COMPANY NOTE

Initiating Coverage

USA | Healthcare | Pharmaceuticals/Specialty

March 24, 2014

Jefferies

Aratana (PETX)

A Leader In Bio-Petnology: Initiating Coverage (Buy)

BUY

Price target $25.00

Price $18.05

EQUITY RESEARCH AMERICAS

Key Takeaway

PETX should be able to drive significant upside to its valuation by executing on its pipeline from a solid cash position. We expect up to six new approvals by 2016E on top of its two approved products, which point to risk-adjusted revenues of $200m by 2020E and a DCF based valuation of c$25.

Zoetis effect enables a new era in BioPetnology: The separation of Zoetis (ZTS, $29.26, Buy) from Pfizer (PFE, $32.18, Buy) has highlighted the key drivers and attractiveness of the Animal Health market. This has sparked considerable interest from investors looking for growth stories in healthcare, enabling a new crop of companies to raise capital and innovate new Animal Health products.

PETX is well capitalized and positioned to innovate in attractive markets: PETX sits at the intercept of Animal Health, Biotechnology and Specialty Pharma. Its focus on new products for the Companion Animal Health market, which is surprisingly under-developed when compared to human therapeutics, lowers the risk for investors and may unlock new markets. PETX's flurry of acquisitions and in-licensing has resulted in an attractive pipeline. The recent public offering, where Jefferies acted as lead bookrunner, has provided PETX with much of the capital required to drive significant revenue growth from 2016E and sustainable profitability from 2018E.

Two year execution window could see significant value added: We look for PETX to gain full approvals for its two products (AT-004, peak sales $60m; AT-005, $27m) in canine lymphoma by 2015E. We expect the company will launch 6 new products for canine osteoarthritis (AT-001, $98m), canine inappetence (AT-002, $38m), canine post-operative pain (AT-003, $71m), feline ocular herpes (AT-006, $65m), and canine oncology (AT-008, $44m; ADXS-cHER2, $10m) by 2016E. Additional product launches thereafter should drive risk-adjusted revenues of $200m by 2020E.

Initiating coverage of PETX with a Buy rating and $25 Price Target: Whilst our revenue estimates are lower than consensus in the mid term, we still see significant upside to valuation on our more conservative assumptions for the lymphoma market. Our 3-stage DCF based valuation points to a Price Target of $25 per share and c39% upside.

Valuation/Risks

Valuation: Our PT of $25 is calculated by 3-stage DCF analysis and implies a long-run EV/Sales multiple of c6x. **Risks**: R&D; Regulatory; M&A; Manufacturing; Launch execution; Competition from larger players; Cash burn rate.

USD	*Prev.*	**2013A**	*Prev.*	**2014E**	*Prev.*	**2015E**	*Prev.*	**2016E**
Rev. (MM)	--	0.1	--	0.3	--	0.8	--	14.2
EV/Rev		NM		NM		NM		31.8x
EBITDA (MM)	--	(19.5)	--	(35.5)	--	(39.1)	--	(32.6)
EV/EBITDA		NM		NM		NM		NM
Cons. EPS	--	(0.39)	--	(1.35)	--	(1.43)	--	(0.85)
EPS								
FY Dec	--	(0.39)	--	(1.55)	--	(1.58)	--	(1.43)
FY P/E		NM		NM		NM		NM

Financial Summary	
Net Debt (MM):	**($81.3)**
Market Data	
52 Week Range:	**$29.32 - $6.00**
Total Entprs. Value (MM):	**$451.2**
Market Cap. (MM):	**$532.5**
Shares Out. (MM):	**29.5**
Float (MM):	**20.3**
Avg. Daily Vol.:	**284,476**

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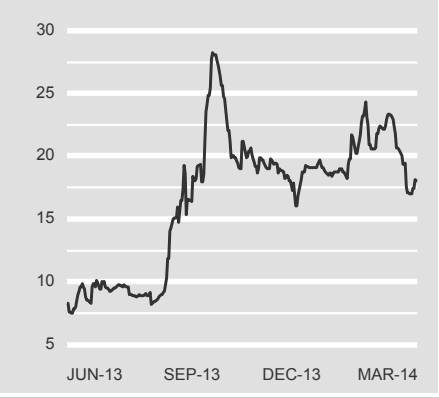
Price Performance



PETX

Initiating Coverage

March 24, 2014

Aratana Therapeutics

Buy: $25.00 Price Target

THE LONG VIEW

Scenarios

Target Investment Thesis

- AT-004 and AT-005 could receive full licensures within the next 12 months
- We expect AT-001, AT-002, and AT-003 (in dogs), and AT-006 to advance in clinical development and believe that pivotal readouts for these drugs are possible by H1'15
- Aratana could raise additional financing by late 2015 or early 2016
- Our 3-stage DCF model, with a terminal decline rate of 3% and discount rate of 12%, yields a valuation of c$25

Upside Scenario

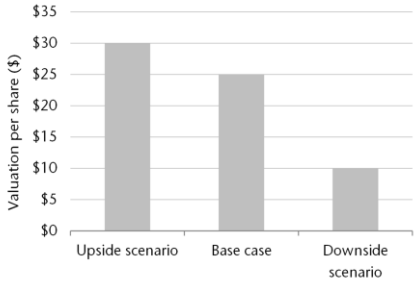
- Quicker-than-expected adoption of AT-004 and AT-005 for lymphoma in dogs
- Earlier-than-expected R&D execution for AT-001, AT-002, AT-003, and AT-006
- If AT-001, AT-002, and AT-003 in dogs, and AT-006 successfully advance and pivotal results are positive, our DCF would yield a valuation of c$30

Downside Scenario

- Delays in obtaining full licensures for AT-004 or AT-005
- R&D portfolio failures (e.g. AT-001, AT-002) and poor launch execution
- If AT-001, AT-002, AT-003 (in dogs), and AT-006 fail, our DCF would yield a valuation of c$10

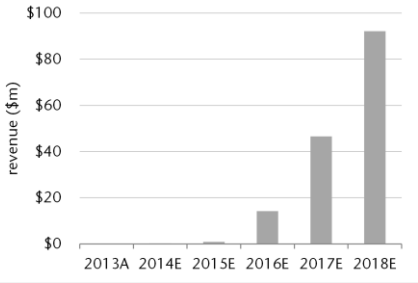
Long Term Analysis

Price Targets in different scenarios



Source: Jefferies estimates

Total revenue ($m)



Source: Company reports, Jefferies estimates

Other Considerations

In addition to the eight products that could be approved by 2016, in our view, Aratana has eight other pipeline candidates and two option programs that could boost growth and add value. The pipeline has been built through savvy acquisitions (e.g., Vet Therapeutics, Okapi Sciences) and in-licensing agreements (e.g., RaQualia, Pacira, Advaxis), which we think will continue to be a part of Aratana's development strategy.

Peer Group - NA

Catalysts

- Mid-2014: Licensing decisions on two Option Programs
- H2'14: Potential readouts from AT-003 pilot study in dogs and dose ranging study in cats
- Late 2014/ early 2015: AT-004 and AT-005 full licensure decisions
- 2014: Potential readout from AT-006 pivotal effectiveness study
- 2014: Product Development Day

Company Description

Aratana Therapeutics is a pet therapeutics company focused on the licensing or acquisition, development and commercialization of innovative biopharmaceutical products for cats, dogs and other companion animals. The company operates at the intersection of the more than $50 billion annual U.S. pet market and the more than $20 billion annual worldwide animal health market. The current product portfolio includes over 15 product candidates consisting of small molecule pharmaceuticals and large molecule biologics that target large opportunities in serious medical conditions in pets.

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Executive Summary

A pure play into novel therapeutics for companion animals

Aratana is an attractive investment in our view, providing a pure play into novel therapeutics developed specifically for companion animals. We believe that the market for companion animals is under-developed and relatively lower risk versus the human therapeutics market. Aratana seeks to exploit some of the largest opportunities in this market in our view by targeting the pain/ inflammation (AT-001, AT-003), inappetence (AT-002) and anti-viral markets (AT-006, AT-007) for dogs and/ or cats. Whilst we are most excited by the development-stage portfolio in the therapeutic areas already mentioned, Aratana already has conditional marketing approvals in the US for two biologic products for the treatment of lymphomas in dogs (AT-004, AT-005), which could develop into significant revenue opportunities over time. Additionally, Aratana has commercialization rights, outside of North America, for a small molecule lymphoma treatment (AT-008), four programs currently in lead selection phase (AT-009 – AT-012), as well as options to in-license two products.

A catalyst and execution story with funding through to the end of 2015E

We expect that the shares will be sensitive to specific development and regulatory catalysts as it transitions towards profitability, which we expect by 2018E. In particular, we highlight the following key catalysts over the next two years:

- **AT-004 and AT-005 (lymphoma):** Full USDA licensing decisions around late 2014/ early 2015; AT-005/ chemotherapy combo data could read out in 2015,
- **AT-006 (ocular herpes virus):** Data readout from a pivotal field study is possible in 2014; Aratana expects an EU filing in 2014,
- **AT-001 (osteoarthritis pain and inflammation):** H1'15 data readout from a pivotal field study in dogs,
- **AT-002 (inappetence):** Top line results in dogs from a pivotal study in H1'15 and an approval decision in 2016,
- **AT-003 (post-operative pain):** We think Aratana could begin a pivotal study upon successful completion of a pilot study and see results as early as H1'15,
- **AT-008 (canine lymphoma):** H2'15 data readout from a pivotal field study,
- **ADXS-cHER2 (osteosarcoma):** H2'15 USDA conditional approval decision.

By 2020E we forecast risk-adjusted revenues of $200m, though if the company were to execute all projects on time and launch in line with our expectations, the de-risked equivalent revenues would increase to $311m by 2020E.

Profitability expected by 2018E; Limited further equity dilution expected

We estimate that Aratana will reach sustainable operating profitability and positive cash flows from 2018E. Assuming that Aratana choses to commercialise the bulk of its portfolio itself, as currently projected by management, we expect that the company would reach more mature levels of operating margins in the range of 55%-65% by 2025E.

Whilst we expect that the company will need to raise additional finances by early 2016E at the latest, we do not expect any further equity dilution in our estimates with debt financing being called on to take the company through to profitability, though this is not certain. We concede that further equity financing could be required should the company experience any major delays to its current programs or embark on any additional material in-licensing or acquisitions to further build out its portfolio.

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Valuation and Recommendation

We are initiating coverage of Aratana with a Buy rating and $25 Price Target, which is derived by a 3-stage DCF analysis. We believe that successful execution of key development milestones for its R&D pipeline over the next two years, and solid early execution of the AT-004 and AT-005 launches should act as positive catalysts for the shares, potentially driving significant additional value for shareholders. We estimate that if all key development milestones for the pipeline are hit by the end of 2015, our DCF-based valuation would increase to c$34 from $25.07 currently.

Risks

Company specific risks for Aratana would include:

- Key development catalysts highlighted in this section,
- Inability to obtain full licensures for AT-004 and AT-005, or worse than expected uptake following full licensure,
- The marketing team is about to launch its first product in the US and is therefore relatively untested,
- Relatively small scale of the company, which may struggle to compete with larger industry players,
- Reliance on 3rd party manufacturers for its products, and
- Inability to raise minimally dilutive financing by 2016.

We would also remind investors of certain industry risks, including political reforms, other key payor pricing pressures, complex manufacturing requirements, patent challenges, adverse weather patterns, animal disease epidemics and the strict regulatory requirements within the Animal Health industry. Any of these could lead to unforeseen events that result in actual financial results being materially different from our forecasts.

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Exhibit 1: Comparable companies valuation table for Aratana

Company	Ticker	Rating	Price LC 03/21/2014	MV US$(m)	Revenue CAGR 13A-15E	EPS CAGR 13A-15E	EV/sales 2013A	EV/sales 2014E	EV/Sales 2015E	EV/Sales 2016E	EV/Sales 2017E	EV/Sales 2018E
Aratana	PETX	BUY	$18.05	$525	NA	NA	3,899.2	1,776.3	590.8	34.0	10.6	5.3
Dechra*	DPH-GB	NC	£6.84	$996	5%	13%	3.2	3.1	2.9	2.8	NA	NA
IDEXX*	IDXX	NC	$121.75	$6,375	8%	12%	4.7	4.4	4.1	NA	NA	NA
Kindred*	KIN	NC	$21.48	$351	NA	9%	NA	NA	57.7	6.4	2.9	1.9
Virbac*	VIRP FP	NC	€164.50	$1,975	5%	10%	2.3	2.2	2.1	NA	NA	NA
Vetoquinol*	VETO FP	NC	€37.42	$605	6%	9%	1.4	1.3	1.2	NA	NA	NA
Zoetis	ZTS	BUY	$29.26	$14,630	5%	13%	4.0	3.8	3.6	3.4	3.2	3.1

Company	P/E 2013A	P/E 2014E	P/E 2015E	P/E 2016E	P/E 2017E	P/E 2018E	EV/EBITDA 2013A	EV/EBITDA 2014E	EV/EBITDA 2015E	EV/EBITDA 2016E	EV/EBITDA 2017E	EV/EBITDA 2018E
Aratana	NA	NA	NA	NA	NA	34.6	NA	NA	NA	NA	NA	17.5
Dechra*	23.6	20.4	18.4	17.2	NA	NA	14.6	14.0	12.9	12.0	NA	NA
IDEXX*	35.0	31.8	27.9	NA	NA	NA	20.3	18.1	16.3	NA	NA	NA
Kindred*	NA	NA	NA	NA	18.5	10.4	NA	NA	NA	NA	NA	NA
Virbac*	23.0	21.2	19.2	NA	NA	NA	6.0	12.1	11.0	NA	NA	NA
Vetoquinol*	18.5	17.3	15.7	NA	NA	NA	9.4	8.6	7.9	NA	NA	NA
Zoetis	20.6	18.5	16.1	13.8	12.0	10.5	14.4	13.1	11.8	10.6	9.7	9.0

*Consensus estimates

Source: Company data, FactSet, Jefferies estimates

Exhibit 2: Summary of Jefferies Global Large Cap Pharmaceuticals and Animal Health coverage and ratings

Company	Ticker	Rating	MV $m	Price 3/21/2014 L.C.	Target price L.C.	Up/down side	Dividend Yield 2014E	Total Return (%)	Revenue CAGR 13A-18E	EPS CAGR 13A-18E	PEG 13A-18E 2014 PE
Abbott	ABT	BUY	$59,428	$38.39	**$45**	**17.2%**	2.3%	**19.5%**	7.5%	16.9%	**0.98**
AbbVie	ABBV	BUY	$84,841	$53.46	**$60**	**12.2%**	3.1%	**15.4%**	7.0%	13.5%	**1.27**
Aratana	PETX	BUY	$525	$18.05	**$25**	**38.5%**	NA	**38.5%**	NA	NA	**NA**
AstraZeneca	AZN LN	HOLD	$81,536	3929p	**3400p**	**-13.5%**	4.3%	**-9.1%**	-1.6%	-3.1%	**NA**
Bayer	BAYN GR	BUY	$111,824	€98.10	**€125**	**27.4%**	2.3%	**29.8%**	5.3%	10.3%	**1.59**
Bristol-Myers	BMY	HOLD	$80,589	$52.06	**$48**	**-7.8%**	2.8%	**-5.0%**	4.0%	12.9%	**2.28**
Eli Lilly	LLY	UNDERPERFORM	$64,528	$57.78	**$45**	**-22.1%**	3.4%	**-18.7%**	0.1%	-0.1%	**NA**
GlaxoSmithKline	GSK LN	HOLD	$127,900	1617p	**1600p**	**-1.1%**	5.1%	**4.0%**	1.1%	4.7%	**3.14**
Johnson & Johnson	JNJ	BUY	$270,592	$95.93	**$105**	**9.5%**	3.0%	**12.4%**	4.2%	6.1%	**2.67**
Merck & Co.	MRK	HOLD	$161,739	$54.66	**$57**	**4.3%**	3.2%	**7.5%**	1.4%	5.1%	**3.17**
Novartis	NOVN VX	HOLD	$199,237	CHF72.55	**CHF75**	**3.4%**	3.4%	**6.8%**	3.4%	7.5%	**2.14**
Novo Nordisk	NOVOB DC	HOLD	$116,917	DKK239.20	**DKK260**	**8.7%**	2.0%	**10.7%**	7.4%	12.8%	**1.86**
Pfizer	PFE	BUY	$205,920	$32.18	**$38**	**18.1%**	3.2%	**21.3%**	-0.1%	3.9%	**3.64**
Roche	ROG VX	BUY	$253,921	CHF264.90	**CHF285**	**7.6%**	3.0%	**10.6%**	3.2%	7.1%	**2.54**
Sanofi	SAN FP	BUY	$135,668	€74.51	**€83**	**11.4%**	3.5%	**14.9%**	5.7%	10.9%	**1.29**
Zoetis	ZTS	BUY	$14,630	$29.26	**$35**	**19.6%**	1.0%	**20.6%**	5.5%	14.5%	**1.28**
Pan Euro Sector (wtd)			**$1,027,003**				**3.3%**		**3.6%**	**7.6%**	**1.99**
US Sector (wtd)			**$942,266**				**3.0%**		**3.0%**	**7.1%**	**2.50**
EU+US Average (wtd)			**$1,969,270**				**3.2%**		**3.3%**	**7.3%**	**2.23**

Source: Company data, FactSet, Jefferies estimates

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Investment Thesis

A rare breed and ahead of the Bio-Petnology crowd

Aratana is an attractive investment opportunity in our view as one of the leading "Bio-Petnology" companies with 2 conditionally approved products, a well-stocked pipeline in attractive therapeutic areas and expected funding through to the end of 2015. By 2016, we expect the 16 portfolio assets (dogs and cats counted separately, Exhibit 3) to have advanced from 2 conditional approvals, 5 late stage products, 5 early/ mid-stage products, and 4 lead selection programs (AT-009 – AT-012), to 8 fully approved products and 8 products in development. We believe that such a robust and de-risked portfolio should solidly position the company to be able to raise the c$70m of estimated debt required to take the company through to sustainable profitability and cash flows from 2018E.

Whilst the number of investment opportunities in the "Bio-Petnology" market has already increased with the IPO of Kindred Biosciences [KIN, $21.48, NC], as the "Zoetis effect" has whetted the market's appetite, we believe that Aratana has a first-mover advantage in terms of its visibility and ability to attract further funding given its relatively advanced business compared to its peers.

