

Surgical Sealants Market Update

Autumn 2008

Brocair Partners Industry Survey Series

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1. Executive Summary

Surgical sealants are typically used after a surgery or a traumatic injury, to bind or hold external tissue such as skin as well as internal tissue such as blood vessels. The key types of surgical sealants are fibrin sealants, synthetic agents, collagen-based compounds and tissue adhesive glues such as glutaraldehyde glues and hydrogels. Among these, fibrin sealants have broad applications throughout the medical community. Recently, a great deal of research and innovation has focused on collagen compounds and hydrogels.

Participants in the surgical sealants market include both large public companies which operate across other segments of the healthcare industry and more specialized “pure-play” companies. Four companies profiled in this report are publicly traded and have a diversified product mix: Cryolife, Omrix, Vascular, and Zymogenetics. One additional public company, Haemacure, focuses exclusively on sealants. The remaining six companies also focus exclusively on sealants but, unlike Haemacure, are private.

Five of the profiled companies make products in the fibrin sealant categories. Additionally, Omrix, Cryolife and Haemacure have invested in R&D for applications based on protein extraction for tissue engineering and immunotherapy. Three have hydrogel-based polymer products, and each of these received FDA approval or a CE mark (an EU health and safety certification) in 2006 and 2007.

Most large public companies operate in multiple product segments and have grown through acquisition of manufacturing and distribution licenses or acquisition of smaller firms. In Section 6 forty-five recent transactions are detailed, including private placements and eleven merger/acquisition transactions.

Vascular Solutions raised \$20.9 million in 2007, Omrix raised \$99.7 million in 2006 and Zymogenetics raised \$126.9 million in 2005. In 2007, Neomend raised \$6.0 million and Vivostat raised \$9.5 million, both in private placements. In 2008, Haemacure raised \$12.5 million through a private placement to fund new product development and Cryolife secured a credit facility with GE Healthcare financial services for \$15.0 million.

2. Surgical Sealants

Types of Surgical Sealants

Surgical sealants are devices that doctors, particularly surgeons, use to hold skin, internal organs, blood vessels (hemostasis) and other tissues of the human body together after they have been severed by injury or surgery. Sealants help control blood loss and/or aid in healing damaged tissues. These devices can be used alone or in conjunction with mechanical sealing processes using sutures and staples.

Surgical sealants are classified into four product categories based on their composition: fibrin sealants, synthetic agents such as cyanoacrylates, collagen-based compounds and tissue adhesive glues. A fifth category, packing agents, are not technically surgical sealants but are used for temporary control of major bleeding.

Desirable attributes for surgical sealants include adequate strength, biodegradability, ability to aid the natural healing process, resistance to infection, localized action, ease of handling and safety.

Fibrin Sealants

Fibrin sealants are a type of surgical tissue adhesive composed of thrombin and fibrinogen (from human and animal blood products). These ingredients interact during application to form a stable clot composed of a blood protein called fibrin and are sometimes referred to as fibrin glues. Since the 1980s, these products have seen wide usage in Japan and Western Europe, but were not approved for use in the United States until 1998 due to the Food and Drug Administration's (FDA) concerns about viral contamination. Fibrin sealants are widely used for hemostasis and tissue adhesion in cardiovascular surgery, pulmonary surgery, burn bleeding and lacerations of the spleen and liver.

Fibrin sealants are popular as they are relatively safe and exhibit a low risk of infection. Moreover, it is the only adhesive type that promotes natural tissue healing. Their disadvantages include a small risk of contamination of glue by viruses in human and animal source materials.

Synthetic Agents/Cyanoacrylates

Cyanoacrylate is a tenacious adhesive, especially when used to bond non-porous materials or materials that contain minute traces of water, thus making it very good at bonding body tissue. It has thus been commonly used for suture-less surgery.

The original cyanoacrylate formula discovered by Eastman Kodak was not FDA approved for medical use because of tendencies to cause skin irritation and to generate heat. In 1998, the FDA approved 2-octyl cyanoacrylate for use in closing wounds and surgical incisions.

