Zacks Small-Cap Research

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Spherix, Inc.

(SPEX-NASDAQ)

SPEX: Initiating Coverage of Spherix, Inc.

INITIATION

We are initiating coverage of Spherix, Inc. with a Neutral rating and $2.00 price target. We are intrigued by the potential for SPX-106T. The company's completed preclinical trials demonstrate SPX-106 offers a potential new and differentiated approach to treating high triglycerides. Despite what looks like pretty intriguing data above, there are several reasons to remain on the side-line for now. Mainly, Spherix has yet to enter clinical testing with SPX-106T. Investors typically do not bid up shares of biotech stocks until human proof-of-concept has been proven (phase 2 data). We could be two years from seeing final phase 2 data on SPX-106T. In the meantime, Spherix will require significant capital to develop SPX-106T through phase 2 studies.

Current Recommendation	**Neutral**
Prior Recommendation	N/A
Date of Last Change	01/17/12
Current Price (01/17/12)	$1.23
Target Price	**$2.00**

SUMMARY DATA

52-Week High	**$9.10**
52-Week Low	**$1.17**
One-Year Return (%)	**-85.72**
Beta	**0.25**
Average Daily Volume (sh)	**116,888**
Shares Outstanding (mil)	**3**
Market Capitalization ($mil)	**$4**
Short Interest Ratio (days)	**2.49**
Institutional Ownership (%)	**3**
Insider Ownership (%)	**1**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**-38.9**
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**

Risk Level	**Average**
Type of Stock	**Small-Value**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue
(millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2010	0.3 A	0.3 A	0.4 A	0.4 A	1.4 E
2011	0.3 A	0.2 A	0.2 E	0.2 E	0.9 E
2012					0.9 E
2013					1.0 E

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

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2010	-$1.25 A	-$1.49 A	-$1.25 A	-$0.49 A	-$4.36 E
2011	-$0.10 A	-$0.40 A	-$0.36 A	-$0.41 E	-$1.86 E
2012					-$2.33 E
2013					-$2.00 E

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WHAT'S NEW

Initiating Coverage

We are initiating coverage of Spherix, Inc. with a Neutral rating and $2.00 price target. We are intrigued by the potential for SPX-106T. The company's recently completed preclinical trials demonstrate SPX-106 offers a potential new and differentiated approach to treating high triglycerides and dyslipidemia. Recent data presentations show the drug achieved statistically significant reductions in triglycerides and cholesterol when administered in combination with D-Tagatose for 9 weeks to genetically engineered (LDLr -/-) mice prone to dyslipidemia. The data show twice-daily oral dosing significantly reduced triglycerides by 43 mg/dl compared with control animals with a mean triglyceride level of 118 mg/dl (p=0.01). The same therapy significantly reduced total cholesterol by 73 mg/dl from a mean level of 378 mg/dl compared with control animals (p=0.01).

In September 2011, Spherix released additional preclinical data on SPX-106T from the above trial. Results show that SPX-106T achieved statistically significant reductions in VLDL and LDL cholesterol over 9 weeks when administrated to genetically engineered mice prone to dyslipidemia. Treatment of animals using a range of low doses of SPX-106T twice-daily significantly reduced VLDL by 35% (from 127 mg/dl to 82 mg/dl) and LDL by 18% (from 141 to 116 mg/dl) (p=0.05). The data also suggest that SPX-106T may also reduce atherosclerotic lesions area in the aortic arch. The aortic arch is generally the region where vessel disease first develops. In longer studies and in models in which high serum triglycerides fully develops, disease spreads in the vessel from the aortic arch to include the thoracic aorta.

In October 2011, Spherix presented a poster at the American Association of Pharmaceutical Scientists (AAPS) National Meeting summarizing the results from the above preclinical genetically engineered mice data. The poster highlights the key findings where SPX-106T significantly reduced serum cholesterol by 30% (-307 mg/dl; $p<0.05$), prevented body weight gain ($p<0.05$), and significantly reduced the amount of subcutaneous, retroperitoneal, and epididymal fat (77, 90, 85% reductions, respectively, $p<0.01$). A key safety finding showed that SPX-106T did not affect the weight of other organs such as the heart and spleen. Spherix remains in preclinical development studying SPX106 both as a monotherapy and in combination with D-Tagatose for the prevention and treatment of atherosclerosis, hypertriglyceridemia and related dyslipidemias.

We expect management will file an investigation new drug (IND) application during the second quarter 2012. Spherix goal is to begin human efficacy testing the combination of SPX106 and D-Tagatose shortly thereafter. We view the story as intriguing, but the story is still early-stage and the need for cash keeps us on the side-lines.

INVESTMENT OVERVIEW

Spherix Incorporated, headquartered in Bethesda, Maryland, is a scientific research company founded in 1967. The company conducts operations through two subsidiaries, Biospherics Incorporated and Spherix Consulting, Inc. Biospherics recently completed preclinical studies on a combination product, SPX-106T, for the treatment of high triglycerides and mixed dyslipidemia. SPX-106T is a combination of SPX-106, a novel agent recently in-licensed from the University of Kentucky and D-tagatose, the company's previous phase 3 candidate for diabetes.

Spherix Consulting provides scientific and strategic support for suppliers, manufacturers, distributors and retailers of conventional foods, biotechnology-derived foods, medical foods, infant formulas, food ingredients, dietary supplements, food contact substances, pharmaceuticals, medical devices, consumer products, and industrial chemicals and pesticides. The Spherix Consulting mission is to provide the necessary strategic, regulatory, and scientific support to clients for the purpose of securing successful market position by assuring the safety, regulatory compliance / approval and benefit of their products.



Biospherics

Biospherics, a wholly owned subsidiary of Spherix Incorporated, is dedicated to developing proprietary products for commercial applications. The company is a leader in the application of chiral carbohydrate chemistry and through this knowledge seeks to develop a pipeline of candidates across a range of therapeutic indications. The company's lead clinical candidate is SPX-106T, under development for the treatment of dyslipidemia (high triglycerides and high cholesterol). SPX-106T is a combination product of SPX-106, recently in-licensed from the University of Kentucky Research Foundation (UKRF) and D-Tagatose, an FDA-approved, naturally occurring, simple sugar previously studies as an oral treatment for glycemic control in patients with Type 2 diabetes and as a potential treatment for high triglycerides.

Focus Turns To Triglycerides

Over the past year, Spherix has shifted its focus from diabetes to the Triglyceride market. Triglyceride lowering is an enormous market opportunity and a growing epidemic driven by an increasingly obese U.S. population. There are an estimated 75 million adult Americans with elevated levels of TGs. Approximately 35 million of these patients are on the borderline (150-199mg/dL) and generally not seeking specific TG prescription medications. Most are on Statins, a nearly $25 billion market. Statins do an excellent job of LDL lowering. Some even contribute to modest raising of HDL. However, all are essentially ineffective in controlling high triglycerides. Another 35 million patients have high TGs (200-499mg/dL), but still only around 5% seek prescription treatment. The final 5 million have ultra-high TGs (>500mg/dL), and are more apt to be on a multitude of prescription drugs.

…Competitive Landscape About To Change…

The TG lowering market is dominated by three classes of drugs, Fibrates (~$2B market), Niacin (~$1B market), and Fish Oil (~$1.5B market). Sales of Fibrates and Niacin are limited by their side-effects and potentially detrimental effect on LDL. Recently, a fish oil (prescription omega-3) product by GlaxoSmithKline, Lovaza, has gained significant market share based on improved efficacy and safety characteristics. However, Lovaza has a nasty fishy taste and its use is limited by the approved label to patients with only ultra-high TGs at greater than 500mg/dL. Data also suggest that Lovaza raises LDL, which would have a detrimental effect to patients with mixed dyslipidemia.

We believe all this is about to change, dramatically. A new TG product from Amarin Pharmaceuticals, ARM101 (purified Ethyl-EPA), recently completed two phase 3 programs, MARINE in patients with ultra-high TGs and ANCHOR in patients with high TGs, both which demonstrated impressive results. The data show powerful TG lowering with neutral effect on LDL.

