Zacks Small-Cap Research

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Grant Zeng, CFA
312-265-9466
gzeng@zacks.com

www.zacks.com
111 North Canal Street, Chicago, IL 60606

ImmunoCellular (IMUC-OTC)

IMUC: At the forefront of targeting cancer stem cells –maintaining an Outperform rating.

Current Recommendation	**Outperform**
Prior Recommendation	N/A
Date of Last Change	02/01/2011
Current Price (07/25/11)	$2.16
Twelve- Month Target Price	**$7.00**

OUTLOOK

IMUC is a clinical stage biotech company focused on the research and development of innovative cancer therapeutics. The Company's lead drug candidate ICT-107 is next generation cancer vaccine targeting cancer stem cells to prevent recurrence. ICT-107 has demonstrated best clinical data for glioblastoma so far and is under a Phase II trial. ICT-107 holds a high promise for glioblastoma and has potential for other cancers. IMUC also has a pipeline based on its off-the-shelf peptide vaccine technology and monoclonal antibody technology which ensures sustainable growth of the Company. IMUC is heading in the right direction and poised to deliver shareholder value.

SUMMARY DATA

52-Week High	**$2.55**
52-Week Low	**$1.37**
One-Year Return (%)	**N/A**
Beta	**N/A**
Average Daily Volume (sh)	**103,874**
Shares Outstanding (mil)	**28.0**
Market Capitalization ($mil)	**$60.5**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**15%**
Insider Ownership (%)	**35%**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2011 Estimate	**N/A**
P/E using 2012 Estimate	**N/A**
Zacks Rank	**N/A**

Risk Level	**N/A**
Type of Stock	**N/A**
Industry	**Med-Biomed/Gene**
Zacks Rank in Industry	**N/A**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2009	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A
2010	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A
2011	0.00 A	0.00 E	0.00 E	0.00 E	0.00 E
2012					0.00 E

Earnings per Share
(EPS is operating earnings before non recurring items)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2009	-$0.05 A	-$0.06 A	-$0.03 A	-$0.06 A	-$0.19 A
2010	-$0.05 A	-$0.09 A	-$0.09 A	-$0.03 A	-$0.25 A
2011	-$0.07 A	-$0.08 E	-$0.07 E	-$0.05 E	-$0.27 E
2012					-$0.32 E

Zacks Projected EPS Growth Rate - Next 5 Years % **N/A**

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WHAT'S NEW

New Data of ICT-107 Were Presented At ASCO 2011

On June 4 at this year's ASCO, IMUC reported new data from its Phase I study of ICT-107 in newly diagnosed glioblastoma multiforme **(GBM).** The new data showed that there is a correlation between the immunological response that ICT-107 generated in the form of antigens and both progression-free and overall survival. These observations suggest that targeting antigens highly expressed by cancer stem cells (CSCs) is a promising strategy for treating patients with glioblastoma.

ICT-107 targets six different antigens mainly targeting glioblastoma cancer stem cells. These antigens are HER-2, TRP-2, gp100, MAGE1, IL-13Rα2, and AIM-2. New data showed that all patients exhibited at least three of these antigens, and 75% exhibited all six. Correlations were observed between increased PFS and quantitative expression of MAGE1 (p=0.03), gp100 (p=0.05), AIM2 (p=0.003), and HER2 (p=0.04), the latter two of which are highly expressed by GBM CSCs.

Patients who demonstrated immunological response to vaccination with ICT-107 had longer PFS compared to non-responders. Responders also exhibited a trend toward longer OS. Patients who had recurrences after vaccination exhibited decreased levels of CD133, a biomarker of CSCs. In contrast, previous studies demonstrated an increase in CD133 expression in patients who underwent treatment with radiation and chemotherapy.

At a median analysis time of 32 months, 11 out of 16 patients in the trial were still alive (69%) and 6 out of 16 (38%) continued to be disease-free.

ICT-107 is the Company's lead cancer vaccine candidate for the treatment of glioblastoma multiforme (GBM). ICT-107 is the only cancer vaccine in clinical trials targeting cancer stem cells (CSCs).

Previously, IMUC reported outstanding Phase I efficacy data and safety profile of ICT-107 for GBM. In total of 16 newly diagnosed GBM patients, two year overall survival (OS) rates were 81% in the drug group compared with the historic median two-year survival rate of 26.5% with standard of care (SOC) alone. Median OS exceeded 30 months in the ICT-107 group compared with 14.6 months in the historical SOC group. The study's median progression-free (PFS) survival of 17.0 months also compared favorably to the historic median PFS of 6.9 months. No serious adverse events have been reported and minor side effects have been limited to fatigue, skin rash and pruritis.

Long-term data from the Phase I clinical trial showed 43.8% patients who received ICT-107 were disease-free at two years, with three of these patients (18.8%) remaining disease-free for more than three years. One of these patients remains disease-free after almost four years. No treatment-related serious adverse events have been observed to date.

There are three key messages we can get from the new data:

- All patients are being targeted by ICT-107 in terms of antigens IMUC is targeting.
- There is a correlation between cancer stem cell antigen levels and survival of these patients after treatment with ICT-107 indicating these tumors may be more susceptible to T-cell killing which ICT-107 induces.
- There is a decrease in CSC population in all the patients in which CSC could be measured after disease recurrence.

The above data from ICT-107 are very impressive and are the most compelling so far for the treatment of glioblastoma. This clearly validates the mechanism of action for ICT-107 which induces a T cell response against CSC and daughter cells which results in reduction in disease progression. Six out of 16 patients continue to be disease free which is quite spectacular in this disease.

Phase II Trial of ICT-107 Has Been Expanded

The Company initiated a **Phase II** trial of ICT-107 for the treatment of newly diagnosed GBM following resection and chemoradiation in January 2011. The Phase II trial is a double-blinded, placebo-controlled, 2:1 randomized study of ICT-107 in approximately 102 patients with newly diagnosed GBM.

The Company had initially planned to conduct the study at up to 15 clinical centers in the U.S. and Canada, but has increased the number of anticipated sites to 20 or more. ImmunoCellular has qualified 21 sites so far and has submitted the trial to 12 prospective sites' Institutional Review Board (IRB) for approval. Of these 12 sites, 6 have received their IRB approval.

The study is enrolling patients at medical institutions in collaboration with leading experts and opinion leaders in neuro-oncology at those sites. First patient was enrolled on January 31, 2011. The Company originally anticipated completing the enrollment approximately in 12 months. With the expansion of clinical sites, the enrollment could be accelerated. Interim analysis will be performed after 17 months (based on 50% events).

Patients will receive at least four intradermal injections of the ICT-107 vaccine and additional doses of vaccine during a maintenance phase until disease progression. The primary objective is to compare overall survival (OS) and progression free survival (PFS) in patients when treated with ICT-107 versus control.

Based on the positive Phase I clinical trial results, the probability of positive Phase II results is high. Unlike the Phase I which showed a 24 month increase in OS, a six month increase in OS would be considered successful and clinically relevant for this disease as the current standard of care increases OS by 2.5 months. Upon the successful conclusion of the Phase II study, IMUC anticipates a lucrative **partnering contract** with a major pharmaceutical or biotech company. The partnership may include a large sum of upfront payment, milestone fees and high royalties.

We maintain an Outperform rating on IMUC with a twelve month price target of $7 dollars.

