

Equity Research

December 8, 2014

Price: \$43.64 (12/5/2014)

Price Target: NA

OUTPERFORM (1)

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Key Data

Symbol	NASDAQ: KITE
Market Cap (MM)	\$1,673.6

Company Quick Take

KITE Flying Into New Horizons In Personalized Oncology

The Cowen Insight

Engineered T-cell therapies are commanding much interest at the ASH meeting based upon their ability to generate deep and highly durable responses in refractory DLBCL, ALL, MCL, and CLL. While these tumor types could support blockbuster product opportunities, Kite and its collaborators at the NCI unveiled a brand new treatment paradigm designed to deliver personalized TCRs to solid tumor patients.

CARs Featured At Special Scientific Symposium

Yesterday, Carl June from the University of Pennsylvania provided an overview of the Chimeric Antigen Receptor (CAR) field of adoptive T cell cancer immunotherapy to a packed lecture hall. Dr. June's talk recounted the early history of CARs, including Zelig Eshhar's creation of the first single chain Fv domain CAR construct in 1993, a discovery that forms the basis of Kite's seminal IP in this field. According to Dr. June, over 235 patients have now been treated with various CAR constructs with over 1,000 years of patient follow up. Based upon this experience, the long-term safety of CARs appears well established (no concerning genotoxicity or T-cell transformations). The majority of CAR clinical studies have employed T cells directed at anti-CD19, a surface marker found on B-cells. While much of the efficacy data on anti-CD19 CARs in refractory leukemias (ALL and CLL) and lymphomas (follicular and large cell) had been presented previously, the high, durable response rates never fail to impress. One notable new detail was that patients who fail blinatumumab, Amgen's recently approved bi-specific antibody directed against anti-CD19/CD3, still respond to anti-CD19 CARs, suggesting a non-overlapping role for both therapies in ALL. Dr. June, whose team at Penn is affiliated with Novartis, also unveiled early work at directing an anti-CD19 CAR against myeloma, a potential new opportunity. Outside of anti-CD19 CARs, Dr. June referred to entire new "fleets" of CARs that are being directed against a number of novel external cancer antigens (EGFRvIII, CD20, etc.), though we caution that work on other CAR antigen's remains fairly early.

NCI And Kite Already Working On The Next Frontier

Kite's scientific collaborator, Dr. Steven Rosenberg, followed Dr. June's discussion with a talk on directing engineered T cells toward solid tumors. Solid tumors rarely express specific cell surface cancer antigens, and therefore are not generally targetable with CARs (EGFRvIII represents one potential exception to this rule). However, solid tumors are known to express internal cancer antigens, and KITE and a few other companies are working on T-cell receptor (TCR) based cell therapies that recognize internal cancer antigens in the context of an MHC molecule. While in theory such an approach could be applied to any of the common epithelial tumors that kill 90% of U.S. patients, the limiting factor is the identification of a mutated antigen that is specific to a cancer cell. T-cells are extremely potent and will seek and destroy any healthy cell that simply under-expresses an antigen. Unfortunately, there are very few known cancer antigens that are shared across patients with a specific tumor type. Mutated forms of the KRAS

protein are found in approximately 50% of melanomas, but lung, breast, colon, and other solid tumors lack similarly prevalent cancer antigens.

Dr. Rosenberg presented groundbreaking work from his laboratory at the NCI directed at overcoming this bottleneck. His team is collecting T-cells known to recognize cancers within individual solid tumor patients (known as tumor infiltrating lymphocytes or TILs). They then used genomic techniques to identify cancer antigens (mutated internal protein sequences) recognized by these T-cells. Once a cancer antigen was identified, it could be used to select and purify a T-cell type that recognizes the antigen as foreign. The T-cell receptor from such a T cell could be cloned and engineered back into that specific patient's T-cells, creating an engineered TCR directed against that patient's cancer. This general approach has been used successfully in at least one patient, and although highly complex (it takes time to identify a unique cancer antigen, select a T-cell clone, engineer a patient specific TCR) it promises in theory to enable highly personalized and effective therapies for any solid tumor patient. Kite Pharma is now working with Dr. Rosenberg's group to streamline the process in an effort to make it commercially viable. While such a strategy is likely years away from being a commercial reality, it could prove revolutionary in terms of expanding the reach of engineered T-cell therapy to all tumor types.

Valuation Methodology And Risks

Valuation Methodology

Biotechnology:

In calculating our 12-month target price, we employ one or more valuation methodologies, which include a discounted earnings analysis, discounted cash flow analysis, net present value analysis and/or a comparable company analysis. These analyses may or may not require the use of objective measures such as price-to-earnings or price-to-sales multiples as well as subjective measures such as discount rates.

