Calithera Biosciences, Inc. (CALA)

Five Data Presentations at AACR 2015

MARKET DATA

Price	$13.47
52-Week Range:	$6.51 - $33.48
Shares Out. (M):	17.4
Market Cap ($M):	$234.4
Average Daily Vol. (000):	89.0
Cash (M):	$103
Cash/Share:	$5.75
Enterprise Value (M):	$287
Float (M):	17.8
LT Debt (M):	$0

Source: Thomson Reuters and JMP Securities LLC

FY DEC		2013A	2014E	2015E
Revenue ($M)	1Q	--	$0.0A	$0.0
	2Q	--	$0.0A	$0.0
	3Q	--	$0.0	$0.0
	4Q	--	$0.0	$0.0
	FY	**--**	**$0.0**	**$0.0**
EPS	1Q	--	--	($0.37)
	2Q	--	($1.22)A	($0.37)
	3Q	--	($0.29)	($0.37)
	4Q	--	($0.31)	($0.37)
	FY	**($3.03)**	**($1.39)**	**($1.49)**
	P/E	NM	NM	NM

Source: Company reports and JMP Securities LLC

STOCK PRICE PERFORMANCE

MARKET OUTPERFORM | Price: $13.47 | Target Price: $20.00

INVESTMENT HIGHLIGHTS

Calithera Biosciences' CB-839 to be featured in oral and poster presentations at AACR 2015; reiterate our Market Outperform rating and $20 price target based on a synthesis of DCF, SOTP and comparable valuation methodologies. Yesterday, CALA announced the release of five abstracts at the American Association for Cancer Research Annual Meeting 2015 to be held in Philadelphia April 18-22. Specifically, preclinical data highlighting the potential of CB-839, an oral glutaminase inhibitor, will be presented by various investigators in different sessions (two oral and three posters) at AACR. We look forward to the incremental data that will likely build on the existing preclinical body of evidence supporting CALA's ongoing Phase I studies (currently in the dose expansion phase) in three tumor types: solid tumors, multiple myeloma and acute leukemias (Figure 2).

Synergies with kinase inhibitors. Of particular interest will be an oral presentation on April 21 (3:50pm-4:05pm) entitled "CB-839, a selective glutaminase inhibitor synergizes with signal transduction pathway inhibitors to enhance anti-tumor activity" by Dr. Mirna Rodriguez. As a reminder, CB-839, which impacts multiple metabolic pathways, has been shown to exhibit anti-tumor activity in several preclinical models, including in triple negative breast cancer (TNBC) by causing a decrease in mTOR1 signaling. In this study, the investigators reviewed combinations of CALA's lead asset with several agents with varying mechanisms in multiple cancer cell lines. When combined with GlaxoSmithKline's (GSK, NC) pan receptor tyrosine kinase inhibitor Votrient (pazopanib) as well as Novartis' (NVS, NC) mTOR inhibitor Afinitor (everolimus) in renal cell carcinoma (RCC) cell lines, CB-839 exhibited synergy (combination index, CI: 0.09-0.085 and 0.48-0.54 respectively). When CB-839 was examined in combination with Genentech's (NC) Tarceva (erlotinib) in several non-small cell lung cancer lines (NSCLC), synergy was seen in this setting as well (CI: 0.39-0.75).

Further, in a KRAS mutant NSCLC line H2122, CB-839 showed an effect with a MEK inhibitor drug in development by AstraZeneca (AZN, NC), selumetinib (CI: 0.46); additionally, anti-tumor activity was observed in an *in vivo* H2122 NSCLC xenograft model, according to the abstract. However, in the KRAS wild type cell line H661, the synergy was weak (CI: 0.9), which may suggest other mechanisms apart from gaining enrichment from glutamine may be at play; and therefore depleting glutamine sources may be insufficient to produce a synergistic effect. Taken together, if the data hold, we anticipate that CALA will pursue drug combination studies in NSCLC and/or RCC patients with the above agents in the near future.