Exhibit 3: Aratana pipeline summary

Product	Generic/ description	Proposed indication	Animal species	Peak sales (m)	JEFe Approval	
					US	Europe
AT-001	Grapiprant	Osteoarthritic pain and inflammation	dogs	$97.9	2016	2017
			cats	$56.2	2018	2019
AT-002	Capromorelin	Appetite stimulant	dogs	$37.5	2016	2017/18
			cats	$125.1	2017	2018
AT-003	Bupivacaine	Post-operative pain	dogs	$70.9	2016	2017
			cats	$43.9	2017	2018
AT-004	anti-CD20 mAb	B-cell lymphoma	dogs	$60.0	Approved	mid 2016
AT-005	Anti-CD52 mAb	T-cell lymphoma	dogs	$27.0	Approved	2016
AT-006	Antiviral	Feline ocular herpes virus	cats	$65.2	2016	2015
AT-007	Antiviral	Feline immunodeficiency virus	cats	$67.9	2017	2017
AT-008	Small molecule	Canine lymphoma	dog	$43.5	NA	2016
ADXS-cHER2	HER-2 targeting immunotherapy	Osteosarcoma	dogs	$9.6	2015	2017
AT-009	Anti-CD52 mAb	Mast cell tumors	canine	NA	NA	NA
AT-010	Anti-CD52 mAb	Atopic dermatitis	dogs	NA	NA	NA
AT-011	NA	Parvovirus	dogs	NA	NA	NA
AT-012	NA	Feline calicivirus	cats	NA	NA	NA

Source: Company data, Jefferies estimates

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Exhibit 4: Summary product portfolios for key Bio-Petnology companies

Company	Drug	Description	Animal species	Proposed indication
Aratana Therapeutics	AT-001	Grapiprant (EP4 antagonist)	dogs/cats	Osteoarthritic pain and inflammation
	AT-002	Capromorelin (ghrelin mimetic)	dogs/cats	Appetite stimulant
	AT-003	Liposomal bupivacaine	dogs/cats	Post-operative pain
	AT-004	anti-CD20 mAb	dogs	B-cell lymphoma
	AT-005	Anti-CD52 mAb	dogs	T-cell lymphoma
	AT-006	Antiviral	cats	Feline ocular herpes virus
	AT-007	Antiviral	cats	Feline immunodeficiency virus
	AT-008	Small molecule	dogs	Canine lymphoma
	ADXS-cHER2	HER-2 targeting immunotherapy	dogs	Osteosarcoma
	AT-009	Anti-CD52 mAb	dogs	Mast cell tumors
	AT-010	Anti-CD52 mAb	dogs	Atopic dermatitis
	AT-011	NA	dogs	Parvovirus
	AT-012	NA	cats	Feline calicivirus
Kindred Biosciences	CereKin	IL-1 inhibitor	dogs/horses	Osteoarthritic pain
	AtoKin	Anti-allergic drug	dogs	Atopic dermatitis
	SentiKin	Centrally acting analgesic	dogs/horses	Postoperative pain
	KIND-006	Pro-motility agent	cats	Gastrointestinal disease
	KIND-007	BTK inhibitor	cats	Cancer/immune disease
	KIND-501	Anti-VEGF protein	dogs	Cancer
	KIND-502	Anti-IgE antibody	dogs	Allergic diseases
	KIND-504	Cancer vaccine	dogs	Cancer
	KIND-506	TNFR-Ig fusion protein	dogs	Inflammatory diseases
	KIND-507	CLTA4-Ig fusion protein	dogs	Autoimmune diseases
Nexvet (private)	NV-01	Caninized mAb	dogs	Osteoarthritis
	NV-02	Feline mAb	cats	Osteoarthritis
	NV-03	Equine mAb	horses	Osteoarthritis
	NV-04	Caninized mAb	dogs	Oncology (lymphoma) and autoimmune diseases
	NV-05	Caninized mAb	dogs	Oncology (lymphoma) and autoimmune diseases
	NV-06	Antibody	NA	Chronic inflammatory diseases
	NV-07	Antibody	NA	Chronic inflammatory diseases
Parnell (private)	Zydax	Pentosan polysulfate sodium	dogs/horses	Osteoarthritis
	Glyde	Nutraceutical powder	dogs	Arthritis
	GONAbreed	Gonadorelin acetate	cattle	Fertility
	Estroplan	Cloprostenol sodium	cattle	Fertility
Premune (private)	Undisclosed	NA	dogs	Allergy
	Undisclosed	NA	dogs/cats	Irritable bowel syndrome
	Undisclosed	NA	dogs/cats/horses	Immune stimulation
VetDC (private)	VDC-1101	Targeted anti-cancer drug	dogs/cats	Lymphoma
	VDC-597	Dual-acting PI3K/mTOR inhibitor	dogs	Multiple tumors (e.g., sarcoma, lymphoma)
	VDC-2101	Drainage device	dogs/cats	Glaucoma

Source: Company data, Jefferies estimates

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Attractive and under developed markets

We believe that the market for companion animals is under-developed and relatively lower risk versus the human therapeutics market. Between 2011-2013, only 14 new animal drug applications (NADAs) were submitted for dogs and cats and only four new chemical entities was approved for pet therapeutics, according to Aratana. Furthermore, human drugs are extensively used off-label to treat companion animal disorders (e.g., inappetence, feline herpes virus, feline immunodeficiency virus), suggesting a need to develop dedicated and effective treatments for animals. We see the drug development process for companion animal therapeutics as being substantially de-risked versus human therapeutics due to the following factors:

- Timelines are substantially reduced since clinical testing are usually directly in the species of interest,
- Development costs are significantly lower as a relatively small number of animal subjects are required for the pivotal studies required for marketing authorisation, and
- The molecules and targets being developed are substantially de-risked by prior development in humans as well as the ability to conduct pre-clinical research in the target species before larger clinical studies commence.

Aratana seeks to exploit some of the largest opportunities in the companion animal market, in our view, by targeting the pain/ inflammation (AT-001, AT-003), inappetence (AT-002) and anti-viral markets (AT-006, AT-007) for dogs and/ or cats. Whilst we are most excited by the development-stage portfolio in the therapeutic areas already mentioned, Aratana already has conditional marketing approvals in the US for two biologic products for the treatment of lymphomas in dogs (AT-004, AT-005), which could develop into significant revenue opportunities over time. Additionally, Aratana has commercialization rights for an osteosarcoma treatment (ADXS-cHER2) and a small molecule for the treatment of lymphoma (AT-008, OUS only), four programs currently in lead selection phase (AT-009 – AT-012) for a variety of additional indications in the areas of oncology, anti-viral and dermatology, three undisclosed candidates in-licensed from Advaxis [ADXS, $4.91, NC], as well as options to in-license two products (Exhibit 3).

Whilst Aratana will likely have to compete with much larger established players, we believe that its focus on producing novel therapeutics in large potential markets that have been relatively ignored in terms of development activity is an attractive proposition. For example, the main industry players have tended to focus on anti-parasiticides, such as tick and flea products due to their large existing market size, but have done relatively little to develop new markets. In addition, while biologics is an area of interest for all players in the animal health industry, Aratana could enjoy a first mover advantage with the first biologics approved in the dog lymphoma space.

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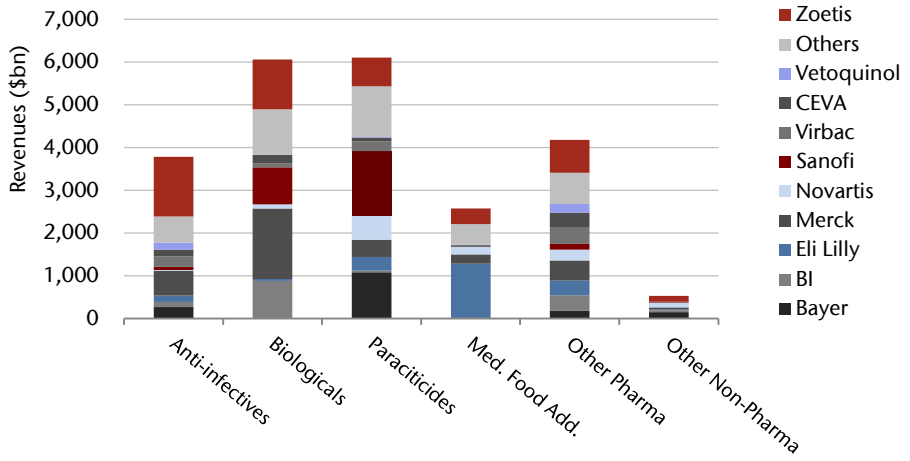
Exhibit 5: Summary of top 10 players by key product segmentation, 2013A



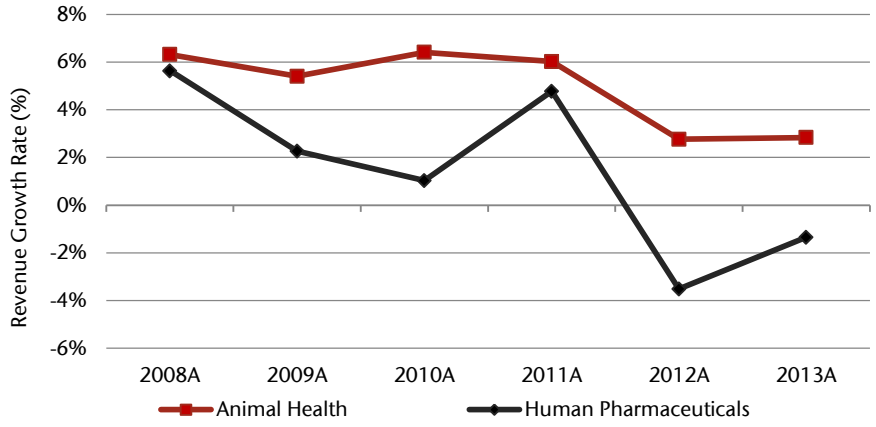
Source: Company data, Jefferies estimates

The Animal Health Industry offers better fundamentals than Human Health

The Animal Health industry offers strong linkage to the positive demographics of human health with lower pricing and asset duration pressures associated with pharmaceuticals in general. Furthermore, a more productive R&D and selling model should help to sustain the long run returns of the industry. In many ways the Animal Health market reminds us of the human health market 15 years ago before managed care, government pricing pressure and an increasingly aggressive generics industry significantly reduced the profitability and duration of many classes of product.

Evidence of this can be seen from the historical and projected growth of the Animal Health Industry versus the Human Pharmaceuticals market. As can be seen in Exhibit 6, the Animal Health Industry grew revenues at a CAGR of 4.7%, versus 0.6% for Human Pharmaceuticals between 2008A-13A. Whilst this is an extreme comparison given the patent cliff in 2012 for many Pharmaceutical companies, it helps to underline the relative insulation of the Animal Health industry from generic substitution and pricing pressure.

Exhibit 6: Historical comparison of human pharmaceuticals versus animal health revenue growth rates, 2008A-2013A



Source: Company data, Jefferies estimates

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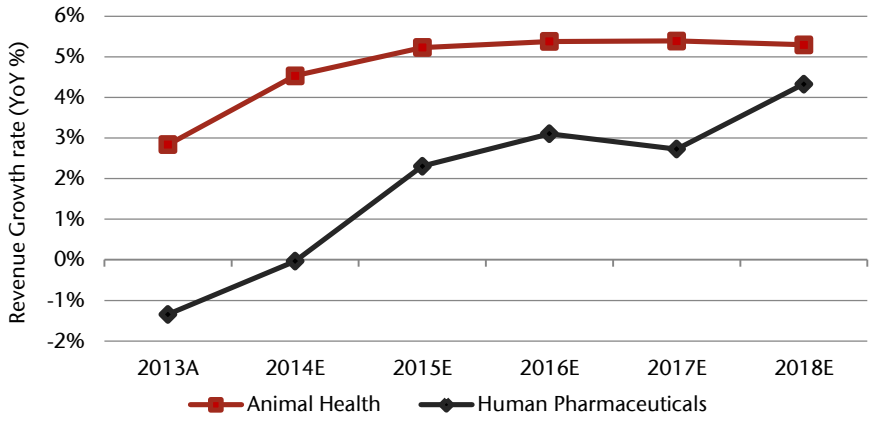
Our Global Animal Health market model projects a 2013A-18E revenue CAGR of 5.2% versus 2.5% for the human pharmaceutical operations of Large Cap Pharmaceuticals companies' within our coverage universe.

Exhibit 7: Comparison of human pharmaceuticals versus animal health pharmaceutical revenue growth rates, 2013A-18E



Source: Company data, Jefferies estimates

Solid execution to date and a clear roadmap for success

Aratana management have been positively received to date by their ability to advance their existing product portfolio as well as in-licensing and acquiring strategic assets at attractive valuations. Examples of the latter include the Vet Therapeutics and Okapi Sciences acquisitions, which boosted the overall portfolio by 2 and 4 products, respectively, and the recent deal to in-license ADXS-cHER2 from Advaxis.

We expect that the shares will be sensitive to specific development and regulatory catalysts as the company transitions towards profitability, which we expect by 2018. In particular we highlight the following key catalysts over the next two years:

- AT-004 and AT-005 (lymphoma): Aratana expects full licensing decisions for these drugs from the USDA around late 2014/ early 2015. The full licensure package for AT-004 has been submitted and the company expects to submit the full package for AT-005 around mid-2014,
- AT-005 (lymphoma): Aratana expects to initiate trials combining AT-005 with various chemotherapy combination regimens over the upcoming months. The company expects these trials to read out in 2015 and beyond,
- AT-001 (osteoarthritis pain and inflammation): In dogs, we think potential data readout from a pivotal field effectiveness study in H1'15 is likely. Aratana plans to initiate this pivotal field effectiveness study in Q2'14 and expects an approval decision in 2016,
- AT-002 (inappetence): In dogs, Aratana expects top line results from a pivotal study in H1'15 and an approval decision in 2016,
- AT-003 (post-operative pain): We think Aratana could begin a pivotal study in dogs upon successful completion of a pilot study (to be initiated in Q2'14) and obtain results from the pivotal study as early as H1'15,
- AT-006 (ocular herpes virus): We think data readout from a pivotal field study is possible in 2014, and Aratana expects an EU filing in 2014. This product, being

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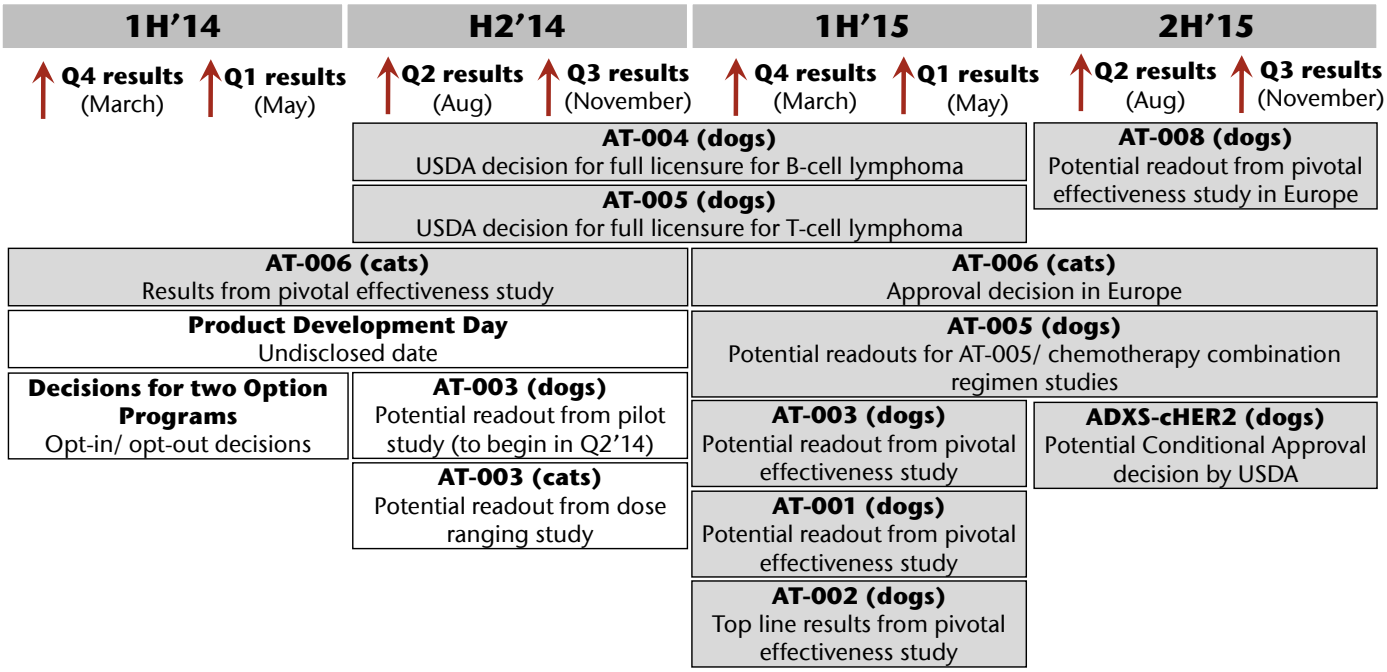
developed under an exclusive license agreement with Novartis, is currently in a pivotal field study in Europe,

- AT-008 (canine lymphoma): We think data readout from a pivotal field study is possible in H2'15. Aratana mentioned that they expect a pivotal field study in Europe in 2014, and
- ADXS-cHER2 (osteosarcoma): Given the efficacy and safety results from the 13 dog study, we think a conditional approval decision by H2'15 is not inconceivable and the filing timeline may be limited by the necessary manufacturing requirements.

Other upcoming events that we would highlight include:

- AT-003 (post-operative pain):
  - In dogs, a pilot field study will be initiated in Q2'14 and we think the study could be completed around H2'14, and
  - In cats, we think results from a dose ranging study may read out in 2014.
- Option Programs: Aratana expects to make opt-in/opt-out decisions on two programs around mid-2014.
- Product Development Day: Aratana expects to talk more about the R&D pipeline and timelines at this event, although a specific date has not yet been set.

Exhibit 8: Summary catalyst calendar for Aratana Therapeutics



Source: Jefferies estimates, company data

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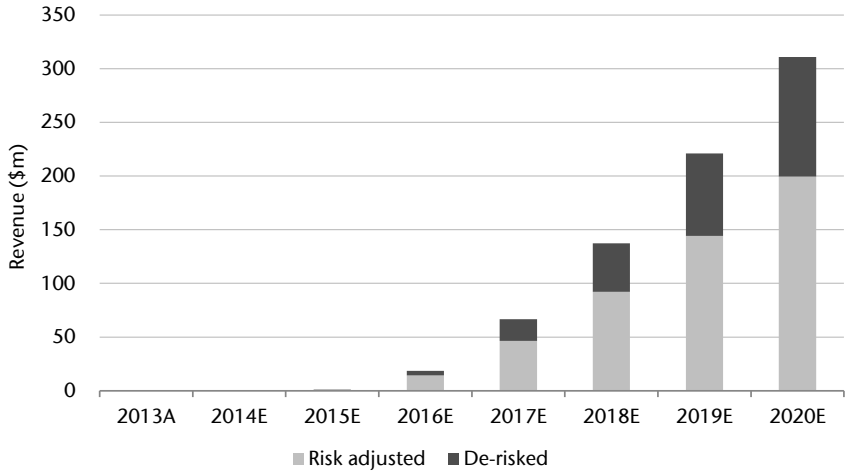
By 2020E we forecast risk-adjusted revenues of $200m, though if the company were to execute all projects on time and launch in line with our expectations, the de-risked equivalent revenues would increase to $311m by 2020E.

Exhibit 9: Aratana risk-adjusted and de-risked revenue, 2013A-20E ($m)

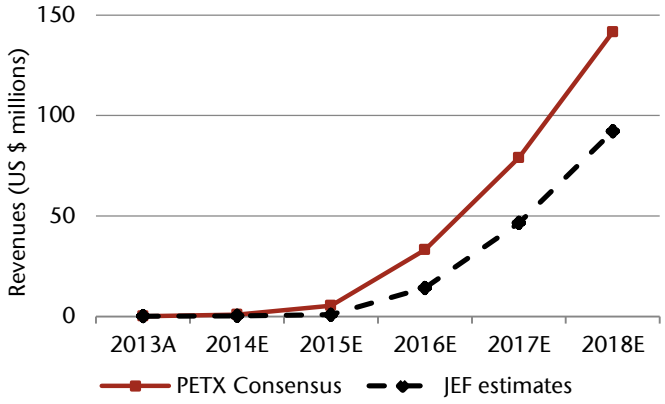


Source: Jefferies estimates

Conservative modelling drives significant valuation upside if mid-term development objectives are met

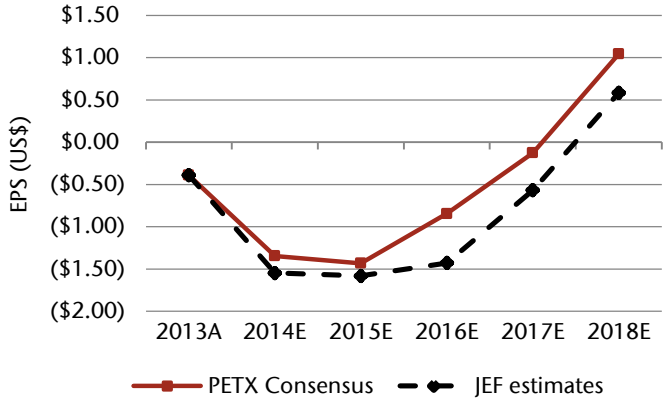
Currently we look for revenues of $92m by 2018E for Aratana, which is c34% lower than consensus (mean $142m; min $112m; max $172m; n=2). Exhibit 10 and Exhibit 11 summarise how our revenue and EPS estimates compare with consensus during the forecast period, 2013A-18E. A summary Income Statement is also provided for reference in Exhibit 12.

