Vitae Pharmaceuticals, Inc. (VTAE)

Preclinical Results from VTP-43742 Support Clinical Advancement

MARKET DATA

Price	$14.13
52-Week Range:	$5.41 - $23.35
Shares Out. (M):	21.4
Market Cap ($M):	$302.4
Average Daily Vol. (000):	226.0
Cash (M):	$68
Cash/Share:	$3.17
Enterprise Value (M):	$250
Float (M):	19.3
LT Debt (M):	$1

Source: Thomson Reuters and JMP Securities LLC

FY DEC		2014E	2015E	2016E
Revenue ($M)	1Q	--	$0.0	--
	2Q	--	$0.0	--
	3Q	$6.2A	$0.0	--
	4Q	$0.0	$20.0	--
	FY	**$8.5**	**$20.0**	**$0.0**
EPS	1Q	--	($0.46)	--
	2Q	--	($0.49)	--
	3Q	($1.04)A	($0.52)	--
	4Q	($0.39)	($0.54)	--
	FY	**($1.07)**	**($2.01)**	**($1.85)**

Source: Company reports and JMP Securities LLC

STOCK PRICE PERFORMANCE

MARKET OUTPERFORM | Price: $14.13 | Target Price: $21.00

INVESTMENT HIGHLIGHTS

Vitae Pharmaceuticals presents impressive preclinical data that supports advancement into autoimmune diseases, including psoriasis; reiterate our Market Outperform rating and $21 price target based on our discounted cash flow and sum-of-the-parts methodologies. During its recent offering, VTAE announced additional preclinical results on its wholly owned ROR-γt program that significantly bolsters our outlook for this potentially best-in-class inhibitor for autoimmune disease. Efficacy in a mouse model of multiple sclerosis, a disease driven by Th17-type immune cell dysfunction, was surprisingly positive, demonstrating results on par with currently marketed Gilenya, (fingolimod, BIIB, NC), corticosteroids, and the recently approved first-line psoriasis treatment secukinumab (Cosentyx, NVS, NC), an inhibitor of IL-17. We anticipate VTAE will submit an IND during 1H15 with subsequent trial initiation, specifically in psoriasis - a Th17 driven condition - with initial results expected in mid-2015. We currently consider this indication as upside to our valuation, with the potential for outsized returns for VTAE and its shareholders.

Autoimmune disease and VTP-43742. As a reminder to investors, Vitae is developing the preclinical compound VTP-43742 for the treatment of various autoimmune-related diseases, including multiple sclerosis, psoriasis, and rheumatoid arthritis. Disease can arise when a number of immune cells are incorrectly triggered or conversely suppressed, causing the immune system to begin recognizing “self” as “non-self”. Th17 cells are a specific subset of white blood cells that stimulate the activity of effector cells, such as macrophages, through the secretion of various cytokines (Figure 1). Suppression of Th17 cells has become a potent and validated mechanism supported by several marketed and in development products. (Stelara/ustekinumab, JNJ; secukinumab, Novartis; brodalumab, Amgen; ixekizumab, Eli Lilly). The central signaling pathway that is activated in stimulated Th17 cells is the RAR-Related Orphan Receptor γ-t (RORγt) receptor.

VTP-43742 was developed to inhibit signaling at ROR-γt (Figure 2) while maintaining an ideal balance of selectivity, efficacy, and bioavailability. Earlier studies with inhibitors of ROR family proteins found isoform selectivity to be critical to avoid unwanted side effects, likely related to the important role the ROR-β isoform plays in eye and neuronal development. Preclinical studies of VTP-43742 have demonstrated activity in a mouse model of multiple sclerosis, EAE, and also demonstrated a high degree of oral bioavailability and a long half-life. Figure 2 demonstrates that animals treated with VTP-43742 showed improvement in clinical score and a high degree of myelination compared to control mice, suggesting significant efficacy (Figures 3 and 4). When VTP-43742 was explored at higher dosages and in comparison to a mouse anti-IL17 inhibitor, exceptional preclinical activity on the model progression was observed,

