

Sage Therapeutics

2Q Snapshot & Model Update

We are updating our SAGE model based on the company's 2Q results (there was no conference call). After its initial public offering in July, and our recent initiation ([here](#)), there isn't much new in the press release. The Phase 1/2 trial for SAGE-547 in SRSE is ongoing, and the key upcoming catalyst for SAGE shares will be updated data from that trial, anticipated in 2H14. Overall, we see Sage as well positioned with a near-term catalyst as well as likely additional data updates and regulatory progress throughout 2015 that could continue to de-risk the story and drive upside. Maintain Overweight.

- **Upcoming events: Phase 1/2 update anticipated in 2H14.** For Sage in 2014, the key catalyst should be presentation of data from the ongoing Phase 1/2 trial in SRSE, which is anticipated in 2H14, potentially at the American Neurological Association meeting (Oct. 12-14, Baltimore) or the American Epilepsy Society meeting (Dec. 5-9, Seattle). Sage also plans to file an IND for SAGE-689 in 2H14 and begin a Phase 1 trial with the compound shortly after, for potential data in 2015. For SAGE-217, IND filing is anticipated in 1H15.
- **2Q results.** 2Q EPS were \$(4.57) vs. cons of \$(0.60) and JPMe of \$(1.22), driven largely by pre-IPO share counts (1.7M common shares outstanding vs. JPMe of 6.2M). 2Q OpEx of \$6.1M was slightly lower than JPMe of \$7.6M. That said, SAGE is not yet an earnings story.
- **Estimate changes.** We have updated our model for 2Q results, changes were minimal. We are maintaining our Dec 15 \$42 price target.
- **Balance sheet update.** SAGE ended 2Q with \$49M in cash (and no debt). Subsequently in July, SAGE completed an IPO (J.P. Morgan acted as joint book-running manager) generating \$94M in net proceeds.

Overweight

SAGE, SAGE US

Price: \$29.58

Price Target: \$42.00

Biotechnology

Cory Kasimov ^{AC}

(1-212) 622-5266

cory.w.kasimov@jpmorgan.com

Bloomberg JPMA KASIMOV <GO>

Whitney G Ijem

(1-212) 622-4668

whitney.g.ijem@jpmorgan.com

Matthew J. Lowe, Ph.D.

(1-212) 622-0848

matthew.j.lowe@jpmorgan.com

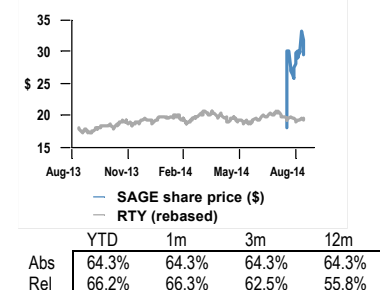
Brittany Turner

(1-212) 622-8527

brittany.turner@jpmorgan.com

J.P. Morgan Securities LLC

Price Performance



Sage Therapeutics, Inc. (SAGE;SAGE US)

FYE Dec	2012A	2013A	2014E (Prev)	2014E (Curr)	2015E
EPS reported (\$)					
Q1 (Mar)	-	(0.76)	(1.17)A	(1.17)A	-
Q2 (Jun)	-	-	(1.22)A	(4.57)A	-
Q3 (Sep)	-	-	(0.46)	(0.61)	-
Q4 (Dec)	-	-	(0.51)	(0.45)	-
FY	(2.74)	(2.15)	(2.49)	(2.93)	(2.26)

Source: Company data, Bloomberg, J.P. Morgan estimates.

Company Data

Price (\$)	29.58
Date Of Price	13 Aug 14
52-week Range (\$)	34.88-24.25
Market Cap (\$ mn)	50.30
Fiscal Year End	Dec
Shares O/S (mn)	2
Price Target (\$)	42.00
Price Target End Date	31-Dec-15




See page 6 for analyst certification and important disclosures.

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Pipeline

Figure 1: SAGE Pipeline

Product Pipeline Highlights

Program	P/C	Ph 1	Ph 2	Ph 3	FDA	Mkt.	Partner Comments
SAGE 547 SRSE							Phase 1/2 ongoing
SAGE 689 SE							IND anticipated 2H14
SAGE 217 RSE							IND anticipated in 1H15

Source: Company reports and J.P. Morgan estimates.