Exhibit 10: Jefferies revenue estimates versus consensus for Aratana, 2013A-2018E ($millions)



Source: FactSet, Jefferies estimates

Exhibit 11: Jefferies EPS estimates versus consensus for Aratana, 2013A-2018E ($)



Source: FactSet, Jefferies estimates

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Exhibit 12: Annual income statement for Aratana, 2013A-2018E

($) millions	2013A	2014E	2015E	2016E	2017E	2018E	Incr. abs. '13A-'18E
Net product sales	0.0	0.2	0.5	2.0	4.1	6.1	6.1
Pipeline revenue	0.0	0.0	0.0	11.1	40.2	82.5	82.5
Royalty revenue	0.0	0.1	0.3	1.1	2.3	3.5	3.5
Manufacturing revenue	0.1	0.0	0.0	0.0	0.0	0.0	(0.1)
Total revenue	**0.1**	**0.3**	**0.8**	**14.2**	**46.5**	**92.1**	**92.0**
Cost of products sold	0.1	0.1	0.2	2.2	6.9	13.6	13.5
Gross profit	**0.0**	**0.2**	**0.7**	**12.0**	**39.6**	**78.5**	**78.5**
R&D	10.9	27.1	29.0	29.0	26.1	23.5	12.6
SG&A	8.6	8.8	11.1	16.2	21.1	26.3	17.8
In-process R&D	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operating income	**(19.9)**	**(44.2)**	**(46.3)**	**(39.4)**	**(13.2)**	**23.6**	**43.5**
Net interest (income)/ expense	0.4	0.7	0.3	2.8	3.6	3.8	3.5
Other expenses (income)	(0.5)	0.0	0.0	0.0	0.0	0.0	0.5
Earnings before taxes	**(19.7)**	**(45.0)**	**(46.7)**	**(42.1)**	**(16.7)**	**19.8**	**39.5**
Taxes	(15.5)	0.0	0.0	0.0	0.0	2.0	17.4
Tax rate	NA	0.0%	0.0%	0.0%	0.0%	10.0%	NA
Net income (loss)	**(4.3)**	**(45.0)**	**(46.7)**	**(42.1)**	**(16.7)**	**17.8**	**22.1**
Changes in value of convertible preferred stock	(1.6)	0.0	0.0	0.0	0.0	0.0	1.6
Net income (loss) for common	**(5.9)**	**(45.0)**	**(46.7)**	**(42.1)**	**(16.7)**	**17.8**	**23.7**
Diluted EPS	**($0.39)**	**($1.55)**	**($1.58)**	**($1.43)**	**($0.57)**	**$0.59**	**$0.98**
Wted avg diluted sh outstanding (m)	11.0	29.0	29.5	29.5	29.5	30.5	19.1
Year-end share count (m)	21.3	29.5	29.5	29.5	29.5	30.5	9.1
Dividends per share	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Margin Analysis	**2013A**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	
Cost of products sold	NA	23%	20%	15%	15%	15%	
Gross margin	NA	78%	80%	85%	85%	85%	
R&D	NA	NA	NA	NA	56%	25%	
SG&A	NA	NA	NA	NA	45%	29%	
Operating margin	NA	NA	NA	NA	NA	26%	
Pretax margin	NA	NA	NA	NA	NA	21%	
Net margin	NA	NA	NA	NA	NA	19%	

% YoY Change	**2013A**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	
Total revenue	NA	NA	214%	1576%	227%	98%	
Cost of products sold	NA	NA	176%	1200%	218%	96%	
Gross profit	NA	NA	225%	1669%	229%	98%	
R&D	50%	148%	7%	0%	(10%)	(10%)	
SG&A	187%	2%	27%	45%	30%	25%	
In-process R&D	NA	NA	NA	NA	NA	NA	
Operating income	NA	NA	NA	NA	NA	NA	
Earnings before taxes	NA	NA	NA	NA	NA	NA	
Net income (loss)	NA	NA	NA	NA	NA	NA	
Diluted EPS	NA	NA	NA	NA	NA	NA	
Shares outstanding	NA	164%	2%	0%	0%	3%	

Source: Jefferies estimates, company data

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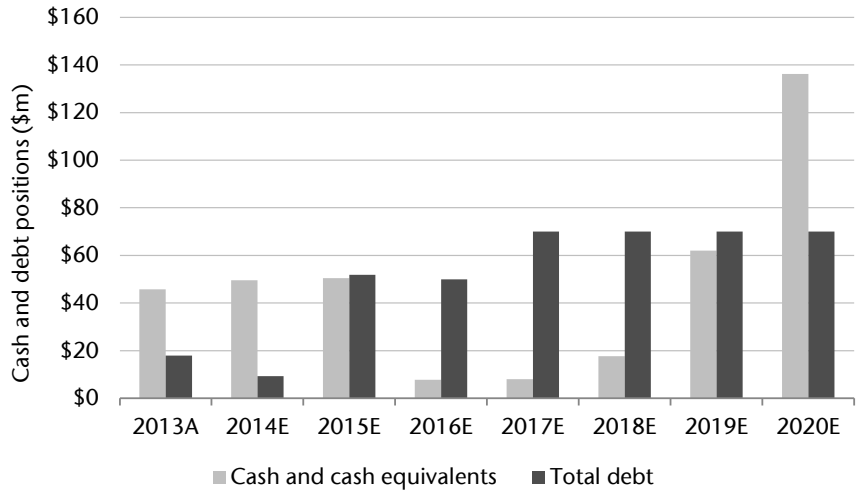
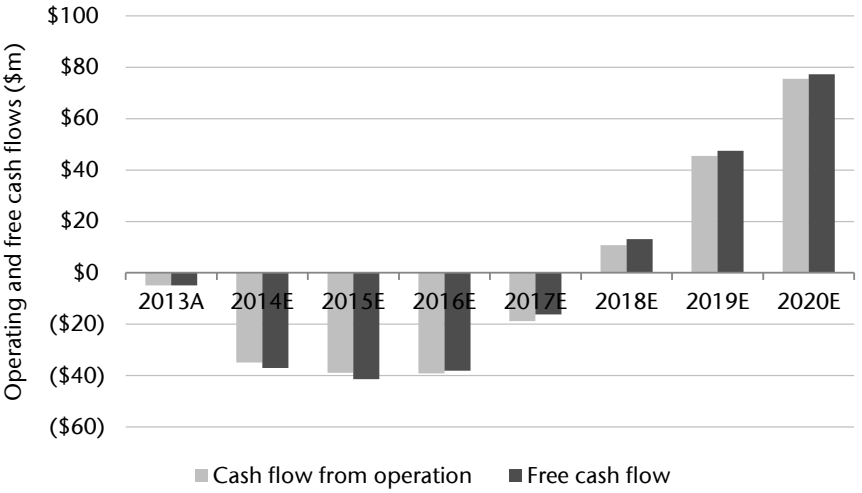
On a risk-adjusted basis we estimate that Aratana will reach profitability around 2018E and sustainable positive cash flows from 2018E also. Exhibit 13 and Exhibit 14 outline our expectations for net cash and cash flow through between 2013A and 2020E.

Exhibit 13: Summary of estimated gross cash and gross debt positions for Aratana, 2013A-20E ($m)



Source: Jefferies estimates, company data

Exhibit 14: Summary of Aratana operating and free cash flow estimates, 2013A-20E ($m)



Source: Jefferies estimates, company data

However, if the company were to achieve its R&D and regulatory milestones on time and launch its products in line with our expectations, our de-risked revenue model could see profitability potentially achieved as early as H1'17E. Furthermore, a fully de-risked revenue scenario would increase our DCF based valuation of Aratana from $25.07 currently to c$47 per share.

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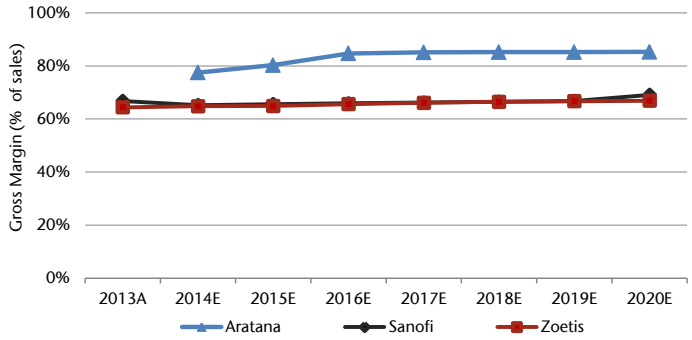
Specialty model and focus on companion animals expected to drive above average margins

Whilst profitability is a long way off for Aratana and visibility on the ultimate capital structure of the company is low, we see the company ultimately reaching above industry average gross and operating margins, due to their exclusive focus on higher margin companion animal products (as opposed to production animals) and royalty income streams. Furthermore, the company's innovative portfolio should garner attractive pricing and margins relative to other companion animal markets, such as anti-parasiticides, which are much more crowded and competitive, in our view.

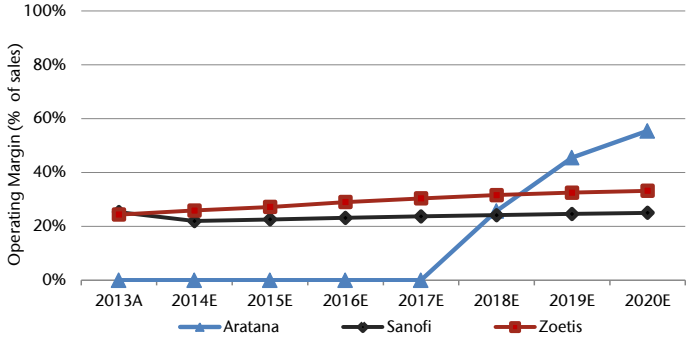
We have modelled mature gross and operating margins of c85% and c55%-65%, respectively during the period 2020E-2025E, which compares very favourably to the margins of other Animal Health companies Exhibit 15 and Exhibit 16.

Exhibit 15: Comparison of Aratana gross margin vs Zoetis and Sanofi, 2013A-20E



Source: Company data, Jefferies estimates

Exhibit 16: Comparison of Aratana operating margin vs Zoetis and Sanofi, 2013A-20E



Source: Company data, Jefferies estimates

Some industry and company-specific risks may concern investors

Although we discuss several of the key industry and company specific risks to an investment in Aratana shares in the remainder of this report, we would highlight the key areas of concern as follows:

Company specific:

- Aratana has not yet developed a commercial footprint in either the US or Europe. Our estimates are based on Aratana building its own field sales force, which will work with distributor reps in the US (other than for AT-004 and AT-006, which will be marketed by Novartis Animal Health [NOVN VX, CHF72.55, Hold]). With the acquisition of Okapi Sciences, we think Aratana has the flexibility for either a solo or partnered launch outside of the US,
- Aratana plans to use third party manufacturers for all approved drug candidates. Therefore, there could be a supply risk for any products that lack alternative contract manufacturing options, and
- While Aratana has a patent portfolio protecting their key products, it may be more difficult to defend non-composition of matter patents for small molecule drugs (e.g., AT-001, AT-002, AT-006),

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Industry specific:

- Changes in legislation in the US could result in more flexibility for pet owners to buy medications for their animals through alternate channels (internet, etc.), which could result in market share losses and pricing pressure, and
- The industry has seen relatively little impact from big box brand and generic competition, which could intensify in the future. Further, there is no law restricting veterinarians from prescribing human drugs for companion animals, even if a drug dedicated to the animal is available.

Exhibit 17 describes the patent information for Aratana's product portfolio as far as we are aware.

Exhibit 17: Summary of selected patent expiries for key products

Product	Proposed indication	Patent expiration summary
AT-001	Osteoarthritic pain and inflammation	A key patent covering crystalline form expires 2/21/2027; other patents for AT-001 to AT-003 expire at various times between 2015 and 2031
AT-002	Appetite stimulation	A key patent covering methods of producing this compound expires 2/1/2020; other patents for AT-001 to AT-003 expire at various times between 2015 and 2031
AT-003	Post-operative pain mgmt	Key patents covering certain compositions and method of production expire 9/18/2018; other patents for AT-001 to AT-003 expire at various times between 2015 and 2031
AT-004	B-cell lymphoma	Patent family related to speciesization of antibodies, including an issued patent expiring in 2029; patent family related to antibody constant domain regions and uses thereof, including a patent expiring in 2032; pending patent applications covering specific canine mAb directed to various targets, includes an allowed US patent application directed to the canine CD52 development antibody that will expire in 2029
AT-005	T-cell lymphoma	Patent family related to speciesization of antibodies, including an issued patent expiring in 2029; patent family related to antibody constant domain regions and uses thereof, including a patent expiring in 2032; pending patent applications covering specific canine mAb directed to various targets, includes an allowed US patent application directed to the canine CD52 development antibody that will expire in 2029
AT-006	Feline ocular herpes infection	Two patent applications for formulation and commercially-viable methods of making the active ingredient that would expire in 2032 and 2031, respectively, if granted
AT-007	Feline immunodeficiency virus	Active ingredient patent that expires in 2020
AT-008	Lymphoma	Composition and use patents that expire between 2024 and 2027

Source: company data

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A leader in the emerging group of Bio-Petnology companies

We consider Aratana to be the leader in the attractive Bio-Petnology segment of Animal Health and we believe the company is well positioned to execute its R&D milestones, launch new products into the market and acquire further assets through in-licensing and other business development activities. With a clear path to profitability in around 2017E/ 18E, we expect little, if any, further equity dilution outside of any significant product/ pipeline acquisitions. We have summarised what we believe to be the key opportunities and threats to Aratana in Exhibit 18.

Exhibit 18: Summary of key opportunities and threats for Aratana

Opportunity	Importance	Comment
Marketed products	High	Revenue growth for first-in-class biologics for dog lymphoma could dramatically accelerate upon full licensure.
Pipeline delivery	High	Aratana currently has 5 late stage products and 5 early/ mid stage products (dogs and cats counted separately), as well as 4 programs in the lead selection stage. We think this could evolve into 8 fully approved products and 8 products in development by 2016, which includes a conditional approval for ADXS-cHER2.
Lower risk development pathway	Medium	The development pathway for animal drugs has a significantly shorter duration and lower cost compared to human drugs.
In-licensing	Low	Aratana has options to in-license two undisclosed pipeline candidates to further bolster its pipeline.

Threat	Importance	Comment
Commercialization	High	Aratana does not have a commercial footprint and sales estimates are based on the company successfully building a direct salesforce.
Legislative reform	Medium	Potential changes to veterinary prescribing practices that could enable pet owners to move to lower cost distributors of medical products.
Competition	Medium	While there are no direct competitors for a number of markets that Aratana plans to enter, off-label use of human drugs for these diseases are common.
Manufacturing	Low	The company expects to rely on contract manufacturers for commercialized products and it is unclear if alternative sourcing options are available for each product.
Patent challenge	Low	The patent portfolio consists primarily of use or manufacturing patents which are generally harder to defend relative to composition of matter patents.
Financials	Low	Company may not be able to secure minimally dilutive financing by 2016.

Source: Company data, Jefferies research

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Valuation & Rating

Price Target Set at $25 Using 3-Stage DCF Model

With Aratana still a predominantly development-stage company at this point and not expected to turn profitable until 2018E, based on our estimates, we think the discounted cash flow method is the most appropriate valuation method. We have therefore assessed the long-term value of Aratana using a three-stage DCF valuation technique.

We have made explicit cash flow projections out to 2025E as phase 1, followed by a steadily declining free cash flow growth rate in phase 2 until it reaches the target terminal decline rate of 3% from 2035E. At this point we calculate the final terminal phase of cash flow valuation using a terminal decline rate of 3% into perpetuity.

Exhibit 19 summarises our assumptions and the NPV of cash flows for each phase of this three-stage DCF valuation technique.

Exhibit 19: Aratana - Summary of assumptions and the NPV of cash flows ($ in millions, except EPS)

Metric	Assumption/ Calculation
Terminal growth rate	-3.0%
Discount rate	12.0%
Stage 1 Net Cash Flow PV (2014E-25E) ($m)	$200
Stage 2 Net Cash Flow PV (2026E-34E) ($m)	$308
Stage 3 Net Cash Flow PV (2034E to perpetuity) ($m)	$149
Cumulative PV of Net Cash Flow	**$658**
Net debt (pro forma post-2014 public offering) ($m)	($82)
Total NPV	**$740**
Number of shares (m, diluted post-2014 public offering)	29.5
Aratana Fair Value (per share)	**$25.07**

Source: Jefferies estimates

$25 Price Target implies long run EV/Sales multiple of 5.5-6.5x

With relatively few valuation methodologies at our disposal, given we expect Aratana to be loss making until 2018E, we have employed a discounted EV/ Sales multiple technique to test our DCF based valuation of $25 per share.

By discounting our long term revenues back to 2014E values using the same 12% discount rate in our 3-stage DCF analysis, we are able to imply long run EV/ Sales multiples against both the current stock price and our Target Price of $25 per share. This technique places the shares on c4x our long run sales estimates at the current stock price and c6x at our Target Price of $25 per share.

As the EV/ Sales multiples of other comparable companies are relatively few and inconsistent (Exhibit 20), we have chosen to rely on the largest company, Zoetis, as the best benchmark, which trades on c4x 2014E sales. On this basis the shares are at least fair value versus Zoetis, though we believe that a higher multiple is warranted for Aratana shares given our long run revenue growth rate of c10% versus c4% for Zoetis and substantially higher operating margins in the 2020E-2025E timeframe.

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Exhibit 20: Comparable companies valuation table for Aratana

Company	Ticker	Rating	Price LC 03/21/2014	MV US$(m)	Revenue CAGR 13A-15E	EPS CAGR 13A-15E	EV/sales 2013A	EV/sales 2014E	EV/Sales 2015E	EV/Sales 2016E	EV/Sales 2017E	EV/Sales 2018E
Aratana	PETX	BUY	$18.05	$525	NA	NA	3,899.2	1,776.3	590.8	34.0	10.6	5.3
Dechra*	DPH-GB	NC	£6.84	$996	5%	13%	3.2	3.1	2.9	2.8	NA	NA
IDEXX*	IDXX	NC	$121.75	$6,375	8%	12%	4.7	4.4	4.1	NA	NA	NA
Kindred*	KIN	NC	$21.48	$351	NA	9%	NA	NA	57.7	6.4	2.9	1.9
Virbac*	VIRP FP	NC	€164.50	$1,975	5%	10%	2.3	2.2	2.1	NA	NA	NA
Vetoquinol*	VETO FP	NC	€37.42	$605	6%	9%	1.4	1.3	1.2	NA	NA	NA
Zoetis	ZTS	BUY	$29.26	$14,630	5%	13%	4.0	3.8	3.6	3.4	3.2	3.1
Company	**P/E 2013A**	**P/E 2014E**	**P/E 2015E**	**P/E 2016E**	**P/E 2017E**	**P/E 2018E**	**EV/EBITDA 2013A**	**EV/EBITDA 2014E**	**EV/EBITDA 2015E**	**EV/EBITDA 2016E**	**EV/EBITDA 2017E**	**EV/EBITDA 2018E**
Aratana	NA	NA	NA	NA	NA	34.6	NA	NA	NA	NA	NA	17.5
Dechra*	23.6	20.4	18.4	17.2	NA	NA	14.6	14.0	12.9	12.0	NA	NA
IDEXX*	35.0	31.8	27.9	NA	NA	NA	20.3	18.1	16.3	NA	NA	NA
Kindred*	NA	NA	NA	NA	18.5	10.4	NA	NA	NA	NA	NA	NA
Virbac*	23.0	21.2	19.2	NA	NA	NA	6.0	12.1	11.0	NA	NA	NA
Vetoquinol*	18.5	17.3	15.7	NA	NA	NA	9.4	8.6	7.9	NA	NA	NA
Zoetis	20.6	18.5	16.1	13.8	12.0	10.5	14.4	13.1	11.8	10.6	9.7	9.0

*Consensus estimates

Source: Company data, FactSet, Jefferies estimates

Initiating Coverage with a Buy Rating

Our PT of $25 for Aratana represents c39% upside versus the current price of $18.05. As a result we rate the shares Buy.

