

COMPANY NOTE

Target | Estimate Change

USA | Healthcare | Biotechnology

December 22, 2014

Jefferies

Radius Health (RDUS) Successful Ph3 for Abaloparatide-SC; Further Upside Potential with RAD1901

Key Takeaway

Ph3 for ABL in osteoporosis hit all endpoints of study for regulatory approval & for potential advantages (vs. Forteo, \$1.25B in 2013 sales). While ABL commercial potential can be debatable, we view current valuation implies below our ~31% increased peak estimate of \$670M. Now with positive Ph3 asset, progress in potentially differentiated breast cancer product RAD1901 (initial Ph1b data in 2015) will likely provide further upside.

In-line positive/clean topline Ph3 data for abaloparatide-SC (ABL) in osteoporosis (Chart 1) - superior efficacy vs. placebo (for regulatory approval) & superior BMD increases/lower hypercalcemia vs. Forteo (commercial advantages). Ph3 hit primary endpoint of reducing new vertebral fractures for ABL (0.72%) vs. placebo (4.36%) at 18 mo (83% reduction, $p < 0.0001$) & numerically lower vs. Forteo (0.98%). Statistically significant secondary endpoints included 43% reduction in non-vertebral fractures vs. placebo (vs. Forteo not disclosed) and increases in BMD from baseline for total spine/hip and femoral neck vs. both placebo and Forteo at 18 mo ($p < 0.0001$; Chart 1). Hypercalcemia was lower with ABL vs. Forteo (6.0% ABL vs. 1.2% placebo vs. 10.8% Forteo); statistical significance not yet provided on safety.

NDA filing for ABL on track for 2H15; potential approval of line extension transdermal patch formulation likely ~2-3 years after ABL approval (not in current assumptions). Per FDA's guidance, NDA package will include data from a 6-mo extension study (ACTIVEExtend) to assess new vertebral/non-vertebral fracture reduction at 24 mo in rolled-over pts receiving alendronate, with data in 2Q15. For more convenient transdermal patch formulation as a line extension to ABL (SC injection), fracture data would not be needed.

Now with high likelihood of ABL regulatory approval, we view its second drug RAD1901 as a further value driver for RDUS. Current EV of ~\$1.2B implies modest sales (vs. our peak estimate of \$670M) if one assumes ~3x sales as take-out value. More importantly, we expect RAD1901 (next-gen SERD) for breast cancer with brain mets, if successful (initial Ph1b data likely in 2015) to provide significant potential upside based on CNS penetration (vs. ARN-801 from Seragon, sold to Roche at \$1.725B).

Valuation/Risks

Our \$45 PT (was \$26) is based on an NPV analysis of abaloparatide-SC & RAD1901. Risks include: (1) regulatory delays/failure & slow commercial uptake and/or competition of abaloparatide-SC, and (2) development delay/failure of RAD1901.

USD	Prev.	2014E	Prev.	2015E	Prev.	2016E	Prev.	2017E
Rev. (MM)	--	0.0	--	0.0	31.5	90.0	26.3	99.8
EPS								
Mar	--	(50.45)A	--	(0.50)	--	--	--	--
Jun	--	(2.22)A	--	(0.50)	--	--	--	--
Sep	--	(0.59)A	--	(0.47)	--	--	--	--
Dec	--	(0.53)	--	(0.44)	--	--	--	--
FY Dec	--	(3.17)	--	(1.91)	(1.33)	0.18	(1.77)	(0.05)

EPS: RDUS completed its IPO in 2Q14

BUY

Price target \$45.00

(from \$26.00)

Price \$37.45

Financial Summary

Book Value (MM):	\$23.4
Book Value/Share:	\$0.79
Net Debt (MM):	(\$68.5)
Long-Term Debt (MM):	\$0.0
Cash/Share:	\$2.31
Cash (MM):	\$68.5

Market Data

52 Week Range:	\$42.57 - \$7.46
Total Entprs. Value (MM):	\$1,163.6
Market Cap. (MM):	\$1,232.1
Shares Out. (MM):	32.9
Float (MM):	21.8
Avg. Daily Vol.:	197,036

