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Company Report

October 10, 2016

VBI Vaccines Inc. (VBIV - $3.19)

Healthcare / Biotechnology

Initiation of Coverage – A Leader in NexGen Vaccines

Ticker:	**VBIV**
Rating:	**Buy**
Price Target:	**$6.00**

We are initiating coverage of VBI Vaccines Inc. (VBIV) with a BUY rating and a $6 price target. VBIV is attempting to leverage its enveloped virus-like particle (eVLP) vaccine platform in the field of infectious disease to prevent cytomegalovirus (CMV), a significant unmet medical need as ~5,000 U.S infants per year develop permanent problems due to CMV. We expect Phase 1 interim data for CMV in 1H17, which if positive, could benefit VBIV's push into immune-oncology and Glioblastoma Multiforme (GBM Phase 1 start 1H17) as >90% of GBM tumors express CMV antigens. We also see the restructuring of already approved Sci-B-Vac for Hepatitis B virus (HBV) as an important value generator for VBIV and we expect a Phase 3 data readout in 2H18. Finally, we view their LPV Thermostability Platform (LPV) as another interesting asset as the recently signed Sanofi and GlaxoSmithKline collaborations attest to the real potential of developing a thermostable vaccine delivery platform like LPV. With multiple catalysts over 2H16 - 2017 targeting unmet medical needs, we believe VBIV is an exciting undiscovered opportunity. We are initiating with a Buy rating, and a $6 price target.

- **Huge market opportunity for CMV patients.** With no prophylactic CMV vaccine approved and with CMV affecting more live births than Down Syndrome or Fetal Alcohol Syndrome, VBI-1501A's interim data in 1H17 is highly anticipated and could help de-risk VBIV's GBM program too.

- **Sci-B-Vac for HBV targets large EU and US markets.** VBIV has re-launced in Israel and expects to start US & EU registration trials in 2H17 targeting a $250M US market for HBV vaccines.

- **LPV Platform early but attractive to vaccine giants.** Both Sanofi and GSK have signed on to develop the LPV thermostable vaccine delivery platform which Is nice validation from larger pharma partners.

- **Initiate with a Buy rating $6 price target.** Our price target is based on Sci-B-Vac at $3/share, CMV & GBM at $1/share, and cash (end '17E) & tech at $2/share.

Trading Data:

Last Price (10/07/2016)	$3.19
52–Week High (06/10/2016)	$4.40
52–Week Low (10/07/2016)	$3.07
Market Cap. (MM)	$115.3
Shares Out. (MM)	38.12

Earnings Estimates: (per share)

	1Q	2Q	3Q	4Q	FY	P/E
FY18E	(0.14)	(0.13)	(0.10)	(0.09)	(0.45)	NA
FY17E	(0.18)	(0.13)	(0.13)	(0.12)	(0.55)	NA
FY16E	(0.14)A	(0.21)A	(0.18)	(0.18)	(0.73)	NA
FY15					(0.63)	NA

Source: Laidlaw & Company estimates

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Summary and Investment Thesis

We are initiating coverage of VBI Vaccines Inc. (VBIV) with a BUY rating and a $6 price target. VBIV is attempting to leverage its enveloped virus-like particle (eVLP) vaccine platform in the field of infectious disease to prevent cytomegalovirus (CMV), a significant unmet medical need as ~5,000 U.S infants per year develop permanent problems due to CMV. We expect Phase 1 interim data for CMV in 1H17 which, if positive, could also serve to benefit VBIV's push into immune-oncology and Glioblastoma Multiforme (GBM Phase 1 start 1H17) and medulloblastoma as >90% of both GBM and medullablastoma tumors express CMV antigens. We also see the restructuring of already approved Sci-B-Vac for HBV as an important value generator for VBIV and we expect a Phase 3 US & EU registration trial to start in 2H17 with data potentially by 2H18. Sci-B-Vac has already been re-launched in Israel in 3Q16 following a manufacturing mishap, but at a pricing level that limits real contribution to VBIV's bottom line. The last program at VBIV is an early stage, yet interesting, LPV that uses a freeze drying process that is designed to make vaccines thermally stable at room temperature and could have broad application. Vaccine giants Sanofi and GlaxoSmithKline have signed on to collaborate in the development of LPV, attesting to the real potential of developing a thermostable vaccine delivery platform. With multiple catalysts over 2H16 - 2017 targeting unmet medical needs, we believe VBIV is an exciting undiscovered opportunity and we are initiating with a Buy rating, and a $6 price target.

Figure 1. Upcoming Potential Catalysts

Event	Expected Timing
Regulatory feedback from EU/US reg.bodies for Sci-B-Vac	4Q16-1Q17
Start Registration Phase 3 Sci-B-Vac	2Q17/3Q17
CMV (VBI-1501A) interim look	2Q17
GBM Phase 1 initiation	2Q17
IND filings of undisclosed compounds	2H17

Source: Company reports; Laidlaw and Company estimates

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Valuation

We value VBIV at $6 based on our expectations for Sci-B-Vac for HBV, VBI-1501A for CMV, their GMB program as well as technology and cash value. We project a 2020 launch of Sci-B-Vac with worldwide sales reaching $115M by year 6 of launch. We put a 4.5x multiple on our 2025 Sci-B-Vac sales, discounted back 8 years at 20% (to account for the risk associated with the Phase 3 trial) for our $3/share value. We project a 2023 launch of VBI-1501A for CMV with worldwide sales reaching over $200M mark by year 5 of launch with a 17% royalty to VBIV from the anticipated partner. Given that royalties drop straight to bottom line as cash, we place a 12x multiple on our anticipated $37M in VBI-1501A royalties in 2027, discounted back 10 years at 35% for our $0.50/share value. We project launch for GBM with worldwide sales also reaching over $200M by year 5 of launch with a 17% royalty to VBIV from the anticipated partner. We place a 12x multiple on our anticipated $22M in royalties in 2027 discounted back 10 years at 35% for our $0.50/share value. We value cash (end of '17E) & the underlying technology value of VBIV at $2/share.

Figure 2. Sum-of-the-Parts Analysis

Sum-of-the-parts valuation		
Segment	Valuation (000's)	Per share value
Sci-B-Vac	$120,354	$3.00
CMV: VBI-1501A	$21,916	$0.50
Glioblastoma	$21,814	$0.50
Cash (end of '17E) & tech	$68,384	$2.00
	$232,468	**$6.00**
2017 fully diluted shares out (000)		38,119

Source: Company reports; Laidlaw and Company estimates

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Company Description

VBI Vaccines (VBIV) is a biotechnology company developing safe and effective vaccines that expand and enhance vaccine protection in both established and emerging markets. In 2Q16, VBIV and Scivac Therapeutics completed their merger. The merger turned VBIV into a commercial stage company with an approved HBV vaccine (Sci-B-Vac), a pipeline of preventative and therapeutic vaccine candidates, and two novel technology platforms.

VBI's eVLP vaccine platform allows for the design of enveloped virus-like particle (eVLP) vaccines that closely mimic the target virus. eVLPs are designed to mimic the organization and conformation of viruses as they occur in nature, but without the viral genome, potentially yielding safer and more potent vaccine candidates. Because of their structural similarity to viruses found in nature, vaccination with a target protein expressed in an eVLP is capable of imparting greater immunity than vaccination with the same recombinant target protein alone. While VBIV is focused first on applying its eVLP technology to develop a vaccine to prevent cytomegalovirus (CMV) infection and Zika Virus, it is also looking to apply this technology in immuno-oncology in glioblastoma multiforme (GBM) and medulloblastoma.

The company's second platform is a thermostable technology that enables the development of vaccines and biologics that can withstand storage or shipment at constantly fluctuating temperatures. VBI's Lipid Particle Vaccine technology (LPV), is a vaccine formulation technology that enables the thermostabilization of vaccines through a proprietary formulation and freeze-drying process, allowing vaccines and biologics to preserve stability, potency, and safety. Many vaccines and biologics are highly sensitive to temperature and physical stress, and many must be stored between 4°C and 8°C to preserve their integrity. Without proper storage, exposure to elevated or freezing temperatures can lead to a loss in potency or reduced safety, limiting protective benefits or therapeutic effects.

