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Atara Biotherapeutics

Biotechnology

US Equity Research
9 September 2015

BUY

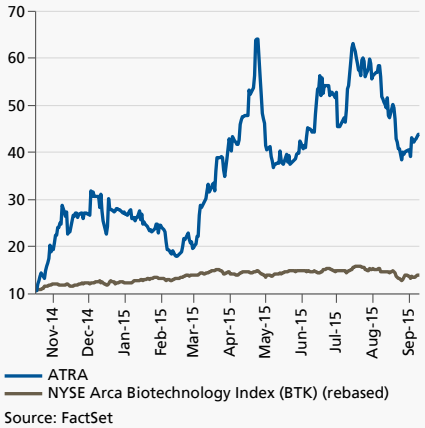
PRICE TARGET	US$80.00
Price (8-Sep)	US$43.78
Ticker	ATRA-NASDAQ

52-Week Range (US$):	9.66 - 65.56
Avg Daily Vol (000s) :	0.3
Market Cap (US$M):	1,060
Shares Out. (M) :	24.2

FYE Dec	2014A	2015E	2016E
Revenue (US$M)	0	0	0
EPS Adj&Dil (US$)	(8.50)	(2.03)	(4.65)

Quarterly Revenue	Q1	Q2	Q3	Q4
2014A	0	0	0	0
2015E	0A	0A	0	0
2016E	0	0	0	0

Quarterly EPS Adj&Dil	Q1	Q2	Q3	Q4
2014A	0.00	0.00	(4.20)	0.00
2015E	(0.41)A	(0.25)A	(0.69)	(0.65)
2016E	(0.88)	(0.96)	(1.41)	(1.35)



Source: FactSet

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Initiation of Coverage

High profile T-cell programs, muscle-wasting assets create broad pipeline value; initiating coverage with BUY, $80 PT

Multiple assets with impressive clinical data and near-term value-driving catalysts

- **T-cell programs show strong efficacy, off-the-shelf potential; est. ~$730M WW peak** - Atara is developing T-cell therapies based on research from MSKCC to treat diseases caused by Epstein-Barr virus (EBV) and cytomegalovirus (CMV) infections following stem cell and solid organ transplantation, where we estimate ~$730M worldwide peak sales. Data from EBV program has shown ~65% OS at two years in HSCT patients and ~58% OS at two years in SOT patients. Atara's T-cells can be generated and banked for later usage and do not require patient-specific generation, saving time and simplifying manufacturing. The platform could also be used in many other diseases beyond the lead indications, including other EBV or CMV-related cancers and diseases, adding an additional ~55,000 patients that we do not currently include in our valuation.
- **PINTA-745 could be $2.4B blockbuster in dialysis, data YE15 -** PINTA-745 is a myostatin blocker designed to build lean muscle mass, with positive data from ongoing Phase 2 in ESRD patients expected by YE15. We estimate ~$1.6B in US peak sales and $830M in EU peak sales by 2025 in ESRD. Protein-energy wasting (PEW) is present in up to 250,000 US dialysis patients based on a retrospective study conducted with dialysis provider DaVita. PINTA-745, a peptibody licensed from Amgen, has been shown to build and maintain muscle mass and also reduce inflammation, which has long been thought to contribute to kidney function decline and atherosclerosis.

Experienced management key to delivering value

Atara's management team is led by former Kleiner Perkins partner and ex-Celgene business development executive Dr. Isaac Ciechanover, who led licensing and M&A activities with an aggregate value of more than $6.7 billion. We view Dr. Ciechanover's experience at Celgene as very meaningful for investors and believe the licensing deal with Sloan Kettering for the T-cell programs and with Amgen for the company's peptibodies illustrate tangible value. Also, Atara's Chief Medical Officer, Dr. Christopher Haqq, was the lead clinician for a pivotal Zytiga study in prostate cancer leading to market approval, with additional experience at Amgen. Please see our full management section on page 37 of our report.

Establishing BUY rating, $80 price target

We are establishing a BUY rating and $80 price target for Atara based on an average of two valuation models. We utilize a sum-of-the-parts probability-adjusted NPV model with a 14% discount rate, and probability-adjust each indication between 30% and 50% based on the product and stage of development. Our effective discount rate is ~24% when taking into account probability adjustments. We also utilize a 5.5x multiple, based on a historical analysis of biotechnology companies, for an EV/S model.

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Investment thesis

We are initiating coverage of Atara Biotherapeutics (ATRA) with a BUY rating and $80 target price. Atara has a broad pipeline led by its T-cell program with Memorial Sloan Kettering Cancer Center (MSK), followed by assets targeting muscle wasting and ovarian cancer. The majority of Atara's assets target orphan diseases, which carry high pricing power and high operating margins. Unlike many development-stage biotechnology companies, Atara has multiple assets that we believe will ultimately be successful. We suspect Atara shares will trade higher based on continued success led by the company's T-cell programs, as well as progress for its PINTA asset targeting protein-energy wasting in dialysis patients.

Atara's T-cell program licensed from MSK has shown very strong efficacy data to date and is addressing an ~$505M market opportunity for Epstein-Barr Virus (EBV) in the US, and ~$173M for cytomegalovirus in hematopoietic stem cell transplant in the US. Both of these markets involve a small number of patients, and are orphan diseases carrying very high pricing power, especially due to the magnitude of benefit seen in Epstein - Barr virus in particular. Atara's T-cell technology may also prove broadly applicable in several additional indications where EBV occurs, including Hodgkin's lymphoma, diffuse large B-cell lymphoma, nasopharyngeal cancer, and gastric cancer. Atara may also successfully expand its T-cell technology into other indications where cytomegalovirus (CMV) is present, including HIV-associated retinitis and glioblastoma. Importantly, we do not currently value these additional indications, suggesting meaningful long-term upside potential to our model.

We believe PINTA-745 could ultimately become a blockbuster product in protein-energy wasting (PEW) for end-stage renal disease (ESRD), which we believe is a ~$1.7B addressable opportunity. The drug was licensed from Amgen which demonstrated interesting early results in three Phase 1 studies, suggesting an increase in lean muscle mass, which could translate into a benefit for dialysis patients, where myostatin is upregulated and blocks muscle growth. Atara is running a Phase 2 study for PINTA-745, where we expect positive clinical data by YE15. Importantly, Atara will be collecting data not only for changes in lean muscle mass, but also regarding quality of life measures, which we view as very important for dialysis patients.

Atara is also conducting a Phase 1 study for STM-434 targeting Activin-A in ovarian cancer, which adds modest value to our price target. We view STM-343 as giving Atara an angle into treatment of cancer directly, complementing its other asset, ATA-842, which is being tested in cachexia of cancer. Similar to PINTA-745, ATA-842 also targets myostatin, which may prevent muscle loss in cancer patients and serve as an important supportive care agent in oncology. These assets are earlier versus other drugs in Atara's pipeline, but add notable breadth for an early-stage biotechnology company.

Finally, Atara is very well capitalized, with an estimated ~$330M on its balance sheet at present, which should provide operational runway to early 2018. Given the substantial cash balance, Atara should be able to advance multiple programs simultaneously, increasing its chances of success.

Company overview

Atara Biotherapeutics is a clinical-stage biotechnology company focused on creating new therapeutics for serious unmet medical needs and conditions, with initial focus on viral-associated diseases (T-cell programs), muscle wasting conditions, and oncology. The company has in-licensed various assets from Amgen and Memorial Sloan Kettering Cancer Center (MSK) and has multiple Phase 1 and 2 studies ongoing. Atara is focused on novel biologic molecules targeting distinct mechanisms of action. All six of the company's assets are biologics, with no small molecules currently in the pipeline.

Atara has two groups of drug candidates: molecularly targeted biologics and T-cell programs. The molecularly targeted biologics have been licensed from Amgen and include: (1) PINTA-745, a peptibody targeting myostatin in Phase 2 for protein-energy wasting (PEW) disease, which affects many end-stage renal disease (ESRD) patients; (2) STM-434, a peptibody targeting Activin A in ovarian cancer and other solid tumors in Phase 1; and (3) five additional molecularly targeted product candidates modulating the TGF-β pathway in preclinical development.

The company is also developing an off-the-shelf T-cell program for use in multiple indications. The T-cell candidates were licensed from MSK in June 2015. T-cell candidates include: Epstein-Barr virus-CTL, which is being tested in Phase 2 for malignancies associated with Epstein-Barr virus (EBV) following hematopoietic stem cell and solid organ transplant, and cytomegalovirus-CTL, also being tested in Phase 2, but for cytomegalovirus viremia and infection associated with hematopoietic stem cell transplant. Finally, Atara is also studying Wilms Tumor 1–CTL, targeting cancers expressing the antigen Wilms Tumor 1 (WT1), which is being evaluated in acute myelogenous leukemia (AML) and multiple myeloma.

Atara currently maintains 100% of the worldwide commercial rights for every asset in its pipeline, except in Japan for PINTA-745 where it was previously licensed to Takeda, with only minimal royalties owed on various programs. Issued intellectual property for Atara's portfolio extends to as long as 2035 at present, and the pipeline is composed entirely of biologic molecules, where the barrier to entry from an FDA generic pathway is much higher than small molecules.

Valuation – establishing $80 price target

We are establishing a BUY rating and $80 price target for Atara Biotherapeutics utilizing a probability adjusted net present value calculation and a probability adjusted enterprise value to sales calculation. Our valuation includes the four clinical stage products for Atara at present: PINTA-745 for protein-energy wasting in end-stage renal disease, STM-434 in ovarian cancer, EBV-CTL and CMV-CTL. We project revenues for each product utilizing a detailed revenue build in both the US and ex-US, calculate either an NPV or EV/S value, and then apply a probability adjustment and discount back to the present to arrive at current value. Importantly, we also include development costs prior to product approval and launch in our NPV calculation.

Our **PINTA-745** peak sales estimates are $1.6B in the US by 2025 and $127M peak ex-US royalty by 2026. We conservatively assume that Atara partners ex-US rights for PINTA-745 and receives a royalty on net sales. We assume PINTA-745 is worth $22 in the US and $3 ex-US on an NPV basis, and $39 in the US and $3 Ex-US based on our EV/S calculation utilizing a 5.5x EV/S multiple on peak sales. For both valuation methodologies, we utilize a 40% probability adjustment, and a 14% discount rate, translating into an effective discount rate of 27%.

We estimate ~$185M US peak sales for **STM-434** by 2025 and ~$11M peak Ex-US royalty by 2026. STM-434 is worth ~$1 combined in the US and Ex-US based on our NPV valuation and $3 combined US and Ex-US based on our EV/S valuation. We currently utilize a 30% probability of success for STM-434. Importantly, we currently model STM-434 in ovarian cancer only, and do not include additional indications. Importantly, we only include ~8% of the ovarian cancer market that we estimate is Activin A positive.

Our model estimates ~$505M US peak sales for the **EBV-CTL** program, and ~$65M Ex-US peak royalties. We estimate EBV-CTL is worth ~$25 in the US and ~$7 Ex-US based on our NPV valuation, and ~$18 US and ~$2 Ex-US based on our EV/S estimate. Both valuation methods assume a 50% probability of success. Importantly, the market for EBV-CTL in terms of patients is very small, which should allow for orphan drug-like pricing, thus we assume ~$300k per patient in the US and ~$200k per patient Ex-US.

We also include value for the **CMV-CTL** program, where we project $173M US peak sales by 2025, and ~$36M Ex-US royalties by 2026. We include revenues for both solid organ and hematopoietic stem cell transplant use of CMV-CTL for cytomegalovirus infections. We value the CMV program at ~$2 using our probability adjusted NPV, which uses a 35% probability adjustment. Our EV/S valuation suggests a $4 value for the CMV-CTL program.

Figure 1: Atara – Valuation

Product	Peak Sales / Royalty ($MM)	Peak Year	NPV at launch ($MM)	Probability Adjustment	Current Value ($MM)	EV/S multiple	Value / Share NPV	Value / Share EV / S	Average NPV, EV / S
PINTA-745									
US	1,575	2025	3,360	40%	539	5.5	$22	$39	$31
Ex-US (royalty)	127	2026	329	40%	69	5.5	$3	$3	$3
STM-434									
US	185	2025	258	30%	(4)	5.5	($0)	$3	$2
Ex-US (royalty)	11	2026	94	30%	15	5.5	$1	$0	$0
EBV-CTL									
Hematopoetic Stem Cell Transplant									
US	164	2025	599	50%	228	5.5	$9	$6	$8
Ex-US (royalty)	42	2025	184	50%	62	5.5	$3	$1	$2
Solid Organ Transplant									
US	342	2023	1,153	50%	386	5.5	$16	$12	$14
Ex-US (royalty)	23	2022	289	50%	98	5.5	$4	$1	$2
CMV-CTL									
US	123	2025	217	35%	35	5.5	$1	$3	$2
Ex-US (royalty)	36	2026	95	35%	17	5.5	$1	$1	$1
Equity Value							**$60**	**$69**	$64
Total Equity Value							$60	$69	$64
Net Cash							$15	$15	$15
Value per share							**$75**	**$84**	**$80**
Shares Outstanding (MM)							24		

Risk-Free Rate	2%
Beta	1.3
Risk Premium	9%
Discount Rate	14%

Source: Company reports, Canaccord Genuity estimates

Catalysts – multiple drivers over next 12 months

We anticipate multiple catalysts to drive ATRA shares higher over the next 12 months, including positive data for PINTA-745 for protein-energy wasting in end-stage renal disease by YE15, additional data for ATRA's T-cell programs with Memorial Sloan Kettering Cancer Center by YE15, and early data for STM-434 in ovarian cancer and other solid tumors by mid-2016. We believe that positive data for multiple clinical programs will both reduce and diversify risk for ATRA shareholders.

Figure 2: Atara - Upcoming expected catalysts

Event	Timing	Description	Effect	Importance	Notes
Data	YE15	PINTA-745	↑	Critical	Results of Phase 2 in PEW in dialysis
Data	YE15	MSK T-cell programs	↑	Critical	Additional data
Data	1H16	STM-434	↑	High	Results of Phase 1 in ovarian and solid tumors

Source: Company reports; Canaccord Genuity estimates

Phase 2 PINTA-745 data YE15, significant driver

We expect positive Phase 2 data for PINTA-745 for protein-energy wasting among end-stage renal disease (ESRD) patients by YE15. We expect the study to show a meaningful change in lean body mass in a dose-dependent manner, with an acceptable safety profile. Importantly, PINTA-745 has previously shown a statistically significant increase in lean body mass in prostate cancer patients receiving androgen deprivation therapy after 29 days of dosing vs placebo, (2.2% ± 0.8% p = 0.008).

The current Phase 2 study for protein-energy wasting in ESRD is evaluating an intravenous administration of 3mg/kg dose weekly for 12 weeks, a 3 mg/kg dose weekly for 3 weeks, followed by 1mg/kg for 9 weeks, and a 6mg/kg dose weekly for 3 weeks, followed by 2 mg/kg for 9 weeks. PINTA-745 targets an addressable market opportunity of ~$5B, by our estimates, and we project US peak sales of ~$1.6B by 2026.

