Message

From: Hansen David [dhansen@mabvax.com]
Sent: 3/30/2015 8:02:48 AM
To: Stetson John [stetson.john@gmail.com]
Subject: Revised presentation for Frost
Attachments: MabVax Presentation Frost 032915.pptx; Untitled attachment 96662.htm

MabVax therapeutics

A Cancer Immunotherapy Company

Harnessing the Human Immune System
To Diagnose and Treat Cancer

March 2015

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Forward Looking Statements

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Differentiated Cancer Immunotherapy Company With Multiple Near Term Clinical Milestones

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Complementary Immuno-Oncology Technologies

- Cancer vaccine program supported by multiple NIH grants
  - In-licensed portfolio from Memorial Sloan-Kettering Cancer Center
- Antibody discovery platform with >100 fully-human antibody leads
  - Novel human antibodies discovered from blood samples of vaccinated patients

Substantial Near Term Clinical Pipeline

- Sarcoma vaccine in Phase 2 with 2016 OS readout
- Ovarian vaccine in Phase 2 with 2016 OS readout
- Neuroblastoma vaccine Phase 2 IND Filed 2H2015
- Lead antibody 5B1: two INDs for Phase 1 trials late 2015
  - Therapeutic and companion diagnostic products targeting metastatic pancreatic cancer

Efficient Productive Well Managed

- Capital efficient development model
- Experienced management and revitalized board with significant public company experience
- Raised $20M in VC/Public money and $6M in NIH grants

Ticker Symbol: MBVX on OTCQB

Capital Efficient Business Model

- Operate as virtual company in all areas but discovery
- Internal focus is on discovery and early development where resource requirements are less intensive
- Externally focus on partnering products at early proof of concept secure additional capital and drive increasing corporate valuation
- Significant NIH funding for both antibody and vaccine programs
- No discovery or early development costs for vaccine program
- Preclinical antibody pipeline robust enough to support early partnering of first assets

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Significant Progress Since Becoming A Public Company In 2014

2014 Milestones Achieved	Timing
Series C financing raised $3M	February
Expanded Management Team: Hiring of CFO and VP Development	February
Initiated GMP manufacturing of lead antibody product candidate	April
Common stock financing and warrant exercise raised $4.5M	July
Merger/ name change/ reverse stock split/ ticker symbol change	July - September
Phase 2 of NIH award of $1.75M to develop 5B1-antibody based diagnostic product	August
Strengthened Board of Directors with 4 new members	September
Agreement with Juno Therapeutics and MSKCC on development of CAR T-cell products	September
Orphan Drug Designation for childhood cancer-neuroblastoma vaccine	September

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Management and Board of Directors

Management

J. David Hansen Founder, President & CEO Board Member	MabVax, Avanir, Xenerex Biosciences, Dura, Schering-Plough, Key, BMS
Philip Livingston, M.D. Founder & Chief Science Officer	Memorial Sloan Kettering Cancer Center, Former Head of Tumor Vaccinology
Gregory Hanson Chief Financial Officer	Avanir, First Cornerstone, Brinson Patrick Securities, Mast Therapeutics, Xxsys Technologies, L-3 Communications
Wolfgang Scholz, Ph.D. Founder & Vice President Antibody Discovery	Avanir, Xenerex Biosciences, Tanabe Research Laboratories USA, Desmos, Scripps Research Institute
Paul Maffuid, Ph.D. Vice President Product Development & Operations	AAIPharma Services, Biopharmalogics, Arena Pharmaceuticals, Amylin, Magellan Labs, Cabrillo Labs, Glaxo Research Institute

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Board of Directors

Ken Cohen	Founder, Former President and CEO of Somaxon Pharmaceuticals, Synbiotics, Canji
Robert Hoffman	Senior VP Finance & CFO of Arena Pharmaceuticals, CFO Polaris Group, Member FASB Advisory Committee
Jeffery Ravetch, M.D., Ph.D	Rockefeller University, National Academy of Sciences and Institute of Medicine, Academy of Arts and Sciences and the American Association for Advancement of Science
Paul Maier	Former CFO Seqenom Inc., Former Sr. VP & CFO Ligand Pharmaceuticals
Michael Wick, M.D., Ph.D.	Telik. CV Therapeutics, Lederle Labs. Associate Professor Harvard Medical School.
Philip Livingston, M.D.	Corporate Officer
J. David Hansen	Corporate Officer

Carbohydrate Antigen Challenges

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- Poorly immunogenic: T-Cell independent immune response (B-cell only) is less robust, short lived and primarily IgM
- Many tumor associated carbohydrate antigens are seen as self so immune response is muted even more
- Resulting antibodies typically low affinity and specificity
- Antigen availability limited – difficult synthesis
- Selection pressure in animals different than in humans so non-human antibodies to carbohydrate antigens not necessarily similar

Solving Carbohydrate Antigen Challenges

- Antigens (sLeA and GD2 especially) present in very high copy numbers on surface of cancer cells (1 million+ per cell)
- Conjugated vaccines (antigen plus carrier protein) the primary method of inducing immune response- many infectious disease vaccines
- That vaccine construct is exactly what we licensed from MSKCC
- We know that repeated vaccinations of cancer patients drives useful immune responses
- MabVax able to discover/recover antibodies with high specificity and affinity along with excellent cytotoxicity
- Significant advantage of starting with fully human antibody sequences
- Self censoring mechanism in human immune system prevents production of self-harming antibodies
- Carbohydrate antigens poorly expressed or inaccessible on normal tissues

Carbohydrate Antigen Expression On Cancer

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Table 3 | **Expression profiles of tumour-associated carbohydrate antigens on malignant tissues**