We believe that successful execution of key development milestones for its R&D pipeline over the next two years, and solid early execution of the AT-004 and AT-005 launches should act as positive catalysts for the shares, potentially driving significant additional value for shareholders. We estimate that if all key development milestones for the pipeline are hit by the end of 2015, our DCF-based valuation would increase to c$34 from $25.07 currently.

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Business Overview & Management

Corporate History

Aratana Therapeutics was incorporated in December 2010 and is a biopharmaceutical company focused on the licensing, development and commercialization of pet therapeutic products.

The company was initially formed on the back of three in-licensed product candidates, AT-001 for osteoarthritic pain and inflammation, AT-002 for appetite stimulation, and AT-003 for post-operative pain management. Aratana successfully completed an initial public offering in June 2013, where the company offered 5.75 million shares of its common stock at a price of $6.00 per share.

Since the IPO, Aratana significantly boosted its pipeline and accelerated its path to becoming a commercial stage company with the acquisitions of Vet Therapeutics (in October 2013) and Okapi Sciences N.V. (in January 2014), which added six drug candidates, including two monoclonal antibodies for lymphoma in dogs that are now approved.

In January 2014, Aratana completed a follow-on public offering where Jefferies LLC [LUK, $27.15, NC] acted as the lead book runner. Aratana sold 5.15 million shares at $19 per share for net proceeds of c$91m. Proceeds from the offering were used to pay for approximately $33.1m of remaining purchase obligations or promissory notes associated with the recent Vet Therapeutics and Okapi Sciences acquisitions, and will also be used for product development, expansion of commercial infrastructure in anticipation of future launches, and other general corporate and working capital purposes.

Current Activities

A premier R&D engine for pet therapeutics

Currently, Aratana is primarily a development stage company with a rich pipeline. The company has 11 product candidates in its development pipeline, with three of them targeting both dogs and cats. Two products, AT-004 (for B-cell lymphoma in dogs) and AT-005 (for T-cell lymphoma in dogs), have been granted conditional approvals by the USDA. In addition, Aratana recently in-licensed three undisclosed candidates from Advaxis and has options to in-license two programs for further development.

AT-004 and AT-005, anti-CD20 and anti-CD52 monoclonal antibodies, respectively, were acquired through the Vet Therapeutics acquisition. The Center for Veterinary Biologics at the USDA granted conditional approval for the two drugs in November 2012 and January 2014, respectively. Aratana is currently conducting clinical studies to support full approvals for these drugs, and the company expects full approval decisions around late 2014/ early 2015. These drugs are the first biologics approved for lymphoma in dogs.

Aratana currently has 11 candidates in its R&D pipeline, four of which are in early lead selection phase. Current therapeutic areas of development including neurology (e.g., pain and inflammation associated with osteoarthritis, stimulation of appetite, post-operative pain management), antiviral (e.g., ocular herpes infection, feline immunodeficiency virus infection), and oncology (e.g., osteosarcoma, lymphoma, mast cell tumor). Chronic pain associated with osteoarthritis in cats, and stimulation of appetite in dogs and cats represent intriguing market opportunities where there are currently no approved treatments, and ADXS-cHER2 has demonstrated strong efficacy and benign safety in an initial 13 dog study. Additionally, since human antiviral and immune-enhancing drugs are often used off-label for feline herpes and immunodeficiency viruses,

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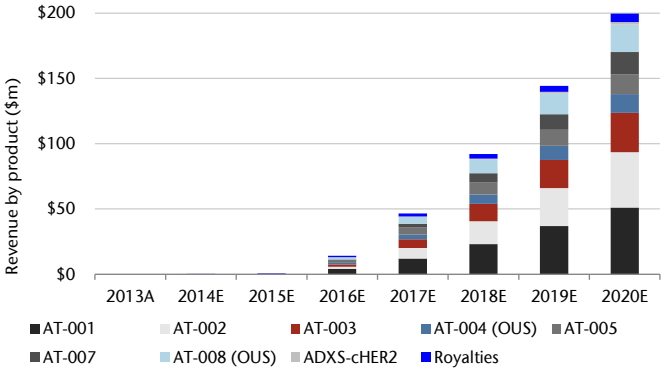
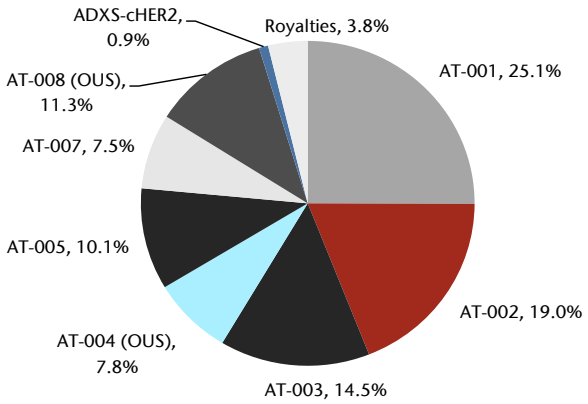
we think dedicated feline antivirals for these indications could be important additions to the treatment armamentarium of veterinarians.

Exhibit 21: Aratana risk-adjusted revenue forecast by key products, 2013A-2020E ($m)



Source: Jefferies estimates

Exhibit 22: Aratana 2018E revenue split by product sales



Source: Jefferies estimates

Management

Steven St. Peter – Chief Executive Officer: Dr. St. Peter is a founder of Aratana and has served as the President and Chief Executive Officer since September 2012. He has been a member of the board of directors since December 2010 and served as the Chairman from December 2010 to September 2012. Dr. St. Peter was a Managing Director at MPM Asset Management LLC from January 2004 to May 2012, where he focused his investments on both venture and buyout transactions across the pharmaceuticals and medical technology industries. He has previous investment experience at Apax Partners and The Carlyle Group, both private equity firms.

Craig A. Tooman – Chief Financial Officer: Mr. Tooman has served as the Chief Financial Officer since November 2013 and as the Treasurer since January 2014. He was a member of the board of directors from April 2012 to November 2013. Mr. Tooman previously served as the Chief Executive Officer of Avanzar Medical, Inc., a privately-held company focused on commercial oncology opportunities, since February 2012. Mr. Tooman was also the founder and principal of Stockbourne LLC, a firm that provides strategic business and financial advisory services, a position he held from January 2011 to November 2013. Prior to this, Mr. Tooman was part of the senior management team at Ikaria Inc., Enzon Pharmaceuticals, ILEX Oncology, and Pharmacia Corporation.

Ernst Heinen – Head of Drug Evaluation and Development: Dr. Heinen has served in this capacity since June 2012. From 1990 to 2012, Dr. Heinen held positions of increasing responsibility at Bayer Animal Health, the animal health division of Bayer AG, where he ultimately served as vice president of research & development and veterinary technical services, Pets. Dr. Heinen currently serves on the Kansas State University Olathe Advisory Board and previously served on the boards of the Kansas City Area Development Council and the Center for Animal Health Innovation, and he is the author of dozens of scientific articles and presentations focused on the animal health industry.

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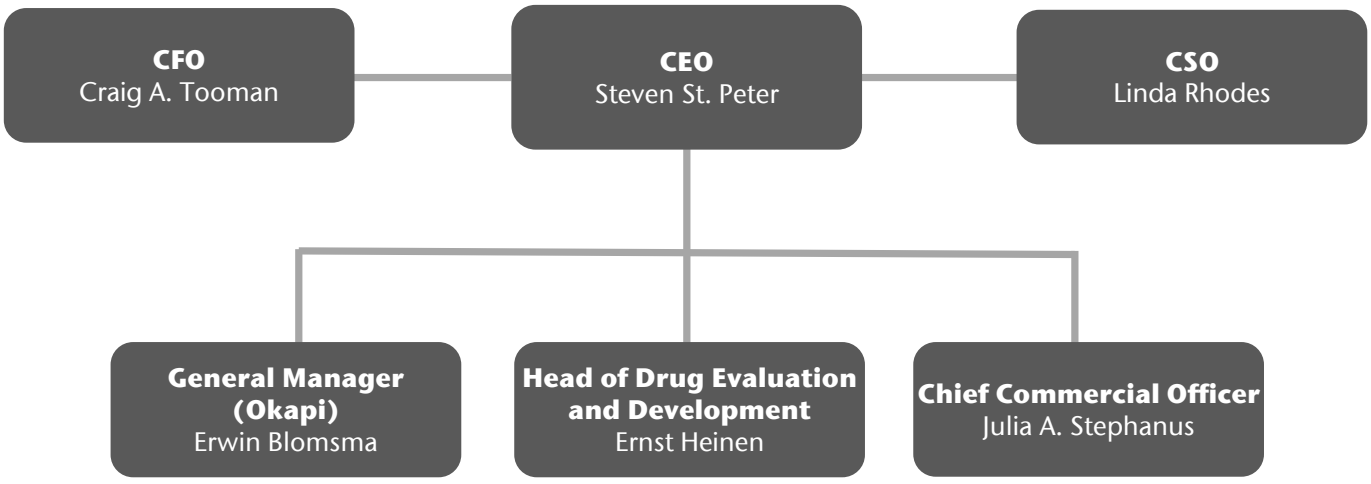
Linda Rhodes – Chief Scientific Officer: Dr. Rhodes has served as the Chief Scientific Officer since September 2012 and as a member of the board of directors since February 2011. In addition, she served as the Chief Executive Officer from February 2011 to September 2012. In 2001, Dr. Rhodes was a founding partner of AlcheraBio LLC, an animal health consulting and contract research firm, which was acquired in October 2008 by Argenta, a New Zealand animal health formulations and contract manufacturing organization, and she served as its Vice President of clinical development from February 2008 to February 2011. Prior to this, Dr. Rhodes also held management positions at Merial Ltd., Merck Research Laboratories, and Sterling Winthrop Drug.

Julia A. Stephanus – Chief Commercial Officer: Ms. Stephanus has served as the Chief Commercial Officer since January 2013. From September 2010 through December 2012, Ms. Stephanus was Director of the global pet franchise for Ceva Animal Health, where she oversaw the commercial development of new products as well as global marketing for strategic pet products. In 2006, Ms. Stephanus founded Summit VetPharm, the developer of Vectra, and served as its President and Chief Executive Officer until it was acquired by Ceva Animal Health in August 2010. Prior to founding Summit VetPharm, Ms. Stephanus worked in various sales and marketing positions for Pfizer Inc. and its legacy companies.

Erwin Blomsma – General Manager: Okapi Sciences NV, Vice President, Aratana Therapeutics: Dr. Blomsma holds a Master's degree in Bioscience Engineering and a Ph.D. in Applied Biological Sciences (1995) from the KU Leuven (Belgium). After post-doctoral studies at UCB, he started his career at Janssen Pharmaceutica (Belgium) in 1996 in the Chemical Process Technology Group. In 2000, he co-founded Crystallics, a spin-off from the University of Leiden (Netherlands) specialising in preformulation research. Crystallics was absorbed by Avantium Technologies in 2001, and he was appointed COO there in 2004, playing a key role in making the company cash-positive.

Exhibit 23: Aratana management organization chart



Source: Company data

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Corporate Activity

Although the company was only incorporated in late 2010, Aratana has rapidly boosted its pipeline through the acquisitions of Vet Therapeutics and Okapi Sciences.

Aratana acquired Vet Therapeutics in October 2013 for a combination of $30m in cash, 625,000 shares of PETX common shares, and a $3m promissory note (7% interest rate) maturing on December 31, 2014. Aratana obtained a proprietary antibody-based biologics platform and accelerated its path to becoming a commercial stage company through this acquisition, as Vet Therapeutics' AT-004 and AT-005 have received conditional US approvals for the treatment of B-cell and T-cell lymphoma in dogs, respectively. Additionally, AT-009 and AT-010, also acquired through Vet Therapeutics, are currently in the lead selection phase.

Aratana acquired Okapi Sciences in January 2014 for a combination of $13.9m in cash, a $14.9m promissory note (7% interest rate) maturing on December 31, 2014, and an additional $16.3m in cash or shares of PETX common stock within 90 days of closing (since repaid with proceeds from the January 2014 secondary offering). Aratana obtained a pet antiviral platform through Okapi, highlighted by AT-006 and AT-007 for feline ocular herpes and immunodeficiency infections, respectively. Other pipeline candidates obtained from Okapi include AT-008 (dog lymphoma) and AT-011, which is in the lead selection phase for parvovirus in dogs.

Exhibit 24: Aratana Therapeutics – Strategic acquisitions

Name	Date	Valuation ($)	Rationale
Vet Therapeutics	Oct 15, 2013	$30m in cash, 625,000 shares of PETX common stock, and $3m promissory note	Gained a monoclonal antibody platform with two key products (i.e., AT-004 and AT-005) and accelerated path to being a commercial stage company
Okapi Sciences	Jan 6, 2014	$13.9m in cash, $14.9m promissory note, and $16.3m in cash or shares of common stock within 90 days of acquisition closing	Gained a pet antiviral platform with six additional product candidates (e.g., AT-006, AT-007) as well as a European base of operations which gives PETX greater flexibility with respect to its commercialization strategy in Europe

Source: Company data

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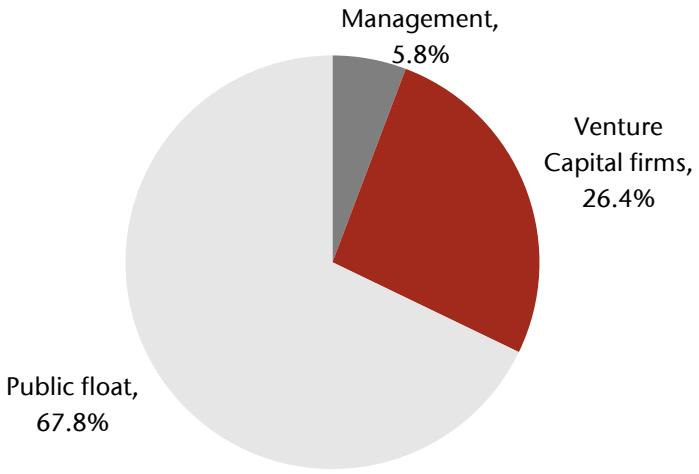
Ownership and shareholder structure

Aratana has one class of common shares in issue listed on the NASDAQ exchange. Following the secondary offering on January 29, 2014, there are 29.5m shares outstanding.

Exhibit 25: Aratana stock ownership by investor type



Source: Company data, Jefferies estimates

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Base Business & Pipeline Review

Whilst Aratana does not yet have any material revenues to date, given that its first two products, AT-004 and AT-005 have only just recently attained conditional marketing approval, we see a strong inflection from 2016E, after the approval of additional pipeline candidates and full approvals of AT-004 and AT-005. By 2020E, we expect risk adjusted sales of $200m for Aratana, of which $193.1m are direct product sales and the remaining $6.4m come from royalties.

Exhibit 26 summarises the indications, peak sales and approval timelines for the overall portfolio.

Exhibit 26: Estimated approval timeline and peak sales estimates for key assets by region

Product	Proposed indication	Animal species	JEFe Approval		JEFe Peak sales ($m)	
			US	EU	US	EU
AT-001	Osteoarthritic pain and inflammation	dogs	2016	2017	$51	$46
		cats	2018	2019	$30	$26
AT-002	Appetite stimulant	dogs	2016	2017/18	$20	$18
		cats	2017	2018	$66	$59
AT-003	Post-operative pain	dogs	2016	2017	$37	$34
		cats	2017	2018	$23	$21
AT-004	B-cell lymphoma	dogs	Approved	mid 2016	$30	$30
AT-005	T-cell lymphoma	dogs	Approved	2016	$14	$14
AT-006	Feline ocular herpes virus	cats	2016	2015	$35	$31
AT-007	Feline immunodeficiency virus	cats	2017	2017	$36	$32
AT-008	Canine lymphoma	dogs	NA	2016	NA	$44
ADXS-cHER2	Osteosarcoma	dogs	2015	2017	$5	$5
AT-009	Mast cell tumors	dogs	NA	NA	NA	NA
AT-010	Atopic dermatitis	dogs	NA	NA	NA	NA
AT-011	Parvovirus	dogs	NA	NA	NA	NA
AT-012	Feline calicivirus	cats	NA	NA	NA	NA

Source: Company data, Jefferies estimates

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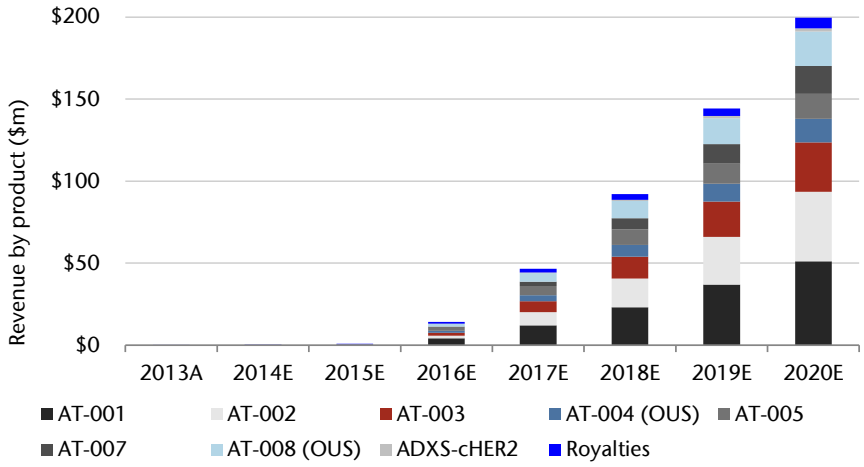
Exhibit 27 shows how revenues develop by each individual product opportunity through to 2020E. Note that royalties come from worldwide sales of AT-006 and US sales of AT-004, both of which are commercialized by Novartis Animal Health.

Exhibit 27: Aratana risk-adjusted product sales and royalties by product, 2013A-20E ($m)



Note that 2013A revenue of $0.123m includes $0.109m of manufacturing revenue
Source: Jefferies estimates, company data

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Exhibit 28 summarises the key base business and pipeline assets of Aratana and describes the market opportunity for these products as well as a brief summary of the existing treatments.

