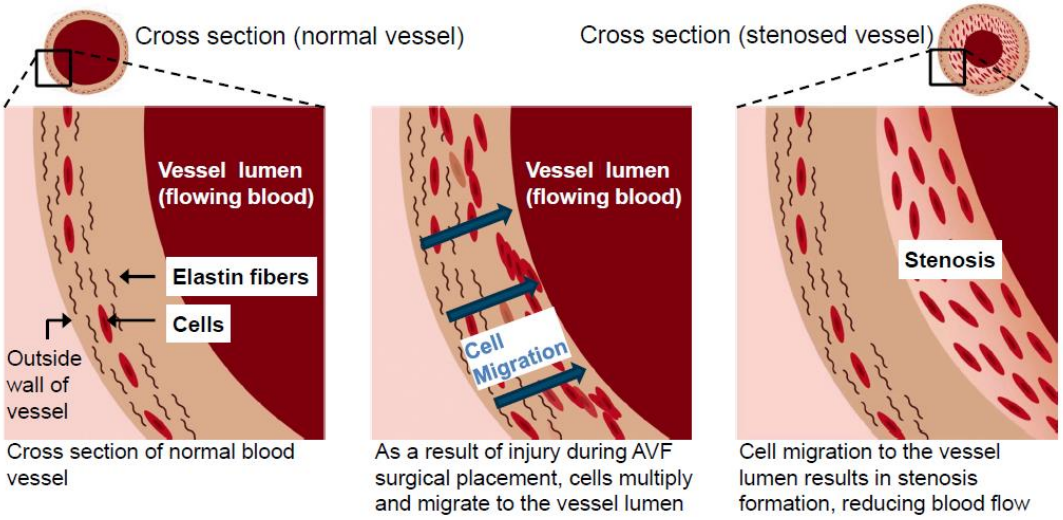
2. **Brachiocephalic AVF (brachial artery to cephalic vein) –** this type of vascular access is preferred after radiocephalic AVFs given the minimal invasiveness of the procedure as compared to brachial basilica AVFs. Furthermore, in instances where patients have had frequent hospitalizations requiring IV access, radiocephalic AVFs are typically unattainable and vascular surgeons will opt for brachialcephalic access.

3. **Brachial-basilic transposition –** vascular access occurring above the elbow, connecting the brachial artery to the basilic vein. The most invasive of the three procedures and as such is the least preferred and typically used in patients who are unsuitable for other AVF procedures.

Despite numerous advancements in hemodialysis since its inception in the 1920s, the biggest determinant of successful treatment is ensuring stable vascular access. One of the more prevalent issues with vascular access is maintaining patency (the state of the vein being expanded). Patency loss occurs largely owing to progressive vascular scarring (neointimal hyperplasia) in the vein wall near the lumen. This progressive scarring, which is inherent to vascular access surgeries owing to injury to the vein, results in a narrowing

of the blood vessel, known as stenosis, which essentially restricts blood flow via the shrinking of lumen. This process is illustrated in **Exhibit 7**, which shows how the physiological changes caused by the rapid blood flow from the artery to the vein, as well as mechanical stresses on the vein wall, lead to the activation of scar forming cells which multiply and migrate from the outside wall to the inside wall of the blood vessel.

**Exhibit 7: Illustration of Venous Injury and Repair Resulting In Stenosis**



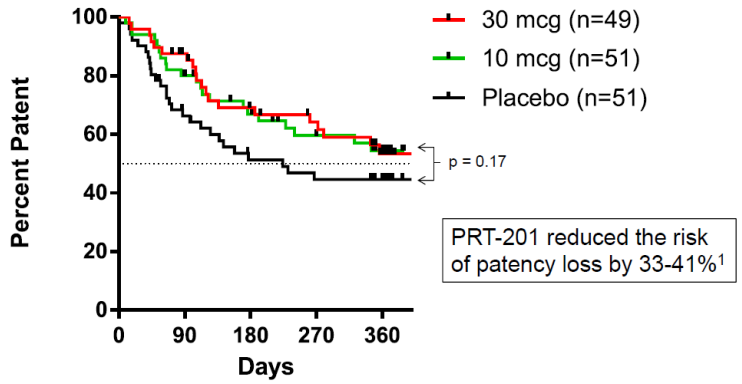

Source: Company Documents

While there are procedures to address patency loss (i.e., balloon angioplasty, thrombectomy, stent deployment, and surgical revision), they are largely invasive, expensive, and these procedures are not certain to improve patency. These procedures are only successful ~70% of the time and in the instances in which they are not, the vascular access site must be abandoned. At this point, a surgeon typically places a catheter to enable hemodialysis and patients who undergo this procedure typically see a doubling in mortality rate vs. those who remain on permanent access. Surgeons eventually have to ultimately place another AVF or AVG, effectively lowering the number of future access sites available to the patient.

# PRT-201 Overview and Opportunity

PRT-201 is a recombinant human elastase that has been evaluated in a Phase 2 study in 151 patients with CKD undergoing the creation of radiocephalic and brachiocephalic AVFs. Specifically, 67 patients underwent the creation of a radiocephalic AVF while 84 patients underwent the creation of a brachiocephalic AVF. These patients were treated with a single administration of either 10 or 30 micrograms of PRT-201 (or placebo) at the time of AVF placement and were followed for up to 12 months subsequent to the procedure.

**Exhibit 8: Phase 2 Primary Endpoint – Patency Loss – (Placebo vs. 30 mcg vs. 10**

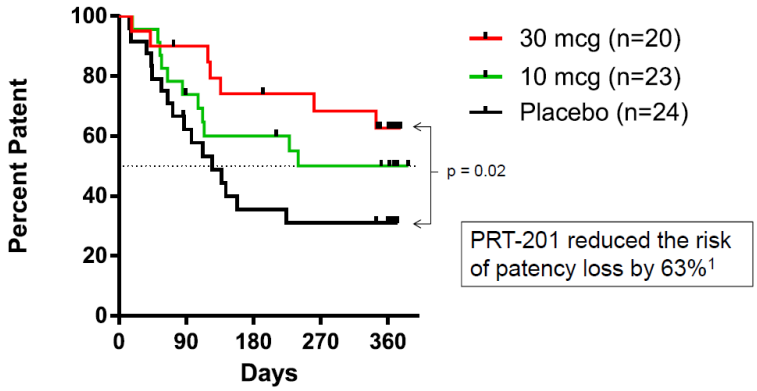



[1] 30 mcg group - All AVFs. Hazard ratio 0.67 (Log-rank, p=0.170) and 0.59 (Cox, p=0.098) Primary unassisted patency is time from AVF surgery to first failure event (thrombosis or procedure to restore or maintain patency).
Proteon Therapeutics, Inc. - Non-Confidential

Source: Company Documents

The primary endpoint for the study was unassisted patency over 12 months defined as the time from access creation until the first occurrence of either AVF thrombosis or a corrective procedure, such as a balloon angioplasty, to maintain patency. While neither of the treatment arms demonstrated a statistically significant improvement in unassisted patency vs. placebo (as seen above in **Exhibit 8**), we note that there was a modest trend toward efficacy. Specifically, treatment with 10mcg and 30 mcg of PRT-201 was associated with a reduction of 31% and 33% of unassisted patency loss.

