OUTPERFORM

Joseph P. Schwartz (617) 918-4575

Joseph.Schwartz@Leerink.com

Paul Matteis (617) 918-4585

Paul.Matteis@Leerink.com

Reason for report: **EARNINGS**



SAGE THERAPEUTICS, INC.

4Q14 Recap: '547 Phase III to Begin Mid-15; Platform Advancing

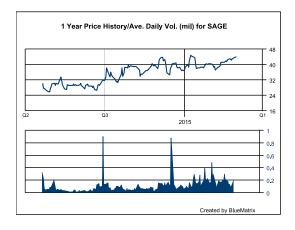
- Bottom Line: We are updating our model to reflect 4Q14 results. 4Q14 OpEx were relatively in-line with our estimates and are expected to increase in 2015 as SAGE-547 advances into Phase III and early-stage pipeline programs mature. We continue to believe that the robust 71-78% response rates observed for '547 in SRSE (Super Refractory Status Epilepticus) de-risk the Phase III, regardless of whether or not it is structured as an open-label or placebo-controlled trial. Reiterate OP on SAGE and \$54 Price Target.
- SAGE continues to expect clarity on the structure of the '547 Phase III by the end of 1Q15. Management sees pros and cons to performing an open-label versus a placebo-controlled trial. While the former could be cheaper, enroll more rapidly, and in our view, pose less clinical risk, an open-label study may not provide SAGE with the most marketable '547 data-set. Conversely, a placebo-controlled study, while it may be slower to enroll fully and could be incrementally riskier, if successful would best demonstrate '547's robust clinical activity. Furthermore, given the battery of comorbidities afflicting SRSE patients, a placebo-controlled trial would also help differentiate which, if any, adverse events/conditions are due to drug versus patients' background conditions.
- Enrollment underway in exploratory Phase IIa trials of SAGE-547. Recall, in our recap of the American Epilepsy Society (AES) conference and our meetings with SAGE's CMO and CSO, we noted that the use of '547 in tremor (or another GABA allosteric modulator) makes clinical and commercial sense given that ~1MM patients in the US are treated with benzodiazapines but MEDACorp key opinion leaders note outcomes are poor. In addition, SAGE is also testing the extra-synaptic GABA receptor modulation hypothesis in postpartum depression (PD). As the PD study is only enrolling a small handful of patients and lacks a placebo arm, SAGE would want to see a very robust response before advancing this program into bigger studies.
- SAGE continues to advance its pipeline of second-generation allosteric modulators. SAGE-217 is being developed as an oral therapy for orphan genetic epilepsies, and SAGE-689 is being developed as an adjunctive intravenous second-line therapy for the treatment of refractory status epilepticus. Both compounds are progressing through preclinical development, and SAGE plans to initiate Phase 1 clinical trials of these molecules in late 2015.

Key Stats: (NASDAQ:SAGE)

S&P 600 Health Care Index: 1,602.91 Price: \$43.89 Price Target: \$54.00 Methodology: DCF analysis with 12% discount rate 52 Week High: \$47.76 52 Week Low: \$24.25 Shares Outstanding (mil): 27.6 Market Capitalization (mil): \$1,211.4 Book Value/Share: \$2.69 Cash Per Share: \$4.63 Dividend (ann): \$0.00 Dividend Yield: 0.0%

Shares Outstanding (mil): Fully diluted shares outstanding estimated as of YE14

Cash Per Share: Cash/diluted shares 4Q14



Dec Yr	1Q	2Q	3Q	4Q	FY Rev	1Q	2Q	3Q	4Q	FY EPS	P/E
2014A	0.0	0.0	0.0	0.0	0.0	(\$3.71)	(\$4.57)	(\$0.50)	(\$0.48)	(\$1.67)	NM
2015E - New	0.0	0.0	0.0	0.0	0.0	(\$0.60)	(\$0.64)	(\$0.68)	(\$0.76)	(\$2.68)	NM
2015E - Old	0.0	0.0	0.0	0.0	0.0	(\$0.51)	(\$0.55)	(\$0.59)	(\$0.65)	(\$2.30)	NM
2016E					0.0					(\$3.44)	NM

Source: Company Information and Leerink Partners LLC Research GAAP EPS.