Cyanoacrylates are commonly used to treat minor lacerations due to their high strength and durability as well as their waterproof properties which eliminate the need for wound dressing. The substance's non biodegradability and potentially carcinogenic properties restrict its usage mainly to external and temporary applications. Medical cyanoacrylates are commercially available under the brands Dermabond, Soothe-N-Seal and Band-Aid Liquid Adhesive Bandage.

Collagen-Based Compounds

Collagen is the main protein of connective tissue in animals and the most abundant protein in mammals, making up about 25% of the whole-body protein content. Collagen-based compounds assist coagulation by delivering fibrinogen to the affected area. Collagen-based compounds have been widely used as sealants and healing aids for burn patients, for the reconstruction of bone and for a wide variety of dental, orthopedic and surgical purposes. Collagen is commercially produced from human and animal (generally bovine) blood.

Collagen-based compounds are commercially available under the brands FloSeal, Proceed and Costasis. These compounds have produced excellent results to date and are the subject of intense research by several top companies in this industry.

Tissue Adhesive Glues

This class of sealants is used to bind tissues after surgeries by forming covalent bonds (a particularly strong form of molecular bond) with the tissues at the site of damage. This results in natural hemostasis and tissue healing. The sealant generally disintegrates after a few days. The most common tissue adhesives are Glutaraldehyde glues and Hydrogels.

Glutaraldehyde is composed of bovine albumin and adhesion compounds. Glutaraldehyde glues are mainly used in the repair of aortic dissection and to provide a stronger arterial wall for surgeries. However, Glutaraldehyde's use is limited as its long term side effects are still being researched. It is commercially available under the brand Bioglue.

Hydrogels are composed of polyethylene glycol and other adhesive polymers. They are primarily used as scaffolds in tissue engineering. Their bio-degradability and ability to minimize air leaks make these sealants popular in most surgical operations. However, their time-consuming application and setting process in addition to the photo activation requirements make them unsuitable for use in hemorrhage situations involving rapid blood loss. These sealants are commercially available under brands such as Focal Seal-L and Co Seal.

Packing Agents and Absorbents

Packing agents and absorbents products are intended for temporary control of major bleeding. Hence they are often used in the preliminary treatment of a major traumatic injury or surgery. Standard surgical sealants such as the ones mentioned above are then used to arrest blood loss completely and assist tissues healing. The military is a major customer for this category of products, and remains a major source of R&D funding. Commonly used packing agents include gauze, bone wax, gelatin, microfibrillar collagen and oxidized cellulose.

Packing agents and absorbents operate by the mechanism of a matrix/clot creation through the accumulation of platelets and creation of fibrinogen through various triggering agents. These are composed of beeswax and vaseline, animal gelatin, bovine collagen and cellulose. Packing agents and absorbents are commercially available under the trademarks of QuikClot, HemCon bandage, Rapid Deployment Hemostatic Bandage and American Red Cross Hemostatic Bandage.

Product Presence of Companies in the Surgical Sealant Market

A number of companies are active in the surgical sealants market. Large diversified concerns such as Genzyme and Pfizer share the space with small, sealant-focused companies such as Haemacure. As seen in Table 1, many firms have a presence in multiple surgical sealant categories, although no firm covers the full range of technologies. The table includes participation at any stage, whether development, manufacture, or sale.

Table 1: Profiled Companies and Product Categories

Companies	Fibrin Sealants	Synthetic Agents	Collagen based Compounds	Tissue Adhesive Gels		Packing Agents and Absorbents
				Glutaraldehyde	Hydrogel	
AccessClosure, Inc.						
Alltracel Pharmaceuticals plc						
Angiotech ¹						
Baxter International ²						
Biomet						