**Exhibit 9: Patency Loss – (Radiocephalic AVF Patients Only)**




Non-prespecified
[1] 30 mcg group. Hazard ratio 0.37 (Log-rank, p=0.02). Dose trend p=0.02 (Log-rank).
Proteon Therapeutics, Inc. - Non-Confidential 17

Source: Company Documents

Efficacy of PRT-201 was more prominent in the subset of patients who underwent the placement of a radiocephalic AVF vs. those that underwent the placement of a brachiocephalic AVF. Specifically, patients who underwent the placement of a radiocephalic AVF at doses of 10mcg and 30mcg saw a 41% and 64% reduction, respectively, in the risk of primary unassisted patency loss. The median patency for the 30mcg subset of patients was 377 days vs. only 125 days for placebo patients, indicating a statistically significant improvement vs. placebo (as seen in **Exhibit 9**).

**Exhibit 10: Phase 2 Primary Endpoint (All Patient Groups)**

| | | PRT-201 | |
|---|---|---|---|
| | | 10mcg | 30mcg |
| All AVF | Number of patients | N = 51 | N = 49 |
| | Unadjusted Risk vs. Placebo | -31% (p=0.19) | -33% (p=0.17) |
| | Adjusted Risk vs. Placebo | -24% (p=0.35) | -41% (p=0.10) |
| Radiocephalic AVF | Number of patients | N = 23 | N = 20 |
| | Unadjusted Risk vs. Placebo | -41% (p=0.18) | -63% (p=0.02) |
| | Adjusted Risk vs. Placebo | -40% (p=0.20) | -61% (p=0.04) |
| Brachiocephalic AVF | Number of patients | N = 28 | N = 29 |
| | Unadjusted Risk vs. Placebo | -14% (p=0.72) | +10% (p=0.82) |
| | Adjusted Risk vs. Placebo | -12% (p=0.76) | -26% (p=0.46) |

Source: Company Documents

Per the Phase 2 protocol, patients were also evaluated based on multiple secondary efficacy endpoints: unassisted maturation, secondary patency, use for hemodialysis and hemodynamically significant lumen stenosis.

Unassisted maturation of the fistula at three months was evaluated using an ultrasound to measure blood flow and lumen diameter. The 30mcg dose showed a statistically significant improvement in maturation at 3 months, with incremental benefits being seen in the patient population that underwent the placement of a radiocephalic AVF vs. brachiocephalic AVF. Please see **Exhibits 11 and 12** for additional information.

**Exhibit 11: Ph2 Secondary Endpoint - Unassisted Maturation - (All Patient Groups)**

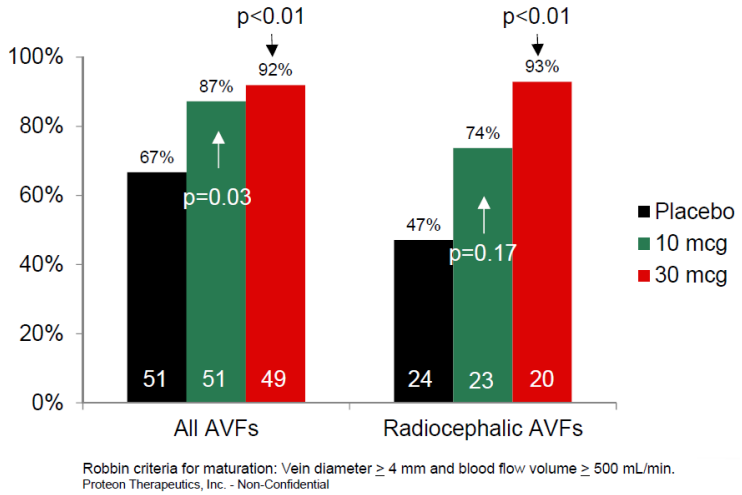
| | | Placebo | PRT-201 | |
|---|---|---|---|---|
| | | | 10mcg | 30mcg |
| All AVF | Number of patients | N = 39 | N = 39 | N = 37 |
| | Percent Mature NFK-KDOQI (1) | 46% | 64% (p=0.11) | 70% (p=0.03) |
| | Percent Mature Robbin (2) | 67% | 87% (p=0.03) | 92% (p<0.01) |
| Radiocephalic AVF | Number of patients | N = 17 | N = 19 | N = 14 |
| | Percent Mature NFK-KDOQI (1) | 24% | 37% (p=0.48) | 57% (p=0.08) |
| | Percent Mature Robbin (2) | 47% | 74% (p=0.17) | 93% (p<0.01) |
| Brachiocephalic AVF | Number of patients | N = 22 | N = 20 | N = 23 |
| | Percent Mature NFK-KDOQI (1) | 64% | 90% (p=0.07) | 78% (p=0.34) |
| | Percent Mature Robbin (2) | 82% | 100% (p=0.11) | 91% (p=0.41) |

1) NKF-KDOQI maturation is defined as average vein lumen diameter > 6 millimeters and an outflow vein blood flow rate > 600 milliliters / minute

2) Robbin maturatino is defined as average vein lumen diameter > 4 millimeters and an outflow vein blood flow rate > 500 milliliters / minute

Source: Company Documents

**Exhibit 12: Phase 2 Maturation Endpoint (All AVFs vs. Radiocephalic AVFs )**




Source: Company Documents

As previously mentioned, patients that have undergone vascular access procedures often require additional procedures (thrombectomy, angioplasty, stent deployment, and surgical revision) to restore blood flow. The procedure rate is calculated based on the number of days in which a procedure was performed to restore or maintain patency divided by the patient's time on the trial. As seen in **Exhibit 13**, there was a 56% reduction in the rate of procedures in the 30 mcg group versus the placebo group. In the subset of patients undergoing the placement of a radiocephalic AVF, there was a 69% reduction in the average rate of procedures in the same dose group. Moreover, in the subset of patients who underwent the placement of a brachiocephalic AVF, there was a 43% reduction in the average rate of procedures for the patients that received the 30mcg dose. We note that there was a 86% reduction in the average rate of procedures in brachiocephalic AVFs excluding central stenosis.