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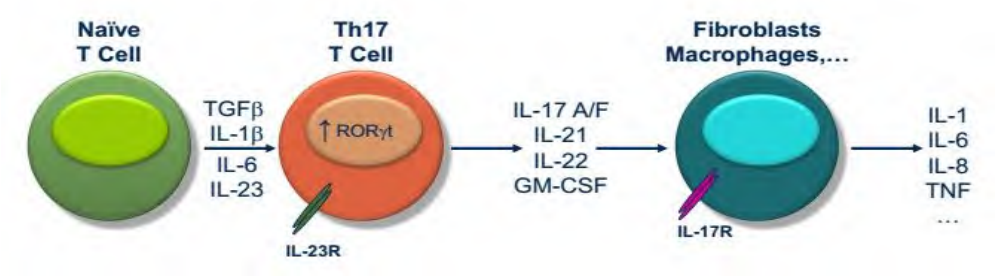
essentially bringing clinical score to baseline. Additionally, examination of transcriptional expression of IL-17A and IL-23R - Th17 specific markers - demonstrated decreased levels in line with a rebalancing of the immune system. We believe this activity is on par with fingolimod and corticosteroid treatment. Histological characterization of treated mice shows a remarkable lack of disease infiltrating immune cells (Figure 5).

Clinical development for VTP-43742 begins to solidify. As mentioned**,** the company expects to submit an IND and begin Phase I single-ascending dose trials in 1H15, with results in mid-2015. Additionally, proof-of-concept, multiple-ascending dose Phase I trials are expected to enroll in 2H15 in psoriasis, with read-out by the end of 2015. Looking further into development, the company plans to initiate two Phase II trials in 2016, one in a large indication and one in an orphan disease.

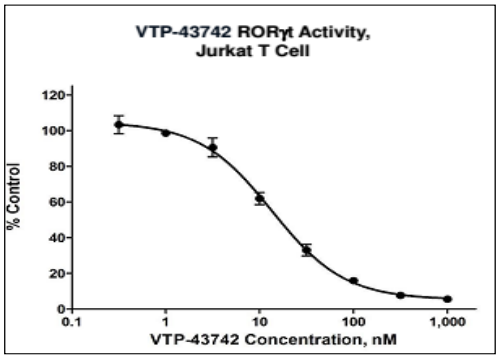
Vitae is an early-stage drug discovery and development company that uses its proprietary CONTOUR structure-based, drug design platform for the development of therapeutic candidates directed against validated targets that are difficult-to-drug. While Vitae's programs are early, they are potentially first-in-class or best-in-class for multi-blockbuster opportunities in Alzheimer's disease and type II diabetes. These programs, designated VTP-37948 and VTP-34072, have been validated scientifically and de-risked financially via separate business development agreements with German biopharmaceutical company, Boehringer Ingelheim (private). Multiple near-term value inflection points provide investors with significant potential upside in the first half of 2015.