INVESTMENT THESIS

We rate SAGE shares Outperform. SAGE Therapeutics (NASDAQ: SAGE) is a neuroscience company started by an experienced team of R&D leaders and CNS specialists focused on developing medicines to treat life-threatening, rare neurological disorders. SAGE's lead product, SAGE-547, is in clinical development for super-refractory status epilepticus (SRSE) and is the first of many compounds the company is developing in its positive allosteric modulation (PAM) portfolio. SAGE-547 is a PAM modulator of both synaptic and extra-synaptic GABA_A receptors that rapidly advanced into Phase I/II clinical development in early 2014. The robust clinical potential of '547 was demonstrated under an emergency Investigational New Drug (IND) program in which 5 out of 7 SAGE-547-treated SRSE patients (each of whom had spent over 30 days in the ICU) were successfully weaned out of a medically induced coma. Preliminary results from the ongoing proof-of-concept study are equally encouraging, as thus far 8 out of 11 SAGE-547treated SRSE patients have been weaned off anesthesia while on '547 therapy; natural history data suggest that SRSE patients are weaned successfully in 30% of cases.. Beyond '547, SAGE is developing a seizure franchise of advanced next generation compounds of novel GABAA allosteric modulators for the treatment of SE and other forms of seizure and epilepsy. SAGE-689 is currently in preclinical development for neuroanesthesia and status epilepticus and is expected to enter a Phase I trial in 2015. In addition, SAGE-217 is being developed as an oral down therapy for orphan genetic epilepsies such as Dravet syndrome and Rett. With additional Phase I/II '547 SRSE data expected in 2015 and the advancement into Phase III coming soon after, we believe SAGE shares are poised to appreciate as de-risking clinical catalysts are realized for the company's lead product and allosteric modulation platform.

VALUATION

We derive a \$54 price target for SAGE shares based on a 12% discount rate and a 3% terminal growth rate. Our base case assumption assumes ~\$1.35B in peak risk-adjusted 2023E sales based on a 75% probability of approval for SAGE-547, and assumes ~\$270MM in peak revenues in 2027E for SAGE-689 and SAGE-217 and ~\$140MM in peak revenues (2027E) for essential tremor

RISKS TO VALUATION

Risks to our valuation include disappointing clinical data, regulatory setbacks, and commercial shortfalls. Because SAGE has only one product currently being examined in patients, the occurrence of any of these could impact the stock significantly.