SciVac merger – Sci-B-Vac for Hepatitis B

Hepatitis B (HBV)

SciVac brings Sci-B-Vac, a licensed and marketed third-generation hepatitis B vaccine. Sci-B-Vac is a commercial stage HBV vaccine that mimics all three viral surface antigens (S protein, Pre-S1, Pre-S2) of the hepatitis B virus and is free of any next-generation adjuvant. Sci-B-Vac offers rapid onset of protection, high levels of anti-HBV antibodies, and can be administered at lower doses than competing HBV 2nd generation vaccines that only target the S protein and are expressed in yeast. GSK's Engerix B and Merck's Recombivax HB are the two currently marketed HBV vaccines in the U.S. While these vaccines have been found to reduce HBV infections, they do not work well in all patients

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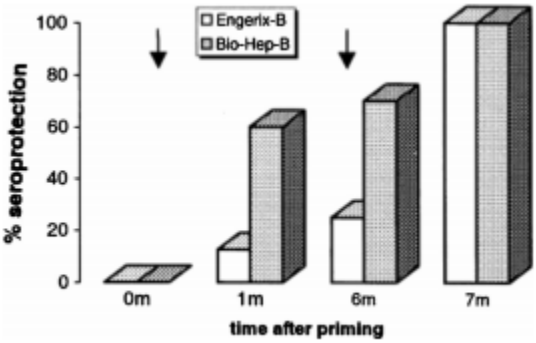
such as patients 40 years and older, obese patients, smokers, and patients with chronic illnesses. Patients who don't respond to the first series of hepatitis B vaccine usually complete a second three-dose vaccine series and are retested 1 to 2 months after completion of the second vaccine series. Less than 5% of people receiving six doses of hepatitis B vaccine administered by the appropriate schedule in the deltoid muscle fail to develop detectable antiHBs antibody. People who still fail to develop anti-HBs are usually chronically infected with HBV (CDC, 2013). From earlier studies, it is becoming evident that when compared to HBV vaccines, more than 50% of patients (neonates, children and young adults) treated with Sci-B-Vac develop seroprotection against HBV much more rapidly (Med Microbiol Immuno, 2015).

Figure 3: Sci-B-Vac rapid onset of seroprotection



Source: Med Microbiol Immuno, 2015

Sci-B-Vac is approved in Israel and in 14 other countries (most sales in Israel) and has demonstrated a favorable safety and efficacy profile in over 300,000 patients to date. VBIV plans to contribute to the growth of Sci-B-Vac and develop late-stage clinical trials to seek additional approvals in Europe, the U.S., Japan and other large markets. VBIV won't know the exact clinical trial design and timeline until they meet with the EU/US regulatory bodies to discuss a path forward. Their first priority will be EU and the US strategy will be influenced by the upcoming FDA decision around Dynavax's Heplisav (PDUFA 12/15/16). Heplisav combines Dynavax's proprietary TLR9 agonist and hepatitis B surface antigen in the attempt of getting efficient immune response after only two doses in one month vs. the six months of existing vaccines. TLR9 agonists have had issues in the past with safety which resulted in a complete response letter (CRL) in 2013 after a negative FDA advisory panel. After the CRL, Dynavax conducted a Phase 3 safety study vs Engerix-B and the entire data set from this was presented in 2Q16 showing a safety profile mostly in line with earlier studies without any new serious rare autoimmune AEs. Even if Heplisav gets approved, it is hard to overstate the size of this market and the potential for another mechanism of action to share the space. Sci-B-Vac had lower sales in 2015 because of a product recall due to damaged vials in unshipped packages. This damage was apparently caused by an automated labeling process, which was fixed in 3Q15 and commercial shipments have been recertified by the Israeli Ministry of Health.

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HBV and its significant market opportunities

Hepatitis B is an infectious illness of the liver caused by the hepatitis B virus. The hepatitis B virus is the major cause of liver disease worldwide. The World Health Organization estimates that two billion people (one-third of the world's population) have been infected by the hepatitis B virus. Of these, ~400M people have chronic infections that put them at high risk of ultimately developing cirrhosis and cancer of the liver and the death of liver tissue. There is no cure for chronic hepatitis B infection, and disease prevention through effective vaccines is critical to reducing the spread of the disease. The virus is transmitted by exposure to infected blood or body fluids, such as semen and vaginal fluids. Perinatal infection is a major route of infection in areas of the world where the disease is common. Other risk factors for developing hepatitis B infection include working in a healthcare setting, blood transfusions, dialysis, sharing razors or toothbrushes with an infected person, travel in countries where the virus is common and living in an institution. Tattooing and acupuncture led to a significant number of cases in the 1980s and still continue to be two of the causes of hepatitis B infection today due to the risk of using non-sterile needles. The hepatitis B virus is 50 to 100 times more infectious than HIV (CDC, 2016).

Specific treatments for viral hepatitis infection exist, but none of the available drugs can clear the infection. Instead, they can stop the virus from replicating, which minimizes liver damage. However, prevention of the disease by vaccination is the only effective medical measure for controlling the spread of the disease and decreasing illness and death due to hepatitis. Vaccines for the prevention of the hepatitis B virus have been routinely recommended for infants since 1991 in the United States. Most vaccines are given in three doses over a course of months. Seroprotection against the hepatitis B virus requires an anti-HBs antibody concentration of at least 10 mIU/ml in the recipient's serum.

The currently available HBV vaccines for prevention of the hepatitis B virus include: Engerix-B and Fendrix, manufactured by GlaxoSmithKline (GSK); Recombivax HB, manufactured by Merck (MRK); Elovac B, manufactured by Human Biologicals Institute, a division of Indian Immunologicals Limited; Gene Vac-B, manufactured by Serum Institute of India; and Shanvac-B, manufactured by Shantha Biotechnics Pvt Ltd, under Sanofi Pasteur. To date, only Engerix-B and Recombivax HB are approved by the FDA for immunization and distribution in the United States; however, the remaining companies above and other companies may seek approval from the FDA or other organizations, including the World Health Organization (WHO), for their respective vaccine products.

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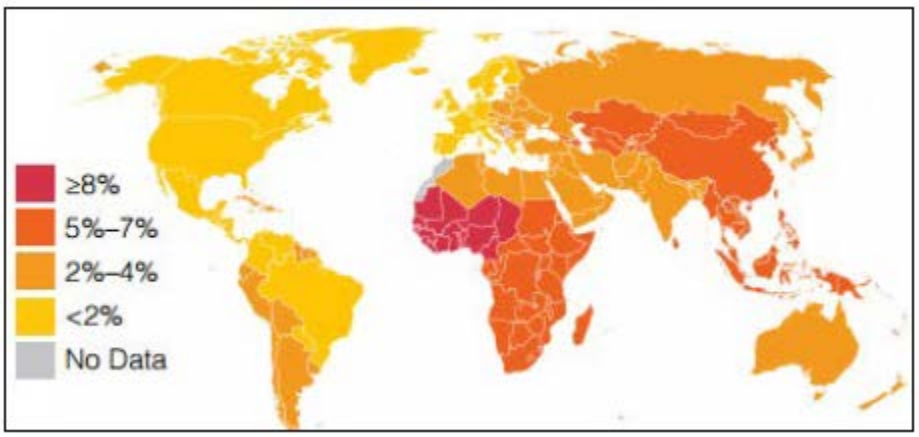
Figure 4: Global HBV Prevalence



Source: Vaccine 2012

Current therapies have shown limited effectiveness creating seroprotection in the dialysis population. An investigator-initiated study suggests that Sci-B-Vac is well-tolerated and highly immunogenic in the population of end-stage renal disease (ESRD) patients who have not responded to a second generation yeast-derived vaccine. They have also shown reduced efficacy of for individuals with suppressed immune systems such as those who suffer from diabetes, cancer, HIV, celiac disease and dialysis patients.

Due to the limitations of currently marketed HBV vaccines, we believe an untapped market opportunity exists for adult populations at higher risk of hepatitis B infection, such as immune-compromised persons and non-responders to currently marketed vaccines. Additionally, even if immune-compromised people receive one or more of the currently available vaccines, the patient's immune response may be inadequate, and, as a result, the vaccination may have to be repeated. For example, in the United States, the CDC recommends HBV vaccinations for all susceptible chronic hemodialysis patients, which is a population of over one million in the United States alone, yet 14%-33% of hemodialysis patients do not respond to the HBV vaccines currently available in the market, according to the CDC. Hemodialysis patients have a reduced response to vaccinations because of the general suppression of the immune system associated with uremia, a complication of chronic kidney disease, referred to as chronic kidney disease (CKD), and acute kidney failure.

