Radius Health

Biotechnology

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US Equity Research
22 December 2014

BUY
unchanged

PRICE TARGET US$40.00↑
from US$30.00

Price (22-Dec)	US$32.67
Ticker	RDUS-NASDAQ

52-Week Range (US$):	7.46 - 32.82
Avg Daily Vol (M) :	137.7
Shares Out. (M) :	29.7
Market Cap (US$M):	972

FYE Dec	2013A	2014E	2015E	2016E
Revenue (US$M)	0.0	0.0	0.0	82.1
EPS Adj&Dil (US$)	(3.97)	(54.05)	(3.06)	(1.52)

Quarterly Revenue	Q1	Q2	Q3	Q4
2013A	-	-	-	-
2014E	0.0A	0.0A	0.0A	0.0
2015E	0.0	0.0	0.0	0.0
2016E	-	-	-	-

Quarterly EPS Adj&Dil	Q1	Q2	Q3	Q4
2013A	-	-	-	-
2014E	(50.45)A	(2.22)A	(0.59)A	(0.79)
2015E	(0.68)	(0.88)	(0.75)	(0.75)
2016E	-	-	-	-

Source: FactSet

Radius is a biotechnology company focused on drugs for endocrine disorders, including osteoporosis.

Raising Target Price

Abaloparatide hits primary endpoint vs. placebo in postmenopausal women with severe osteoporosis; raise PT to $40 from $30

Top-line abaloparatide data vs. placebo positive

Abaloparatide showed an 83% reduction in the incidence of vertebral fracture versus placebo ($p<0.001$), achieving the primary endpoint, which we view as a clear positive. In addition, the Forteo arm showed a 78% reduction in fracture risk versus placebo, which was less favorable than abaloparatide. We believe the numerically better reduction in vertebral fracture for abaloparatide vs Forteo will translate into a commercial advantage following FDA approval. Radius expects to submit its NDA for abaloparatide approval in 2H15.

Await details on non-vertebral fracture for Forteo

Abaloparatide reduced non-vertebral fractures versus placebo by 43%, which was statistically significant, an important factor for commercialization. Details for hip fracture were not reported, as the number of events may have been small in the study. Importantly, Radius did not disclose details on the non-vertebral fracture rate, or reduction in non-vertebral fracture for Forteo. We believe that the numerical comparison of non-vertebral and hip fracture rates for abaloparatide vs. Forteo will be important for investors, and await these data at an upcoming medical conference. Full data are expected in 2015, possibly at ASBMR in October or ECE in May 2015. Importantly, we believe Radius is being careful not to suggest any comparative claims versus Forteo, which could be the reason that additional data were not yet disclosed.

Safety looks clean with abaloparatide vs. placebo and Forteo

Safety data for the abaloparatide group was positive, with only dizziness showing slightly higher incidence rates of 10% vs. 6.1% in the placebo arm and 7.3% in the Forteo group. However, like previous trials demonstrated, the abaloparatide arm had less hypercalcemia than Forteo (6% vs. 10.8%), demonstrating the superior mechanism of action of abaloparatide by indicating a less resorptive, catabolic effect that currently plagues Forteo, while having notable anabolic efficacy.

Raise price target to $40, BUY rating

Although we await further details on the Forteo non-vertebral fracture arm, we believe the data presented today are positive as the drug moves into the registration process 2H15. We raise our price target to $40 from $30 based in an increased probability adjustment for abaloparatide to 70% from 65%. Additionally, given the recent positive data presented at SABCS in metastatic breast cancer, we model RAD1901 into our valuation with a 25% probability adjustment. $4 of the $10 increase is attributed to abaloparatide, whereas $6 is tied to RAD-1901.

RAD1901 peaks $265M in metastatic breast cancer by 2023

We estimate ~$265M in peak sales for RAD1901 by 2023. Based on SEER data, there were ~50,000 patients with hormone receptor positive (HR+), HER2- disease and ~15,000 patients with HR+/HER2+ disease in 2013. Detailed epidemiology studies performed by Swallow et al reported 60% of front line metastatic patients receive ET, totaling ~39,000 patients (Swallow et al. CMRO; 2014). Studies show that 74% of patients are on first-line ET (~28,900 patients, mainly tamoxifen), 19% are on second-line ET (~7,400 patients, split between aromatase inhibitors and fulvestrant), and 7% are on third line ET (~2,700 patients). Additionally, as the patient fails one line of therapy, the duration of subsequent therapies decreases from 10 months in first line to 3 months in third line use. We extrapolated this data to 2023 by assuming a 2% increase in patients per year, as well as a $3,000 price target (fulvestrant is ~$2,000/month), and a ~5% price increase per year. We give peak shares of 15%, 20%, and 35% for RAD1901 in the front-, second-, and third-line endocrine therapy, to achieve peak sales of ~$265M by 2023.