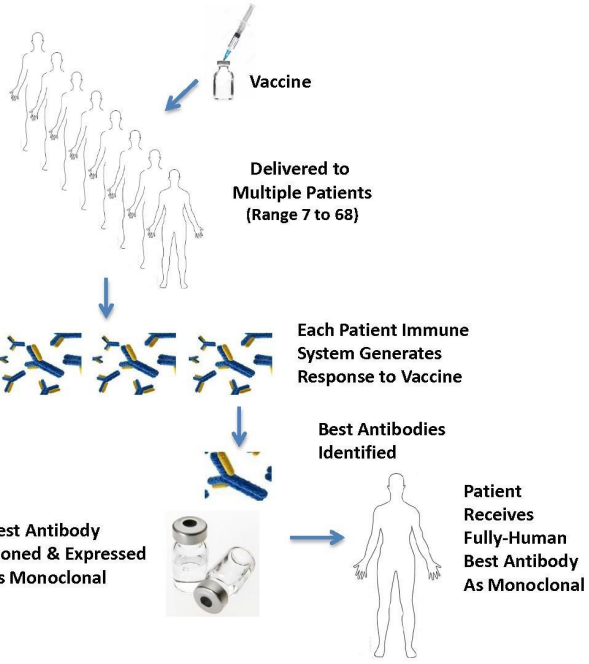
Tumour	Tumour-associated carbohydrate antigens*													
	sLe^x	Le^x	sLe^a	Le^a	sTn	Tn	TF	Le^y	Globo H	PSA	GD2	GD3	Fucosyl GM1	GM2
B-cell lymphoma	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	ND	ND	✓
Breast	ND	ND	✓	ND	✓	✓	✓	✓	✓	ND	ND	ND	ND	✓
Colon	ND	ND	✓	ND	✓	ND	✓	✓	ND	ND	ND	ND	ND	✓
Lung	✓	ND	ND	ND	✓	ND	ND	✓	✓	ND	ND	ND	ND	✓
Melanoma	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	ND	✓
Neuroblastoma	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	✓	ND	✓
Ovary	ND	ND	ND	ND	✓	ND	✓	✓	✓	ND	ND	ND	ND	✓
Prostate	ND	ND	ND	ND	✓	✓	✓	✓	ND	ND	ND	ND	ND	✓
Sarcoma	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	✓	✓	ND	✓
Small cell lung	ND	ND	✓	ND	ND	ND	ND	ND	✓	✓	ND	ND	✓	✓
Stomach	ND	✓	✓	✓	✓	✓	✓	✓	✓	ND	ND	ND	ND	✓

Globo H, globohexaosylceramide; Le, Lewis; ND, not detected at given threshold; PSA, polysialic acid; s, sialyl; TF, Thomsen–Friedenreich; Tn, 2-6-α-*N*-acetyl-galactosaminyl. *Antigens present on at least 50% of cancer cells in at least 60% of biopsy specimens based on REFS 191,192.

Astronomo, R.D. and D.R. Burton, *Carbohydrate vaccines: developing sweet solutions to sticky situations?* Nat Rev Drug Discov, 2010. **9**(4): p. 308-24.

Ticker Symbol: MBVX on OTCQB

Antibody Discovery Technology Leverages Immune Response From Many Vaccinated Patients



- Repeatedly vaccinate to drive and achieve a specific antibody response
- Take full advantage of unique characteristics of human immune system to produce highly useful and protective antibodies
- From patient blood samples, our experienced team can rapidly identify neutralizing target specific human antibodies
- Fully human antibodies have natural advantages; minimize side effects, cross reactivity and immunogenicity
- Created a discovery library of >100 fully human antibody leads
- Lead antibody discovery entering clinical trials in 2015

Discovery And Characterization of mAbs Derived from Vaccinated Individuals

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Clone	Ag	cDNA	Expressed	Cell Line	Purified	FACS	CDC	ADCC	Affinity	Internalize	In vivo
1B3	F-GM1	x	x	x	x	x	x				
1B3G3	F-GM1	x									
2E2	GD2	x	n		na	x					
32E2	GD2	x	x	x	x	x	x	x		x	
1E9	GD2	x	n		na						
2E11	GD2	x	x								
2E12	GD2	x	x	x	x		x				
11B10	GD2	x	x		x						
1B6	GD2	x	x	x	x	x	x				
1B7	GD2	x	x	x	x	x				x	
1B7DA	GD2	x	x	x	x	x	x	x	x	x	x
1G2	GD2	x	x	x	x	x	x	x		x	
1G4	GD2	x	x								
1G4G	GD2	x	x	x	x	x	x	x		x	
1H3	GD2	x	n		na						
2A12	GD2	x									
2F5	GD2	x	n		na						
2F7	GD2	x	x	x	x	x	x	x		x	
2G8	GD2	x	x								
2G8G	GD2	x	x	x	x	x	x	x		x	
2H12	GD2	x	x	x	x	x	x	x		x	
31F9	GD2	x	x	x	x	x	x	x		x	
31F9V2	GD2	x	x	x	x	x	x	x			
3G1	GD2	x	x	x	x	x	x				
4A2	GD2	x	x	x	x	x	x				
4F1	GD2	x	x								
4F1G	GD2	x	x	x	x	x					
1B1	GD3	x	x	x	x	x	x				
1B5	GD3	x	x	x	x	x	x				
1C9	GD3	x	x	x	x	x	x				
1D4	GD3	x	x	x	x	x	x				
3B11	GD3	x		x							
3G10	GD3	x									
4H7	GD3	x	x	x	x	x	x				
1E2	GM2	x	x								
5E11	GM2										
1A2	GM2										
1B8	GM2	x	x	x							
2A3	GM2	x	x								
2A5	GM2	x	x		x						
2A5G	GM2	x	x	x	x	x	x	x			
2B6	GM2	x	x	x	x	x	x				
2B6G3	GM2	x	x		x		x	x			
2C4b	GM2	x	x	x							
2D1	GM2	x	x	x	x	x	x				
2D12	GM2	x	x	x	x	x	x				
2D1G3	GM2	x	x	x	x	x	x	x			
2E11G	GM2	x	x	x	x	x	x	x			
2H5	GM2	x	x	x	x	x	x	x			
2H6	GM2	x	x	x	x	x		x			
3A6	GM2	x	x	x	x						
3C1	GM2	x	x	x	x		x				
3C10	GM2	x	x	x	x	x	x	x		x	

Clone	Ag	cDNA	Expressed	Cell Line	Purified	FACS	CDC	ADCC	Affinity	Internalize	In vivo
3D7	GM2	x	x	x	x	x	x				
3D7G	GM2	x	x	x	x	x	x	x			
3G1b	GM2	x	x	x	x	x	x				
3H3	GM2	x	x	x							
3H6	GM2	x	x								
4H3	GM2	x	x	x	x	x	x				
10F7	GM3	x	n		na						
1D1	KLH	x	n	x	na						
E4.B6	KLH	x	x	x	x	na	na	na			
3E3	MUC1	x	x								
2E9	MUC1	x	x	x	x						
3E9	MUC1	x	x								
2A5b	MUC1	x	x	x	x	x	x				
2A5bG3	MUC1	x		x							
2F12	MUC1	x		x							
2F12G3	MUC1	x									
5H5	MUC1	x	x								
1DF3	panG	x	x	x	x	x	x				
1D11	panG	x	x		x	x	x				
1F5	panG	x	x								
1H7	panG	x	x	x	x		x				
2B10	panG	x	x		x						
2C4	panG	x	x		x	x	x				
2C7	panG	x	x	x	x	x	x				
61D11	panG	x	x	x	x	x	x				
61D11G3	panG	x	x	x	x	x	x	x		x	
RF2-25	RSV	x	x		x	na	na	na			
7E3	sLeA	x	x	x	x	x	x				x
5B1	sLeA	x	x	x	x	x	x	x	x	x	x
5B1Cxs DB	sLeA	x	x	x	x	x	na	na	x	x	
5H11	sLeA	x	n		na						
7E3Cxs DB	sLeA	x	x	x	x	x	na	na		x	
7E3G	sLeA	x	x	x	x	x	x				
7E3G3	sLeA	x	x	x	x	x	x	x		x	
9H3	sLeA	x	n		na	x					
2C3	Tn/TF	x	x	x	x	x	x				
2C3G3	Tn/TF	x	x		x	x	x	x			
2F3	Tn/TF	x	x	x	x	x	x				
2F3G	Tn/TF	x	x	x	x	x	x	x		x	
2H7	Tn/TF	x	x								
2H7G	Tn/TF	x	x	x	x	x					