Expect T-cell program update by YE15

We would expect Atara to present updated data for its T-cell programs in EBV and CMV at upcoming scientific congresses by YE15, expanding on pervious data presented at ASCO and AACR in 2015.

STM-434 results expected 1H16 in ovarian cancer

Atara may present Phase 1 data for STM-434 in ovarian cancer and other solid tumors in early 2016, which may expand the number of programs with proof-of-concept clinical data. Atara is currently conducting a Phase 1 study for ATM-434 alone or in combination with liposomal doxorubicin in ovarian cancer or other solid tumors. STM-434 targets the Activin A receptor via a peptibody, with technology similar to PINTA-745. The study is open-label, with primary endpoints of maximum tolerated dose (MTD) and safety.

Risks to our outlook

Clinical risks

Atara Biotherapeutics is a clinical stage biotechnology company and we see various clinical regulatory, competitive, and safety risks to our rating and price target. Importantly, Atara's T-cell programs are not approved by FDA and could generate negative clinical data. Although clinical data for the T-cell program in EBV specifically has been encouraging, future clinical results here may be negative. The T-cell program for both EBV and CMV in solid organ transplant could generate results that are deemed not meaningful to physicians based on currently available therapies. Atara's T-cell therapies require HLA matching, which may be inadequate to insure safety. If unexpected safety signals surface in any of the ongoing clinical trials related to HLA matching, Atara may have to return to the autologous process of producing T-cells, resulting in higher cost, and longer timeline to approval.

The PINTA-745 program may also generate negative efficacy and/or safety data in the current Phase 1/2 trial and/or in subsequent trials. A previous Phase 1 study for PINTA-745 in muscle wasting in prostate cancer patients did suggest a statistically significant improvement in lean muscle mass, but also showed some signs of diarrhea at the highest dose. Although the study numbers were small, this could suggest that diarrhea could surface in the ongoing Phase 1/2 study, as PINTA-745 will be dosed at 3.0 mg/kg, but also at 6.0 mg/kg, where the 6.0 mg/kg dose was higher than tested in the prior study. Even if PINTA-745 shows acceptable efficacy and safety in Phase 1/2 for end-stage renal disease, the drug could show negative results in a larger Phase 3 trial.

The STM-434 program is early in development, and has not yet generated data in humans. The ongoing Phase 1 study could generate negative data in ovarian cancer and other solid tumors. Importantly, even if the study is successful, investors may question the commercial opportunity.

Manufacturing risks

Atara's T-cell programs carry higher manufacturing risk versus biologic antibodies and small molecules since they are generated from human samples in a complex manner. Atara could experience challenges in transferring manufacturing from MSK to a larger, commercial-scale facility. FDA may also request more stringent validation that the efficacy seen from the T-cell therapies generated from the large-scale facility are comparable to those seen at MSK. Also, any changes to the manufacturing process could affect the efficacy and safety of the T-cell products, requiring additional manufacturing refinement.

Although less complex, the PINTA-745 and STM-434 programs also carry manufacturing risk, as they are biologic products. Atara could experience manufacturing delays in terms of scale-up, etc. that could cause clinical and/or commercial delays, potentially resulting in downside to our Price Target and the share price. Also, FDA could require additional data on manufacturing, potentially delaying clinical and/or approval timelines.

Regulatory risks

Atara's programs are not approved by FDA and could carry higher regulatory risk than expected. Specifically, FDA could require long-term outcomes data for PINTA-745 in ESRD, requiring much longer clinical trials than we currently model, resulting in higher costs. In addition, the agency may allow for approval based on an increase in lean muscle mass, but could require very large trials post-approval, increasing R&D spend for Atara.

Atara's T-cell programs utilize a complex approach to generating T-cells reactive to specific antigens, which could result in FDA requiring more in-depth safety data than expected. The agency could also require a head-to-head study versus Rituxan, although Atara is generally focused on Rituxan failures at the current time.

Commercial and competitive risks

Atara may secure FDA approval for one or more products in its pipeline, but may generate revenues below our estimates. Also, the company may be unable to secure favorable reimbursement due to growing pressure on drug costs in the US. If Atara is required to price its drug(s) at a lower price than expected, or to offer substantial discounts and rebates to payors, revenues may be lower, and investors may be disappointed as a result.

The biotechnology sector is highly competitive, and current and/or future competitors may emerge for Atara's products that could result in materially lower revenues than projected. The oncology space in particular is characterized by very rapid uptake for new products, as well as rapid product switches when more effective or safer drugs for a given indication emerge. If competitive products enter the market from other companies with better efficacy and/or safety, they may rapidly erode market share from Atara.

Financial risks

Atara has no revenues, and may not have revenues for several years, during which time the company is likely to raise significant additional capital, resulting in potential dilution for shareholders. The company may not be able to raise the required capital to continue its ongoing clinical programs, resulting in a delay or discontinuation of one or more studies. Additionally, Atara may raise capital at a low share price, increasing the level of dilution to shareholders. The company may also raise more capital than expected, potentially resulting in more dilution for shareholders than expected.

Intellectual property risks

Atara's pipeline consists entirely of biologic assets, increasing the barriers to entry from an intellectual property standpoint, but other entities or companies may challenge the company's intellectual property portfolio. If other entities determine that Atara's intellectual property is invalid, Atara may be required to pay royalties to one or more parties, or damages if products pertaining to the patents are marketed. Also, intellectual property that Atara may file in the future may not be granted by the USPTO or other patent bodies, potentially decreasing the commercial runway for one of more products.

T-cell programs could peak at $730M combined worldwide

Atara has three clinical stage T-cell-based therapies under worldwide exclusive license from Memorial Sloan Kettering Cancer Center (MSK), where the technology has been developed and refined over two decades. The premise of the platform is to re-train a patient's immune system to recognize a specific antigen by introducing exogenous T-cells that have already been primed to that target. These agents are created from the blood of various donors (allogeneic) and banked for future therapeutic use. Patients are matched to the proper T-cell type, saving time and manufacturing costs.

EBV-CTL estimated at $505M peak in US

The most advanced of Atara's T-cell programs is EBV-CTL, targeting Epstein-Barr virus (EBV)-associated lymphomas, which can occur following bone marrow **and** solid organ transplant. We estimate peak sales for the product could reach $505M in the US and $65M in royalties ex-US. The program is completing Phase 2 trials and has received FDA Breakthrough Therapy Designation, potentially accelerating clinical development and regulatory approval timelines. We estimate approval to be in 2018. We believe that the ex-US market opportunity is substantial, but are currently modeling this as a royalty build.

CMV-CTL may peak at $173M in US

Additionally, Atara has two other cytotoxic T-cell therapies: CMV-CTL in Phase 2 for CMV-associated viremia and infection following bone marrow transplant, and WT1-CTL in Phase 1 for WT1-expressing ovarian cancers and other solid tumors. We estimate peak sales for CMV-CTL could reach $123M in the US and $36M in royalties ex-US. We believe that the Ex-US market opportunity is substantial, but are currently modeling this as a royalty build across all indications.

Figure 3: Atara's T-cell candidates

DRUG CANDIDATE	INDICATION	CURRENT DEVELOPMENT STATUS
EBV-CTL	Epstein-Barr virus -associated lymphomas (EBV-LPD) following allogenic hematopoietic stem cell transplantation (alloHCT) and solid organ transplantation (SOT)	Phase 2 (FDA Breakthrough Designation)
CMV-CTL	Cytomegalovirus (CMV)-associated viremia and infection resistant to anti-virals following allogenic hematopoietic stem cell transplantation (alloHCT)	Phase 2
WT1-CTL	Wilms Tumor 1-expressing solid tumors (AML, MM, ovarian cancers)	Phase 1

Source: clinicaltrial.gov

Epstein - Barr virus (EBV) program: estimate $505M US peak sales

We estimate EBV-CTL may peak at ~$164M in the US by 2025 for the treatment of rituximab-refractory EBV-associated lymphomas (EBV-LPD) following allogenic hematopoietic stem cell transplant (alloHCT), assuming accelerated FDA approval by 2018 based on receipt of Breakthrough Therapy Designation. We expect approval in 2019 for EBV-CTL for the treatment of rituximab-refractory EBV-associated lymphomas (EBV-LPD) following solid organ transplant (SoT), with revenues peaking at ~$342M in the US by 2023. We believe EBV-CTL will see rapid adoption assuming success in pivotal clinical trials and approval for a condition with high mortality and limited durable efficacy with current standard of care.

EBV post hematopoietic stem cell transplant

We model ~$164M US peak sales based on a detailed revenue build for EBV-CTL based on projected cases of ~8,850 alloHCT. We conservatively estimate ~1,400 of these patients will develop EBV-LPD, ~1,240 of which will fail to achieve a durable response to rituximab. Our model assumes a 45% peak share by 2025 in alloHCT. We assume $300,000 for a full cost of treatment at launch in 2018, increasing to $356,000 by 2025 assuming 2.5% price increases annually. Our resulting US peak sales estimate for EBV-CTL is ~$164M by 2025, after ~15% discounts and rebates.

Figure 4: EBV-CTL model in HSCT (US)

EBV-LPD (US) - HSCT	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Total hematopoetic stem cell transplants	**19,620**	**19,774**	**19,930**	**20,087**	**20,245**	**20,404**	**20,565**	**20,727**	**20,891**	**21,056**	**21,223**
allogeneic	8,422	8,464	8,506	8,549	8,591	8,634	8,677	8,721	8,764	8,808	8,852
Incidence of EBV-LPD (1-40%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Total HSCT patients with EBV	1,347	1,354	1,361	1,368	1,375	1,381	1,388	1,395	1,402	1,409	1,416
rituximab-treated patients	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
rituximab-failed patients	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
HSCT EBV patients failing Rituxan	1,179	1,185	1,191	1,197	1,203	1,209	1,215	1,221	1,227	1,233	1,239
% share EBV-CTL				10%	20%	35%	40%	45%	45%	45%	45%
Patients receiving EBV-CTL				120	241	423	486	549	552	555	558
Total cost				300,000	307,500	315,188	323,067	331,144	339,422	347,908	356,606
EBV-CTL HSCT demand ($000s)				35,904	73,971	133,349	156,990	181,934	187,415	193,061	198,877
inventory build / (drawdown)											
% discounts and rebates				(5,386)	(11,096)	(20,002)	(23,548)	(27,290)	(28,112)	(28,959)	(29,831)
Total EBV-CTL HSCT revenues ($000s)				**32,345**	**62,973**	**114,467**	**133,649**	**153,882**	**154,390**	**159,041**	**163,658**

Source: Company reports, Canaccord Genuity estimates

Ex-US, we model ~$283M peak sales by 2022 and a 15% royalty to ATRA, or ~$42M for EBV-CTL in hematopoetic stem cell transplant patients. We assume ~16,300 cases of alloHCT in the EU by 2022. We conservatively estimate ~2,600 of these patients will develop EBV-LPD, ~2,300 of which will fail to achieve a durable response to rituximab. Our model assumes a 45% peak share by 2022 in alloHCT. We assume a cost of $300,000 for a full cost of treatment at launch, and do not include price increases based on policies from the EU payor system. Our resulting EU peak sales estimate for EBV-CTL is ~$283M by 2022, after ~15% discounts and rebates.

Figure 5: EBV-CTL model in HSCT (EU)

EBV-CTL (EU) - HSCT	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Total hematopoetic stem cell transplants	39,657	40,213	40,779	41,355	41,941	42,538	43,146	43,764	44,394	45,035	45,687
allogeneic	15,815	15,894	15,974	16,053	16,134	16,214	16,295	16,377	16,459	16,541	16,624
Incidence of EBV-LPD (1-40%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Total HSCT patients with EBV	2,530	2,543	2,556	2,569	2,581	2,594	2,607	2,620	2,633	2,647	2,660
% failing Rituxan	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
HSCT EBV patients failing Rituxan	2,214	2,225	2,236	2,247	2,259	2,270	2,281	2,293	2,304	2,316	2,327
% share EBV-CTL				10%	20%	35%	40%	45%	45%	45%	45%
Patients receiving EBV-CTL				225	452	795	913	1,032	1,037	1,042	1,047
Cost per dose				100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Doses per year				3	3	3	3	3	3	3	3
Annual cost				300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
% adherence				100%	100%	100%	100%	100%	100%	100%	100%
Total cost				300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
EBV-CTL HSCT demand ($000s)				67,424	135,523	238,351	273,763	309,523	311,071	312,626	314,189
inventory build / (drawdown)											
% discounts and rebates				(10,114)	(20,328)	(35,753)	(41,064)	(46,428)	(46,661)	(46,894)	(47,128)
Total EBV-CTL HSCT revenues EU ($000s)				**63,650**	**124,143**	**219,290**	**250,776**	**282,571**	**280,114**	**281,514**	**282,922**
% royalty				15%	15%	15%	15%	15%	15%	15%	15%
Royalty to Atara				$ 9,547	$ 18,621	$ 32,893	$ 37,616	$ 42,386	$ 42,017	$ 42,227	$ 42,438

Source: Company reports, Canaccord Genuity estimates

Estimate $342M US peak for EBV-CTL in solid organ transplant

Atara is also evaluating EBV-CTL in patients where EBV reactivation occurs post-solid organ transplant leading to EBV-associated lymphomas. We model ~31,000 solid organ transplants in the US by 2023, and assume ~6% have EBV-LPD, or ~1,850 by 2023. We also assume that ~88% fail Rituxan treatment, or ~1,600 patients. We model ~40% share for EBV-CTL by 2023, or ~649 patients at ~$340,000, resulting in our $342M estimate.

Figure 6: EBV-CTL model in SoT (US)

EBV-LPD (US) - SoT	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Total solid organ transplants	29,680	29,828	29,977	30,127	30,278	30,429	30,581	30,734	30,888	31,042	31,353
Incidence of EBV-LPD (1-20%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Total SoT patients with EBV	1,781	1,790	1,799	1,808	1,817	1,826	1,835	1,844	1,853	1,863	1,881
% failing Rituxan	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
HSCT EBV patients failing Rituxan	1,558	1,566	1,574	1,582	1,590	1,598	1,606	1,614	1,622	1,630	1,646
% share EBV-LPD				5%	15%	25%	30%	35%	40%	40%	40%
Patients receiving EBV-CTL				79	238	399	482	565	649	652	658
Total cost				300,000	307,500	315,188	323,067	331,144	339,422	347,908	356,606
EBV-CTL SoT demand ($000s)				23,725	73,319	125,880	155,607	187,010	220,164	226,797	234,792
inventory build / (drawdown)											
% discounts and rebates				(3,559)	(10,998)	(18,882)	(23,341)	(28,052)	(33,025)	(34,020)	(35,219)
Total EBV-LPD SoT revenues ($000s)				**20,166**	**62,321**	**106,998**	**132,266**	**158,959**	**187,140**	**192,777**	**199,573**
Total EBV-CTL revenues - US ($000s)				**52,511**	**125,295**	**221,465**	**265,915**	**312,841**	**341,530**	**351,818**	**363,231**

Source: Company reports, Canaccord Genuity estimates

Ex-US, we model ~$435M peak sales for EBV-CTL in solid organ transplant by 2022. We model ~33,000 solid organ transplants, and ~6% EBV reactivation, resulting in ~1,950 patients with EBV-LPD post solid organ transplant in the EU. We assume 88% fail Rituxan treatment, resulting in ~1,700 patients eligible for EBV-CTL therapy. We assume 35% share for EBV-CTL by 2023, or ~600 patients on drug at a cost of ~300,000 per dose, resulting in our EU peak sales estimate for EBV-CTL in patients post solid organ transplant. We assume a 15% royalty to Atara after 15% discounts and rebates, resulting in ~$23M by 2022.