15E 2Q15E 3Q15E 4Q15E 2015E 2016E 2017E 2018E	2Q15E	1Q15E	2014	4Q14	3Q14	2Q14	1Q14	2013	SAGE P&L (\$MM) GAAP
19.1 72.9	-	-	- !	-	-	-	-	-	SAGE-547
	-	-	-	-	-	-	-	-	SAGE-689
	-	-	- 1	-	-	-	-	-	SAGE-217
	-	-	- 1	-	-	-	-	-	Tremor
19.1 72.9	-	-	-	-	-	-	-	-	Total Revenue (p/w)
1.9 7.3	-	-	_	-	-	-	-	-	cogs
2.0 13.0 14.0 16.0 55.0 71.5 78.7 86.5	13.0	12.0	24.1	8.9	6.6	4.4	4.2	14.4	R&D
3.5 3.6 3.7 3.8 14.6 26.3 47.3 54.7	3.6	3.5	9.7	3.4	2.9	1.8	1.6	3.9	SG&A
5.5 16.6 17.7 19.8 69.6 97.8 127.9 148.5	16.6	15.5	33.8	12.4	9.5	6.2	5.8	18.3	Operating Expenses
5.5) (16.6) (17.7) (19.8) (69.6) (97.8) (108.8) (75.6)	(16.6)	(15.5)	(33.8)	(12.4)	(9.5)	(6.2)	(5.8)	(18.3)	Operating Income
	-	-	0.0	0.0	0.0	0.0	-	0.0	Interest Income (Expense)
	-	-	(0.0)	(0.0)	(0.0)	(0.0)	-	(0.0)	Other Income (expense)
5.5) (16.6) (17.7) (19.8) (69.6) (97.8) (108.8) (75.6)	(16.6)	(15.5)	(33.8)	(12.4)	(9.5)	(6.2)	(5.8)	(18.3)	EBT
	-	-	-	-	-	-	-	-	Tax
5.5) (16.6) (17.7) (19.8) (69.6) (97.8) (108.8) (75.6)	(16.6)	(15.5)	(36.1)	(12.4)	(9.9)	(7.8)	(6.1)	(18.3)	Net Income (Loss)
.60) \$ (0.64) \$ (0.68) \$ (0.76) \$ (2.68) \$ (3.44) \$ (3.69) \$ (2.48)	\$ (0.64)	\$ (0.60)	\$ (1.67)	\$ (0.48)	(0.50)	(4.57) \$	\$ (3.71) \$	\$ (1.92)	Diluted EPS
5.8 25.9 26.0 26.1 26.0 28.5 29.5 30.5	25.0	25.0	21.6	25.7	10.6	17	1.6	0.5	Basis Shares Outstanding
.60) \$ (0.64) \$ (0.68) \$ (0.76) \$ (2.68) \$ (3.44) \$ (5.8 25.9 26.0 26.1 26.0 28.5	25.9								Diluted EPS Basic Shares Outstanding Diluted Shares Oustanding

Source: SEC Filings and Leerink Partners Research

SAGE BS & CFS (\$MM) GAAP	2013	1Q14	2Q14	3Q14	4Q14	2014	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E
Net Cash	8.1	55.2	49.1	136.7	127.8	127.8	113.3	97.7	81.0	62.4	62.4	122.3	25.7	(36.4)
Cash & Equivalents	8.1	55.2	49.1	136.7	127.8	127.8	113.3	97.7	81.0	62.4	62.4	122.3	25.7	(36.4)
Debt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Change in Cash	5.3	47.4	(6.1)	81.4	(8.8)	113.8	(14.6)	(15.6)	(16.6)	(18.6)	(65.4)	59.8	(96.6)	(62.1)
Operating Cash Flow	(17.5)	(5.6)	(6.1)	(12.6)	(8.8)	(33.1)	(14.6)	(15.6)	(16.6)	(18.6)	(65.4)	(89.2)	(94.6)	(59.1)
Net Income (Loss)	(18.3)	(5.8)	(7.8)	(9.9)	(12.4)	(35.8)	(15.5)	(16.6)	(17.7)	(19.8)	(69.6)	(97.8)	(108.8)	(75.6)
SOE	0.1	0.2	0.4	0.6	0.7	1.8	0.9	1.0	1.1	1.2	4.2	7.8	12.6	14.1
D&A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.6	2.4
Other	0.7	0.0	1.3	(3.3)	2.8	0.8	-	-	-	-	-	-	-	-
Investing Cash Flow	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(1.0)	(2.0)	(3.0)
CapEx	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(1.0)	(2.0)	(3.0)
Other	-	-	-	-	-	-	-	-	-	-	-	-		1
Financing Cash flow	22.8	53.0	-	94.0	-	147.0	-	-	-	-	-	150.0	-	
Equity Issuance (Buyback)	22.8	53.0	-	94.0	-	147.0	-	-	-	-	-	150.0	-	-
Debt Issuance (Retirement)	-	-	-	-	-	-	-	-	-	-	-	-	-	
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: SEC Filings and Leerink Partners Research

SAGE DCF Analysis	2014	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	TV
Cash Flow From Operations (\$MM)	(33)	(65)	(89)	(95)	(59)	23	194	305	430	577	524	504	501	383	275	209	120	
Cash Flow From Investing (\$MM)	(0)	(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	
Net Borrowing (Repayment) (\$MM)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Free Cash Flow (\$MM)	(33)	(65)	(90)	(97)	(62)	19	189	299	423	569	515	495	492	374	266	200	111	1269
Discount Periods	-	-	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	
NPV FCF (\$MM)	-	(65)	(80)	(77)	(44)	12	107	151	191	230	186	159	142	96	61	41	20	232