Michael G. King, Jr.
mking@jmpsecurities.com
(212) 906-3520

We are bullish on CALA. Calithera is an early-stage, oncology-focused, drug discovery and development company attempting to exploit the increasing knowledge of the cancer cell's ability to hijack the energy production mechanisms required for the utilization of energy from a variety of sources. The company's first product candidate, CB-839, is a novel inhibitor of glutaminase, an enzyme that converts glutamine to glutamate, the latter of which is a critical feedstock for the cell's energy production system. The company was founded by Susan and Chris Molineaux, two of the main founders of Proteolix, the company that developed Kyprolis (carfilzomib) and which was eventually sold to Onyx for $700MM. Onyx, in turn, was acquired by Amgen (AMGN, NC) in 2013 for $10 billion.

FIGURE 1. Upcoming Catalysts

Timing	Catalyst
2Q15	Preclinical presentations at AACR (April 18-22, Philadelphia)
1H15	Anticipated presentation of CB-839 (single agent) Phase I safety and efficacy in solid and heme tumors
1H15	Initiation of Phase Ib combo expansion trials (TNBC + paclitaxel)
mid-2015	Initiation of Phase Ib combo expansion trials (R/R MM + pomalidomide)
2H15	IND filing for arginase inhibitor

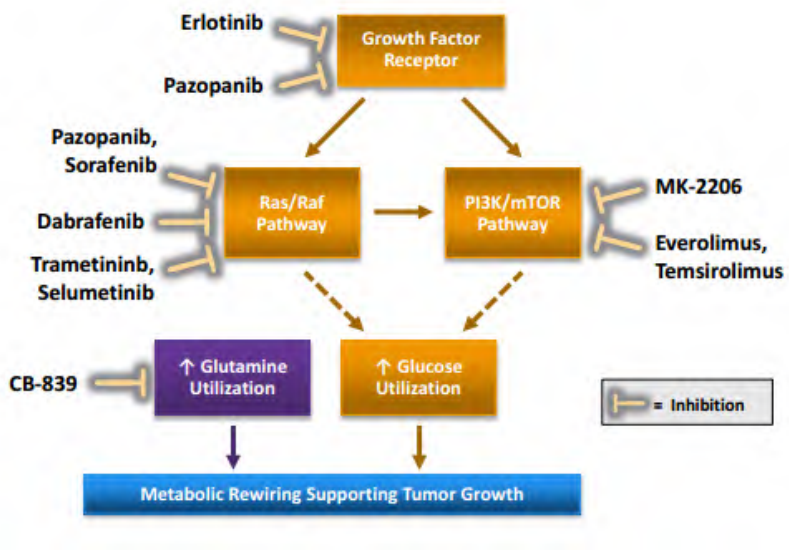
Source: JMP Securities LLC and Company Reports

FIGURE 2. Phase I Trial Design

Trial	Tumor Types	Trial Design
CX-839-001	Solid Tumors (including Triple-negative Breast Cancer (TNBC))	• Dose escalation in all solid tumors • Dose expansion cohorts in selected tumor types • Phase 1b in TNBC in combination with paclitaxel
CX-839-002	Multiple Myeloma (MM) Non-Hodgkin's Lymphoma (NHL)	• Dose escalation in MM and NHL • Dose expansion cohorts in MM and selected subtypes of NHL • Phase 1b in MM in combination with pomalidomide and dexamethasone
CX-839-003	Acute Lymphocytic Leukemia (ALL) Acute Myeloid Leukemia (AML)	• Dose escalation in ALL and AML • Dose expansion cohorts in ALL and AML

Source: Company Reports

FIGURE 3. CB-839 Acts Synergistically With Drugs That Target Ras/Raf and PI3K/mTOR Pathways