Figure 7: EBV-CTL model in SOT (EU)

EBV-LPD (EU) - SOT	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Total solid organ transplants	31,477	31,635	31,793	31,952	32,112	32,272	32,434	32,596	32,759	32,923	33,087
Incidence of EBV-LPD (1-20%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Total SoT patients with EBV	1,889	1,898	1,908	1,917	1,927	1,936	1,946	1,956	1,966	1,975	1,985
% failing Rituxan	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
HSCT EBV patients failing Rituxan	1,653	1,661	1,669	1,677	1,686	1,694	1,703	1,711	1,720	1,728	1,737
% share EBV-LPD				5%	15%	25%	30%	35%	40%	40%	40%
Patients receiving EBV-CTL				84	253	424	511	599	688	691	695
Cost per dose				100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Doses per year				3	3	3	3	3	3	3	3
Annual cost				300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
% adherence				100%	100%	100%	100%	100%	100%	100%	100%
Total cost				300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
EBV-CTL SoT demand ($000s)				25,162	75,864	127,072	153,249	179,684	206,380	207,412	208,449
inventory build / (drawdown)											
% discounts and rebates				(3,774)	(11,380)	(19,061)	(22,987)	(26,953)	(30,957)	(31,112)	(31,267)
Total EBV-LPD SoT revenues ($000s)				**21,388**	**64,484**	**108,011**	**130,262**	**152,732**	**175,423**	**176,300**	**177,182**
% royalty				15%	15%	15%	15%	15%	15%	15%	15%
Royalty to Atara				$ 3,208	$ 9,673	$ 16,202	$ 19,539	$ 22,910	$ 26,313	$ 26,445	$ 26,577

Source: Company reports, Canaccord Genuity estimates

Rituxan efficacy limited for Epstein-Barr virus in HSCT

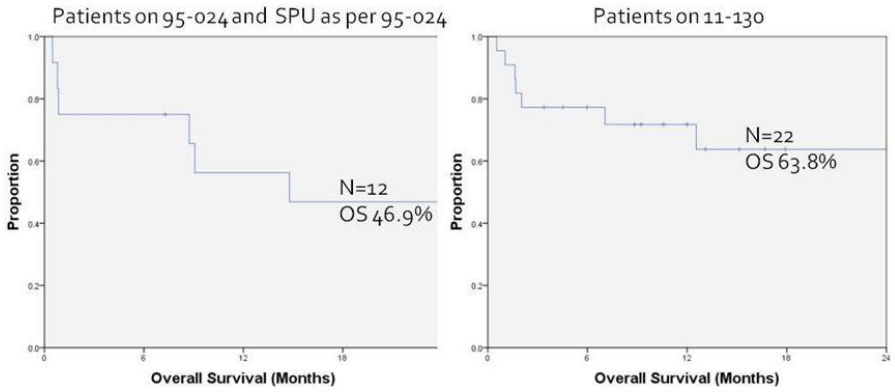
Prior to transplantation, patients undergo a conditioning process to prevent graft rejection or GvHD (graft vs. host disease) by depleting T-cells within the grafts. These conditioning regimens may include immunosuppressants, chemotherapy or radiation therapy. As a result of T-cell depletion, Epstein-Barr virus (EBV), normally a latent virus carried by 90% of the world population, is reactivated in 30-60% of transplant patients. Data on the use of antivirals are inconclusive, both as prophylaxis and as treatment. Consequently, up to 7% of alloHCT transplant patients and up to 10% of SOT patients may develop EBV-associated lymphoproliferative diseases (EBV-LPD). The disease is typically characterized as an aggressive B-cell malignancy, with median survival of 31 days without treatment in HCT patients, and high mortality across both transplant groups with high risk features.

There is currently no FDA-approved treatment for EBV-LPD, although rituximab is often used off-label. Multi-agent chemotherapy +/- rituximab is also an option for some patients, but it is associated with significant toxicity and mortality. Rituximab is most effective in treating prior to (e.g. viremia) or during early signs of clinical disease, but efficacy can be limited by a lack of CD20 expression. Durable responses have been seen in approximately 25-50% of alloHCT, but patients who fail therapy have a median overall survival of just 16-56 days. Two-year overall survival in SOT patients is approximately 33%.

Very strong EBV data in HSCT post-Rituxan encouraging

Atara has shown positive data in EBV-associated lymphoproliferative diseases (EBV-LPD) in patients undergoing hematopoietic stem cell transplantation (HSCT), based on two studies conducted at MSK. Investigators from MSK presented interim Phase 2 results from the two ongoing Phase 2 trials at ASCO 2015 demonstrating an impressive ORR of 65% across 34 alloHCT recipients, with 19 complete responses (CR) and 3 partial responses (PR). At the time of the presentation, the lead investigator reported that no patients who achieved CR or PR responses had died from EBV lymphoma. This efficacy was seen with minimal toxicity, including no reported cases of infusion-related reactions, cytopenia or cytokine release syndrome. There was one minor case of GvHD that was resolved with topical steroids. The company expects the trials to be completed in 2016. EBV-CTL received Breakthrough Therapy Designation from the FDA in March 2015 for the drug in EBV-LPD in HSCT, potentially enabling the company to expedite development and regulatory timelines.

Figure 8: Durable efficacy seen in alloHSCT patients during interim Phase 2



Source: Prockop S. ASCO 2015; Company Reports

Figure 9: Current clinical trials - EBV-CTL

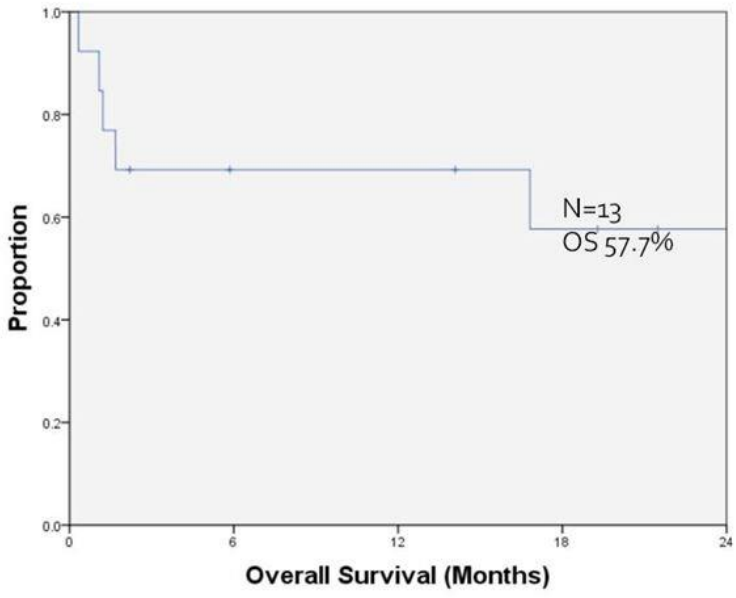
Drug	Title	Trial	Inclusion	Study Arm	Endpoints
EBV-CTL	Biological Therapy in Treating Patients at High-Risk or With Lymphoma, Lymphoproliferative Disease, or Malignancies	Trial Identifiers: 95-024 NCT00002663 Phase: 1/2 Study Start to Est Completion: Mar 1995 - Mar 2016 Enrollment: 84	EBV-positive LPD immunocompromised	AlloSCT recipients	Primary Safety, MTD, PK, Efficacy (2 years)
EBV-CTL	Therapeutic Effects Of Epstein-Barr Virus Immune T-Lymphocytes Derived From A Normal HLA-Compatible Or Partially- Matched Third-Party Donor in the Treatment of EBV Lymphoproliferative Disorders and EBV-Associated Malignancies	Trial Identifiers: 11-130 NCT01498484 Phase: 2 Study Start to Est Completion: Dec 2011- Dec 2016 Enrollment : 112	EBV-positive LPD immunocompromised	AlloSCT recipients SoT recipients	Primary Efficacy (3 weeks) Secondary Disease free (6 months) Complete remission

Source: clinicaltrials.gov

EBV data in solid organ transplant also robust

Atara is also testing its EBV-CTL drug in patients that have Epstein-Barr virus following a solid organ transplant (SOT). Early data are very encouraging, with a 57.7% survival rate at 2 years, comparing favorably to a 33% survival rate for rituximab (Figure 10). The study involved n=13 patients and was conducted at MSK in New York. One patient had a CR going past 22 month.

Figure 10: EBV-CTL: 2-year OS in solid organ transplant (interim Phase 2)



Source: Prockop S. ASCO 2015; Company Reports

The ongoing Phase 2 study (11-130) includes both alloHCT and SOT patients with an estimated total enrollment of n=112, with primary endpoint of response. The company expects trial completion in YE2016, and will then discuss future plans with FDA.

Cytomegalovirus program adds $173M in US

CMV-CTL is Atara's second T-cell candidate. Similar to Epstein-Barr virus, cytomegalovirus (CMV) can also occur following allogeneic hematopoietic cell transplantation (alloHCT) and can cause multi-organ disease. CMV-CTL is being evaluated in two Phase 2 trials in CMV-associated infection and persistent viremia following alloHCT.

Figure 11: Current clinical trials for Atara and MSKCC with CMV-CTL

Drug	Title	Trial	Inclusion	Study Arms	Endpoints
CMV-CTL	Trial of Third Party Donor Derived CMVpp65 Specific T-cells for The Treatment of CMV Infection or Persistent CMV Viremia After Allogeneic Hematopoietic Stem Cell Transplantation	14-070 Phase 2 NCT02136797 Study Start to Est Completion: May 2014 - Mar 2017 Enrollment: 41	CMV Infection Persistent CMV Viremia	Single arm	Primary Efficacy (Complete Response) Secondary Safety
CMV-CTL	Primary Transplant Donor Derived CMVpp65 Specific T-cells for The Treatment of CMV Infection or Persistent CMV Viremia After Allogeneic Hematopoietic Stem Cell Transplantation	12-086 Phase 2 NCT01646645 Study Start to Est Completion: Jul 2012- Jul 2016 Enrollment: 80	CMV Infection Persistent CMV Viremia	Single arm	Primary Efficacy (Complete Response) (3 years) Secondary Safety (3 years)

Source: clinicaltrial.gov

We estimate US peak sales of ~$123M for CMV-CTL in the US by 2025, based on usage in patients who fail prophylactic antiviral treatment for CMV. We estimate ~9,300 alloHCTs in the US by 2025, based on data from the US Health Resources and Services Administration Blood Cell Transplant report. Our model assumes 65% of these patients are CMV positive, or ~6,000 by 2025. We assume that all patients are treated prophylactically with antiviral therapy, with ~20% failing treatment and becoming eligible for Atara's CMV-CTL treatment, or ~1,200 patients by 2025. We model ~30% market share for CMV-CTL by 2025, or ~363 patients on therapy. We assume a cost of ~$113,000 per dose and ~3 doses per patient, arriving at a total cost per patient of ~$338,000. Multiplying by 363 patients on drug, we calculate ~$123M US peak sales by 2025.

Figure 12: EBV-CTL US revenue build – CMV in allogenic stem cell transplant

Transplants (US)	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Allogenic stem cell translant	8,421	8,506	8,591	8,677	8,763	8,851	8,939	9,029	9,119	9,210	9,302
Autologous stem cell transplant	11,088	11,199	11,311	11,424	11,538	11,653	11,770	11,888	12,006	12,127	12,248
Total Stem Cell transplants	19,509	19,704	19,901	20,100	20,301	20,504	20,709	20,916	21,126	21,337	21,550
% CMV positive	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Total CMV +ive AlloSCT	**5,474**	**5,529**	**5,584**	**5,640**	**5,696**	**5,753**	**5,811**	**5,869**	**5,927**	**5,987**	**6,047**
% patients failing prophylactic antiviral	**1,095**	**1,106**	**1,117**	**1,128**	**1,139**	**1,151**	**1,162**	**1,174**	**1,185**	**1,197**	**1,209**
CMV-CTL share	0%	0%	0%	0%	5%	10%	15%	20%	25%	30%	30%
Patients on therapy	0	0	0	0	57	115	174	235	296	359	363
Cost per dose					100,000	102,000	104,040	106,121	108,243	110,408	112,616
Doses per year					3	3	3	3	3	3	3
Annual cost					300,000	306,000	312,120	318,362	324,730	331,224	337,849
% adherence					100%	100%	100%	100%	100%	100%	100%
Total cost					300,000	306,000	312,120	318,362	324,730	331,224	337,849
CMV-CTL demand ($000s)											
inventory build / (drawdown)											
% discounts and rebates											
Total CMV-CTL revenues ($000s)					**17,088**	**35,209**	**54,409**	**74,736**	**96,241**	**118,977**	**122,570**

Source: Company reports, Canaccord Genuity estimates

Project $238M EU peak for EBV-CTL in CMV by 2026

We estimate EU peak sales of ~$238M for CMV-CTL in the EU by 2026, based on usage in patients who fail prophylactic antiviral treatment for CMV, and project a 15% royalty to Atara totaling $36M, as we conservatively estimate that the company will partner in the EU. We estimate ~17,400 alloHCTs in the EU by 2025. Our model assumes 65% of these patients are CMV positive, or ~11,400 by 2026. We assume that all patients are treated prophylactically with antiviral therapy, with ~20% failing treatment and becoming eligible for Atara's CMV-CTL treatment, or ~2,300 patients by 2026. We model ~35% market share for CMV-CTL by 2026, or ~795 patients on therapy. We assume a cost of ~$100,000 per dose and ~3 doses per patient, arriving at a total cost per patient of ~$300,000. Multiplying by 795 patients on drug, we calculate ~$238M EU peak sales by 2026.