- MARINE: 229 patients with very high triglycerides (>500mg/dL) for 12 weeks on 2g or 4g of AMR1-1 per day vs. placebo (baseline TG = 680 mg/dL, on background statin therapy). Results for the 4g group showed a reduction in TGs by 33% ($p<0.0001$), reduction in non-HDL-C by 18% ($p<0.0001$), and a reduction in LCL-C by 2.3% (ns).

- ANCHOR: 702 patients with mixed dyslipidemia (200-499mg/dL) for 12 weeks on 2g or 4g of AMR1-1 per day vs. placebo (baseline TG = 259 mg/dL, LDL-C = 83 mg/dL, on background statin therapy). Results for the 4g group showed a reduction in TGs by 21.5% ($p<0.0001$), reduction in non-HDL-C by 13.6% ($p<0.0001$), and a reduction in LCL-C by 6.2% ($p=0.0067$).

We believe ARM101, if approved, will quickly become the market leader for TG lowering. The drug has outstanding safety with the potential for broad market use. The new drug application (NDA) for ARM101 was filed on September 26, 2011. We note both the MARINE and ANCHOR trials were run under special protocol assessments (SPA) with the U.S. FDA, so we are confident this drug will win approval in July 2012, at the very least for the population defined in MARINE. Amarin still needs to conduct an outcome study to expand the label to include the data from ANCHOR. The trial, called REDUCE-IT, will enroll 8,000 patients "at risk" for cardiovascular events. Amarin management estimates the trial will take 6 years and $100 to $125 million to complete. It should get underway in 2012. Assuming positive results from the REDUCE-IT study and intellectual property (IP) protection – which has been a major thorn in Amarin's side – and ARM101 could achieve peak sales of $3 billion.

Another company is working on late-stage medical food agent for high triglycerides. Acasti Pharma is currently in phase 2 trials with CaPre, a highly purified Omega-3 phospholipid derived from Krill (shrimp-like crustacean). Beside powerful triglyceride-lowering capability similar to Fish Oil, Acasti believes that CaPre has significant anti-oxidant and anti-inflammatory properties to improve cardiovascular health. Acasti believes its product has the right balance of powerful TG lowering with neutral to positive effects on LDL and HDL.

…Management's Triglyceride Strategy…

Following the initiation of the phase 3 NEET program (discussed at the end of this report), management began a phase 2 trial with D-Tagatose in diabetes testing lower doses, looking to answer the FDA's question on "lowest efficacious dose." The phase 2 dose-ranging program tested 2.5g, 5g, and 7.5g in a single-blind design, with 34 patients in each group. The primary endpoint for the study was reduction in HbA1c after six months of treatment. Results of the phase 2 program showed that the 7.5g TID dose is the lowest efficacious dose. D-tagatose produced a -0.3% reduction in HbA1c in the 7.5g dose group vs. the 2.5 g dose group in the evaluable efficacy (EE) population, from a mean randomization HbA1c of 7.4%. The reduction of the 7.5g dose was 0.2% more than the 2.5g dose in the ITT population.

It was data from this phase 2 program in diabetes that gave us our first glimpse of efficacy in lowering triglycerides. The baseline TG level at the start of the phase 2 trial was 180 mg/dL, far below the baseline from Amarin's ANCHOR program at 259 mg/dL.

Change From Baseline	2.5g TID	7.5g TID
…Data at 3 Months	N/R	-31mg/dL (-17%)
…Data at 6 Months	+11 mg/dL (+6%)	-29mg/dL (-16%)
…Difference Between 7.5g and 2.5g (Adjusted)		-42mg/dL (-22%)

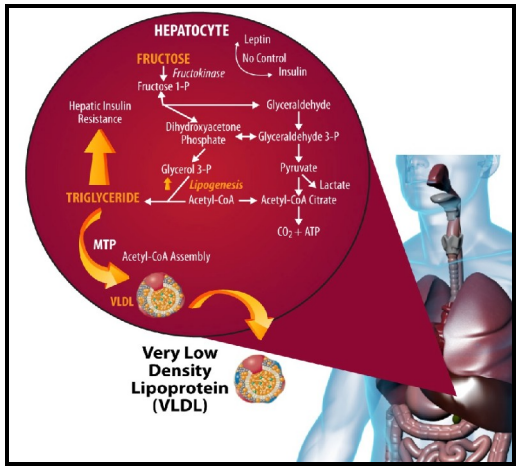
The results from D-Tagatose 7.5g, 16% absolute reduction and 22% adjusted reduction aren't quiet as impressive as Amarin's 30% absolute and 46% adjusted reduction with ARM101, but we note the massive difference in baseline: 180mg/dL for Spherix and 265 mg/dL for Amarin (4g cohort), played a huge role in helping the ARM101 data look more impressive. It is a lot easier to lower TG level in patients with elevated disease than in the borderline population that Spherix tested. After all, Spherix's phase 2 trial was a diabetes program where the TG lowering effect was more a secondary effect rather than a designed protocol. Data from the phase 2 program also demonstrated slight LDL lowering (-10mg/dL) and had no effect on HDL (+1mg/dL) at 6 months. That's good news.

Spherix is going back and looking at the correlation between TG response and BMI. We suspect that management will find the patients that responded with the best TG lowering will be the ones with the highest BMI and highest TG at baseline. If this holds true, this would be consistent with the HbA1c data from NEET, and encouraging from an enrollment criteria for the next clinical study with D-Tagatose in TGs.

Method-Of-Action (MOA) in Dyslipidemia → BMI is an indirect measurement of adiposity. Excess caloric intake leads to increased triglycerides input and adipocyte enlargement. As adipocytes enlarge, they begin to function as an endocrine organ. Enlarged adipocytes present in obese (high BMI) individuals see increased levels of lipolysis. D-Tagatose likely competes with glucose for transport into the adipocyte via the GLUT-4 transporter.

Therefore, D-Tagatose interferes with lipolysis inside the adipocyte. The drug follows the Fructose pathway in the liver. D-Tagatose lowers blood lipoprotein and glucose levels, without causing myopathy (muscle fiber disease) or rhabdomyolysis (release of muscle fibers into the blood stream). D-Tagatose does not stimulate insulin secretion.

The unique mechanism of action and potential to treat patients with mixed dyslipidemia and high blood glucose creates a drug with potential utility in patients with metabolic syndrome. As noted above, there are an estimated 75 million people in the U.S. with high triglycerides and nearly 30 million with diabetes. The correlation between the two is 80%, meaning there are an estimated 25 million people in the U.S. with both high triglycerides and diabetes.



- Metabolic Syndrome is a combination of medical disorders that increase the risk of developing cardiovascular disease and diabetes. Characteristics of metabolic syndrome include: central obesity (>102 cm for males / >88 cm for females), high triglycerides (>150 mg/dL), low HDL-C (<40mg/dL), high LDL-C (>130mg/dL), high blood pressure (>130/85 mmHg), and high fasting plasma glucose (>6%).

The efficacy profile of D-Tagatose, based on the phase 2 dosing ranging study and the phase 3 NEET program in diabetes, looks to be ideal for the treatment of metabolic syndrome:

D-Tagatose Efficacy Profile*	
HbA1c	↓
Triglycerides	↓
LDL	↓
HDL	↑
LDL:HDL Ratio	✓

* Based on phase 3 (NEET) & phase 2 at 6 Months (Protocol 70971-005); *Source: Spherix, Inc.*