In an investigator initiated clinical trial of ESRD patients who had not responded to four double-dose injections of Engerix-B (4x40 mcg), 86% (n=29) responded positively to three lower-dose injections of Sci-B-Vac (3x10 mcg). It should be noted that Sci-B-Vac achieves these seroprotection rates without the use of nextgeneration adjuvants, which are substances that enhance the body's immune response to an antigen, whose safety and efficacy profiles remain an open issue due to limited clinical history. Sci-B-Vac is adjuvanted only with alum, a commercially accepted adjuvant with robust safety data. We expect the further U.S. clinical studies to support efficacy of Sci-B-Vac in the pre-dialysis, HIV and diabetic subpopulations.

Sci-B-Vac shown rapid onset of immunity, as measured by levels of antibodies to the hepatitis B virus (anti-hepatitis B surface antigen (HBsAg)). The results

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of certain clinical trials conducted outside of the United States and not under an IND may suggest that two doses of Sci-B-Vac instead of the conventional three may be sufficient to induce adequate seroprotection. Possible Activity of Sci-B-Vac against emerging hepatitis B virus mutants. Second generation (i.e., single antigen) HBV vaccines, in combination with nucleoside analog-based therapy (antiviral drug therapy) of chronic hepatitis B, apply selective pressures on the hepatitis B virus in infected individuals, which leads to the generation and accumulation of mutations in the S antigen. The hepatitis B virus that contains these mutations is usually resistant to neutralization by antibodies raised by conventional second-generation HBV vaccines, which raise antibodies against the only S antigen. These mutations create public health concerns, as they can be responsible for reactivation of hepatitis B and what is referred to as occult hepatitis B infection. The prevalence of escape mutants, which means that hepatitis B infection may occur and/or may be transmitted to others, is growing; recent reports show up to 7% of the general population and up to 20% of liver transplant patients and HIV-infected individuals have hepatitis B virus escape mutants. VBIV believes that Sci-B-Vac may have the potential to maintain immune control in patients infected with hepatitis B virus escape mutants.

Enveloped Virus-Like Particle (eVLP) Platform

On August 11, 2011, VBIV acquired eVLP vaccine technology through the acquisition of ePixis. The eVLP vaccine technology allows for the expression of enveloped glycol-proteins within a lipid-bilayer membrane of a virus like particle (VLP). The technology enables the synthetic manufacture of an enveloped virus like particle (eVLP). Many viruses are enveloped in that they are surrounded by a lipid bilayer membrane. Such viruses display antigenic proteins in the surface of their “envelope” which can be targets for vaccine development. The ability to synthetically manufacture an enveloped virus like particle is different from previously developed VLP technologies, which did not include the lipid bilayer membrane, and thus these technologies were unable to express antigenic proteins within an envelope as they occur in nature. Unlike first-generation and second-generation VLP approaches, which have yielded successful vaccines such as GenHevac B and Engerix-B, Recombivax HB for HBV as well as Cervarix for HPV eVLP doesn’t limit the target virus (Vaccine, 2012). VBIV’s eVLP Platform provides a stable foundation that mimics enveloped viruses and is suitable for a wide array of vaccine candidates. eVLPs are an innovative new class of synthetic vaccines that are designed to closely mimic the structure of viruses.

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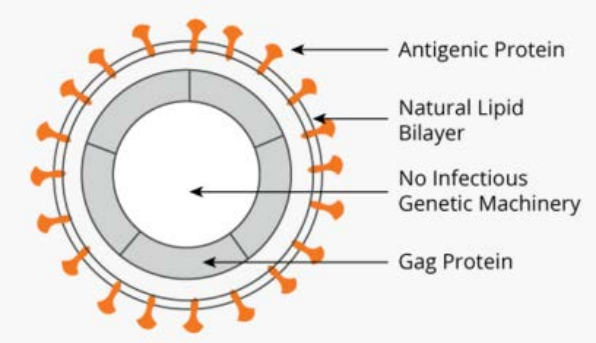
Figure 5: eVLP Vaccine Components and Design



Source: Company Website

The eVLP platform consists of third-generation virus-like particle vaccines that closely mimic the structure of target viruses with potential preventative and therapeutic vaccine applications.

Figure 6: Evolution of Virus-like particle vaccines

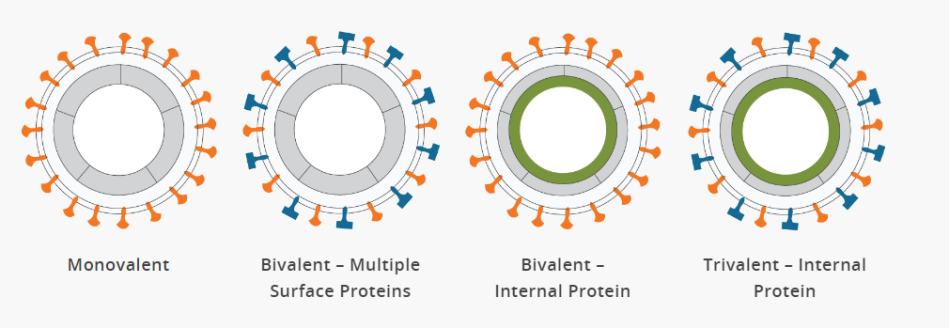
	First-Generation	Second-Generation	Third Generation (eVLP Platform)
Design	Antigens are prodiced and self-assemble	Antigens of interest	Common protein backbone and lipid membrane in which the antigen of interest can be expressed
Advantage(s)	Simple structures and repetitive pattern of antigenic epitopes	Can be applied to multiple different target antigens; VLP structure is not limited to the properties of the antigen	Enables more natural presentation of target antigen within a membrane that more closely mimics a virus; can express multiple target antigens in a single VLP.
Limitation(s)	Only a very limited number of antigens spontaneously form orderly VLP structures; cannot be applied to all enveloped viruses.	Antigen of interest is artificially bound to the structural protein and not represented in a natural configuration	Additional process knowledge needed to meet FDA/EMA purification.

Source: Company Presentation / Laidlaw Reports

The platform's lead program is a vaccine to prevent CMV infection that has completed preclinical proof of concept. VBIV is also exploring additional (undisclosed) eVLP candidates for development. eVLP Vaccines are highly immunogenic since eVLP immune responses are comparable to or better than a natural infection by closely mimicking the structure of the target virus. They are customizable because they provide the ability to rationally design a vaccine by including different antigens and controlling their relative expression. eVLP vaccines are also safe since unlike live-attenuated vaccines, they cannot revert back to an infectious state. Also, they are commercially viable since unlike

some vectored delivery approaches, eVLP-based vaccines are manufactured and purified using scalable methods, and VBIV has demonstrated commercially-suitable yields.

Figure 7: Customizable Design to tailor the immune response



Source: Company Website

eVLPs are produced after transient transfection of cells with plasmids encoding the murine leukemia virus ("MLV") Gag and target surface or internal proteins of interest. MLV Gag expression induces "building" of particles from membrane of transfected cells; the target protein of interest is incorporated into the outer envelope during the budding process. eVLPs are purified using a process designed to yield material with acceptable residual host cell impurities. Batch consistency is demonstrated using an in vivo potency release assay.

Infectious Disease

Cytomegalovirus (CMV)

VBIV is developing a prophylactic vaccine to prevent cytomegalovirus ("CMV") infection, a leading cause of serious birth defects in newborns when a mother is infected during pregnancy. Based on preclinical data, VBIV has completed work for GMP manufacturing of its lead candidate VBI-1501A for use in Phase I trials; VBIV expects to evaluate safety, tolerability, and also immunological proof of concept in humans during Phase I trials by measuring CMV neutralizing antibodies in fibroblasts and epithelial cells. Phase 1 started in 2Q16 with a 20 month expected time to completion and an interim look in 1H17. Following the interim look, VBIV intends to partner up for continued development.