Figure 13: EBV-CTL CMV revenue model - EU

Transplants (EU)	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Allogenic stem cell translant	15,660	15,816	15,974	16,134	16,295	16,458	16,623	16,789	16,957	17,127	17,298	17,471
Autologous stem cell transplant	22,919	23,148	23,379	23,613	23,849	24,088	24,329	24,572	24,818	25,066	25,316	25,570
Total Stem Cell transplants	38,578	38,964	39,354	39,747	40,145	40,546	40,951	41,361	41,775	42,192	42,614	43,040
% CMV positive	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
Total CMV +ive AlloSCT patients	**10,179**	**10,280**	**10,383**	**10,487**	**10,592**	**10,698**	**10,805**	**10,913**	**11,022**	**11,132**	**11,244**	**11,356**
% patients failing prophylactic antiviral	**2,036**	**2,056**	**2,077**	**2,097**	**2,118**	**2,140**	**2,161**	**2,183**	**2,204**	**2,226**	**2,249**	**2,271**
CMV-CTL share (%)	**0%**	**0%**	**0%**	**0%**	**0%**	**5%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**
Patients on therapy	0	0	0	0	57	115	174	235	296	359	363	427
Patients on CMV-CTL						**107**	**216**	**327**	**441**	**557**	**675**	**795**
Total cost						300,000	300,000	300,000	300,000	300,000	300,000	300,000
CMV-CTL demand ($000s)												
inventory build / (drawdown)												
% discounts and rebates												
Total CMV-CTL revenues EU ($000s)						**32,094**	**64,829**	**98,217**	**132,265**	**166,985**	**202,385**	**238,477**
% royalty								15%	15%	15%	15%	15%
Royalty to Atara								$ 14,732	$ 19,840	$ 25,048	$ 30,358	$ 35,772

Source: Company reports, Canaccord Genuity estimates

Early CMV data encouraging

Interim data on n=38 patients from the Phase 2 proof-of-concept trial was presented at ASH 2014. Despite antiviral drugs, n=12 had over clinical disease and n=26 had CMV viremia. Of 25 evaluable patients, there were 5 CRs and 9 PRs. There were limited toxicities observed associated with CMV-CTL therapy. No patients developed GvHD in the study. The study demonstrated robust efficacy in a difficult to treat patient population.

Long list of additional T-cell indications attractive

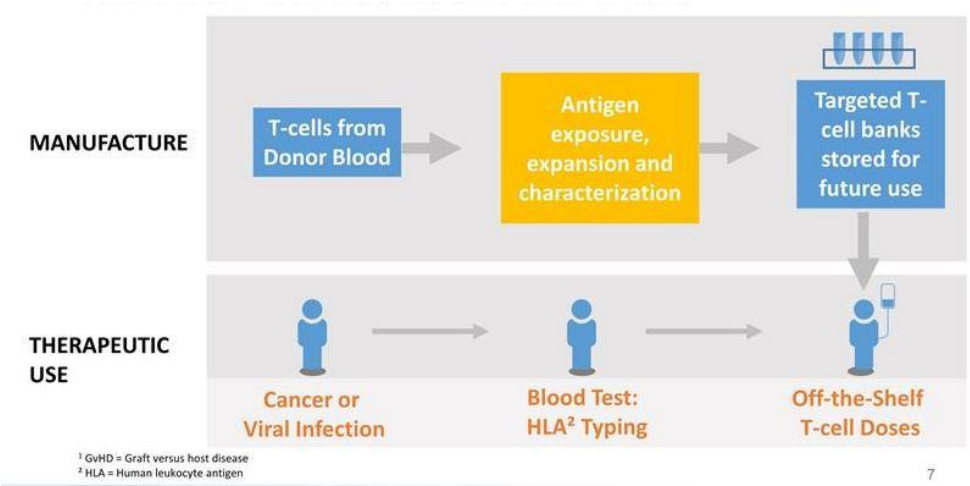
Beyond the lead programs for EBV-CTL and CMV-CTL, we believe both agents may have broader therapeutic utility against other EBV and CMV viral-mediated diseases. Cumulatively, other EBV-related cancers (i.e. Hodgkin's lymphoma, nasophyaryngeal and gastric cancers) could translate into another 30,000 patients that may benefit from EBV-CTL, and other CMV-related diseases (i.e. retinitis, GBM and congenital CMV) could add an additional 33,000 patients that may benefit from CMV-CTL. Additionally, WT1-CTL, Atara's third T-cell candidate, adapts the technology to non-viral targets and expands the platform into targeted agents in oncology.

Off-the-shelf capability simplifies manufacturing

Unlike other experimental approaches within immunotherapy, such as CAR-T, that engineer personalized T-cell therapies based on blood samples collected from individual patients, Atara and MSK take a semi-personalized, off-the-shelf approach, which reduces and simplifies production and ensures on-demand availability.

Cytotoxic T-lymphocytes (CTLs) are produced by exposing the whole blood of third-party donors to specific viral (in the case of EBV and CMV) or cellular (in the case of WT1) antigens. This results in activated T-cells that are specific to the antigen that can be characterized, immunologically type-matched and banked for future therapeutic use.

Figure 14: CTL production



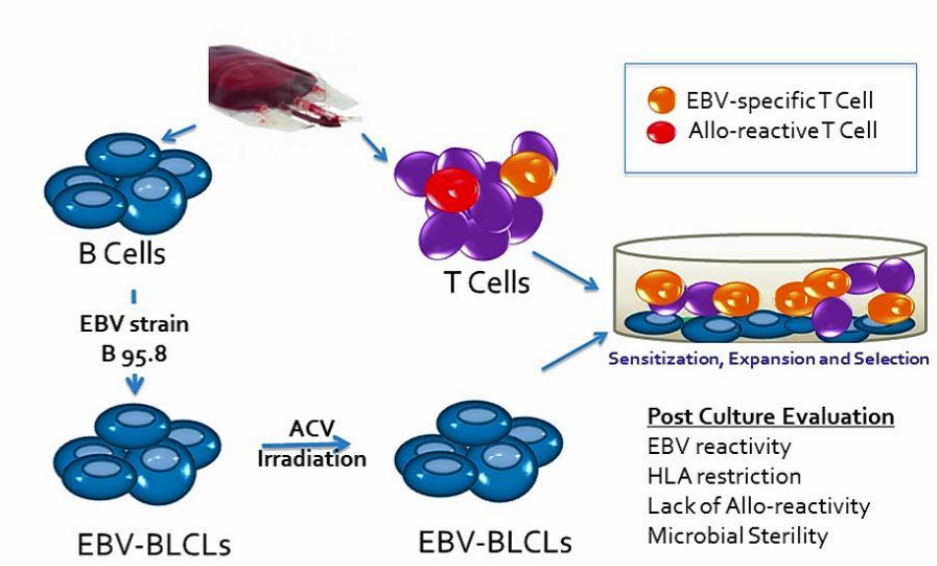
Source: Company reports

MSK has developed this technology and science in over two decades of research. The first report (Papadopoulous, 1994) supporting the use of donor-derived bulk T-cells in EBV-LPD demonstrated a 100% response in 5 patients, but 40% of patients developed GvHD. In subsequent years; the process was improved by eliminating allo-reactive T-cells associated with GvHD from donor-derived blood and only expanding EBV-specific T-cells ex-vivo. This process, however, still required the availability of an eligible donor and up to eight weeks to generate the product for the specific patient. Atara's approach takes blood samples from consenting healthy donors and generates a growing library of 330 fully characterized EBV-CTLs under good manufacturing practice (GMP) conditions.

By utilizing T-cells harvested from third-party healthy donors, Atara's T-cell products can be prepared in advance, fully characterized, banked, and made ready for off-the-shelf use. This ensures availability which is of extreme importance within diseases where survival is measured in days. Atara's current products have little to no GvHD. This ensures an adequate match to the specific EBV-specificity in up to 98% of patients.

Specifically, MSK and Atara generate EBV cytotoxic T-cell lines by transforming B-cells with a laboratory-strain of the EBV (B95.8). These transformed B-cells present EBV-antigen. They are irradiated, and cold cultured from the T-cells from the same donor leukophoresis. The culture is re-stimulated weekly for a month. And over that time, EBV-specific T-cells (indicated in gold) are expanded and sensitized, while potentially allo-reactive T-cells are not. At the end of that period, the culture is accessed for its EBV-specificity, HLA restriction, lack of allo-reactivity and sterility, and is frozen for future use. Atara has demonstrated that the EBV-specificity and absence of allo-reactivity translates to the in-vivo behavior of these cells.

Figure 15: EBV-specific T-cell generation



Source: Company reports

Muscle wasting asset PINTA-745 potential blockbuster at $1.7B

PINTA-745 is a myostatin inhibitor currently being evaluated for the treatment of protein-energy wasting (PEW), a serious complication characterized by depletion of protein and fat stores within the body, and a strong predictor of mortality in end-stage renal disease (ESRD) patients. We estimate peak sales for the product could reach $1.6B in the US by 2025 and $127M ex-US royalties by 2026. The program is one of two clinical-stage peptibody compounds licensed from Amgen in 2012. Atara holds worldwide rights to the molecule except for Japan where it was previously licensed to Takeda. We expect data from the recently completed Phase 1/2 trial in PEW to read out at by year end.

Estimate $1.6B US peak sales by 2025

We estimate US revenues of PINTA-745 may peak at ~$1.6B within the PEW in ESRD indication alone. Assuming initiation of an 18-month US pivotal Phase 3 in 2016, we conservatively estimate approval by 2020. As there is currently no approved standard of care for this serious condition, we believe PINTA-745 might qualify for a FDA expedited review program (possibly Breakthrough Therapy Designation with strong Phase 2 data) and, once approved, will see rapid adoption assuming success in pivotal clinical trials and approval for this condition.

We model ~$1.6B US peak sales in 2025 based on a detailed revenue build for PEW in ESRD based on epidemiology data from the US Renal Data System (USRDS) of 463,000 patients undergoing dialysis in 2015, with approximately half of these patients experiencing PEW. We assume an annual cost of $26,000 at launch, increasing to $28,700 by 2025 assuming a 2.5% price increase annually. We also adjust for adherence, which we project at 85%.

Figure 16: PINTA-745 in PEW (US) revenue model

PEW (US)	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Total ESRD	675,824	689,340	703,127	717,190	731,533	746,164	761,087	776,309	791,835	807,672	823,825
Total transplant	191,948	193,868	195,806	197,764	199,742	201,739	203,757	205,794	207,852	209,931	212,030
Total non-transplant patients	462,958	467,587	472,263	476,986	481,755	486,573	491,439	496,353	501,317	506,330	511,393
Hemodialysis	421,095	425,306	429,559	433,855	438,194	442,575	447,001	451,471	455,986	460,546	465,151
Peritoneal Dialysis	41,862	42,281	42,704	43,131	43,562	43,998	44,438	44,882	45,331	45,784	46,242
Total patients with PEW	250,000	252,500	255,025	257,575	260,151	262,753	265,380	268,034	270,714	273,421	276,156
as % of non-transplant ESRD patients	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
% share											
PINTA745						5%	12%	17%	22%	28%	28%
nutritional support											
PINTA745 treated patients						13,138	31,846	45,566	59,557	75,191	75,943
Cost per dose						500	510	520	531	541	552
Doses per year						52	52	52	52	52	52
Annual cost						26,000	26,520	27,050	27,591	28,143	28,706
% adherence						85%	85%	85%	85%	85%	85%
Total cost						22,100	22,542	22,993	23,453	23,922	24,400
PNTA745 demand ($000s)						290,342	717,864	1,047,686	1,396,775	1,798,697	1,853,018
inventory build / (drawdown)											
% discounts and rebates						(43,551)	(107,680)	(157,153)	(209,516)	(269,805)	(277,953)
Total US PNTA745 revenues ($000s)						**246,790**	**610,184**	**890,533**	**1,187,259**	**1,528,893**	**1,575,065**

Source: Company reports; Canaccord Genuity estimates; USRDS reports

Ex-US adds $830M peak by 2025

We estimate revenues for PINTA-745 may peak at ~$830M ex-US within the PEW in ESRD indication, equating to $124M in royalties. We believe that there is an appreciable ex-US market opportunity but conservatively model it as a royalty build and include only the EU. Assuming an initiation of an 18-month EU pivotal Phase 3 trial, we estimate approval in 2021. Importantly, we do not assume price increases in the EU, and we assume a 25% price discount to the US.

Figure 17: PINTA-745 in PEW (ex-US) revenue model

PEW (EU)	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Total ESRD	525,300	535,806	546,522	557,453	568,602	579,974	591,573	603,405	615,473	627,782	640,338
Transplant											
Total non-transplant patients	341,445	348,274	355,239	362,344	369,591	376,983	384,523	392,213	400,057	408,058	416,220
Hemodialysis	315,180	321,484	327,913	334,472	341,161	347,984	354,944	362,043	369,284	376,669	384,203
Peritoneal Dialysis	26,265	26,790	27,326	27,873	28,430	28,999	29,579	30,170	30,774	31,389	32,017
Total patients with PEW	175,500	179,010	182,590	186,242	189,967	193,766	197,642	201,594	205,626	209,739	213,934
as % of non-transplant ESRD patients	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%	51%
% share											
PINTA745							5%	12%	17%	22%	28%
nutritional support											
PINTA745 treated patients							9,882	24,191	34,956	46,143	58,832
Cost per dose							375	375	375	375	375
Doses per year							52	52	52	52	52
Annual cost							19,500	19,500	19,500	19,500	19,500
% adherence							85%	85%	85%	85%	85%
Total cost							16,575	16,575	16,575	16,575	16,575
PNTA745 demand ($000s)							163,795	400,971	579,403	764,812	975,136
inventory build / (drawdown)											
% discounts and rebates							(24,569)	(60,146)	(86,910)	(114,722)	(146,270)
Total EU PNTA745 revenues ($000s)						-	139,226	340,825	492,493	650,090	828,865
% royalty							15%	15%	15%	15%	15%
Royalty to Atara							**$ 20,884**	**$ 51,124**	**$ 73,874**	**$ 97,514**	**$ 124,330**

Source: Company reports; Canaccord Genuity estimates

DaVita analysis supports market opportunity

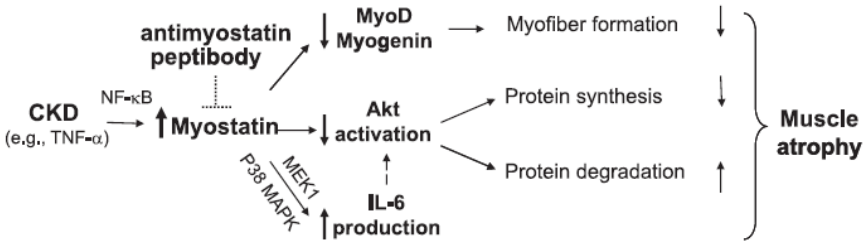
PEW is a condition characterized by malnutrition, muscle wasting and systemic chronic inflammation, and further increases the risk of death and hospitalization in chronic kidney disease (CKD) patients. There are currently no FDA-approved treatments for PEW; current standard of care is primarily supportive and does not adequately address the underlying causes. High-protein diets and enteral nutrition are often used to correct nutritional imbalances but have not demonstrated an ability to stabilize muscle mass or serum protein parameters in the long term. Corticosteroids, anabolic steroids and growth hormones have been shown to improve muscle protein synthesis albeit with the potential for long-term serious adverse event. And the use and benefits of anti-inflammatory drugs are inconclusive. **PINTA-745 can potentially address the significant unmet needs of muscle wasting and systemic inflammation** observed in CKD patients.