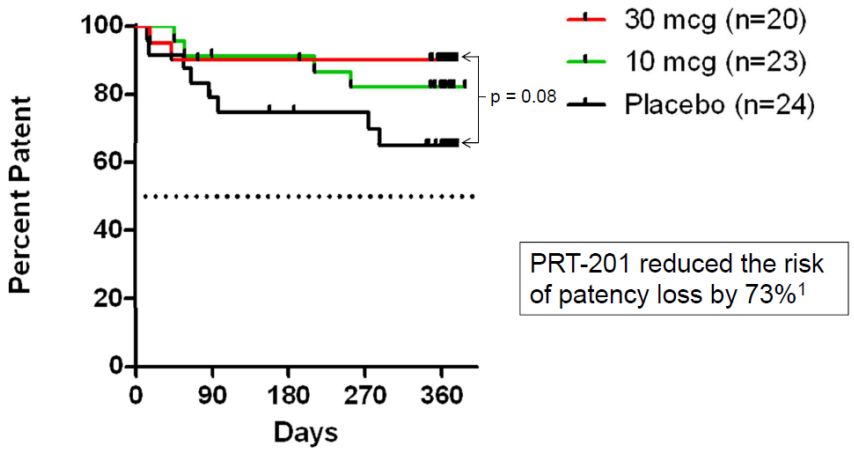
**Exhibit 13: Ph2 Secondary Endpoint – Avg. Procedure Rate To Restore/ Maturation Patency - (All Patient Groups)**

| | | Placebo | PRT-201 | |
|---|---|---|---|---|
| | | | 10mcg | 30mcg |
| **All AVFs (Prespecified)** | Number of patients | N = 51 | N = 50 | N = 48 |
| | Procedures per Year | 0.9 | 0.8 (p=0.53) | 0.4 (p=0.07) |
| **All AVFs Excluding Central Stenosis** | Number of patients | N = 51 | N = 50 | N = 48 |
| | Procedures per Year | 0.8 | 0.7 (p=0.44) | 0.2 (p<0.01) |
| **Radiocephalic AVFs** | Number of patients | N = 24 | N = 23 | N = 20 |
| | Procedures per Year | 1.0 | 0.8 (p=0.63) | 0.3 (p=0.06) |
| **Brachiocephalic AVFs** | Number of patients | N = 27 | N = 27 | N = 28 |
| | Procedures per Year | 0.7 | 0.7 (p=0.72) | 0.4 (p=0.50) |
| **Brachiocephalic AVFs Excluding Central** | Number of patients | N = 27 | N = 27 | N = 28 |
| | Procedures per Year | 0.7 | 0.7 (p=0.54) | 0.1 (p=0.07) |

Source: Company Documents

Relating to secondary patency loss, defined as abandonment of the AVF (which typically occurs following loss of primary unassisted patency due to thrombosis or failure of a follow-on procedure to restore patency), while there was no statistically significant difference there was a trend toward prolonged secondary patency in patients who received radiocephalic AVFs.

**Exhibit 14: Phase 2 Secondary Endpoint – Secondary Patency– (All Patient Groups)**




Non-prespecified. Secondary patency is time from the AVF surgery to AVF abandonment.
[1] 30 mcg group. Hazard ratio 0.27 (Log-rank, p= 0.08). Dose trend p=0.06 (Log-rank).
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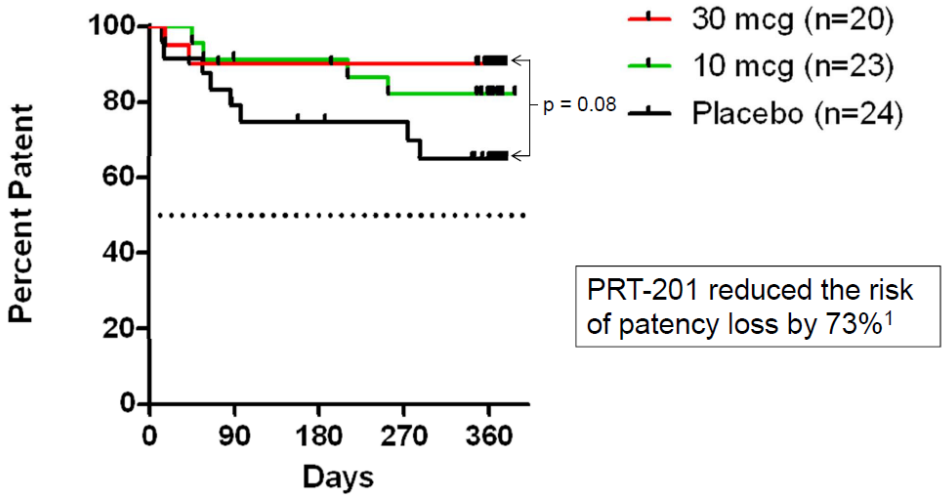
Source: Company Documents

As it relates to the last two secondary endpoints, use for hemodialysis and hemodynamically significant lumen stenosis, there were not any statistically significant differences in either dose groups vs. placebo. However, there were positive trends observed favoring PRT-201. Specifically, hemodialysis use in the 30mcg arm was 69% vs. 53% in the placebo group. Separately, there was a trend to fewer patients in the active arm with a hemodynamically significant stenosis (30% for 10mcg group and 39% for 30mcg group) compared to placebo (51%) at 6 weeks.

**Exhibit 15: Phase 2 Secondary Endpoint – Secondary Patency– (All Patient Groups)**




Non-prespecified. Secondary patency is time from the AVF surgery to AVF abandonment.
[1] 30 mcg group. Hazard ratio 0.27 (Log-rank, p= 0.08). Dose trend p=0.06 (Log-rank).
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Source: Company Documents

**Exhibit 16: Phase 2 Safety and Tolerability Overview**

| | | PRT-201 | |
|---|---|---|---|
| | Placebo | 10mcg | 30mcg |
| N (%) | N = 51 | N = 51 | N = 49 |
| Any adverse event | 42 (82) | 39 (77) | 43 (88) |
| AVF thrombosis | 13 (26) | 8 (16) | 7 (14) |
| Venous stenosis | 10 (20) | 7 (14) | 8 (16) |
| Steal syndrome | 7 (14) | 2 (4) | 6 (12) |
| Hypoesthesia | 7 (14) | 6 (12) | 6 (12) |
| AVF incisional pain | 5 (10) | 9 (18) | 9 (18) |
| AVF site complication | 5 (10) | 4 (8) | 4 (8) |
| Nausea | 5 (10) | 1 (2) | 2 (4) |
| Peripheral edema | 5 (10) | 0 (0) | 2 (4) |
| Arterial stenosis | 4 (8) | 5 (10) | 0 (0) |
| Paresthesia | 1 (2) | 1 (2) | 5 (10) |
| Pain in extremity | 0 (0) | 1 (2) | 5 (10) |

Source: Company Documents

As demonstrated by the robust Phase 2 data in the radiocephalic AVF arm in the 30mcg dose cohort, PRT-201 is able to significantly improve upon many aspects of vascular access while being relatively safe and tolerable. We believe that Proteon's decision to move forward with a Phase 3 program in only radiocephalic AVF patients makes sense given the longer patency inherent in brachiocephalic AVFs that make demonstrating an effect size with PRT-201 more difficult for 1-year follow-up.