Figure 8: Safety and Tolerability of VBI-1501A CMV Candidate

Phase 1: Safety and Tolerability of VBI-1501A	
Aim	Safety and Tolerability of VBI-1501A CMV Candidate.
Design	Staggered Enrollment with Vaccinations at 0, 2, and 6 months for 20 months duration
Dosing - started 6/23/16	5 groups of 25 patients. Group 1: 0.5µg (gB content/dose) VBI-1501A (gB-G eVLPs +alum); Group 2: 1.0µg VBI-1501A; Group3: 2.0µg VBI-1501A; Group 4: 2.µg VBI-1501 (unadjuvanted gB-G eVLPs); Group 5: Placebo (buffer/sucrose used for VBI-1501 suspension.
Endpoints	1': Safety and Tolerability; 2': level of anti-CMV nAb in Fibrobalsts/Epithelial Cells; glycoprotein B (gB) binder titers (ITR), gB avidity measurement
Patients	~125 CMV-seronegative healthy adults (18-40 yrs)
Results	Interim potency data available 1 month after second immunization 1H17 and final data 1H18.

Source: Company Reports

CMV is a common virus that infects one in every two people in many developed countries. Most CMV infections are "silent", meaning most people who are infected with CMV exhibit no signs or symptoms. However, CMV can cause serious disease in newborns when a mother is infected during pregnancy – this is known as congenital CMV infection. Each year, approximately 5,000 U.S (CDC, 2013) infants will develop permanent problems due to CMV, including deafness, blindness, and mental retardation. In the U.S., congenital CMV infection is the most common intrauterine infection with direct annual costs of over $1B (PLoS Neglected Tropical Diseases, 2011). CMV affects more live births than Down Syndrome or Fetal Alcohol Syndrome, making it a key public health priority and a strong candidate for recommended universal vaccination among certain high-risk populations. VBIV's eVLP Platform gives rise to a CMV vaccine candidate capable of generating a potent and durable immune response.

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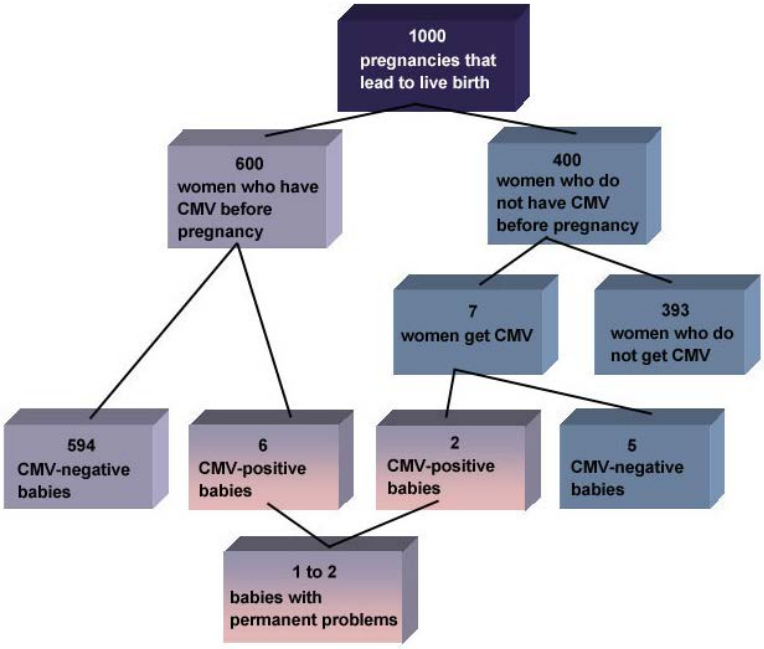
Figure 9: U.S. Children Affected by CMV



Source: J Clin Virol, 2009

In the process of clearing CMV infection, neutralizing antibodies (nAbs) against glycoprotein B (gB) enables protective immunity. Although past experiences have struggled to show high-titer and durable nAbs in both epithelial cells and fibroblasts, VBIV's preclinical data has been very encouraging. On top of the eVLP approach, which provides fluidity from the lipid bilayer, VBIV has engineered a gB antigen attached to a transmembrane and cytoplasmic domain of a G protein giving rise to the gB-G eVLP, which improved nAb response and prevented epithelial cell infection. There was neutralization in fibroblasts and epithelial cells, which are the two clinically-relevant cell types that are susceptible to CMV infection, and there were also durable and high titer antibodies anticipated to impart long-lasting immunity in vaccine recipients. In the mouse model, gB-G eVLP is the best inducer of nAbs especially in epithelial cells as Cytogam was used as a positive control (Part A, Figure X). In another batch of gB-G eVLP, nAbs of epithelial cells showed statistically significant ($p<0.001$) for gB-G eVLPs (Part B, Figure X).

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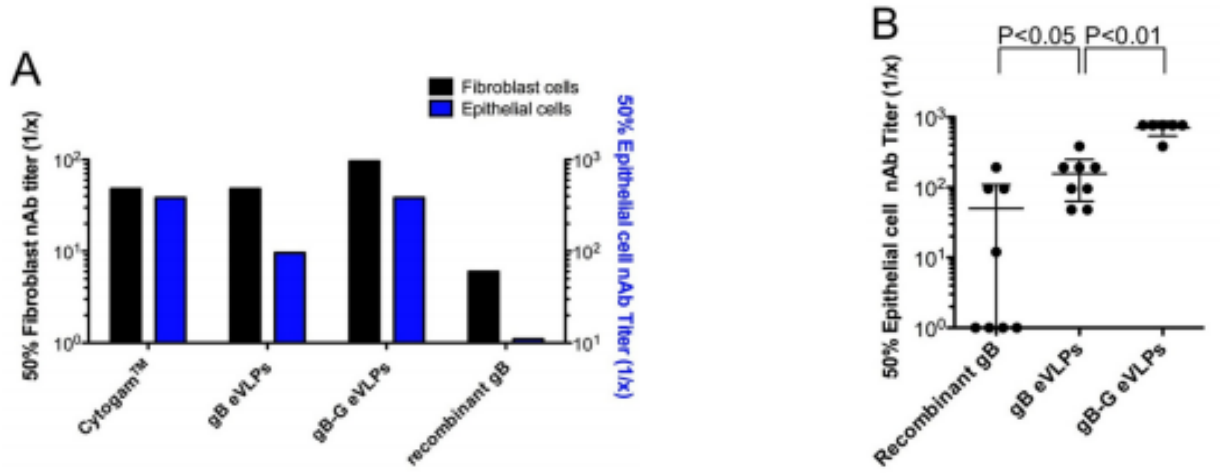
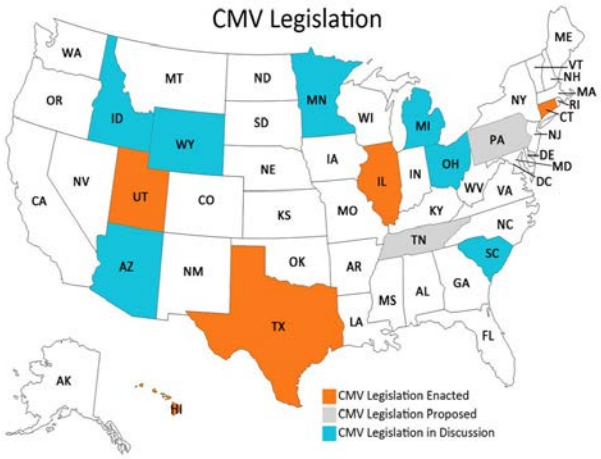
Figure 10: A) gB-G eVLP as best inducer of nAbs in mouse model; B) gB-G eVLP as top inducer of nAbs in epithelial cell in mice



Source: Clinical and Vaccine Immunology, 2014

While CMV infections are mostly undetected since the majority of affected infants are asymptomatic at birth, recent evidence suggests that routine screening of newborns could allow infected infants to receive consistent monitoring and treatment if necessary to ultimately increase their chances of proper development. Empowered CMV families from across the nation have teamed up with professionals and politicians in several states in hopes of making a difference with CMV legislation. Legislation has effectively passed in 6 states, with additional states in progress. In 2013, the Utah legislature passed the CMV Public Health Initiative. Connecticut, Hawaii, Illinois, Texas and most recently, Tennessee have followed suit. Idaho, Michigan, Minnesota, Pennsylvania, South Carolina and Wyoming are currently working through CMV legislation.