Companies	Fibrin Sealants	Synthetic Agents	Collagen based Compounds	Tissue Adhesive Gels		Packing Agents and Absorbents
				Glutar-delhyde	Hydrogel	
C.R. Bard, Inc.						
Covidien						
Cryolife, Inc.						
CSL Ltd./CSL Behring ³						
Gelita AG ⁴						
Genzyme						
Haemacure Corporation						
HyperBranch Medical Technology						
Johnson & Johnson/Ethicon ⁵						
King Pharmaceuticals						
Neomed, Inc.						
Nycomed International Mgmt GmbH ³						
Ormix Biopharmaceuticals Inc.						
Orthovita ¹						
Pfizer						
Pharming Group N.V.						
St. Jude Medical						
Synovis Life Technologies, Inc. ⁶						
ThermoGenesis Corporation						
Tissuemed Ltd.						
Vascular Solutions Inc.						
Vivostat A/S						
Z-Medica Corporation						
Zymogenetics, Inc.						

1 - Orthovita and Angiotech have a sales and distribution agreement on Vitagel™. Orthovita owns the patent and has out-licensed the sales and distribution of the product to Angiotech which also has a \$25 million equity position in Orthovita's common stock.

2 - Baxter markets a collagen based sealant, COSEAL™, which is a trademark of Angiodevice International GmbH, a subsidiary of Angiotech.

3 - Nycomed International Management GmbH manufactures Beriplast®, which is marketed by CSL Behring.

4 - Gelita AG manufactures Gelita, a pure gelatin based product which is used in different products as well as in local hemostats. It does not feature under any of the five product categories. The product works by accumulating platelets and triggering the blood to clot.

5 - Ethicon, a Johnson & Johnson subsidiary, markets fibrin sealants, EVICEL™ and EVITHROM™ which are manufactured by Ormix.

6 - Biovascular Inc. has the sales and distribution rights to market Glubran and Glubran2, synthetic surgical sealants developed by Synovis Life Technologies, Inc.

3. Company Profiles

AccessClosure, Inc.



Headquarters: Mountain View, CA, US

Exchange: unlisted

Stock Price: NA

Market Cap: NA

Net Sales: NA

www.accessclosure.com

Company Profile

AccessClosure, Inc., founded in 2002, is a privately held medical device company that develops and commercializes pioneering products for vascular closure (mainly arterial closure after surgeries) during interventional and diagnostic procedures.

The company's first and only product, the Mynx vascular closure system (VCS), is based on a polyethylene glycol (PEG) surgical sealant that instantly expands in the tissue tract, forming a clot. The sealant then dissolves within 30 days, leaving a healed artery.

Mynx VCS has been granted a CE Mark and received FDA approval on May 16, 2007. The company has shown significant growth in the last year through sales of Mynx VCS.

Recent Developments

- Received FDA clearance for Mynx VCS. (May 16, 2007)

Investors

- Integral Capital Partners
- New Leaf Venture Partners
- Onset Ventures
- Three Arch Partners
- Healthcor Partners

Cryolife, Inc.



Headquarters: Kennesaw, GA, US
 Exchange: NYSE (CRY)
 Stock Price: USD 14.95 (8.20.08)
 Market Cap: USD 418.7 m (8.20.08)
 Net Sales: USD 94.76 m (2007)

www.cryolife.com

Company Profile

Cryolife, Inc., founded in 1984, develops and commercializes biomaterials, surgical adhesives and implantable medical devices for cardiac and vascular transplant applications. The company also preserves and distributes human tissues (derived from human and bovine blood samples) for these applications.