Figure 1: RAD1901 metastatic breast cancer - US revenue

RAD1901 MBC - US

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Breast Cancer - Incidence	**232,670**	**237,323**	**242,070**	**246,911**	**251,849**	**256,886**	**262,024**	**267,265**	**272,610**	**278,062**	**283,623**
Stage 1	88,415	90,183	91,987	93,826	95,703	97,617	99,569	101,561	103,592	105,664	107,777
Stage 2	65,148	66,451	67,780	69,135	70,518	71,928	73,367	74,834	76,331	77,857	79,415
Stage 3	13,960	14,239	14,524	14,815	15,111	15,413	15,721	16,036	16,357	16,684	17,017
Metastatic - Stage 4	65,148	66,451	67,780	69,135	70,518	71,928	73,367	74,834	76,331	77,857	79,415
Front line chemotherapy	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
MBC patients receiving front line chemotherapy	26,059	26,580	27,112	27,654	28,207	28,771	29,347	29,934	30,532	31,143	31,766
Front line endocrine therapy	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
MBC patients receiving front line endocrine therapy	39,089	39,870	40,668	41,481	42,311	43,157	44,020	44,900	45,798	46,714	47,649
First line endocrine therapy	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
MBC patients on 1st line endocrine therapy	28,926	29,504	30,094	30,696	31,310	31,936	32,575	33,226	33,891	34,569	35,260
RAD1901 % Market share				5%	10%	10%	12%	12%	15%	15%	15%
Second line endocrine therapy	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
MBC patients on 2nd line endocrine therapy	7,427	7,575	7,727	7,881	8,039	8,200	8,364	8,531	8,702	8,876	9,053
RAD1901 % Market share				5%	10%	15%	15%	20%	20%	20%	20%
Third line endocrine therapy	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MBC patients on 3rd line endocrine therapy	2,736	2,791	2,847	2,904	2,962	3,021	3,081	3,143	3,206	3,270	3,335
RAD1901 % Market share				10%	15%	20%	25%	30%	35%	35%	35%
Total potential RAD1901 1st line patients				1,535	3,131	3,194	3,909	3,987	5,084	5,185	5,289
Duration of therapy - 10 months				10	10	10	10	10	10	10	10
Total potential RAD1901 2nd line patients				394	804	1,230	1,255	1,706	1,740	1,775	1,811
Duration of therapy - 6 months				6	6	6	6	6	6	6	7
Total potential RAD1901 3rd line patients				290	444	604	770	943	1,122	1,145	1,167
Duration of therapy - 3 months				3	3	3	3	3	3	3	4
Price				$3,000	$3,150	$3,308	$3,473	$3,647	$3,829	$4,020	$4,221
RAD1901 total revenue (000's)				$55,751	$118,018	$136,033	$169,922	$193,038	$247,514	$265,087	$296,480

Source: Canaccord Genuity estimates

For Ex-US metastatic breast cancer, we use the same clinical assumption was the US revenue build but increase the patient population by 1.75x based on a higher population incidence in the EU. Additionally, we take a 30% discount in pricing to $2,100 and do not include a price increase in the Ex-US revenue build.