Figure 11: CMV Legislation by State



Source:National CMV foundation, 2016

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Competition

There are currently no prophylactic CMV vaccine approved for congenital infection making the market wide open. The main competition for VBIV could come from Merck's v160-001 (Phase 1), Pfizer's Redvax, Hookipa's HB101, and Vakzine's VPM2001. Within the CMV vaccine space, VBIV has several key competitors, some of whom are further advanced with their CMV vaccine development. Among these, GSK, with adjuvanted, recombinant protein, gB-based vaccine was furthest advanced but does not appear to have progressed beyond the end of Phase 1 since 2012. Additionally, Merck has a highly potent vaccine based on a replication of defective CMV virus with and adjuvant and is currently enrolling for a Phase 1 clinical trial. Despite being behind Merck and GSK in terms of development. VBIV believes there are reasons why its CMV vaccine may have some advantages, including that: 1) VBIV's vaccine is based on the successful VLP category of vaccines, which has recently been used in the successful introduction of cervical cancer vaccines, 2) it is currently expected to use aluminum phosphate as an adjuvant, which has a more extensive history of safety through its inclusion in several pediatric vaccines, and 3) it has demonstrated competitive anti-CMV responses in preclinical animal models.

Zika Virus

On 7/19/16, VBIV announced their plan to use their eVLP Platform to develop a vaccine candidate to prevent Zika virus infection. VBIV is developing a bivalent Zika vaccine candidate consisting of E glycoprotein (found on the surface of Zika virus) and NS1 glycoprotien (secreted during Zika viral replication). Testing has confirmed the presence of E glycoproteins on the surface of its Zika eVLPs; the conformation was found to be suitable for receptor binding and cell entry. VBIV believes the resemblance of their Zika eVLPs target proteins shape to the virus in nature could potentially show potent immune response. They have begun testing in animal models to help validate the immunogenicity and protective potential of this approach. Zika is a flavivirus related to dengue, yellow fever, and West Nile. While the acute manifestations of Zika virus infection are typically mild, the disease has been associated with a number of neurological complications. There is scientific consensus that the Zika virus can cause congenital microcephaly, a condition where a child is born with a smaller than expected head due to abnormal brain development. Zika virus may also cause Guillain-Barre syndrome (GBS), a disorder in which the body's immune system attacks the nerves, leading to muscle weakness or, in severe cases, paralysis. Zika is spread primarily through the bite of an infected Aedes species mosquito, but some evidence suggests that it may also be transmitted sexually or during childbirth. In February 2016, the World Health Organization (WHO) declared Zika a Public Health Emergency of International Concern (PHEIC), saying that the virus was "spreading explosively" in the Americas. There is currently no vaccine to prevent Zika infection.

Immuno-Oncology

Glioblastoma multiforme (GBM)

VBIV has applied its eVLP Platform in the development of a glioblastoma multiforme ("GBM") therapeutic vaccine candidate. VBIV intends to create a GBM immunotherapy that will stimulate the patient's own immune system to identify and kill GBM cancer cells, with the goal of creating a commercially-

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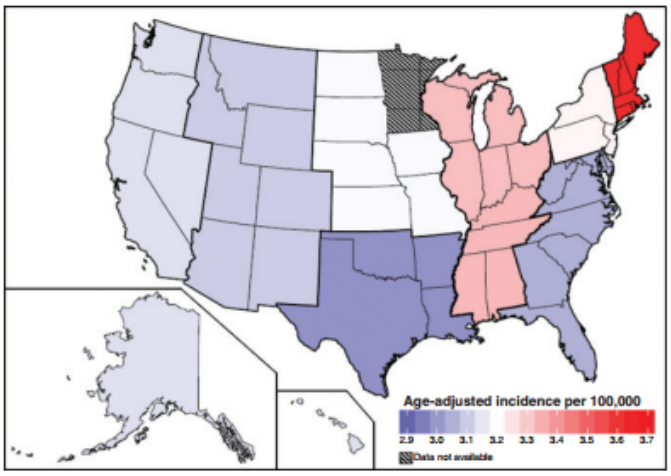
viable therapy that is more effective and tolerable than current treatments. Columbia University's Brain Tumor Center is performing research to evaluate VBIV's GBM immunotherapy candidate in ex vivo studies using GBM patient samples.

Glioblastoma is among the most common and aggressive malignant primary brain tumors in humans. In the U.S., the average annual age-adjusted incidence rate of GBM is 3.19/100,000 population making it the highest incidence rate among brain and CNS tumors with malignant behavior (CBTRUS, 2013). Incidence is highest in the northeast and lowest in the south-central region of the U.S (Fig. 12).

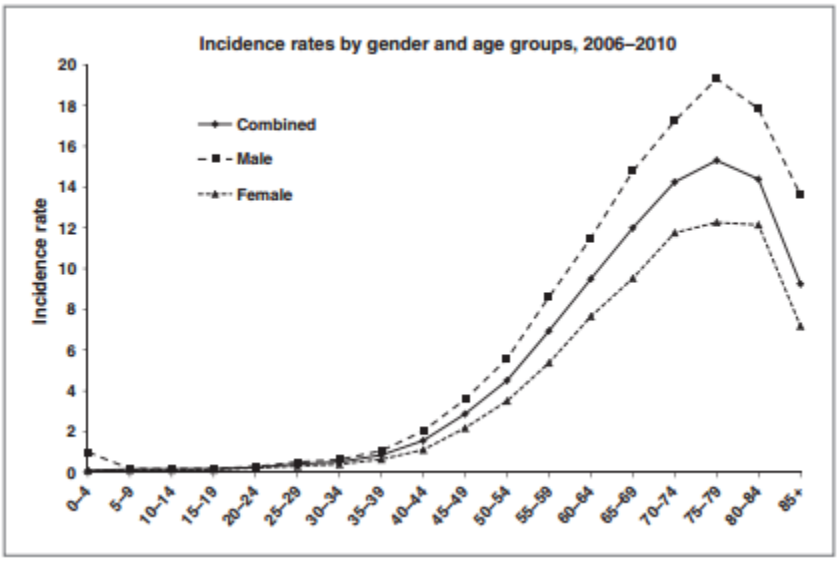
Figure 12: Incidence of GBM by state



Source: Cancer, Epidemiology, Biomarkers & Prevention, 2014

GBM is mostly diagnosed at older ages with the median age of diagnosis of 64 years old (CBTRUS, 2013). While uncommon in children, the incidence continues to rise with increasing age, peaking between 75 to 84 years of age.

Figure 13: Incidence of GBM by gender and age



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Source: Cancer, Epidemiology & Prevention, 2014

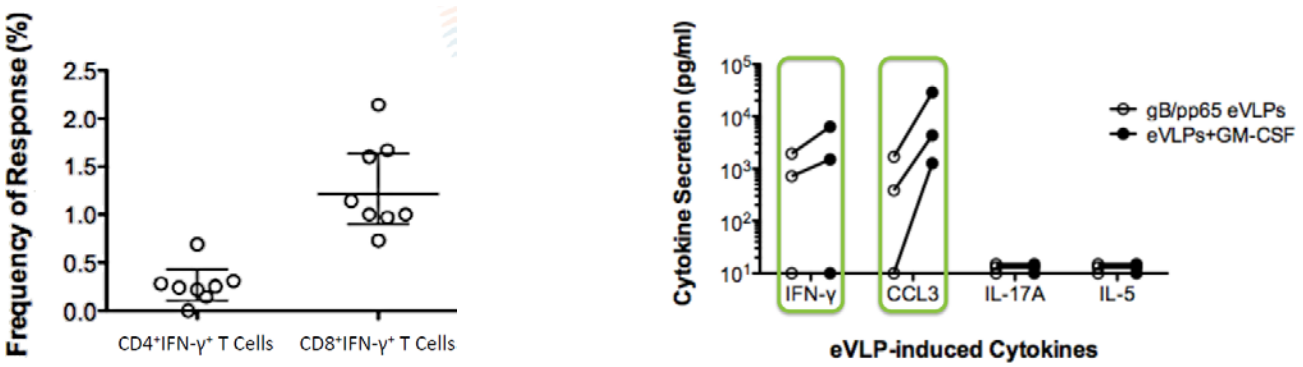
With the highest number of cases of malignant tumors, there are an estimated 12,120 new cases of GBM predicted in 2016 (American Brain Tumor Association, 2015). The current standard of care for GBM is surgical resection, followed by radiation and chemotherapy. Even with aggressive treatment, GBM progresses rapidly and is exceptionally lethal, with median patient survival of less than sixteen months. A growing body of research has demonstrated that GBM tumors are particularly susceptible to infection by cytomegalovirus (CMV), with over 90% of GBM tumors expressing CMV antigens in multiple solid tumors, such as GBM (Curr Opin Oncol, 2013), medulloblastoma (J Clin Invest, 2011), meningioma (PLos ONE 9, 2013) and breast cancer (J Clin Virol, 2010).