Source: Company Reports

FIGURE 4. Income Statement

Calithera Biosciences (CALA)	2012A	2013A	1H14	3Q14A	4Q14E	2014E	1Q15E	2Q15E	3Q15E	4Q15E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Income Statement ($MM)	**2012A**	**2013A**	**1H14**	**3Q14A**	**4Q14E**	**2014E**	**1Q15E**	**2Q15E**	**3Q15E**	**4Q15E**	**2015E**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**	**2021E**	**2022E**	**2023E**	**2024E**	**2025E**
Product Sales and Royalties:																					
CB-839																					
US Sales											-	-	-	54.6	310.5	625.0	965.1	1,268.5	1,459.7	1,551.8	1,616.9
ROW Royalties											-	-	-	-	6.3	41.1	86.6	132.9	182.8	211.1	226.2
Total Product Sales and Royalties	-	-	-	-	-	-	-	-	-	-	-	-	-	54.6	316.8	666.1	1,051.7	1,401.4	1,642.5	1,762.9	1,843.1
Cost of Goods Sold												-	-	6.5	37.3	75.0	115.8	152.2	175.2	186.2	194.0
Gross Profit	-	-	-	-	-	-	-	-	-	-	-	-	-	48.0	279.5	591.1	935.9	1,249.2	1,467.3	1,576.7	1,649.1
Operating Expenses:																					
Research and development	6.6	9.9	7.5	4.0	4.5	16.0	5.0	5.2	5.5	5.8	21.5	43.0	86.0	133.3	173.3	207.9	228.7	251.6	276.8	304.5	334.9
General and administrative	1.4	2.5	2.1	1.1	1.2	4.4	1.3	1.5	1.6	1.7	6.0	13.1	39.3	70.7	102.5	128.1	140.9	153.6	165.9	174.2	182.9
Total operating expenses	8.0	12.4	9.6	5.1	5.7	20.4	6.3	6.7	7.1	7.5	27.5	56.1	125.3	204.0	275.8	336.1	369.7	405.2	442.7	478.7	517.8
Operating income (loss)	(8.0)	(12.4)	(9.6)	(5.1)	(5.7)	(20.4)	(6.3)	(6.7)	(7.1)	(7.5)	(27.5)	(56.1)	(125.3)	(156.0)	3.8	255.0	566.2	844.0	1,024.6	1,098.0	1,131.3
Operating margin (%)														*-285.8%*	*1.2%*	*38.3%*	*53.8%*	*60.2%*	*62.4%*	*62.3%*	*61.4%*
Interest income																					
Interest expense																					
Total other income, net	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pretax income (loss)	(8.0)	(12.4)	(9.6)	(5.1)	(5.7)	(20.4)	(6.3)	(6.7)	(7.1)	(7.5)	(27.5)	(56.1)	(125.3)	(156.0)	3.8	255.0	566.2	844.0	1,024.6	1,098.0	1,131.3
Income tax benefit (provision)						0.0					0.0	0.0	0.0	0.0	(0.2)	(25.5)	(113.2)	(253.2)	(358.6)	(384.3)	(396.0)
Tax Rate															*5%*	*10%*	*20%*	*30%*	*35%*	*35%*	*35%*
Comprehensive income (loss)	(8.0)	(12.4)	(9.6)	(5.1)	(5.7)	(20.4)	(6.3)	(6.7)	(7.1)	(7.5)	(27.5)	(56.1)	(125.3)	(156.0)	3.6	229.5	453.0	590.8	666.0	713.7	735.3
Basic EPS to common shareholders	**$ (366.13)**	**$ (3.03)**	$ (1.22)	$ (0.29)	$ (0.31)	**$ (1.39)**	$ (0.32)	$ (0.32)	$ (0.32)	$ (0.32)	**$ (1.27)**	**$ (2.47)**	**$ (4.51)**	**$ (4.70)**	**$ 0.10**	**$ 6.27**	**$ 11.79**	**$ 14.64**	**$ 15.72**	**$ 16.05**	**$ 15.75**
Diluted EPS to common shareholders	**$ (366.13)**	**$ (3.03)**	$ (1.22)	$ (0.29)	$ (0.31)	**$ (1.39)**	$ (0.32)	$ (0.32)	$ (0.32)	$ (0.32)	**$ (1.27)**	**$ (2.47)**	**$ (4.51)**	**$ (4.70)**	**$ 0.10**	**$ 6.27**	**$ 11.79**	**$ 14.64**	**$ 15.72**	**$ 16.05**	**$ 15.75**
Basic shares outstanding	0.0	4.1	7.9	17.6	18.6	14.7	19.7	20.9	22.2	23.5	21.6	22.7	27.8	33.2	34.8	36.6	38.4	40.3	42.4	44.5	46.7
Diluted shares outstanding	0.0	4.1	7.9	17.6	18.6	14.7	19.7	20.9	22.2	23.5	21.6	22.7	27.8	33.2	34.8	36.6	38.4	40.3	42.4	44.5	46.7