Exhibit 28: Market opportunity and competitive landscape for key assets

Drug	Generic	Proposed indication	Animal species	Market opportunity	Existing treatments
AT-001	grapiprant	Osteoarthritic pain and inflammation	dogs and cats	Arthritis Incidence is estimated at 20% in dogs and 23% in cats, according to Aratana. Veterinarians recommended NSAID therapy for 82% of the dogs they treated with osteoarthritis, and they believe approximately 60% receive treatment, according to Brakke Consulting	Primarily NSAIDs (e.g., carprofen), also corticosteroids and disease modifying products (e.g., glycosaminoglycan, glucosamine)
AT-002	capromorelin	Appetite stimulant	dogs	2.1% of dogs in the US are diagnosed with cancer annually with ~61% receiving some form of treatment, according to Brakke Consulting. Chemotherapy is the most common form of treatment and inappetence is seen in approximately 30% of dogs who receive chemotherapy, according to Aratana.	No approved treatments. Some human antidepressants (e.g., benzodiazepines, cyproheptadine, mirtazapine) have been used off-label, and tube feeding could be used in the hospital setting
			cats	Inappetence commonly occurs in conjunction with chronic renal failure (CRF); Aratana estimates that 1.6% of cats in the US have CRF and that 30% these experience inappetence	No approved treatments. Some human antidepressants (e.g., benzodiazepines, cyproheptadine, mirtazapine) have been used off-label, and tube feeding could be used in the hospital setting
AT-003	bupivacaine	Post-operative pain	dogs	Approximate 19m dogs surgeries are performed each year, with ~50% being spays and neuters.	NSAIDs, opioids (e.g., fentanyl)
			cats	Approximate 14m dogs surgeries are performed each year, with ~58% being spays and neuters.	NSAIDs (e.g., Onsior, Meloxicam), butorphanol
AT-004	anti-CD20 mAb	B-cell lymphoma	dogs	~300,000 dogs are diagnosed annually with lymphoma, in the US, of which approximately 76% are of B-cell origin, according to Aratana	Chemotherapy (e.g., prednisolone, CHOP, doxorubicin), radiation, surgery
AT-005	Anti-CD52 mAb	T-cell lymphoma	dogs	~300,000 dogs are diagnosed annually with lymphoma, in the US, of which approximately 24% are of T-cell origin, according to Aratana	Chemotherapy (e.g., prednisolone, CHOP, doxorubicin), radiation, surgery
AT-006		Feline ocular herpes virus	cats	It is estimated that up to 97% of all cats have been exposed to the feline herpes virus (FHV-1) and ~4% of cats are diagnosed with FHV-1, according to industry sources	PETX knows of no direct competitor, and off-label human drugs and antibacterials are used to treat symptoms and secondary infections; vaccines exist but the majority of cats are unvaccinated, feline interferon (only approved in Europe), lysine
AT-007		Feline immune-deficiency virus	cats	~2.5% of domesticated cats in the US were found to be FIV-seropositive in a 2004 study; prevalence in Europe is highly variable, ranging from 2.1% to 12.5%	LTCI (immune-enhancing protein), feline interferon omega (approved in Europe), and veterinarians may use human antivirals, or anti-inflammatory agents
AT-008		Canine lymphoma	dogs	See AT-004 and AT-005	Chemotherapy, radiation, surgery
ADXS-cHER2	HER2-targeting immunotherapy	Osteosarcoma (bone cancer)	dogs	It is estimated that 8,000 - 10,000 cases of osteosarcoma are diagnosed in dogs in the US each year, according to Advaxis	Current standard of care consist of surgery (amputation of affected limb) followed by chemotherapy (e.g., cisplatin, carboplatin, doxorubicin), while radiation is another option

Source: Company data, Jefferies estimates

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Marketed products

AT-004

AT-004 is a caninized anti-CD20 monoclonal antibody (canine version of the human drug Rituxan) for the treatment of B-cell lymphoma in dogs. The USDA Center for Veterinary Biologics (CVB) granted a conditional license in November 2012. The required material for a full license was submitted to the CVB in early 2014 and Aratana expects a decision by late 2014 or early 2015.

In multiple studies, an AT-004 dosing regimen of 2 doses of 5.0 mg/kg each on the first week followed by 1 dose of 5.0 ± 1.0 mg/kg per week for 7 weeks resulted in significantly increased survival compared to the non-treated historical group. An initial safety study using a similar dosing regimen did not show any treatment-related side effects, although there were rare cases of lethargy, inflammation, or hypersensitivity, which required treatment with antihistamines or anti-inflammatory agents. Aratana believes this drug could be used as monotherapy or in combination with existing chemotherapy. Aratana has conducted clinical work for the AT-004/ chemotherapy combination regimens and plans to submit these results for peer-review publication in the future.

AT-004 is commercialized by Novartis Animal Health in the US and Canada as part of an agreement between the companies, commercialization right outside of these regions was retained by Aratana. Although this drug is currently approved in the US, Aratana does not expect meaningful sales before the product gains a full license. We currently project global peak sales of c$60m for AT-004, although Aratana is only expected to receive net sales-based royalties ranging from mid-teens to mid-twenties percent in the partnered territories.

Chemotherapy with generic human-labeled drugs (e.g., doxorubicin, CHOP) is currently the most commonly recommended treatment, while other treatments include radiation and surgery. Additionally, two privates companies are also developing treatments for lymphoma in dogs:

- Nexvet, an Australian company, is developing fully caninized monoclonal antibodies (NV-04/ NV-05) for oncology targets, including lymphoma, and
- VetDC, a US company, is developing a small molecule drug (VDC-1101) for lymphoma. VDC-1101 is a double prodrug of the anti-proliferative nucleotide analog 9-(2-phosphonylmethoxyethyl) guanine (PMEG). In 62 dogs with lymphoma, VDC-1101 demonstrated a 77% overall response rate and dose-limiting toxicities were generally manageable and reversible. The company expects a US submission in 2014.

Our due diligence uncovered a wide range of estimates on the incidence rate of lymphoma in dogs. According to Aratana, approximately 300,000 dogs are diagnosed with lymphoma each year in the US, with roughly 76% (~228,000) originating from B-cells and 24% (~72,000) originating from T-cells.

Exhibit 29: AT-004 – JEFe peak sales calculation

Calculation		Reference/ comments
Annual WW incidences of B-cell lymphoma	100,000	JEF assumption based on range of refs
AT-004 peak penetration	20%	JEF assumption
Dogs treated with AT-004	20,000	
AT-004 revenue/ dog/ year	$3,000	JEF assumption
Annual WW peak revenue (m)	**$60.0**	

Source: Jefferies estimates

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AT-005

AT-005 is a caninized anti-CD52 monoclonal antibody (canine version of the human drug Campath) for the treatment of T-cell lymphoma in dogs. The USDA Center for Veterinary Biologics granted a conditional license in January 2014. Aratana currently expects to submit the full license application around mid-2014, and a CVB decision around late 2014/ early 2015.

In multiple studies, AT-005 treatment in client-owned dogs significantly increased survival relative to the non-treated historical groups. A safety study, using a dosing regimen of 2.5 mg/kg administered with two doses on week 1 to 4, at 2 to 3 day intervals, followed by 4 doses every other week, did not show any treatment-related side effects. In the next several months, Aratana plans to initiate trials of AT-005 in combination with various chemotherapy regimens and expect the trials to read out in 2015 and beyond.

Aratana plans to initially focus sales effort on the top 1,000 veterinary cancer specialists, but does not expect significant sales for AT-005 before obtaining a full license. We project global peak sales of c$27m for AT-005.

Exhibit 30: AT-005 – JEFe peak sales calculation

Calculation		Reference/ comments
Annual WW incidences of B-cell lymphoma	45,000	JEF assumption based on range of refs
AT-005 peak penetration	20%	JEF assumption
Dogs treated with AT-004	9,000	
AT-005 revenue/dog/year	$3,000	JEF assumption
Annual WW peak revenue (m)	**$27.0**	

Source: Jefferies estimates

R&D Portfolio

Animal drug approval process

The regulatory requirements for animal drugs are more favourable compared to that for human drugs, and result in advantages in terms of developing timing and costs. Whereas developing a successful human drug could take up to 10 years and incur costs that could reach $1 billion, developing an animal drug is more favourable at only around 3-5 years and roughly $10m, respectively.

In the US, the FDA Center for Veterinary Medicine (CVM) and USDA Center for Veterinary Biologics (CVB) are typically responsible for approval of small molecule and biologic therapeutics for animals, respectively. In Europe, The EMA's Committee for Medicinal Products for Veterinary Use (CVMP) is responsible for reviewing applications for animal pharmaceuticals and vaccines, and the European Commission is responsible for granting marketing authorizations. There are three main sections in animal drug applications that are similar across both the US and Europe:

- **Effectiveness**: Early pilot studies may be done in laboratory or field animals to establish effectiveness, dose range, and pharmacokinetics of a product. After establishing an effective dose, a company could initiate a pivotal field study after reaching concurrence with the FDA on the study protocol. The pivotal study should be multi-site, randomized, and placebo-controlled. In the US and EU, regulatory agencies generally require the treatment and placebo arms of the study to each have approximately 100 to 150 animal subjects. In many cases, a pivotal field study designed with clinical sites in both the US and EU may satisfy the regulatory requirements in both regions.

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- **Safety**: To assess the safety of animal drugs, regulatory bodies typically require companies to provide data from a study in laboratory animals that uses higher doses over a period of time, as determined by the intended dosing regimen in the label. The CVM will typically review the study design to help assure that the results meet agency requirements. The studies are designed with clear safety margins and will help establish a safe dose and identify any potential safety concerns. Field safety data are also collected and evaluated by different agencies to help ensure that drugs will be safe in the target population.

- **Chemistry, Manufacturing, and Controls (CMC)**: Regulatory agencies require companies to provide documentation on the process by which the active pharmaceutical ingredient (API) is made and the controls applicable to that process that ensure the API and the final product formulation meeting certain criteria (e.g., purity, stability). For the FDA and EMA, both pharmaceutical API and commercial formulations are required to be manufactured in cGMP facilities. While the USDA does not have a cGMP requirement, manufacturing facilities for veterinary biologics must be inspected by the CVB and have an establishment license.

Additionally, European authorities also require a risk assessment for potential human exposure, while US authorities do not require an environmental impact statement.

Approval timelines

Typically, the FDA could issue a decision on an administrative New Animal Drug Application (NADA) within 4-6 months. The USDA does not have a statutory review timeline, but the agency will issue a time-limited conditional license for emergencies, or where there is no approved product available, after the manufacturing and safety requirements have been substantially fulfilled and a reasonable expectation of efficacy has been established. A company would then have 1-2 years to obtain full license for the products. For the CVMP, a final opinion to recommend approval of or reject an application is generally given with 210 days of submission of a dossier (similar to a NADA in the US). If a product is recommended for approval by the CVMP, the European Commission will typically then grant final product approval.

Key pipeline products

AT-001

AT-001 (grapiprant) is a selective prostaglandin E receptor 4 (EP4) antagonist for the proposed treatment of pain and inflammation associated with osteoarthritis (OA). This drug is currently in development in both dogs and cats. In dogs, a dose has been selected and a pivotal effectiveness study is expected to start in Q2'14 that is similar to the initial efficacy study described below. In cats, Aratana plans to pursue a chronic indication and is currently designing a study protocol for this indication.

In dogs, the efficacy and safety of AT-001 has been demonstrated in multiple studies. An initial efficacy study (n>350), measured using the Canine Brief Pain Inventory (validated pain scoring system), showed statistically significantly greater clinical success rate for the treatment groups relative to the placebo group (61.6% vs. 42.4%, $p<0.05$), while a toxicity study (n=36) found no drug-related effects during a nine month dosing period. However, in the toxicity study, the incidences of GI effects (e.g., loose or mucous stool) were higher in some animals of the treatment groups compared to the control group, and a significant decrease in mean serum albumin was observed at weeks 26 and 39 in the highest AT-001 dose group (50mg/kg).

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In cats, Aratana is currently working with experts to develop a protocol for this drug for this indication, after earlier proof of concept studies in acute post-operative settings showed a dose-dependent increase of blood parameters related to liver metabolism.

Osteoarthritis is the most common inflammatory joint disease in pets and the incidence of arthritis could be around 20% in dogs and 23% in cats, according to Aratana. The US cat and dog analgesic market was approximately $260m in 2011 and was comprised primarily of NSAIDs (e.g., Rimadyl, Deramaxx, Metacam), with sales of approximately $220m (April 2012 Brakke Consulting Pain Management Products Survey). Other treatments include products that improve the health of joints, such as glycosaminoglycan (e.g., Adequan) and glucosamine (e.g., Dasaquin, Cosequin), and corticosteroids. While NSAIDs are the most commonly used treatment, drawbacks include gastrointestinal side effects and periodic lab blood tests that could be burdensome for pet owners. For cats, there is no chronic treatment for pain and inflammation associated with OA. In addition to the products above, Kindred Biosciences [KIN, $21.48, NC] is developing CereKin (oral formulation of diacerein, an interleukin-1 beta inhibitor) for osteoarthritis pain and inflammation in dogs. Kindred expects data from a pivotal study for this drug in Q2'14 and intend to submit for US approval around mid-2014, with a potential decision in H1'15. Nexvet, a private company, is developing NV-01 and NV-02, monoclonal antibodies for osteoarthritis in dogs and cats, respectively.

Aratana plans to market this product using its own primary salesforce as well as a distributor salesforce. We estimate launch in 2016 and global peak sales of c$98m in dogs for AT-001, and 2018 and c$56m in cats.

Exhibit 31: AT-001 in dogs – JEFe peak sales calculation

Calculation		Reference/ comments
Total dogs (m)	158	
US (m)	83	American Pet Products Association (APPA)
Europe (m)	75	The European Pet Food Industry (FEDIAF)
Arthritis incidence rate	20%	Johnston SA, Vet. Clin. North. Am. Small. Anim. Pract., 1997
Dogs with arthritis (m)	31.6	
Diagnosis rate	35%	JEF estimate
% receiving treatment	49%	Brakke Consulting
Dogs with arthritis receiving Tx (m)	5.4	
AT-001 peak penetration	30%	JEF assumption
Dogs receiving AT-001 (m)	1.6	
AT-001 revenue/dog/year	$60	JEF assumption
Annual WW peak revenue (m)	**$97.9**	

Source: Jefferies estimates

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Exhibit 32: AT-001 in cats – JEFe peak sales calculation

Calculation		Reference/ comments
Total Cats (m)	181	
US (m)	96	Aratana estimate
Europe (m)	85	Aratana estimate
Arthritis incidence rate	23%	Aratana estimate
Cats with arthritis (m)	41.6	
Diagnosis rate	15%	JEF assumption
% receiving treatment	30%	JEF assumption
Cats with arthritis receiving Tx (m)	1.9	
AT-001 peak penetration	50%	JEF assumption
Cats receiving AT-001 (m)	0.9	
AT-001 revenue/cat/year	$60	JEF assumption
Annual WW peak revenue (m)	**$56.2**	

Source: Jefferies estimates

AT-002

AT-002 (capromorelin) is a selective ghrelin agonist for the proposed stimulation of appetite in dog and cats. A pivotal effectiveness study in 150 client-owned dogs are ongoing, and top line results are expected in H1'15. The company is currently developing a protocol for a field study to assess the ability AT-002 to improve appetite and body weight in chronic diseased cats.

In dogs, AT-002 has already showed favorable efficacy in a 7-day, placebo-controlled, blinded dosing study (n=30). AT-002 treatment resulted in statistically significant percent improvement in mean appetite score on Day 6 (AT-002 vs. placebo: 79% vs. 23%, $p<0.05$) and mean body weight on Day 6 (+3.2% vs. -0.2%, $p<0.05$). Aratana also believes this drug could be well-tolerated in dogs based on a 12-month toxicology (n=32).

In cats, several laboratory studies have shown statistically significantly improved food intake after AT-002 administration, and a two week safety study in kidney-compromised and normal cats also showed no treatment related side effects.

Inappetence in companion animals could arise from a range of underlying diseases, and there are currently no approved treatments for this disorder in dogs and cats. That said, human treatments affecting feeding control in the central nervous system (e.g., benzodiazepines, cyphroheptadine, mirtazapine) have been used off-label in companion animals, and tube feeding may also be used in the hospital setting.

In dogs, Aratana highlighted that inappetence is observed in approximately 30% of dogs that receive chemotherapy, and in cats, the company mentioned that inappetence is common among those afflicted with chronic renal failure. Similar to AT-001, this product will be sold through both the Aratana and distributor salesforces. We estimate AT-002 will launch in 2016 with global peak sales of c$38m in dogs, and 2017 and c$125m in cats.

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Exhibit 33: AT-002 in dogs – JEFe peak sales calculation

Calculation		Reference/ comments
Total dogs (m)	158	
US (m)	83	American Pet Products Association
Europe (m)	75	The European Pet Food Industry (FEDIAF)
Cancer diagnosis rate	2.1%	Brakke Consulting
Dogs diagnosed with cancer (m)	3.3	
% receiving treatment	61%	Brakke Consulting
Dogs receiving Tx (m)	2.0	
% treatment with chemotherapy	58%	Brakke Consulting
Dogs receiving chemotherapy (m)	1.2	
% suffering inappetence	30%	Aratana estimate
Dogs suffering inappetence (m)	0.4	
AT-002 peak penetration	40%	JEF assumption
Dogs treated with AT-002 (m)	0.1	
Revenue/dog/year	$266	
Price/day	$2.00	JEF assumption
Days usage/year	133	JEF assumption
Annual WW peak revenue (m)	**$37.5**	

Source: Jefferies estimates

Exhibit 34: AT-002 in cats – JEFe peak sales calculation

Calculation		Reference/ comments
Total Cats (m)	181	
US (m)	96	Aratana estimate
Europe (m)	85	Aratana estimate
Chronic renal failure (CRF) incidence	1.6%	Aratana estimate
Cats with CRF (m)	2.9	
% with inappetence	30%	Aratana estimate
CRF cats suffering inappetence (m)	0.9	
AT-002 peak penetration	40%	JEF assumption
Cats treated with AT-002 (m)	0.3	
Revenue/cat/year	$360	
Price/day	$2.00	JEF assumption
Days usage/year	180	JEF assumption
Annual WW peak revenue (m)	**$125.1**	

Source: Jefferies estimates

AT-003

AT-003 is an injectable liposomal formulation of bupivacaine, a local anaesthetic, for the management of post-operative pain in dogs and cats. Aratana plans to initiate a pilot study in Q2'14 in dogs following orthopaedic surgery. Aratana has also initiated a dose ranging study in laboratory cats and expects to file a NADA in 2016.

In dogs, Aratana has selected a dose for further evaluation through a dose ranging study (n=40) using a surgical pain model, and demonstrated that the only treatment related effects of AT-003 were associated with non-adverse injection site reactions, due to low incidence rate and severity, through a 4-week pivotal safety study (n=60, twice daily dosing).

In cats, Aratana is continuing to refine the dosing regimen in the orthopaedic surgical pain model. A dose ranging study in soft tissue and orthopaedic surgical pain models failed to demonstrate superiority of AT-003 over conventional bupivacaine HCl in soft tissue surgery pain model.

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Commonly used drug classes for post-operative pain in dogs and cats include NSAIDs and opioids (e.g., fentanyl in dogs, butorphanol in cats). With the safety concern and monitoring burden associated with NSAIDs, we think long-acting, localized painkillers like AT-003 could have an important role in the post-operative pain management paradigm. Additionally, Kindred Biosciences is developing SentiKin (oral formulation of flupirtine) for post-operative pain in dogs and intends to submit this drug for marketing approval in the US in late 2014 and potential approval decision in late 2015.

According to Aratana, veterinarians perform approximately 19m and 14m surgeries in dogs and cats in the US, respectively, each year. We think the comparatively low cost spay and neuter surgeries, which Aratana estimates are roughly 50% of dog surgeries and 58% of cats surgeries, could be a limited opportunity. However, pain management in other surgical procedures, such as orthopaedic and cancer surgeries, could present viable opportunities for AT-003, in our view. We estimate an AT-003 launch in 2016 with global peak sales of c$71m in dogs, and 2017 and c$44m in cats.

Exhibit 35: AT-003 in dogs – JEFe peak sales calculation

Calculation		Reference/ comments
Dog surgeries/year (m)	38	Aratana estimate
% Non-spay and neuter surgeries	50%	Aratana estimate
Non-spay/ neuter surgeries (m)	19.0	
AT-003 peak penetration	10%	JEF assumption
Dogs treated with AT-003 (m)	1.9	
AT-003 revenue/dog/year	$37.3	
Price/day	$2.7	JEF assumption
Treatment period (days)	14	JEF assumption
Annual WW peak revenue (m)	**$70.9**	

Source: Jefferies estimates

Exhibit 36: AT-003 in cats – JEFe peak sales calculation

Calculation		Reference/ comments
Cat surgeries/year (m)	28	Aratana estimate
% Non-spay and neuter surgeries	42%	Aratana estimate
Non-spay/ neuter surgeries (m)	11.8	
AT-003 peak penetration	10%	JEF assumption
Cats treated with AT-003 (m)	1.2	
AT-003 revenue/cat/year	$37.3	
Price/day	$2.7	JEF assumption
Treatment period (days)	14	JEF assumption
Annual WW peak revenue (m)	**$43.9**	

Source: Jefferies estimates

AT-006

AT-006 is a feline specific antiviral for the proposed treatment of ocular herpes infection caused by feline herpes virus-1 (FHV-1). A pivotal effectiveness study is ongoing in Europe, and Aratana expects a filing in 2014. An INAD has been filed with the FDA. Aratana has mentioned that a FDA decision could be possible 12-18 months following EU approval.