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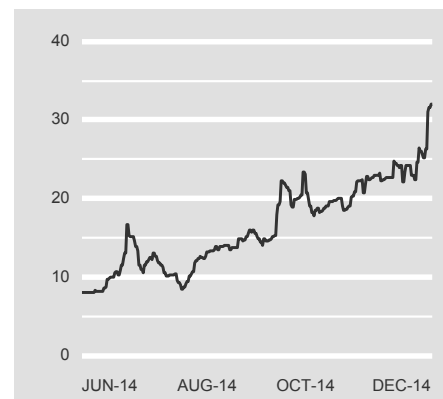
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Price Performance



Scenarios

Target Investment Thesis

- Positive topline Phase 3 data for lead product abaloparatide-SC in osteoporosis announced on 12/22/14
- RDUS' cash at end-3Q14 of ~\$69M is roughly sufficient into our projected profitability in ~2018
- Our NPV analysis puts a target price of \$45 per share including abaloparatide-SC (~\$30/sh for U.S. sales and ~\$9/sh for EU sales) and ~\$6/sh for RAD1901 combined U.S./EU sales

Upside Scenario

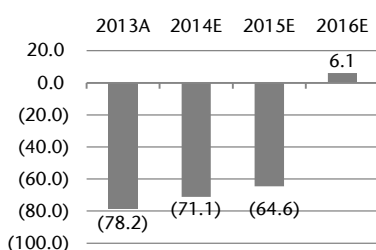
- Better-than-expected sales of abaloparatide-SC in osteoporosis
- If RAD1901 is successful in BCBM, our NPV analysis pegs a fair value for RDUS shares at ~\$63

Downside Scenario

- Regulatory failure of abaloparatide-SC
- Slower than expected commercial uptake of abaloparatide-SC
- Clinical failure of RAD-1901 in BCBM
- If RAD1901 fails in the clinic in BCBM and abaloparatide-SC U.S. sales are ~30% below our current assumptions, our NPV analysis pegs a fair value for RDUS shares at ~\$30

Long Term Analysis

Net Income/Loss (\$ in MM)



Source: FactSet, Jefferies estimates

Long Term Financial Model Drivers

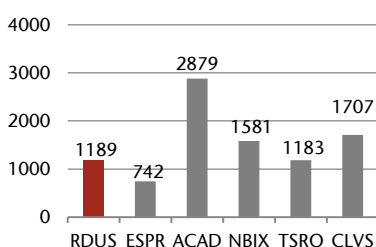
LT revenue CAGR ('17-'22)	43%
Organic Revenue Growth	43%
Acquisition Contribution	0%
Gross Margin Expansion	N/A

Other Considerations

With clean, positive topline Phase 3 data for abaloparatide-SC (announced on 12/22/14) we view FDA approval (NDA filing in 2H15) is highly likely. Now with an asset with positive Phase 3 data, we expect focus on RDUS to shift to its second drug RAD1901. While riskier but higher reward, we expect positive Ph1b data (likely in 2015) in breast cancer with brain metastasis to provide potentially significant upside from current levels.

Peer Group

Enterprise Value (\$ in MM)



Source: FactSet, Jefferies estimates

Recommendation / Price Target

Ticker	Rec.	PT
RDUS	Buy	\$45
ESPR	NC	N/A
ACAD	Buy	\$42
NBIX	Buy	\$24
TSRO	Buy	\$40
CLVS	NC	N/A

Catalysts

- Abaloparatide-SC 24-months extension study data in 2Q15
- Potential NDA filing for abaloparatide-SC in 2H15
- Potential Phase 1b data for RAD1901 in ER-positive breast cancer patients with brain metastases in 2015.

Company Description

Radius Health, Inc., IPOed on 6/5/14, is a biopharmaceutical company focused on developing therapies for osteoporosis and other endocrine diseases. The company's lead product is abaloparatide-SC (BA058), a novel synthetic peptide analog of parathyroid hormone-related protein (PTHrP), with positive topline Phase 3 data in osteoporosis announced on 12/22/14 and potential NDA filing in 2H15. Additional pipeline products include a transdermal (TD) formulation of abaloparatide, abaloparatide-TD; RAD1901, an oral selective estrogen receptor down-regulator/degrader (SERD) for the treatment of breast cancer brain metastases (BCBM) and vasomotor symptoms; and RAD140, a non-steroidal selective androgen receptor modulator. Radius was founded in 2003 and is headquartered in Cambridge, Massachusetts.