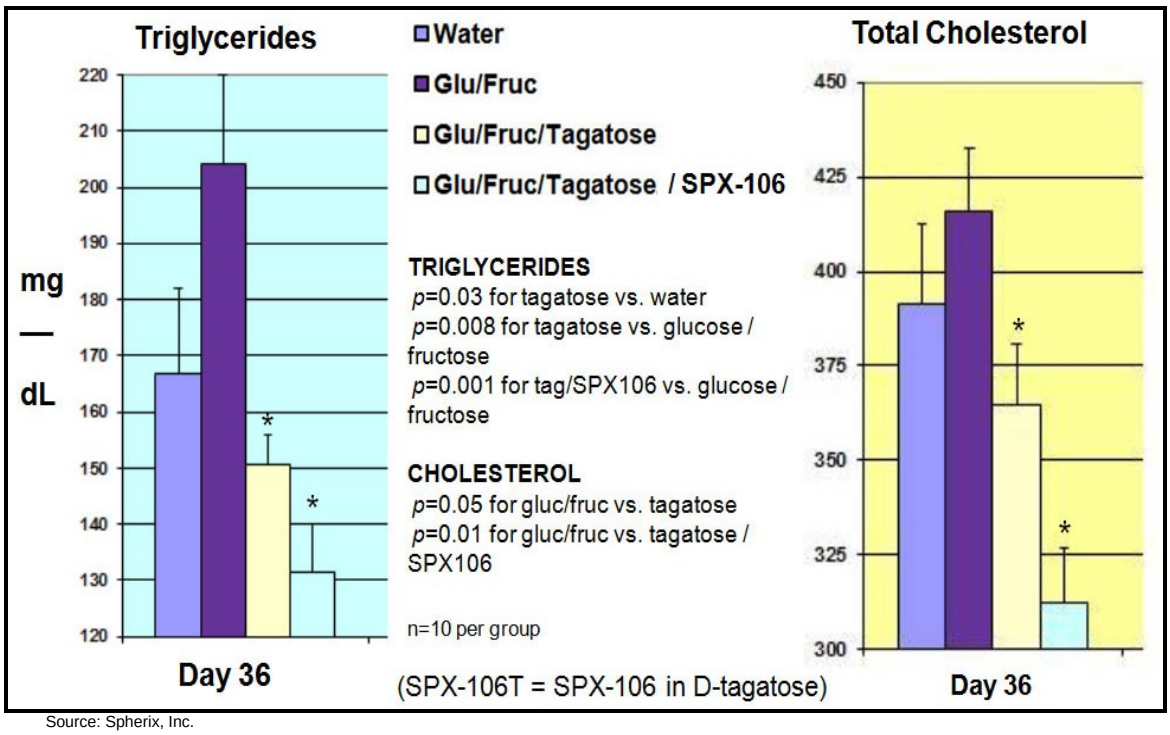
…Back To Animal Studies…

All the work above noted with D-Tagatose has been under an investigation new drug (IND) application for Type 2 diabetes. That's includes the phase 2 dose-ranging study that offered up the preliminary data in triglycerides. To conduct triglyceride specific programs, Spherix has to go back to conduct some preclinical studies to establish safety and proof-of-principle. The development plan for 2011 included a number of IND-enabling studies:

- ✓ The first is a drug synthesis and formulation study that utilizes a radio-labeled D-Tagatose designed to enable management to track the drug in the body. These studies include liver cell studies, fat cell studies, gastrointestinal cell studies, and rat whole-body studies.

- ✓ Secondly, Spherix has human clinical assay development studies underway designed to measure and compare SPX-106, D-Tagatose, D-Glucose, and D-Fructose simultaneously in blood samples. These studies help management design human PK/PD studies in phase 1 trials.

- ✓ The third study tested SPX-106 and D-Tagatose in genetically modified mice on a high carbohydrate diet. Certain mouse models develop obesity before they develop high triglycerides and atherosclerosis. Results of these studies help management understand the effects of both drugs on triglycerides as well as body mass (BMI). Below we highlight some of these data in LDLr Knockout Mice with diet-induced atherosclerosis.



Source: Spherix, Inc.

Results show that mice on a carbohydrate-supplemented diet (glucose / fructose) had significantly higher triglycerides and total serum cholesterol levels vs. mice on a D-Tagatose supplemented diet. When SPX-106 was added to the diet, results show a strong synergistic effect with D-Tagatose.

- ✓ Similarly, in a fourth study, management tested the effects of D-Tagatose in wild type hamsters on a high fat / high carbohydrate ("Western") diet. These hamsters developed dyslipidemia and, along with the genetically modified mice on a high carbohydrate diet noted above, helped management understand the relationship between diet andSPX-106 and D-Tagatose in patients suffering from metabolic syndrome.

- ✓ Spherix has also conducted combination studies with D-Tagatose and a recently in-licensed candidate from Robert Lodder's (President of Spherix) laboratory at the University of Kentucky, SPX10624258 (SPX-106). Studies in hamsters and apoE knockout mice have been completed. Results of studies with respect to extent of atherosclerosis in the original mice LDLr knockout mice have been announced, and studies of atherosclerosis in the first experiment designed specifically to test the effect of SPX-106T on atherosclerosis should be announced soon.

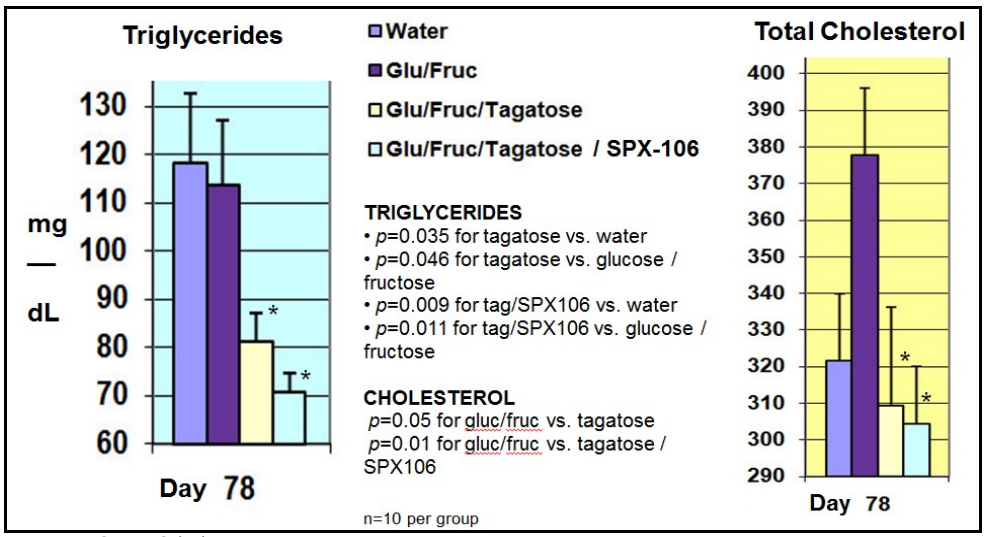
Spherix is finishing a safety and toxicology study now, while also preparing the Investigational New Drug (IND) application for human clinical trials with SPX-106T in dyslipidemia for later in 2012. The first phase 1 trial will be focused on safety, tolerability, and pharmacokinetics. We expect a small program in 8-12 patients, with dose escalation looking for pre-calculated PK and intolerability (maximum tolerated dose – MTD).

…About SPX-106…

In June 2010, Spherix signed a licensing agreement with the University of Kentucky Research Foundation (UKRF) whereby the company acquired worldwide rights to the international patents filed under the Patent Cooperation Treaty (PCT) on behalf of UKRF for D-Tagatose as a lipid-lowering agent for prevention and treatment of atherosclerosis, hypertriglyceridemia, and related dyslipidemias. Spherix also licensed the rights to five unique formulations that include D-Tagatose as one of the active pharmaceutical ingredients for the treatment of atherosclerosis and metabolic syndrome. The most advanced preclinical candidates in-licensed from UKRF is a small molecule, SPX-10624258 (dubbed SPX-106). It has been formulated with D-Tagatose to create SPX-106T.

Management has been tight-lipped about the mechanism around SPX-106, as utility patents are being filed in the U.S. and worldwide. We are expecting patent approval by 2014. What we do know is that SPX-106 is not a carbohydrate like D-Tagatose but is found in nature. The drug has been tested in humans, but never for a therapeutic application. Perhaps it has been tested as food additive. We do know that SPX-106 has never been designated as GRAS like D-Tagatose. In 2011, Spherix initiated the preclinical development of SPX-106 and D-Tagatose as a treatment for hypertriglyceridemia. The hypothesis → SPX-106 works catabolically to reduce cholesterol and triglycerides while D-Tagatose works anabolically by prevent the synthesis of lipids.