FHV-1 is the second most common viral disease in cats and around 4% of cats are diagnosed with FHV-1, according to Aratana. Human antivirals, especially acyclic nucleoside analogues (e.g., cidofovir, famciclovir, ganiclovir, trifluridine) are commonly used to treat symptoms and antibacterial drugs are used to prevent secondary bacterial infections. While FHV-1 vaccines exist, they will not completely prevent an infection if the cat is already exposed to the virus and cats may still succumb to this virus at high doses.

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According to Aratana, the majority of cats are unvaccinated for FHV-1. Other treatments recommended for FHV-1 treatment include interferons, which could help stimulate local immunity against viral infections, and lysine, which could help disrupt viral replication.

We estimate AT-006 launches in 2015 and 2016 in the EU and US, respectively, and global peak sales of c$65m. Novartis Animal Health has worldwide commercialization rights and Aratana is entitled to net sales-based royalties ranging from high single digits to mid-teens percent.

Exhibit 37: AT-006 in cats – JEFe peak sales calculation

Calculation		Reference/ comments
Total Cats (m)	181	
US (m)	96	Aratana estimate
Europe (m)	85	Aratana estimate
FHV-1 diagnosis rate	4.0%	
Cats diagnosed with FHV-1 (m)	7.2	
% receiving treatment	75%	JEF assumption
Cats treated for FHV-1 (m)	5.4	
AT-006 peak annual penetration	40%	JEF assumption
Cats treated with AT-006 (m)	2.2	
AT-006 revenue/cat/year	$30.0	JEF assumption
Annual WW peak sales (m)	**$65.2**	

Source: Jefferies estimates

AT-007

AT-007 is a feline specific antiviral that is from the same compound family as tenofovir, and is being developed for the proposed treatment of feline immunodeficiency virus (FIV). Aratana is conducting a pilot study in Europe and recently filed an INAD with the FDA. Aratana has mentioned that it believes it can obtain both full EMA approval and conditional FDA approval in 2017 with a minor use in minor species (MUMS) designation.

There is no dedicated antiviral treatment for FIV in cats, although human antivirals and interferons (e.g., Virbagen Omega) are used. In 2006, the USDA also approved Lymphocyte T-Cell Immunomodulator (LTCI), an immune-modulating protein, to aid in the treatment of FIV by restoring a cat's normal immune function.

FIV affects cats worldwide and epidemiologic studies have shown prevalence range of 2.5% to 44%. We currently estimate AT-007 launches in 2017 in both the EU and US, and global peak sales of c$68m.

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Exhibit 38: AT-007 in cats – JEFe peak sales calculation

Calculation		Reference/ comments
Total Cats (m)	181	
US (m)	96	Aratana estimate
Europe (m)	85	Aratana estimate
FIV positive rate	2.5%	Scientific literature, JEF assumption
Cats with FIV (m)	4.5	
Diagnosis rate	25%	JEF assumption
Cats Diagnosed (m)	1.1	
% receiving treatment	75%	JEF assumption
Cats treated for FIV (m)	0.8	
AT-007 peak annual penetration	40%	JEF assumption
Cats treated with AT-007 (m)	0.34	
AT-007 revenue/cat/year	$200	JEF assumption
Annual WW peak revenue (m)	**$67.9**	

Source: Jefferies estimates

AT-008

AT-008 is a small molecule drug for the treatment of canine lymphoma and Aratana only has commercial rights outside of North America. This product has been granted MUMS status in the EU. We currently estimate drug launch in 2016 and peak sales of c$44m.

Exhibit 39: AT-008 in dogs – JEFe peak sales calculation

Calculation		Reference/ comments
Total lymphoma annual incidence	72,500	
B-cell	50,000	JEF assumption based on range of refs
T-cell	22,500	JEF assumption based on range of refs
AT-008 peak penetration	20%	JEF assumption
Dogs treated with AT-008	14,500	
AT-008 revenue/dog/year	$3,000	JEF assumption
Annual OUS peak revenue (m)	**$43.5**	

Source: Jefferies estimates

ADXS-cHER2

ADXS-cHER2 is an immunotherapy that targets HER2 over-expressing cancers such as osteosarcoma. The antigen in ADXS-cHER2 is a combination antigen, combining two external and three internal binding epitopes of the HER-2 peptide into a truncated combination peptide, fused to truncated listeriolysin O (LLO). Delivery of the HER2 antigen fused to the immunostimulant LLO, directly inside antigen presenting cells, could help drive an immune response to HER2 over-expressing cells. Aratana indicated that they will discuss the available data with the USDA, and believe that they could obtain conditional USDA approval for this drug within 2-3 years.

An initial study in 13 dogs with osteosarcoma that received standard of care (amputation and follow up chemotherapy), subsequent vaccination with ADXS-cHER2 led to statistically significantly prolonged overall survival (p=0.032) vs. dogs that did not receive this drug. Median survival for the placebo group was 8 months, whereas the median survival time for the ADXS-cHER2 group has not been reached. The first four dogs treated with ADXS-cHER2 are still alive, with each surviving over 21 months. There were no short- or long-term complications associated with the immunotherapy and only low-grade, transient toxicities reported in the 13 dog study. Some side effects include nausea, vomiting, and mild fever, which occurred within several hours of vaccination.

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Osteosarcoma has an incidence rate of ~8 out of every 100,000 dogs and primarily occurs in older dogs and those of larger breeds. Roughly 8,000 to 10,000 cases are diagnosed in dogs each year in the US, according to Advaxis. Current standard of care is surgery (e.g., amputation) followed by chemotherapy (e.g., cisplatin, doxorubicin), and radiation can also be used. We think the initial efficacy and safety profile for ADXS-cHER2 appears promising and believe conditional approval and launch in the US could occur as early as 2015. We currently estimate peak worldwide sales of c$10m for this drug.

Exhibit 40: ADXS-cHER2 in dogs – JEFe peak sales calculation

Calculation		Reference/ comments
Annual WW osteosarcoma incidence	16,000	Scientific literature, Advaxis
ADXS-cHER2 peak penetration	20%	JEF assumption
Dogs treated with ADXS-cHER2	3,200	
ADXS-cHER2 revenue/dog/year	$3,000	JEF assumption
Annual WW peak revenue (m)	**$9.6**	

Source: Jefferies estimates

Lead selection programs

- AT-009: This is a caninized anti-CD52 monoclonal antibody for the proposed treatment of canine mast cell tumors. Aratana plans to initiate proof of concept (POC) studies around early to mid-2015.
- AT-010: This is a caninized anti-CD52 monoclonal antibody for the proposed treatment of atopic dermatitis, which is the most common allergic skin disease in dogs. Aratana plans to initiate POC studies around mid to late 2015.
- AT-011: Aratana is evaluating a group of antiviral compounds for the treatment of parvovirus in dogs. The company plans to select the compound to develop as AT-011 based on pharmacokinetic, safety, and efficacy studies in cats.
- AT-012: Aratana is evaluating a group of molecules for the treatment of feline calicivirus, which is one of the two main viral causes of respiratory infection in cats. The company plans to select a development candidate by early to mid-2015.

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Clinical data summary

Available data suggest favourable efficacy and tolerable safety profiles for AT-001 – AT-005 and ADXS-cHER2, in our view. We will look for efficacy data for AT-001 in cats and see chronic pain as a promising indication for this product.

Exhibit 41: Efficacy and safety summary for key Aratana products

Product	Proposed indication	Species	Efficacy summary	Safety summary
AT-001	Osteoarthritic pain and inflammation	dogs	An initial efficacy study (n>350) found that clinical success rates, as measured using the Canine Brief Pain Inventory (validated pain scoring system), was statistically significantly greater for the treatment groups relative to the placebo group (61.6% vs. 42.4%, p<0.05), and adverse reactions were comparable to PBO.	A 9-month toxicity study (n=36) found no drug-related effects during the nine month dosing period, although the incidences of GI effects (e.g., loose or mucous stool) were higher in some animals of the treatment groups compared to the control group, and a significant decrease in mean serum albumin was observed at weeks 26 and 39 in the highest dose group (50mg/kg)
		cats	Initial proof of concept studies in surgical pain showed a clear effectiveness signal, but the relatively high doses needed for acute pain treatment, in combination with general anesthesia medication, could lead to an increase of blood parameters related to liver metabolism.	Evaluation of this drug in post-operative settings found a dose-dependent increase of blood parameters related to liver metabolism (signal of potential liver toxicity). Results suggest a trend that is a combined effect of the medication used to produce general anesthesia and high AT-001 doses.
AT-002	Appetite stimulant	dogs	A 7-day, placebo-controlled, blinded dosing study (n=30) demonstrated that AT-002 treatment resulted in statistically significant % improvement in appetite score on Day 6 (AT-002 vs. placebo: 79% vs. 23%, p<0.05) and body weight on Day 6 (+3.2% vs. -0.2%, p<0.05).	Based on a 12-month toxicology study (n=32), Aratana believes that this drug could be well tolerated in dogs
		cats	Several Aratana laboratory studies showed statistically significant increase in food intake after AT-002 treatment.	A two week safety study in kidney-compromised and normal cats showed no treatment related side effects.
AT-003	Post-operative pain	dogs	Aratana conduced a dose ranging study (n=40) using a surgical pain model and has chosen a dose for further evaluation.	The 4-week pivotal safety study (n=60), using twice-weekly dosing, showed that the only effects of AT-003 were associated with injection site reactions, but it was non-adverse due to a low incidence rate and severity.
		cats	A dose ranging study in soft tissue and orthopedic surgical pain models did not demonstrate a benefit of AT-003 over conventional bupivacaine HCl in soft tissue surgery. Aratana is continuing to refine the dose regimen and application technique.	Pilot toxicokinetic study with three doses of AT-003, bupivacaine, and saline did not show any negative findings in any dose group, with the exception of limited injection site abrasions.
AT-004	B-cell lymphoma	dogs	Studies with AT-004, with a dosing regimen of 2 doses of 5.0 mg/kg each on the first week followed by 1 dose of 5.0 ± 1.0 mg/kg per week for 7 weeks, resulted in significant increased survival compared to the non-treated historical group.	Initial safety study, with a dosing regimen of 2 doses of 5.0mg/kg each during the first week followed by 1 dose of 5.0 ± 1.0mg/kg per week for 7 weeks, showed no treatment related side effects. Rare instances of lethargy, inflammation or hypersensitivity were observed, which required treatment with antihistamines or anti-inflammatory drugs.
AT-005	T-cell lymphoma	dogs	Studies with AT-005 in client-owned dogs demonstrated that AT-005 significantly increased survival compared to the non-treated historical group.	A safety study, using a dosing regimen of 2.5 mg/kg administered with two doses on week 1 to 4 at 2 to 3 day intervals followed by 4 doses every other week, demonstrated no treatment related side effects.
ADXS-cHER2	Osteosarcoma	dogs	In a study (n=13) where dogs received standard of care (amputation and follow up chemotherapy), ADXS-cHER2 treatment led to statistically significantly prolonged overall survival (p=0.032). Median survival for placebo group was 8 months, whereas the median survival time for the ADXS-cHER2 group has not been reached. The first four dogs treated with ADXS-cHER2 are alive, with each surviving over 21 months.	There were no short- or long-term complications associated with the immunotherapy and only low-grade, transient toxicities reported in the 13 dog study. Some side effects include nausea, vomiting, and mild fever, which occurred within several hours of vaccination.

Source: Company data

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Partnership and licensing agreements

Aratana in-licensed AT-001 and AT-002 from RaQualia, AT-003 from Pacira [PCRX, $68.57, NC], and ADXS-cHER2 from Advaxis. AT-004 and AT-005 were obtained through the Vet Therapeutics acquisition, although Novartis Animal Health has commercialization rights for AT-004 in US and Canada. AT-006, AT-007, AT-008 and AT-011 were the primary assets acquired through the Okapi Sciences acquisition. Novartis Animal Health has worldwide commercialization rights for AT-006 and Aratana only has Europe and ROW commercialization rights for AT-008.

Exhibit 42: Commercial partnerships and terms for key assets

Product	Proposed indication	Species	Partnership	Key terms
AT-001	Osteoarthritic pain and inflammation	dogs	None	In-licensed from RaQualia and PETX could pay milestone payments of up to $10m and net sales-based royalty in the mid-single digits
		cats	None	In-licensed from RaQualia and PETX could pay milestone payments of up to $10m and net sales-based royalty in the mid-single digits
AT-002	Appetite stimulant	dogs	None	In-licensed from RaQualia and PETX could pay milestone payments of up to $8.5m and net sales-based royalty in the mid-single digits
		cats	None	In-licensed from RaQualia and PETX could pay milestone payments of up to $8.5m and net sales-based royalty in the mid-single digits
AT-003	Post-operative pain	dogs	None	In-licensed from Pacira. PETX is obligated to make milestone payments and net sales-based tiered royalties ranging in the low- to mid-20%'s
		cats	None	In-licensed from Pacira. PETX is obligated to make milestone payments and net sales-based tiered royalties ranging in the low- to mid-20%'s
AT-004	B-cell lymphoma	dogs	Novartis Animal Health	Commercialized by Novartis in the US and Canada - PETX to receive net sales-based royalties ranging from mid-teens to mid-twenties. PETX retained commercialization rights in other regions.
AT-005	T-cell lymphoma	dogs	None	NA
AT-006	Feline ocular herpes virus	cats	Novartis Animal Health	Novartis has worldwide commercialization rights and PETX is entitled to milestone and net sales-based royalties raning from high single digits to mid-teens
AT-007	Feline immunodeficiency virus	cats	None	NA
AT-008	Canine lymphoma	dogs	None	PETX only has Europe and ROW commercialization rights
ADXS-cHER2	Osteosarcoma	dogs	None	In-licensed from Advaxis and PETX could pay milestone payments of up to $34.5m, and tiered net sales-based royalty from mid-single digit to 10%

Source: Company data

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Patents

Aratana has built a solid portfolio of patents around their key marketed and pipeline assets and for their small molecule product, the company mentioned that foreign counterparts have been filed in major markets.

Exhibit 43: Patent summary for key products

Product	Proposed indication	Patent summary
AT-001	Osteoarthritic pain and inflammation	A key patent covering crystalline form expires 2/21/2027; other patents for AT-001 to AT-003 expire at various times between 2015 and 2031
AT-002	Appetite stimulation	A key patent covering methods of producing this compound expires 2/1/2020; other patents for AT-001 to AT-003 expire at various times between 2015 and 2031
AT-003	Post-operative pain management	Key patents covering certain compositions and method of production expire 9/18/2018; other patents for AT-001 to AT-003 expire at various times between 2015 and 2031
AT-004	B-cell lymphoma	Patent family related to speciesization of antibodies, including an issued patent expiring in 2029; patent family related to antibody constant doman regions and uses thereof, including a patent expiring in 2032; pending patent applications covering specific canine mAb directed to various targets
AT-005	T-cell lymphoma	Patent family related to speciesization of antibodies, including an issued patent expiring in 2029; patent family related to antibody constant doman regions and uses thereof, including a patent expiring in 2032; pending patent applications covering specific canine mAb directed to various targets, includes an allowed US patent application directed to the canine CD52 development antibody that will expire in 2029
AT-006	Feline ocular herpes infection	Two patent applications for formulation and commercially-viable methods of making the active ingredient that would expire in 2032 and 2031, respectively, if granted
AT-007	Feline immunodeficiency virus	Active ingredient patent that expires in 2020
AT-008	Lymphoma	Composition and use patents that expire between 2024 and 2027

Source: Company reports

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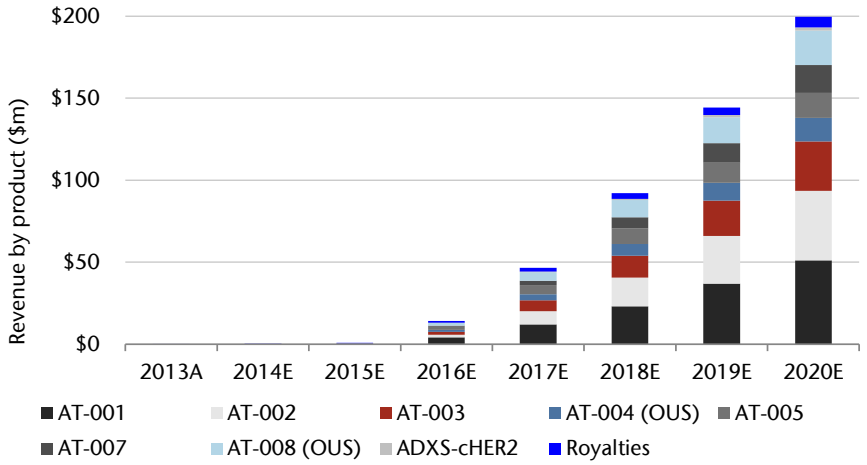
Financials

Revenues expected to ramp materially from 2016E

Whilst Aratana does not yet have any material revenues to date, given that its first two products, AT-004 and AT-005 have only just recently attained conditional marketing approval, we see a strong inflection from 2016E, after the approval of additional pipeline candidates and full approvals of AT-004 and AT-005. By 2020E, we expect risk adjusted sales of c$200m for Aratana, of which $193.1m are direct product sales and the remaining $6.4m come from royalties. Exhibit 44 shows how revenues develop by each individual product opportunity through to 2025E. Note that royalties come from worldwide sales of AT-006 and US sales of AT-004, both of which are commercialized by Novartis Animal Health.

Exhibit 44: Aratana risk-adjusted product sales and royalties by product, 2013A-20E ($m)



Note that 2013A revenue of $0.123m includes $0.109m of manufacturing revenue
Source: Jefferies estimates, company data

Exhibit 45 shows the additional revenues that could be added should timely execution of all clinical trials and regulatory approvals occur versus our risk-adjusted estimates that currently drive our cash flow and EPS estimates. It is worth noting that we have generally used higher probabilities of success for Aratana's R&D-stage products than we would for a human therapeutics model. This is to reflect the fact that much of the risk is removed in products that have already been extensively studied in humans (e.g. AT-003) or the target species in preclinical or "proof-of-concept" studies.