Upping PT to \$45 (from \$26) on increased probability of success for abaloparatide-SC (ABL), faster market penetration, and ~31% higher peak ABL sales estimates. With positive Phase 3 data, we are increasing our probability of success for ABL to 100% (from 90%) and increasing our peak U.S./EU ABL sales estimates by ~31% to \$670M (from ~\$512M). In addition, from launch (~2017/2018 in the U.S./EU) we assume faster penetration, more in line with Forteo launch experience, thus increasing our ABL sales by ~108%/75%/48%/41% to ~\$55M/\$192M/\$331M/\$452M (see Chart 2). Although ABL did not show superiority over Forteo in non-vertebral fracture risk reduction (would have been the best-case scenario in our view, albeit a very low probability), ABL (vs. Forteo) showed statistically significant BMD increases in all measures (lumbar spine, total hip and femoral neck at 6, 12 and 18 months) and lower hypercalcemia. Combined with potentially faster onset of action (vs. Forteo; data remains to be seen), we view it is reasonable to assume its market penetration similar to Forteo, more than doubling its sales in the 3rd full-year on market. At peak, our ~\$670M sales in 2027 represent ~54% of current Forteo sales.

Regarding potential generic entry of Forteo (teriparatide), its potential impact on brand drugs, particularly ones with improved profiles such as abaloparatide, remains to be seen. For a comparison, Pfizer's (PFE, \$32.09, Buy) growth hormone product Genotropin (somatropin) sales have not been meaningfully impacted by Sandoz's generic Omnitrope entry in 2006-2007 (Genotropin sales from \$808M in 2005 to \$772M in 2013).

Our \$45 PT (vs. \$26 previously) is based on NPV analysis of ~\$30/sh (from \$20/sh previously) for abaloparatide-SC U.S. sales in osteoporosis (100% [from 90%] probability adjusted peak sales of ~\$670M in 2027) and ~\$9/sh (from \$6/sh previously) for abaloparatide-SC EU royalties in osteoporosis (100% [from 90%] probability adjusted peak royalties of ~\$58M in 2027; and now assumed \$100M/\$50M upfront/regulatory milestone payment from EU partner vs. \$35M upfront previously), and ~\$6/sh for RAD1901 U.S./EU sales in ER+ BCBM (unchanged; 50% probability-adjusted peak sales of \$470M in 2025), discounting at an annual rate of ~11%.

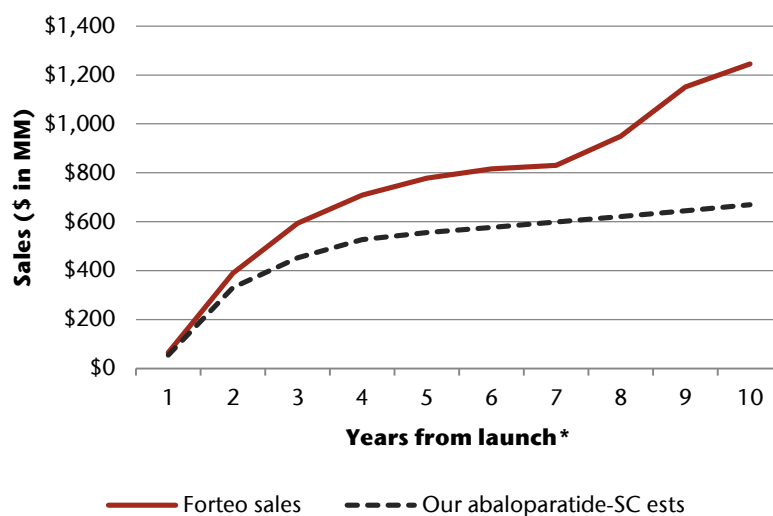
Chart 1: Phase 3 Data for Abaloparatide-SC: Percent Change in BMD from Baseline

	Lumbar Spine			Total Hip			Femoral Neck		
	6 mo	12 mo	18 mo	6 mo	12 mo	18 mo	6 mo	12 mo	18 mo
Placebo	0.6	0.45	0.63	0.31	0.09	-0.10	-0.13	-0.41	-0.43
Abaloparatide-SC	6.58**	9.77**	11.20*	2.32**	3.41**	4.18**	1.72**	2.65**	3.60**
Teriparatide	5.25*	8.28*	10.49*	1.44*	2.29*	3.26*	0.87*	1.54*	2.66*

**p <0.0001 vs. placebo and teriparatide

*p <0.0001 vs. placebo

Source: Company reports and Jefferies

Chart 2: Abaloparatide-SC Sales Projections vs. Forteo Sales from Launch

* For abaloparatide-SC, we forecast launch in 2017/2018 in U.S./EU, respectively. Forteo launch in December 2002 in U.S. and June 2003 in EU