Sum NPV FCF (\$MM) Net Cash 4Q14	1362 128
Implied SAGE Mkt Cap (\$MM)	\$ 1,490
SAGE Per Share Value	\$ 54.00

Cost of Equity	12.0%
TG Rate	3.0%
Diluted Shares Oustanding YE14	27.6

Source: Leerink Partners Research

SAGE-547 SRSE Revenue Model	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
US Status Epelepticus Patients	150,000	151,350	152,712	154,087	155,473	156,873	158,284	159,709	161,146	162,597	164,060	165,537	167,026	168,530	170,046	171,577	173,121
% refractory to benzodiazepines	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
Second-Line Status Epelepticus Patients	50,000	50,450	50,904	51,362	51,824	52,291	52,761	53,236	53,715	54,199	54,687	55,179	55,675	56,177	56,682	57,192	57,707
% refractory to AEDs	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Refractory Status Epelepticus (RSE) Patients	35,000	35,315	35,633	35,954	36,277	36,604	36,933	37,265	37,601	37,939	38,281	38,625	38,973	39,324	39,678	40,035	40,395
% super refractory - 1 failed wean attempt	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%
Super RSE Patients	25,000	25,225	25,452	25,681	25,912	26,145	26,381	26,618	26,858	27,099	27,343	27,589	27,838	28,088	28,341	28,596	28,854
%RSE treated with SAGE-547	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
%SRSE treated with SAGE-547	0.0%	0.0%	0.0%	1.5%	5.0%	10.0%	20.0%	30.0%	40.0%	50.0%	30.0%	18.0%	10.8%	5.0%	3.0%	2.0%	2.0%
Patients on SAGE-547	-	-	-	385	1,296	2,615	5,276	7,985	10,743	13,550	8,203	4,966	3,006	1,404	850	572	577
Annual Cost of Therapy	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000	\$60,000
US Gross Revenues (\$MM)	0	0	0.0	23.1	77.7	156.9	316.6	479.1	644.6	813.0	492.2	298.0	180.4	84.3	51.0	34.3	34.6
Approval Probability	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
US Probability-Weighted Revenues (\$MM)	0	0	0.0	17.3	58.3	117.7	237.4	359.3	483.4	609.7	369.1	223.5	135.3	63.2	38.3	25.7	26.0
ROW as % of US	0%	0%	0%	10%	25%	35%	45%	55%	60%	65%	129%	245%	457%	587%	582%	519%	308%
SAGE-547 ROW Gross Revenues (SMM)		- 070		2	19	55	142	264	387	528	634	729	824	494	297	178	107
SAGE-547 ROW p(w) Revenues (\$MM)	0	0	0	1.7	14.6	41.2	106.8	197.6	290.1	396.3	475.6	546.9	618.0	370.8	222.5	133.5	80.1
y/y Growth Rate						283%	259%	185%	147%	137%	20.0%	15.0%	13.0%	-40.0%	-40.0%	-40.0%	-40.0%
				25.4	97.2	211.8	459.0	742.6	1,031.3	1,341.4	1,126.3	1,027.2	1,004.4	578.7	347.7	212.3	141.4
SAGE-547 WW P(w) Revenues	0	0	0	19.1	72.9	158.8	344.3	557.0	773.5	1006.1	844.7	770.4	753.3	434.0	260.8	159.2	106.1

Assumptions
Annual Cost
Probability of Approval
Source: Leerink Partners Research \$60,000 75%

Product	Event	Timing
SAGE-547	Top-line Phase I/II Data	4Q14
SAGE-547	End-of-phase II meeting with FDA	1Q15
SAGE-547	Proof-of-Concept Data for ET and PPD Studies	2015
SAGE-547	Initiate Pivotal Trials	2015
SAGE-217	Initiate Phase I Studies	2015
SAGE-689	Initiate Phase I Studies	2015

