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EQUITY RESEARCH
Company Report

June 15, 2017

MabVax Therapeutics (MBVX - $1.56)

Healthcare/Biotechnology

Ticker:	**MBVX**
Rating:	**Buy**
Price Target:	**$18.00**

Encouraging MVT-2163 (PET Imaging Agent) Phase I Trial Results Could Facilitate Upcoming MVT-1075 Development

Yesterday MBVX reported encouraging results of MVT-2163 (PET imaging agent) in pancreatic cancer or other CA19-9 positive malignancies Phase I trial as the agent can illuminate multiple CA19-9^{+} tumor lesions even over strong background noises. The study remains ongoing and we believe this outcome could bode well for the upcoming 177^{Lu} loaded MVT-1075 radiotherapy in PDAC development.

- **Details.** MBVX presented encouraging MVT-2163 in pancreatic cancer Phase I study results at the Society of Nuclear Medicine and Molecular Imaging (SNMMI) meeting. The data showed that after pre-loading cold HuMab-5B1 antibody (MVT-5873), at various levels and durations, MVT-2163 could illuminate many primary and metastatic tumor lesions even in the presence of heavy background noise (in the liver). The effectiveness of the agent is illustrated by exhibiting high maximum standardized uptake values (SUV_{max}). For instance, the first observed results of two days post administration were ~9 g/mL and continued to increase through day 7 (~26 g/mL) reaching a highest level of 101 g/mL. It is an open-label dose escalation trial with 12 patients organized into three cohorts (n=3, 3, 6/cohort). Patients received MVT-2163 (3mg) with 0, 17, and 47 mg of cold MVT-5873, respectively. MVT-5873 is administered prior to MVT-2163 with varying durations between the administrations. The study remains ongoing for further validating the effectiveness of MVT-2163 as a PET imaging agent.
- **Implications.** The news, in our opinion, is very encouraging given MVT-2163 has demonstrated the potential to be an effective PET imaging agent for detecting more difficult-to-detect smaller tumor lesions. We anticipate further studies to support this expectation with more data possibly in 2H17. We also believe the valuable bio-distribution and potential proper dosimetry data of MVT-2163 gained from the Phase I trial should potentially bode well for the upcoming development of MVT-1075, a 177^{Lu} loaded radiotherapy, in PDAC. MBVX is scheduled to start a MVT-1075 dose finding Phase I trial this month and we anticipate data readouts starting in 2H17 and beyond. We believe the major variable to be adjusted for the dose finding study is the radiation level, but not the amounts of antibodies.
- **Action.** We are reiterating our Buy rating and $18 price target to reflect our view on highly encouraging developments of the broad HuMab-5B1-based platform. The valuation is based on peer comparable, probability adjusted DCF and sum-of-the-parts analyses.

Trading Data:

Last Price (6/14/2017)	$1.56
52–Week High (9/9/2016)	$6.05
52–Week Low (6/9/2017)	$1.35
Market Cap. (MM)	$13
Shares Out. (MM)	4.858

Earnings Estimates: (per share)

(Dec)	1Q	2Q	3Q	4Q	FY	P/E
FY-17E	-0.85A	-0.69	-0.70	-0.70	-2.91	NM
FY-16A	-0.15	-0.92	-0.86	-0.81	-3.64	NM
FY-15A	-6.25	-0.29	-0.20	-1.03	-13.44	NM
FY-14A	-	-	-	-	-9.51	NM

Source: Laidlaw & Company estimates

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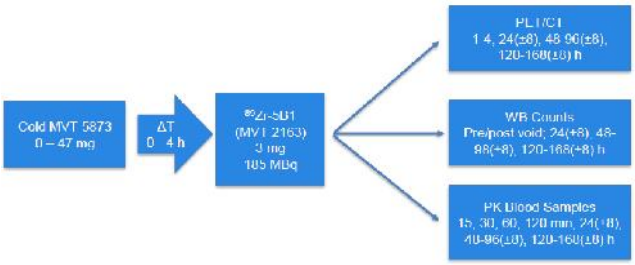
- **MVT-2163 (PET imaging agent) Phase I trial design and preliminary results.** Figure 1 illustrates the study design of this Phase I trial. Figure 2 highlights that the cold MVT-5873 pre-dosing could reduce the background noise level and better show the metastatic tumor lesions in the liver.