**Phase 3 Trial Design and Data Expectation Discussion**

Proteon held an end of Phase 2 meeting with the FDA in April 2013. Following these discussions, Proteon is conducting two randomized, double-blind placebo-controlled trials involving 300 patients in each Phase 3 trial. Proteon will be evaluating the 30 microgram dose of PRT-201 in patients undergoing surgical procedures to create a radiocephalic AVF. Patients will be randomized 2:1 to receive either 30mcg PRT-201 or placebo, respectively. The primary endpoint for the study is primary unassisted patency and the secondary endpoint will is secondary patency, similar to the Phase 2 study. Additional secondary endpoints include unassisted maturation, rate of "rescue" procedures, and successful use for hemodialysis.

Currently, the company is enrolling patients in the first Phase 3 trial (enrollment commenced during 3Q14) and also expects to initiate the second Phase 3 trial during 1H15. We expect the company to release top-line data from the first pivotal study in 1H17. Of note, Proteon's current expectation is to report the data in 1Q17, but we allow for additional time in case patient enrollment is slower than expected.

Although Proteon is planning to conduct two Phase 3 trials of PRT-201 in radiocephalic AVF, we assume that if the drug is successful, the company will file for approval based on the first study. Our reasoning that if the benefits seen at the 30 mcg dose in radiocephalic patients in Phase 2 are reproducible in a larger study (and not due to statistical chance), the resulting p-values would be well below (i.e. better than) the threshold needed for the company to file on a single study.

That said, Proteon will begin enrollment of a second, parallel Phase 3 trial in the first half of 2015 in order to generate sufficient data in the event that the company is unable to file on the first pivotal trial. We expect Proteon to prioritize putting the quicker enrolling centers in the first pivotal trial, leading to a slower enrollment curve in the second study. We currently estimate that data from the second Phase 3 trial will be available in the first half of 2018, roughly one year after the company reports data from the first Phase 3 trial.

# Market Opportunity for PRT-201

As previously mentioned, more than ~110,000 ESRD patients begin hemodialysis each year, and based on our consultation calls with vascular surgeons, the recommended form of vascular access is AVFs. Direct access catheters are used in patients who must begin hemodialysis immediately (and will transition to an AVF after it matures) or in patients who have exhausted all available AVF sites. Based on previously mentioned rates of failure in AVG, it is estimated that ~60% of hemodialysis patients dialyze with an AVF in the United States (67-83% in Europe and ~90% in Japan). As it relates to AVFs, surgeons ideally prefer to place new patients with radiocephalic AVFs as it allows for the maximum number of additional sites in case of complete patency loss/abandonment. However, owing to the location of radiocephalic AVFs, which are closer to the wrist, blood vessels are smaller and have lower blood flow. Due in part to this dynamic, roughly half of new patients who are evaluated for AVF placement are unable to have a radiocephalic procedure.

We highlight that ~50% of radiocephalic AVFs fail to mature into usable fistulas (unassisted maturation) for hemodialysis. Unassisted maturation is defined per the National Kidney Foundation (NKF) criteria as a lumen diameter > 6 millimeters. Of the fistulas that achieve unassisted maturation, 70% thrombose or require some form of procedural intervention to maintain sufficient patency. Eventually, it is estimated that ~35% of these fistulas are eventually abandoned. This represents significant market opportunity for PRT-201 to change standard of care if the drug can demonstrate improvements in short-term maturation rates and long-term patency.

**Takeaways from Vascular Surgeon Consults**

Our conversations with vascular surgeons were highly encouraging as it relates to the need of an agent to improve upon patency and maturation of fistulas. The ability for a new drug to demonstrate a clinically significant improvement in unassisted maturation of a fistula (one that does not require a rescue or interventional procedure such as a balloon angioplasty) was cited as addressing the greatest unmet medical need and would likely become standard of care. Given the improvement in maturation demonstrated in the Phase 2 PRT-201 study, specifically in patients undergoing the placement of a radiocephalic AVF, we believe this benefit of the drug would bode well for driving market uptake if results are replicated in Phase 3.

We also highlight that, while the Phase 3 PRT-201 studies include only radiocephalic AVF procedures, physicians mentioned they would be likely to consider using such a drug in brachiocephalic AVF procedures as the underlying mechanism of action does not change despite the altered site of the fistula (i.e., if successful in radiocephalic AVFs, physicians believe it would also be beneficial for other fistulas). Interestingly, the ability of PRT-201 to maintaining patency was cited by one surgeon as a hypothetical conflict-of-interest, given that these surgeons are compensated per procedure, incentivizing them to perform more surgeries and place more fistulas. We do not believe this represents significant market risk for PRT-201, as the same surgeon noted that patient outcomes drive practice and that significant improvements in maturation would demand that the drug be used for applicable patients. Meanwhile, we believe that the nephrologists who refer their patients

for vascular access surgery would prioritize sending patients to surgeons utilizing PRT-201.

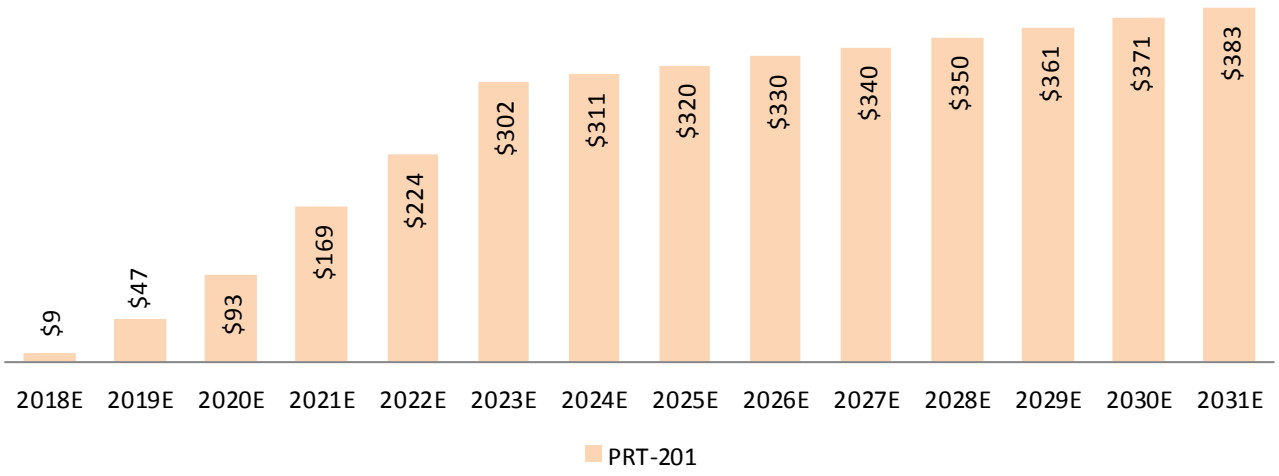
**Sales Estimates for PRT-201**

Given that the Phase 3 program is being conducted in patients who are receiving a radiocephalic AVF, we estimate that the FDA will only approve use of PRT-201 in patients undergoing the placement of radiocephalic AVFs, and note potential for off-label usage in brachiocephalic AVFs per vascular surgeon consult commentary. As seen in **Exhibit 18** (on page 18), we estimate for PRT-201 includes use in patients initiating hemodialysis (native patients) and also existing hemodialysis patients undergoing repeat procedures following failure of an existing AVF, with the latter contributing to a lesser degree of our total estimates.