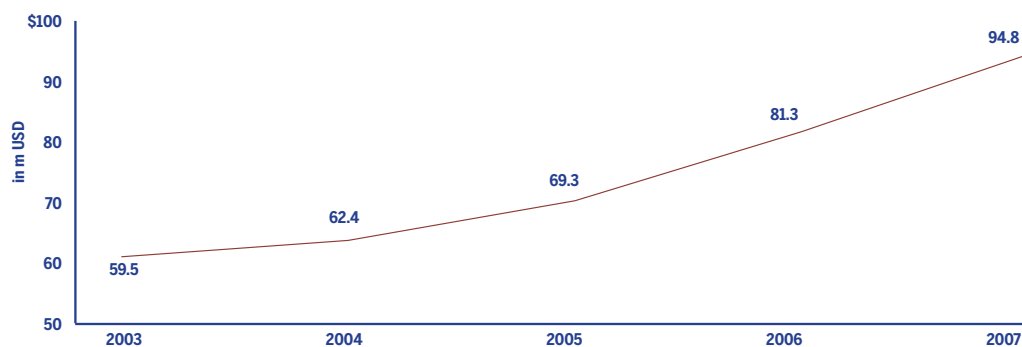
The company's product line includes BioGlue® Surgical Adhesive, CryoLife-O'Brien®, Stentless Porcine Aortic Bioprosthesis, and ProPatch Soft Tissue Repair Matrix. The company's surgical adhesive BioGlue® is a two-component surgical adhesive made up of purified bovine serum albumin (BSA) and glutaraldehyde. Additionally, the company manufactures Hemostase MPH®, the only natural hemostasis product synthesized from a plant polymer. Cryolife also distributes CardioWrap® for MAST BioSurgery, Inc. BioGlue® accounts for 46% of revenue.

Because the regulatory path is easier outside the US, the company's products are normally marketed in international markets before they are introduced in the US. In 2007, international revenues accounted for 14% of total revenues.

Recent Developments

- Reported revenue of \$25.6 million in the first quarter of 2008, which represented a 4% increase relative to the comparable quarter last year of \$24.5 million. (April 30, 2008)
- Closed a \$15.0 million credit facility with GE healthcare financial services. (March 31, 2008)
- Implant of First FDA-Cleared SynerGraft(R) Processed Human Pulmonary Heart Valve. (March 24, 2008)
- Signed distribution agreement with Proxy Biomedical Surgical Meshes for inclusion of BioGlue® surgical adhesive in hernia repair kit. (September 17, 2007)
- Was awarded U. S. Patent for BioFoam(R). (June 14, 2007)
- Reached agreement with the Cleveland Clinic to develop innovative heart valve for high risk patients. (January 10, 2007)

5-Year Sales Chart



3-Year Stock Chart



Haemacure Corporation



Headquarters: Montreal, Canada
 Exchange: Toronto Stock Ex. (HAE)
 Stock Price: CAD 0.14 (8.20.08)
 Market Cap: CAD 28.9 m (8.20.08)
 Net Sales: CAD 0.12 m (FY 2007)

www.haemacure.com

Company Profile

Haemacure Corporation, founded in 1991, is a specialty bio-therapeutics company which develops human biological adhesives, hemostats and therapeutic proteins for commercialization.

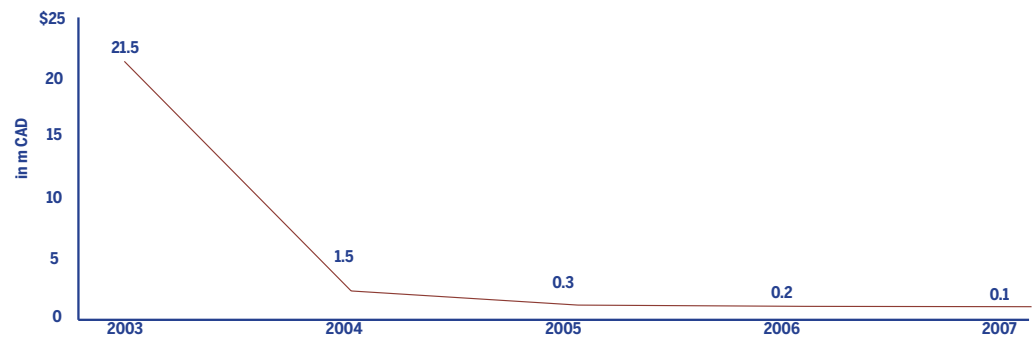
Haemacure's leverages its proprietary plasma protein extraction technology to develop bio-therapeutic products, including surgical hemostats. Haemacure's main product candidate, Hemaseel[®]HMN, is a human-derived fibrin sealant with its Phase II-Phase III clinical trials scheduled in 2009. The company's second product candidate, Hemaseel[®]Thrombin is an active hemostat now in its preclinical stage. Research in therapeutic proteins is in its nascent stage. Haemacure currently generates revenue only through fibrin sealant delivery devices under the trademarks HemaSyst[™] and HemaMyst[™].