The International Society of Renal Nutrition and Metabolism (ISRNM) in a 2013 consensus paper estimated the prevalence of PEW to be between 20-60% of patients receiving dialysis, supporting the notion of a large market opportunity for PINTA-745. In order to better quantify the prevalence of PEW and determine the market opportunity for therapies, Atara collaborated on a study with DaVita, one of the largest dialysis providers within the US, to define the prevalence of PEW within DaVita's network of dialysis centers. The result of this retrospective chart review of 56,350 DaVita patients undergoing dialysis for at least six months showed that 54% of patients met the criteria for PEW with serum albumin ≤ 3.8 g/dL, a surrogate of protein loss and muscle breakdown. By extrapolating this rate to the 460,000 patients that the USRDS estimates are currently on dialysis, we calculate **approximately 250,000 PEW patients within the US alone**, a very sizable, unaddressed market opportunity.

Myostatin, a validated regulator of muscle mass

CKD patients experience a high degree of systemic chronic inflammation linked to factors including an increased production of inflammatory mediators such as TNF-alpha. This results in the activation of downstream pathways, increasing synthesis of myostatin within skeletal muscles, which activates other inflammatory mediators, leading to muscle atrophy.

Figure 18: Proposed mechanism of myostatin inhibition in treating PEW



Source: Zhang, FASEBJ, 2011.

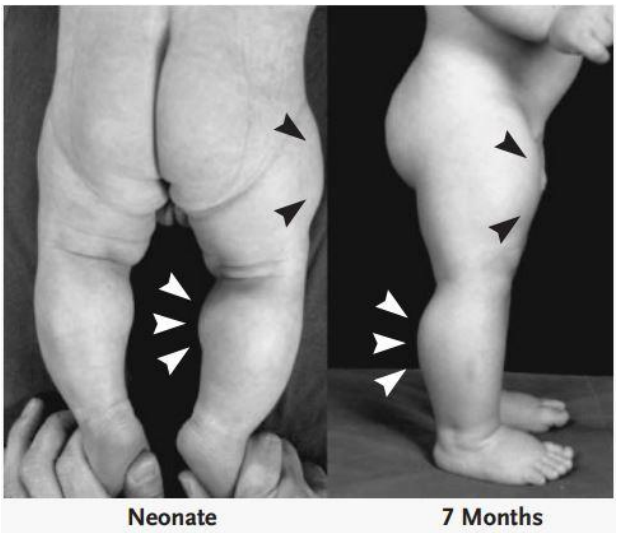
Animals lacking a functional myostatin gene or treated with agents used to block the activity of myostatin have shown significantly more muscle mass. Mice bred without the myostatin-expressing gene demonstrated a two- to three-fold increase in skeletal muscles. Natural mutations have also been observed within certain species of cattle and dogs; in each case, the animal experienced muscle mass.

Figure 19: Myostatin gene mutations in a bull

Source: McPherron, Proc. Natl. Acad. Sci. 1997

One case of natural mutation in humans was described in the New England Journal of Medicine (Schuelke, 2004). A newborn had mutations to both copies of the myostatin-producing gene, and was determined to be "extraordinarily muscular, with protruding muscles in his thighs and upper arms" at birth upon physical examination and confirmed by scans. The child was subsequently followed through his development; motor and mental development was normal, and muscle size and strength continued to increase.

Figure 20: Myostatin gene mutations in a human



Source: Schuelke, N Engl J Med 2004

There has been considerable interest in myostatin inhibition as a therapeutic approach in muscle wasting diseases since the gene encoding myostatin was discovered in 1997. Much of the development has been focused on orphan myopathies such as Duchenne muscular dystrophy. PINTA-745 is the only compound in development being evaluated in muscle wasting associated with PEW.

Figure 21: Myostatin inhibitors in clinical development

Phase/Status	Compound/MOA	Company	Population/Notes
Phase 2 Completed (2014-2015)	PINTA-745 (peptibody)	Atara	48 adult PEW in ESRD patients
Phase 2 Ongoing (2014-2017)	PF-06252616 (antibody)	Pfizer	105 pediatric DMD patients
Phase 1/2 Planned (2015-2017)	BMS-986089 (monobody)	BMS	40 pediatric DMD patients
Phase 1 Completed (2011-2015)	LY2495655 (antibody)	Lilly	32 advanced cancer patients
Phase 1/2 Completed (2005-2007)	Stamulumab (antibody)	Wyeth/Pfizer	108 patient with adult muscular dystrophies (Development suspended due to lack of efficacy)

Source: Canaccord Genuity estimates; clinicaltrials.gov

Early data from AMGN interesting

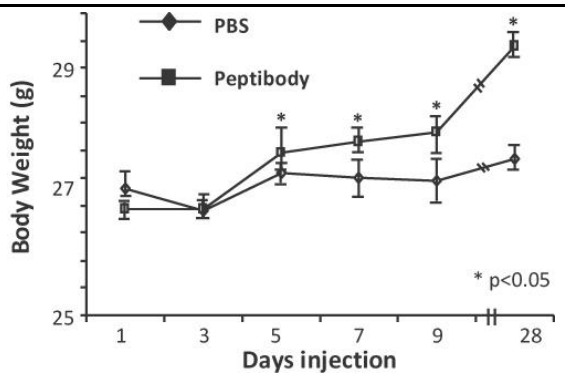
The development of PINTA-745 (previously known as AMG-745) started in the labs of Amgen, where scientists conducted a series of preclinical studies evaluating the compound and its analogue in different mouse models of muscle wasting, including androgen deficiency, CKD, cancer cachexia, immune-deficiency and Duchenne muscular dystrophy models. The drug demonstrated increased body weight gain, increased or improved maintenance of skeletal muscle mass and increased strength compared with control mice across these models. Two Phase 1 trials were conducted following IND evaluating safety in healthy adults. An additional Phase 1 trial was conducted in men with prostate cancer undergoing androgen deprivation therapy. These trials showed PINTA-745 was generally safe and well-tolerated. A statistically significant improvement was seen in lean-body mass in the PINTA-745 arm in the prostate cancer trial.

Highlights of anti-myostatin peptibody in preclinical CKD mouse model (Zhang L. FASEB J, 2011)

- 5-7% increase in body weight
- ~10% increase in muscle mass (decrease muscle breakdown/increase muscle protein production)
- Reduction in circulating inflammatory markers (TNF-alpha, IL-6)

In the study, researchers observed a 2-3x increase in the levels of myostatin mRNA within the muscles of CKD mice as compared to control mice, and that CKD induces myostatin expression only within muscles and not measurably in serum. In CKD mice, the PINTA-745/s, a version of PINTA-745 developed for mice, demonstrated increased body weight and muscle mass and reduction in muscle destruction and markers of inflammation in seven days after treatment. These effects persisted over 28 days.

Figure 22: Increased body weight in PINTA-745/s mouse CKD model seen as early as 5 days



Source: Zhang L. FASEB J, 2011

Highlights from Phase 1 trial in patients receiving androgen deprivation therapy in prostate cancer (Padhi D. J Clin Endocrinol Metab, 2014)

- Statistically significant increase in lean body mass in the 3.0 mg/kg AMG-745 arm vs. placebo at end of study and maintained at one month follow-up
- Additional improvements in fat body mass and lower-extremity muscle size
- AMG-745 was generally well tolerated with adverse events reported as mild or moderate in severity.

Amgen conducted a randomized, double-blind, placebo-controlled, multiple-dose Phase 1 study evaluating the safety and efficacy of PINTA-745 (previously AMG-745) in 54 men with prostate cancer undergoing androgen deprivation therapy. Patients undergoing ADT experience a variety of side effects, including loss of muscle mass which is believed to be attributed to the upregulation of active myostatin proteins.

The trial evaluated three doses (0.3 mg/kg, 1.0 mg/kg, 3.0 mg/kg) of PINTA-745 vs. placebo given subcutaneously weekly for four weeks. Treatment arms were well balanced compared to placebo. Efficacy measures were evaluated only in the 3.0 mg/kg cohort vs placebo. Safety was evaluated across all three doses.

PINTA-745 demonstrated 1.5% increase vs -0.7% decline in lean body mass, a statistically significant improvement compared to placebo. Lower-extremity muscle size was evaluated, with PINTA-745 demonstrating statistically significant 1.2% vs a 0.7% improvement at the end of study (day 29) and at the one-month follow-up (day 58).

Figure 23: Effect of PINTA-745 in prostate cancer patients on ADT

	Lean Body Mass[a]	Whole-Body Fat[b,c]	Lower-extremity Muscle Size[d]
End point: percentage change from baseline to day 29[e]			
AMG 745	1.5% (0.5%)	−1.7% (0.7%)	1.2% (0.7%)
Placebo	−0.7% (0.5%)	0.8% (0.7%)	−0.7% (0.7%)
Between-group difference	2.2% (0.8%)	−2.5% (1.0%)	1.8% (1.0%)
P value	.008	.021	.065
End point: percentage change from baseline to follow-up day 58[e]			
AMG 745	1.9% (0.5%)	−1.5% (1.1%)	2.7% (0.7%)
Placebo	0.2% (0.5%)	0.5% (1.1%)	−0.1% (0.7%)
Between-group difference	1.7% (0.7%)	−2.0% (1.5%)	2.8% (1.0%)
P value	.023	.183	.007

[a] As assessed by DXA scan.
[b] Prespecified exploratory analysis.
[c] As assessed by CT scan.
[d] Values are least squares mean (SE), except *P* values.
[e] Lean body mass (minus the head), as assessed by DXA scan.

Source: Padhi et al, J Clin Endocrinol Metab 2014, 99(10):E1967-E1975.

Figure 24: Lean body mass changes via DXA scan AMG-745 Phase 1

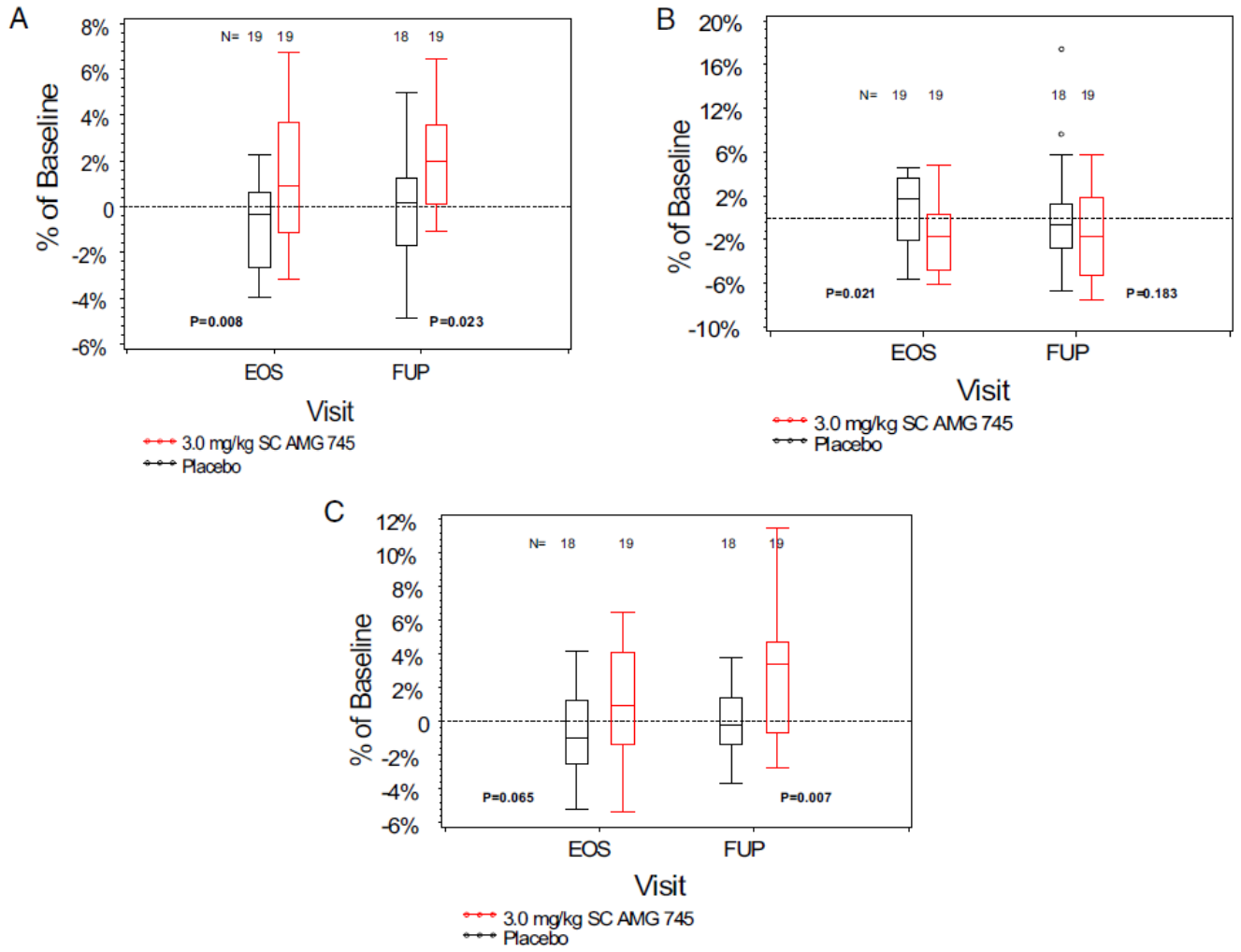


Figure 2. A, Lean body mass and percentage change from baseline in total lean body mass determined by blinded central review of DXA data in men with prostate cancer on ADT receiving AMG 745 or placebo. The bottom and top of the boxes represent the first and third quartiles, and the horizontal band inside the box indicates the median value. The ends of the whiskers indicate the minimum and maximum data in the range of observations. Black color represents the placebo group, whereas red color indicates the AMG 745-treated group. EOS represents day 29, and FUP represents 1 month after day 29. *P* values are based on ANOVA comparison of the placebo, and AMG 745 3 mg/kg treatment groups are indicated. B, body fat and ercentage change from baseline in total body fat determined by blinded central review of DXA data in men with prostate cancer on ADT receiving AMG 745 or placebo. The bottom and top of the boxes represent the first and third quartiles, and the horizontal band inside the box indicates the median value. The ends of the whiskers indicate the minimum and maximum data in the range of observations. Black color represents the placebo group, whereas the red color indicates the AMG 745-treated group. EOS represents day 29, and FUP represents 1 month after day 29. *P* values are based on an ANOVA comparison of the placebo, and AMG 745 3 mg/kg treatment groups are indicated. C, Lower extremity muscle size and percentage change from baseline in lower extremity muscle size determined by blinded central review of CT data in men with prostate cancer on ADT receiving AMG 745 or placebo. The bottom and top of the boxes represent the first and third quartiles, and the horizontal band inside the box indicates the median value. The ends of the whiskers indicate the minimum and maximum data in the range of observations. Black color represents the placebo group, whereas the red color indicates the AMG 745-treated group. EOS represents day 29, and FUP represents 1 month after day 29. *P* values are based on ANOVA comparison of the placebo and AMG 745 3 mg/kg treatment groups are indicated. FUP, follow-up period.

