



# CAPITAL MARKET REPORT

Health Discovery Corporation OTCBB: HDVY

Personalized medicine is becoming increasingly prevalent in the medical industry. The realization of personalized medicine will be accomplished, in part, with the development of molecular diagnostic tests. This development is possible through advanced mathematical pattern recognition techniques as demonstrated by **Health Discovery Corporation's** SVM and RFE-SVM technology, shown to be effective in hundreds of published papers from some of the top accredited universities in the world.

The company boasts a robust intellectual property portfolio, with 43 issued and 32 pending patents. These patents are centered around the Support Vector Machine, a unique state-of-the-art machine learning (artificial intelligence) "pattern-recognition" tool capable of identifying important patterns embedded in massive amounts of data (even up to infinite dimensional space).

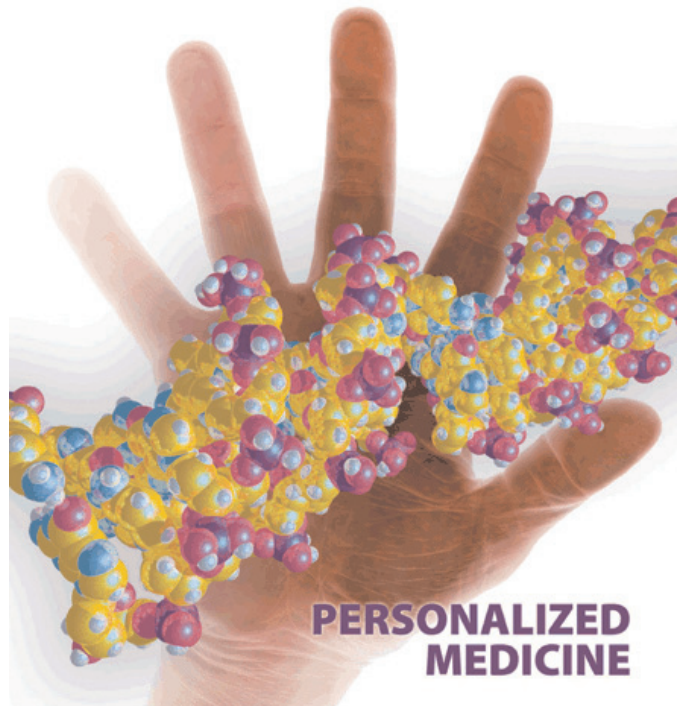
The SVM technology, which was invented at Bell Labs, now Lucent Technologies, is based upon the advances in statistical learning theory developed by Humboldt Prize winner Vladimir Vapnik, Ph.D. Health Discovery's SVM patents have some of the earliest priority dates but for the two Lucent patents covering techniques invented by Drs. Vapnik, Isabelle Guyon, Bernhard Boser and Corinna Cortes. Drs. Vapnik and Guyon are members of the Health Discovery Corporation's Scientific Advisory Board.

The value of this technology and portfolio has been validated by the licensing of Health Discovery's specific applications to internationally recognized diagnostic companies such as Abbot Molecular (NYSE: ABT) and Quest Diagnostics Incorporated (NYSE: DGX). Health Discovery Corporation has successfully defended its IP by obtaining a \$600,000 settlement of claim against Ciphergen, now Vermillion (NasdaqGM: VRML) in 2007.

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### Company Statistics

Publicly Traded: Symbol HDVY.OB  
Stock Price (7/27/10): \$0.14\*  
52-week High/Low: \$0.06 - \$0.43\*  
Market Capitalization: \$29.52 million\*  
Cash (March 31, 2010): \$3.8 million\*\*  
Development Stage: Early Stage Operating

\*Source: Yahoo! Finance as of close of business July 27, 2010

\*\* Source: SEC 10Q Filing May 17, 2010

### Why is this technology significant?

Personalized medicine is becoming the new paradigm in healthcare that is transforming the way \$2.6 trillion dollars is spent in the US and \$4 trillion globally. This is a significant market, and Health Discovery is positioned to become a leader in biomarker discovery.

According to Craig Mundie, Chief Research Officer at Microsoft, the medical industry is going to "become more 'data driven'...that medicine can take on and have a more predictive component."

Using Health Discovery Corporation's SVM technology allows diagnostic companies to perform more accurate tests and therefore enables doctors to develop more personalized treatments.

### Sensitivity and Specificity

"Sensitivity" and "Specificity" are technical terms that provide percentages that relate to identifying false negatives (those with a negative test who actually have the disease), false positives (those with a positive test who do not have the disease), true positives (those who test positive and have the disease) and true negatives (those who test negative and do not have the disease). Tests with higher Sensitivity and Specificity percentages are more likely to provide an accurate assessment and reduce the need for additional testing such as biopsies.