KEY POINTS

- We maintain an Outperform rating for ImmunoCellular Therapeutics (IMUC) and reiterate our twelve-month price target is $7.00.
- IMUC is at the forefront of targeting cancer stem cells, the root cause of cancer and cancer recurrence. The Company holds two proprietary drug development platform technologies: active immunotherapy and monoclonal antibody technology. Both technologies target specific cancer antigens and cancer stem cells.
- The Company’s lead drug candidate is ICT-107, a personalized, dendritic cell-based vaccine for the treatment of glioblastoma. ICT-107 has demonstrated compelling efficacy data and safety profile in finished Phase I studies in patients with newly diagnosed glioblastoma. The Company just initiated a Phase II trial, and enrollment is expected to complete in 12 months.
- There is an unmet medical need for the treatment of glioblastoma. Relapse of glioblastoma is attributed to the recurrence and persistence of cancer stem cells. IMUC’s ICT-107 specifically targets cancer stem cells of glioblastoma, which may be an ultimate solution to treat glioblastoma more efficaciously with fewer side effects.

- ICT-107 works the same way as Dendreon's Provenge does, but has advantages over the first-in-class cancer vaccine approved by the FDA in terms of manufacturing convenience, easy logistics, potential less side effects, cost advantages and much larger addressable markets.

- The glioblastoma market is a multibillion dollar business. If ICT-107 ultimately reaches the market, it will command a huge market share of the GBM market due to its outstanding efficacy data and safety profile. This means a lot to a small biotech company like IMUC even with a few hundred million dollars in sales. With the Phase II trial underway, IMUC is one step closer to achieve its long term goal.

- The market potential is even greater if we consider that ICT-107 can also target other cancer indications, such as melanoma, breast cancer and ovarian cancer. If IMUC only develops ICT-107 for ovarian and GBM to be conservative, the potential market size for those two indications is huge.

- In addition to ICT-107, the Company's active immunotherapy technology also includes ICT-121, an off-the-shelf peptide cancer vaccine for glioblastoma and other cancer indications. Also on the pipeline are a series of monoclonal antibodies targeting specific cancer antigens/cancer stem cells. In spite of preclinical development, these candidates ensure sustainable growth of the Company in the long term.

OVERVIEW

ImmunoCellular Therapeutics, Ltd. (IMUC) is a development stage biotech company focused on research, development and commercialization of new therapeutics to fight cancer using the immune system.

IMUC holds two proprietary platform technologies to fight cancer and cancer stem cells. The first technology is **active immunotherapy technology**, which develops cancer vaccines to target specific cancer/cancer stem cells. The active immunotherapy technology includes dendritic cell (DC) -based vaccine (ICT-107) and off-the-shelf peptide vaccine (ICT-121).

The second technology is **monoclonal antibody technology (mAB)** which targets novel cancer antigens and CSCs. The mAB technology was acquired in February 2008 from Molecular Discoveries LLC. This technology consists of (1) a platform technology referred to as differentiated immunization for antigen and antibody discovery (DIAAD) for the potentially rapid discovery of targets (antigens) and monoclonal antibodies for diagnosis and treatment of diverse human diseases and (2) certain monoclonal antibody candidates for the potential detection and treatment of multiple myeloma, small cell lung, pancreatic and ovarian cancers.

Based on the above two platform technologies, IMUC has established a pipeline targeting a wild range of cancer indications. The Company's lead drug candidate is **ICT-107**, an active immunotherapeutic for the treatment of glioblastoma. In completed Phase I clinical trials, ICT-107 has demonstrated compelling efficacy data and safety profile. IMUC received the approval from the FDA to commence **Phase II** clinical trial for ICT-107 in early January 2011 and began to enroll patients early February 2011.

ICT-107, like Dendreon's Provenge, is an autologous, or personalized, dendritic cell-based vaccine that works by activating a patient's own immune system against specific tumor-associated antigens. This is accomplished by extracting dendritic cells from a patient, loading them with the antigens, and reintroducing them to the patient's body to trigger an immune response.

However, the Company's **ICT-121** is an off-the-shelf peptide-based vaccine that works by stimulating an immune response to CD-133, a protein that is over-expressed by many cancer cells. ICT-121 is still in **preclinical** studies.

In addition to the above two active immunotherapies, IMUC also has a series of **monoclonal antibodies** under **preclinical development** for the treatment and diagnosis of various cancer indications.

The Company was originally incorporated in Delaware in March, 1987 under the name Redwing Capital Corp and changed its name to Optical Molecular Imaging, Inc. in connection with the reverse merger on January 31, 2006 with Spectral Molecular Imaging, Inc. On November 2, 2006, the Company changed its name to ImmunoCellular Therapeutics, Ltd. to reflect the disposition of the Spectral Molecular Imaging subsidiary and the acquisition of the cellular-based technology from Cedars-Sinai Medical Center.

ImmunoCellular is headquartered in Woodland Hills, California.

INVESTMENT THESES

ImmunoCellular Reports 2011 First Quarter Financial Results

On May 16, 2011, ImmunoCellular Therapeutics (IMUC) reported financial results for the first quarter ended March 31, 2011.

IMUC generate no revenues during the three months ended March 31, 2010 and 2011. The Company does not expect to generate any operating revenues during 2011.

General and administrative expenses for the three months ended March 31, 2010 and 2011 were $451,197 and $553,721, respectively. The increase in general and administrative expenses is primarily due to increases in personnel costs, investor relations and professional fees. Included in personnel costs are bonuses tied to the achievement of certain clinical milestones.

Research and development expenses for the three months ended March 31, 2010 and 2011 were $179,695 and $917,214, respectively. The increase in research and development expenses is primarily due to increased costs associated with the commencement of Phase II clinical trials of ICT-107.

IMUC had $138,951 of non-cash expense for the three months ended March 31, 2010, consisting of $131,083 of stock based compensation, $6,960 of change in fair value of the warrant derivatives and $908 of depreciation expense. For the three months ended March 31, 2011, IMUC incurred $1,292,575 of non-cash expense consisting of $241,981 of stock based compensation, $1,046,991 of change in fair value of warrant derivatives, and $3,603 of depreciation expense.

Net loss was $768,462 and $2,758,271 for the three months ended March 31, 2010 and 2011, respectively.

As of March 31, 2011, IMUC had $11.3 million in cash and investment. At the same time, the Company had no long-term debt obligations, no capital lease obligations, no material purchase obligations or other similar long-term liabilities.

Cancer Stem Cells: The Root Cause of Cancer

Cancer treatment with therapeutics has made great progress in the past decade. Chemotherapy has long been the only option for oncologists to fight cancers. But the toxicities associated with chemotherapeutics have limited their use. While killing cancer cells, chemotherapeutic agents also kill healthy cells within the body making them highly toxic to humans. The situation changed when targeted therapy entered into the