We make investment recommendations on early stage (pre-commercial) biotechnology companies based upon an assessment of their technology, the probability of pipeline success, and the potential market opportunity in the event of success. However, because these companies lack traditional financial metrics, we do not believe there are any good methodologies for assigning a specific target price to such stocks.

Investment Risks

Biotechnology:

There are multiple risks that are inherent with an investment in the biotechnology sector. Beyond systemic risk, there is also clinical, regulatory, and commercial risk. Additionally, biotechnology companies require significant amounts of capital in order to develop their clinical programs. The capital-raising environment is always changing and there is risk that necessary capital to complete development may not be readily available.

Risks To The Price Target

Kite Pharma is unprofitable, has no approved products, and will likely need to raise additional capital from the public markets prior to turning profitable. There is limited clinical trial experience on lead candidate KTE-C19, and eACT's more broadly. Moreover, KTE-C19 faces a number of clinical, regulatory, and commercial hurdles prior to becoming successful, and projecting any future sales for KTE-C19 is inherently difficult.

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Addendum

Stocks Mentioned In Important Disclosures

Ticker	Company Name
KITE	Kite Pharma

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Cowen and Company Rating System effective May 25, 2013

Outperform (1): The stock is expected to achieve a total positive return of at least 15% over the next 12 months

Market Perform (2): The stock is expected to have a total return that falls between the parameters of an Outperform and Underperform over the next 12 months

Underperform (3): Stock is expected to achieve a total negative return of at least 10% over the next 12 months

Assumption: The expected total return calculation includes anticipated dividend yield

Cowen and Company Rating System until May 25, 2013

Outperform (1): Stock expected to outperform the S&P 500

Neutral (2): Stock expected to perform in line with the S&P 500

Underperform (3): Stock expected to underperform the S&P 500

Assumptions: Time horizon is 12 months; S&P 500 is flat over forecast period

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Buy – The fundamentals/valuations of the subject company are improving and the investment return is expected to be 5 to 15 percentage points higher than the general market return

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Cowen And Company Rating Definitions

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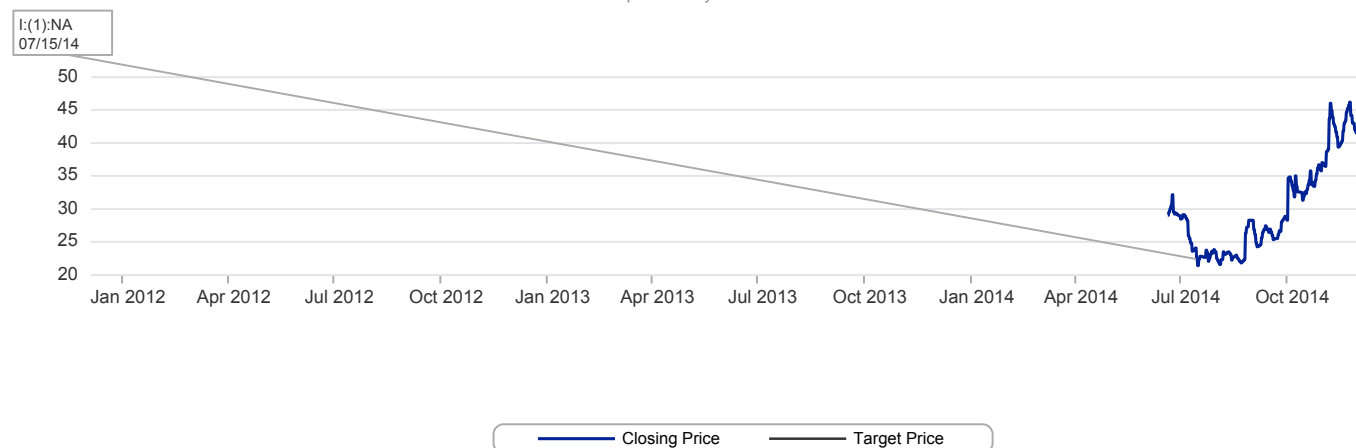
Rating	Count	Ratings Distribution	Count	IB Services/Past 12 Months
Buy (a)	440	59.95%	105	23.86%
Hold (b)	278	37.87%	10	3.60%
Sell (c)	16	2.18%	0	0.00%

(a) Corresponds to "Outperform" rated stocks as defined in Cowen and Company, LLC's rating definitions. (b) Corresponds to "Market Perform" as defined in Cowen and Company, LLC's ratings definitions. (c) Corresponds to "Underperform" as defined in Cowen and Company, LLC's ratings definitions.

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Kite Pharma Rating History as of 12/05/2014

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Legend for Price Chart:

I = Initiation | 1 = Outperform | 2 = Market Perform | 3 = Underperform | UR = Price Target Under Review | T = Terminated Coverage | \$xx = Price Target | NA = Not Available | S=Suspended

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