Source: Company reports and Jefferies

Radius Health Income Statement

Radius Health (RDUS)

Income Statement

(\$ in thousands except per share)

	2013	1Q14	2Q14	3Q14	4Q14E	2014E	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Revenues																					
Abaloparatide-SC for PMO (U.S.)												-	54,792	155,310	230,357	305,699	335,748	350,974	366,890	383,529	400,922
Growth y/y														183%	48%	33%	10%	5%	5%	5%	5%
Growth q/q																					
Royalty for abaloparatide-SC for PMO (EU)												-	9,074	25,210	36,651	47,676	51,325	52,590	53,886	55,215	
Growth y/y														178%	45%	30%	8%	2%	2%	2%	2%
RAD1901 for ER+ BCBM (U.S./EU)														18,152	91,854	196,339	299,680	396,457	470,131	543,886	
Growth y/y															406%	114%	53%	32%	19%	14%	11%
Other revenues												90,000	45,000								
Total Revenues	-	-	-	-	-	-	-	-	-	-	-	90,000	99,792	164,383	255,567	360,503	475,277	598,637	719,161	833,873	926,268
% growth y/y														64.7%	55.5%	41.1%	31.8%	26.0%	20.1%	16.0%	11.1%
Expenses																					
Cost of Goods Sold		-	-	-	-	-	-	-	-	-	-	-	9,863	23,296	32,250	41,919	51,312	65,677	82,985	97,563	109,228
% gross margin (Including royalties to Ipsen & Eisai)													82.0%	85.0%	86.0%	86.3%	84.7%	81.3%	77.4%	74.6%	72.8%
R&D	60,536	9,717	10,618	13,817	13,974	48,126	13,000	12,500	11,000	9,220	45,720	34,290	30,861	30,861	32,404	34,996	37,796	40,820	44,085	47,612	51,421
% growth y/y	10.1%					-20.5%					-5.0%	-25.0%	-10.0%	0.0%	5.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
% of total revenues														18.8%	12.7%	9.7%	8.0%	6.8%	6.1%	5.7%	5.6%
SG&A	6,829	2,139	3,070	2,836	2,854	10,899	3,000	3,600	4,300	5,013	15,913	35,803	48,335	53,168	63,802	73,372	80,709	87,166	94,139	101,670	109,804
% growth y/y	-27.9%					59.6%					46.0%	125.0%	35.0%	10.0%	20.0%	15.0%	10.0%	8.0%	8.0%	8.0%	8.0%
% of total revenues													48.4%	32.3%	25.0%	20.4%	17.0%	14.6%	13.1%	12.2%	11.9%
Restructuring cost																					
Total Expenses	67,365	11,856	13,688	16,653	16,828	59,025	16,000	16,100	15,300	14,232	61,632	70,093	89,058	107,326	128,456	150,288	169,817	193,663	221,210	246,845	270,453
Income (loss) from Operations (EBIT)	(67,365)	(11,856)	(13,688)	(16,653)	(16,828)	(59,025)	(16,000)	(16,100)	(15,300)	(14,232)	(61,632)	19,907	10,734	57,058	127,112	210,215	305,459	404,974	497,951	587,027	655,815
% growth y/y															65.4%	45.3%	32.6%	23.0%	17.9%	11.7%	7.7%
Operating margin															49.7%	58.3%	64.3%	67.6%	69.2%	70.4%	70.8%
Other Income (Expense), Net	6,675	(2,632)	1,079	(767)	(770)	(3,090)	(750)	(750)	(750)	(750)	(3,000)	(13,800)	(12,600)	(6,300)	500	1,000	2,000	3,000	4,000	5,000	6,000
Earnings (Loss) Before Taxes	(60,690)	(14,488)	(12,609)	(17,420)	(17,598)	(62,115)	(16,750)	(16,850)	(16,050)	(14,982)	(64,632)	6,107	(1,866)	50,758	127,612	211,215	307,459	407,974	501,951	592,027	661,815
Provision for Taxes	-					-					-	-	-	-	6,381	21,122	46,119	81,595	125,488	177,608	198,545
Tax Rate															5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	30.0%
Net Income (Loss)	(60,690)	(14,488)	(12,609)	(17,420)	(17,598)	(62,115)	(16,750)	(16,850)	(16,050)	(14,982)	(64,632)	6,107	(1,866)	50,758	121,231	190,094	261,341	326,379	376,463	414,419	463,271
Extinguishment of preferred stock																					
Accretion of preferred stock	(17,471)	(4,969)	(4,031)			(9,000)															
Earnings to preferred stockholders																					
Net Income (Loss) to Common Stockholders	(78,161)	(19,457)	(16,640)	(17,420)	(17,598)	(71,115)	(16,750)	(16,850)	(16,050)	(14,982)	(64,632)	6,107	(1,866)	50,758	121,231	190,094	261,341	326,379	376,463	414,419	463,271
EPS (LPS) - Basic	(203.91)	(50.45)	(2.22)	(0.59)	(0.53)	(3.17)	(0.50)	(0.50)	(0.47)	(0.44)	(1.91)	0.18	(0.05)	1.45	3.43	5.32	7.24	8.95	10.22	11.14	12.33
EPS (LPS) - Diluted	(203.91)	(50.45)	(2.22)	(0.59)	(0.53)	(3.17)	(0.50)	(0.50)	(0.47)	(0.44)	(1.91)	0.18	(0.05)	1.27	2.67	4.14	5.64	6.97	7.96	8.68	9.60
% growth y/y (diluted)																					
Shares - Basic	383	386	7,500	29,746	33,173	22,466	33,505	33,672	33,841	34,010	33,757	34,350	34,693	35,040	35,391	35,745	36,102	36,463	36,828	37,196	37,568
Shares - Diluted	383	386	7,500	29,746	33,173	22,466	33,505	33,672	33,841	34,010	33,757	34,350	34,693	40,040	45,441	45,895	46,354	46,818	47,286	47,759	48,236
Cash, Cash Equivalents & Investments	12,303	29,558	79,021	68,514	109,216	109,216	92,466	75,616	59,566	44,583	44,583	50,690	48,824	99,581	220,813	410,906	672,247	998,626	1,375,090	1,789,509	2,252,779