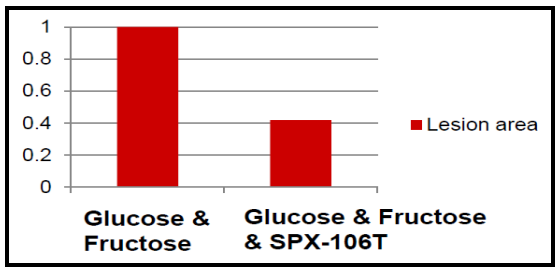
In June 2011, Spherix announced SPX106 achieved statistically significant reductions in triglycerides and cholesterol when administered in combination with D-Tagatose for 9 weeks to genetically engineered (LDLr -/-) mice prone to dyslipidemia. The first experimental data show twice-daily oral dosing significantly reduced triglycerides by 43 mg/dl compared with control animals with a mean triglyceride level of 118 mg/dl (p=0.01). The same therapy significantly reduced total cholesterol by 73 mg/dl from a mean level of 378 mg/dl compared with control animals (p=0.01).



Source: Spherix, Inc.

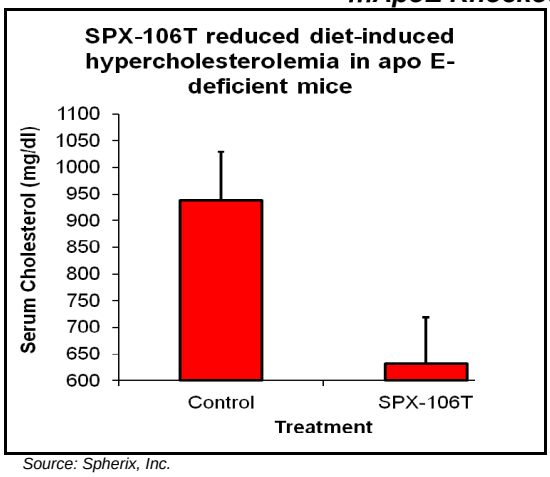
In September 2011, Spherix released additional preclinical data on SPX-106T from the above trial. Results show that SPX-106T achieved statistically significant reductions in VLDL and LDL cholesterol over 9 weeks when administrated to genetically engineered mice prone to dyslipidemia. Treatment of animals using a range of low doses of SPX-106T twice-daily significantly reduced VLDL by 35% (from 127 mg/dl to 82 mg/dl) and LDL by 18% (from 141 to 116 mg/dl) (p=0.05).

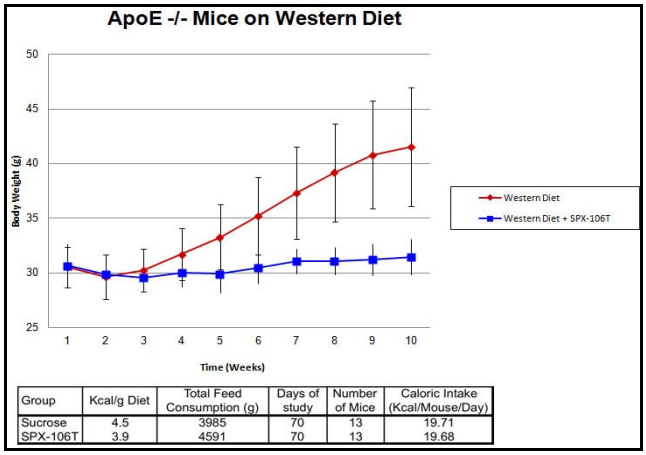
Importantly, SPX-106T also reduced atherosclerotic lesion area in the aortic arch to less than one-half the value of the untreated group when compared to the control (glucose & Fructose). The aortic arch is generally the region where vessel disease first develops. In longer studies and in models in which high serum triglycerides fully develops, disease spreads in the vessel from the aortic arch to include the thoracic aorta.



In October 2011, Spherix presented a poster at the American Association of Pharmaceutical Scientists (AAPS) National Meeting summarizing the results from the above preclinical genetically engineered mice data. The poster highlights the key findings where SPX-106T significantly reduced serum cholesterol in apoE -/- mice by 30% (-307 mg/dl; p<0.05), prevented body weight gain (p<0.05), and significantly reduced the amount of subcutaneous, retroperitoneal, and epididymal fat (77, 90, 85% reductions, respectively, p<0.01). A key safety finding showed that SPX-106T did not affect the weight of other organs such as the heart and spleen.

…ApoE Knockout Mice fed Western Diet…





Group	Kcal/g Diet	Total Feed Consumption (g)	Days of study	Number of Mice	Caloric Intake (Kcal/Mouse/Day)
Sucrose	4.5	3985	70	13	19.71
SPX-106T	3.9	4591	70	13	19.68

Source: Spherix, Inc.

Spherix remains in preclinical development studying SPX106 both as a monotherapy and in combination with D-Tagatose for the prevention and treatment of atherosclerosis, hypertriglyceridemia and related dyslipidemias. We are expecting management to release results from the atherosclerosis study shortly.

We are intrigued by the potential combination product, SPX-106T. Management believes the drug's dual-mechanism where D-tagatose works on the anabolic side of metabolism and SPX106 works on the catabolic side of lipid metabolism may also impact body mass index (BMI). Essentially, as D-tagatose prevents the formation of lipids and SPX106 accelerates their degradation (oxidation) in the body, BMI is reduced independent of caloric intake.

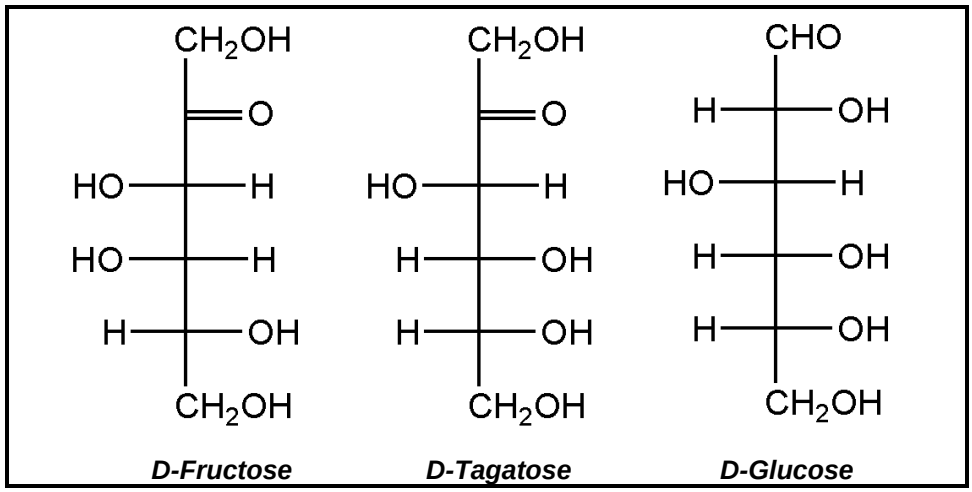
We expect management will file an investigation new drug (IND) application in the second quarter of 2012. Spherix goal is to begin human efficacy testing the combination of SPX106 and D-Tagatose around mid-2012. This trial is like similar to a phase 1 design, looking at evidence of potential adverse events and pharmacokinetics in a small number of patients. The trial will employ a dose escalation protocol until pre-calculated PK safety levels are reached, or intolerable side effects become evident, to find the maximum tolerated dose (MTD). This study will screen people with elevated BMIs (range of 28 to 45) and very high triglyceride levels. Enrollment should complete in about two months and we are expecting see to see the data around the third quarter of 2012. If successful, management will look to demonstrate proof-of-concept in a large phase 2 study in 2013 and 2014.

D-Tagatose Backgrounder

Previously, Spherix was been developing D-Tagatose, a naturally occurring monosaccharide (hexose) simple sugar often found in dairy products, for the treatment of Type 2 diabetes. D-Tagatose is a low-calorie, full-bulk sweetener previously approved by the U.S. Food and Drug Administration (FDA) as a Generally Recognized As Safe (GRAS) food ingredient. It has a very similar taste and texture to sucrose (table sugar) and is 92% as sweet, but with only 38% of the calories. It has been GRAS by the U.S. FDA since 2001, the WHO since 2004, and the EFSA since 2006. It is FDA approved for use as a low calorie sweetener in foods, and was most commonly used in the U.S. as an excipient in OTC products such as throat lozenges, cough syrup, toothpaste, and mouthwash.