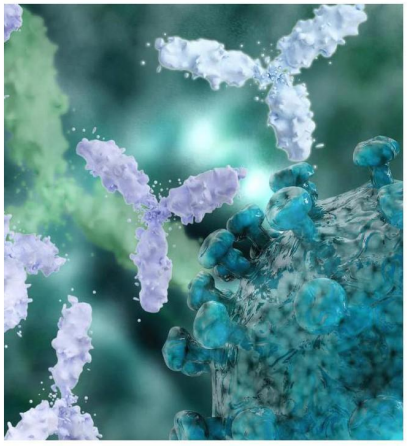
[DateTime]

Near-Term Pipeline Supported by Robust Therapeutic Antibody Discovery Program

- 5B1 based therapeutic and diagnostic products are most advanced and planned for FIH late-2015
- Currently have identified four additional antibody targets with promising therapeutic potential

Antibody Program	Originating Human Vaccine Clinical Trial	Target	Clinical Indication(s)	Antibody	Internalized (yes, no, not determined)	Mode of Action	Stage of Development
5B1	Breast Cancer	sLe(a)	Pancreatic, breast, colon, ovarian, and small cell lung cancers	5B1-T1	Y	ADCC, CDC	FIH 2H 2015
				^{89}Zr-5B1	Y	PET Diagnostic	FIH 2H 2015, Companion Diagnostic to 5B1-T1
				5B1-ADC1	Y	Payload	Candidate Selection
GD2	Sarcoma	GD2	Neuroblastoma, Sarcoma	GD2-31F9	Y	TBD	Candidate Selection
	Melanoma	GD2	Neuroblastoma, Sarcoma	GD2-1B7	Y	TBD	Candidate Selection
GD3	Sarcoma	GD3	Sarcoma	4H7	ND	TBD	Lead Optimization
GM2	Sarcoma	GM2	Sarcoma	2B6, 3C10	ND	TBD	Lead Optimization
Fucosyl-GM1	SCLC	Fuc-GM1	Small cell lung cancer	3D8	ND	TBD	Lead Optimization

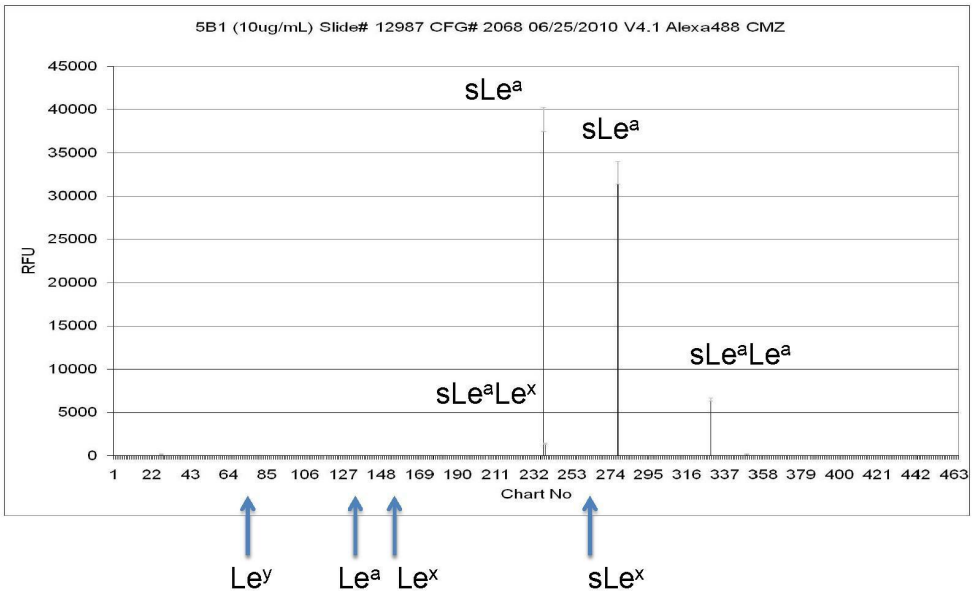
Lead Antibody Program Meets Significant Need In Metastatic Pancreatic and Colon Cancer



- HuMab 5B1 target is overexpressed in pancreatic and colon cancer
  - Target is the most extensively studied and clinically useful biomarker for pancreatic cancer
  - Only currently validated assay approved by FDA
  - High copy numbers on cancer cell membrane makes an attractive molecular target
  - Target facilitates tumor proliferation, invasion, metastatic spread[1]
  - Increased expression correlated to poor survival[1]
- HuMab 5B1 derived from a patient vaccinated with MabVax's vaccine
  - Seven Stage IV patients vaccinated in 4Q08 and six are still alive (median: 197 weeks post vaccination)
  - Patient from whom derived the HuMab 5B1 antibody remains disease free at 5+ years[2]

1. Ben-David T, Sagi-Assif O, Meshel T, et al. Immunol Lett 2008; 116: 218-24.20,
2. Personal communication with lead investigator at MSKCC

Highly Specific Antibody To sLe^a Antigen
Glycan Array Analysis of r5B1 (IgG)



Source: Consortium for Functional Glycomics

Significant *In Vitro* Activity of Recombinant sialyl Lewis[a] Antibodies r5B1 (IgG) and r7E3 (IgM)

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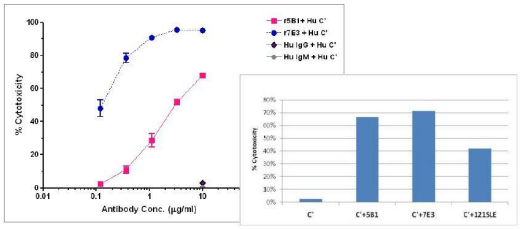
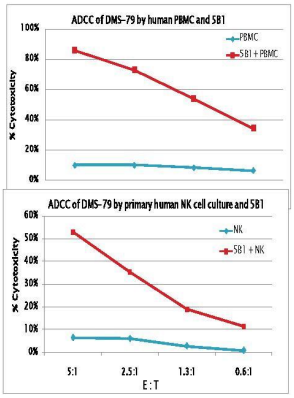
Complement Mediated Cytotoxicity



