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SAGE Therapeutics

Biotechnology

US Equity Research
9 January 2015

BUY
unchanged

PRICE TARGET US$58.00
unchanged

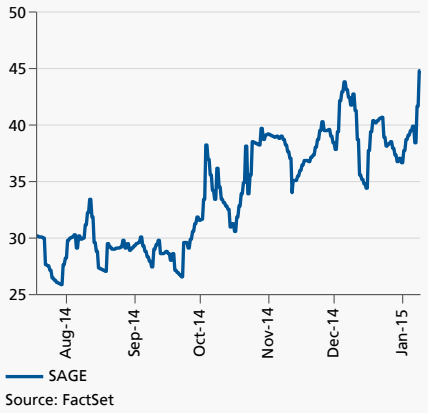
Price (8-Jan)	US$44.73
Ticker	SAGE-NASDAQ

52-Week Range (US$):	24.25 - 44.98
Avg Daily Vol (M) :	131.4
Shares Out. (M) :	24.0
Market Cap (US$M):	1,044

FYE Dec	2014E	2015E	2016E
Sales (US$M)	0.0	0.0	0.0
EPS Adj&Dil (US$)	(1.84)	(1.51)	(1.54)

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

Quarterly EPS Adj&Dil	Q1	Q2	Q3	Q4
2014E	(3.70)A	(4.57)A	(0.30)	(0.42)
2015E	(0.39)	(0.35)	(0.37)	(0.40)
2016E	-	-	-	-



Source: FactSet

SAGE Therapeutics is a biopharmaceutical company focused on developing drugs to treat CNS disorders where no effective options exist.

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Company Update

Positive update for SAGE-547 from two studies, Phase 3 slated for mid-2015

71% of patients weaned from anesthesia coma in Phase 1/2

Seventeen of 20 patients receiving SAGE-547 in Phase 1/2 were weaned off of an anesthesia-induced coma, and did not have recurrence of Status Refractory Status Epilepsy, a significant positive, in our view. Importantly, most patients improved quickly, within the first five days of treatment. Patients were treated for n=5 days with SAGE-547, with weaning beginning on day 3. Patients were in an anesthesia-induced coma for 11 days prior to treatment.

78% response in emergency use study also impressive

Emergency use results for SAGE-547 showed a 78% response rate, consistent with the 71% response rate seen in Phase 1/2, which is encouraging in our view. Ten patients were treated, with nine evaluable, and a mean age of 17. We believe that the very strong results seen in the emergency use study combined with Phase 1/2 data may help expedite development and review at FDA.

Safety encouraging in very sick patients

None of the Serious Adverse Events noted in the study were related to drug, and we view the overall safety profile as very positive. We remind investors of the serious etiology for the n=20 patients treated with SAGE-547 for Super Refractory Status Epilepsy – Brain hemorrhage (n=4), infection (n=4), worsening of seizure (n=2), primary or metastatic brain tumors (n=2). One patient had a stroke, sickle cell anemia, lupus, posterior reversible encephalopathy syndrome, and toxic ingestion. Five deaths were reported, independent of treatment response, which we believe were related to the underlying etiology of the disease.

Expect Phase 3 initiation mid-2015

SAGE expects to initiate a Phase 3 trial for SAGE-547 mid-2015, following discussions with FDA on final trial design, and we estimate results during 2016. We expect the Phase 3 trial to include a control arm, and believe the trial could allow crossover for placebo patients due to the serious nature of the disease. However, we await final details from SAGE after the company meets with FDA. Importantly, due to the high >70% response rate seen for SAGE-547 in the Phase 1/2 and emergency use study, the size, enrollment period, and time to data for the Phase 3 study could be less than previously thought.

Figure 1: SAGE valuation – average of NPV and P/S

Valuation method	Value/share
Net Present Value	$40
Price to Sales	$75
Average	$58

Source: Canaccord Genuity estimates

Figure 2: SAGE NPV valuation

Product	Peak Sales / Royalties ($MM)	Year	NPV at launch	Probability Adjustment	Current Value ($MM)	Value / Share
SAGE-547						
US	$984	2020	$2,148	55%	$864	$32
Ex-US - royalty	$82	2024	$177	55%	$71	$3
Total SAGE-547 revenues	$1,066				$935	
Total Product Value					935	$35
Cash					149	$6
Total Equity Value					**1,084**	**$40**
Shares Outstanding (MM)					27	