FIGURE 1. Th17 Immune Regulation



Source: Company Reports

FIGURE 2. VTP-43742 Biochemical Activity and Isoform Selectivity



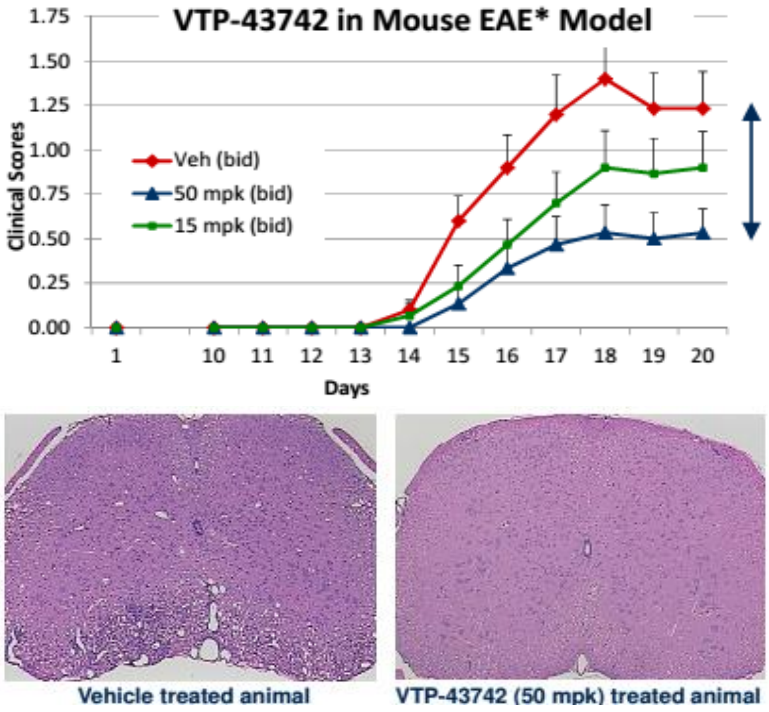
Assay	VTP-43742
hRORγt Ki (nM)	3.7 nM
hRORα Ki (nM)	4,712 nM
hRORβ Ki (nM)	3,914 nM

Parameter	VTP-43742
Dog oral bioavailability	66%
Dog half life ($t_{1/2}$)	15 hrs

Parameter	VTP-43742
Human RORγt binding K_i	3.7 nM
Jurkat T cell assay: RORγt IC_{50}	17 nM