Antibody Dependent Cytotoxicity



Mab	Affinity (nM)	KD(M)	KA(1/M)	Association ka(1/Ms)	Dissociation kd(1/s)	Isotype
r5B1	0.14	$1.4X10^{-10}$	$7x10^{9}$	$1.1x10^{6}$	$1.6x10^{-4}$	IgG1/λ
r7E3	0.04	$3.6X10^{-11}$	$2.8x10^{10}$	$8.8x10^{5}$	$3.2x10^{-5}$	IgM/κ
121SLE	0.35	$3.5X10^{-10}$	$2.8x10^{9}$	$2.7x10^{6}$	$9.4x10^{-4}$	mse IgM

HuMab 5B1 Antibody Target Significantly Overexpressed On Multiple Cancers

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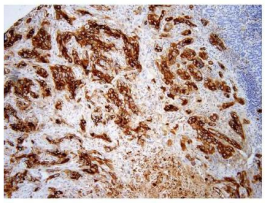
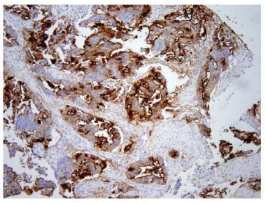
Significant homogeneity and staining intensity of cancer cells in these tissues

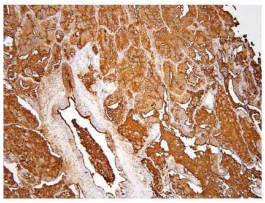
Pancreas, ductal adenocarcinoma, stage III



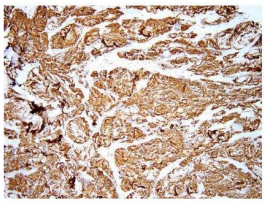
Sigmoid colon, carcinoma stage IIIB (ǂ)



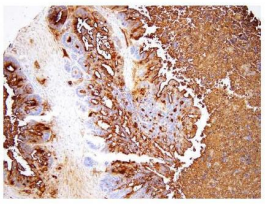
Lung, adenocarcinoma, Stage IB



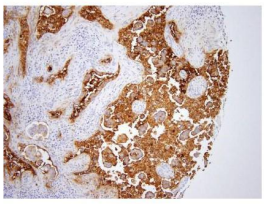
Urinary bladder, muscinous adenocarcinoma, stage IV



Ovary, metastatic carcinoma from colon



Lymph node, metastatic carcinoma , IIIA



Unpublished data. All work performed at Pathology Department, MSKCC

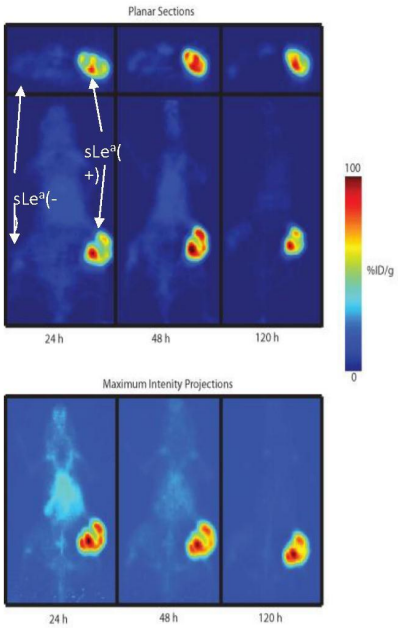
5B1 Staining in Normal Tissues Probed by Immunohistochemistry on Tissue Microarrays

Normal Tissue	Stain
Brain	neg
Breast	+
Colon	+
Kidney	neg
Liver	neg
Lung	neg
Lymph node	neg
Muscle	neg
Pancreas	+
Placenta	neg
Skin	neg
Spleen	neg
Stomach	neg

Unpublished data. All work done at Pathology Department MSKCC

- Positive cells are restricted to the secretory ducts and lumen of these tissues.
- These locations are inaccessible to the immune effector mechanisms.

5B1 Antibody Conjugate PET Imaging Agent ^{89}Zr-5B1: sLe^a Specific Diagnostic Antibody



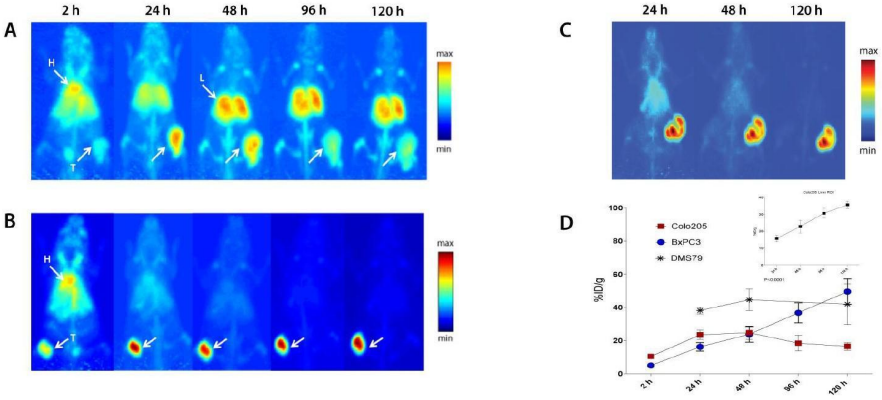
Dual Xenografts - ^{89}Zr-5B1 PET images

sLe^a(+) – DMS79 small lung cancer (right side of mouse)

sLe^a(-) – SK-MEL-28 melanoma (left side of mouse)

All work done in collaboration with and in the lab of Jason S. Lewis, Ph.D. Member, Memorial Sloan-Kettering Cancer Center, Vice Chairman & Chief Attending, Department of Radiology

^{89}Zr-5B1 PET Imaging of Human Colon, Pancreatic & SCLC Xenografts in SCID Mice



PET maximum intensity projections of mice-bearing colo205 (A), BxPC3 (B), and DMS79 (C) xenografts showing delineation of tumor (T) by ^{89}Zr-5B1.

All work done in collaboration with and in the lab of Jason S. Lewis, Ph.D. Member, Memorial Sloan-Kettering Cancer Center, Vice Chairman & Chief Attending, Department of Radiology

HuMab 5B1-PET Improves Imaging Compared To Standard Agent In Use Today

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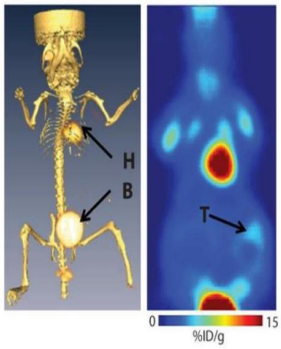
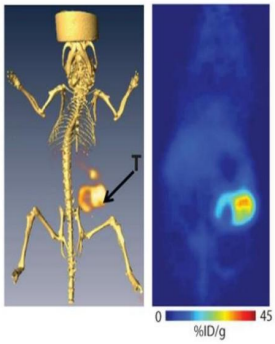
Mice ortho-topically transplanted with BxPC3-luc pancreatic tumor xenografts



The co-registration of FDG-PET and computed tomography (CT) (left) and planar sections of FDG-PET only (right) displayed minimal tumor detection of the tracer with a high uptake in highly metabolic tissues



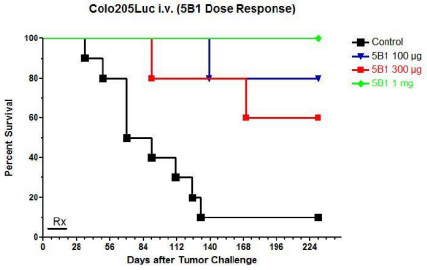
Acquired ^{89}Zr radiolabed-5B1 antibody (^{89}Zr-5B1) PET image of the same mouse co-registered with CT exhibited exceptional tumor detection of the BxPC3-luc tumor xenografts.