Figure 2: RAD1901 metastatic breast cancer Ex-US revenue

RAD1901 MBC - Ex-US

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Breast Cancer - Incidence	**407,173**	**415,316**	**423,622**	**432,095**	**440,737**	**449,551**	**458,542**	**467,713**	**477,067**	**486,609**	**496,341**
Stage 1	154,726	157,820	160,976	164,196	167,480	170,830	174,246	177,731	181,286	184,911	188,610
Stage 2	114,008	116,288	118,614	120,987	123,406	125,874	128,392	130,960	133,579	136,250	138,975
Stage 3	24,430	24,919	25,417	25,926	26,444	26,973	27,513	28,063	28,624	29,197	29,780
Metastatic - Stage 4	114,008	116,288	118,614	120,987	123,406	125,874	128,392	130,960	133,579	136,250	138,975
Front line chemotherapy	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
MBC patients receiving front line chemotherapy	45,603	46,515	47,446	48,395	49,363	50,350	51,357	52,384	53,432	54,500	55,590
Front line endocrine therapy	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
MBC patients receiving front line endocrine therapy	68,405	69,773	71,169	72,592	74,044	75,525	77,035	78,576	80,147	81,750	83,385
First line endocrine therapy	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%	74%
MBC patients on 1st line endocrine therapy	50,620	51,632	52,665	53,718	54,792	55,888	57,006	58,146	59,309	60,495	61,705
RAD1901 % Market share				5%	10%	10%	12%	12%	15%	15%	15%
Second line endocrine therapy	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%	19%
MBC patients on 2nd line endocrine therapy	12,997	13,257	13,522	13,792	14,068	14,350	14,637	14,929	15,228	15,533	15,843
RAD1901 % Market share				5%	10%	15%	15%	20%	20%	20%	20%
Third line endocrine therapy	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MBC patients on 3rd line endocrine therapy	4,788	4,884	4,982	5,081	5,183	5,287	5,392	5,500	5,610	5,723	5,837
RAD1901 % Market share				10%	15%	20%	25%	30%	35%	35%	35%
Total potential RAD1901 1st line patients				2,686	5,479	5,589	6,841	6,978	8,896	9,074	9,256
Duration of therapy - 10 months				10	10	10	10	10	10	10	10
Total potential RAD1901 2nd line patients				690	1,407	2,152	2,196	2,986	3,046	3,107	3,169
Duration of therapy - 6 months				6	6	6	6	6	6	6	6
Total potential RAD1901 3rd line patients				508	777	1,057	1,348	1,650	1,964	2,003	2,043
Duration of therapy - 3 months				3	3	3	3	3	3	3	3
Price				$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100
RAD1901 total revenue (000's)				$68,294	$137,688	$151,147	$179,812	$194,546	$237,569	$242,320	$247,167

Source: Canaccord Genuity estimates

RAD1901 estimated $202M in metastatic breast cancer with brain metastases

Because RAD1901 can cross the blood brain barrier and penetrate the CNS, we estimate peak sales of ~$202M in this patient population. According to ASCO, about 20-30% of all metastatic breast cancer patients will have brain metastases. Therefore, we estimate about ~12,000 patients by 2014, and ~14,000 by 2023 with a 2% population increase per year. We give peak share of 35% for RAD1901 in these patients and assume a 10-month duration of therapy to our estimated peak share of $202M by 2023.

Figure 3: RAD1901 metastatic breast cancer with brain metastases - US revenue

RAD1901 CNS MBC - US

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
HR+ Metastatic BC with Brain Mets	12,000	12,240	12,485	12,734	12,989	13,249	13,514	13,784	14,060	14,341	14,628
RAD1901 % Market Share				5%	10%	15%	20%	25%	30%	35%	35%
Total RAD1901 patients				637	1,299	1,987	2,703	3,446	4,218	5,019	5,120
Duration - 10 months	10	10	10	10	10	10	10	10	10	10	10
Price				$3,000	$3,150	$3,308	$3,473	$3,647	$3,829	$4,020	$4,221
Total Revenue (000's)				$ 19,102	$ 40,916	$ 65,731	$ 93,865	$ 125,661	$ 161,500	$ 201,794	$ 216,121

Source: Canaccord Genuity estimates

Figure 4: RAD1901 metastatic breast cancer with brain metastases - US revenue

RAD1901 CNS MBC - Ex-US

HR+ Metastatic BC with Brain Mets	21,000	21,420	21,848	22,285	22,731	23,186	23,649	24,122	24,605	25,097	25,599
RAD1901 % Market Share				5%	10%	15%	20%	25%	30%	35%	35%
Total RAD1901 patients				1,114	2,273	3,478	4,730	6,031	7,381	8,784	8,960
Duration - 10 months	10	10	10	10	10	10	10	10	10	10	10
Price				$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100	$2,100
Total Revenue (000's)				$ 23,400	$ 47,735	$ 73,035	$ 99,328	$ 126,643	$ 155,011	$ 184,463	$ 188,152