Spherix licensed the food and beverage rights to D-tagatose, branded as Naturlose, to the Swedish-Danish dairy company, Arla Foods in 1996. The economics of using Naturlose in foods were not favorable however. Although the product was viewed as a safe low-calorie sweetener, artificial sweeteners such as saccharin at 400x, aspartame at 200x, and sucralose at 600x the sweetness of table sugar offered far better margins. Arla Foods never pushed forward with significant investment in Naturlose, and eventually returned the rights to the molecule back to Spherix in June 2009.

D-tagatose is a naturally occurring L-epimer of D-Fructose with an inversion at the C4 position. Spherix used chiral carbohydrate research to create L-sugars that would not be metabolized by the body, but would retain sweetness. The production process for D-Tagatose starts with enzymatically hydrolyzing lactose into glucose and galactose. The galactose is then isomerized to produce D-Tagatose. The body lacks the enzyme necessary to efficiently metabolize this molecule, and thus it is poorly absorbed in the small intestine. As a result, D-Tagatose does not stimulate insulin secretion (no beta cell exhaustion). Only about 25% is metabolized to CO_2 and H_2O, significantly lower than fructose and glucose. The rest passes to the lower intestine where it is fermented by bacteria to produce short-chain fatty acids and CO_2.



Method-Of-Action (MOA) in Dyslipidemia → The body converts carbohydrates into lipids, which have higher energy density for long-term storage. The metabolism of tagatose in the liver is similar to that of fructose. The molecules are phosphorylated at the C1 position by fructokinase and then cleaved by aldolase-B into glyceraldehydes (GA) and dihydroxyacetone phosphate (DHAP). These molecules are further metabolized into CO_2 and H_2O. However, the rate at which this metabolism occurs for tagatose is about half that of fructose. And similar to phosphorylated fructose (fructose-1-P), phosphorylated tagatose (tagatose-1-P) is an inhibitor of glycogen phosphorylase. This slow inhibition of glycogen phosphorylase effectively lowers sugar levels by increasing glycogen synthesis and decreasing glycogen utilization.

- Diabetes Mellitus or type 2 diabetes (T2D) is a chronic (lifelong) disease marked by high levels of sugar in the blood. It begins when the body does not respond correctly to insulin, a hormone released by the pancreas that regulates and controls blood sugar levels. Patients with T2D often have high triglycerides as well. Type 2 diabetes is the most common form of diabetes and accounts for over 90% of all diabetes cases. According to the World Health Organization (WHO), there are an estimated 175 million people (3% of the population) worldwide with diabetes, approximately 28 million (nearly 10% of the population) of which are in the U.S. Plus, in the U.S., there are an estimated 57 million Americans – nearly 20% of the country's population – that are considered pre-diabetic or at risk for developing full onset adult diabetes.

The Center for Disease Control and Prevention (CDC) estimates that 1 out of 3 Americans born after 2000 will develop diabetes in their lifetime. It is an enormous medical problem and one that costs the U.S. an estimated $135 billion each year. The number eclipses $200 billion worldwide.

…Phase 3 Diabetes Trial Analyses…

In October 2010, Spherix released data from a phase 3 program called NEET (Naturlose Efficacy Evaluation Trial) testing D-Tagatose in the treatment of Type 2 diabetes. The double-blind, placebo-controlled trial randomized 356 treatment-naïve patients to either 15g for D-Tagatose TID (3x daily) or placebo, with meals for a period of up to one year as an adjunct to diet and exercise. The trial was conducted in the U.S. and India. The average HbA1c in patients at the time of entering the trial was 7.5% (inclusion criteria was between 6.6% and 9.0%).

Top-line results of the trial were mixed, showing overall statistical significance and improvement in HbA1c trends over the length of the trial, but lack of strong efficacy that would effectively complete with currently approved Type 2 Diabetes drugs such as metformin, thiazolidinediones (TZDs), and sulfonylureas (SU). The results were more similar to what has been achieved with Dipeptidyl peptidase-4 inhibitors (DPP-4) and injectable glucagon-like peptide 1 (GLP-1) agents when the mean baseline HbA1c levels is 7.0-7.9% (Bloomgarden et al. Diabetes Care, Vol.29, No.9, 9/2006).

The phase 3 data from NEET show that D-Tagatose was more effective in the U.S. population than in the Indian population, as the per protocol (PP) patients in the U.S. who were treated with D-Tagatose had a reduction in HbA1c of 0.4% at two months, 0.6% at six months and 1.1% at 10 months on therapy ($p<0.05$). Results in the Indian PP population show essentially no change in HbA1c after 2, 6, or 10 months. Overall results from the global PP population were statistically significant at month 10, but fail to impress given limited efficacy of a reduction of only 0.4%. The global intent-to-treat / last observation carry forward (ITT-LOCF) population showed only limited response after 10 months on drug.

A responder analysis paints a better picture of the trial's outcome. We believe having 60% of the patients achieve an HbA1c below 7% (ADA guidelines), vs. 25% for placebo, is meaningful, and clearly shows D-Tagatose is efficacious. Management conducted further analyses of the data and concluded that adiposity and baseline BMI (body mass index) played an important role in outcome. Quite simply, in patients with an elevated BMI, that is, in patients with sufficient numbers and size of adipocytes (fat cells) for dietary carbohydrate effects to be manifested, the D-Tagatose mechanism becomes effective in the control of blood glucose and plasma triglyceride (TG) levels.

Responders	**HbA1c < 6.5%**		**HbA1c < 7%**	
	D-Tagatose	**Placebo**	**D-Tagatose**	**Placebo**
…Percent of Patients	24%	10%	60%	25%
	n/s		p=(0.03)	

	U.S.	**India**
…Average BMI	28.3	25.8
…Average Triglyceride Level	189 mg/dL	171 mg/dL
PP Reduction in HbA1c	-1.1%	-0.2%

This explains why the drug worked in the U.S. population and not in the Indian population. The U.S. population's higher BMI and higher TG level provided the framework for the D-Tagatose mechanism of action to become effective. The association between high carbohydrate diet and hyper-triglyceridemia is stronger for those who are overweight (BMI >28). Insulin resistance is more common among the overweight and the obese (BMI >30) and is suspected to be a result of carbohydrate-induced hyper-triglyceridemia. D-Tagatose, which shares a common metabolic pathway with other sugars, competes with glucose for transport into the adipocyte. This competition appears to inhibit glucose uptake and interfere with the formation of free fatty acids overload.

In the company's post-hoc analysis of the phase 3 results, management noted an interesting correlation between high BMI, high HbA1c, and high TGs. The correlation matrix below demonstrates why management believes their drug can be an effective molecule for controlling both HbA1c and TG level in patients with poor glucose control due to metabolic syndrome and elevated BMI.

CORRELATION	HbA1c	BMI	TG
HbA1c	-	.72	.80
BMI	.72	-	.72
TG	.80	.72	-

…Efficacy & IP Issues in Diabetes…

Spherix holds the patents for use of D-Tagatose as a treatment for Type 2 diabetes. However, these patents expire in 2012. If approved, Spherix will qualify for five years of extended exclusivity based on the new chemical entity (NCE) application. There is no patent for D-Tagatose in Europe. However, similar to the U.S., Spherix can receive seven to ten years of data exclusivity in the European Union if the European Medicines Agency (EMA) approves the marketing authorization application (MAA). Yet, regardless of five or ten years of market exclusivity, we simply do not see D-Tagatose as a viable treatment option in its current form for Type 2 diabetes. The dose of 15 g TID is inconvenient and the efficacy is too low, especially in treatment naïve patients that typically start out on metformin and move to once-daily or once-weekly DPP-IV or GLP-1 agents.

That being said, during the third quarter 2011, management filed a patent application with the U.S. PTO seeking protection for a combination D-Tagatose / metformin product. If granted, the combination product would have 20 years of market exclusivity. However, in order to gain approval in the U.S., Spherix still needs to conduct a cardiovascular outcome study to show no increased risk of adverse cardiac events in patients taking D-Tagatose. This FDA requirement would need to be conducted prior to approval in patients that have Type 2 diabetes. Since these are not necessarily at “at risk” patients for adverse cardiac events, we estimate such a trial would need to enroll 10,000 patients over six to eight years, at a cost of $150 to $200 million, before data could be analyzed.