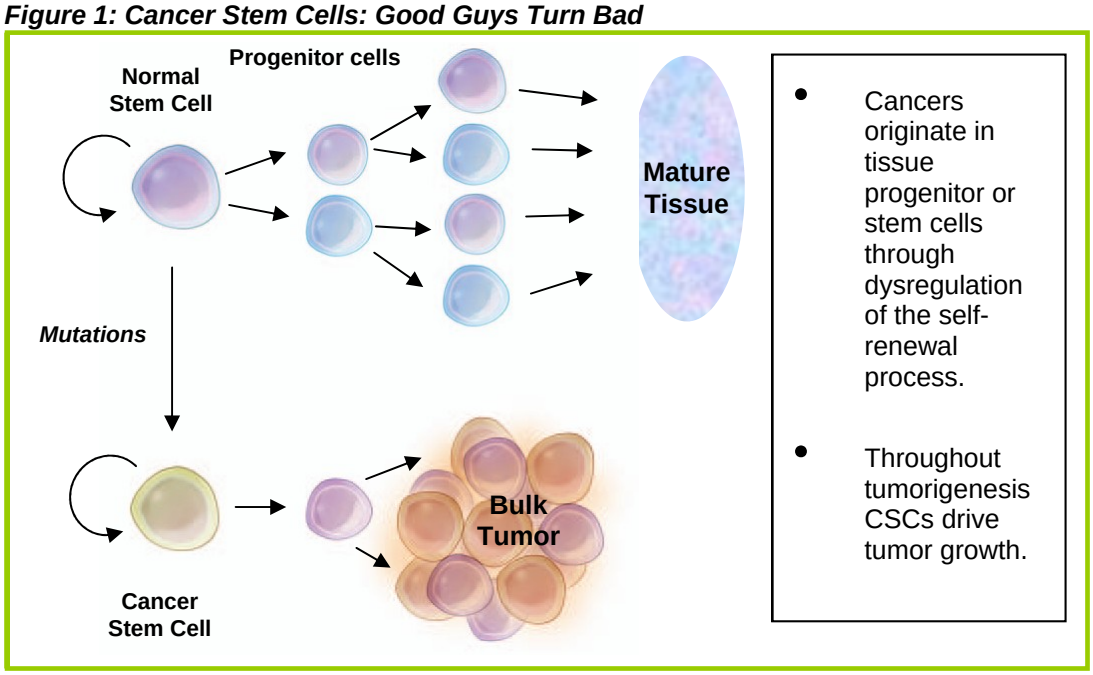
market a decade ago. Targeted therapeutic agents selectively kill cancer cells while leaving healthy cells unattacked. The combination of chemotherapy and targeted therapy has become the standard regime of cancer treatment currently.

However, the advent of targeted therapy has not solved the long existing, notorious problem of cancer treatment: relapse, or recurrence. The regenerative power of cancer has come to occupy the very center of cancer study. Scientists and clinicians have come to recognize that, for some cancers, this regenerative power appears to be driven by a specific cell type called **cancer stem cells (CSCs)** which is lurking within the cancer, capable of dormancy, growth and infinite regeneration. Since the groundbreaking work on cancer stem cells in 1994 by John Dick from the University of Toronto, scientists and clinicians have gained tremendous understanding of cancer stem cells.

Like regular stem cells in a body, cancer stem cells also possess incredible regenerative ability. But unlike a normal stem cell, a cancer stem cell could not stop regenerating, dividing and producing more cells. The finding of cancer stem cells may lead to a shift in cancer treatment strategy.
The discovery of cancer stem cells (CSCs) began a revolution in the cancer treatment paradigm. This revolution prompted groundbreaking research that gave rise to a new generation of cancer therapeutics designed to target what is widely believed to be the root cause of cancer.

Dubbed as the "evil cousin" of regular stem cells, CSCs are believed to generate tumors much in the same way that their relatives generate healthy tissue. Though CSCs appear to constitute a small portion of the overall tumor mass, their resistance to radiation and chemotherapy and ability to migrate from the original tumor site increase the chance of tumor recurrence. New treatments that effectively target and destroy these CSCs are therefore critical to ensuring long-term cancer-free survival.

Figure 1: Cancer Stem Cells: Good Guys Turn Bad



Source: Company presentation

IMUC is at the Forefront of Targeting Cancer Stem Cells

ImmunoCellular has two key technologies which specifically target cancer stem cells. One is **active immunotherapy** and another one is **monoclonal antibody technology**. IMUC's technologies utilize both arms of human immune system to fight cancers. The active immunotherapy uses the cellular (T-cell based) immune system to deploy special killers to target and destroy cancer cells while the monoclonal antibody technology uses the humoral (B-cell based) immune system to fight cancers.

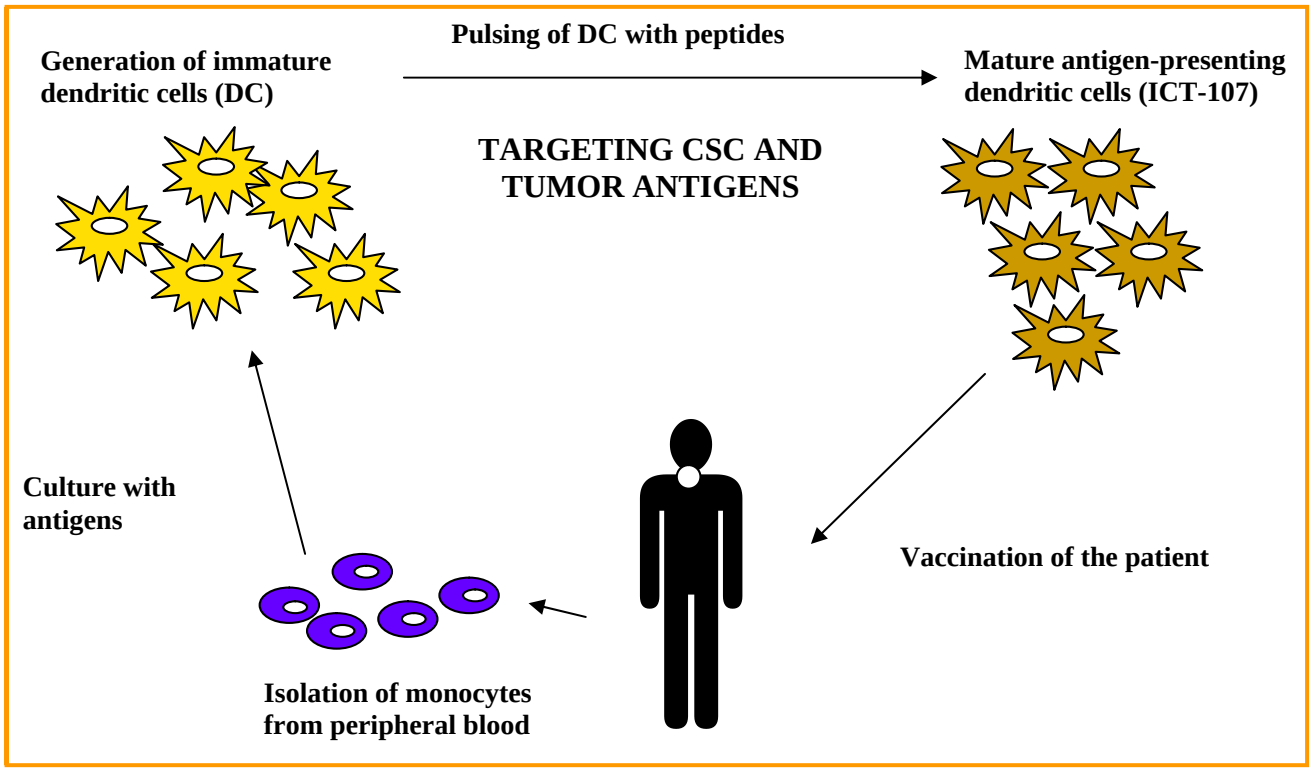
IMUC's product development strategy is to utilize both of these mechanisms to maximize the powerful synergies between the two immune systems. While active immunotherapies have the potential to provide long-term protection against cancer and prevent its recurrence, monoclonal antibodies can confer an immediate shield against the disease. This is especially important when the patient's immune system is compromised due to treatment, which can initially prevent an adequate cellular response. Both technologies have the potential to attack CSCs without harming healthy tissues.

The Active Immunotherapy Technology

IMUC's active immunotherapy technology includes cellular vaccine (ICT-107) and off-the-shelf peptide vaccine (ICT-121).