Risk-Free Rate	3.0%
Beta	1.8
Risk Premium	4%
Discount Rate	10%

Source: Canaccord Genuity estimates

Figure 3: SAGE P/S valuation

Product	Peak revenues	Year	probability	P/S	Value / share
SAGE-547					
US	$984	2020	55%	6	66
Ex-US	$82	2024	55%	6	4
Total Product Value					$70
Cash					$6
Total Equity Value					**$75**
Shares Outstanding (MM)					27

Risk-Free Rate	3.0%
Beta	1.8
Risk Premium	4%
Discount Rate	10%

Source: Canaccord Genuity Estimates

Figure 4: SAGE income statement

Revenues	2012A	2013A	1Q14A	2Q14A	3Q14E	4Q14E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
SAGE-547													
US							-	-	-	-	81,823	337,154	607,793
Ex-US							-	-	-	-	51,888	52,148	209,633
Ex-US royalty									-	-	8,821	8,865	35,638
Total			-	-	-	-	-	-	**-**	**-**	**90,644**	**346,019**	**643,431**

Income Statement	2012A	2013A	1Q14A	2Q14A	3Q14E	4Q14E	2014E	2015E	2016E	2017E	2018E	2019E	2020E
Total Revenue	-	-	-	-	-	-	-	-	-	-	90,644	346,019	643,431
COGS	-	-	-	-	-	-	-	-	-	-	9,064	34,602	64,343
Gross Profit	-	-	-	-	-	-	-	-	-	-	81,580	311,417	579,088
Operating Expenses													
Research and development	7,229	14,357	4,173	4,381	6,325	9,747	24,626	39,236	41,689	42,996	47,760	57,785	71,508
General and administrative	2,402	3,922	1,617	1,807	1,825	1,843	7,092	7,559	7,687	7,764	32,806	35,706	38,893
Total Operating Expense	9,631	18,279	5,790	6,188	8,150	11,591	31,718	46,795	49,376	50,760	80,565	93,491	110,401
EBITDA													
Operating income	(9,631)	(18,279)	(5,790)	(6,188)	(8,150)	(11,591)	(31,718)	(46,795)	(49,376)	(50,760)	1,015	217,926	468,687
Interest (expense) income, net	-	1	-	1	1	1	3	8	3	8	3	8	3
Other income (expense), net	(1)	(3)	-	(5)	(5)	(5)	(15)	(40)	(15)	(40)	(15)	(40)	(15)
Pre-tax income (GAAP)	(9,632)	(18,281)	(5,790)	(6,192)	(8,154)	(11,595)	(31,730)	(46,827)	(49,388)	(50,792)	1,003	217,894	468,675
Pre-tax income (non-GAAP)													
Taxes (GAAP)		-	-	-	-	-	-	-	-	-	371	80,621	173,410
Tax rate (GAAP)	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
Accretion of redeemable convertible preferred	(4)	(7)	(326)	(1,577)									
Net Income (GAAP)	**(9,637)**	**(18,288)**	**(6,116)**	**(7,769)**	**(8,154)**	**(11,595)**	**(33,633)**	**(46,827)**	**(49,388)**	**(50,792)**	**632**	**137,273**	**295,265**
GAAP EPS (diluted)	($8.62)	($12.26)	($3.70)	($4.57)	($0.30)	($0.42)	($1.84)	($1.51)	($1.54)	($1.44)	$0.02	$3.21	$6.29
Diluted shares	1,118	1,492	1,653										
Pro forma - diluted shares		9,514	16,774	1,701	27,270	27,543	18,322	30,973	32,084	35,292	38,821	42,703	46,974
Pro forma EPS (diluted)		**($1.92)**	**($0.36)**	**($4.57)**	**($0.30)**	**($0.42)**	**($1.84)**	**($1.51)**	**($1.54)**	**($1.44)**	**$0.02**	**$3.21**	**$6.29**

Source: Company reports, Canaccord Genuity estimates

Appendix: Important Disclosures

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Target Price / Valuation Methodology:

SAGE Therapeutics - SAGE:

Our price target of $58 is based on an average of our NPV and P/S valuations. Our NPV valuation estimates a $40 value for the stock, and our P/S valuation estimates a $75 value for the stock.