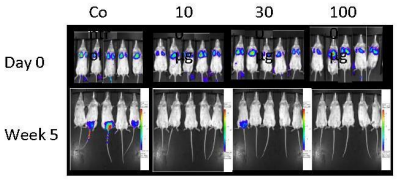
Journal of Nuclear Medicine (Nov. 2013)

Received $1.75 Million NIH Contract for Development of Imaging Product

Ticker Symbol: MBVX on OTCQB

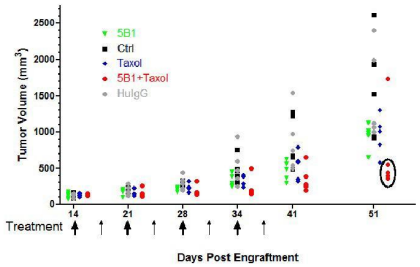
Positive Effect Of 5B1 On Human Colon & Pancreatic Tumors in Animal Models





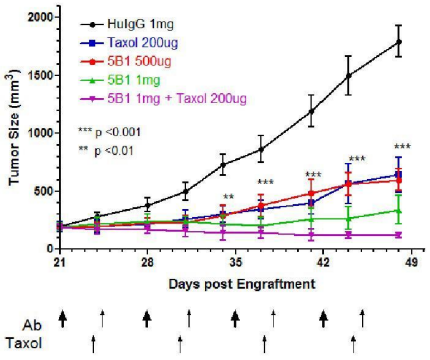
Cells: 0.5 million Colo205-luc cells injected IV on day 0 into 5-8 weeks old female SCID mice.

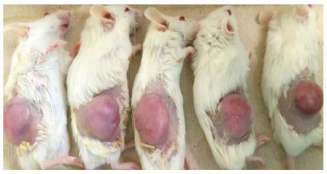
Treatment: r5B1 i.p. injection on Day 4 after tumor cell injection. 5B1was given twice a week for first two weeks and once a week for next 7 weeks. Five of 10 control animals shown in imaging, 1 animal dead by week 5.



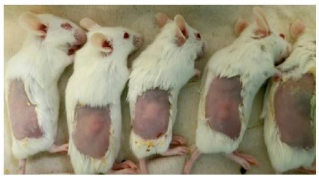
Cell injection: 1 million BxPC3 cells into hind flank of 6 weeks old female CB17 SCID mice (Day 0).
Treatment: Start on Day 14 after tumors are grown to ≥100 mm^3. Human IgG or 5B1 (0.5 mg) was given ip twice a week, Taxol (0.2 mg/dose) was administered iv on days 14, 21, 28 and 34.

Reduced Tumor Growth With 5B1 Treatment of DMS-79 Tumors in Animal Models





Hu IG



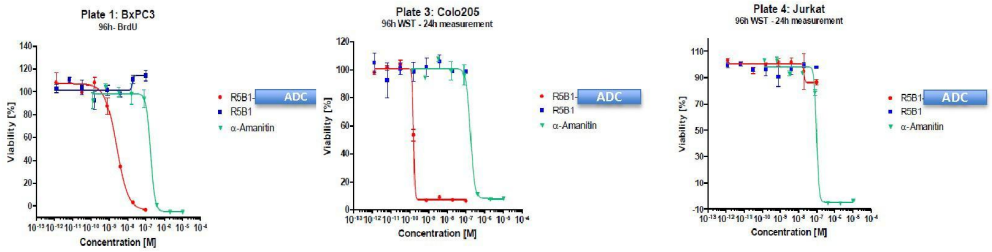
5B1 + Tax

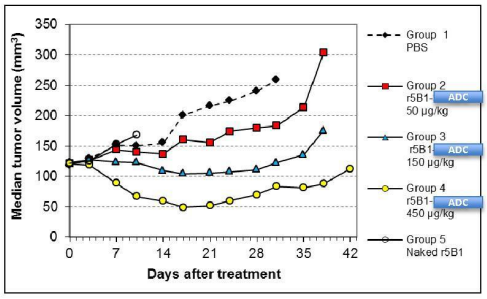
Cell injection: 5 million DMS79 cells into hind flank of 6 weeks old female CB17 SCID mice (Day 0).
Treatment: Start on Day 21 after tumors are grown to 193±64 mm^3. Human IgG or 5B1 (0.5 or 1 mg) was given ip twice a week, Taxol (0.2 mg/dose) was administered iv on days 23,30, 37 and 44. Significantly different from control by 2-way ANOVA at $p<0.01$ (**) and $p<0.001$ (***), N=5.

Feasibility Established for 5B1-Toxin Conjugates

MabVax therapeutics

BrdU Cell Proliferation Assay with BxPC3 and Colo205 Cells. WST-I Assay with Jurkat Cells As Control





Single dose Rx on day 0, median values shown (Group2 had one outlier/non-responder). Dose dependent mean tumor inhibition by 5B1-ADC but not 5B1 alone. (Data from final report July 2014)

- 5B1-Toxin ADC demonstrates potent *in vitro* and *in vivo* cytotoxicity in two pancreatic cell lines known to express sialyl Lewis[a]
- Encouraging therapeutic window
- Successful conjugation of linker and toxin to antibody without apparent loss of specificity and binding efficiency
- 5B1 –Toxin ADC is not cytotoxic to target antigen-negative cells

$1 Billion Market Opportunity For New Metastatic Pancreatic And Colon Cancer Treatment

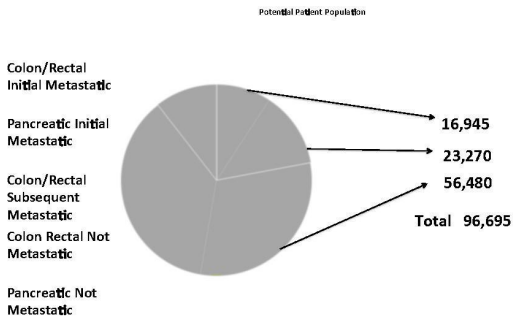
MabVax therapeutics

Critical Unmet Medical Need: Metastatic Pancreatic and Colon Cancer

- Extremely poor 5-Year survival rate for metastatic pancreatic and colon cancer
- Significant need for improved imaging agents to diagnosis, stage, and assess impacts of treatment of pancreatic cancer