The potential for 20 years of market exclusivity with D-Tagatose/Metformin makes things more interesting from a partnering standpoint. Still, six to eight years before approval and potentially $200 million is a lofty hurdle to overcome for the U.S. market. In fact, we see it as simply not viable. Spherix will continue to search for a development partner for the combination (assuming the patent is granted), focusing on Europe where such an outcome study is not necessary, but we do not include a deal in our financial model.

Research, Manufacturing, and IP Issues

The preclinical work on D-Tagatose and SPX-106 is being conducted at a leading global contract research organization (CRO). Management initiated the contract in December 2010 and work should continue into 2012. Spherix and the CRO are working to design and execute studies in cell culture, animal models and humans to clarify the mechanism of action of SPX-106 and D-tagatose in modulating triglycerides in the metabolic syndrome. The commercial intent of the triglyceride program is to develop a formulation, dose and dosing regimen appropriate for the lipid market segment and uniquely different from the diabetes market. We expect that Spherix will develop a completely new brand separate from the diabetes brand.

Spherix does not own or operate a manufacturing facility. As a reminder, management first acquired D-Tagatose for use in the trials from Arla Foods Ingredients amba (Arla). However, Arla discontinued its manufacturing of the drug, forcing Spherix to seek a new manufacturing partner. In June 2009, management signed a Supply Agreement with Inalco, S.p.A. Spherix used both Inalco and Arla D-Tagatose in the phase 2 and phase 3 trials conducted under the IND for Type 2 diabetes. Unfortunately, Inalco discontinued manufacturing of D-Tagatose and sold its facility to Nutrilab. Spherix received a final shipment of 8.5 metric tons of D-Tagatose in April 20, 2011. Management believes the 8.5 metric tons provides sufficient supply to conduct the triglycerides studies through phase 3 studies.

The use patent for the new SPX-106 and D-Tagatose combination in the U.S. will last until 20 years after the date of the original PCT filing (Nov 2009). If SPX-106 is approved for use as a drug by the U.S. FDA as a treatment for high triglycerides and related dyslipidemias, we believe it will be eligible for a five-year New Chemical Entity (NCE) exclusivity period following FDA approval, and seven or more years of market exclusivity in the European Union, if approved by the European Medicines Agency (EMA). This exclusivity, along with 20 years of patent production, should be enough to quash any IP issues similar to the issues that have hit Amarin’s stock so hard in the past few months.

The company has two active patients for the treatment of diabetes:

Patent No.	Title	Issued	Expires
U.S. 5,447,917	D-Tagatose as an Anti-Hyperglycemic Agent	09/05/1995	09/05/2012
U.S. 5,356,879	D-Tagatose as an Anti-Hyperglycemic Agent	10/18/1994	02/14/2012

Spherix has two patents pending:

Title	Filed	Status
D-Tagatose Based Composition And Methods For Preventing And Treating Atherosclerosis, Metabolic Syndrome And Symptoms Thereof	November 4, 2009	Pending*
D-Tagatose And Biguanide Composition And Methods	April 1, 2010	Pending

** licensed from UKRF*

Spherix Consulting

Spherix Consulting became part of Spherix Inc. in July 2007 when current CEO and COO, Claire L. Kruger, joined the company. The impetus of creating Spherix Consulting came at the time management was pushing D-Tagatose into the phase 3 NEET trial for Type 2 diabetes. Spherix needed to attract senior scientific leadership to help design and run the program. Spherix acquired a wealth of development and commercialization knowledge surrounding the implementation of the phase 3 trial for D-Tagatose, and decided to leverage this talent into a Health Science consulting business to help fund operations and retain top scientific talent while NEET progressed.

Spherix Consulting is a team of health sciences consultants that are credentialed professionals with the experience, expertise, and management skills to provide efficient and effective support to its clients. In the simplest terms, they help clients make science-based decisions. Spherix Consulting offers a network of internationally recognized consultants to assist clients with questions about global product approval strategy and achievement of successful regulatory submissions and product approvals. The company evaluates health and environmental risks of legacy products, their components and potential contaminants that are under regulatory scrutiny, subject to product liability and tort litigation and/or exposed to changing scientific standards or public perceptions. Spherix also evaluates risks associated with new products and helps clients devise and implement strategies to mitigate and manage these risks. These services include:

- ✓ Product Stewardship: Spherix will assist in the design of programs to assess and evaluate risk to human health and safety and to the environment associated with product manufacture, storage and transport, use, and disposal. The company will help implement risk management strategies to eliminate, or limit to acceptable levels, these risks, and to develop a communication plan to inform the public, government officials, employees and customers about product risks and how they are being managed.

- ✓ Safety & Efficacy Review: Spherix Consultants will review and evaluate safety data relating to toxicity, and develop efficacy-testing protocols for marketing approval.

- ✓ Regulatory Compliance: Spherix represents clients before regulatory authorities including the FDA, the EMEA, the EPA, and the CSPC. The company help clients pursue GRAS (“generally recognized as safe”) determinations; and prepare and submit notifications under the FDA’s food contact notification (FCN) program. In addition, company consultants help address recent regulatory developments; develop data waiver strategies, and perform Good Laboratory Practice (GLP) inspections.

- ✓ Strategy Analyses: Spherix helps its clients establish market strategies by providing guidance in discovery, dose selection for safety assessment, chemistry and manufacturing, efficacy assessment, and post marketing surveillance. Consultants provide full support from discovery through post-marketing surveillance with the aim of ensuring that safe and effective new products reach the public in a timely fashion.

- ✓ CRO Capabilities: Spherix helps its clients design, place and monitor pre-clinical and clinical trials, including the development of protocols, dosage and exposure assessments, oversight of patient recruitment and site management entities. Spherix Consultants also aid in and the preparation and submittal of required documentation for study oversight and management.

Many of the clients of Spherix Consulting are large, well-known companies with a number of successful products on the market. The proliferation of new products in the food and pharmaceutical areas creates a growing need for the regulatory services of the company. During 2008 and 2007, Health Sciences provided services to 16 and 10 companies, respectively. The company generally provides its services on either a fixed-price basis or on a "time and expenses" basis, charging hourly rates for each staff member involved in a project, based on his or her skills and experience. Revenues and operating margins for any particular quarter are generally affected by staffing mix, resource requirements, and timing and size of engagements.

Spherix Consulting is also monitoring and directing the clinical and preclinical programs for D-Tagatose and SPX-106 at Biospherics. Spherix Consulting revenue accounted for 99% of the company's total revenue in 2008, 2009, and 2010. In 2010, one customer of Spherix Consulting accounted for over 10% of revenues. No other single customer accounted for 10% or more of consolidated revenue. During the third quarter 2011, Spherix Consulting contributed revenues of $0.2 million. There are over a dozen customers. For the full year 2011, we expect Spherix Consulting to generate revenues of approximately $0.9 million.

Financial Position

Spherix exited the third quarter 2011 with $5.0 million in cash and cash equivalents. Operating cash burn for the first three quarters of the year was $3.1 million. Spherix burned $0.6 million in the most recent quarter. We project revenues in 2011 will come in at $0.9 million, with net loss totaling $3.4 million, or $1.86 per share. We remind investors that Spherix instituted a 1-for-10 reverse stock split in early May 2011.