The company's subsidiary in Sarasota, Florida, handles sales and marketing, as well as clinical and regulatory matters.

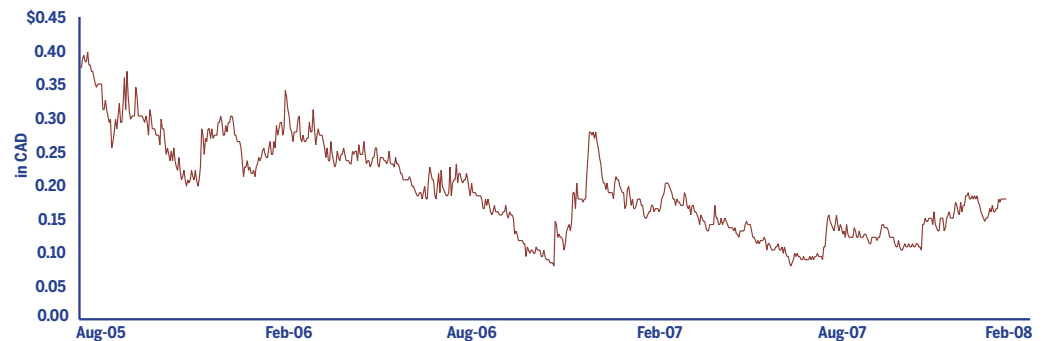
Recent Developments

- Raised gross proceeds of C\$12.5 million in two tranches through a private placement to finance development of Hemaseel[®]HMN. (January 17, 2008)
- Expanded manufacturing and research capability through new plant construction and recruitment of senior scientists. (December 13, 2007)
- Technology acquisition alliance signed with UTEK Corporation. (June 21, 2007)
- Preliminary findings of its "plasma discard analysis" were positive. (June 14, 2007)
- Board Chairman Mr. Joseph Galli assumed role of CEO. (February 1, 2007)

5-Year Sales Chart



3-Year Stock Chart



HyperBranch Medical Technology

Headquarters: Durham, NC, US

Exchange: Unlisted

Stock Price: NA

Market Cap: NA

Net Sales: NA

www.hyperbranch.com

Company Profile

HyperBranch Medical Technology, founded in 2003, is a biosurgical device company which designs, develops, and manufactures surgical sealants for general and specialty surgery use, including general, ocular, and plastic cosmetic & reconstructive surgery. It serves various surgical applications, including composition, synthesis, hydrogel formation, delivery methods, sterilization, and packaging.

The company manufactures surgical sealants based on its proprietary polymers and their cross-linked hydrogels. The company's product line includes OcuSeal – ocular bandage, Dura Sealant and Pleural Sealant. OcuSeal ocular bandage is used to provide a protective barrier for stabilizing ocular (eye related) wounds. Dura Sealant is used to heal dural damages (dura mater is a hard and inflexible tissue surrounding the brain and spinal cord) which occur in intracranial aneurysms, tumors, or spinal disc disease. Pleural Sealant is a specially designed hydrogel that, when used in conjunction with sutures or staples, creates a seal against air leaks. Tissue Plane Sealant, an upcoming product in the company's pipeline is planned for use as a sealant to close dead space by adhering opposing tissue surfaces.

Recent Developments

- HyperBranch received CE Mark for OcuSeal™. (December 20, 2007)

Investors

- H.I.G. Investors
- The Aurora Funds, Inc.

Neomend, Inc.