Significant Number of New Patients Means Significant Market Opportunity

- Relevant patient population exceeds 96,000 new patients per year
- $1B Annual Market Opportunity
- Potential utility in small cell lung and and breast cancers



All incidence and survival date from National Cancer Institutes SEER data

Ticker Symbol: MBVX on OTCQB

HuMab 5B1 Clinical Candidate Selection Summary

- HuMab 5B1-T1: Lead 5B1 Program Therapeutic Antibody
  - ✓ Binds to target on cancer cells with high specificity and affinity
  - ✓ Does not cross react with related carbohydrates
  - ✓ Potent cancer cell killing
  - ✓ Efficacy in animal models of pancreatic, colon, small cell lung cancer
  - ✓ Active as antibody drug conjugate
  - ✓ Acceptable profile in acute and repeat dose toxicology model
- ^{89}Zr-HuMab 5B1: Lead 5B1 Program Diagnostic Antibody
  - ✓ ^{89}Zr-5B1 selected based on superior PET imaging seen established in animal models
- HuMab 5B1 clinical supplies being manufactured by Patheon
- Phase 1 clinical trials for both diagnostic and therapeutic products to start 4Q2015 at MSKCC
- Early results reported by end of year/first of next

5B1 Antibody Based PET Imaging Agent

Next Generation Imaging and Companion Diagnostic

MabVax therapeutics

- Broadly applicable with up to 80% of pancreatic and colon tumors/metastases expressing target antigen
- Current FDG-PET unreliable detection of small primary lesions and metastases
- Very positive animal model results from human xenograph experiments with shedding and non-sheading tumors
- Key role as gateway diagnostic for follow-on therapeutic antibody
- Market potential as a stand along product is $150M to $200M annually
- Potential go to market alone strategy
  - Lower cost clinical trials
  - Regulatory pathway has lower bar than therapeutic
  - MabVax manufactures antibody and can contract out coupling chemistry
  - Already existing independent radio-pharmacies generate radiolabel and conjugate to antibody for just in time delivery to customers

Ticker Symbol: MBVX on OTCQB

- Scientific founders of Juno and researchers at MSKCC working on CAR T-cell therapy for solid tumors
- Requested use of variable binding domains from antibody sequences discovered by MabVax as targeting mechanism for new CAR constructs
- MabVax jointly owns (including patent rights) these new inventions with MSKCC
- License agreement between MSKCC and Juno required additional agreement between MabVax and Juno
- Juno has optioned right to license CAR T-cell therapies incorporating MabVax targeting sequences in exchange for milestones and royalties paid to MabVax as well as MSKCC.
- Negotiating license currently

HuMab Anti-GD2 Clinical Candidate Selection Summary

- GD2 is a validated target
  - ✓ Recently approved anti-GD2 chimeric antibody approved for neuroblastoma
  - ✓ Large Phase III trial in neuroblastoma stopped early because of efficacy
  - ✓ Expressed in very high copy numbers on surface of sarcoma and neuroblastoma
- MabVax has discovered multiple potentially useful anti-GD2 antibodies
  - ✓ Antibodies with differentiated characteristics
  - ✓ Good specificity and affinity
  - ✓ Efficacy in animal models of sarcoma and neuroblastoma
  - ✓ Internalized so potential as antibody drug conjugate
- Will evaluate use as a PET imaging agent
- Current *in vitro* and *in vivo* animal model experiments conducted under a sponsored research agreement at MSKCC
- Goal to start GMP manufacturing by late 2015 if have sufficient capital

Glycan Array Analysis
1B7 vs CH14.18

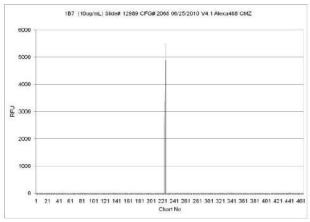


Chart #	Glycan Structure	RFU	StDEV	SEM	% CV
226	Neu5Acα2-8Neu5Acα2-3(GalNAcβ1-4)Galβ1-4Glcβ-Sp0	5188	601	300	12
224	Neu5Acα2-8Neu5Acα2-8Neu5Acα2-3(GalNAcβ1-4)Galβ1-4Glcβ-Sp0	3523	328	164	9
223	Neu5Acα2-8Neu5Acα2-8Neu5Acα2-8Neu5Acα2-3(GalNAcβ1-4)Galβ1-4Glcβ-Sp0	2667	189	95	7
441	Neu5Acα2-3Galβ1-4GlcNAcβ1-3Galβ-Sp8	23	14	7	61
340	GlcNAcα1-4Galβ1-4GlcNAcβ1-3Galβ1-4(Fucα1-3)GlcNAcβ1-3Galβ1-4(Fucα1-3)GlcNAcβ-Sp0	14	12	6	88

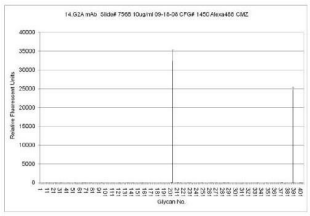


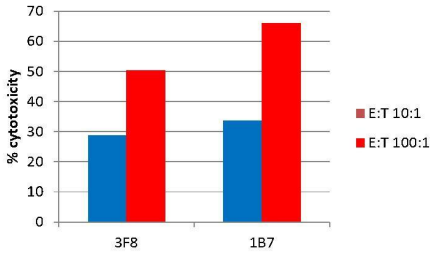
Chart #	Glycan Structure	RFU	StDEV	SEM	% CV
205	Neu5Acα2-8Neu5Acα2-3(GalNAcb1-4)Galb1-4Glcb-Sp0	32405	5825	2912	18
390	GalNAcα1-3(Fucα1-2)Galb1-3GalNAcα1-3(Fucα1-2)Galb1-4GlcNAcb-Sp0	24790	1276	638	5
373	Neu5Acα2-3Galb1-4(Fucα1-3)GlcNAcb1-3GalNAcα-Sp14	141	12	6	9
203	Neu5Acα2-8Neu5Acα2-8Neu5Acα2-3(GalNAcb1-4)Galb1-4Glcb-Sp0	140	63	31	45
213	Neu5Acα2-3GalNAcα-Sp8	120	33	16	27

Source: Consortium for Functional Glycomics

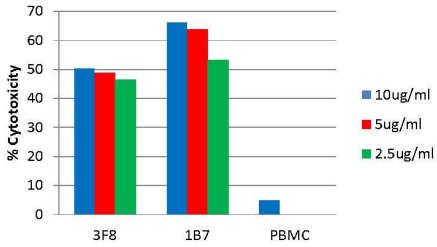
ADCC & CDC Activity of 1B7 & 3F8 on CHLA255 Cells