Source: SEC Filings and Leerink Partners Research



Disclosures Appendix Analyst Certification

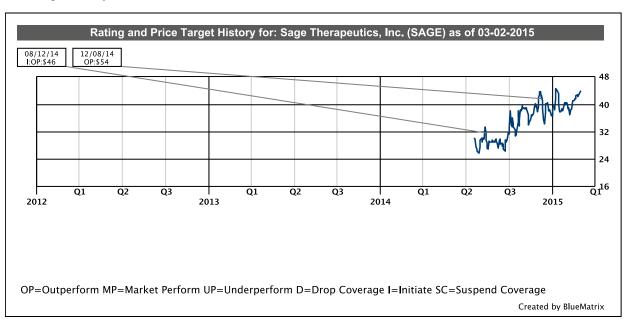
I, Joseph P. Schwartz, certify that the views expressed in this report accurately reflect my views and that no part of my compensation was, is, or will be directly related to the specific recommendation or views contained in this report.

Valuation

We derive a \$54 price target for SAGE shares based on a 12% discount rate and a 3% terminal growth rate. Our base case assumption assumes ~\$1.35B in peak risk-adjusted 2023E sales based on a 75% probability of approval for SAGE-547, and assumes ~\$270MM in peak revenues in 2027E for SAGE-689 and SAGE-217 and ~\$140MM in peak revenues (2027E) for essential tremor.

Risks to Valuation

Risks to our valuation include disappointing clinical data, regulatory setbacks, and commercial shortfalls. Because SAGE has only one product currently being examined in patients, the occurrence of any of these could impact the stock significantly.





Distribu	ition of Ratings/Investment Bank	Ratings/Investment Banking Services (IB) as of 12/31/14 IB Serv./Past 12 Mos.									
Rating	Count	Percent	Count	Percent							
BUY [OP]	150	70.00	61	41.00							
HOLD [MP]	64	30.00	0	0.00							
SELL [UP]	0	0.00	0	0.00							

Explanation of Ratings

Outperform (Buy): We expect this stock to outperform its benchmark over the next 12 months.

<u>Market Perform (Hold/Neutral):</u> We expect this stock to perform in line with its benchmark over the next 12 months.

<u>Underperform (Sell):</u> We expect this stock to underperform its benchmark over the next 12 months. The degree of outperformance or underperformance required to warrant an Outperform or an Underperform rating should be commensurate with the risk profile of the company.

For the purposes of these definitions the relevant benchmark will be the S&P 600® Health Care Index for issuers with a market capitalization of less than \$2 billion and the S&P 500® Health Care Index for issuers with a market capitalization over \$2 billion.

Important Disclosures

This information (including, but not limited to, prices, quotes and statistics) has been obtained from sources that we believe reliable, but we do not represent that it is accurate or complete and it should not be relied upon as such. All information is subject to change without notice. This is provided for information purposes only and should not be regarded as an offer to sell or as a solicitation of an offer to buy any product to which this information relates. The Firm, its officers, directors, employees, proprietary accounts and affiliates may have a position, long or short, in the securities referred to in this report, and/or other related securities, and from time to time may increase or decrease the position or express a view that is contrary to that contained in this report. The Firm's salespeople, traders and other professionals may provide oral or written market commentary or trading strategies that are contrary to opinions expressed in this report. The Firm's proprietary accounts may make investment decisions that are inconsistent with the opinions expressed in this report. The past performance of securities does not guarantee or predict future performance. Transaction strategies described herein may not be suitable for all investors. Additional information is available upon request by contacting the Editorial Department at One Federal Street, 37th Floor, Boston, MA 02110.

Like all Firm employees, analysts receive compensation that is impacted by, among other factors, overall firm profitability, which includes revenues from, among other business units, Institutional Equities, and Investment Banking. Analysts, however, are not compensated for a specific investment banking services transaction. MEDACorp is a network of healthcare professionals, attorneys, physicians, key opinion leaders and other specialists accessed by Leerink and it provides information used by its analysts in preparing research.