Given the robust data demonstrated in the radiocephalic AVF arm in the 30mcg cohort in Phase 2, we believe PRT-201 is poised to become standard-of-care for vascular access procedures if the current Phase 3 trials are successful. Furthermore, assuming approval of PRT-201, Proteon believes PRT-201 would not be subject to CMS ESRD bundling but rather would fall under Medicare Part B and would be reimbursed at average selling price + 6%.

We estimate PRT-201 achieving peak penetration of 45% (of radiocephalic procedures) during 2023, representing revenues of $302M (growing to $383M by 2031 due to y/y changes in pricing).

**Exhibit 17: PRT-201 Projected Sales in Radiocephalic AVFs**




Source: Oppenheimer & Co., Inc

As shown in our market model in **Exhibit 18**, we assume Proteon would receive $10,500 per treatment of PRT-201 at launch. While the company has not provided guidance regarding pricing, we think this estimate may prove to be conservative given the high failure rates and associated cost burden for maintaining vascular access in hemodialysis patients.

## Exhibit 18: PRT-201 Market Model

| PRT-201 - AV Fistulas (US) | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total # of Hemodialysis Patients | | | | | | | | | | | | | | | |
| Individuals receiving hemodialysis (US) | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 | 390,000 |
| New patients starting hemodialysis | | | | | | | | | | | | | | | |
| Hemodialysis incidence | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 |
| Total # of AVF procedures (US) | | | | | | | | | | | | | | | |
| New hemodialysis patients | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 | 82,500 |
| Seconday AVF from existing patients | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 | 39,000 |
| Secondary AVF rate | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% | 10.0% |
| **Total** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** | **121,500** |
| Total # Patients Eligible for PRT-201 (US) | | | | | | | | | | | | | | | |
| % Radiocephalic - new | 45% | 45% | 48% | 50% | 52% | 55% | 55% | 55% | 55% | 55% | 55% | 55% | 55% | 55% | 55% |
| % Radiocephalic - secondary | 21% | 22% | 23% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% | 25% |
| **Total** | **45,315** | **45,705** | **48,570** | **51,000** | **52,650** | **55,125** | **55,125** | **55,125** | **55,125** | **55,125** | **55,125** | **55,125** | **55,125** | **55,125** | **55,125** |
| PRT-201 Penetration | | | | | | peak | | | | | | | | | |
| Radiocephalic AVF (US) | 1.9% | 9.5% | 17.3% | 28.8% | 36.0% | 45.0% | 45.0% | 45.0% | 45.0% | 45.0% | 45.0% | 45.0% | 45.0% | 45.0% | 15.0% |
| PRT-201 Patients on Drug | | | | | | | | | | | | | | | |
| Radiocephalic AVF (US) | 861 | 4,344 | 8,393 | 14,688 | 18,954 | 24,806 | 24,806 | 24,806 | 24,806 | 24,806 | 24,806 | 24,806 | 24,806 | 24,806 | 8,269 |
| **Total** | **861** | **4,344** | **8,393** | **14,688** | **18,954** | **24,806** | **24,806** | **24,806** | **24,806** | **24,806** | **24,806** | **24,806** | **24,806** | **24,806** | **8,269** |
| PRT-201 - Avg Revenue Per Tx | | | | | | | | | | | | | | | |
| Radiocephalic AVF (US) | **$10,500** | **$10,815** | **$11,139** | **$11,474** | **$11,818** | **$12,172** | **$12,538** | **$12,914** | **$13,301** | **$13,700** | **$14,111** | **$14,534** | **$14,970** | **$15,420** | **$15,882** |
| PRT-201 - Revenues ($000s) | | | | | | | | | | | | | | | |
| Radiocephalic AVF (US) | $9,044 | $46,978 | $93,492 | $168,525 | $223,995 | $301,951 | $311,010 | $320,340 | $329,950 | $339,849 | $350,044 | $360,545 | $371,362 | $382,503 | $131,326 |
| **Total** | **$9,044** | **$46,978** | **$93,492** | **$168,525** | **$223,995** | **$301,951** | **$311,010** | **$320,340** | **$329,950** | **$339,849** | **$350,044** | **$360,545** | **$371,362** | **$382,503** | **$131,326** |

Source: Company Documents

# Intellectual Property

As of October 2014, Proteon held 20 patents worldwide and there are 26 patent applications pending. Proteon's patent portfolio consists of formulation patents that relate to the PRT-201 formulation and its manufacture and methods of use. Proteon states that the expiration date the relevant patents is December 4, 2028, excluding any impact from possible patent term extension which would extend exclusivity into 2032. Relating to therapeutic use patents, Proteon's portfolio consists of seven issued patents in the US and two issued patents in the EU. The expected expiration of these patents is September 24, 2020; however, several US patents relating to systems and kits including elastase and a catheter were awarded patent term extension, extending the coverage to June 30, 2021. Of note, for modeling purposes we assume PRT-201 exclusivity through 2031.

PRT-201 has also received Orphan Designation from FDA, which provides additional exclusivity protection for a period of 7 years following approval. While this would prevent a generic version of PRT-201 from launching, novel products with superior efficacy and/or safety may be approved, if developed.

# Near-Term Financial Outlook

We estimate pro forma cash balances of ~$79.4M at the end of 3Q14, which we believe will be sufficient to fund the Phase 3 program and other ancillary activities related to the development of PRT-201. Of note, Proteon estimates that it will utilize $9.4M of the IPO proceeds to accelerate the commencement of the second Phase 3 study and an additional $28.4M to conduct the necessary chemistry and manufacturing control (CMC) activities. Based on these assumptions, we project R&D expenses of ~$13M during 2015, growing to ~$32M during 2016. We expect R&D expenses to decrease to ~$16M during 2017 following the completion of the first Phase 3 study and CMC activities. Separately, we currently model SG&A expense growing from $4.8M in 2015 to $5.3M in 2016 and $7.4M in 2017.

# Management

## Timothy P. Noyes

### President and CEO

Mr. Noyes joined Proteon in April 2006 as the company's President and CEO. He has also served on the board of directors during since that time. Prior to Proteon, Mr. Noyes served as Chief Operating Officer of Trine Pharmaceuticals. Mr. Noyes has also held several management positions with GelTex Pharmaceuticals from 1996 to 2001. Prior to GelTex, Mr. Noyes worked for several years at Merck across multiple roles in its hypertension and heart failure group and managed care division. Mr. Noyes received an A.B. from Harvard College and an M.B.A. from Harvard Business School.