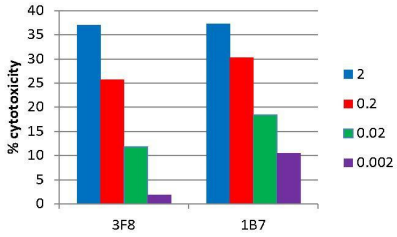
MabVax therapeutics

Different E:T ratio, mAb at 10ug/ml



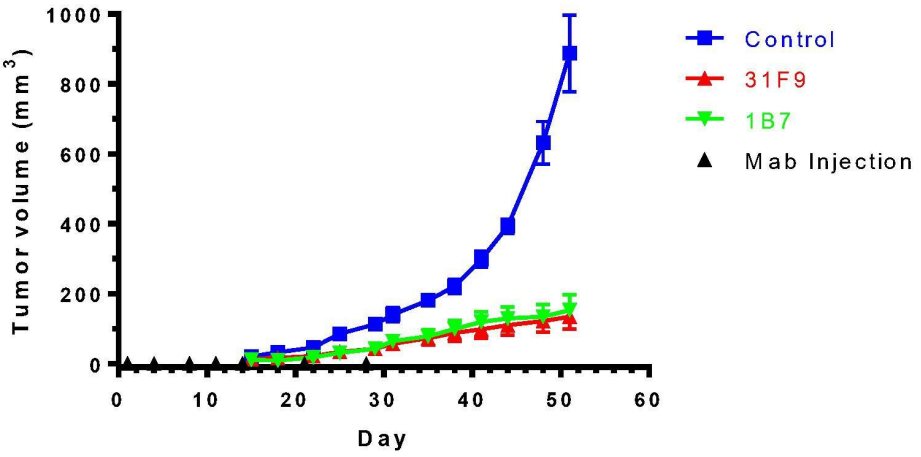
mAb at various concentrations (E:T=100:1)





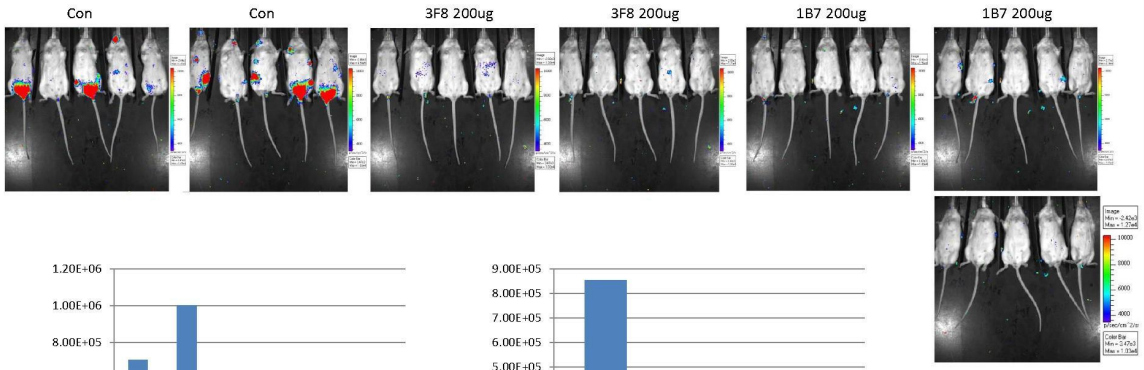
- Comparable ADCC activity with CHLA255luc (NB) Cells and PBMC effector cells
- Comparable CDC activity

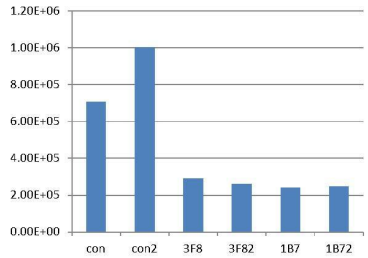
Tumor Growth Suppression In TC71 Xenograft in SCID Mice

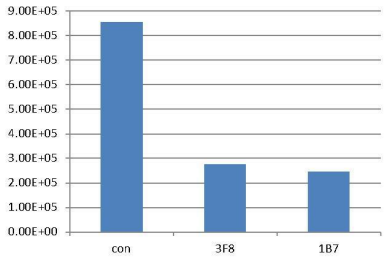


$0.1x10^6$ cells sc;
Dose 0.2 mg/mouse (~ 8 mg/kg)

1B7 Compared to 3F8 in CHLA255luc IV Model

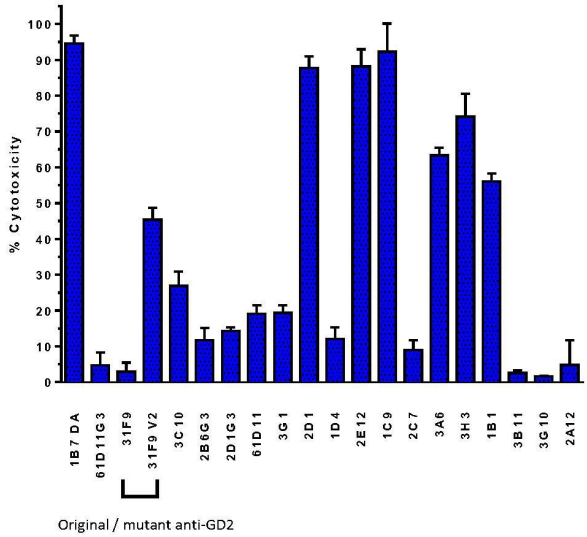






Mouse: CB17 SCID 5month old
Cell injection: 0.5 millions of CHLA255luc i.v. injected into tail vein on 2/18/2011
Treatment: 3F8 and 1B7 at 200ug respectively injected i.p. on 2/22/2011 (+4 days). The treatment is given once every week.
Imaging: with IVIS 200 imaging system at week 3 (day 25)

CDC of anti-Carbohydrate mAbs against TC-71 (Sarcoma) Cells



Key Issue:

- GD2 can be expressed on peripheral nerves
- Administration of mAbs can cause great pain
- CDC activity is primary causative factor

Clinically Advanced Cancer Vaccine Program

- Vaccines elicit an immune response against validated tumor antigens present on solid tumors
  - Targets are primarily carbohydrates and not possible to raise human antibody responses against unless vaccinate
  - Serology from the sarcoma study demonstrates 98% of patients generate an immune response to the vaccine
- Two late stage Phase II clinical programs; sarcoma and ovarian cancer
  - All patients enrolled and vaccinated and minimal expense for survival follow-up in 2016
- Neuroblastoma vaccine ready for Phase 2 trial initiation in 2H2015
  - Received US FDA Orphan Drug Designation
- Broader portfolio includes completed early stage clinical trials in melanoma, breast cancer , and small cell lung cancer
  - On hold until readouts on sarcoma and ovarian trials
- Plan to pursue out-licensing option for sarcoma and ovarian cancer vaccines after survival endpoint reached 2016