Source: Padhi et al, J Clin Endocrinol Metab 2014, 99(10):E1967-E1975.

Figure 25: Incidence of treatment-emergent adverse events

Preferred Term	Placebo All Placebo Subjects, n, % (n = 23)	AMG 745 0.3 mg/kg sc 4-Week Dosing, n, % (n = 6)	AMG 745 1.0 mg/kg sc 4-Week Dosing, n, % (n = 6)	AMG 745 3.0 mg/kg sc 4-Week Dosing, n, % (n = 19)	AMG 745 All AMG 745 Subjects, n, % (n = 31)	Total All Subjects, n, % (n = 54)
Fatigue	1 (4)	0 (0)	1 (17)	3 (16)	4 (13)	5 (9)
Injection site bruising	1 (4)	1 (17)	0 (0)	1 (5)	2 (6)	3 (6)
Diarrhea	2 (9)	0 (0)	0 (0)	4 (21)	4 (13)	6 (11)
Contusion	0 (0)	0 (0)	0 (0)	3 (16)	3 (10)	3 (6)

Source: Padhi et al, J Clin Endocrinol Metab 2014, 99(10):E1967-E1975.

Safety for PINTA-745 in the Phase 1 study was acceptable with fatigue and diarrhea being reported. Fatigue was reported at 16% for the 3.0 mg/kg dose vs. ~4% baseline, and diarrhea was reported at 21% vs. 9% baseline, although patient numbers were small in the 3 mg/kg cohort (n=19). We look for further detail from the ongoing phase 1/2 study in end-stage renal disease patients to determine whether diarrhea is present, in what % of patients, and at what grade of severity. Also, although deemed unrelated to drug, one patient in the Phase 1 study receiving the 3 mg/kg dose experienced syncope 19 days after the last dose of PINTA-745, along with an adverse event of ECG change. Importantly, the patient had a prior history of first-degree atrioventricular block with syncopal episodes. In addition, another patient at the 3 mg/kg dose was discontinued after the second dose because of adverse events of erythema of the abdomen, reported as moderate, decreasing to mild, and related to PINTA-745.

Figure 26: Preclinical/clinical development of PINTA-745

Phase/ Status	Trial Design/ Trial Goals	Inclusion	Study Arms	Results
Two Phase 1 Safety Trials **Completed**	97 patients Safety and tolerability	Healthy volunteers	0.3mg/kg, 1mg/kg, 3mg/kg IV and SC PINTA-745	no treatment-related SAEs; no dc due to AE/death; AEs similar to placebo group, most common: injection site reaction
Phase 1 Prostate Cancer on ADT **Completed**	54 patients Randomized, Double-blinded, Placebo-controlled Safety and efficacy	Men with prostate cancer who were receiving androgen deprivation therapy (ADT)	0.3mg/kg, 1mg/kg, 3mg/kg SC qw x 4w PINTA-745 Placebo	no treatment-related SAEs; statistically significant increase in lean body mass in 3mg/kg group at end of study, and one month follow-up Padhi D, J Clin Endocrinol Metab. 2014 Oct;99(10):E1967-75
Phase 1/2 PEW in ESRD **Completed**	48 patients Randomized, Double-blinded, Placebo-controlled Dose-ranging, Safety, Efficacy	ESRD patients, serum albumin ≤ 3.8g/dL	3mg/kg, 6mg/kg IV PINTA-745 Placebo	Primary endpoint: change in muscle mass Results expected YE2015

Source: clinicaltrials.gov; Company Reports

Phase 1/2 in PEW study underway, early results support favorable safety profile

The first look at PINTA-745's efficacy in PEW is expected by YE15 when Atara will present top-line data from the fully enrolled Phase 1/2 trial. The proof-of-concept trial is a double-blind, randomized, placebo-controlled study evaluating safety and efficacy of PINTA-745 in 48 PEW patients across six US sites. Dosing is given intravenously once weekly for 12 weeks across three different dose/dosing regimens, with an eight-week follow-up period. The primary endpoint of the study will evaluate the maximum tolerated dose and percent change in lean body mass (LBM) compared to baseline at 12 weeks. Secondary endpoints will include change in muscle composition based on CT and DXA scans, and change in physical function, based on the six-minute walk test (6MWT) and stair climbing power test (SCPT).

While we believe that LBM is an important objective measure as a primary endpoint, it is the secondary endpoints, in our opinion, that will provide the necessary color to begin to build the value proposition of PINTA-745 in terms of QoL and outcomes, specifically in terms of reducing disability. We also point out that this is the first time the company will evaluate the drug in an intravenous delivery.

Atara conducted a review of all available data for the ongoing Phase 1/2 study after the first eight patients at the 3 mg/kg dosing level completed one month of treatment, as pre-specified by the study protocol. The analysis showed no dose-limiting toxicities, treatment-related serious adverse events, or grade 3 or higher adverse events. The analysis also showed no antibody formation. All adverse events deemed possibly related to PINTA-745 were all grade 1 or 2 in severity, with muscle pain the most commonly reported event.

Also, pharmacokinetic data for these first eight patients showed a longer half-life in ESRD patients versus healthy volunteers and men with prostate cancer. Drug levels at 3 mg/mg for protein-energy wasting in end-stage renal disease were similar to those seen at 10 mg/kg as predicted by the prior Phase 1 data. The pK data also showed that administrating loading doses of PINTA-745 followed by maintenance doses is more appropriate for this patient population, and the current Phase 1/2 dosing schedule was modified to reflect this.

Atara also conducted a safety review of the first eight patients at the 6mg/kg weekly loading dose followed by 2 mg/kg weekly maintenance dose level who had completed one month of treatment. Results were similar to those seen for the earlier review of the 3 mg/kg dose, with no dose-limiting toxicities, treatment-related serious adverse events, or grade 3 or higher adverse events. The analysis also showed no antibody formation. All adverse events deemed possibly related to PINTA-745 were all grade 1 or 2 in severity, with muscle pain the most commonly reported event.

PINTA-745 fits well with current dialysis protocols

PINTA-745's dosing schedule and properties lend themselves well to use in end-stage renal disease, or dialysis patients, in our view. As a result of its formulation as a peptibody, PINTA-745 has a half-life of four days, considerably shorter than that of most therapeutic antibodies with a half-life of up to two weeks. The shorter half-life of PINTA-745 means that drug levels in the blood can be more tightly controlled by the physician while conveniently aligning with dialysis treatment schedules, which we believe is particularly important in the ESRD patient population given change in patient weight.

Long-term outcomes data could solidify positioning

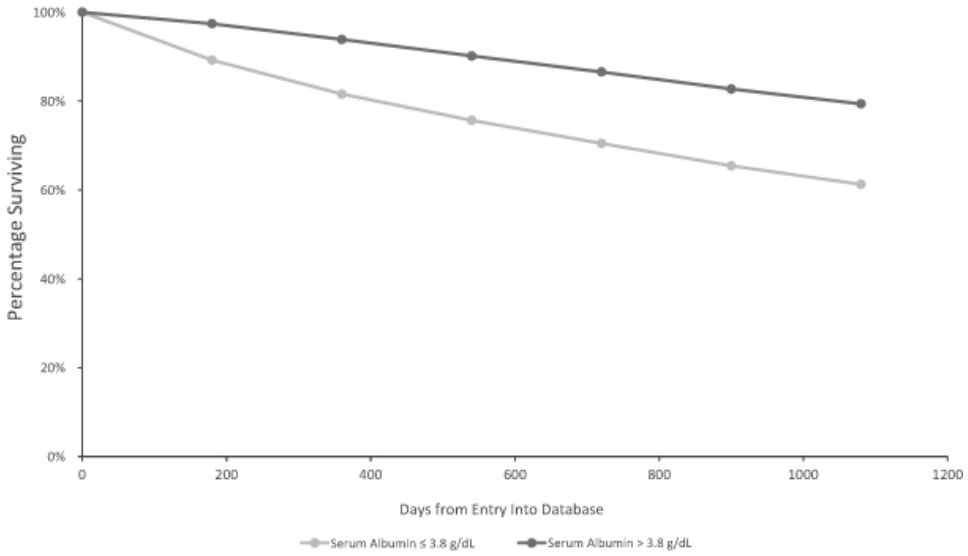
A meta-analysis conducted USRDS data determined a 39% increase in the risk of cardiovascular death with every 1 g/dl fall in the serum albumin level (Fung, 2002). Atara conducted a similar retrospective analysis using DaVita data, confirming an increased mortality in these patients with lower serum album. We believe that PINTA-745 will be widely adopted as a standard of care in ESRD patients if Atara is able to demonstrate an improvement in serum albumin as a secondary endpoint within the upcoming Phase 3 pivotal study, and confirm this reduction in overall mortality within a long-term outcomes study after approval.

Figure 27: Low serum albumin correlates with mortality in ESRD patients

Serum Albumin (g/dL)	1-year mortality	3- year mortality
≤3.8	11%	40%
>3.8	3%	21%

Source: clinicaltrials.gov; Company Reports

Figure 28: DaVita study: survival rates based upon serum albumin levels



Source: Company reports

Preliminary data shows PINTA-745 efficacy extends beyond muscle

Researchers believe that inflammation plays a critical role in PEW and the overall health decline of ESRD patients. Although the focus has primarily been on efficacy in building and preserving muscle mass in PEW, PINTA-745's anti-inflammatory properties may be a feature within its eventual label if this translates into an improvement in mortality. As described previously, the drug demonstrated a reduction in inflammatory mediators within the preclinical CKD mice model. There is no data to determine the clinical relevance at this point in time.

Figure 29: Anti-inflammatory properties of PINTA-745

Cytokine	Control Mice (pg/ml)	CKD Mice Treated with Placebo (pg/ml)	CKD Mice Treated with PINTA 745/s (pg/ml)	P Values	
				CKD Mice vs. Control Mice	CKD Mice Treated with Placebo vs. CKD Mice Treated with PINTA 745/s
Fibrinogen (µg/ml)	156.75 ± 34.87	2877.5 ± 1007.68	323.25 ± 306.50	0.0016*	0.003*
IFN- ϒ (pg/ml)	16.15 ± 5.04	17.55 ± 2.58	12.57 ± 2.66	0.638	0.036*
IL-6 (pg/ml)	5.8 ± 0.48	10.48 ± 2.23	3.05 ± 0.73	0.041*	0.036*
M-CSF-1 (ng/ml)	7.31 ± 2.51	11.61 ± 2.08	7.48 ± 1.0	0.039*	0.012*
TNF- α (ng/ml)	0.1 ± 0.06	0.151 ± 0.03	0.075 ± 0.04	0.189	0.033*

Source: Company reports

Expect PINTA-745 initially outside dialysis bundle

We remind investors that many drugs utilized within the care of patients undergoing hemodialysis are reimbursed by a bundle payment system as a part of Medicare reform as of January 2011. The company believes that reimbursement for PINTA-745 will initially be excluded from the bundle, and expects that it will take a few years to be evaluated for inclusion. The economics of this will be important for dialysis providers, as PINTA-745 will be reimbursed separately. Additionally, based on its product profile, it has the potential to reduce the utilization of other drugs and further reduce hospitalization, improving the economics to dialysis centers.

STM-434 early in ovarian cancer, but estimate $200M worldwide peak sales

STM-434 is an Activin A inhibitor currently in Phase 1 for ovarian cancer, and other solid tumors, where we estimate ~$185M US peak sales if successful in the clinic and approved by FDA. Activin A expression is elevated in ovarian cancer and has been shown to be involved in the growth and proliferation of ovarian cancer and other tumors. Although early, we include STM-434 revenues in our valuation, but apply a 30% probability adjustment based on the early stage of development.

Estimate $185 US peak sales by 2025

We model ~$185M US peak sales for STM-434 by 2025 based on a detailed revenue breakout for the ovarian cancer market. Importantly, we consider only patients where patients are Activin-A positive. We assume total drug-treated prevalence for ovarian cancer of ~66,067 patients based on SEER data from the National Cancer Institute and treatment patterns in ovarian cancer. Our work indicates that ~11% of patients have high levels of Activin A expression, or ~7,300. We assume 38% peak share here for STM-434, or ~2,725 patients on drug by 2025 at a cost of ~$22,000 per month, and ~3 months of total treatment. Our resulting peak sales estimate for STM-434 in the US is ~$185M by 2025.

Figure 30: STM-434 in ovarian cancer (US revenue build)

US Ovarian Cancer Market Model	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
First-line patients											
Stage III	9,132	9,360	9,594	9,834	10,080	10,332	10,590	10,855	11,126	11,404	11,689
Stage IV	8,863	9,085	9,312	9,545	9,783	10,028	10,278	10,535	10,799	11,069	11,345
1st-line patients	**17,995**	**18,445**	**18,906**	**19,379**	**19,863**	**20,360**	**20,869**	**21,390**	**21,925**	**22,473**	**23,035**
1st-line platinum refractory	6,343	6,502	6,664	6,831	7,002	7,177	7,356	7,540	7,729	7,922	8,120
1st-line relapse <6 mo.	4,049	4,150	4,254	4,360	4,469	4,581	4,695	4,813	4,933	5,056	5,183
2nd-line platinum refractory/resistant patients	**10,392**	**10,652**	**10,918**	**11,191**	**11,471**	**11,758**	**12,052**	**12,353**	**12,662**	**12,978**	**13,303**
1st-line relapse > 6 mo.	8,817	9,038	9,264	9,495	9,733	9,976	10,226	10,481	10,743	11,012	11,287
2nd-line relapsed platinum sensitive patients	**8,817**	**9,038**	**9,264**	**9,495**	**9,733**	**9,976**	**10,226**	**10,481**	**10,743**	**11,012**	**11,287**
Potential 3rd-line patients	**14,407**	**14,767**	**15,136**	**15,515**	**15,903**	**16,300**	**16,708**	**17,126**	**17,554**	**17,993**	**18,442**
Total drug-treated disease prevalence	51,612	52,902	54,224	55,580	56,969	58,394	59,854	61,350	62,884	64,456	66,067
% clear cell and granulosa cell tumors Activin A positive	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Patients eligible for STM-434	**5,677**	**5,819**	**5,965**	**6,114**	**6,267**	**6,423**	**6,584**	**6,748**	**6,917**	**7,090**	**7,267**
% market share for STM-434					5%	15%	20%	38%	38%	38%	38%
Total STM-434 patients					313	963	1,317	2,564	2,629	2,659	2,725
Cost per month					$20,000	$20,000	$20,500	$21,013	$21,538	$22,076	$22,628
Duration (months)					3	3	3	3	3	3	3
Total revenue Ovarian (Clear cell and granulosa cell) (000's)				**$ -**	**$ 18,800**	**$ 57,810**	**$ 80,982**	**$ 161,655**	**$ 169,839**	**$ 176,089**	**$ 185,003**

Source: Company reports, Canaccord Genuity estimates

Ex-US adds $11M in royalties peak by 2026

We model ~$70M ex-US peak sales for STM-434 in Activin A-positive ovarian cancer by 2026, based on ~38% peak share in ~3,100 eligible patients. We assume a similar cost per month as the US at $20,000 and 3 months of treatment. Importantly, we do not assume price increases in Europe due to reimbursement policies. We assume potential EMA approval and launch in 2020. We also assume that Atara partners STM-434 ex-US and model a ~15% royalty equating to ~$11M.