## Steven K. Burke, M.D.

### SVP and Chief Medical Officer

Dr. Burke joined Proteon in August 2006 as the company's SVP and CMO. Prior to Proteon, Dr. Burke held various positions at Genzyme Corporation from 2000 to 2006, serving most recently as Senior Vice President of Medical and Regulatory Affairs and Vice President of Clinical Research. He also held roles at GelTex, including VP of Clinical Research and Medical Director from 1994 to 2000. Dr. Burke received an A.B. from Harvard College and an M.D. from Cornell University Medical College. He also completed a medical residency at Brigham and Women's Hospital and is certified by the American Board of Internal Medicine.

## George A. Eldridge

### SVP and CFO

Mr. Eldridge joined Proteon in September 2013 as the company's SVP and CFO. Prior to Proteon, Mr. Eldgridge served as a consultant to companies in the biotechnology industry from 2009 to 2013. He also served as CFO of Targanta Therapeutics from 2006 to 2009 and as CFO of Therion Biologics from 2002 to 2006. Mr. Eldridge also served as CFO of Curis Inc. and Boston Life Sciences. Prior to entering the biotechnology field, Mr. Eldridge was an investment banker at Kidder Peabody. He holds a B.A. from Dartmouth College and an M.B.A. from University of Chicago, Booth School of Business.

## Daniel P. Gottlieb

### VP, Marketing and Business Development

Mr. Gottlieb joined Proteon in September 2007 and has served as the company's VP of Marketing and Business Development since March 2013, prior to which he was Senior Director of Marketing and Business Development from June 2010 until March 2013. Prior to joining Proteon, Mr. Gottlieb served as Strategic Marketing Manager of Endovascular Products at Abbott Vascular from 2006 to 2007. He has also held numerous positions at Guidant Corporation from 1999 to 2006. Mr. Gottlieb holds a B.A. from the University of Pennsylvania and an M.B.A from the Tuck School of Business at Dartmouth College.

## Exhibit 19: Proteon Therapeutics Income Statement

**Proteon Therapeutics (PRTO)** **Oppenheimer & Co.**

($000's) [FY - DEC]

| | 2012A | 2013A | 2014E | | | | | 2015E | | | | | 2016E | 2017E | 2018E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FY:12A | FY:13A | Q1A | Q2A | Q3E | Q4E | FY:14E | Q1E | Q2E | Q3E | Q4E | FY:15E | FY:16E | FY:17E | FY:18E |
| **Revenues from Product Sales** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9,044 |
| PRT-201 AVF Hemodialysis (US) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 9,044 |
| PRT-201 AVF Hemodialysis (EU) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Licensing revenue and Milestones** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total revenues** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 9,044 |
| Cost of Goods | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 904 |
| **Gross profit** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 8,140 |
| **Operating expenses** | | | | | | | | | | | | | | | |
| Research and development | 5,907 | 3,994 | 1,393 | 1,393 | 1,741 | 2,002 | 6,527 | 2,302 | 2,877 | 3,453 | 4,144 | 12,776 | 31,940 | 15,970 | 11,977 |
| Selling, general and administrative | 2,089 | 3,128 | 828 | 828 | 2,328 | 1,164 | 5,148 | 1,176 | 1,187 | 1,199 | 1,211 | 4,774 | 5,251 | 7,351 | 30,000 |
| Other | | - | | | | | | | | | | | | | |
| **Total expenses** | 7,996 | 7,122 | 2,221 | 2,221 | 4,069 | 3,166 | 11,675 | 3,478 | 4,065 | 4,652 | 5,355 | 17,550 | 37,191 | 23,321 | 41,977 |
| **Operating income** | (7,996) | (7,122) | (2,221) | (2,221) | (4,069) | (3,166) | (11,675) | (3,478) | (4,065) | (4,652) | (5,355) | (17,550) | (37,191) | (23,321) | (33,838) |
| Financial expense, net | - | (861) | (429) | (429) | (429) | - | (1,286) | - | - | - | - | - | - | - | - |
| Other income (expense) | (6,107) | (6,048) | (1,753) | (1,753) | - | - | (3,505) | - | - | - | - | - | - | - | - |
| **Pre-tax income** | (14,103) | (14,031) | (4,402) | (4,402) | (4,498) | (3,166) | (16,466) | (3,478) | (4,065) | (4,652) | (5,355) | (17,550) | (37,191) | (23,321) | (33,838) |
| Income tax expense (benefit) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Net income** | (14,103) | (14,031) | ($4,402) | ($4,402) | ($4,498) | ($3,166) | ($16,466) | ($3,478) | ($4,065) | ($4,652) | ($5,355) | ($17,550) | ($37,191) | ($23,321) | ($33,838) |
| Basic shares outstanding | 231 | 4,566 | 6,763 | 6,763 | 14,990 | 14,991 | 10,877 | 15,091 | 15,092 | 15,092 | 15,093 | 15,092 | 15,395 | 15,703 | 16,017 |
| Diluted shares outstanding | 231 | 4,566 | 6,763 | 6,763 | 14,990 | 14,991 | 10,877 | 15,091 | 15,092 | 15,092 | 15,093 | 15,092 | 15,395 | 15,703 | 16,017 |
| **GAAP EPS (basic and diluted)** | ($61.16) | ($3.07) | ($0.65) | ($0.65) | ($0.30) | ($0.21) | ($1.51) | ($0.23) | ($0.27) | ($0.31) | ($0.35) | ($1.16) | ($2.42) | ($1.49) | ($2.11) |
| Cash and Equivalents | $ 7,471 | $ 5,152 | $ - | $ 25,416 | $ 79,431 | $ 76,132 | $ 76,132 | $ 72,679 | $ 68,640 | $ 64,012 | $ 58,683 | $ 58,683 | $ 24,580 | $ 169 | $ (28,383) |