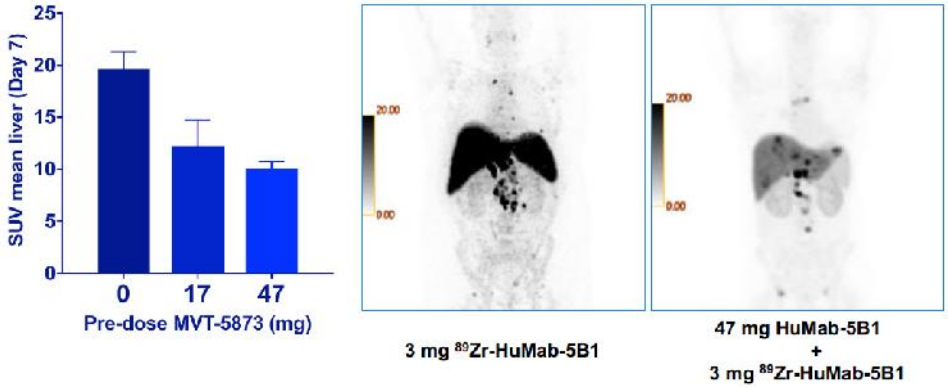
Figure 1: MVT-2163 in pancreatic cancer Phase I trial design



Patient Cohort Information					
Cohort	1	2	3A	3B	3C
Patients (n)	3	3	2	2	2
MVT-2163 (mg)	3	3	3	3	3
Delay btw cold and hot mAb (min)	n/a	15	15	>120	>240
MVT-5873 (mg)	0	17		47	
Total mAb (mg)	3	20		50	

Source: O'Donoghue, J.A., et. al., 2017- Society of Nuclear Medicine and Molecular Imaging (SNMMI) meeting presentation

Figure 2: Cold MVT-5873 pre-dose reduces liver SUV levels



Source: Lohrmann, C., et. al., 2017- SNMMI meeting new clinical concepts and first-in-human presentation

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Anticipated milestones in 2017 and beyond

Product	Indication	Event	Timing	Importance
MVT-5873	Pancreatic adenocarcinoma (PDAC)	Report interim results of the combination Phase I /II study	**4Q17**	****
		Report results of the combination Phase I /II study	**2018**	****
MVT-1075	Pancreatic adenocarcinoma (PDAC)	Potentially start Phase I study	**June, '17**	***
		Potentially report early Phase I data	**2H17**	***
HuMab-5B1 ADC	Pancreatic adenocarcinoma (PDAC)	Potentially start Phase I study	**2018**	***
MVT-2163	Pancreatic adenocarcinoma (PDAC)	Potentially report additional Phase I data	**2H17**	***
HuMab-Tn		Potentially report preclinical data	**2H17**	***
		Potential partnership for further development	**2017**	****
Sarcoma vaccine	Sarcoma	Potentially report Phase II study OS results	**2017**	**
Ovarian cancer vaccine	Ovarian cancer	Potentially report Phase II study OS results	**2017**	**

***** / ***** Major catalyst event that could impact share price very significantly while *** event is more informative*

Source: Laidlaw & Company estimates and company presentation.

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Major risks

Clinical study failure could have a major impact on MBVX share value. Despite promising pre-clinical results of the company's lead products, HuMab-5B1 and HuMab-5B1-PET, it remains too early to predict the longer term safety and efficacy from the upcoming clinical studies. Given that clinical validation has not been established, it would be critical for these studies to demonstrate efficacy and a positive safety profile in order to increase the assets and shareholder value. Negative results of Phase I and future clinical studies could have a materially negative impact on the shareholder value; especially since the company has a very diverse-limited pipeline profile.