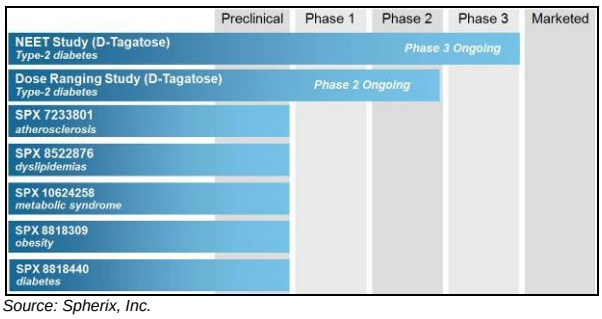
In October 2011, Spherix raised approximately $1.15 million through a private placement of approximately 0.5 million shares of common stock at $2.365 per share. The offering came with 100% warrant coverage. The existing capital structure looks as follows:

Basic Shares (September 30, 2011)	**2.562M**
Stock Options Granted	**0.004M**
Warrants @ $2.96	**0.016M**
@ $2.24	**0.533M**
@ $8.00	**0.213M**
@ $8.13	**0.013M**
@ $15.63	**0.013M**
@ $15.00	**0.210M**
@ $28.75	**0.008M**
@ $32.50	**0.110M**
Fully Diluted Shares	**3.682M**

Management expects to use cash of $4 to $6 million in 2012. We believe management will need to raise funds again in 2012. We remind investors the company has a history of raising cash concurrent with releasing clinical data. The last three cash raises (all private placements Rodman & Renshaw) came on the day the company released clinical data. This makes it difficult to recommend the stock when almost all good news is immediately met with dilutive offerings of the common stock.

This is a primary concern for investors. Spherix is back to a very early-stage development company. The leading pipeline candidate, SPX-106T has yet to even enter the clinic. We estimate the company will require $15 million to bring SPX-106T to a partnership level (through phase 2 development). At the current stock price, this would be over 200% dilutive for current shareholders.

Pipeline



Source: Spherix, Inc.

MANAGEMENT

Claire L. Kruger, Ph.D., D.A.B.T. – *Chief Executive Officer and Chief Operating Officer*
Dr. Claire L. Kruger has served as Chief Executive Officer, Chief Operating Officer, and as a member of the Spherix Board of Directors since 2007. She also serves as Director of Spherix Consulting. Dr. Kruger is a toxicologist with more than 20 years of consulting experience. Her primary area of expertise is in pharmaceuticals, consumer products and foods, where she provides scientific, regulatory, and strategic support to clients in both the U.S. and international regulatory arenas. She has conducted toxicity evaluations of food contaminants, as well as health risk assessments and exposure assessments of drugs, cosmetics, and pesticides. Her clients include food, drug, and dietary supplement manufacturers, agricultural producers, biotechnology companies, trade associations, and law firms. In her role as a consultant, Dr. Kruger has been involved in the safety evaluation of a variety of consumer products, providing oversight of product compliance with current and emerging scientific and regulatory guidance. Dr. Kruger received her Ph.D. in Toxicology from Albany Medical College, and her B.S. in Biology from Clarkson University, Potsdam, NY

Robert A. Lodder, Ph.D. – *President*
Dr. Robert A. Lodder has been a member of the Spherix Board of Directors since 2005 and has served as President of the company since August 2007. He has served as a Professor of Pharmaceutical Sciences at the College of Pharmacy, University of Kentucky Medical Center, and currently holds joint appointments in the Department of Electrical and Computer Engineering, and the Division of Analytical Chemistry of the Department of Chemistry at Kentucky. He was a founder of InfraReDx, Inc. in 1998 and Prescient Medical, Inc. in 2004. Dr. Lodder received his B.S. degree cum laude in Natural Science and his M.S. in Chemistry in 1983 from Xavier University, Cincinnati, Ohio in 1981. He received his Ph.D. in Analytical Chemistry in 1988 from Indiana University

Robert L. Clayton, CPA – *Chief Financial Officer and Treasurer*
Mr. Robert L. Clayton was elected Chief Financial Officer and Treasurer in August 2007. He previously served as Director of Finance and Controller of the Company. Prior to joining Spherix, he was a Senior Auditor for the public accounting firm Rubino & McGeehin, Chartered. Mr. Clayton holds a B.S. in business and management from the University of Maryland and a C.P.A. from the District of Columbia.

Robert J. Vander Zanden, Ph.D. – *Chairman of the Board*
Dr. Robert J. Vander Zanden, Board Member since 2004, was elected Spherix Chairman of the Board in early 2009. Having served as a Vice President of R&D with Kraft Foods International, he brings a long and distinguished career in applied technology, product commercialization, and business knowledge of the food science industry to Spherix. In his 30-year career, he has been with ITT Continental Baking Company as a Product Development Scientist; with Ralston Purina's Protein Technology Division as Manager Dietary Foods R&D; with Keebler as Group Director, Product and Process Development; with Grupo Gamesa, a Frito-Lay Company, as Vice President, Technology; and with Nabisco as Vice President of R&D for their International Division. With the acquisition of Nabisco by Kraft Foods, he became the Vice President of R&D for Kraft's Latin American Division. Dr. Vander Zanden retired from Kraft Foods in 2004. He currently holds the title of Adjunct Professor and Lecturer in the Department of Food Science and Human Nutrition at Clemson University, where he also is a member of their Industry Advisory Board. His focus on achieving product and process innovation through training, team building and creating positive working environments has earned him multiple awards for product and packaging innovation. Dr. Vander Zanden holds a Ph.D. in Food Science and an M.S. in Inorganic Chemistry from Kansas State University, and a B.S. in Chemistry from the University of Wisconsin – Platteville, where he was named a Distinguished Alumnus in 2002.

RECOMMENDATION

Initiating Coverage

We are intrigued by the potential for SPX-106T. The company's preclinical data has demonstrated SPX-106 offers a potential new and differentiated approach to treating high triglycerides. Data presented in June 2011 show the drug achieved statistically significant reductions in triglycerides and cholesterol when administered in combination with D-Tagatose for 9 weeks to genetically engineered (LDLr -/-) mice prone to dyslipidemia. The data show twice-daily oral dosing significantly reduced triglycerides by 43 mg/dl compared with control animals with a mean triglyceride level of 118 mg/dl (p=0.01). The same therapy significantly reduced total cholesterol by 73 mg/dl from a mean level of 378 mg/dl compared with control animals (p=0.01).

In September 2011, Spherix released additional preclinical data on SPX-106T from the above trial. Results show that SPX-106T achieved statistically significant reductions in VLDL and LDL cholesterol over 9 weeks when administrated to genetically engineered mice prone to dyslipidemia. Treatment of animals using a range of low doses of SPX-106T twice-daily significantly reduced VLDL by 35% (from 127 mg/dl to 82 mg/dl) and LDL by 18% (from 141 to 116 mg/dl) (p=0.05).

The data suggest that SPX-106T may also reduce atherosclerotic lesions area in the aortic arch. The aortic arch is generally the region where vessel disease first develops. In longer studies and in models in which high serum triglycerides fully develops, disease spreads in the vessel from the aortic arch to include the thoracic aorta.

In October 2011, Spherix presented a poster at the American Association of Pharmaceutical Scientists (AAPS) National Meeting summarizing the results from the above preclinical genetically engineered mice data. The poster highlights the key findings where SPX-106T significantly reduced serum cholesterol by 30% (-307 mg/dl; p<0.05), prevented body weight gain (p<0.05), and significantly reduced the amount of subcutaneous, retroperitoneal, and epididymal fat (77, 90, 85% reductions, respectively, p<0.01). A key safety finding showed that SPX-106T did not affect the weight of other organs such as the heart and spleen. Spherix remains in preclinical development studying SPX106 both as a monotherapy and in combination with D-Tagatose for the prevention and treatment of atherosclerosis, hypertriglyceridemia and related dyslipidemias. We expect management will file an investigation new drug (IND) application in the next few months. Spherix goal is to begin human efficacy testing the combination of SPX106 and D-Tagatose around the middle of 2012

…Concerns Keep Us At Neutral…

Despite what looks like pretty intriguing data above, there are several reasons to remain on the side-line for now. Mainly, Spherix has yet to enter clinical testing with SPX-106T. Investors typically do not bid up shares of biotech stocks until human proof-of-concept has been proven (phase 2 data). We could be two years from seeing final phase 2 data on SPX-106T.

In the meantime, Spherix will require significant capital to develop SPX-106T through phase 2 studies. This would be a level where management can begin to shop around SPX-106T for a development and commercialization partnership. We estimate the company will require $15 million to bring SPX-106T to a partnership level. At the current stock price, this would be over 200% dilutive for current shareholders.

We believe management will need to raise funds again in 2012. We remind investors the company has a history of raising cash concurrent with releasing clinical data. The last three cash raises (all private placements Rodman & Renshaw) came on the day the company released clinical data. With that kind of history, investors may be hesitant to own the stock prior to major catalysts. There seems little opportunity to book profits and reap the rewards of positive data without getting hit immediately with a dilutive offering on the same day.