## Personalized Medicine – Molecular Diagnostics: The Right Treatment for the Right Person



In a blinded validation study of 71 independent prostate tissue samples that included both fresh prostate tissues and formalin fixed tissues, the 4-gene test gave a sensitivity of **90%** with a specificity of **97%** (the 95% confidence interval was 86% - 100%)\*. This is significantly superior to traditional PSA testing.

\* Source: *UruToday International Journal*, August 2009

Health Discovery, with its licensing partners, is developing the four-gene urine-based test as an alternative and complement to the traditional PSA test. This represents a large potential recurring royalty-revenue source for the company. It is only one of many diagnostic opportunities that Health Discovery is currently pursuing.

### Melanoma Risk Detection: An App For That



The incidence of people under 30 developing melanoma is increasing faster than any other demographic group, soaring by 50 percent in young women since 1980. It is the most common form of cancer for young adults 25 to 29 years-old and the second most common cancer in adolescents and young adults 15- to 29-years old. At the same time, over 3 billion people or 47% of the world's population use mobile phones and that rate grows daily.

Imagine a person being able to take a picture of a suspicious mole or growth and send it to Health Discovery for image analysis. The company then uses SVM technology to determine whether there is a high, medium or low risk for melanoma (never a "no risk" outcome). The results are sent to the customer, along with a referral to a nearby dermatologist or surgeon who is a member of the company's network. Health Discovery is working to make this a reality.

### Additional HDC Personalized Medicine Products in Development

Health Discovery announced an exclusive agreement with the Pancreas, Biliary and Liver Surgery Center of New York that will provide Health Discovery Corporation clinical specimens to be utilized to complete the final validation of HDC's molecular diagnostic test for colon cancer. This test demonstrated a **93%** Sensitivity and a **93%** Specificity in a previous validation study.



In the United States, colorectal cancer is the fourth most common cancer in men, after skin, prostate, and lung cancer. It is also the fourth most common cancer in women, after skin, lung, and breast cancer. Health Discovery has identified and patent-protected colon cancer-specific biomarkers that can be used in the development of molecular diagnostic assays for colon cancer detection, disease discrimination, and even a potential vaccine.

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Health Discovery Corporation has identified and patent-protected a subset of genes that separates Benign Prostatic Hyperplasia (BPH) from all other prostate conditions, including normal, dysplasia and prostate cancer, with a high degree of accuracy. This newly discovered gene signature could be used as a surrogate biomarker to significantly reduce both costs and time in a pharmaceutical clinical trial for a new BPH drug and could cut years off the clinical trial, saving hundreds of millions of dollars in clinical trial costs.

Digital mammography takes an electronic image of the breast and stores it directly in a computer, where it can be accessed and sent electronically. Health Discovery Corporation's MammoSIGHT technology introduces the use of Support Vector Machines in detecting malignancy while interpreting these digital mammograms.

Health Discovery Corporation has identified and patent-protected a set of leukemia genes that can separate ALL-T-cell leukemia from ALL-B-cell leukemia with a high degree of accuracy. The company has signed an agreement with The University of Texas, M.D. Anderson Cancer Center to analyze a gene expression database to identify new biomarkers and pathways involved in leukemia.

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Flow cytometry is an effective tool in detecting hematological conditions such as myelodysplastic syndrome (MDS). However, because of the large amount of data present in a flow cytometry analysis, it is often difficult to fully utilize the data through a manual process. Health Discovery's support vector machine is used to construct an automated system that takes the flow cytometry data as the input and predicts the cytogenetics results.

The developments described above represent the most promising and current areas of focus for Health Discovery. The company plans to expand its research into additional medical areas as it discovers new biomarkers.

Market opportunities in the medical industry alone run into the billions of dollars. Capital Market Relations believes that this intellectual property portfolio is currently undervalued by the market and as the company gains investor exposure, proper market recognition and valuation will be attained.

In addition to the medical field, the company has identified several industries in which vast amounts of data are generated and the use of Health Discovery's SVM technology could be utilized to identify important patterns, to increase efficiency and reduce costs. These industries include the financial services, law enforcement, homeland security, fraud detection, weather forecasting, decryption, and more.

## Select Comparables

### **Luminex Corp. (NasdaqGM: LMNX)**

Develops, manufactures and markets proprietary biological testing technologies with applications throughout the diagnostic and life sciences industries.

**Current Market Cap: \$659M\***

### **Cepheid (NasdaqGS: CPHD)**

An on-demand molecular diagnostics company that develops, manufactures, and markets fully-integrated systems and tests for genetic analysis in the clinical, industrial and biothreat markets.

**Current Market Cap: \$979M\***

### **Genomic Health, Inc. (NasdaqGM: GHDX)**

A life science company focused on the global development and commercialization of genomic-based clinical laboratory services for cancer that allow physicians and patients to make individualized treatment decisions.