Source: Jefferies and Company financials

Radius Health Balance Sheet and Cash Flow Statement

Radius Health (RDUS)

Balance Sheet

(\$ in thousands, except per share)

	2013	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Assets													
Cash & cash equivalents	12,303	53,469	11,758	11,277	39,362	46,664	75,093	73,102	83,147	94,100	106,092	132,090	133,097
Marketable securities	-	55,747	32,825	39,413	9,462	52,917	145,720	337,805	589,100	904,527	1,268,998	1,657,418	2,119,682
Prepaid expenses and other current assets	334	351	368	387	406	426	448	470	493	518	544	571	600
Total current assets	12,637	109,566	44,952	51,077	49,230	100,008	221,260	411,376	672,740	999,144	1,375,634	1,790,080	2,253,379
Property and equipment, net	76	80	84	88	92	97	102	107	112	118	124	130	136
Other non-current assets	45	50	54	60	66	72	80	88	96	106	117	128	141
Total assets	12,758	109,696	45,090	51,224	49,388	100,177	221,442	411,571	672,949	999,368	1,375,874	1,790,338	2,253,657
Liabilities and Stockholders' Equity (Deficit)													
Accounts payable & accrued expenses	22,307	24,538	26,991	29,691	32,660	35,926	39,518	43,470	47,817	52,599	57,859	63,644	70,009
Current portion of note payable, net of discount	13,005	-	12,000	12,000	6,000	-	-	-	-	-	-	-	-
Total current liabilities	35,312	24,538	38,991	41,691	38,660	35,926	39,518	43,470	47,817	52,599	57,859	63,644	70,009
Note payable	-	30,000	18,000	6,000	-	-	-	-	-	-	-	-	-
Warrant liability	1,945	-	-	-	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Liabilities	290,059	54,538	56,991	47,691	38,660	35,926	39,518	43,470	47,817	52,599	57,859	63,644	70,009
Total Stockholders' Equity (Deficit)	(277,301)	55,158	(11,902)	3,534	10,728	64,252	181,923	368,101	625,132	946,770	1,318,016	1,726,694	2,183,648
Total Liabilities & Stockholders' Equity	12,758	109,696	45,090	51,224	49,388	100,177	221,442	411,571	672,949	999,368	1,375,874	1,790,338	2,253,657
Cash/share	\$32.10	\$4.86	\$1.32	\$1.48	\$1.41	\$2.49	\$4.86	\$8.95	\$14.50	\$21.33	\$29.08	\$37.47	\$46.70
Book value/share	(\$723.44)	\$2.46	(\$0.35)	\$0.10	\$0.31	\$1.60	\$4.00	\$8.02	\$13.49	\$20.22	\$27.87	\$36.15	\$45.27
Long-term debt-to-capitalization ratio	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Return on equity	NA	NA	NA	NA	NA	NA	66.6%	51.6%	41.8%	34.5%	28.6%	24.0%	21.2%