Source: JMP Securities LLC and Company Reports

Company Description

Calithera Biosciences, based in San Francisco, CA, is a clinical-stage biotechnology company focused on the discovery and development of novel small molecules directed against cancer and immune cell metabolism to treat both solid tumor and hematologic malignancies. The company's lead product candidate, CB-839, is an internally discovered and wholly owned potent, oral selective inhibitor of glutaminase. Inhibition of glutaminase by CB-839, in effect, starves cancer cells of glutamate - a critical substrate for cancer cell metabolism, growth, and survival. CB-839 is currently in Phase I analysis in both solid and hematologic tumors. Planned Phase Ib cohorts in combination with standard of care agents in triple negative breast cancer and multiple myeloma are expected to be initiated. A second wholly owned pre-clinical candidate is Calithera's first-in-class arginase inhibitor, directed at immune checkpoint modulation and engaging the activation of cytotoxic T-cells. Calithera intends to submit an IND to the FDA for the arginase program in late 2015.

Investment Risks

Potential risks to our price target include, but are not limited to, clinical, regulatory, commercial, and competitive factors.

Scientific and clinical. Drug development is an inherently risky business. Cancer metabolism, and specifically, the role of glutaminase in cancer pathogenesis, remains largely unproven, creating significant risk associated with Calithera's scientific platform. Like all clinical trials, CB-839 clinical development carries some risk of failure. CB-839 may fail to maintain the requisite safety or to demonstrate meaningful efficacy to warrant further development through to regulatory approval.

Regulatory and commercial. The ability of Calithera or its potential partners to market its drugs depends on those drugs obtaining approval from the FDA and foreign regulatory agencies. Failure to achieve approval or delays in the timelines to approval could negatively impact the company's share price.

Competitive. Oncology drug development is an increasingly competitive field. Calithera faces competition from companies developing small molecule therapies also directed at cancer cell metabolism in ways that may resemble those of Calithera's pipeline. Small molecule oncology therapies employing other mechanisms of action are also in development by several biopharma companies to treat similar patient populations to that of CB-839 and may yield superior risk-benefit outcomes. Some of these companies may have access to greater resources, development, and commercial expertise compared to Calithera.

Financial. We anticipate that Calithera may seek additional equity financing in the form of a secondary offering in order to complete the development of CB-838 and advance its future pipeline candidates, exposing existing shareholders to some degree of dilution risk.

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Market Outperform (MO): JMP Securities expects the stock price to outperform relevant market indices over the next 12 months.
Market Perform (MP): JMP Securities expects the stock price to perform in line with relevant market indices over the next 12 months.
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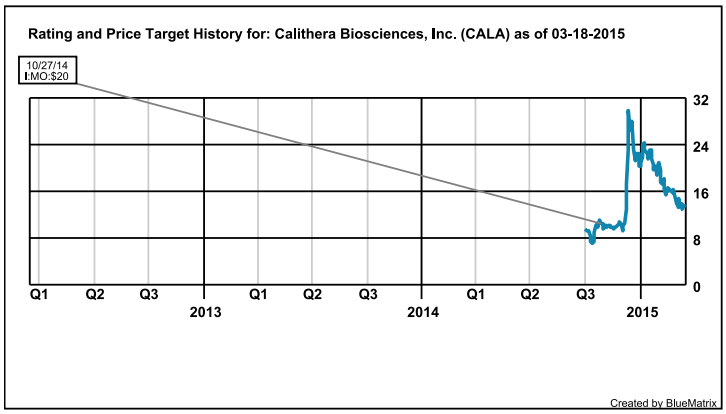
JMP Rating	Regulatory Equivalent	# Co's Under Coverage	*% of Total*	Regulatory Equivalent	# Co's Under Coverage	*% of Total*	# Co's Receiving IB Services in Past 12 Months	*% of Co's With This Rating*
MARKET OUTPERFORM	Buy	286	*63.84%*	Buy	286	*63.84%*	88	*30.77%*
MARKET PERFORM	Hold	152	*33.93%*	Hold	152	*33.93%*	22	*14.47%*
MARKET UNDERPERFORM	Sell	8	*1.79%*	Sell	8	*1.79%*	0	*0%*
COVERAGE IN TRANSITION		1	*0.22%*		1	*0.22%*	0	*0%*
TOTAL:		448	*100%*		448	*100%*	110	*24.55%*

Stock Price Chart of Rating and Target Price Changes:

Note: First annotation denotes initiation of coverage or 3 years, whichever is shorter. If no target price is listed, then the target price is N/A. In accordance with NASD Rule 2711, the chart(s) below reflect(s) price range and any changes to the rating or price target as of the end of the most recent calendar quarter. The action reflected in this note is not annotated in the stock price chart. Source: JMP Securities.