ICT-107 is an autologous, or personalized, **dendritic cell-based vaccine** that works by activating a patient's immune system against specific tumor-associated/CSCs antigens. This is accomplished by extracting dendritic cells from a patient, loading them with the antigens, and reintroducing them to the patient's body to trigger an immune response.

Figure 2: Active Immunotherapy of ICT-107



Source: Company presentation

IMUC recently completed a Phase I clinical trial of ICT-107 in newly diagnosed glioblastoma patients with compelling efficacy data and safety profile. The Company just initiated a **Phase II** trial of ICT-107 at the end of January 2011.

The Company's active immunotherapy also includes ICT-121, an **off-the-shelf peptide (plus adjuvant) vaccine** that works by stimulating an immune response to CD-133, a protein that is over-expressed by many CSCs, but not by healthy cells. ICT-121 is a platform technology targeting a variety of cancer stem cells including glioblastoma, breast, ovarian, pancreatic, colon and other solid tumors. ICT-121 is in **preclinical studies**.

Monoclonal Antibody Technology

While IMUC's cancer vaccines are designed to elicit a cellular immune response, the Company's monoclonal antibodies are designed to selectively seek and destroy cancer cells/CSCs. Because they are engineered to bind only to cancer-specific antigens, they may also be used to diagnose a wide range of cancers.

The Company's monoclonal antibodies, all are in **preclinical trials**, are produced using its proprietary differentiated immunization for antigen and antibody discovery (**DIAAD**) technology, which enables the rapid discovery of antigen targets and corresponding monoclonal antibodies for the treatment and diagnosis of cancers and other diseases.

ICT-107 Holds High Promise for the Treatment of Glioblastoma

ImmunoCellular's lead product candidate is **ICT-107**, an autologous, or personalized, dendritic cell-based vaccine. ICT-107 is similar to Dendreon's vaccine Provenge, the first in class cancer vaccine approved by the FDA for prostate cancer. However, ICT-107 is specifically designed to target **glioblastoma** stem cells. Whereas dendritic cells used in Provenge are exposed to only one antigen specific to prostate cancer cells (PAP/GM-CSF), ICT-107 are exposed to six different antigens mainly targeting glioblastoma cancer stem cells.

This is accomplished by extracting dendritic cells from a patient. These dendritic cells are then loaded with antigens that are highly specific to CSCs found in GBM tumors, and are reintroduced to the patient's body to trigger an immune response to destroy these CSCs.

Table 1: ICT-107 targets GBM CSCs but has broad potential

Antigens	Tumor Expression	CSC Expression
gp100	melanoma, brain cancer	
Trp-2	melanoma, brain cancer	High
Her-2/Neu	breast and ovarian cancer	Medium
MAGE-1	melanoma, brain cancer	
AIM-2	breast, ovarian, colon, brain	High
IL-13aR2	brain cancer	

Source: company presentation

ICT-107 is the only cancer vaccine in clinical trials targeting CSCs. The Company has finished a **Phase I** trial of ICT-107 for the treatment of newly diagnosed glioblastoma multiforme (GBM), also called glioblastoma, the most common and most aggressive type of primary brain tumor. Though at its early stage development, ICT-107 has already demonstrated outstanding efficacy data and safety profile.

In total of 16 newly diagnosed GBM patients, two year overall survival (OS) rates were 81% in the drug group compared with the historic median two-year survival rate of 26.5% with standard of care (SOC) alone. Median OS exceeded 30 months in the ICT-107 group compared with 14.6 months in the historical standard of care (SOC) group. The study's median progression-free (PFS) survival of 17.0 months also compared favorably to the historic median PFS of 6.9 months. Eleven of the 16 patients continue to survive. No serious adverse events have been reported and minor side effects have been limited to fatigue, skin rash and pruritis.

Long-term data from the Phase I clinical trial showed 43.8% patients who received ICT-107 were disease-free at two years, with three of these patients (18.8%) remaining disease-free for more than three years. One of these patients remains disease-free after almost four years. No treatment-related

serious adverse events have been observed to date. Following is the summary of the Phase I study results.

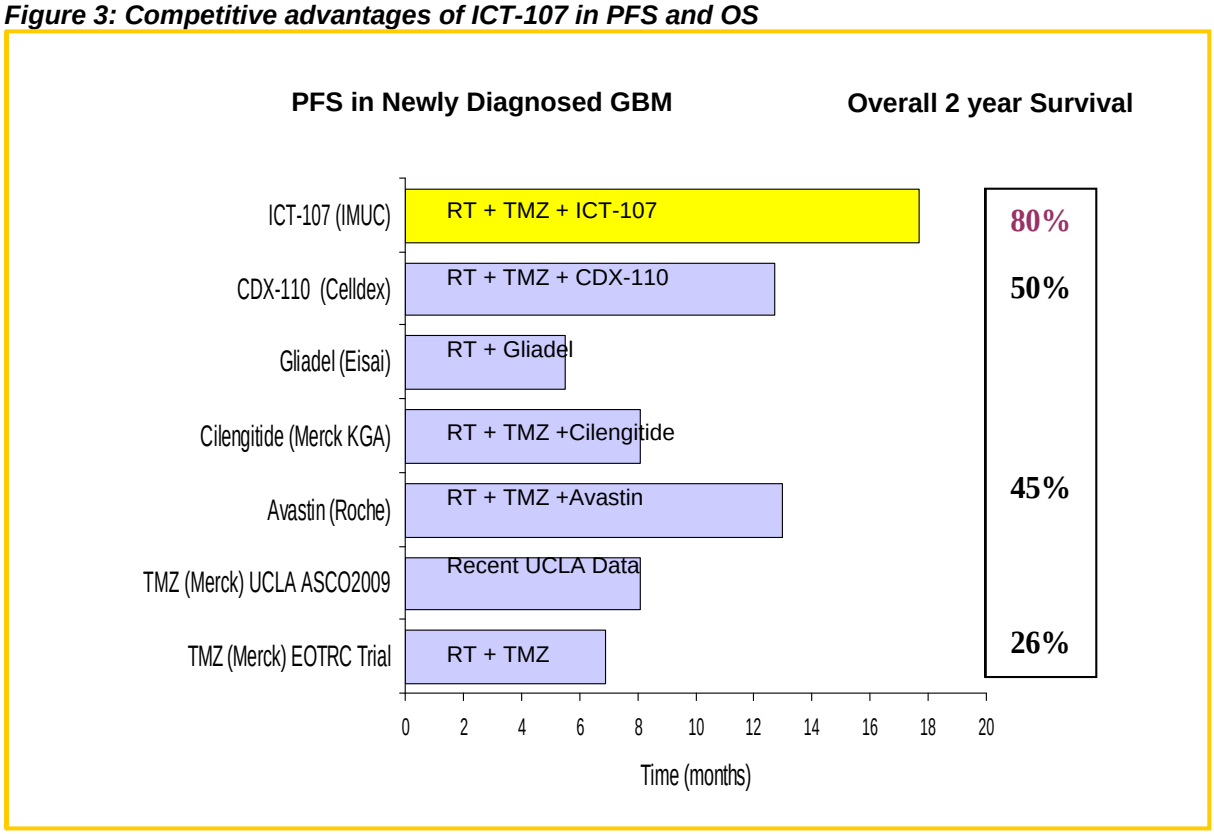
Table 2: Summary of PFS and OS - Newly Diagnosed GBM Patients

		ICT- 107 + SOC* (n=16)	SOC (Stupp, NEJM, 2005) (n=287)
	Median Age	52	56
PFS (%)	At 6 months	100	53.9
	At 12 months	62.5	26.9
	At 18 months	43.8	18.4
	At 24 months	43.8	10.7
	Median (months)	**16.9**	**6.9**
OS (%)	At 6 months	100	86.3
	At 12 months	100	61.1
	At 18 months	93.8	39.4
	At 24 months	80.2	26.5
	Median (months)	**NR > 30**	**14.6**

*SOC= Standard of Care (XRT +TMZ); NR=Not reached

The above data from ICT-107 are the most compelling so far for the treatment of glioblastoma. The median PFS of 17 months compares favorably with 12.7 months for CDX-110 (Celldex: CLDX) and 13.6 months for Avastin (Roche: RHHBY). This is encouraging although ICT-107 is at its early stages of development.