Source: Oppenheimer & Co. Inc., Company Reports

## Exhibit 20: Proteon Therapeutics Statement of Cash Flows

| Proteon Therapeutics, Inc. | 2012A | 2013A | 2014E | | | | | 2015E | | | | | 2016E | 2017E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ($000's) [FY - DEC] | FY:12A | FY:13A | Q1A | Q2A | Q3E | Q4E | FY:14E | Q1E | Q2E | Q3E | Q4E | FY:15E | FY:16E | FY:17E |
| Net income (loss) | (7,970) | (7,912) | (2,697) | (2,697) | (4,498) | (3,166) | (13,057) | (3,478) | (4,065) | (4,652) | (5,355) | (17,550) | (37,191) | (23,321) |
| Adjustments | | | | | | | | | | | | | | |
| Depreciation and amortization | 195 | 57 | 10 | 10 | 10 | 10 | 39 | 20 | 20 | 20 | 20 | 80 | 80 | 100 |
| Stock compensation expense | 110 | 155 | 25 | 25 | 25 | 25 | 99 | 25 | 25 | 25 | 25 | 100 | 105 | 200 |
| Revaluation of warrants | | | | | - | - | - | - | - | - | - | - | - | - |
| Impairment of bonds | | | | | - | - | - | - | - | - | - | - | - | - |
| Amortization of intangible asset | (5) | (65) | | | - | - | - | - | - | - | - | - | - | - |
| (Gain) loss from sale of assets | - | | | | - | - | - | - | - | - | - | - | - | - |
| Deferred tax provision | | | | | - | - | - | - | - | - | - | - | - | - |
| Excess tax benefit from share based compensation | | | | | | | - | | | | | - | - | - |
| Other | - | 747 | 421 | 421 | - | - | 841 | - | - | - | - | - | - | - |
| Changes in operating assets and liabilities | | | | | | | - | | | | | - | | |
| Accounts receivable | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Inventories | | | - | | - | - | - | - | - | - | - | - | - | - |
| Prepaid expenses and other current assets | 320 | 71 | (740) | (740) | - | - | (1,480) | - | - | - | - | - | - | - |
| Deferred revenue | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Accounts payable and other liabilities | (884) | 290 | 866 | 866 | (325) | (148) | 1,257 | - | - | - | - | - | 2,536 | (1,140) |
| **Cash flow from operations** | **(8,234)** | **(6,657)** | **(2,117)** | **(2,117)** | **(4,788)** | **(3,279)** | **(12,301)** | **(3,433)** | **(4,020)** | **(4,607)** | **(5,310)** | **(17,370)** | **(34,469)** | **(24,161)** |
| (Purchase)/Sale of available for sale securities | 7,417 | 2,672 | (7,220) | (7,220) | - | - | (14,440) | - | - | - | - | - | | |
| Purchase of fixed assets | (34) | 55 | (18) | (18) | (20) | (20) | (76) | (20) | (20) | (20) | (20) | (80) | (80) | (250) |
| Other | (1) | - | | | | | - | | | | | - | | |
| **Cash flow from investing** | **7,382** | **2,727** | **(7,238)** | **(7,238)** | **(20)** | **(20)** | **(14,516)** | **(20)** | **(20)** | **(20)** | **(20)** | **(80)** | **(80)** | **(250)** |
| Proceeds from issuances of common stock | | 21 | 12,282 | 12,282 | 58,823 | - | 83,386 | - | - | - | - | - | - | - |
| Proceeds from issuance of warrants | | | | | - | - | - | - | - | - | - | - | - | - |
| Payments of capital lease obligation | | | | | - | - | - | - | - | - | - | - | - | - |
| Proceed from the exercise of options and warrants | | | | | - | - | - | - | - | - | - | - | - | - |
| Proceeds from the issuance of convertible notes | (9) | 4,293 | | | - | - | - | - | - | - | - | | | |
| Excess tax benefit from stock-based compensation exp | | | | | - | - | - | - | - | - | - | - | - | - |
| Other | | | | | - | - | - | - | - | - | - | - | - | - |
| **Cash flow from financing** | **(9)** | **4,314** | **12,282** | **12,282** | **58,823** | **-** | **83,386** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Net increase (decrease) in cash | (861) | 384 | 2,927 | 2,927 | 54,015 | (3,299) | 56,569 | (3,453) | (4,040) | (4,627) | (5,330) | (17,450) | (34,549) | (24,411) |
| Cash and equivalents at beginning | 3,270 | 2,409 | 2,793 | 5,720 | 8,646 | 62,661 | 2,793 | 59,362 | 55,909 | 51,870 | 47,242 | 59,362 | 41,913 | 7,363 |
| **Ending Cash** | **2,409** | **2,793** | **5,720** | **8,646** | **62,661** | **59,362** | **59,362** | **55,909** | **51,870** | **47,242** | **41,913** | **41,913** | **7,363** | **(17,048)** |

Source: Oppenheimer & Co. Inc., company reports

## Exhibit 21: Proteon Therapeutics Balance Sheet

| Proteon Therapeutics, Inc. | 2012A | 2013E | 2014E | | | | | 2015E | | | | | 2016E | 2017E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ($000's) [FY - DEC] | FY:12A | FY:13A | Q1A | Q2A | Q3E | Q4E | FY:14E | Q1E | Q2E | Q3E | Q4E | FY:15E | FY:16E | FY:17E |
| **Assets** | | | | | | | | | | | | | | |
| Current Assets: | | | | | | | | | | | | | | |
| Cash and cash equivalents | 2,409 | 2,793 | | 8,646 | 62,661 | 59,362 | 59,362 | 55,909 | 51,870 | 47,242 | 41,913 | 41,913 | 7,363 | (17,048) |
| Investment securities | 5,062 | 2,359 | | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 | 16,770 |
| Accounts Receivable | - | - | | - | - | - | - | - | - | - | - | - | - | - |
| Inventories | - | - | | - | - | - | - | - | - | - | - | - | - | - |
| Deferred tax assets | | - | | - | - | - | - | - | - | - | - | - | - | - |
| Prepaid expense and other current assets | 232 | 178 | | 447 | 447 | 447 | 447 | 447 | 447 | 447 | 447 | - | - | - |
| **Total current assets** | **7,703** | **5,330** | **-** | **25,863** | **79,878** | **76,579** | **76,579** | **73,126** | **69,087** | **64,459** | **59,130** | **58,683** | **24,133** | **(278)** |
| Fixed assets, net | 79 | 62 | | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 |
| Intangible assets, net | | - | | - | - | - | - | - | - | - | - | - | - | - |
| Deferred tax assets | | 267 | | - | - | - | - | - | - | - | - | - | - | - |
| Other non-current assets | - | - | | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 | 1,194 |
| **Total assets** | **7,782** | **5,659** | **-** | **27,142** | **81,157** | **77,858** | **77,858** | **74,405** | **70,366** | **65,738** | **60,409** | **59,962** | **25,412** | **1,001** |
| **Liabilities** | | | | | | | | | | | | | | |
| Current liabilities: | | | | | | | | | | | | | | |
| Accounts payable | 469 | 399 | | 994 | 669 | 520 | 520 | 520 | 520 | 520 | 520 | 520 | 3,057 | 1,917 |
| Current maturities of Financials Liabilities | | 3,727 | | - | - | - | - | - | - | - | - | - | - | - |
| Accrued interest payable | | - | | - | - | - | - | - | - | - | - | - | - | - |
| Deferred revenue | | 2,948 | | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 | 2,948 |
| Accrued expenses and other | 735 | 2,694 | | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 | 2,006 |
| **Total current liabilities** | **1,204** | **9,768** | **-** | **5,948** | **5,623** | **5,474** | **5,474** | **5,474** | **5,474** | **5,474** | **5,474** | **5,474** | **8,011** | **6,871** |
| Warrants | | - | | - | - | - | - | - | - | - | - | - | - | - |
| Long-term portion of deferred revenue | 2,948 | - | | - | - | - | - | - | - | - | - | - | - | - |
| Long-term debt | | - | | - | - | - | - | - | - | - | - | - | - | - |
| Other | | - | | - | - | - | - | - | - | - | - | - | - | - |
| **Total liabilities** | **4,152** | **9,768** | **-** | **5,948** | **5,623** | **5,474** | **5,474** | **5,474** | **5,474** | **5,474** | **5,474** | **5,474** | **8,011** | **6,871** |
| **Total stockholders' equity** | **3,630** | **(4,109)** | **-** | **21,194** | **75,534** | **72,384** | **72,384** | **68,931** | **64,891** | **60,264** | **54,934** | **54,487** | **17,401** | **(5,870)** |
| **Total liabilities and equity** | **7,782** | **5,659** | **-** | **27,142** | **81,157** | **77,858** | **77,858** | **74,405** | **70,366** | **65,738** | **60,409** | **59,962** | **25,412** | **1,001** |