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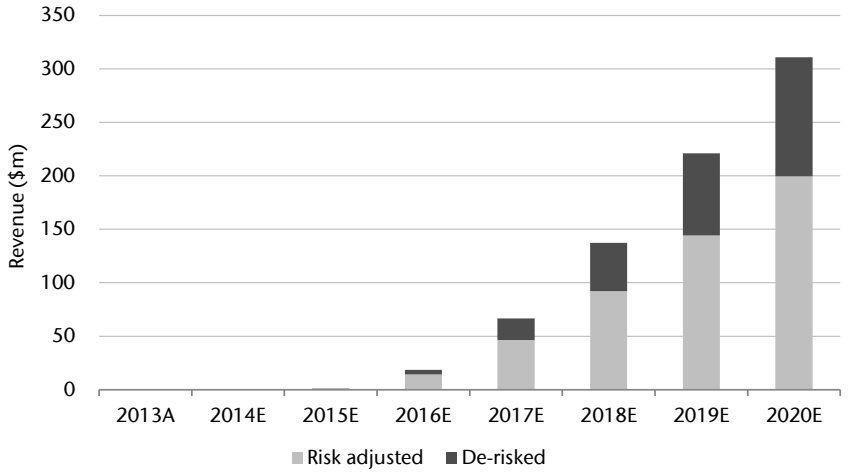
Exhibit 45: Estimated de-risked product sales and royalties versus risk-adjusted estimates, 2013A-20E ($m)



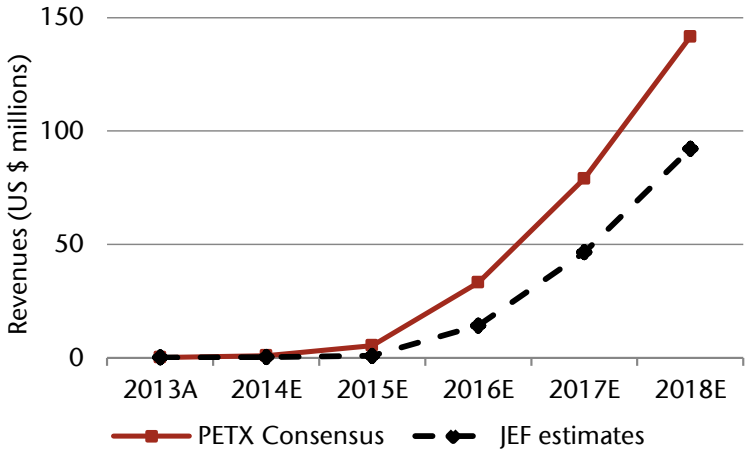
Source: Jefferies estimates, company data

Below consensus estimates based on a conservative view of AT-004/ AT-005

We have formed a more conservative view of the lymphoma market opportunities for AT-004 and AT-005 for now, as there is some uncertainty as to the total market opportunity from both a market size (lymphoma incidence) and uptake (by pet owners). Whilst this may place our 2016E-18E revenue estimates substantially below consensus at present, we still believe that much of the long term potential of the company from these products and other pipeline opportunities is not priced into the shares at present.

In particular, we are most excited about the opportunities for AT-001 in osteoarthritic pain/ inflammation (peak sales $154m; 2016E launch in dogs), AT-002 in appetite stimulation (peak sales $163m; 2016E launch in dogs) and AT-003 in post-operative pain management (peak sales $115m; 2016E launch in dogs).

Exhibit 46: JEF versus consensus revenue estimates, 2013A-18E ($m)



Source: Jefferies estimates, company data

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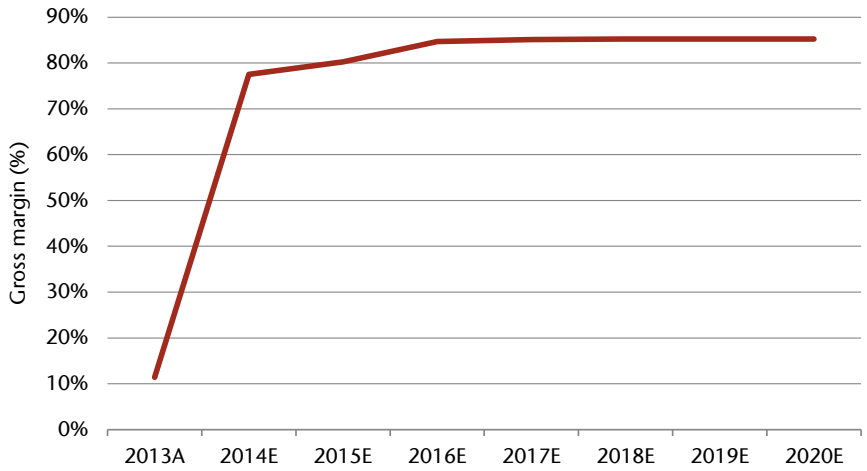
Positive gross margin mix peaks at c85% in 2018E

We see the gross margin gradually improving through to 2018E, as higher margin pipeline candidates gain approvals and the scale of manufacturing increases overall.

Exhibit 47: Aratana gross margin estimates, 2013A-20E (% revenues)



Note: 2013 revenue of $0.123m includes $0.109m of manufacturing revenue sold at cost
Source: Jefferies estimates, company data

Whilst Aratana has sufficient manufacturing capacity for its near term monoclonal antibody product requirements (AT-004/ AT-005), we note that it has no internal manufacturing capabilities of its own for drug products regulated by the CVM. Instead Aratana will rely on cGMP compliant contract manufacturers or its partners on certain products (e.g. Pacira for AT-003).

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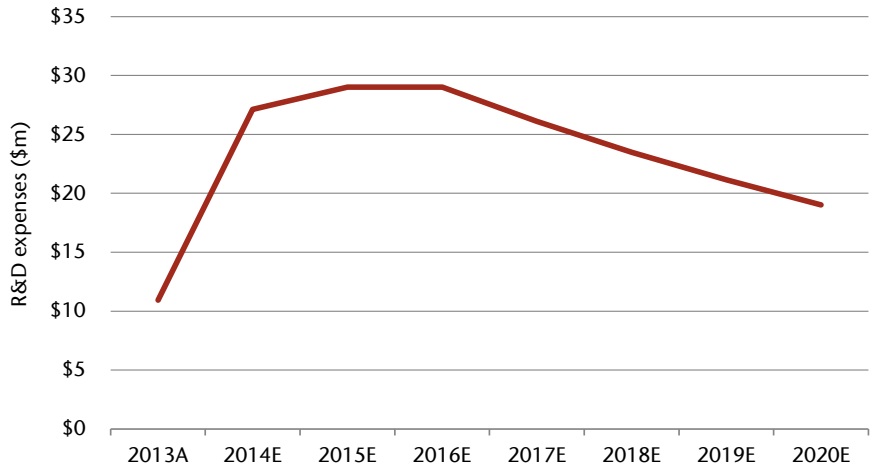
R&D expenses expected to peak in 2015E/16E

We expect a significant step-up in R&D expenses from 2014E as the expansion of the pipeline resulting from recent acquisitions significantly increases the number of ongoing pivotal trials. Our expectation is that R&D expenses associated with announced product development plans should peak in 2015E/16E at around $29m and then decline steadily thereafter.

Exhibit 48: Aratana R&D spend estimates, 2013A-20E ($m)



Source: Jefferies estimates, company data

Whilst the decline in R&D expenses modelled by us may not actually occur as the company most likely in-licenses or acquires additional R&D product opportunities, we have also not attributed any revenue streams to such activities. Given our reliance on DCF as the primary valuation methodology for Aratana, we believe that the steady drop-off in R&D expenses modelled by us is sufficiently conservative to assess long-run cash flows.

Our 2014E R&D spend estimates are in-line with management guidance, which implies that our SG&A estimates are also in-line, given that our overall use of cash from operations is in line with guidance (Exhibit 49).

Exhibit 49: Jefferies 2014 estimates versus management guidance

Metric	Guidance/Goal	JEF Estimate
Clinical development	$25 - $30m	$27.1m
Use of cash from operations	$35 - $40m	$35.7m

Source: Jefferies estimates, company data

SG&A expected to ramp steadily beyond 2018E

Aratana management intends to commercialize its products in the United States and Europe through a direct sales organization, augmented with select national and regional distributors and additional strategic partnerships where it is most practical to do so.

We expect Aratana's sales infrastructure to be limited initially as the company will only build a salesforce to cover six territories in 2014, and then expand to 12 territories by 2015. To promote their novel cancer biologics (e.g., AT-004, AT-005), Aratana plans to initially target a core group of around 1,000 veterinarians, including around 300 veterinary oncologists, who focus exclusively in oncology. Additionally, these oncology relationships could also be leveraged for other Aratana portfolio products, as AT-002 (for

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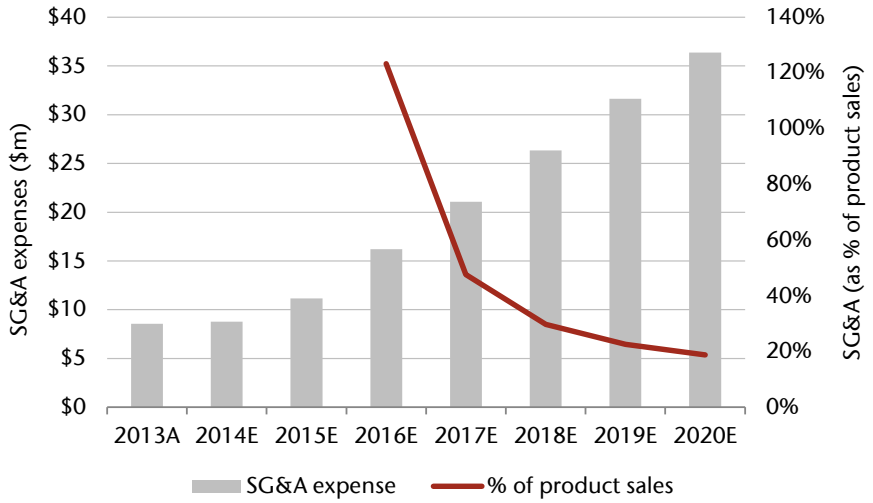
inappetence) could be used in dogs following chemotherapy, AT-003 (post-operative pain) could be used in dogs following cancer surgeries, and ADXS-cHER2 is used in osteosarcoma. In addition to its own salesforce, Aratana will rely heavily on distributor representatives to expand its commercial reach as it launches additional products from 2016. The company estimates that the top three distributors alone cover 70% of pet therapeutics sales in the United States, each of which carries approximately 275 field sales reps, 175 telesales reps and c12 distribution centers across the country. This should allow Aratana to build its direct sales organization steadily over time as revenues gradually build to support it.

Our model calls for long-run SG&A costs to peak at c$50m in the 2023E-25E timeframe, though this would likely increase if further product opportunities are in-licensed or acquired. Exhibit 50 shows our current estimates for SG&A spend and as a percentage of direct product sales from 2013A-20E.

Exhibit 50: Aratana SG&A spend estimates ($m and as a % of direct product sales), 2013A-20E



Source: Jefferies estimates, company data

Operating profitability expected in 2018E

We expect the transition to profitability and sustainable cash flows by 2018

We expect that Aratana will make the transition from a loss-making company with almost no revenues in 2013A to a profitable company with c$92m in revenues by 2018E. In the interim period, both management guidance and our own estimates show that the company has sufficient cash resources until the end of 2015E. We then assume non-dilutive debt-based financing to take the company through to operating profitability and positive net cash flows in 2018E.

Exhibit 51 shows our operating profit and operating margin assumptions through to 2020E, whereas Exhibit 52 shows our estimates for EPS compared to consensus.

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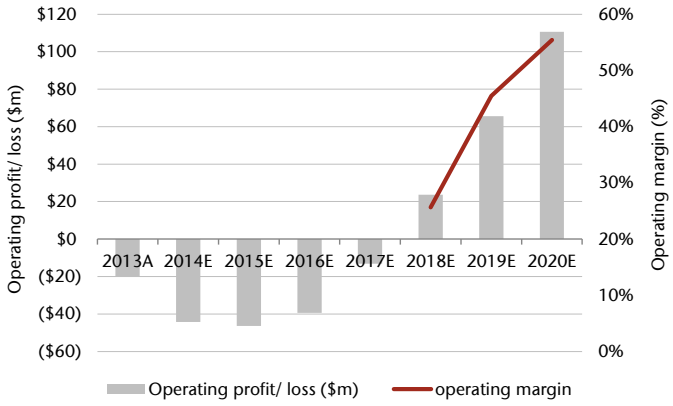
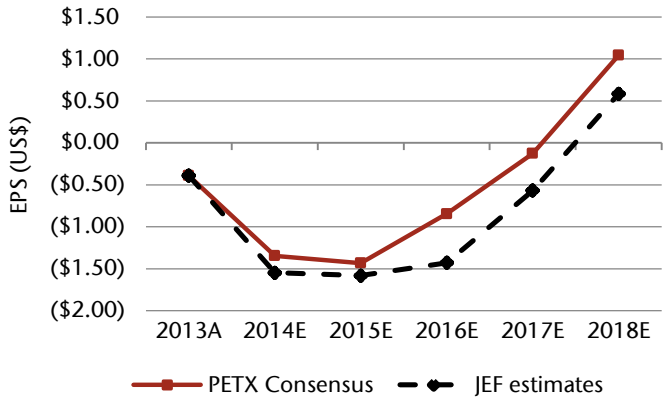
Exhibit 51: Aratana operating profit and operating margin estimates, 2013A-20E ($m)



Source: Company data, Jefferies estimates

Exhibit 52: Jefferies EPS estimates versus Consensus, 2013E-2018E ($ per share)



Source: FactSet, company data, Jefferies estimates

Given our more conservative revenue estimates for Aratana's lead products, we are not surprised to see that we have lower EPS estimates than consensus out to 2018E at least. However, as discussed earlier in this report this is also reflected in our lower Price Target versus much of the street, which despite being lower still represents significant upside (c39%) versus the current stock price.

Positive cash flows also expected from 2018E

As already described in this section, we anticipate that Aratana should become cash flow positive from 2018E. Whilst the company appears to have sufficient financial resources to see it through to the end of 2015E at least (absent any material cash outflows for additional in-licensing fees or product acquisitions), we do anticipate that some form of debt-based refinancing will be needed to reach sustainable cash flows in 2018E, which is reflected in the increased interest charges modelled by us from 2016E.

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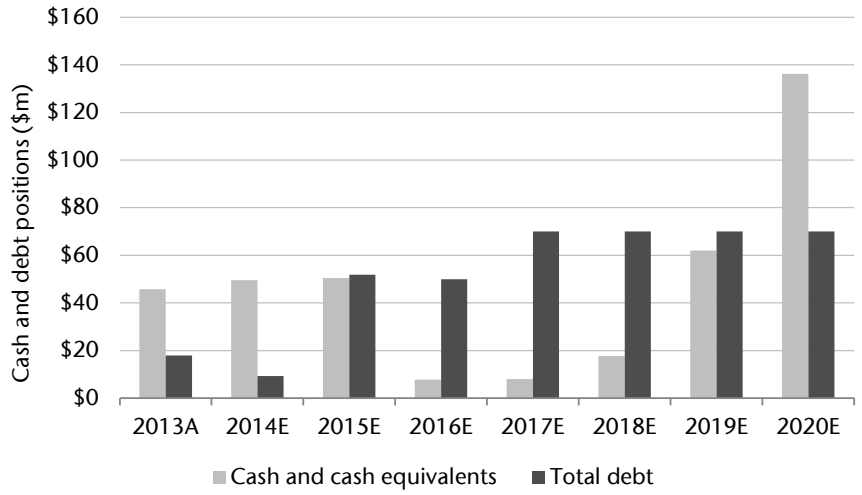
Exhibit 53 summarizes the development of Aratana's gross cash, gross debt and net cash/debt position through to 2020E.

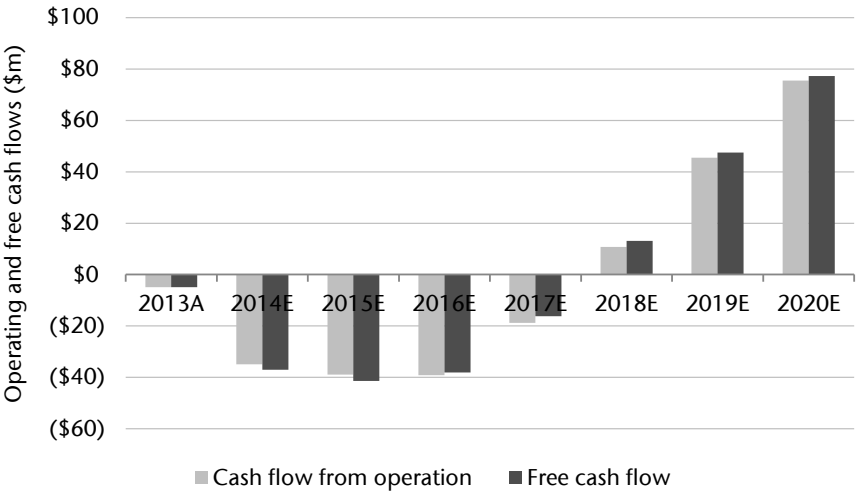
Exhibit 53: Summary of estimated gross cash and debt positions for Aratana, 2013A-20E ($m)



Source: Jefferies estimates, company data

Exhibit 54 gives and overview of the expected operating and free cash flows for Aratana through to 2020E, based on our estimates.

Exhibit 54: Summary of Aratana operating and free cash flow estimates, 2013A-20E ($m)



Source: Jefferies estimates, company data

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Financial Model

Exhibit 55: Key global revenues for Aratana, 2013A-2018E

(US$) Millions	2013A	2014E	2015E	2016E	2017E	2018E	Incr. abs. '13E-'18E
AT-005 - dog (US)	$0.0	$0.2	$0.5	$2.0	$4.1	$6.1	$6.1
Total launched products	**$0.0**	**$0.2**	**$0.5**	**$2.0**	**$4.1**	**$6.1**	**$6.1**
AT-001 - dog (US)	$0.0	$0.0	$0.0	$4.1	$10.3	$16.5	$16.5
AT-001 - cat (US)	$0.0	$0.0	$0.0	$0.0	$0.0	$1.0	$1.0
AT-001 - dog (OUS)	$0.0	$0.0	$0.0	$0.0	$1.9	$5.6	$5.6
AT-001 - cat (OUS)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
AT-002 - dog (US)	$0.0	$0.0	$0.0	$1.6	$3.9	$6.3	$6.3
AT-002 - cat (US)	$0.0	$0.0	$0.0	$0.0	$3.3	$8.3	$8.3
AT-002 - dog (OUS)	$0.0	$0.0	$0.0	$0.0	$0.7	$2.1	$2.1
AT-002 - cat (OUS)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.7	$0.7
AT-003 - dog (US)	$0.0	$0.0	$0.0	$1.9	$4.7	$7.5	$7.5
AT-003 - cat (US)	$0.0	$0.0	$0.0	$0.0	$1.2	$2.9	$2.9
AT-003 - dog (OUS)	$0.0	$0.0	$0.0	$0.0	$0.8	$2.5	$2.5
AT-003 - cat (OUS)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.5	$0.5
AT-004- dog (OUS)	$0.0	$0.0	$0.0	$1.2	$3.6	$7.2	$7.2
AT-005 - dog (OUS)	$0.0	$0.0	$0.0	$0.5	$1.6	$3.2	$3.2
AT-007 - cat (US)	$0.0	$0.0	$0.0	$0.0	$1.8	$4.5	$4.5
AT-007 - cat (OUS)	$0.0	$0.0	$0.0	$0.0	$0.8	$2.4	$2.4
AT-008 - dog (Canilox) (OUS)	$0.0	$0.0	$0.0	$1.7	$5.2	$10.4	$10.4
ADXS-cHER2 - dog (US)	$0.0	$0.0	$0.0	$0.1	$0.4	$0.7	$0.7
ADXS-cHER2 - dog (OUS)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.1	$0.1
Total pipeline products	**$0.0**	**$0.0**	**$0.0**	**$11.1**	**$40.2**	**$82.5**	**$82.5**
AT-004 - dog (US)	$0.0	$0.1	$0.2	$0.7	$1.4	$2.0	$2.0
AT-006 - cat (US)	$0.0	$0.0	$0.0	$0.1	$0.4	$0.7	$0.7
AT-006 - cat (OUS)	$0.0	$0.0	$0.1	$0.3	$0.6	$0.8	$0.8
Total royalties	**$0.0**	**$0.1**	**$0.3**	**$1.1**	**$2.3**	**$3.5**	**$3.5**
Total manufacturing revenue	**$0.1**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**($0.1)**
Total revenue	**$0.1**	**$0.3**	**$0.8**	**$14.2**	**$46.5**	**$92.1**	**$92.0**

Source: Jefferies estimates, company data

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Exhibit 56: Annual income statement for Aratana, 2013A-2018E