Figure 3: Competitive advantages of ICT-107 in PFS and OS



Source: company filings and presentation

The Company initiated a **Phase II** trial of ICT-107 for the treatment of newly diagnosed GBM following resection and chemoradiation in February 2011. The Phase II trial is a double-blinded, placebo-controlled, 2:1 randomized study of ICT-107 in approximately 102 patients with newly diagnosed GBM. The study will be conducted in approximately 15 clinical trial centers in the U.S. and Canada.

IMUC has contracted with Averion, a contract research organization (CRO), to conduct the Phase II trial of ICT-107. First patient was enrolled on January 31, 2011. The Company anticipates completing the enrollment approximately in 12 months. Interim analysis will be performed after 17 months (based on 50% events).

Patients will receive at least four intradermal injections of the ICT-107 vaccine and additional three doses of vaccine during a maintenance phase. The primary objective is to compare overall survival (OS) and progression free survival (PFS) in patients when treated with ICT-107 versus control.

We have a high expectation that the Phase II trial will be successful based on the Phase I study results. Unlike the Phase I which showed a 24 month increase in OS, a six month increase in OS would be considered successful and clinically relevant for this disease as the current standard of care increases OS by 2.5 months. Upon the successful conclusion of the Phase II study, IMUC anticipates a lucrative **partnering contract** with a major pharmaceutical or biotech company. The partnership may include a large sum of upfront payment, milestone fees and high royalties.

ICT-107 Holds Advantages over Provenge

Dendreon's **Provenge** is the first cancer vaccine that got the FDA nod at the end of April, 2010 for the treatment of advanced, hormone-resistant prostate cancer. This is certainly good news for the whole class of therapeutic cancer vaccines including ICT-107. Dendreon's shares climbed as high as $57.69 per share (market cap of $8.3 billion) at the news of Provenge approval. Since then Dendreon's shares have declined as low as $25.78 per share in early July 2010 and currently trade at about $35 per share (with a market cap of $5.1 billion). There are reasons for the price decline. One of the key factors triggering the share price decline is the **manufacturing/logistics problems** for Provenge.

It takes three steps to produce Provenge. First, the patient goes to a blood center for a leukapheresis procedure to collect the patient's own immune cells; Secondly, the isolated cells are sent to Dendreon's manufacturing facility to produce Provenge; Thirdly, the finished Provenge is shipped to an infusion center to treat the patient. The recommended course of therapy for Provenge is 3 complete doses within one month. Depending on the patient location and the location of Dendreon's manufacturing facility, the whole process from the cell collection to patient infusion could take up to 72 hours.

ICT-107 works the same way as Dendreon's Provenge does. However, IMUC has developed an innovative method for the manufacturing of ICT-107 with its collaborators. The new method employs a closed-bag system designed to produce highly potent dendritic cells from white blood cells collected from patients, and for subsequently cryopreserving the dendritic cells for future vaccine treatments. The process has also been optimized to produce high levels of certain cytokines which are correlative of dendritic cells' ability to boost immune response. Engineering and validation runs have confirmed that this process may be used to produce 20 or more doses of ICT-107 vaccine from a single blood collection, which may be frozen and later used for vaccination and maintenance of immune response in patients until disease recurrence.

Therefore, it's important to recognize the differences between Provenge and ICT-107.

- ICT-107 has a higher purity of dendritic cells (great than 80%) and is optimized for interleukin-12 (IL-12) secretion. Provenge is only 20-25% activated monocytes and the rest are lymphocytes and other cell types which are not needed for immunization. Therefore, a much smaller dosage of ICT-107 is required for vaccination, therefore reducing side effects.

- IMUC's process produces 20 or more dosages of vaccine in a single production run which could be good for up to 4 years if boosted every quarter. The Company uses cryopreservation technology to freeze these cells and store it for long term (almost like off-the-shelf product). Provenge is produced one dose at a time and Dendreon has to deliver Provenge within 18 hours to the patient after it is produced. IMUC certainly has a manufacturing convenience and logistic advantage.

- Cost advantage is apparent. COGS for ICT-107 is much lower (15,000/20 = $750 per shot of vaccine). Therefore, gross profit margin will be much higher (95% for ICT-107 compared to 60-70% for Provenge at scale, currently close to 40%).

- Due to limited treatment options for glioblastoma multiforme, IMUC should have pricing power if ICT-107 is approved for that indication. Therefore, management assumes first year reimbursement potential of $120K (same as Avastin) and 60K for the second year and third year. Total reimbursement should be roughly $240,000.

- While Provenge is specifically indicated for prostate cancer, addressable market for ICT-107 could be glioblastoma multiforme (GBM), melanoma, breast cancer, ovarian cancer and colon cancer. If IMUC only develops it for ovarian and GBM to be conservative, the potential market size for those two indications is huge (more than $2 billion dollars).

It's clear that IMUC's ICT-107 has many advantages over the first-in-class cancer vaccine Provenge including manufacturing convenience, easy logistics, potential less side effects, cost advantages and much larger addressable market, etc.

Great Market Opportunities for ICT-107

Glioblastoma multiforme (GBM), also called glioblastoma, is the most common and most aggressive type of primary brain tumor and accounts for approximately 50% to 60% of all primary brain tumors.

According to National Cancer Institute (NCI) data, the peak incidence occurs between the ages of 45 and 70 years. In the United States, the age-adjusted brain tumor incidence rate was 6.5 per 100,000 men and women per year. The age-adjusted death rate was 4.3 per 100,000 men and women per year. It is estimated that 22,020 men and women (11,980 men and 10,040 women) will be diagnosed with and 13,140 men and women will die of cancer of the brain and other nervous system in 2010 in the US. Worldwide, approximately 176,000 new cases of brain and other CNS tumors were diagnosed in the year 2000, with an estimated mortality of 128,000.

Glioblastomas are among the most aggressively malignant human neoplasms. The median survival time from the time of diagnosis without any treatment is usually less than 1 year. Despite multimodality treatment consisting of open craniotomy with surgical resection of as much of the tumor as possible, followed by concurrent or sequential gamma knife radiotherapy, chemoradiotherapy, targeted therapy, and symptomatic care with corticosteroids, median survival is about 14 months. The overall 5-year survival is less than 10% with the standard of care today. Increasing age (> 60 years of age) carries a worse prognostic risk. Death is usually due to cerebral edema or increased intracranial pressure.

It is very difficult to treat glioblastoma due to several complicating factors
- The tumor cells are very resistant to conventional therapies
- The brain is susceptible to damage due to conventional therapy
- The brain has a very limited capacity to repair itself
- Many drugs cannot cross the blood-brain barrier to act on the tumor

Surgery is the first stage of treatment of glioblastoma. It is used to take a section for a pathological diagnosis, to remove some of the symptoms of a large mass pressing against the brain, to remove disease before secondary resistance to radiotherapy and chemotherapy, and to prolong survival.