Headquarters: Irvine, CA, US

Exchange: Unlisted

Stock Price: NA

Market Cap: NA

Net Sales: NA

www.neomendinc.com

Company Profile

Neomend, Inc., founded in 1999, is a biomedical device company, which develops surgical wound healing products for commercialization.

Its platform technology, Pro/PEG, is a bioadhesive polymer hydrogel. Neomend's product pipeline is comprised of ProGEL Surgical Sealant for sealing air leaks during lung surgery, ProGEL-AB for sealing wounds and preventing post-surgical adhesions and ProGEL-VS for sealing vascular access sites. The company reports that initial studies indicate that ProGEL Surgical Sealant maintains a superior high pressure withstanding ability and swell-to-weight ratio compared to current products in the market.

NeoMend is currently seeking strategic alliances for its Pro/PEG technology, according to the company's President and CEO Mr. W. Jerry Mezger.

Recent Developments

- Raised \$6.0 million in its series C round of funding. (July 11, 2007)
- Completed the acquisition of 3M Innovative Properties Company from 3M Co. (June 22, 2007)

Investors

- Novo Ventures
- Prospect Venture Partners
- Sanderling Ventures
- Vivo Ventures

Omrix Biopharmaceuticals Inc.



Headquarters: New York, NY, US
Exchange: NASDAQ (OMRI)
Stock Price: USD 22.25 (8.20.08)
Market Cap: USD 381.0 m (8.20.08)
Net Sales: USD 61.70 m (2007)

www.omrix.com

Company Profile

Omrix Biopharmaceuticals, founded in 1985, develops and commercializes biosurgical and passive immunotherapy products.

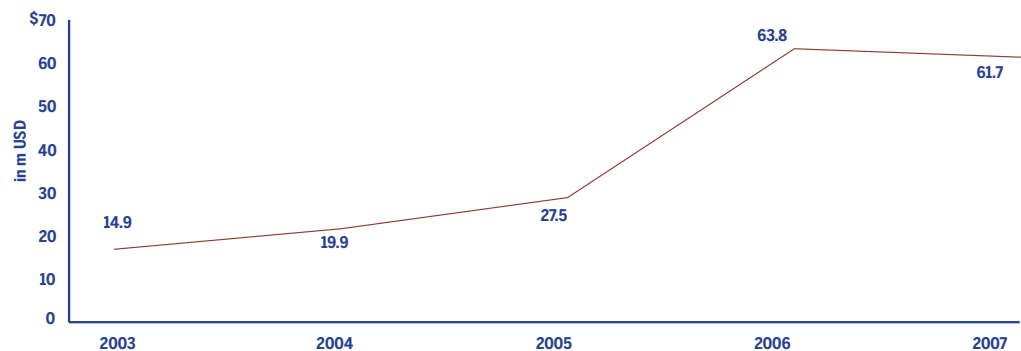
Omrix has two major product divisions – biosurgery and passive immunotherapy, both based on the company's proprietary protein purification technology. Biosurgery products include fibrin sealant variants under the trademarks Evicel™ and Quixil™ as well as the thrombin-based sealant Evithrom™. The company also develops fibrin patches and other surgical products such as Adhexil™ and Aeris™. Adhexil™ prevents certain tissue adhesion during surgeries while Aeris™ minimizes lung volume reduction during pulmonary surgeries. Evicel™ and Evithrom™ are marketed in the US and are in phase 3 clinical stages in Europe. Quixil™ has been launched in Europe while Adhexil™ and Aeris™ and its fibrin patch are still in phase 2 clinical stages.

The company has a development and supply agreement with Ethicon, a Johnson and Johnson Subsidiary, and a manufacturing and supply agreement with Aeris Therapeutics, Inc. It markets its products in Israel, the United States, and Europe, as well as in other geographic areas. Roughly 46% of Omrix's revenue comes from sealants and other bio-surgery products, with the remaining being derived from immunotherapy products.