**Current Market Cap: \$385M\***

### **Illumina, Inc. (NasdaqGS: ILMN)**

Founded in 1998, began offering SNP genotyping services in 2001 and launched its first system, the Illumina BeadLab, in 2002, using GoldenGate Genotyping technology.

**Current Market Cap: \$5.03B\***

### **Affymetrix, Inc. (NasdaqGS: AFFX)**

Commenced commercial sales of the GeneChip® system for research use in 1994, and currently sells its products directly to pharmaceutical, biotechnology, agrichemical, diagnostic and consumer products companies, as well as academic, government, and other non-profit research institutes.

**Current Market Cap: \$317M\***

### **Vermillion, Inc. (OTC: VRML.PK)**

Vermillion, Inc. discovers, develops, and commercializes diagnostic tests that help physicians to diagnose and treat patients. The company currently has one patented product (based on Health Discovery technology.)

**Current Market Cap: \$108M\***

\*All market cap figures derived from Yahoo! Finance at close of business July 27, 2010



## Technology Overview

Since their introduction in 1992, Support Vector Machines marked a breakthrough in the theory of machine learning systems. Support Vector Machines quickly gained attention from the pattern recognition community due to their theoretical and computational merits, particularly in their ability to accurately identify patterns within huge volumes of data.

Many commercial institutions have already incorporated SVMs into product and research applications. Industries utilizing SVM technology include large corporations within the software and computer fields, biomedical and pharmaceutical companies, and automotive, financial, and retail industries.

RFE-SVM is used to identify a small subset of the key attributes that are useful for accurately classifying data within complex datasets which often have hundreds, or even thousands, of attributes. The key attributes are ranked according to their importance in separating the classes while unneeded attributes are eliminated from consideration.

HDC's scientists have applied RFE-SVM technology to clinical and gene expression datasets to identify biomarkers for separating tumor versus normal tissues. RFE-SVM technology is able to rank order the analyzed genetic information to determine the most important gene in the molecular diagnostic test. The ability to rank order the genes also allows HDC scientists to select different combinations of genes to produce highly discriminative biomarker groups that work around potential IP claims of competitors while identifying new biomarker combinations that may be available for patent protection by the company.

The statements included in this executive summary concerning predictions of economic performance and management's plans and objectives constitute forward-looking statements made pursuant to the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, as amended, and Section 27A of the Securities Act of 1933, as amended. These statements involve risks and uncertainties that could cause actual results to differ materially from the forward-looking statements. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this summary. Health Discovery Corporation undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise. Readers should refer to Health Discovery's filings with the Securities and Exchange Commission, available at [www.sec.gov](http://www.sec.gov) for more information regarding Health Discovery and its business.

## Management and Key Advisors

### **Stephen D. Barnhill, M.D. Chairman and CEO**

Founded BCL clinical laboratories which was acquired by Corning-Metpath (now Quest Diagnostics.) Founded NMS Laboratories, which was acquired by a New York-based Pharmaceutical Company, with patents acquired by Johnson & Johnson, licensed Prostate Cancer test to LabCorp (Laboratory Corporation of America). Trained in Clinical Pathology/Laboratory Medicine.

### **R. Scott Tobin, J.D. President and General Counsel**

Corporate M&A attorney with Hunter, McLean, Exley and Dunn, Executive Vice President for Global Strategies at a publicly traded technology company, CEO of a North Carolina manufacturer, General Counsel to a global software firm, Managing Partner of the Atlanta office of a European law firm.

### **Maher Albitar, M.D., Chief Medical Officer**

Until recently, Dr. Albitar was the Medical Director of Hematology and Oncology and Chief of Research and Development at Quest Diagnostics Nichols Institute San Juan Capistrano, Calif. Prior to Quest Diagnostics, Dr. Albitar was a tenured full professor at the M.D. Anderson Cancer Center and the University of Texas, where he served as chief of the hematopathology of the leukemia section with joint appointment in the clinical leukemia department.

### **John Norris, J.D., MBA, Chief Operating Officer**

Former Deputy Commissioner of the FDA, advised the senior management of numerous global healthcare businesses including Pfizer, Merck, Johnson & Johnson, and Glaxo. Responsible for the billion dollar turn-around and sale of laser-eye-surgery pioneer Summit Technology.

### **Tom Gallagher, J.D., Executive Vice President and Managing Director of Global IP Strategies**

Former Vice President at Goldman, Sachs & Co. Fifteen years on Wall Street as a securities and business transaction lawyer. An Assistant General Counsel managing risk on a transaction and policy basis for a then-\$9 billion publicly traded company. Member of an investment management team at Goldman Sachs that advised clients with approximately \$1.5 billion in assets.

**More Information:  
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Capital Market Relations has been compensated by Health Discovery Corporation in the amount of \$10,000 per month to conduct an investor relations campaign and the principals may hold equity positions in the company.