Management has noted its intension to in-license additional clinical-stage compounds to fill the pipeline void. However, we note this also requires cash. Until the company secures long-term funding and has demonstrated clear human proof-of-concept with SPX-106T, we remain on the side-line.

PROJECTED FINANCIALS

Spherix, Inc.
Income Statement

	2010 A	Q1 A	Q2 A	Q3 A	Q4 E	2011 E	2012 E	2013 E	2014 E	2015 E
SPX-106-T	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
YOY Growth	-	-	-	-	-	-	-	-	-	-
Pipeline	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*	*$0*
YOY Growth	-	-	-	-	-	-	-	-	-	-
Licensing & Collaborative	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
YOY Growth	-	-	-	-	-	-	-	-	-	-
Consulting	**$1.4**	**$0.3**	**$0.2**	**$0.2**	**$0.2**	**$0.9**	**$0.9**	**$1.0**	**$1.1**	**$1.1**
YOY Growth	*5.4%*	*-7.8%*	*-43.1%*	*-46.2%*	*-50.5%*	*-37.8%*	*1.0%*	*11.1%*	*10.0%*	*0.0%*
Total Revenues	**$1.4**	**$0.3**	**$0.2**	**$0.2**	**$0.2**	**$0.9**	**$0.9**	**$1.0**	**$1.1**	**$1.1**
YOY Growth	*5.4%*	*-7.8%*	*-43.1%*	*-46.2%*	*-50.5%*	*-37.8%*	*1.0%*	*11.1%*	*10.0%*	*0.0%*
Direct Costs / CoGS	$0.5	$0.1	$0.1	$0.1	$0.1	$0.5	$0.5	$0.5	$0.6	$0.6
Gross Margin	*63.9%*	*70.8%*	*36.0%*	*56.0%*	*35.0%*	*47.6%*	*50.0%*	*50.0%*	*50.0%*	*50.0%*
Research & Development	$4.8	$0.4	$0.4	$0.4	$0.5	$1.6	$3.5	$5.0	$7.5	$5.0
% R&D	*338.3%*	*938.2%*	*217.4%*	*187.1%*	*250.0%*	*183.1%*	*388.9%*	*500.0%*	*681.8%*	*454.5%*
Sales, General & Admin	$4.1	$0.9	$0.7	$0.7	$0.8	$3.1	$3.2	$3.6	$4.0	$4.5
% SG&A	*284.83%*	*306.36%*	*368.46%*	*329.35%*	*400.00%*	*344.8%*	*355.6%*	*360.0%*	*363.6%*	*409.1%*
Operating Income	($8.0)	($1.1)	($1.0)	($0.9)	($1.2)	($4.3)	($6.3)	($8.1)	($11.0)	($9.0)
Operating Margin	*-559.3%*	-	-	-	-	*-480.3%*	*-694.4%*	*-810.0%*	*-995.5%*	*-813.6%*
Interest & Other Income	$0.1	$0.9	$0.0	$0.0	$0.0	$0.9	$0.1	$0.1	$0.1	$0.1
Pre-Tax Income	($7.9)	($0.2)	($1.0)	($0.9)	($1.2)	($3.4)	($6.2)	($8.0)	($10.9)	($8.9)
Taxes	$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%*
Net Income	($7.9)	($0.2)	($1.0)	($0.9)	($1.2)	($3.4)	($6.2)	($8.0)	($10.9)	($8.9)
Net Margin	*-549.4%*	-	-	-	-	*-378.1%*	*-683.3%*	*-800.0%*	*-986.4%*	*-804.5%*
Reported EPS	**($4.36)**	**($0.10)**	**($0.40)**	**($0.36)**	**($0.41)**	**($1.86)**	**($2.33)**	**($2.00)**	**($1.81)**	**($1.11)**
YOY Growth	*600.7%*	-	-	-	-	*-57.2%*	*24.8%*	*-14.0%*	*-9.6%*	*-38.8%*
Weighted Ave. Shares Out	1.8	2.4	2.6	2.6	3.0	2.6	4.0	6.0	8.0	8.0

Source: Zacks Investment Research, Inc. *Jason Napodano, CFA*

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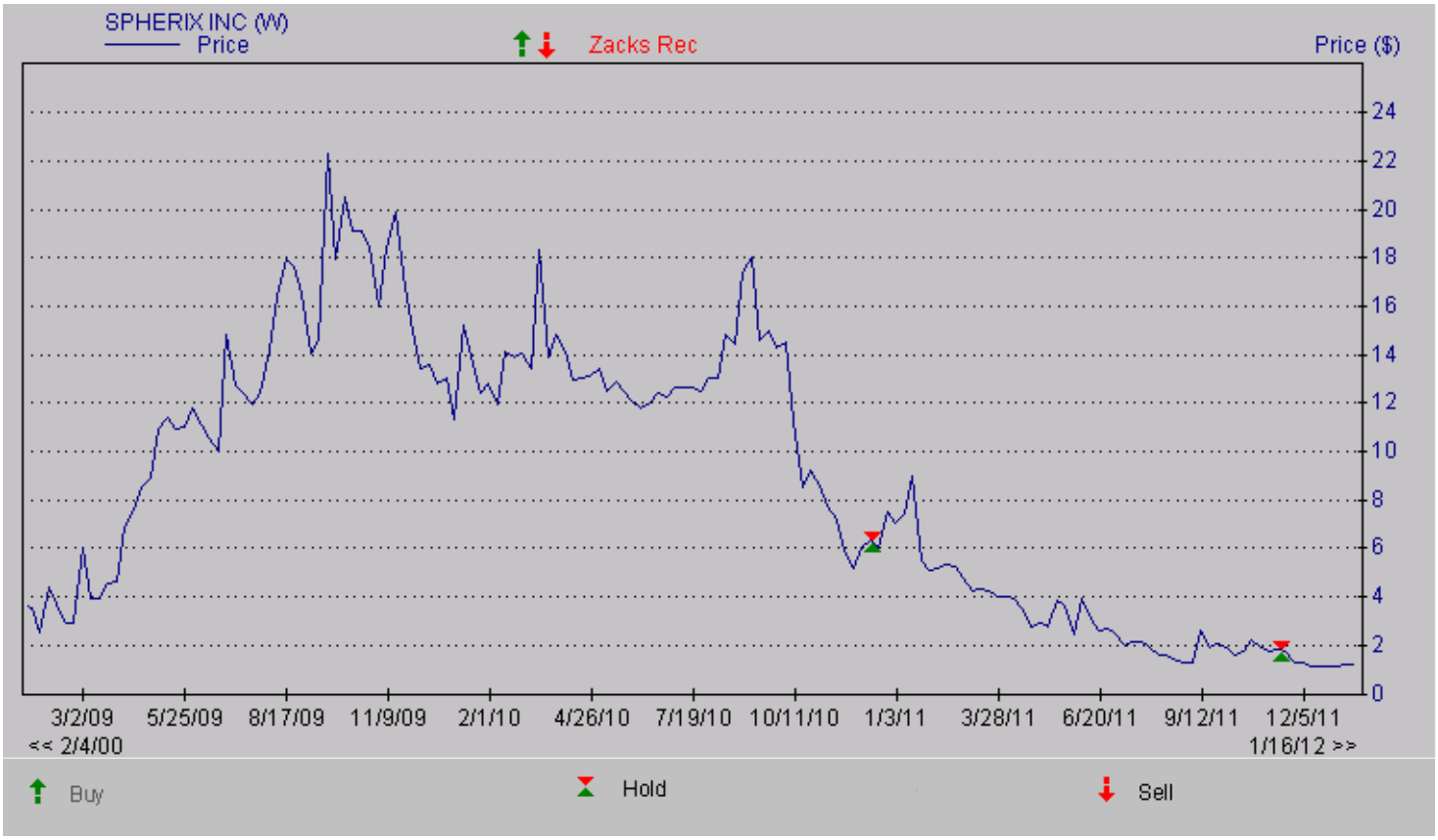
HISTORICAL ZACKS RECOMMENDATIONS



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