Source: Canaccord Genuity estimates

Figure 5: RDUS income statement

(000's) [FY - DEC]												
Revenues	**2013A**	**1Q14A**	**2Q14A**	**3Q14A**	**4Q14E**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
abaloparatide - US								82,120	239,867	357,419	465,944	583,042
abaloparatide - Ex-US								-	90,548	204,751	251,503	298,717
Total								**82,120**	**330,415**	**562,170**	**717,447**	**881,759**
Income Statement	**2013A**	**1Q14A**	**2Q14A**	**3Q14A**	**4Q14E**	**2014E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
Total Revenue	-	-	-	-	-	-	-	82,120	264,315	457,747	594,210	738,375
COGS	-	-	-	-	-	-	-	16,424	52,863	91,549	118,842	147,675
Gross Profit	-	-	-	-	-	-	-	65,696	211,452	366,198	475,368	590,700
Operating Expenses												
Research and development	60,536	9,717	10,618	13,817	14,926	49,078	74,464	59,354	55,796	65,122	84,196	117,620
abaloparatide-SC	45,977	8,107	9,728	10,132	12,158	40,126	27,052	18,937	13,256	13,256	13,256	13,256
abaloparatide-TD	11,459	185	278	523	785	1,770	31,380	21,966	15,376	10,763	7,534	5,274
RAD1901	-	-		1,027	1,000	2,027	12,100	14,520	23,232	37,171	59,474	95,158
RAD140	-	-				-	-					
other	3,100	1,425	1,710	819	983	4,937	3,932	3,932	3,932	3,932	3,932	3,932
General and administrative	6,829	2,139	3,070	2,836	2,700	10,745	13,200	57,484	85,902	102,993	133,697	166,134
Total Operating Expense	67,365	11,856	13,688	16,653	17,626	59,823	87,664	116,838	141,698	168,115	217,893	283,754
EBITDA												
Operating income	(67,365)	(11,856)	(13,688)	(16,653)	(17,626)	(59,823)	(87,664)	(51,142)	69,754	198,083	257,475	306,946
Other income (expense), net	9,085	(2,233)	1,727	(802)	(802)	(2,110)	(5,824)	(2,110)	(5,824)	(2,110)	(5,824)	(2,110)
Loss on retirement of note payable			(203)									
Interest (expense) income, net	(2,410)	(399)	(445)	24	24	(796)	(1,544)	(796)	(1,544)	(796)	(1,544)	(796)
Accretion of preferred stock		(4,969)	(4,031)									
Pre-tax income (GAAP)	(60,690)	(19,457)	(16,640)	(17,431)	(18,404)	(71,932)	(95,032)	(54,048)	62,386	195,177	250,107	304,040
Pre-tax income (non-GAAP)												
Taxes (GAAP)	-	-	-	-	-	-	-	-	23,083	72,215	92,540	112,495
Tax rate (GAAP)	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
Net Income (GAAP)	(60,690)	(19,457)	(16,640)	(17,431)	(18,404)	(71,932)	(95,032)	(54,048)	39,303	122,961	157,568	191,545
GAAP EPS (diluted)	**($3.97)**	**($50.45)**	**($2.22)**	**($0.59)**	**($0.79)**	**($54.05)**	**($3.06)**	**($1.52)**	**$1.05**	**$3.14**	**$3.83**	**$4.43**
Diluted shares outstanding	15,278	386	7,500	29,746	23,200	15,208	31,539	35,562	37,340	39,207	41,167	43,226

Source: Canaccord Genuity estimates

Figure 6: RDUS valuation

Product	Peak Sales ($MM)	Year	NPV at launch	Probability Adjustment	Current Value ($MM)	Scenario probability	Value / Share
abaloparatide							
US	$822	2022	$1,335	70%	$751	100%	$26
Ex-US - co-promote	$346	2021	$418	70%	$206	50%	$4
Ex-US - royalty	$346	2021	$198	70%	$138	50%	$2
Total abaloparatide					**$958**		**$32**
RAD1901							
US	$467	2023	$657	25%	$164		$6
Ex-US	$427	2023	$185	25%	$46		$0
Total abaloparatide					**$211**		**$6**
Total Product Value					$958		$38
Cash					60		$2
Total Equity Value					**1,018**		**$40**
Shares Outstanding (MM)					29		

Risk-Free Rate	3.0%
Beta	1.8
Risk Premium	5%
Discount Rate	12%

Source: Canaccord Genuity estimates

Appendix: Important Disclosures

Analyst Certification

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Target Price / Valuation Methodology:

Radius Health - RDUS:

Our $40 price target is based on a probability-adjusted net present value analysis.