Yet-to-be-validated vaccinated patient derived monoclonal antibody (Mab) screening platform could remain uncertain. Although monoclonal antibodies have been established as a validated cancer treatment modality; currently there is no Mab derived from vaccinated patients that has been approved or is in a late clinical development stage to demonstrate efficacy. As such, clinical risks for monoclonal antibody based cancer therapy derived from successfully vaccinated patients are higher than similar products generated from other more proven development platforms.

Product may not be approved or reach anticipated sales. Although MBVX's current pipeline products have exhibited the potential to generate positive clinical outcomes from current and future trials; it remains too early to project whether any of these products would be approved by regulatory agencies. Even if the products were to enter the market, sales could be significantly below projections due to the specific product label under approval, physician consensus for prescribing the drug, changes of treatment paradigms, entrance of competitors, and the possible changes in pricing flexibility and payer reimbursement. A revenue outlook below expectations could also negatively affect MBVX shareholder value.

Additional financings could dilute shareholder value. Although the company currently has ~$10MM (pro forma) cash after its recent financing, MBVX most likely would need more financial resources going forward if they want to expand and further develop their pipeline. Should the future operational expenses, especially from R&D, increase significantly, products not receive FDA approval, or product revenue not reach expectations; the company might need to issue new equity to raise additional cash. Under such a scenario, the share value of existing shareholders could be diluted.

Limited trading liquidity limits shareholder options. Given that MBVX shares only entered the public market recently; daily trading volume and name recognition are relatively modest. As such, shareholders wanting to increase or reduce their positions more substantially in a volatile stock market may face constraints.

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Figure 1: Income Statement

MabVax Therapeutics – Income Statement

($ '000)	2014	2015	2016	1Q17	2Q17E	3Q17E	4Q17E	2017E	2018E	2019E	2020E	2021E
Revenue												
Grants	304	1,267	148	0	0	-	-	0	1	1	0	0
Product revenue	10	0	0	0	0	-	-	0	0	0	1,500	3,383
Total revenues	314	1,267	148	0	0	0	0	0	1	1	1,500	3,383
Gross revenue											1,500	3,383
Research and development	3,503	9,597	7,801	2,818	2,959	3,018	3,200	11,996	14,275	16,987	20,554	24,049
General and administrative	5,204	9,795	9,010	2,274	2,069	2,111	2,132	8,586	9,444	10,294	11,118	11,896
Marketing and sales												
Total operating costs and expenses	8,707	19,392	16,811	5,092	5,029	5,129	5,331	20,581	23,719	27,281	31,672	35,945
Operating Incomes (losses)	(8,393)	(18,125)	(16,663)	(5,092)	(5,029)	(5,129)	(5,331)	(20,581)	(23,718)	(27,280)	(30,172)	(32,562)
Interest and other income (expense)	(0)	(0)	(997)	(263)	(250)	(340)	(270)	(1,123)	(1,123)	(1,123)	(1,123)	(1,123)
Change in fair value of warrant liability	475	20	0	0	0	-	-	0	0	0	0	0
Tax												
Net Income (Loss)	(7,918)	(18,105)	(17,660)	(5,355)	(5,279)	(5,469)	(5,601)	(21,704)	(24,841)	(28,403)	(31,295)	(33,684)
Deemed dividend on Series A-1 preferred-stock	(2,215)	(9,018)	0	0	0	-	-	0	0	0	0	0
Deemed dividend on Series A-1 warrant		(179)	0	0	0	-	-	0	0	0	0	0
Deemed dividend on Series B preferred stock		(8,656)	0	0	0	-	-	0	0	0	0	0
Accretion of preferred stock dividends	(445)	(93)	0	0	0	-	-	0	0	0	0	0
Net loss allocable to common stockholders	(10,578)	(36,051)	(17,660)	(5,355)	(5,279)	(5,469)	(5,601)	(21,704)	(24,841)	(28,403)	(31,295)	(33,684)
Basic and diluted net loss per share	($9.51)	($13.44)	($3.64)	($0.85)	($0.69)	($0.70)	($0.70)	($2.91)	($2.38)	($2.11)	($2.02)	($1.93)
Shares used to calculate the basic and diluted net loss per share	1,112	2,682	4,858	6,302	7,644	7,844	8,044	7,459	10,459	13,459	15,459	17,459
Margin Analysis (% of Sales/Revenue)												
Costs of goods										15%	15%	15%
R&D	1115%	757%	5269%	NA	NA	NA	NA	NA	1427487%	1698709%	1370%	711%
SG&A	1657%	773%	6086%	NA	NA	NA	NA	NA	944429%	1029427%	741%	352%
Operating Income (loss)	-2671%	-1430%	-11255%	NA	NA	NA	NA	NA	-2371815%	-2728036%	-2011%	-962%
Pretax	-2520%	-1429%	-11928%	NA	NA	NA	NA	NA	-2484069%	-2840290%	-2086%	-996%
Tax Rate												
Net Income	-705%	-2845%	-11928%	NA	NA	NA	NA	NA	-2484069%	-2840290%	-2086%	-996%
Financial Indicator Growth Analysis (YoY%)												
Total Revenue	NA	303%	-88%	-100%	NA	NA	NA	-100%	NA	0%	149904%	126%
R&D	NA	174%	-19%	66%	85%	81%	13%	54%	19%	19%	21%	17%
SG&A	NA	88%	-8%	-14%	7%	-13%	6%	-5%	10%	9%	8%	7%
Operating Income (Losses)	NA	116%	-8%	21%	43%	25%	10%	24%	15%	15%	11%	8%
Pretax Income	NA	241%	-51%	22%	39%	26%	10%	23%	14%	14%	10%	8%
Net Income	NA	241%	-51%	22%	39%	26%	10%	23%	14%	14%	10%	8%
EPS	NA	41%	-73%	463%	-25%	-19%	-14%	-20%	-18%	-11%	-4%	-5%