Upcoming Events

Figure 2: SAGE Upcoming Events

Anticipated Newsflow Highlights

Program	Event	Expected Timing	Significance
SAGE 547	Data Update from Phase 1/2 Trial	2H14	High
	Potential Pivotal trial Start	2015	Low
	Potential Pivotal Data	2016	High
	Potential NDA/MAA Filings	2016	Low
SAGE 689	IND Filing	2H14	Low
SAGE 217	IND Filing	1H15	Low

Source: Company reports and J.P. Morgan estimates.

Figure 3: SAGE Income Statement

Sage Therapeutics Income Statement

Cory Kasimov
cory.w.kasimov@jpmorgan.com
212.622.5266

	2013A	1Q14A	2Q14A	3Q14E	4Q14E	2014E	2015E	2016E	2017E	2018E
US 547 Revenues						-	-	-	26.5	195.5
EU 547 Revenues						-	-	-	-	2.2
Total Product Revenue						-	-	-	26.5	197.7
License & Milestone	✓	-	-	-	-	-	-	-	-	-
Contract, Grant & Collaboration	✓	-	-	-	-	-	-	-	-	-
Total Revenues	-	-	-	-	-	-	-	-	26.5	197.7
COGS	-	-	-	-	-	-	-	-	3.4	21.5
R&D	14.4	4.2	4.4	6.5	9.5	24.55	48.3	56.0	67.5	79.5
SG&A	3.9	1.6	1.8	1.9	2.2	7.5	14.0	56.2	62.7	64.4
Collaboration Expense	-	-	-	-	-	-	-	-	-	-
Total Operating Expenses	18.3	5.8	6.2	8.4	11.7	32.1	62.3	112.2	133.6	165.4
Operating Income	(18.3)	(5.8)	(6.2)	(8.4)	(11.7)	(32.1)	(62.3)	(112.2)	(107.1)	32.4
Net interest & other income	(0.0)	-	(0.0)	-	-	(0.0)	-	-	-	-
Accretion of redeemable conv. pref stock	(0.0)	(0.3)	(1.6)	-	-	(1.9)	-	-	-	-
Income Tax (benefit)	-	-	-	-	-	-	-	-	-	-
GAAP Net Income	(18.3)	(6.1)	(7.8)	(8.4)	(11.7)	(34.0)	(62.3)	(112.2)	(107.1)	32.4
Non-GAAP Net Income	(18.3)	(6.0)	(7.6)	(8.2)	(11.5)	(33.2)	(61.4)	(110.5)	(104.6)	35.9
GAAP Basic EPS	(3.89)	(1.17)	(4.57)	(0.61)	(0.45)	(2.93)	(2.26)	(3.53)	(3.06)	0.85
GAAP Diluted EPS	(2.15)	(1.17)	(4.57)	(0.61)	(0.45)	(2.93)	(2.26)	(3.53)	(3.06)	0.82
Non-GAAP Basic EPS	#DIV/0!	(1.14)	(4.45)	(0.60)	(0.45)	(2.86)	(2.23)	(3.48)	(2.99)	0.94
Non-GAAP Diluted EPS	(2.15)	(1.14)	(4.45)	(0.60)	(0.45)	(2.86)	(2.23)	(3.48)	(2.99)	0.91
Basic Shares Outstanding	4.7	5.2	1.7	13.7	25.8	11.6	27.5	31.8	35.0	38.0
Shares added		5.2	1.0	12.0	1.0	19.2	2.0	2.0	2.0	2.0
Diluted Shares Outstanding	8.5	5.2	1.7	13.7	25.8	11.6	27.5	31.8	35.0	39.5
Margin Analysis:										
Gross margin	NM	NM	NM	NM	NM	NM	NM	NM	87%	89%
Operating margin	NM	NM	NM	NM	NM	NM	NM	NM	NM	16.36%
Net margin	NM	NM	NM	NM	NM	NM	NM	NM	NM	16.36%
Tax Rate	0.0%	0%	0%	0%	0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cost Analysis:										
COGS as % of tot. prod. sales	NM	NM	NM	NM	NM	0.00%	15%	15%	13%	11%
R&D as % of tot. revenue	NM	NM	NM	NM	NM	NM	NM	NM	254.41%	40.20%
SG&A as % of tot. revenue	NM	NM	NM	NM	NM	NM	NM	NM	236.23%	32.55%
Year-over-year growth:										
Total revenue	NM	NM	NM	NM	NM	NM	NM	NM	NM	645.30%
R&D Expense	98.60%	61.56%	NM	NM	NM	71.02%	96.51%	16.06%	20.54%	17.78%
SG&A Expense	63.28%	100.62%	NM	NM	NM	91.84%	86.07%	301.43%	11.52%	2.70%
Total operating expenses	89.79%	70.85%	NM	NM	NM	75.49%	94.06%	80.24%	19.09%	23.77%
Operating income	NM	NM	NM	NM	NM	75.49%	94.06%	80.24%	-4.55%	-130.21%
Net income	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
EPS	NM	NM	NM	NM	NM	35.95%	-22.65%	55.93%	-13.31%	-126.77%
Basic Shares	33.44%	16.34%	NM	NM	NM	146.92%	136.79%	15.59%	10.11%	8.58%
Diluted Shares	NM	NM	NM	NM	NM	#DIV/0!	#DIV/0!	15.05%	13.16%	7.41%