Cash Flow Statement

(\$ in thousands except per share)

	2013	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Operating Activities													
Net income/(loss)	(60,690)	(71,115)	(64,632)	6,107	(1,866)	50,758	121,231	190,094	261,341	326,379	376,463	414,419	463,271
Depreciation & amortization	54	56	57	59	61	63	64	66	68	70	73	75	77
Change in working capital	9,693	2,210	2,432	2,677	2,945	3,241	3,566	3,924	4,318	4,751	5,228	5,752	6,329
Other	5,926	32,210	(9,568)	(9,323)	(3,055)	3,241	3,566	3,924	4,318	4,751	5,228	5,752	6,329
Net cash from operations	(45,017)	(36,639)	(71,711)	(481)	(1,915)	57,303	128,428	198,009	270,045	335,953	386,992	425,999	476,006
Investing Activities													
Capital expenditures	(2)	-	-	-	-	-	-	-	-	-	-	-	-
Securities transactions	3,973	-	30,000	-	30,000	(50,000)	(100,000)	(200,000)	(260,000)	(325,000)	(375,000)	(400,000)	(475,000)
Other	-	-	-	-	-	-	-	-	-	-	-	-	-
Net cash from investments	3,971	-	30,000	-	30,000	(50,000)	(100,000)	(200,000)	(260,000)	(325,000)	(375,000)	(400,000)	(475,000)
Financing Activities													
Issuance of common/preferred stock	42,870	77,805	-	-	-	-	-	-	-	-	-	-	-
Repayments/proceeds of debt, net	(8,187)	-	-	-	-	-	-	-	-	-	-	-	-
Other	13.00	-	-	-	-	-	-	-	-	-	-	-	-
Net cash from financing	34,696	77,805	-	-	-	-	-	-	-	-	-	-	-
Net Change in Cash and Cash Equivalents	(6,350)	41,166	(41,711)	(481)	28,085	7,303	28,428	(1,991)	10,045	10,953	11,992	25,999	1,006
Cash and cash equivalents at beginning of period	18,653	12,303	53,469	11,758	11,277	39,362	46,664	75,093	73,102	83,147	94,100	106,092	132,090
Cash and cash equivalents at end of period	12,303	53,469	11,758	11,277	39,362	46,664	75,093	73,102	83,147	94,100	106,092	132,090	133,097

Source: Jefferies and Company financials

Company Description

Radius Health, Inc. is a biopharmaceutical company focused on developing therapies for osteoporosis and other endocrine diseases. The company's lead product is abaloparatide-SC (BA058), a novel synthetic peptide analog of parathyroid hormone-related protein (PTHrP), with topline data readout for ongoing Phase 3 for osteoporosis released on 12/22/14 and potential NDA filing in 2H15. Additional pipeline products include a transdermal patch of abaloparatide, abaloparatide-TD; RAD1901, an oral selective estrogen receptor down-regulator/degrader (SERD) for the treatment of breast cancer brain metastases and vasomotor symptoms; and RAD140, a nonsteroidal selective androgen receptor modulator. Radius was founded in 2003 and is headquartered in Cambridge, Massachusetts.