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Jeffrey H. Spurr
Director of Research
(415) 835-3903

RESEARCH PROFESSIONALS

FINANCIAL SERVICES

Alternative Asset Managers
Devin Ryan (212) 906-3578
Brian McKenna (212) 906-3545

Commercial & Specialty Finance
Christopher York (415) 835-8965
Hannah Kim, CFA (415) 835-8962

Consumer Finance
David M. Scharf (415) 835-8942
Douglas Greiner (212) 906-3525

Financial Processing & Outsourcing
David M. Scharf (415) 835-8942
Douglas Greiner (212) 906-3525

Insurance
Matthew J. Carletti (312) 768-1784
Christine Worley (312) 768-1786

Investment Banks & Brokers
Devin Ryan (212) 906-3578
Brian McKenna (212) 906-3545

Mortgage Operating Companies
REITs: Agency, Hybrid, & Commercial Mortgage
Steven C. DeLaney (404) 848-7773
Trevor Cranston, CFA (415) 869-4431
Charter Robinson (757) 613-8955
Benjamin Zucker (212) 906-3529

HEALTHCARE

Biotechnology
Liisa A. Bayko (312) 768-1785
Masha Chapman (415) 835-8944
Bhumika Sharma, PhD (312) 768-1795
Jason N. Butler, PhD (212) 906-3505
Michael G. King, Jr. (212) 906-3520
Bryan Czyzewski, PhD (212) 906-3577
Naureen Quibria, PhD (212) 906-3514

Healthcare Services & Facilities
Peter L. Martin, CFA (415) 835-8904
Aaron Hecht (415) 835-3963
Arthur Kwok (415) 835-8908

Life Science Tools & Diagnostics
J. T. Haresco, III, PhD (415) 869-4477
Marie T. Casey, PhD (415) 835-3955

Medical Devices
J. T. Haresco, III, PhD (415) 869-4477
Marie T. Casey, PhD (415) 835-3955

Medical Devices & Supplies
David Turkaly (212) 906-3563
John Gillings (212) 906-3564

Specialty Pharmaceuticals
Oren G. Livnat, CFA (212) 906-3566
Nazibur Rahman (212) 906-3519

REAL ESTATE

Housing & Land Development
Peter L. Martin, CFA (415) 835-8904
Aaron Hecht (415) 835-3963
Bharathwajan Iyengar (415) 835-3902

Lodging & Leisure
Robert A. LaFleur (212) 906-3510
Whitney Stevenson (212) 906-3538

Property Services
Mitch Germain (212) 906-3546
Peter Lunenburg (212) 906-3537

REITs: Healthcare, Residential, & Specialty
Peter L. Martin, CFA (415) 835-8904
Aaron Hecht (415) 835-3963
Arthur Kwok (415) 835-8908

REITs: Office, Industrial, & Diversified
Mitch Germain (212) 906-3546
Peter Lunenburg (212) 906-3537

Residential Services
Peter L. Martin, CFA (415) 835-8904
Aaron Hecht (415) 835-3963
Bharathwajan Iyengar (415) 835-3902

TECHNOLOGY

Internet Security & Communications Infrastructure
Erik Suppiger (415) 835-3918
John Lucia (415) 835-3920

Internet & Digital Media
Ronald V. Josey III (212) 906-3528
Ignatius Njoku (415) 835-8960
Andrew Boone, CFA (415) 835-3957
Michael Wu (415) 835-8996

Software
Patrick Walravens (415) 835-8943
Peter Lowry (415) 869-4418
Mathew Spencer (415) 835-8930
Greg McDowell (415) 835-3934
Rishi Jaluria (415) 835-3961

Wireless & Cloud Computing Technologies
Alex Gauna (415) 835-8998

ADDITIONAL CONTACTS

Thomas R. Wright
Director of Equities
(212) 906-3599

Thomas Healy
Head of Institutional Sales
(212) 906-3533

600 Montgomery Street, Suite 1100
San Francisco, CA 94111
www.jmpsecurities.com