In addition, recent research has demonstrated that with phosphoprotein 65 (pp65) to pulse primed dendritic cells can extend overall survival in patients with glioblastoma. It is interesting to note that greater than 90% of GBM contains CMV pp65 only present in the infected brain tissue. Recent advances in this field are promising, but there is still need for improved CMV vaccination approaches for GBM (Nature, 2015).

VBIV is leveraging its eVLP Platform and its expertise in CMV to develop a therapeutic vaccine candidate that has been designed to direct an immune response against glycoprotein B and pp65, two CMV antigens that are highly immunogenic targets during natural infection. The vaccine candidate includes an adjuvant that mobilizes dendritic function and enhances immunity. VBIV has demonstrated the ability to manufacture eVLPs with yields and purity that are expected to be suitable for vaccine production at a commercial scale.

Preclinical work with Columbia University evaluating the ability of its vaccine candidate (gB/pp65 eVLP) showed stimulation of both CD4+ and CD8+ T cell responses in peripheral blood mononuclear cells (PBMCs) harvested from healthy patients and patients with GBM (Figure 14). Anti-tumor CD4+ and CD8+ immune responses are critical to efficacious anti-tumor immunity. VBIV was also able to show stimulation of IFN-g and CCL3 (also correlated with enhanced tumor immunity) at similar levels found in PBMC samples of healthy volunteers and GBM patients when adjuvanted with human granulocyte-macrophage colony stimulating factor (GM-CSF). GBM trials should start as early as 1H17 around the interim look data from Phase 1 CMV trial and we expect data in the 1H18 followed by partnering for continued development.

Figure 14: Stimulation of $CD4^+$ and $CD8^+$ T Cells by gB/pp65 and IFN-g and CCL3 with GM-CSF adjuvant in PBMCs



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Source: Company presentation

Medulloblastoma

As of 6/16/16, VBIV announced that it was developing a novel therapeutic vaccine candidate for medulloblastoma. A grant from the Meghan Rose Bradley Foundation was given to VBIV to conduct research on VBIV's immunotherapy candidate in ex vivo studies with medulloblastoma patient samples. Medulloblastoma immunotherapy requires the identification of antigens, used to direct the immune response, that are consistently expressed on tumor cells. As mentioned previously, research has shown that medulloblastoma tumors (just like GBM) are particularly susceptible to infection by CMV as over 90% of some medulloblastoma tumors express CMV antigens. Also, antiviral therapies that inhibit CMV replication have been shown to reduce medulloblastoma tumor cell growth (in vitro and in vivo), which suggests that CMV may increase the malignancy of infected cells.

VBIV has developed VBI-1901, a bivalent therapeutic vaccine candidate designed to direct an immune response against gB and pp65, two CMV antigens that are highly immunogenic targets during natural infection. VBI-1901 includes granulocyte-macrophage colony-stimulating factor (GM-CSF), an adjuvant that mobilizes dendritic function and enhances Th1-type immunity. VBIV is evaluating the ability of VBI-1901 to stimulate CD4+ and CD8+ immune responses in peripheral blood mononuclear cells (PBMCs) harvested from healthy patients with medulloblastoma; CD4+ and CD8+ immune responses are critical to efficacious anti-tumor immunity. VBIV will also monitor several biomarkers predictive of clinical efficacy.

LPV Platform

Vaccines are typically sensitive to fluctuations in temperature that can degrade, destroy or inactivate the potency of a vaccine and introduce safety risks. As a consequence, 90% of vaccines are transported through a "cold-chain" of temperature controlled environments, transportation and storage. VBIV's Lipid Particle Vaccine technology, or LPV, is a vaccine formulation technology that enables the thermostabilization of vaccines through a proprietary formulation and freeze-drying process. The technology is constituted by three lipids, monopalmitoylglycerol (MPG), dihexadecyl phosphate (DCP) and cholesterol mixed in a proprietary ratio with vaccine antigen using a patented method. The resulting mixture is then lyophilized (freeze dried) and can be stored for extended periods of time outside of the cold-chain.

VBIV has active collaborations with a number of vaccine innovators and manufacturers, including with Sanofi and GlaxoSmithKline, two of the leading vaccine producers in the world. Sanofi is currently evaluating VBIV's LPV technology with one of its lead vaccine assets. Under the terms of the Sanofi Agreement, Sanofi can acquire certain rights to extend its use of the LPV technology to additional vaccine assets. On 2/9/16, VBIV also executed the GSK Agreement, which provides GSK with the rights to negotiate an exclusive

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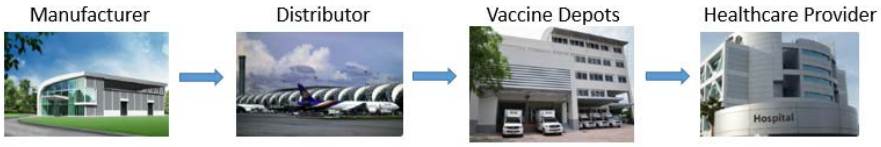
license to the LPV technology for use within a defined field. These two partnerships provide solid large-pharma validation of the underlying technology. Further terms of the collaboration were not disclosed.

Figure 15: Depiction of the cold-chain



Source: Laidlaw and Company estimates

LPV platform has long-lasting stability across a variety of conditions, demonstrated potency in multiple preclinical animal models and with formulations stored at 4°C and 40°C for up to one year. It can be used for either new or existing vaccines and has been used to preserve stability and potency of several classes of vaccine antigens and biologics, including protein-based, monoclonal antibodies, whole-inactivated, and live attenuated vaccines and viral vectors. It has a simple and scalable process.

LPV is important because vaccines and biologics vary greatly in their ability to remain viable during handling, storage, and administration. The stability of a particular vaccine formulation depends on many factors including the type of antigen (active ingredient) and the presence of other vaccine components such as adjuvants, stabilizers, and preservatives. Reliance on a cold chain increases vaccine costs by up to 20% and is a significant barrier to patient access in many emerging markets. In addition to maintaining the cold chain, there is a separate challenge of verifying any lapses in the chain to ensure the viability of the vaccine before it is administered, particularly in poor or remote areas. Moreover, the critical issue of public health safety and strict quality controls could drive demand for more stable vaccines and biologics by governments and global health organizations, even in areas where a cold chain already exists.

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Major Risks

Exogenous events could impact our outlook. We believe pharmaceutical companies have the least control over competitive, political, and regulatory risks. Although we have incorporated competitive assumptions into our forecasts, there may be other risks beyond the scope of our analysis. Changes in the drug reimbursement system, as well as any political or regulatory amendments, may significantly influence the earnings power of these companies.

Actual clinical results and the FDA's conclusions may deviate from expectations. Many of our assumptions are based on a review of incomplete clinical trial data available in the public domain. Often, our conclusions are drawn from early stage data, which may not be reflected by pivotal studies. Furthermore, the FDA's conclusions may not coincide with our own, materially changing our revenue and earnings assumptions.

Compliance issues, product recalls, and other mandates by regulatory authorities could materially change our expectations. Regulatory compliance issues, ranging from accounting irregularities to defective manufacturing practices, could materially change our assumptions and earnings outlook. Unanticipated product recalls and labeling changes could also have adverse consequences on our earnings assumptions.