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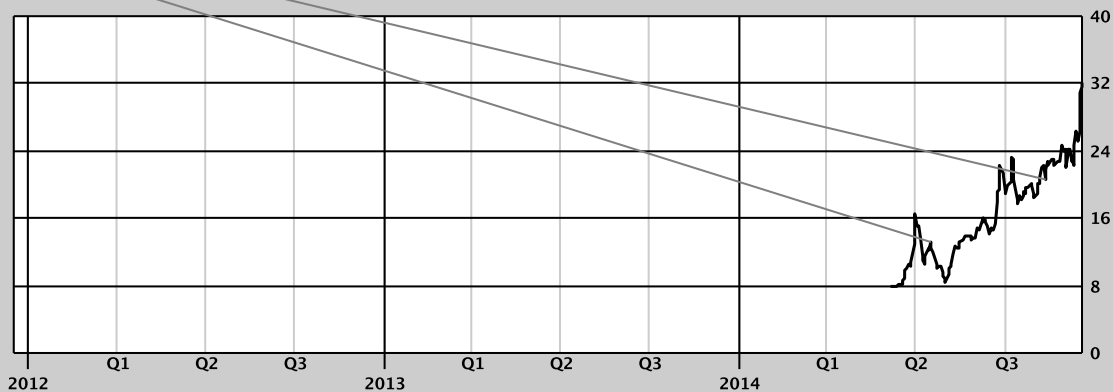
Other Companies Mentioned in This Report

- ACADIA Pharmaceuticals Inc. (ACAD: \$32.24, BUY)
- Neurocrine Biosciences (NBIX: \$23.17, BUY)
- Pfizer, Inc. (PFE: \$32.09, BUY)
- Tesaro, Inc. (TSRO: \$37.83, BUY)

Rating and Price Target History for: Radius Health, Inc. (RDUS) as of 12-19-2014

07/16/14
I:B:\$17

11/11/14
B:\$26



Rating and Price Target History for: ACADIA Pharmaceuticals Inc. (ACAD) as of 12-19-2014

03/18/13
I:B:\$13

04/12/13
B:\$18

08/06/13
B:\$26

03/03/14
B:\$38

11/11/14
B:\$42

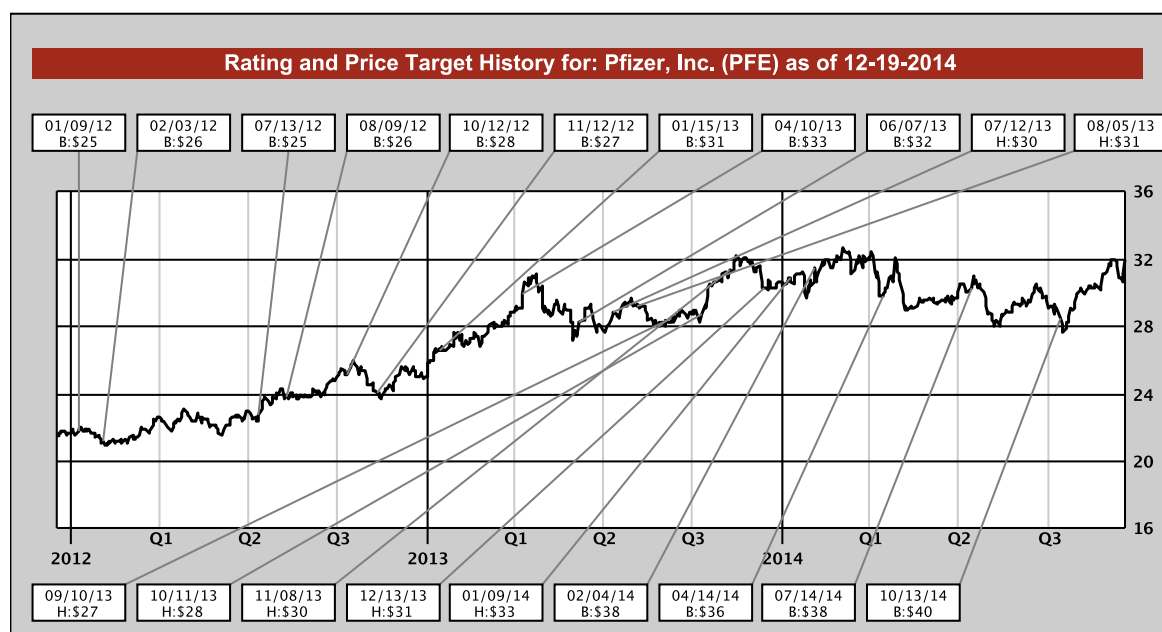


Rating and Price Target History for: Neurocrine Biosciences (NBIX) as of 12-19-2014



Rating and Price Target History for: Tesaro, Inc. (TSRO) as of 12-19-2014





Distribution of Ratings

Rating	Count	Percent	IB Serv./Past 12 Mos.	
			Count	Percent
BUY	1042	52.00%	275	26.39%
HOLD	817	40.77%	145	17.75%
UNDERPERFORM	145	7.24%	5	3.45%

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