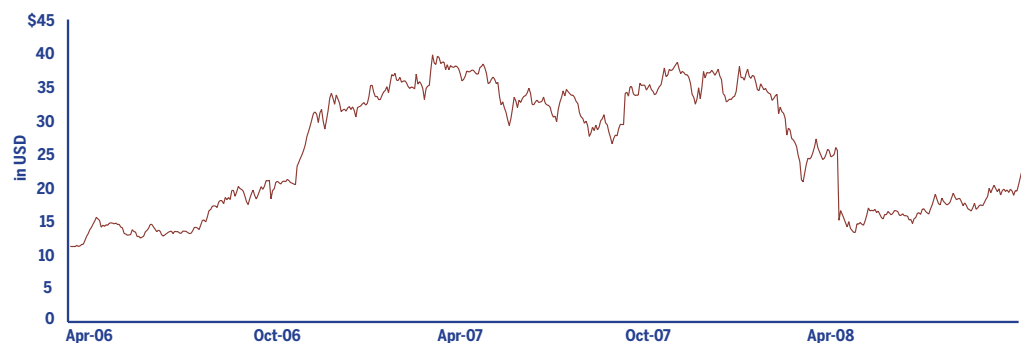
Recent Developments

- Larry Ellberger was appointed as Board Chairman and Pamela McNamara was elected as new board member. (May 15, 2008)
- Reported revenue of \$17.7 million in Q1 2008. (May 9, 2008)
- Initiated Phase II clinical trial for fibrin patch product candidate. (March 27, 2008)
- Received FDA Approval for Evicel™ liquid fibrin sealant. (January 10, 2008)
- Received FDA Approval to market its thrombin stand-alone product, Evithrom™, with a general hemostasis in surgery indication. (August 28, 2007)

5-Year Sales Chart



3-Year Stock Chart



Tissuemed Ltd.



Headquarters: Leeds, UK

Exchange: unlisted

Stock Price: NA

Market Cap: NA

Net Sales: NA

www.tissuemed.com

Company Profile

Tissuemed Limited, founded in 1985, develops and commercializes tissue-based therapeutic devices. The company has its origins in the development of the first tissue heart valve which gained regulatory approval in Europe and subsequently developed “living” vascular grafts and collagen patches. The company is known for developing the first light-activated surgical adhesives.

More recently, Tissuemed has focused on the development of surgical sealants under the trademark Tissuepatch3, a surgical film which helps surgeons seal leakages of air, blood and other fluids. Tissuepatch3 is composed of functional carboxylic groups (binding agents) and amino acids (base agent). Its ability to effectively seal leakages makes it a popular sealant in thoracic (lung related) surgeries while applications in other surgical areas are being explored by the company’s R&D team.

The company is headquartered in Leeds, UK, where its financial, administration, research and development, production, sales, marketing, clinical studies and regulatory affairs are managed.

Recent Developments

- Appointed Cardio Solutions (UK) Ltd as its distributor for Tissuepatch3 in UK. (October, 2007)
- Attained CE mark for its Tissuepatch3 surgical sealant. (April, 2007)

Investors

- 3i Group Plc
- Baird Capital Partners Europe Limited
- Chord Capital
- ISIS Equity Partners LLP
- Rensburg Investment Management Limited
- YFM Private Equity Group

Vascular Solutions, Inc.



Headquarters: Minneapolis, MN, US

Exchange: NASDAQ (VASC)

Stock Price: USD 8.94 (8.20.08)

Market Cap: USD 140.4 m (8.20.08)

Net Sales: USD 52.86 m (FY 2007)

www.vascularsolutions.com

Company Profile

Vascular Solutions, Inc., founded in 1997, is a medical company which provides clinical solutions for diagnostic and interventional vascular procedures.