After surgery, **radiotherapy** is the mainstay of treatment for glioblastoma. A pivotal clinical trial carried out in the early 1970s showed that GBM patients who received radiation had a median survival more than double those who did not receive radiation therapy. Subsequent clinical research has attempted to build on the backbone of surgery followed by radiation.

Chemotherapy (including targeted therapy) is a third method to treat glioblastoma. Although the addition of chemotherapy to radiation improves survival in many cancer types, this is not the case for glioblastoma. Most studies showed no benefit from the addition of chemotherapy to radiation for glioblastoma patients. However, currently, two chemotherapeutic agents (including one targeted therapy) approved by the FDA are frequently used for the treatment of glioblastoma in combination with radiation therapy. They are **Temodar** (temozolomide) from Merck/Schering Plough for newly diagnosed GBM and **Avastin** from Roche for recurred GBM.

A large clinical trial of 573 newly diagnosed GBM patients randomized to standard radiation versus radiation plus temozolomide chemotherapy showed that the group receiving temozolomide survived a median of 14.6 months as opposed to 12.1 months for the group receiving radiation alone. This treatment regime is currently considered standard of care for glioblastoma and has a 26% survival at two years.

The US FDA recently approved Avastin (bevacizumab) to treat patients with recurred glioblastoma (but not newly diagnosed GBM which is ICT-107's initial target) after standard therapy based on the results of 2 studies that showed Avastin reduced tumor size in some glioblastoma patients. In the first study, the efficacy of Avastin was demonstrated by an objective response rate of 25.9%. Median duration of response was 4.2 months. In the second study, the efficacy of Avastin was supported by an objective response rate of 19.6%. Median duration of response was 3.9 months.

A third chemotherapeutic agent on the market for glioblastoma is Bristol Myers Squibb's **Carmustine** injection and Eisai's Carmustine wafer, which are less frequently used.

Clearly, there is an unmet medical need for the treatment of glioblastoma. Relapse of glioblastoma is attributed to the recurrence and persistence of cancer stem cells. Therefore, targeting cancer stem cells (CSCs) may be an ultimate solution to treat glioblastoma more efficaciously with fewer side effects. IMUC's ICT-107 is specifically designed to target cancer stem cells of glioblastoma. So far, the data from ICT-107 are the most compelling for the treatment of glioblastoma compared to marketed products and products under development. This is encouraging although ICT-107 is at its early stages of development. The Company began to enroll patients at the end of January 2011 in a **Phase II** trial of ICT-107 for the treatment of GBM.

The glioblastoma market is a multibillion dollar business. Worldwide sales of Temodar reached $1 billion in 2009 and about $800 million in the first nine months of 2010. If ICT-107 ultimately reaches the market, it will command a huge market share of the GBM market due to its outstanding efficacy data and safety profile in our view. This means a lot to a small biotech company like IMUC even with a few hundred million dollars in sales. With the Phase II trial enrolling patients soon, IMUC is one step closer to achieve its long term goal.

The market potential is even greater if we consider that ICT-107 can also target other cancer indications, such as melanoma, breast cancer and ovarian cancer. If IMUC only develops ICT-107 for ovarian and GBM to be conservative, the potential market size for those two indications is huge.

Strong Pipeline Ensures Sustainable Growth

In addition to ICT-107, IMUC has another active immunotherapeutic candidate **ICT-121** which is an off-the-shelf, peptide-based vaccine that works by stimulating an immune response to CD-133, a protein that is over-expressed by many CSCs, such as glioblastoma, but not by healthy cells. ICT-121 is under preclinical studies and the Company plans to bring ICT-121 into clinic in the near future.

The Company also has a series of **monoclonal antibodies** in preclinical studies. These antibodies are designed to target different cancer types. The following table summarizes IMUC's pipeline.

Table 3: Summary of IMUC's Pipeline

Compound Name	Preclinical	Phase I	Phase II	Phase III	NDA	Approved
Active Immunotherapies						
ICT-107 (Glioblastoma)	√	√	√			
ICT-121 (Glioblastoma)	√					
Monoclonal Antibodies						
ICT-109 (Pancreatic and SCLC)	√					
ICT-37 (Multiple Cancers)	√					
ICT-69 (Multiple Myeloma)	√					
Diagnostic Test for SCLC	√					

Source: Company website and SEC filings

Experienced Management Team

Manish Singh, Ph.D., MBA, President and Chief Executive Officer
Prior to joining ImmunoCellular Therapeutics, Dr. Singh was a Director of California Technology Ventures, an early stage venture capital firm in Pasadena, California, from June 2003 to December 2007. During his tenure at California Technology Ventures, Dr. Singh co-lead investments by that firm in several life sciences companies including Aliva Biopharmaceuticals, SurgRx, Vivant Medical, Angioscore and Ceregene. He also acted as the interim CEO of Aliva Biopharmaceuticals, and was a board member or observer for several companies, including Aliva, Angioscore and Ceregene. Before joining California Technology Ventures, Dr. Singh spent 14 years in various scientific and managerial positions in research, product development, manufacturing, and business development at Genetic Therapy, Inc. (acquired by Novartis Pharmaceuticals), Chiron Corporation, and Cell Genesys.

Dr. Singh holds ten issued patents and patent applications. Dr. Singh received his BS in Chemical Engineering from IIT (Roorkee, India), MS in Chemical Engineering from Worcester Polytechnic Institute, and his Ph.D. in Biochemical Engineering at the University of Maryland Baltimore County and did his post-doctoral work at the American Red Cross in Biomedical Sciences. He also received his MBA at the Anderson School at UCLA, where he was a Deutschman Venture Fellow and a Patrick J. Welsh Entrepreneurship Fellow.

John S. Yu, M.D., Chief Scientific Officer and Chairman of the Board
Dr. Yu is a member of the full-time faculty in the Department of Neurosurgery at Cedars-Sinai Medical Center. An internationally renowned neurosurgeon, Dr. Yu's clinical focus is on the treatment of malignant and benign brain and spinal tumors. He is also conducting extensive research in immune and gene therapy for brain tumors. He has also done extensive research in the use of neural stem cells as delivery vehicles for brain cancers and neurodegenerative diseases.

Dr. Yu earned his bachelor's degree in French literature and biological sciences from Stanford University. He earned his medical degree from Harvard Medical School and master's degree from the Harvard University's Department of Genetics. He completed his neurosurgical residency at Massachusetts General Hospital in Boston.

C. Kirk Peacock, Chief Financial Officer
Mr. Peacock is a Certified Public Accountant and previously was Chief Financial Officer with CytRx Corporation, a ribonucleic acid interference and biopharmaceutical company focused on the development and commercialization of high-value human therapeutics from August 2003 through July 2004. Mr. Peacock has experience as Chief Financial Officer with several start-up companies including DigitalMed, Inc., a venture-backed subsidiary of Tenet Healthcare, and Ants.Com, Inc., a venture-backed company of Bertelsmann Ventures. Mr. Peacock was also a manager with a large, international accounting firm for a number of years. Mr. Peacock serves as a director on the Board of Directors and a member of the Audit Committee of Laird Norton Company LLC. Mr. Peacock is a graduate of Claremont McKenna College.