Source: J.P. Morgan estimates, Company data.

Investment Thesis, Valuation and Risks

Sage Therapeutics (Overweight; Price Target: \$42.00)

Investment Thesis

We have an OW rating on SAGE based on the potential of SAGE-547 for the treatment of super-refractory status epilepticus (SRSE) – a life-threatening state of persistent seizure that is unresponsive to currently available therapies (and an orphan indication). We believe SAGE-547's unique mechanism of action should continue to generate positive data and that the significant unmet need in SRSE will drive uptake of SAGE-547 upon commercialization. Follow-on candidates SAGE-689 and SAGE-217 for earlier lines of SE could grow the top line with significant infrastructure synergy.

Valuation

Our probability-weighted Dec-15 PT of \$42 is based on a blended average of our proprietary probability-adjusted sum-of-the-parts scenario analysis (50% weighting) and risk-adjusted NPV model (50% weighting).

SAGE Valuation Summary

SAGE Valuation Summary			
Discount rate	14%		
4Q15 Fully Diluted Shares (m)	29.0		
Main value drivers	Prob of approval	Peak WW sales est (avg. scenario)	Avg peak yr
SAGE-547- Status Epilepticus - US	60%	\$ 1,032	2022
SAGE-547- Status Epilepticus - G7	50%	\$ 582	2024
Valuation methodology	Value / share	Weighting	Adj. value/ share
DCF			
P/E 2016			
Real options scenario analysis	\$ 42.32	50%	21.16
Risk adjusted NPV analysis	\$ 42.05	50%	21.03
Total			\$ 42.19
Catalyst/liquidity discount			0%
YE15 Price Target			\$ 42

Source: J.P. Morgan estimates.

Risks to Rating and Price Target

SAGE is susceptible to the standard risks that apply to the entire biotech industry, including development, regulatory, commercial, manufacturing, financing, and IP pitfalls. More specific risks to the downside include clinical setbacks for the key pipeline product SAGE-547 and pre-clinical candidates SAGE-689 and SAGE-217, regulatory hurdles, commercial setbacks and personnel risk.