In the past 12 months, the Firm has received compensation for providing investment banking services to Sage Therapeutics, Inc. .

Leerink Partners LLC makes a market in Sage Therapeutics, Inc.



Leerink Partners LLC has acted as the manager for a public offering of Sage Therapeutics, Inc. in the past 12 months.

©2015 Leerink Partners LLC. All rights reserved. This document may not be reproduced or circulated without our written authority.

Leerink Partners LLC Equity Research									
	Leerink Partners L	LC Equity Researc	<u>en</u>						
Director of Equity Research	John L. Sullivan, CFA	(617) 918-4875	john.sullivan@leerink.com						
Associate Director of Research	Alice C. Avanian, CFA	(617) 918-4544	alice.avanian@leerink.com						
	,	(011) 010 1011							
Healthcare Strategy	John L. Sullivan, CFA	(617) 918-4875	john.sullivan@leerink.com						
	Alice C. Avanian, CFA	(617) 918-4544	alice.avanian@leerink.com						
Biotechnology	Howard Liang, Ph.D.	(617) 918-4857	howard.liang@leerink.com						
	Joseph P. Schwartz	(617) 918-4575	joseph.schwartz@leerink.com						
	Michael Schmidt, Ph.D.	(617) 918-4588	michael.schmidt@leerink.com						
	Gena Wang, Ph.D., CFA	(212) 277-6073	gena.wang@leerink.com						
	Paul Matteis	(617) 918-4585	paul.matteis@leerink.com						
	Jonathan Chang, Ph.D.	(617) 918-4015	jonathan.chang@leerink.com						
	Richard Goss	(617) 918-4059	richard.goss@leerink.com						
Life Science Tools	Dan Leonard	(212) 277-6116	dan.leonard@leerink.com						
and Diagnostics	Justin Bowers, CFA	(212) 277-6066	justin.bowers@leerink.com						
Pharmaceuticals/Major	Seamus Fernandez	(617) 918-4011	seamus.fernandez@leerink.com						
•	Aneesh Kapur	(617) 918-4576	aneesh.kapur@leerink.com						
Specialty Pharmaceuticals	Jason M. Gerberry, JD	(617) 918-4549	jason.gerberry@leerink.com						
	Derek C. Archila	(617) 918-4851	derek.archila@leerink.com						
Medical Devices, Cardiology	Danielle Antalffy	(212) 277-6044	danielle.antalffy@leerink.com						
,	Puneet Souda	(212) 277-6091	puneet.souda@leerink.com						
& Orthopedics	Richard Newitter	(212) 277-6088	richard.newitter@leerink.com						
	Ravi Misra	(212) 277-6049	ravi.misra@leerink.com						
Healthcare Services	Ana Gupte, Ph.D.	(212) 277-6040	ana.gupte@leerink.com						
Healthcare Technology	David Larsen, CFA	(617) 918-4502	david.larsen@leerink.com						
& Distribution	Christopher Abbott	(617) 918-4010	chris.abbott@leerink.com						
Digital Health	Steven Wardell	(617) 918-4097	steven.wardell@leerink.com						
Sr. Editor/Supervisory Analyst	Mary Ellen Eagan, CFA	(617) 918-4837	maryellen.eagan@leerink.com						
Supervisory Analysts	Robert Egan		bob.egan@leerink.com						
	Amy N. Sonne		amy.sonne@leerink.com						
Editorial	Cristina Diaz-Dickson	(617) 918-4548	cristina.diaz-dickson@leerink.com						
Research Associate	Carmen Augustine	(212) 277-6012	carmen.augustine@leerink.com						

New York 299 Park Avenue, 21st floor New York, NY 10171 (888) 778-1653 Boston One Federal Street, 37th Floor Boston, MA 02110 (800) 808-7525

San Francisco 201 Spear Street, 16th Floor San Francisco, CA 94105 (800) 778-1164