James G. Bender, Ph.D., M.P.H., Vice President, Clinical Development
Dr. Bender, who joined IMUC in 2008, brings more than 20 years of clinical development experience to the company. He joined the company from IDM Pharma, where he was from 2002 through 2008, serving most recently as director of product development where he led the efforts relating to the clinical development of a cancer vaccine, IDM-2101, for lung cancer. Prior to that, he was at Nexell Therapeutics where he held various positions relating to the development of therapeutic stem cell and cancer vaccine products. Prior to that, Dr. Bender spent 10 years with Baxter Healthcare Corporation, eight years with the University of New Mexico School of Medicine and five years with St. Joseph's Hospital in Albuquerque, New Mexico. He has over 75 scientific publications, is an inventor on 11 U.S. patents and holds a Ph.D. degree in immunology from the University of New Mexico and an M.P.H. in laboratory management from the University of Michigan.

INDUSTRY OUTLOOK

Our Outlook for the Biotech Industry is Positive in General

There are a number of strong secular growth drivers that still power the biotech industry-namely, an aging population and an enormous research and development (R&D) effort to bring new, better drugs to market. People are living longer, and many have prescription pharmaceuticals to thank for it. Recent breakthroughs in oncology, neurology, and cardiology offer sizable market opportunities. Biotechnology research is finally starting to deliver. Expanded knowledge of genomics and proteomics is attracting significant attention from some of the industry's larger players. Drug companies are finding ways to reformulate and enhance current products. This is clearly a positive for the biotech industry. Demand for innovative medicines remains strong and biotechnology should deliver the next wave of pharmaceutical products to the market. This should allow the group to outperform the broader sector.

Licensing/partnership are the lifeline of biotech industry. We expect to see continued partnership and in-licensing/out-licensing activities for biotech companies in the next few years.

We also expect further consolidation throughout the industry because we believe that current market environment in the Pharma/Biotech industry is favorable for M&A activities. The big pharmaceutical companies have long been faced with big challenges such as patent expiration for blockbusters, low research and development productivity, and generic competition. Platform technologies and efficient R&D efforts in smaller biotech companies may be part of the solution to the challenges faced by big Pharma companies. As long as the challenges still exist in the pharmaceutical industry, the buyout of smaller biotech companies by big Pharma/giant biotech companies will continue to make sense.

For individual biotech companies, we think companies with one or more of the following fundamentals will be attractive.

- With approved products on the market which can generate cash for the company;

- With a strong balance sheet and low cash burn rate; huge amount of cash will be needed to provide funds for drug development before it can reach the market;

- With platform technologies with deep, diversified pipeline (from early to late stage drug candidates); platform technology can produce series drug candidates, and is usually worth more than a single drug candidate program. When a drug candidate is moving closer to market, it usually reduces development risks.

Investors should pay attention to those large profitable biotechnology stocks, as well as small-cap biotechnology stocks with promising pipelines.

VALUATION AND RECOMMENDATION

We maintain our Outperform rating on ImmunoCellular Therapeutics (IMUC) shares and reiterate our twelve-month price target is $7.00.

We think ImmunoCellular Therapeutics is at the forefront of fighting against cancer in a totally different way than ever before. By targeting cancer stem cells, ICT-107 and the Company's other candidates, may be the ultimate solution for cancer metastasis and recurrence. The Company has all the makings of a successful biotech company in our view.

The approval of Provenge, the first active immunotherapeutic agent by Dendreon, has cleared uncertainty of clinical and regulatory paths for the whole class of such drugs. With an appropriate growth strategy in place, the Company is heading in the right direction and well positioned to grow dramatically in the coming years. The Company will become profitable in 2015 with the approval and commercial launch of ICT-107 according to our model.

We admit that it's always difficult to value a development stage biotech company, ImmunoCellular is no exception. We don't think absolute valuation such as free cash flow method is appropriate for ImmunoCellular Therapeutics since generating positive cash flow is still years away. Without revenue and operating income in the foreseeable future, it's also very difficult to come up with a value using a relative valuation metrics. However, we do think that IMUC should be worth more than current value of $50 million in market cap by comparing the Company with its peers in the same industry.

Currently, the Company shares are trading at about $1.77 per share which values the Company at about $50 million based on about 28 million shares outstanding. This is certainly a huge discount compared to its peers. Most small biotech companies of development stage are valued from $50 million to $500 million depending on how advanced the pipeline is and which indications the company is targeting. IMUC is a middle stage of development biotech company, and its lead candidate ICT-107 is under Phase II clinical trials. ICT-107 currently targets glioblastoma, but has potential for other cancer indications. Market potential is huge even for the glioblastoma market alone. Therefore, we think at this time IMUC should be valued at about $150 million in market cap which translate into a share price of $7.00.

We noticed recent acquisition of private BioVex by Amgen. The deal was valued at $1 billion with $425 million in upfront and up to $575 million in additional payments upon the achievement of certain regulatory and sales milestones. BioVex is developing OncoVex, an oncolytic vaccine in Phase III clinical development, for the treatment of melanoma and head and neck cancer.

Although BioVex's OncoVex is in more advanced trials (Phase III) than IMUC's ICT-107 (Phase II), we also noticed that IMUC has a broader technology. Therefore, this transaction convinces us that IMUC is undervalued.

Dendreon is a vivid example how investors can profit from potential blockbuster candidate. Market cap for Dendreon has risen from about $200 million to $5 billion within one year after Provenge was approved. Apparently, risk is high for IMUC at this stage, but return should also be high. Investors with high risk tolerance and relatively long investment horizon may consider IMUC as a component of their portfolios.

Catalysts over the next 18 months include:

- Peer reviewed publication of Phase I trial (3Q, 2011)
- Initiate Phase I clinical trial for an off-the-shelf vaccine (2011)
- Complete Phase II enrollment by Q1, 2012
- Interim Analysis of Phase II in Q3, 2012
- Additional trials based on ICT-107 (Recurrent, or Pediatric GBM and ovarian cancer)

On the business development side, the Company has been exploring potential partnership opportunities for its antibody technology platform. IMUC may announce an agreement later this year. If successful, such a partnering program will provide the Company with cash to further advance its clinical programs.

RISKS

Early to Middle Stage of Development Poses Higher Risks

IMUC has two proprietary platform technologies: active immunotherapy and monoclonal antibody technology. Both technologies target specific cancer antigens and cancer stem cells. However, most of its drug candidates are at their early stages of development (preclinical) at this point. The most advanced candidate is ICT-107 for which the Company just initiated a Phase II trial. Early to middle stage of development poses greater risks as the drug candidate must navigate through the long clinical trials and regulatory review process in order to get into market.

Cash Burn Concern has Been Relieved

Since its inception, IMUC has been losing money. The Company has no revenue source to fund its operations, but depends on outside financing for ongoing operations.

The Company had $11.3 million in cash as of March 31, 2011. IMUC raised about $8 million from certain institutional and other investors in February 2011. Current cash will last for about 18 to 20 months. The Company will use the funds to accelerate the development of its lead drug candidate ICT-107. The positive side is that the raised capital boosts the Company's balance sheet and that it further validates the Company's technology and pipeline potential.

Another positive sign for the cash burn is that the Company is making efforts to monetize its antibody platform technology and if successful, this could provide the Company with additional cash for its operations. Also, if data from the Phase II trial of ICT-107 are positive, the Company could land a favorable partnership from big pharma or biotech companies.