Sage Therapeutics: Summary of Financials

Income Statement - Annual	FY13A	FY14E	FY15E	FY16E	Income Statement - Quarterly	1Q14A	2Q14A	3Q14E	4Q14E
Revenues	0	0	0	-	Revenues	0A	0A	0	0
Cost of products sold	0	0	0	-	Cost of products sold	0A	0A	0	0
Gross profit	-	-	-	-	Gross profit	-	-	-	-
SG&A	(4)	(8)	(14)	-	SG&A	(2)A	(2)A	(2)	(2)
R&D	(14)	(25)	(48)	-	R&D	(4)A	(4)A	(7)	(10)
Operating income	(18)	(32)	(62)	-	Operating income	(6)A	(6)A	(8)	(12)
EBITDA	(18)	(32)	(62)	-	EBITDA	(6)A	(6)A	(8)	(12)
Net interest (income) / expense	-	-	-	-	Net interest (income) / expense	-	-	-	-
Other income / (expense)	(0)	(0)	0	-	Other income / (expense)	0A	(0)A	0	0
Income taxes	0	0	0	-	Income taxes	0A	0A	0	0
Net income - GAAP	(18)	(34)	(62)	-	Net income - GAAP	(6)A	(8)A	(8)	(12)
Net income - recurring	(18)	(34)	(62)	-	Net income - recurring	(6)A	(8)A	(8)	(12)
Diluted shares outstanding	8	12	27	-	Diluted shares outstanding	5A	2A	14	26
EPS - excluding non-recurring	(2.15)	(2.93)	(2.26)	-	EPS - excluding non-recurring	(1.17)A	(4.57)A	(0.61)	(0.45)
EPS - recurring	(2.15)	(2.93)	(2.26)	-	EPS - recurring	(1.17)A	(4.57)A	(0.61)	(0.45)
Balance Sheet and Cash Flow Data	FY13A	FY14E	FY15E	FY16E	Ratio Analysis	FY13A	FY14E	FY15E	FY16E
Cash and cash equivalents	8	122	181	-	Sales growth	-	-	-	-
Accounts receivable	-	-	-	-	EBIT growth	89.8%	75.5%	94.1%	-
Inventories	-	-	-	-	EPS growth - recurring	(21.3%)	36.0%	(22.6%)	-
Other current assets	0	0	0	-					
Current assets	8	123	182	-	Gross margin	-	-	-	-
PP&E	0	0	0	-	EBIT margin	-	-	-	-
Total assets	9	123	182	-	EBITDA margin	-	-	-	-
				-	Tax rate	0.0%	0.0%	0.0%	-
Total debt	0	0	0	-	Net margin	-	-	-	-
Total liabilities	2	3	3	-					
Shareholders' equity	6	120	179	-	Net Debt / EBITDA	42.3%	379.7%	290.4%	-
				-	Net Debt / Capital (book)	494.2%	6916.1%	9352.3%	-
Net income (including charges)	(18)	(34)	(62)	-					
D&A	0	0	0	-	Return on assets (ROA)	(317.3%)	(51.8%)	(40.9%)	-
Change in working capital	1	0	0	-	Return on equity (ROE)	(472.0%)	(53.9%)	(41.7%)	-
Other	0	1	1	-					
Cash flow from operations	(18)	(33)	(61)	-	Enterprise value / sales	-	-	-	-
				-	Enterprise value / EBITDA	NM	2.2	2.1	-
Capex	(0)	0	0	-	Free cash flow yield	(7.0%)	(9.6%)	(7.5%)	-
Free cash flow	(18)	(33)	(61)	-					
Cash flow from investing activities	(0)	0	0	-					
Cash flow from financing activities	23	147	120	-					
Dividends	-	-	-	-					
Dividend yield	-	-	-	-					

Source: Company reports and J.P. Morgan estimates.

Note: \$ in millions (except per-share data). Fiscal year ends Dec

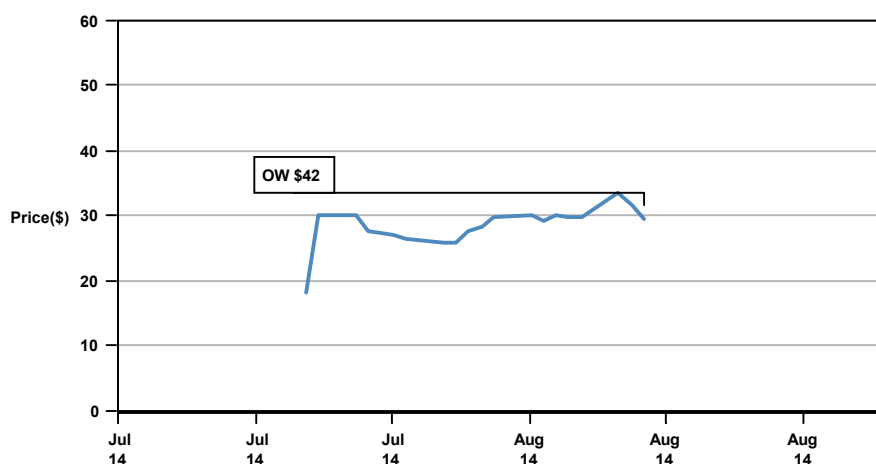
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Sage Therapeutics (SAGE, SAGE US) Price Chart



Date	Rating	Share Price (\$)	Price Target (\$)
12-Aug-14	OW	31.81	42.00

Source: Bloomberg and J.P. Morgan; price data adjusted for stock splits and dividends.
Initiated coverage Aug 12, 2014.

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