Figure 31: STM-434 in ovarian cancer (EU revenue build)

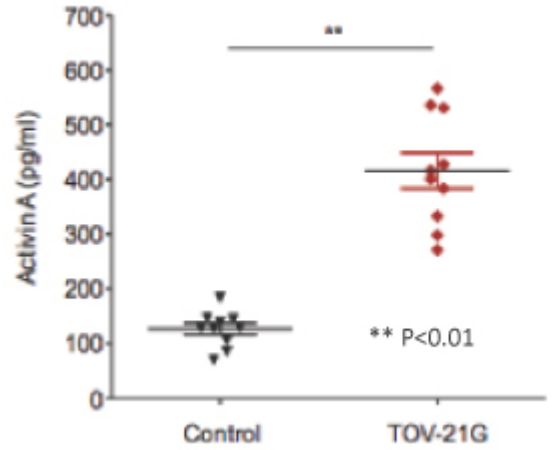
EU Ovarian Cancer Market Model	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E
First-line patients												
Stage III	13,698	14,040	14,391	14,751	15,120	15,498	15,885	16,282	16,689	17,107	17,534	17,973
Stage IV	13,295	13,627	13,968	14,317	14,675	15,042	15,418	15,803	16,198	16,603	17,018	17,444
1st-line patients	**26,992**	**27,667**	**28,359**	**29,068**	**29,794**	**30,539**	**31,303**	**32,085**	**32,887**	**33,710**	**34,552**	**35,416**
1st-line platinum refractory	9,515	9,753	9,996	10,246	10,503	10,765	11,034	11,310	11,593	11,883	12,180	12,484
1st-line relapse <6 mo.	6,073	6,225	6,381	6,540	6,704	6,871	7,043	7,219	7,400	7,585	7,774	7,969
2nd-line platinum refractory/resistant patients	**15,588**	**15,978**	**16,377**	**16,787**	**17,206**	**17,636**	**18,077**	**18,529**	**18,993**	**19,467**	**19,954**	**20,453**
1st-line relapse > 6 mo.	13,226	13,557	13,896	14,243	14,599	14,964	15,338	15,722	16,115	16,518	16,931	17,354
2nd-line relapsed platinum sensitive patients	**13,226**	**13,557**	**13,896**	**14,243**	**14,599**	**14,964**	**15,338**	**15,722**	**16,115**	**16,518**	**16,931**	**17,354**
Potential 3rd-line patients	**21,611**	**22,151**	**22,705**	**23,272**	**23,854**	**24,451**	**25,062**	**25,688**	**26,331**	**26,989**	**27,664**	**28,355**
Total drug-treated disease prevalence	**77,417**	**79,353**	**81,337**	**83,370**	**85,454**	**87,591**	**89,780**	**92,025**	**94,325**	**96,684**	**99,101**	**101,578**
% clear cell and granulosa cell tumors Activin A positive	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Patients eligible for STM-434	**2,377**	**2,437**	**2,498**	**2,560**	**2,624**	**2,690**	**2,757**	**2,826**	**2,896**	**2,969**	**3,043**	**3,119**
% market share for STM-434						5%	15%	25%	35%	38%	38%	38%
Total STM-434 patients						134	414	706	1,014	1,113	1,141	1,170
Cost per month							$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Duration (months)						3	3	3	3	3	3	3
Total revenue Ovarian (Clear cell and granulosa cell) (000's)					$	8,069	$ 24,811	$ 42,386	$ 60,824	$ 66,797	$ 68,467	$ 70,179
% royalty						15%	15%	15%	15%	15%	15%	15%
Royalty to Atara					**$**	**1,210**	**$ 3,722**	**$ 6,358**	**$ 9,124**	**$ 10,020**	**$ 10,270**	**$ 10,527**

Source: Company reports, Canaccord Genuity estimates

Preclinical data early, but interesting

Preclinical data for STM-434 and analogues have shown some evidence of tumor growth inhibition in TOV-21G mouse models and also in an inhibin knockout mouse model (granulosa cell tumors). In the preclinical study in TOV-21G mice, it was shown that tumors derived from human clear-cell ovarian carcinoma had high levels of serum Activin A, similar to tumors observed in human ovarian cancer patients (Figure 31).

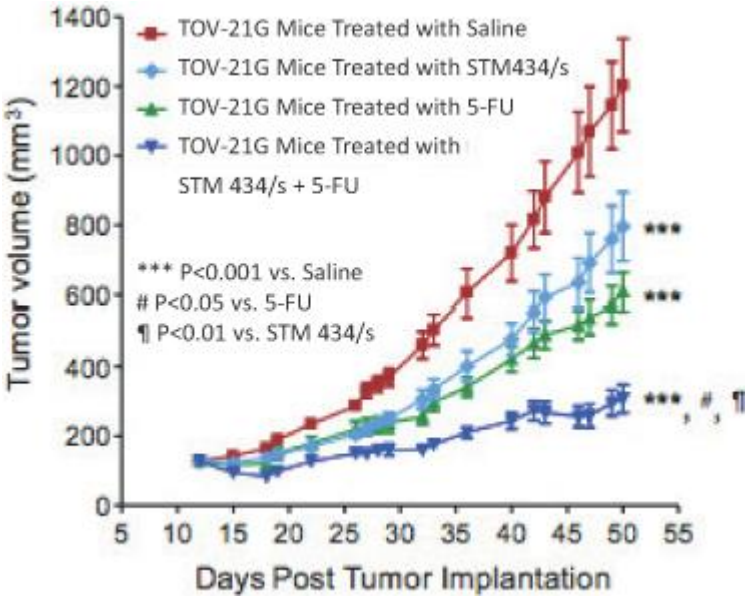
Figure 32: TOV-21G mouse model data on Activin A



Source: Company report

In addition, Atara and Amgen presented an additional preclinical study at the American Society of Clinical Oncology in 2013 evaluating STM-434 as a single agent and in combination with 5-FluoroUracil (5-FU). STM-434 showed a similar tumor volume reduction as a single agent compared to 5-FU, and ~73% tumor reduction when combined with 5-FU (figure below).

Figure 33: STM-434 additive effect with 5-FU mouse model



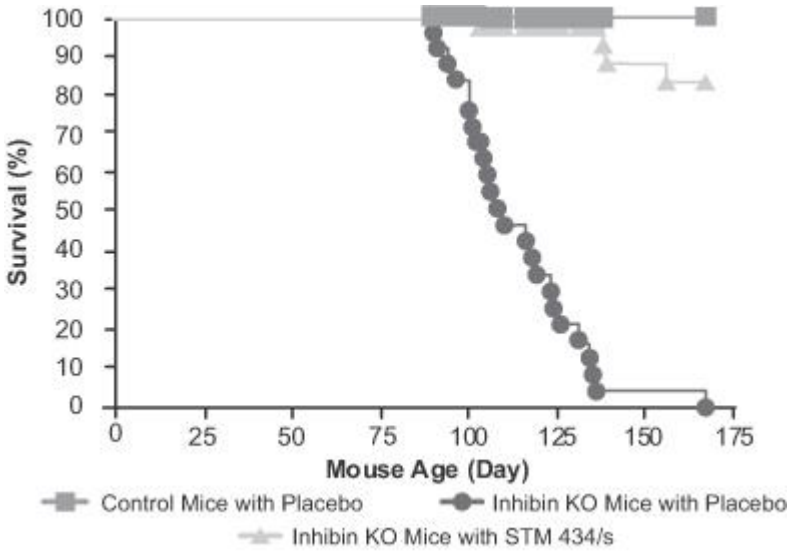
Source: Company report

Finally, STM-434 was studied in an inhibin knockout mouse model for granulosa cell tumors, demonstrating reduction on ovarian tumor size in mice and improved survival (Figures below). Although these studies were not performed in humans, we view the results in mice as interesting, and warranting further study in Phase 1 in humans.

Figure 34: STM-434 mouse knockout model - ovarian tumor size

Source: Company report

Figure 35: STM-434 mouse knockout model - survival vs. placebo



Source: Company report

Phase 1 study underway, adjusted for bleeding risk

Atara has initiated an open-label Phase 1 study in ovarian cancer and solid tumors targeted to enroll n=66 patients, assuming all cohorts are expanded to the maximum number of patients allowed. Patients will initially be dosed once every four weeks. The study consists of three parts – part 1 involves dose escalation beginning at 0.25 mg/kg, with plans to test to the maximum tolerated dose, or MTD. Part 2 is designed to obtain additional safety and exploratory efficacy data in patients with advanced ovarian cancer, including clear and granulosa cell tumors. Part 3 will study STM-434 in combination with chemotherapy in patients with ovarian cancer who have received prior treatment. Atara expects that approximately two-thirds of patients in the dose escalation portion of the study will have tumors outside the ovary. Atara expects to release Phase 1 data in 1H16.

Importantly, Amgen previously studied a related analogue of STM-434, STM-217, that showed bleeding in monkeys. The eight-week pharmacology study for STM-217 was conducted in 2009 in neutered male cynomolgus monkeys, designed to explore the ability of STM-217 to reverse the effects of androgen deprivation. Two weekly doses of STM-217 were evaluated at 3 mg/kg and 10 mg/kg. The study showed that STM-217 was effective in mitigating muscle and bone loss in the animal model. Other clinical observations included bleeding from the muzzle in some monkeys and one animal bleeding from a skin lesion above the buttock.

Atara performed additional in vitro studies for STM-217 and 434 to further characterize the observation. Platelets were evaluated, and neither STM-217 nor 434 impacted platelet function. Atara also measured BMP-9, a factor involved in bleeding and blood vessel development known to be mutated in humans with hereditary hemorrhagic telangiectasia. Interestingly, both STM-217 and 434 bound to BMP-9, suggesting that bleeding seen with STM-217 may also be observed with STM-434.

Based on findings from the in vitro work regarding bleeding risk, the Phase 1 protocol has been modified to exclude patients at high risk of bleeding, and also enhance monitoring of patients for bleeding or increased risk for bleeding.

Since beginning enrollment in October 2014, bleeding has been observed in a subset of patients, with some cases deemed potentially drug-related. Atara reviewed the events with the safety committee and deemed the associated doses to be safe and well tolerated, with the study continuing at escalating doses.

Intellectual property

2012 Amgen licensing agreement

Between September 2012 and April 2014, Atara entered into licensing agreements with Amgen for the development, manufacturing, use and distribution of the following molecules:

- two clinical-stage molecules (PINTA-745, STM-434)
- five preclinical-stage molecules (STM-217, ATA-777, ATA-842, ActR2B5, ATA-M43)

Atara holds the worldwide rights to these molecules, except for PINTA-745 in Japan which was previously licensed to Takada, and has the right, subject to certain limitations, to grant sublicenses under such licensed intellectual property.

Figure 36: Issued patents and pending patent applications

Asset	Expiration
PINTA-745	US: expected expirations from 2026 to 2034 for US outside US: expected expirations from 2023 to 2034
STM-434	US: expected expirations from 2027 through 2035 ex-US: expected expirations from 2026 through 2035

Source: Company report, Canaccord Genuity

Figure 37: Licensing fees and royalty payments to Amgen

Payment	Description
License fee	PINTA-745: $250,000 and 205,128 shares of Series A-1 convertible preferred stock (convertible to one common share) Other molecules: 410,256 shares of Series A-1 convertible preferred stock (convertible to one common share)
Clinical supplies	PINTA-745: $553,000
Running royalties	PINTA-745: Escalating mid- to high-single-digit royalties based on sales Other molecules: Escalating low- to mid-single-digit royalties based on sales
Milestones	PINTA-745 $129.0 million in development and commercialization milestones Other molecules: $81.5 million for each license agreement

Source: Company report, Canaccord Genuity

2014 MSK licensing agreement

In September 2014, Atara entered into an exclusive option agreement with Memorial Sloan Kettering Cancer Center (MSK) to license the exclusive worldwide rights to three clinical stage T-cell programs, as well as other T-cell programs that are discovered or developed by MSK pursuant to sponsored research funded by Atara. In June 2015, Atara exercised this option and holds the worldwide rights to the following therapies:

- T-cells activated against Epstein-Barr virus, or EBV
- T-cells activated against cytomegalovirus, or CMV
- T-cells activated against Wilms tumor 1, or WT1

Figure 38: Licensing fees and royalty payments to MSK

Payment	Description
Exclusive option to license	$1.25 million and 59,761 shares of ATRA common stock (at the time of issuance estimated to have fair value of $750,000)
License fee	$4.5 million
Running royalties	Escalating mid-single-digit royalties based on sales
Milestones	up to $33.0 million based on additional license fees and achievement of specified development, regulatory and sales-related milestones

Source: Company report, Canaccord Genuity

Financial overview

We estimate the company currently has ~$330M of cash, cash equivalents and short-term available-for-sale investments as a result of the company's follow-on offering in July 2015 of 3,980,768 shares of common stock. As of June 30, 2015, the company had 24.2 million shares outstanding. The company currently has no debt.

Management

The company has a seasoned management team with deep drug development experience across large biotech and pharmaceutical companies.

Isaac Ciechanover, M.D. – President and CEO
Dr. Isaac Ciechanover founded Atara Biotherapeutics in August 2012. Immediately prior to Atara, he was a partner in the life sciences practice at Kleiner Perkins Caufield & Byers. Earlier, as Celgene's executive director for business development, he led the company's venture capital efforts as well as licensing and M&A activities with an aggregate value of more than $6.7 billion. Also at Celgene, he was global project leader for the company's first clinical-stage biologic therapy. Dr. Ciechanover has held business development and venture capital roles at Amylin Pharmaceuticals, Pequot Ventures' healthcare practice and Pfizer. He holds a B.A. from Stanford University, an M.Phil. in epidemiology from Cambridge University, an M.D. from Weill Cornell Medical College and an M.B.A. from Harvard Business School.

Christopher Haqq, M.D., Ph.D. – Chief Medical Officer
Dr. Christopher Haqq joined Atara Biotherapeutics as CMO in September 2012. He was recently vice president for clinical research and development at Cougar Biotechnology and Johnson & Johnson's Janssen, where he was the lead clinician for a pivotal prostate cancer study leading to market approval for Zytiga (abiraterone acetate). Previously at Amgen, he led early development studies of the anti-insulin-like growth factor type 1 receptor AMG 479 (ganitumab) antibody. Earlier in his career, Dr. Haqq practiced as a medical oncologist and led a translational science laboratory as an assistant adjunct professor in the Division of Hematology/Oncology at the University of California, San Francisco. Dr. Haqq completed his M.D. and Ph.D. at Harvard Medical School and his B.S. at Stanford University. He is board certified in medical oncology and internal medicine. Dr. Haqq is an inventor of three patents and an author of nearly 50 medical publications.