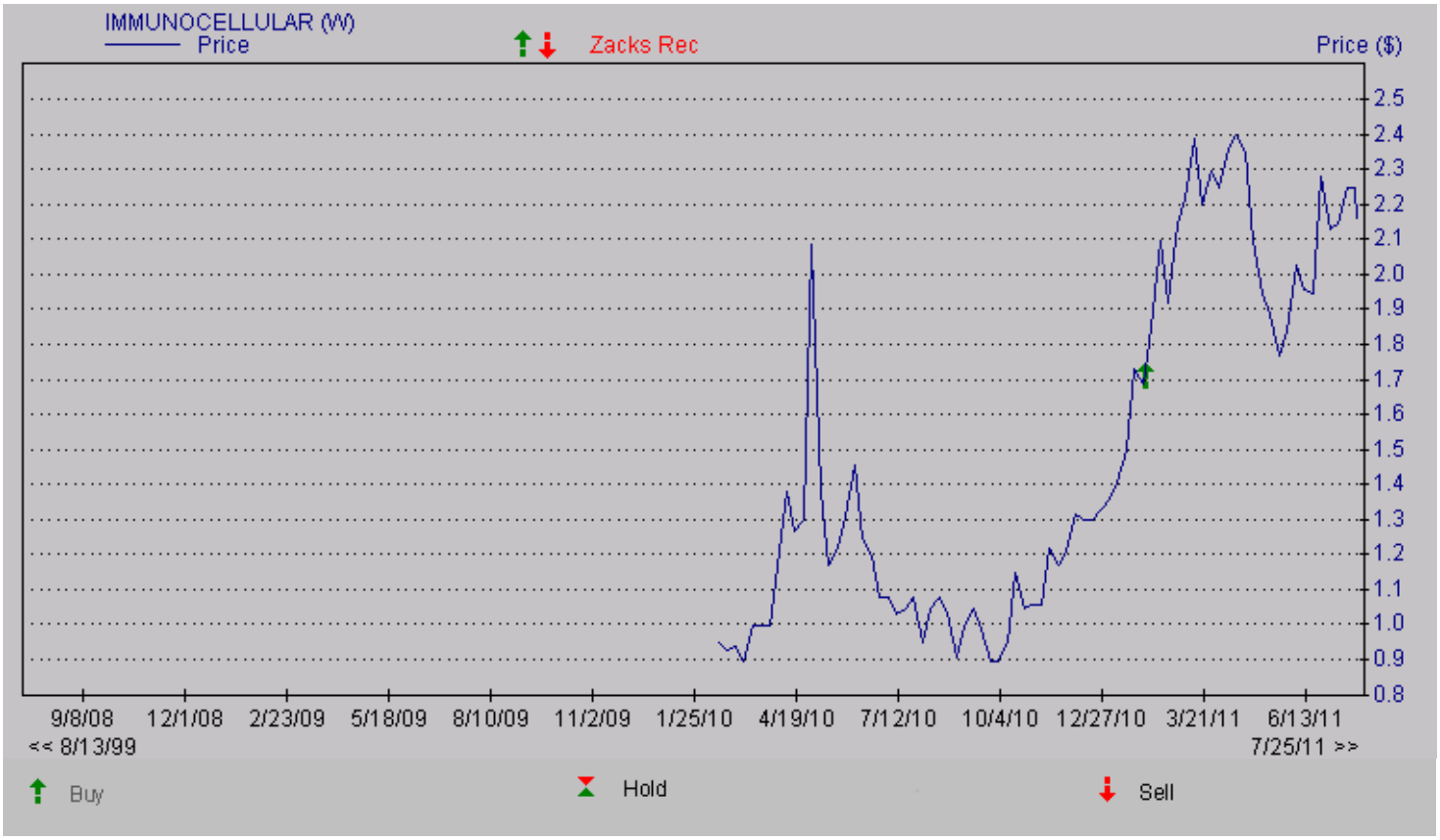
PROJECTED INCOME STATEMENT

	2010A (Dec)					2011E (Dec)					2012E (Dec)	2013E (Dec)	2014E (Dec)	2015E (Dec)
$ in million except per share data	Q1	Q2	Q3	Q4	FYA	Q1	Q2E	Q3E	Q4E	FYE	FYE	FYE	FYE	FYE
R&D revenue	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1.00	$1.00	$2.00	$3.50	$5.00	$5.00
Product revenue	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15.75
Total Revenues	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$1.00**	**$1.00**	**$2.00**	**$3.50**	**$5.00**	**$20.75**
YOY Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	*315.0%*
CoGS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Income	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$1.00**	**$1.00**	**$2.00**	**$3.50**	**$5.00**	**$20.75**
Gross Margin	-	-	-	-	-	-	-	-	-	-	-	-	*100.0%*	*100.0%*
R&D	$0.18	$0.51	$1.13	$0.48	$2.29	$0.92	$1.30	$1.40	$1.60	$5.22	$9.50	$7.50	$5.00	$7.50
% SG&A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SG&A	$0.45	$0.64	$0.50	$0.45	$2.04	$0.55	$0.55	$0.60	$0.65	$2.35	$2.50	$2.75	$3.50	$5.00
% R&D	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	$0.13	$0.20	$0.21	$0.27	$0.81	$0.24	$0.25	$0.30	$0.35	$1.14	$1.30	$1.30	$1.40	$1.50
% Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operating Income	**($0.8)**	**($1.4)**	**($1.8)**	**($1.2)**	**($5.1)**	**($1.7)**	**($2.1)**	**($2.3)**	**($1.6)**	**($7.7)**	**($11.3)**	**($8.1)**	**($4.9)**	**$6.8**
Operating Margin	-	-	-	-	-	-	-	-	-	-	-	-	-	*32.5%*
Other Net	($0.0)	($1.3)	$0.6	($2.5)	($3.1)	($1.0)	$0.0	$0.0	$0.0	($1.0)	$0.0	$0.0	$0.0	$0.0
Pre-Tax Income	**($0.8)**	**($2.6)**	**($1.2)**	**($3.7)**	**($8.2)**	**($2.8)**	**($2.1)**	**($2.3)**	**($1.6)**	**($8.8)**	**($11.3)**	**($8.1)**	**($4.9)**	**$6.8**
Income taxes(benefit)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Tax Rate	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Reported Net Income	**($0.8)**	**($2.6)**	**($1.2)**	**($3.7)**	**($8.2)**	**($2.8)**	**($2.1)**	**($2.3)**	**($1.6)**	**($8.8)**	**($11.3)**	**($8.1)**	**($4.9)**	**$6.8**
YOY Growth	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Margin	-	-	-	-	-	-	-	-	-	-	-	-	-	*32.5%*
Shares Out	*15.0*	*19.2*	*21.0*	*21.6*	*19.2*	*24.3*	*28.0*	*31.0*	*32.0*	*28.8*	*35.0*	*40.0*	*45.0*	*50.0*
Reported EPS	**($0.05)**	**($0.14)**	**($0.06)**	**($0.17)**	**($0.43)**	**($0.11)**	**($0.08)**	**($0.07)**	**($0.05)**	**($0.30)**	**($0.32)**	**($0.20)**	**#####**	**$0.14**
YOY Growth	-	-	-	-	-					-	-	-	-	-
One time charge	0.00	*0.95*	*(0.64)*	*3.11*	*3.43*	*1.05*	*0.00*	*0.00*	*0.00*	*1.05*	*0.00*	*0.00*	*0.00*	*0.00*
Non GAAP Net Income	**($0.8)**	**($1.7)**	**($1.8)**	**($0.5)**	**($4.8)**	**($1.7)**	**($2.1)**	**($2.3)**	**($1.6)**	**($7.7)**	**($11.3)**	**($8.1)**	**($4.9)**	**$6.8**
Non GAAP EPS	**($0.05)**	**($0.09)**	**($0.09)**	**($0.03)**	**($0.25)**	**($0.07)**	**($0.08)**	**($0.07)**	**($0.05)**	**($0.27)**	**($0.32)**	**($0.20)**	**#####**	**$0.14**

Source: Company filings and Zacks Investment Research

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HISTORICAL ZACKS RECOMMENDATIONS



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