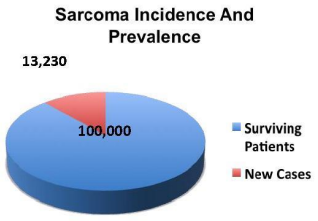
Ticker Symbol: MBVX on OTCQB

Sarcoma Vaccine POC Phase II Results Due 1H2016

MabVax therapeutics

Medical Management Of Recurrent Disease

- 5,290 deaths per year
- Recurrence rates up to 50%
- Current therapies ineffective at preventing recurrence



Clinical Program Status

- Randomized, multicenter, double-blind Phase II trial of 136 patients at 13 sites
- Fully enrolled with all patients fully vaccinated
- Monitoring for overall survival
- Statistically powered to show a 50% improvement in PFS and OS

Commercial Opportunity

- Good economics: single vaccine for all patients allows cost efficient manufacturing from non-recombinant components
- Limited competitors in adjuvant market aimed at prolonging PFS and OS
- Market opportunity is ~$200MM to ~$300MM in annual sales

All incidence and survival date from National Cancer Institutes SEER data

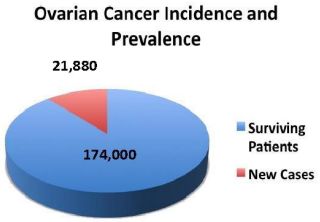
Ticker Symbol: MBVX on OTCQB

Ovarian Vaccine POC Phase II Results Due 1H2016

MabVax therapeutics

Medical Management Of Recurrent Disease

- 13,850 deaths per year
- Recurrence rate is 70% and 5-year survival is 40%
- Current therapies ineffective at preventing recurrence



Clinical Program Status

- *Completely NCI funded and managed by GOG*
- Randomized, multicenter, double-blind Phase II trial of 164 patients initiated in July 2010 at 20+ sites
- Fully enrolled and all patients vaccinated
- Monitoring for overall survival
- Statistically powered to show a 50% improvement in PFS and OS

Commercial Opportunity

- Good economics: single vaccine for all patients allows cost efficient manufacturing from non-recombinant components
- Limited competitors in adjuvant market aimed at prolonging PFS and OS
- Market opportunity is ~$200MM to ~$400MM in annual sales

All incidence and survival date from National Cancer Institutes SEER data

Ticker Symbol: MBVX on OTCQB

Neuroblastoma: Childhood Cancer Vaccine Program IND 2H2015

MabVax therapeutics

Difficult disease

- Second leading cause of cancer death in children
- Standard of care results which have relapse rate of 40% to 60% in 12 months and therapies have significant toxicities
- ≈700 new cases per year US

Favorable Results From Phase 1 Clinical Trial

- Patients with high-risk NB in second (or later) complete, very good partial, or partial remission.
- Phase 1 results: 12 of 15 remain free of disease and all are alive at 29 to 40 months
- Treatment well tolerated

Transition to Phase 2 Clinical Trial

- NIH SBIR Phase 1 grant for manufacturing Phase II clinical material awarded
- Draft Protocol reviewed and accepted by NANT Scientific Review Committee
- Orphan Drug status granted by FDA in 2014
- Single study approval possible
- Launch Phase II study 2H2015

Clin Cancer Res 2014;20:1375-1382. Published February 11, 2014.

Ticker Symbol: MBVX on OTCQB

MabVax therapeutics

- 20 issued vaccine patents in United States and 41 in ROW
  - Issued patents covering monovalent vaccines, methods of manufacture, methods of use
- 8 applications pending: 2 in United States and 6 in ROW
  - Covering proprietary antibody discovery program and lead development candidates
  - Covering combinations of monovalent vaccines in areas of small cell, breast, and ovarian cancer
- Orphan drug designation available for vaccine and antibody products
  - Received US FDA ODD in Sept 2014 for neuroblastoma vaccine

Ticker Symbol: MBVX on OTCQB

Robust Pipeline with Multiple Near-Term Milestones

MabVax therapeutics

Antibody Program

Program	Indication	Partner	Pre-IND	Phase 1	Phase 2	Notes
HuMab 5B1-Therapeutic	Metastatic Pancreatic & Colon	NIH, MSKCC, Patheon	→			Early data end of year
HuMab 5B1-PET imaging	Metastatic Pancreatic & Colon	NIH, MSKCC, Patheon	→			Early data end of year
HuMab-ADC	Metastatic Pancreatic	Heidelberg Pharma	→			
1B7/31F9	Saroma & Neuroblastoma	MSCC	→			

Vaccine Program

Trivalent vaccine	Sarcoma	MSKCC, NCI	→	→	→	OS data 1H16
Pentavalent Vaccine	Ovarian Cancer	MSKCC, NCI, GOG	→	→	→	OS data 1H16
Bivalent Vaccine	Neuroblastoma	MSKCC, NANT, NCI	→	→		Enters Phase 2 in 2H15
Multiple	Melanoma, breast, SCLC,		→	→		On hold pending

Ticker Symbol: MBVX on OTCQB

MabVax therapeutics

Milestone	Expected Timing
Engineering batch of antibody being manufactured	1H15
Expand ADC antibody development program as a follow-on therapeutic agent	1H15
Expand preclinical development program for follow-on antibodies	1H15
Pre-IND meeting with FDA	1H15
IND enabling toxicology completed	2H15
GMP manufactured clinical trial material available	2H15
IND for diagnostic PET imaging agent and therapeutic antibody	2H15
HuMab 5B1 antibody products enter phase 1 trials	2H15
Initiate neuroblastoma vaccine Phase 2 clinical trial	2H15
Report preliminary safety results from phase 1 diagnostic and therapeutic product clinical trials	2H15

Ticker Symbol: MBVX on OTCQB

Differentiated Cancer Immunotherapy Company With Near Term Milestones

- MabVax: Cost effective discovery and early development of multiple novel products with significant commercial potential
- Advancing two unique and complementary oncology-focused immunotherapy
  - Cancer vaccine program Backed by NIH funding delivers results in 18 months
  - Fully-human antibody program delivers early results in ~9 months for diagnostic and therapeutic products (end of 2015)
- Robust pipeline allows early stage partnering of first programs for early return
- Experienced management and board with significant public company experience

Ticker Symbol: MBVX on OTCQB

A Cancer Immunotherapy Company

Harnessing the Human Immune System To Diagnose and Treat Cancer

Company Contacts

David Hansen
President and CEO
dhansen@mabvax.com
858-259-9405 x 301

Gregory Hanson
Chief Financial Officer
gregoryhanson@mabvax.com
858-259-9405 x 303

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