Risks to achieving Target Price / Valuation:

SAGE Therapeutics - SAGE:

Clinical trials for SAGE-547, 689, and 217 may ultimately fail, resulting in substantial downside to our estimates and price target. SAGE currently has no products approved by FDA or European regulatory agencies and has no revenues at present. Also, the exact number of patients suffering from super-refractory status epilepticus and other subsets of status epilepticus is not known. The actual number of SRSE patients may be smaller than modeled, which could result in difficulty enrolling clinical studies and longer clinical timelines. Smaller patient numbers could also result in lower revenues than our current estimates. Later-stage clinical trials for SAGE-547 may fail despite encouraging initial data from emergency use cases, resulting in lack of clinical approval, revenues, and downside to our price target. In addition, safety signals may emerge in Phase 1/2 and Phase 3 studies that were not seen in the initial emergency use cases. Safety signals could prevent FDA approval if serious. SAGE utilizes third parties, or clinical research organizations, to conduct its clinical studies for SAGE-547. Should these organizations conduct poor quality control, poor selection of clinical investigators, or improper statistical analysis, SAGE shares could be adversely impacted. Also, if the clinical research organization does not recruit the studies in a timely fashion, investors may become disappointed, creating downward pressure on the stock. Even assuming regulatory approval, SAGE's products may not perform well in the marketplace, resulting in lower revenues. If the pace of the launch is too slow, investors may be disappointed, and shares may be under pressure. Competitive products may emerge that generate better clinical data versus SAGE's pipeline. At present, SAGE's principal competitor is Marinus Pharmaceuticals, which is developing a reformulated form of Ganaxalone, a known GABA positive allosteric modulator neuroactive steroid, for potential treatment of drug-resistant partial complex seizures and fragile X syndrome. Also, many of SAGE's competitors have substantially more resources to fund clinical development, and may do so in a faster and/or more effective manner. SAGE is also likely to need substantial additional funding going forward, potentially creating downward pressure related to financing. Research and development costs may be higher than we have anticipated, requiring additional capital and potential dilution. SAGE expects to continue to incur substantial operating losses for the foreseeable future. The company may never become profitable, or profitability may take much longer than originally anticipated, disappointing some investors and resulting in downside to the share price.

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Global Stock Ratings (as of 01/09/15)

Rating	Coverage Universe		IB Clients
	#	%	%
Buy	651	60.45%	32.41%
Hold	331	30.73%	12.99%
Sell	42	3.90%	0%
Speculative Buy	53	4.92%	60.38%
	1077*	100.0%	

*Total includes stocks that are Under Review

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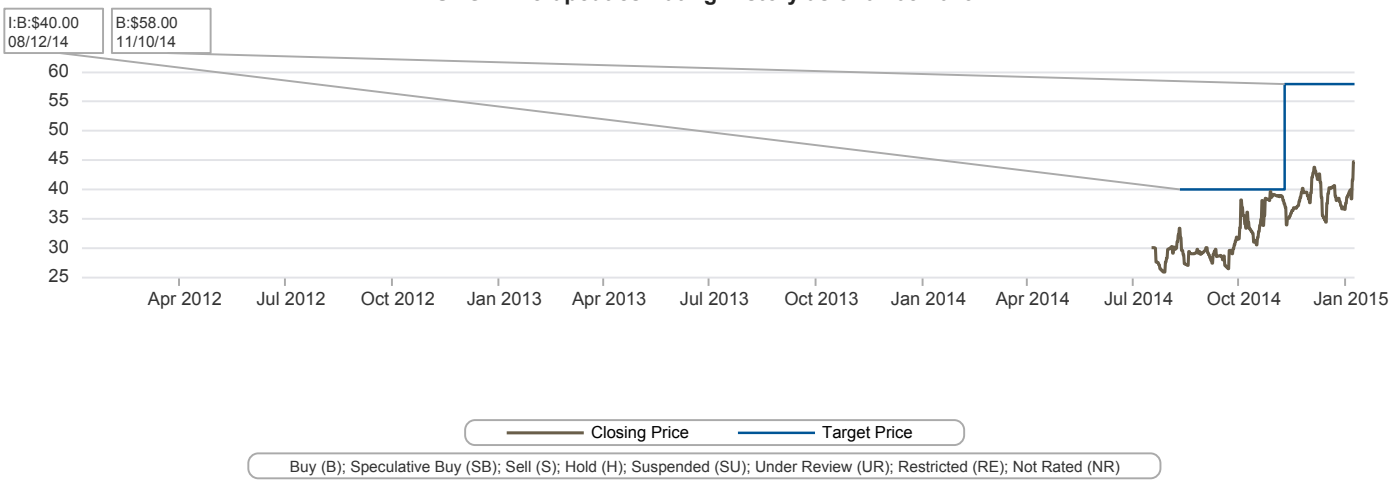
SAGE Therapeutics Rating History as of 01/08/2015



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