($) millions	2013A	2014E	2015E	2016E	2017E	2018E	Incr. abs. '13A-'18E
Net product sales	0.0	0.2	0.5	2.0	4.1	6.1	6.1
Pipeline revenue	0.0	0.0	0.0	11.1	40.2	82.5	82.5
Royalty revenue	0.0	0.1	0.3	1.1	2.3	3.5	3.5
Manufacturing revenue	0.1	0.0	0.0	0.0	0.0	0.0	(0.1)
Total revenue	**0.1**	**0.3**	**0.8**	**14.2**	**46.5**	**92.1**	**92.0**
Cost of products sold	0.1	0.1	0.2	2.2	6.9	13.6	13.5
Gross profit	**0.0**	**0.2**	**0.7**	**12.0**	**39.6**	**78.5**	**78.5**
R&D	10.9	27.1	29.0	29.0	26.1	23.5	12.6
SG&A	8.6	8.8	11.1	16.2	21.1	26.3	17.8
In-process R&D	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operating income	**(19.9)**	**(44.2)**	**(46.3)**	**(39.4)**	**(13.2)**	**23.6**	**43.5**
Net interest (income)/ expense	0.4	0.7	0.3	2.8	3.6	3.8	3.5
Other expenses (income)	(0.5)	0.0	0.0	0.0	0.0	0.0	0.5
Earnings before taxes	**(19.7)**	**(45.0)**	**(46.7)**	**(42.1)**	**(16.7)**	**19.8**	**39.5**
Taxes	(15.5)	0.0	0.0	0.0	0.0	2.0	17.4
Tax rate	NA	0.0%	0.0%	0.0%	0.0%	10.0%	NA
Net income (loss)	**(4.3)**	**(45.0)**	**(46.7)**	**(42.1)**	**(16.7)**	**17.8**	**22.1**
Changes in value of convertible preferred stock	(1.6)	0.0	0.0	0.0	0.0	0.0	1.6
Net income (loss) for common	**(5.9)**	**(45.0)**	**(46.7)**	**(42.1)**	**(16.7)**	**17.8**	**23.7**
Diluted EPS	**($0.39)**	**($1.55)**	**($1.58)**	**($1.43)**	**($0.57)**	**$0.59**	**$0.98**
Wted avg diluted sh outstanding (m)	11.0	29.0	29.5	29.5	29.5	30.5	19.1
Year-end share count (m)	21.3	29.5	29.5	29.5	29.5	30.5	9.1
Dividends per share	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Margin Analysis	**2013A**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	
Cost of products sold	NA	23%	20%	15%	15%	15%	
Gross margin	NA	78%	80%	85%	85%	85%	
R&D	NA	NA	NA	NA	56%	25%	
SG&A	NA	NA	NA	NA	45%	29%	
Operating margin	NA	NA	NA	NA	NA	26%	
Pretax margin	NA	NA	NA	NA	NA	21%	
Net margin	NA	NA	NA	NA	NA	19%	

% YoY Change	**2013A**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	
Total revenue	NA	NA	214%	1576%	227%	98%	
Cost of products sold	NA	NA	176%	1200%	218%	96%	
Gross profit	NA	NA	225%	1669%	229%	98%	
R&D	50%	148%	7%	0%	(10%)	(10%)	
SG&A	187%	2%	27%	45%	30%	25%	
In-process R&D	NA	NA	NA	NA	NA	NA	
Operating income	NA	NA	NA	NA	NA	NA	
Earnings before taxes	NA	NA	NA	NA	NA	NA	
Net income (loss)	NA	NA	NA	NA	NA	NA	
Diluted EPS	NA	NA	NA	NA	NA	NA	
Shares outstanding	NA	164%	2%	0%	0%	3%	

Source: Jefferies estimates, company data

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Exhibit 57: Quarterly income statement for Aratana, Q1 2013A - Q4 2014E

($ in millions, except EPS)	1Q:13A	2Q:13A	3Q:13A	4Q:13A	2013A	1Q:14E	2Q:14E	3Q:14E	4Q:14E	2014E
Net product sales	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**
AT-005 - US	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
Pipeline revenue	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Royalty revenue	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**
Manufacturing revenue	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total revenue	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.3**
Cost of products sold	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Gross profit	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**
R&D	2.1	2.5	3.2	3.1	10.9	5.3	6.8	7.3	7.8	27.1
SG&A	1.2	1.3	1.4	4.7	8.6	1.8	2.1	2.3	2.6	8.8
In-process R&D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amortization of intangible assets	0.0	0.0	0.0	0.4	0.4	1.4	2.5	2.4	2.3	8.6
Operating income	**(3.3)**	**(3.7)**	**(4.7)**	**(8.1)**	**(19.9)**	**(8.6)**	**(11.3)**	**(11.9)**	**(12.5)**	**(44.2)**
Net interest expense/ (income)	0.0	0.1	0.1	0.2	0.4	0.2	0.2	0.2	0.1	0.7
Other expenses (income)	(0.1)	(0.3)	(0.0)	(0.0)	(0.5)	0.0	0.0	0.0	0.0	0.0
Earnings before taxes	**(3.3)**	**(3.4)**	**(4.7)**	**(8.3)**	**(19.7)**	**(8.8)**	**(11.5)**	**(12.0)**	**(12.7)**	**(45.0)**
Taxes	0.0	0.0	0.0	(15.5)	(15.5)	0.0	0.0	0.0	0.0	0.0
Tax rate	0.0	0.0	0.0	1.9	0.8	0.0	0.0	0.0	0.0	0.0
Net income (loss)	**(3.3)**	**(3.4)**	**(4.7)**	**7.1**	**(4.3)**	**(8.8)**	**(11.5)**	**(12.0)**	**(12.7)**	**(45.0)**
Changes in value of convertible preferred stock	(0.8)	(0.8)	0.0	0.0	(1.6)	0.0	0.0	0.0	0.0	0.0
Net income (loss) for common stockholders	**(4.1)**	**(4.2)**	**(4.7)**	**7.1**	**(5.9)**	**(8.8)**	**(11.5)**	**(12.0)**	**(12.7)**	**(45.0)**
Diluted EPS	**(4.73)**	**(4.63)**	**(0.22)**	**0.33**	**(0.39)**	**(0.32)**	**(0.39)**	**(0.41)**	**(0.43)**	**(1.55)**
Weighted avg diluted shares outstanding	0.9	0.9	20.8	21.3	11.0	27.4	29.5	29.5	29.5	29.0
Margin Analysis	**1Q:13A**	**2Q:13A**	**3Q:13A**	**4Q:13A**	**2013A**	**1Q:14E**	**2Q:14E**	**3Q:14E**	**4Q:14E**	**2014E**
Cost of products sold	NA	NA	NA	89%	89%	NA	23%	23%	23%	23%
Gross margin	NA	NA	NA	11%	11%	NA	78%	78%	78%	78%
R&D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SG&A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Operating margin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pretax margin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Net margin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
% YoY Change	**1Q:13A**	**2Q:13A**	**3Q:13A**	**4Q:13A**	**2013A**	**1Q:14E**	**2Q:14E**	**3Q:14E**	**4Q:14E**	**2014E**
Total revenue	NA	NA	NA	NA	NA	NA	NA	NA	10%	120%
Cost of products sold	NA	NA	NA	NA	NA	NA	NA	NA	(72%)	(44%)
Gross profit	NA	NA	NA	NA	NA	NA	NA	NA	647%	1395%
R&D	21%	28%	95%	100%	50%	150%	175%	125%	150%	148%
SG&A	146%	102%	34%	110%	187%	50%	65%	60%	(45%)	2%
In-process R&D	NA	NA	NA	NA	NA	0%	0%	0%	0%	0%
Amortization of intangibles	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Operating income	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Earnings before taxes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Net income (loss)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diluted EPS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Shares outstanding	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: Jefferies estimates, company data

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Exhibit 58: Balance sheet for Aratana Therapeutics, 2013A-2018E

($) millions	2013A	2014E	2015E	2016E	2017E	2018E
Cash and short-term investments	45.8	49.6	50.4	7.8	8.0	17.7
Cash and cash equivalents	41.1	44.9	50.4	7.8	8.0	17.7
Short-term investments	4.7	4.7	0.0	0.0	0.0	0.0
Accounts receivable	0.0	0.1	0.2	4.6	13.2	26.0
Inventories	0.2	0.1	0.1	1.8	4.9	9.4
Prepaid expenses and taxes	0.3	1.0	1.0	1.0	1.0	1.0
Other Current assets	1.4	1.4	1.4	1.4	1.4	1.4
Current assets	**48.6**	**53.1**	**54.1**	**17.6**	**29.4**	**56.5**
Net property, plant and equipment	0.0	2.7	5.1	6.2	6.5	7.0
Goodwill and intangible items	66.9	108.2	101.4	95.2	89.6	84.5
Total Assets	**115.6**	**164.1**	**160.6**	**118.9**	**125.6**	**148.0**
Liabilities and Shareholders' Investment						
Current portion of long term debt	6.8	3.7	1.8	0.0	0.0	0.0
Accrued expenses	2.5	4.0	4.0	4.0	4.0	4.0
Accounts payable	0.8	0.1	0.1	1.4	3.9	7.5
Deferred income	0.8	0.8	0.8	0.8	0.8	0.8
Current portion of deferred licensing revenue	0.0	0.3	0.0	0.0	0.0	0.0
Other current liabilities	0.5	0.5	0.5	0.5	0.5	0.5
Current liabilities	**11.4**	**9.4**	**7.2**	**6.7**	**9.2**	**12.8**
Long-term debt	11.2	5.6	50.0	50.0	70.0	70.0
Deferred licensing revenue	0.0	0.5	0.5	0.5	0.5	0.5
Contingent consideration	0.0	3.8	3.8	3.8	3.8	3.8
Deferred tax liabilities	6.0	9.8	9.8	9.8	9.8	9.8
Other non-current liabilities	0.1	1.5	1.5	1.5	1.5	1.5
Total Liabilities	**28.6**	**30.6**	**72.9**	**72.4**	**94.9**	**98.5**
Common equity	87.0	133.5	87.7	46.5	30.7	49.5
Common stock	0.0	0.0	0.0	0.0	0.0	0.0
Additional paid-in capital	112.8	203.3	203.3	203.3	203.3	203.3
Retained earnings (accumulated deficit)	(25.9)	(69.9)	(115.7)	(156.9)	(172.7)	(153.9)
Shareholders' Equity	**87.0**	**133.5**	**87.7**	**46.5**	**30.7**	**49.5**
Total Liabilities and Equity	**115.6**	**164.1**	**160.6**	**118.9**	**125.6**	**148.0**

Source: Jefferies estimates

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Exhibit 59: Cash Flow Statement for Aratana Therapeutics, 2013A-2018E

($) millions	2013A	2014E	2015E	2016E	2017E	2018E
Net income (GAAP)	(4.3)	(45.0)	(46.7)	(42.1)	(16.7)	17.8
Adjustments to reconcile net income	1.1	9.7	8.2	7.7	7.2	6.7
Depreciation and amortization	0.4	8.7	7.2	6.8	6.2	5.7
Share-based compensation expense	0.7	0.9	0.9	0.9	0.9	0.9
Change in current assets and liabilities	(1.7)	0.4	(0.4)	(4.7)	(9.2)	(13.7)
Net cash from operating activities	**(4.9)**	**(34.9)**	**(38.9)**	**(39.2)**	**(18.8)**	**10.8**
Capital expenditures	(0.0)	(2.8)	(2.8)	(1.6)	(1.0)	(1.1)
Purchases of marketable securities	(3.0)	0.0	0.0	0.0	0.0	0.0
Sales of marketable securities	4.7	0.0	4.7	0.0	0.0	0.0
Acquisition of businesses and in-process R&D	(66.9)	(48.4)	0.0	0.0	0.0	0.0
Change in restricted cash	0.1	0.0	0.0	0.0	0.0	0.0
Other	6.0	8.1	0.0	0.0	0.0	0.0
Net cash from investing activities	**(59.1)**	**(43.1)**	**1.9**	**(1.6)**	**(1.0)**	**(1.1)**
Net change in short term debt	6.1	(3.0)	(1.9)	(1.8)	0.0	0.0
Net change in long term debt	11.8	(5.6)	44.4	0.0	20.0	0.0
Net preferred stock transactions	3.4	0.0	0.0	0.0	0.0	0.0
Net common stock transactions	69.8	90.5	0.0	0.0	0.0	0.0
Net cash from financing activities	**91.1**	**81.9**	**42.5**	**(1.8)**	**20.0**	**0.0**
Net change in cash	27.1	3.8	5.5	(42.6)	0.2	9.7
Cash at beginning of period	14.0	41.1	44.9	50.4	7.8	8.0
Cash at end of period	**41.1**	**44.9**	**50.4**	**7.8**	**8.0**	**17.7**

Source: Jefferies estimates

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Company Description

Aratana is a development-stage biopharmaceutical company focused on the licensing, development and commercialization of innovative prescription medications for pets, or pet therapeutics

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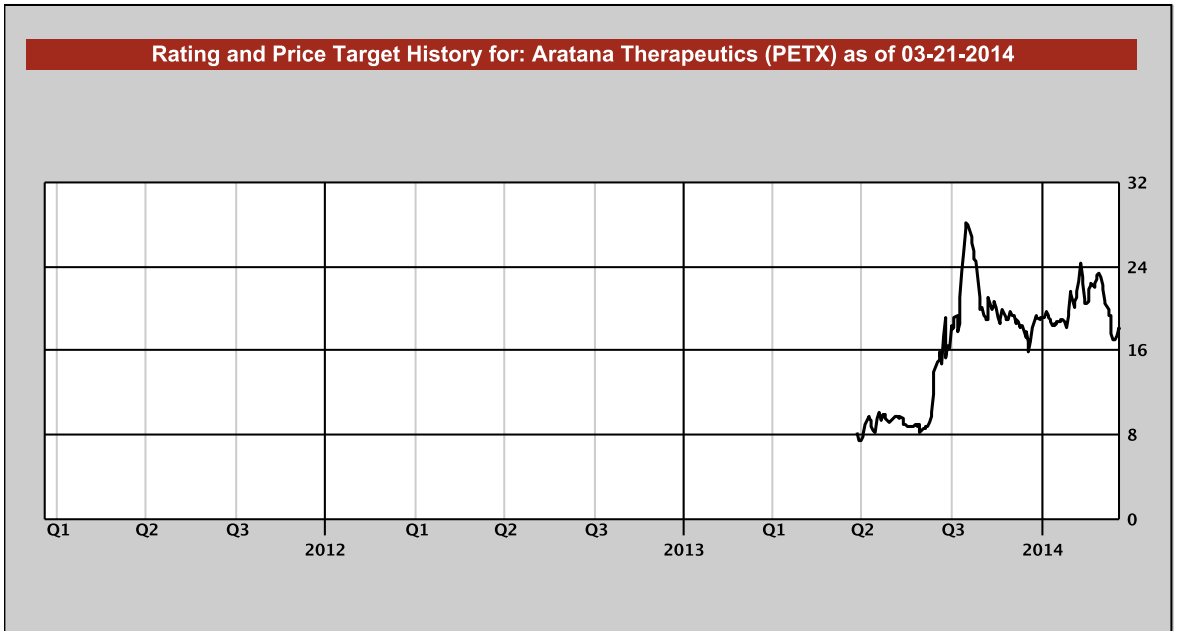

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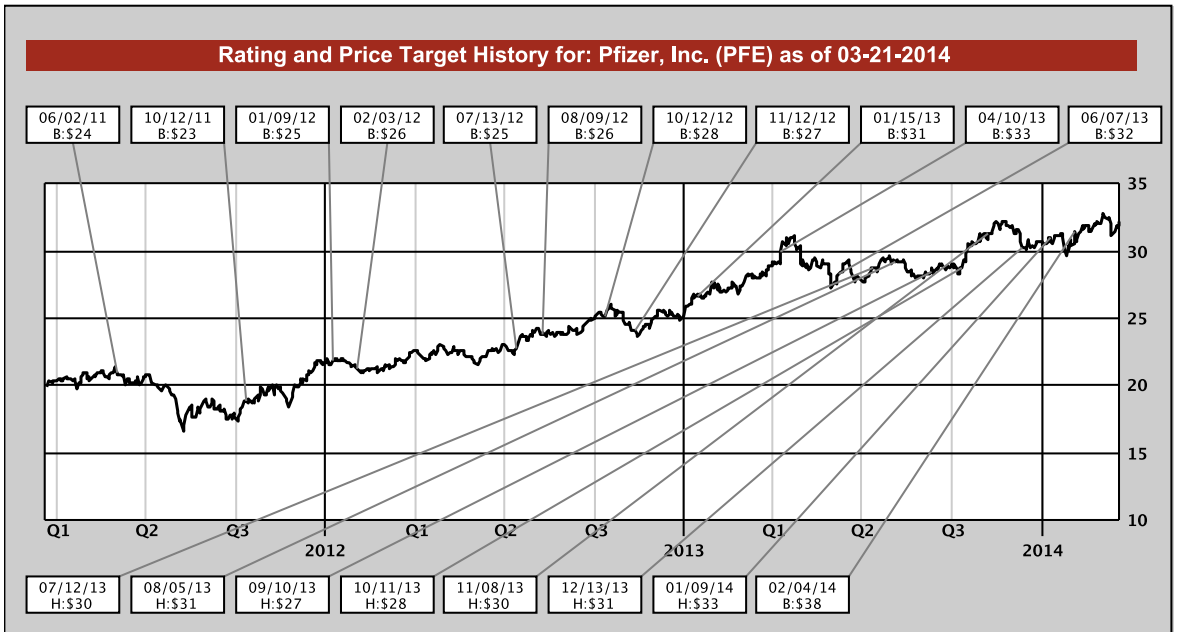

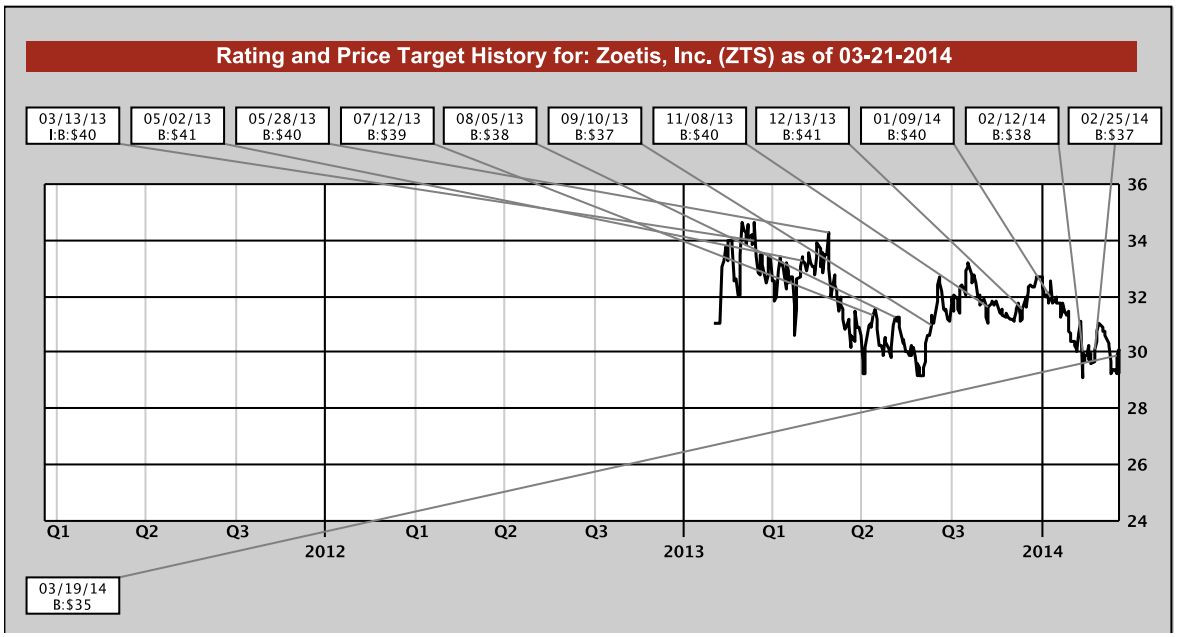

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