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Source: Bloomberg LP; Company reports; Laidlaw & Company estimates.

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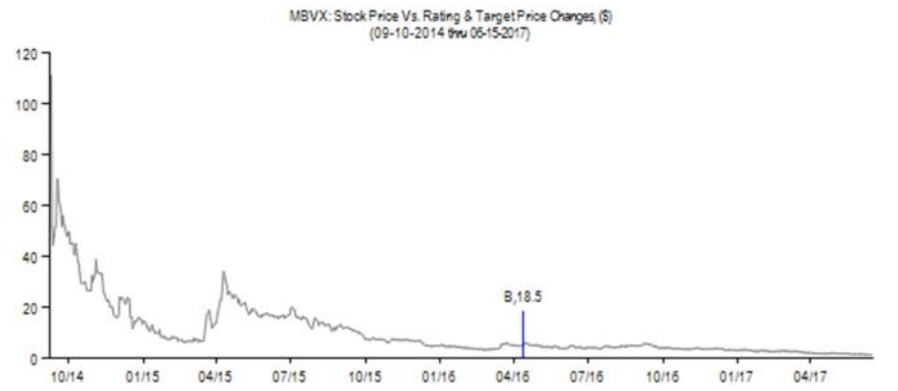
RATINGS INFORMATION

Rating and Price Target Change History



3 Year Rating Change History

Date	Rating	Closing Price ($)
04/13/2016	Buy (B)	5.18

3 Year Price Change History

Date	Target Price ($)	Closing Price, ($)
04/13/2016	18.50**	5.18

** *Split Adjusted*

Source: Laidlaw & Company **Created by: Blue-Compass.net**

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			Investment Banking	Brokerage
Strong Buy (SB)	Expected to significantly outperform the sector over 12 months.	0.00%	0.00%	0.00%
Buy (B)	Expected to outperform the sector average over 12 months.	64.44%	31.11%	2.22%
Hold (H)	Expected returns to be in line with the sector average over 12 months.	2.22%	0.00%	0.00%
Sell (S)	Returns expected to significantly underperform the sector average over 12 months.	0.00%	0.00%	0.00%

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