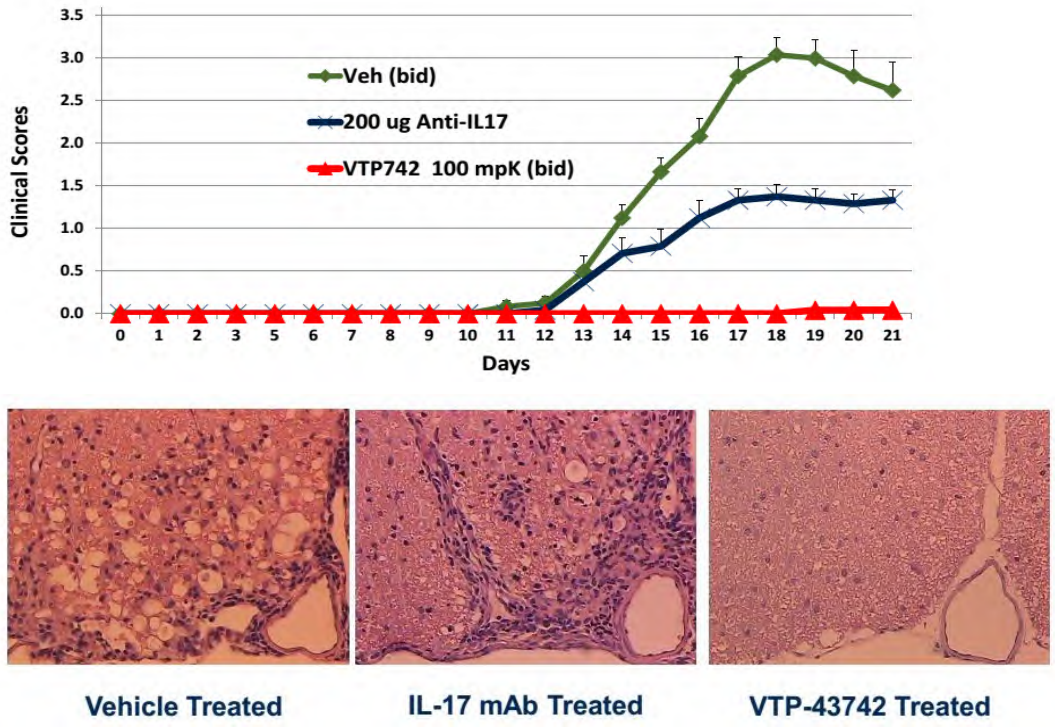
Source: Company Reports

FIGURE 3. Initial Mouse Model EAE Studies



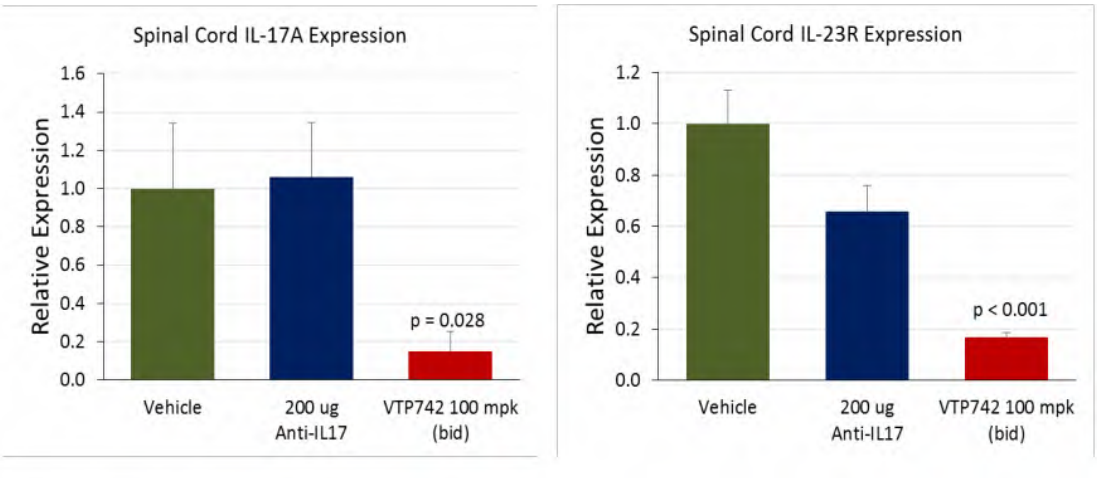
Source: Company Reports

FIGURE 4. Mouse Model EAE Studies with Active Comparator



Source: Company Reports

FIGURE 5. Expression Levels of Immune Related Biomarkers



Source: Company Reports

FIGURE 6. Upcoming Catalysts

Timing	Program	Catalyst
1H15	VTP-34072 (HSDβ-1)	Phase II clinical results expected in type-2 diabetes
1H15	VTP-43742 (ROR-γt)	Phase I clinical trials slated to begin in psoriasis
1H15	VTP-38543 (LXRβ)	Phase I clinical trials slated to begin in atopic dermatitis
Mid-2015	VTP-43742 (ROR-γt)	Results from SAD Phase I healthy volunteers
End-2015	VTP-43742 (ROR-γt)	Results from MAD Phase I psoriasis
1H16	VTP-38443 (LXRβ)	Phase I clinical trials slated to begin in acute coronary syndrome
2016	VTP-43742 (ROR-γt)	Initiation of Phase II clinical trials

Source: Company Presentations

Company Description

Vitae is a biotechnology company focused on leveraging a discovery and development platform for the advancement of small molecule drugs to treat important unmet clinical diseases. Utilizing the company's proprietary Contour structure based discovery platform, Vitae is able to rapidly discover novel lead molecules with desired target efficacy and biological stability that support significant derisking at very early stages of drug development. Vitae has initially focused its development on two targets that treat large patient markets: type-2 diabetes and Alzheimer's disease. The company's most advanced clinical asset is VTP-34072, an inhibitor of 11-β HSD1, a preclinically validated target in diabetes and metabolic disease that is currently in Phase II clinical trials. Data is expected from this trial in the first half of 2015.