Legal risks could lead to additional liabilities and revenue loss. In addition to the expenses incurred by patent challenges, product liability and other legal suits could occur and lead to additional liabilities and revenue loss, which could substantially change our financial assumption

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Management

Jeff Baxter, President and CEO. Mr. Baxter joined VBIV in September of 2009. Previously, he was a managing partner for the venture capital firm, The Column Group. Until July of 2006, Mr. Baxter was SVP, R&D Finance and Operations, of GlaxoSmithKline (GSK). In his 19 years of pharma experience, he has held line management roles in commercial, manufacturing and IT and the office of the CEO. His most recent position in R&D included responsibility for finance, pipeline resource planning and allocation, business development deal structuring and SROne (GSK's in-house $125m venture capital fund). He also chaired GSK's R&D Operating Board

David E. Anderson, Ph.D., Chief Scientific Officer. A dynamic and well-published immunologist with broad expertise in the areas of vaccine development, autoimmunity and tumor immunology, Dr. Anderson joined VBIV full time in 2009 from Harvard Medical School, where he held a position as Assistant Professor. As a co-founder and Chief Scientific Officer of VBIV, Dr. Anderson is an inventor of much of the Company's intellectual property and actively manages its ongoing expansion. Dr. Anderson holds a Ph.D. from Harvard University and a B.S. from the University of California at Davis.

Dr. Curtis Lockshin, CTO. Dr. Lockshin served as SciVac Therapeutics' Chief Executive Officer from September 2014 to May 2016, and joined VBI following the merger transaction. From October 2011 to February 2013, Dr. Lockshin served as Vice President of Corporate R&D Initiatives for OPKO Health, Inc., a multi-national biopharmaceutical and diagnostics company. Since April 2013, Dr. Lockshin has served on the board of directors of RXi Pharmaceuticals Corp., a biotechnology company focused on discovering and developing innovative therapeutics.

Egidio Nascimento, CA, CFO. Mr. Nascimento joined VBIV in 2005 with a wealth of experience in finance and accounting, having previously worked as VP of Finance at Genome Canada and as CFO of two start-up companies. Subsequent to starting and managing KPMG's New & Emerging Business group in Ottawa, he has focused his career on managing and securing financing for leading-edge technology and biotechnology companies.

Marc J. Kirchmeier, Ph.D., VP, Formulation Development. Dr. Kirchmeier joined VBIV in April of 2010. He comes to VBIV from Merck Research Laboratories, where he was a Director in Bioanalytical and Formulation Sciences. During his initial tenure, he was responsible for biologics formulation and later worked on biochemical and biophysical characterization of vaccines, proteins and carbohydrates. Dr. Kirchmeier's career has been very focused on biopharmaceutical formulation and delivery. Prior to VBIV and Merck, he was a Scientist at Corixa Corporation, now GlaxoSmithKline, where he formulated monoclonal antibodies in addition to particulate and adenoviral vaccines. Dr. Kirchmeier holds a Ph.D. in Chemistry from Oregon State University and a B.S. in Biochemistry from Western Washington University.

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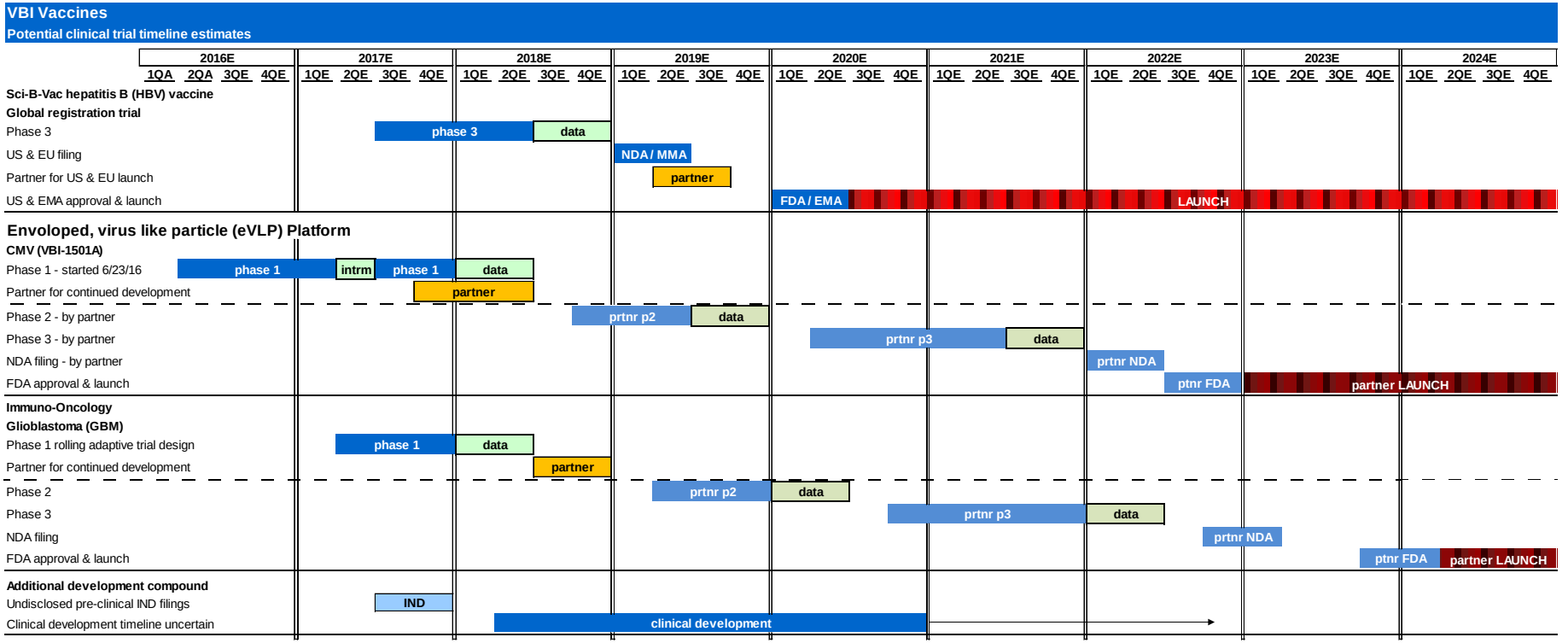
Figure 16: Potential clinical trial timelines



Source: Company reports; Laidlaw & Company estimates

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Figure 17: Quarterly Income Statement

VBI Vaccines
Quarterly income statement

($000's except per share)	2015A Year	2016E 1QA	2016E 2QA	2016E 3QE	2016E 4QE	2016E Year	2017E 1QE	2017E 2QE	2017E 3QE	2017E 4QE	2017E Year
Revenues											
Sci-B-Vac revenues	$396			$25	$25	$50	$150	$850	$1,250	$1,750	$4,000
Services revenues			$50	10	10	70	10	10	10	10	40
Collaboration revenue		$48	32	15	15	110	15	15	15	15	60
Total sales	**$396**	**$48**	**$82**	**$50**	**$50**	**$230**	**$175**	**$875**	**$1,275**	**$1,775**	**$4,100**
COGS		377	703	250	250	1,580	250	250	250	250	1,000
Gross margin	**396**	**(329)**	**(621)**	**(200)**	**(200)**	**(1,350)**	**(75)**	**625**	**1,025**	**1,525**	**3,100**
SG&A	6,477	1,980	3,138	3,000	3,000	11,118	3,000	3,000	3,250	3,250	12,500
R&D	7,075	254	2,123	2,150	2,250	6,777	2,250	2,250	2,500	2,500	9,500
Operating income/(loss)	**(13,156)**	**(2,563)**	**(5,882)**	**(5,350)**	**(5,450)**	**(19,245)**	**(5,325)**	**(4,625)**	**(4,725)**	**(4,225)**	**(18,900)**
Interest expense	(356)	(25)	(3)	(5)	(5)	(38)	(5)	(5)	(5)	(5)	(20)
Income tax benefit/(loss)						0					0
Adj-Net income/(loss)	**(13,512)**	**(2,588)**	**(5,885)**	**(5,355)**	**(5,455)**	**(19,283)**	**(5,330)**	**(4,630)**	**(4,730)**	**(4,230)**	**(18,920)**
Forex gain/(loss)	41	1,509	(531)	(500)	(500)	(22)					
Other non-cash	(450)					0					
Net income/(loss) as reported	**(13,920)**	**(1,079)**	**(6,416)**	**(5,855)**	**(5,955)**	**(19,305)**					
Adj-EPS ex-non-cash	**($0.63)**	**($0.14)**	**($0.21)**	**($0.18)**	**($0.18)**	**($0.73)**	**($0.18)**	**($0.13)**	**($0.13)**	**($0.12)**	**($0.55)**
EPS as reported	**($0.65)**	**($0.06)**	**($0.23)**	**($0.20)**	**($0.20)**	**($0.73)**					
Shares out (000)	21,439	18,915	27,619	29,119	29,619	26,318	30,119	35,619	36,119	36,619	34,619
Fully diluted shares (000)	21,439	18,915	30,740	32,369	32,869	28,723	33,619	39,119	39,619	40,119	38,119