John McGrath, Jr. – Chief Financial Officer
John F. McGrath, Jr. joined Atara as CFO in January 2013. He was previously executive in residence and operating partner at Kleiner Perkins Caufield & Byers. Mr. McGrath was also vice president and chief financial officer for Network Equipment Technologies, Inc., which developed and sold network equipment for real-time communications. Earlier in his career, he was vice president of finance for Aspect Communications, director of finance for TCSI Corporation and manager in the high technology and manufacturing practice at Ernst & Young. Mr. McGrath is a registered C.P.A. (inactive) in California and earned a B.S. from the University of Wyoming and an M.B.A. from the Stanford Graduate School of Business. He has served on the board of the Presidio Fund, a publicly traded mutual fund, and as Audit Committee chairman on the boards of Actel Corporation and Endwave Corporation.

Gad Soffer – Chief Operating Officer
Gad Soffer joined Atara in March 2013 as COO. Previously at Celgene, he led product development and lifecycle management for Abraxane, a breast, lung, and pancreatic cancer treatment also in development for melanoma. He also led $6 billion in

business development transactions while advising on venture investment and strategic partnerships. Earlier, Mr. Soffer was a healthcare consultant with Easton Associates. He earned an M.B.A. at Harvard Business School, an M.S. at Columbia University and an A.B. from Harvard University.

Mitchell Clark – Chief Regulatory and Quality Assurance Officer

Mitch Clark is the chief regulatory and quality assurance officer at Atara with responsibility for global regulatory strategy and quality assurance. Mr. Clark has over 30 years of global regulatory affairs, quality assurance, and drug development experience in the pharmaceutical industry. His professional experience includes senior management experience at a number of organizations such as Schering AG (based in its UK and Berlin offices), American Pharmaceutical Partners (APP), Abraxis Bioscience, Celgene Corporation, and NantPharma, LLC. Among his previous positions, he served as the senior vice president, regulatory affairs at NantPharma, LLC where he established the regulatory affairs and quality assurance functions. He was senior vice president of global regulatory affairs at Abraxis. Mr. Clark holds a B.Pharm from The University of Nottingham, England.

Figure 39: ATRA - Income Statement

Atara Biotherapeutics

($000's) [FY - DEC]	2014A	1Q15A	2Q15A	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E	2020E
Revenue:											
PINTA-745 - US									-	-	246,790
PINTA-745 - Ex-US royalty									-	-	-
STM-434 - US									-	18,800	57,810
STM-434 - Ex-US royalty									-	-	1,210
EBV-CTL - US											
HSCT									32,345	62,973	114,467
Solid Organ Transplant									20,166	62,321	106,998
EBV-CTL - Ex-US royalty											
HSCT									9,547	18,621	32,893
Solid Organ Transplant									3,208	9,673	16,202
CMV-CTL - US									-	17,088	35,209
CMV-CTL - Ex-US royalty									-	-	-
Total revenue	**-**	-	-	-	-	**-**	**-**	**-**	**65,267**	**189,477**	**611,580**
COGS	-	-	-	-	-	-	-	-	10,502	32,237	112,255
Gross profit	-	-	-	-	-	-	-	-	54,765	157,241	499,325
Operating expenses:											
Research and development	**15,446**	**5,767**	**7,007**	**12,771**	**12,198**	**37,743**	**124,300**	**144,750**	**146,982**	**150,306**	**150,280**
PINTA745	2,311	1,477	1,433	1,500	200	4,610	50,000	53,333	56,000	58,800	61,740
STM 434	4,389	664	628	1,250	1,250	3,792	13,333	16,667	17,500	12,250	8,575
ATA 842	624	982	1,825	1,000	1,000	4,807	4,000	7,333	13,333	35,000	36,750
T-cell therapy Programs (Option to license T-cell therapies	2,000	122	4,587	5,380	5,379	15,468	38,617	48,150	39,918	23,014	20,911
EBV-CTL				3,267	3,267	6,533	25,067	30,080	15,040	7,520	6,768
CMV-CTL				1,513	1,513	3,025	12,050	16,870	23,618	14,171	12,754
WT1-CTL				601	600	1,201	1,500	1,200	1,260	1,323	1,389
Other R&D											
Employee and overhead costs	6,122	2,522	3,034	3,641	4,369	13,566	18,350	19,267	20,230	21,242	22,304
Research and development costs paid to Amgen	(1,066)					0					
In-process R&D acquired from Amgen	-					0					
In-process R&D acquired from MSK			(4,500)								
Selling, General and Administrative	12,710	3,544	3,601	4,500	4,500	16,145	17,044	18,748	29,998	52,498	86,248
Total operating expenses	42,536	9,311	6,108	17,271	16,698	49,388	141,344	163,499	176,980	202,804	236,528
Operating Profit	**(42,536)**	**(9,311)**	**(6,108)**	**(17,271)**	**(16,698)**	**(49,388)**	**(141,344)**	**(163,499)**	**(122,215)**	**(45,564)**	**262,796**
Interest expense / income (net)	125	153	163			316					
Provision (benefit) for income taxes	25	(2)				(2)					
Unrealized losses on investments	25	82				82					
Other comprehensive loss			(48)								
Income tax benefit (expense)											
Net income	**(42,361)**	**(9,078)**	**(5,993)**	**(17,271)**	**(16,698)**	**(49,040)**	**(141,344)**	**(163,499)**	**(122,215)**	**(45,564)**	**262,796**
GAAP EPS	**($8.50)**	**($0.41)**	**($0.25)**	**($0.69)**	**($0.65)**	**($2.03)**	**($4.65)**	**($4.90)**	**($3.38)**	**($1.20)**	**$6.60**
Shares Diluted	4,986	21,918	24,224	24,951	25,699	24,198	30,423	33,373	36,113	37,919	39,815

Source: Company reports, Canaccord Genuity estimates

Figure 40: ATRA - Balance Sheet

($000's) [FY- JUN]	2014A	1Q15A	2Q15A	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E	2020E
Atara Balance Sheet	**2014A**	**1Q15A**	**2Q15A**	**3Q15E**	**4Q15E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
Assets											
Cash and cash equivalents	21,897	71,329	26,190	262,609	251,614	251,614	216,476	185,120	171,176	160,129	458,695
Short-term available-for-sale investments	82,219	95,367	128,841	169,157	177,615	177,615	215,892	241,799	263,561	284,646	301,725
Prepaid expenses and other current assets	1,910	2,995	5,603	5,883	6,177	6,177	7,509	8,410	9,166	9,900	10,494
Total Current Assets	**106,026**	**169,691**	**160,634**	437,649	435,406	435,406	439,877	435,329	443,903	454,674	770,914
Property/Equipment, Net	48	47	42	44	46	46	56	63	69	74	79
Other assets	48	79	426	-	-	-	-	-	-	-	-
Total Assets	**106,122**	**169,817**	**161,102**	**875,342**	**870,858**	870,858	879,810	870,720	887,875	909,423	1,541,906
Liabilities											
Accounts payable	440	794	1,703	1,788	1,878	1,878	2,282	2,556	2,786	3,009	3,190
Accrued compensation	1,225	522	924	970	1,019	1,019	1,238	1,387	1,512	1,633	1,731
Series A-1 convertible preferred shares issued to Amgen	1			-	-		-	-	-	-	-
Income tax payable		1	1	1	1	1	1	2	2	2	2
License fee payable to MSK		-	4,500	4,725	4,961	4,961	6,030	6,754	7,362	7,951	8,428
Other accrued liabilities	1,058	2,197	4,516	4,742	4,979	4,979	6,052	6,778	7,388	7,979	8,458
Total Current Liabilities	**2,724**	**3,514**	**11,644**	**12,226**	**12,838**	12,838	15,604	17,477	19,049	20,573	21,808
Other long-term liabilities	216	209	203	213	224	224	272	305	332	359	380
Total Liabilities	**2,940**	**3,723**	**11,847**	**12,439**	**13,061**	**13,061**	**15,876**	**17,781**	**19,382**	**20,932**	**22,188**
Preferred stock	-	-	-								
Common stock	2	2	2								
Additional paid-in capital	144,169	216,159	214,313								
Accumulated other comprehensive income	(100)	(18)	(66)								
Accumulated Deficit	(40,889)	(50,049)	(64,994)								
Total Equity	**103,182**	**166,094**	**149,255**	**862,902**	**857,797**	**857,797**	**863,934**	**852,939**	**868,493**	**888,491**	**1,519,718**
Total Liabilities & Shareholders' Equity	**106,122**	**169,817**	**161,102**	**875,342**	**870,858**	**870,858**	**879,810**	**870,720**	**887,875**	**909,423**	**1,541,906**

Source: Company reports, Canaccord Genuity estimates

Figure 41: ATRA - Statement of Cash Flows

($000's) [FY- JUN]	2014A	1Q15A	2Q15A	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E	2020E
Atara statement of cash flows											
Net Income (Loss)		(9,160)	(14,945)	(17,271)	(16,698)	(58,074)	(141,344)	(163,499)	(122,215)	(45,564)	262,796
Adjustments to reconcile net loss to net cash used in operating activities:											
Non-cash research and development expenses		-	-			-	-				
Depreciation expense		6	5	5	5	21	84	84	84	84	84
Investment premium amortization, net		358	522	522	522	1,924	7,696	7,696	7,696	7,696	7,696
Stock-based compensation expense		2,483	2,570	3,598	5,037	13,688	22,797	23,936	25,133	26,390	27,709
Interest accrued on notes receivable from stockholder		-	-			-	-				
Changes in operating assets and liabilities:						-	-				
Other assets		(31)	7			(24)	-				
Prepaid expenses and other current assets		(1,081)	(2,233)	(280)	(294)	(3,888)	(1,331)	(901)	(757)	(733)	(594)
Accounts payable		354	808			1,162	-				
Income tax payable		-	-			-	-				
Other accrued liabilities		1,139	2,108	226	237	3,710	1,073	726	610	591	479
License fee payable to MSK			4,500	225	236	4,961	1,069	724	608	589	477
Accrued compensation		(703)	402	(46)	(49)	(396)	(220)	(149)	(125)	(121)	(98)
Other long-term liabilities		13	(40)	10	11	(6)	48	33	27	27	22
Cash from Operating Activities		(6,622)	(6,296)	(13,011)	(10,993)	(36,922)	(110,128)	(131,350)	(88,939)	(11,042)	298,571
Purchase of short-term investments		(54,796)	(56,529)	-	-	(111,325)	-	-	-	-	-
Maturities of short-term investments		41,368	22,142	-	-	63,510	-	-	-	-	-
Purchase of property and equipment		(5)	-	(2)	(2)	(9)	(10)	(7)	(6)	(5)	(4)
Cash from Investing Activities		(13,433)	(34,387)	(2)	(2)	(47,824)	(10)	(7)	(6)	(5)	(4)
Repayment of notes receivable from stockholder		-	-			-	-				
Proceeds from sale of common stock, net of offering costs		69,487	-	200,000		269,487	75,000	100,000	75,000		
Taxes paid related to net share settlement of restricted stock units			(4,468)			(4,468)	-				
Proceeds from sale of convertible preferred stock		-	-			-	-				
Offering costs incurred in connection with sale of convertible preferred stock		-	-			-	-				
Offering costs incurred in anticipation of initial public filing		-	(42)			(42)	-				
Cash from Financing Activities		69,487	(4,510)	200,000	-	264,977	75,000	100,000	75,000	-	-
Net Change in Cash		49,432	4,293	186,987	(10,995)	229,717	(35,137)	(31,356)	(13,944)	(11,047)	298,567
Net Cash - Beginning Balance		21,897	71,329	75,622	262,609	71,329	309,183	216,476	185,120	171,176	160,129
Net Cash - Ending Balance		71,329	75,622	262,609	251,614	251,614	216,476	185,120	171,176	160,129	458,695

Source: Company reports, Canaccord Genuity estimates

Appendix: Important Disclosures

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Rating	Coverage Universe		IB Clients
	#	%	%
Buy	622	62.89%	33.44%
Hold	281	28.41%	12.46%
Sell	29	2.93%	3.45%
Speculative Buy	57	5.76%	56.14%
	989*	100.0%	

*Total includes stocks that are Under Review

Canaccord Genuity Ratings System

BUY: The stock is expected to generate risk-adjusted returns of over 10% during the next 12 months.

HOLD: The stock is expected to generate risk-adjusted returns of 0-10% during the next 12 months.

SELL: The stock is expected to generate negative risk-adjusted returns during the next 12 months.

NOT RATED: Canaccord Genuity does not provide research coverage of the relevant issuer.

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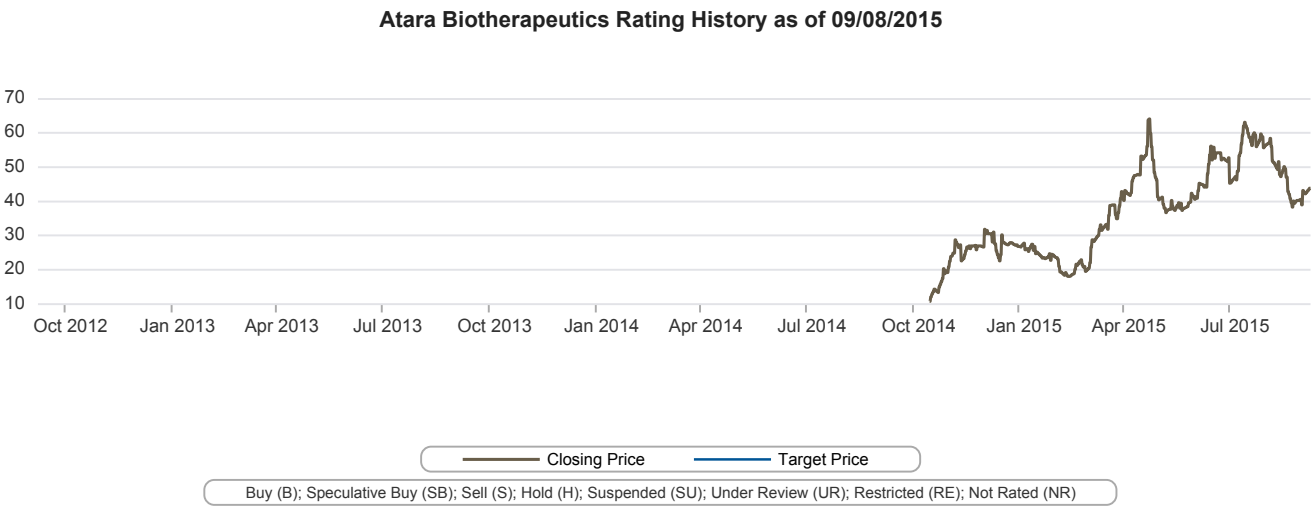

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