Risks to achieving Target Price / Valuation:

Radius Health - RDUS:

Risks to our outlook and price target include the following: the Phase 3 study for abaloparatide in osteoporosis may be negative, or fail to meet investor expectations, resulting in downside to shares and our price target. Also, Phase 3 data may be positive in terms of efficacy, but show an unexpected safety signal, also resulting in downside to our price target. Antibody formation was been seen in Phase 2 studies, with one patient showing potential evidence of neutralizing antibodies. Even assuming positive Phase 3 data for subcutaneous abaloparatide in osteoporosis, FDA approval may be delayed or may not occur at all, also resulting in downside to shares and our price target. FDA may also grant approval, but require large, lengthy and expensive post-approval studies, which could also result in downside to shares and our price target. Clinical data from other osteoporosis products including anti-sclerostin antibodies from Amgen, Merck, Eli Lilly and Novartis could be viewed as superior to abaloparatide, pressuring shares. Competition from existing and new osteoporosis products could also result in lower revenues that expected, leading to downside to our estimates and the share price. Although unlikely, a paragraph 4 challenge could be filed against Lilly's Forteo, a molecule closely related to abaloparatide, which investors may interpret as increasing risk for abaloparatide, and pressuring Radius shares. Forteo was approved as an NDA, where the ANDA pathway is well established. Even though Forteo is essentially a biologic, since it is a peptide, it is feasible although unlikely that a generic challenger could emerge. FDA has approved a generic version of Lovenox, a biologic approved via the NDA pathway, although the process took many years. If a generic version of Forteo were to reach the market, usage of abaloparatide could decline, resulting in downside to our estimates and price target. Also, if FDA were to approve a generic version of Copaxone, a peptide used to treat multiple sclerosis, investors may see increased risk of a generic challenge and approval for abaloparatide, as both products are classified as NDA filings for biologic peptides. A transdermal microneedle formulation for abaloparatide may not be feasible, which investors may view as negative for life cycle management and commercial competitive positioning for Radius, pressuring shares. Even if a microneedle formulation can be developed to show equal efficacy to the subcutaneous formulation, FDA may require a full clinical study versus a bridging study, which would require additional funding and time to approval.

Distribution of Ratings:

Global Stock Ratings (as of 12/22/14)

Rating	Coverage Universe		IB Clients
	#	%	%
Buy	649	60.43%	33.90%
Hold	320	29.80%	12.81%
Sell	51	4.75%	0%
Speculative Buy	54	5.03%	59.26%
	1074*	100.0%	

*Total includes stocks that are Under Review

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

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

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

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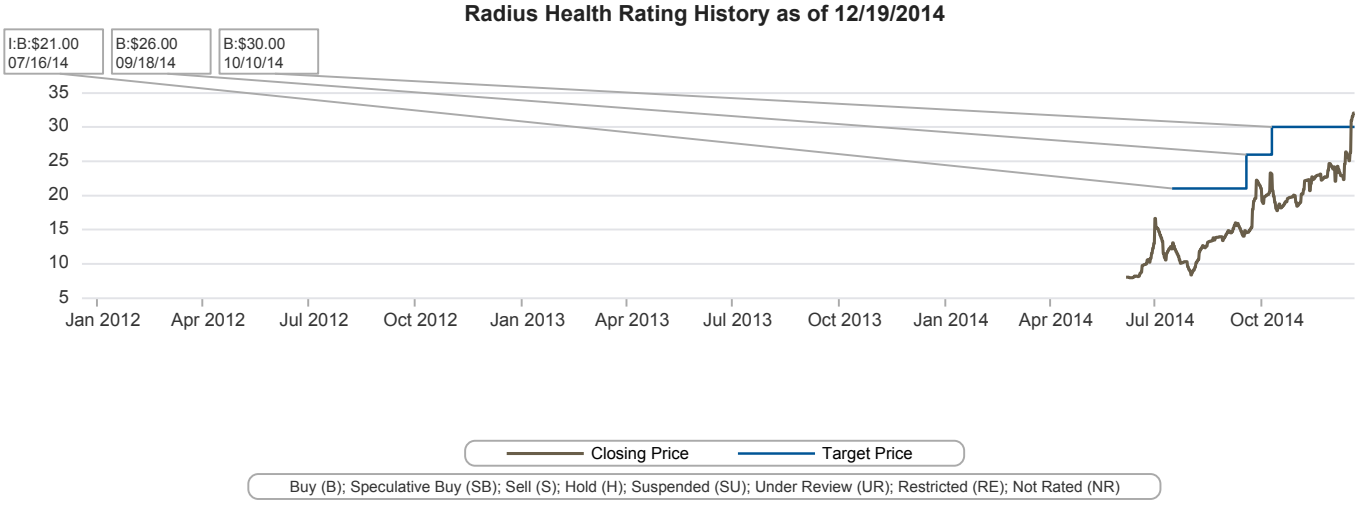
Canaccord Genuity or one or more of its affiliated companies intend to seek or expect to receive compensation for Corporate Finance/ Investment Banking services from Radius Health in the next six months.

An analyst has visited the material operations of Radius Health. No payment was received for the related travel costs.

Radius Health Rating History as of 12/19/2014



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