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

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Figure 18: Annual Income Statement

VBI Vaccines
Annual income statement

($000's except per share)	2015A	2016E	2017E	2018E	2019E	2020E	Comments
Revenues							
Sci-B-Vac revenues	$396	$50	$4,000	$6,000	$8,000	$10,000	2H21 EU & US launch
Services revenues	0	70	40	60	70	100	
Collaboration revenue	0	110	60	80	90	100	
Total sales	**$396**	**$230**	**$4,100**	**$6,140**	**$8,160**	**$10,200**	
COGS	0	1,580	1,000	1,000	1,000	1,000	
Gross margin	**396**	**(1,350)**	**3,100**	**5,140**	**7,160**	**9,200**	
SG&A	6,477	11,118	12,500	13,500	13,000	13,750	
R&D	7,075	6,777	9,500	10,250	11,500	11,500	
Operating income/(loss)	**(13,156)**	**(19,245)**	**(18,900)**	**(18,610)**	**(17,340)**	**(16,050)**	
Interest expense	(356)	(38)	(20)	(20)	(20)	(20)	
Income tax benefit/(loss)	0	0	0	0	0	0	
Adj-Net income/(loss)	**(13,512)**	**(19,283)**	**(18,920)**	**(18,630)**	**(17,360)**	**(16,070)**	
Non-cash comp	41	(22)					
Net income/(loss) as reported	**(13,920)**	**(19,305)**					
Adj-EPS ex-non-cash	**($0.63)**	**($0.73)**	**($0.55)**	**($0.45)**	**($0.35)**	**($0.30)**	
EPS as reported	**($0.65)**	**($0.73)**					
Shares out (000)	21,439	26,318	34,619	41,369	49,181	52,744	
Fully diluted shares (000)	21,439	28,723	38,119	44,869	52,931	56,744	
Cash	$12,476	$11,018	$18,384	$46,917	$51,242	$32,222	

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

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Figure 19: Balance Sheet

VBI Vaccines
Balance sheet

($000's except per share)	1Q16A	2Q16A	2016E	2017E	2018E	2019E	2020E
Current Assets							
Cash and equivalent	$10,960	$21,808	$11,018	$18,384	$46,917	$51,242	$32,222
Total Current Assets	**12,962**	**24,939**	**14,518**				
LT deposits	123	123	123				
Other LT	303	488	500				
PP&E	1,800	1,891	2,000				
Intangible assets	385	66,561	66,500	66,500	66,500	66,500	66,500
Goodwill		1,714	1,714				
Total Assets	**15,573**	**95,716**	**85,355**	**86,500**	**87,750**	**91,250**	**93,750**
Current Liabilites							
Total Current Liabilites	**3,136**	**6,861**	**8,150**	**9,061**	**8,750**	**11,751**	**13,752**
Liab for severence pay	373	340					
Deferrred revs	1,640	669					
Total Liabilities	**5,149**	**9,181**	**10,461**	**10,311**	**10,000**	**13,251**	**15,252**
Shareholders' Equity							
Common shares	44,369	122,251	125,000	135,000	145,000	150,000	175,000
Additional paid in capital	50,563	54,827	59,947	70,662	80,853	93,462	85,031
OCI reserves	(1,654)	(1,273)	(1,500)	(2,000)	(2,000)	(2,000)	(2,000)
Accumulated deficit	(82,854)	(89,270)	(108,553)	(127,473)	(146,103)	(163,463)	(179,533)
Total SE (deficit)	**10,424**	**86,535**	**74,894**	**76,189**	**77,750**	**77,999**	**78,498**
Total liabilities & SE	**15,573**	**95,716**	**85,355**	**86,500**	**87,750**	**91,250**	**93,750**

Source: Bloomberg LP; Company reports; Laidlaw & Company estimate

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Figure 20: Cash flow Statement

VBI Vaccines
Statement of cash flows

($000's except per share)	1Q16A	2Q16A	2016E	2017E	2018E	2019E	2020E
Operating Cash Flow							
Net Income/Loss	(1,079)	(7,495)	(19,283)	(18,920)	(18,630)	(17,360)	(16,070)
Depreciation & Amort	132	280	500				
Stock based comp		1,042	2,000				
Accrued debt discount							
Interest related party loan							
Accrued severence	16						
Change in working capital	(465)	(714)	(1,000)				
Cash from operations	**(1,396)**	**(6,887)**	**(17,783)**	**(21,920)**	**(23,630)**	**(20,610)**	**(18,820)**
Investing Activities							
PP&E	(106)	(232)	(500)				
Cash aqc in busines combo		2,126	2,500				
Acquisition intangibles							
Restricted/ST deposits	(27)	(27)	(27)				
Cash from investing	**(133)**	**1,867**	**1,973**	**(125)**	**(150)**	**(175)**	**(200)**
Financing Activities							
Issuance common shares		13,610	13,610	29,411	52,313	25,110	
Loan - related parties	0						
Repay LTD		(150)	(150)				
Cash from financing	**0**	**13,460**	**13,460**	**29,411**	**52,313**	**25,110**	**0**
Change in cash	**(1,529)**	**8,440**	**(2,350)**	**7,366**	**28,533**	**4,325**	**(19,020)**
Cash, start of period	12,476	12,476	12,476	11,018	18,384	46,917	51,242
Forex	13	892	892				
Cash, end of period	**10,960**	**21,808**	**11,018**	**18,384**	**46,917**	**51,242**	**32,222**

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

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DISCLOSURES:

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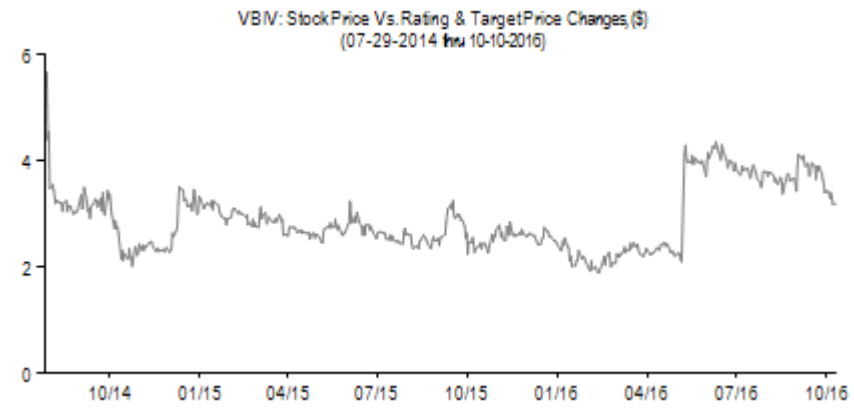
Additional information available upon request.

‡ Laidlaw & Company expects to receive or intends to seek compensation for investment banking services from the company in the next three months.

RATINGS INFORMATION

Rating and Price Target Change History



3 Year Rating Change History

Date	Rating	Closing Price ($)

3 Year Price Change History

Date	Target Price ($)	Closing Price, ($)

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

Laidlaw & Company Rating System*		% of Companies Under Coverage With This Rating	% of Companies for which Laidlaw & Company has performed services for in the last 12 months	
			Investment Banking	Brokerage
Strong Buy (SB)	Expected to significantly outperform the sector over 12 months.	2.56%	2.56%	0.00%
Buy (B)	Expected to outperform the sector average over 12 months.	58.97%	28.21%	2.56%
Hold (H)	Expected returns to be in line with the sector average over 12 months.	5.13%	0.00%	0.00%
Sell (S)	Returns expected to significantly underperform the sector average over 12 months.	2.56%	0.00%	0.00%

ADDITIONAL COMPANIES MENTIONED

Sanofi SA (SNY – Not Rated)
GlaxoSmithKline (GSK – Not Rated)
Merck (MRK- Not Rated)
Dynavax Technologies (DVAX – Not Rated)
Pfizer (PFE – Not Rated)

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