The second asset, VTP-37948, is an inhibitor of BACE-1, a target of high interest in the treatment of Alzheimer's disease that has entered Phase I clinical trials with expected biomarker and data read-outs by the end of 2015. Both of these clinical candidates target large markets and have been partnered since discovery for further development by Boehringer Ingelheim GmBH, resulting in significant upfront and milestone payments totaling $152.4MM. The company has also used its platform to develop preclinical candidate inhibitors against difficult-to-target pathways in autoimmune disease, cardiovascular disease, and dermatological conditions. These wholly owned assets include VTP-43742, a ROR-γt inhibitor strongly implicated in autoimmune diseases such as multiple sclerosis, psoriasis, and rheumatoid arthritis. Additionally, the company has developed VTP-38443 for the treatment of acute coronary syndrome, and VTP-38543 for the treatment of atopic dermatitis, both of which stimulate the LXRβ receptor. Vitae is also developing an as-yet unnamed program to develop preclinical compounds for immune-oncology applications.

Investment Risks

Clinical and regulatory. If either VTP-34072 in diabetes or VTP-37948 in Alzheimer's is not able to meet any of its primary outcomes or suffer from safety and tolerability issues, Vitae and Boehringer Ingelheim (BI) may choose to end development in any of its current indications. Additionally, if the FDA and EMEA do not approve VTP-34072 or VTP-37948, Vitae's stock price would likely suffer.

Partnering. Vitae has partnered with (BI) in the development of VTP-34072 in diabetes and VTP-37948 in Alzheimer's. BI is responsible for the continued clinical and commercial development of both candidates and may decide to end development for one or more indications. If it were necessary for Vitae to develop and market any of its programs due to the loss or inability to retain a partner, it may be difficult to develop an internal commercial structure. Management has limited experience in commercial and marketing activities.

Competitive. The diabetes market is crowded and saturated with low-cost generic manufacturers of metformin and sulfonylureas. It may be difficult for BI and Vitae to garner significant market share. The high bar for safety and efficacy differentiation for the diabetes primary care market may limit adoption. VTP-37948 is not the only BACE-1 inhibitor in development and will not be a first-in-class therapy if Merck/Ligand are successful in bringing their drug to market. It may be difficult to compete in a market dominated by these therapies.

Financial. Vitae currently derives revenue from research and development funding and from license or collaboration agreements. The company sold ~6,875,000 shares in September 2014, raising net proceeds of ~$51.15MM. We expect this funding to be able to carry it through to 2016. Like most non-profitable biotechnology companies, VTAE will likely need to seek additional financing, exposing current investors to dilutive risk.

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JMP Securities was manager or co-manager of a public offering of securities for Vitae Pharmaceuticals, Inc. (VTAE) in the past 12 months, and received compensation for doing so.

JMP Securities expects to receive OR intends to seek compensation for investment banking services from Vitae Pharmaceuticals, Inc. in the next 3 months.

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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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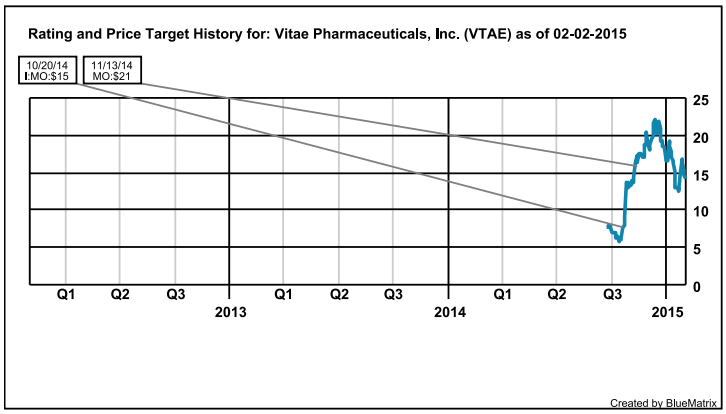
JMP Rating	Regulatory Equivalent	# Co's Under Coverage	*% of Total*	Regulatory Equivalent	# Co's Under Coverage	*% of Total*	# Co's Receiving IB Services in Past 12 Months	*% of Co's With This Rating*
MARKET OUTPERFORM	Buy	283	*63.17%*	Buy	283	*63.17%*	94	*33.22%*
MARKET PERFORM	Hold	154	*34.38%*	Hold	154	*34.38%*	20	*12.99%*
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%*	116	*25.89%*

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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