Source: Oppenheimer & Co., Company Reports

**Investment Thesis**

Our bullish investment thesis stems from our belief that PRT-201 is poised to become standard of care during hemodialysis access procedures if Phase 3 clinical studies are successful. In our view, the company's current market valuation does not fully reflect the full potential of PRT-201 to take meaningful share in the sizable hemodialysis access market. While the clinical trial risk associated with Phase 3 is appreciable, we believe PRTO shares represent a significantly favorable risk/reward proposition for investors with appropriate risk and time horizons.

**Price Target Calculation**

Our 12- to 18-month $18 price target for PRTO is derived from a sum-of-the-parts analysis of the company's development pipeline drugs, namely PRT-201. We value PRTO using a sum-of-parts probability-adjusted net present value (pNPV) approach, calculating anticipated profits from PRT-201 discounted at 10.5% through 2031 with no terminal value. We then adjust for clinical and regulatory risk by assigning an estimated probability of success. We currently assign a 54% probability of approval for PRT-201. Although we are optimistic that the Phase 3 studies will be positive, we account for the added risk associated with the Phase 2 subgroup analyses by assuming a lower chance of Phase 3 success compared to other drugs in pivotal trials.

**Key Risks to Price Target**

We would expect a material decline in PRTO shares in the event of unsuccessful US phase 3 programs for PRT-201. Our estimates assume the drug launching in 2H2018 based on a regulatory filing of a single pivotal study demonstrating efficacy in AVF. If the first Phase 3 study is positive, but the p-value associated with the primary endpoint isn't strong enough to support registration on a single pivotal, PRTO will need to wait for data from the second trial before seeking approval. In this scenario, the drug would then be launched roughly 1 year later than our current estimates.

Additional risks to our price target include commercial, competitive, reimbursement and IP-related risks that could imapct PRTO's ability to meet our sales estimates for PRT-201 after approval.

# Important Disclosures and Certifications

***Analyst Certification -*** The author certifies that this research report accurately states his/her personal views about the subject securities, which are reflected in the ratings as well as in the substance of this report. The author certifies that no part of his/her compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in this research report.

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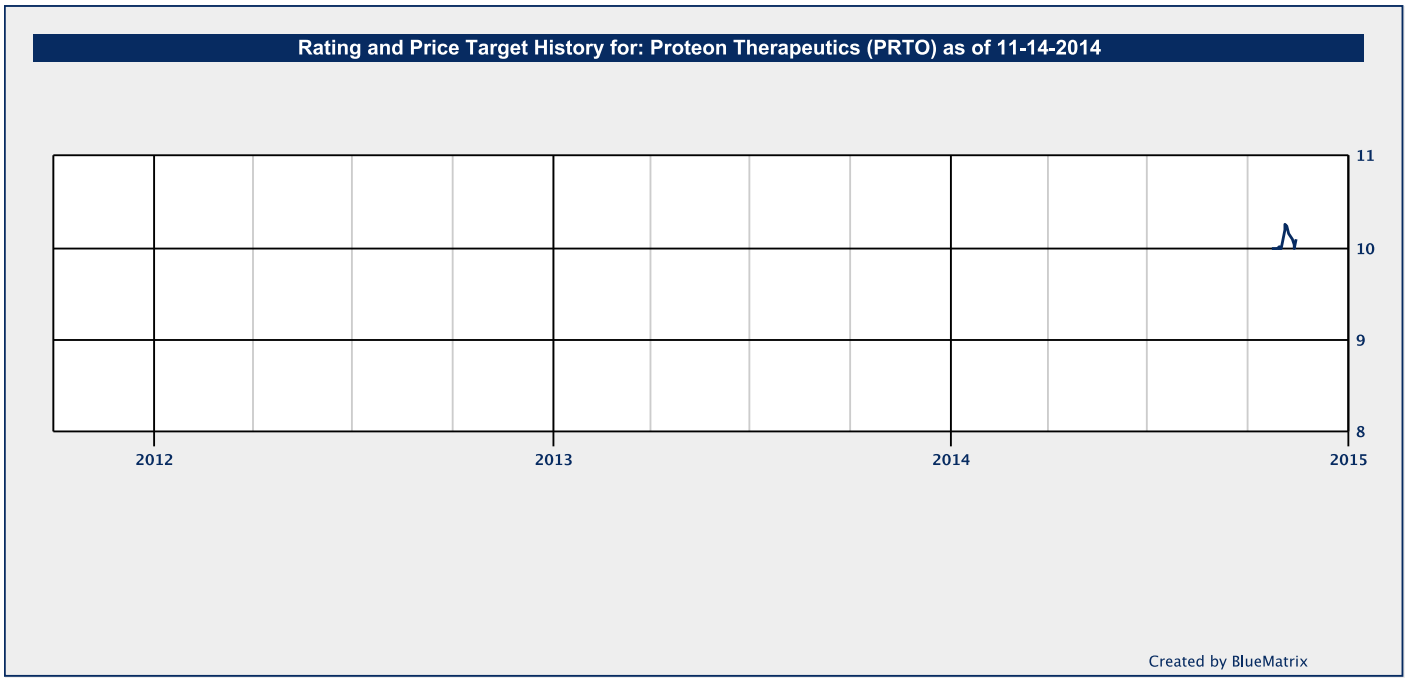


All price targets displayed in the chart above are for a 12- to- 18-month period. Prior to March 30, 2004, Oppenheimer & Co. Inc. used 6-, 12-, 12- to 18-, and 12- to 24-month price targets and ranges. For more information about target price histories, please write to Oppenheimer & Co. Inc., 85 Broad Street, New York, NY 10004, Attention: Equity Research Department, Business Manager.

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| | | | IB Serv/Past 12 Mos. | |
|---|---|---|---|---|
| Rating | Count | Percent | Count | Percent |
| OUTPERFORM [O] | 319 | 54.62 | 147 | 46.08 |
| PERFORM [P] | 258 | 44.18 | 96 | 37.21 |
| UNDERPERFORM [U] | 7 | 1.20 | 0 | 0.00 |

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In the past 12 months Oppenheimer & Co. Inc. has managed or co-managed a public offering of securities for PRTO.

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