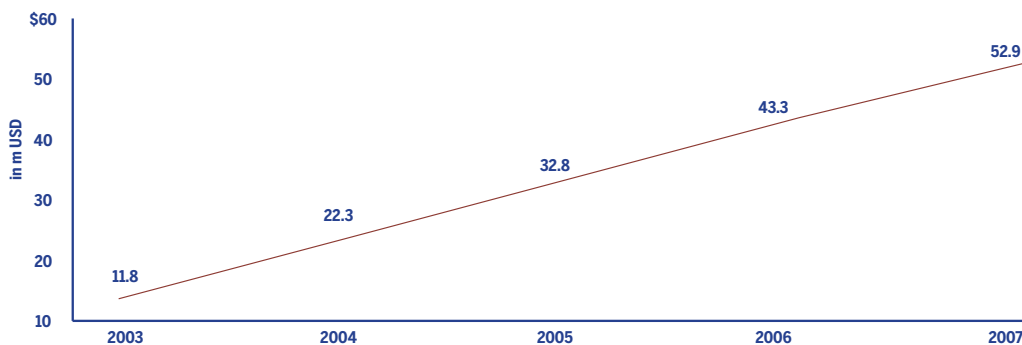
The company specializes in the manufacture of hemostasis products, extraction and specialty catheters, as well as vein access products, diagnostic products and products used in the course of surgery. Vascular offers a variety of hemostasis products in its D-Stat series, which use biologically active components such as thrombin to induce blood clotting. Its D-Stat series includes D-Stat Dry, D-Stat 2 Dry, D-Stat Radial, D-Stat Clamp Accessory & Handle, D-Stat Flowable, and Duett Pro. Product variants are mainly based on differing modes of thrombin injection in to the blood stream using bandages, clamps and syringes. Approximately 47% of sales are accounted for by hemostatic and surgical sealant products.

In the US, Vascular markets its devices to interventional cardiologists and radiologists through its own sales team. The company mainly uses independent distributors overseas except in Germany, where its subsidiary Vascular Solutions GmbH handles sales.

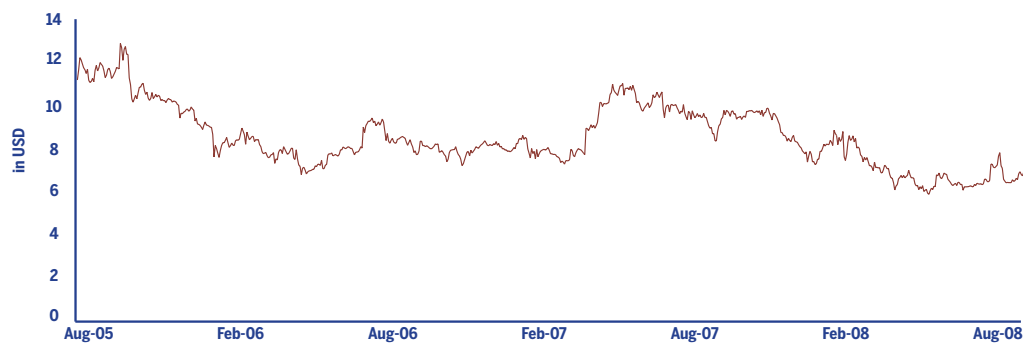
Recent Developments

- Vascular and Diomed Holdings agreed on a mutual settlement of \$3.6 million to drop patent infringement claims by the latter. (April 9, 2008)
- Vascular received \$4.5 million in compensation in a product disparagement litigation with Marine Polymer Technologies. (April 8, 2008)
- Announced distribution of Guardian Hemostasis Valve in the US (July 9, 2007)

5-Year Sales Chart



3-Year Stock Chart



Vivostat A/S



Headquarters: Birderoed, Denmark

Exchange: unlisted

Stock Price: NA

Market Cap: NA

Net Sales: NA

www.vivostat.com

Company Profile

Vivostat A/S, founded in 2000, is a privately owned company based in Birkerød, Denmark, which specializes in the development and manufacture of fibrin based hemostasis and surgical sealant products.

The company manufactures products under the trademark Vivostat® System, which utilizes the patented technology of on-site preparation and application of patient-derived fibrin sealant or platelet rich fibrin (PRF®). Vivostat® System is comprised of two groups of products:

Vivostat®: An autologous fibrin sealant is used during surgery to prevent and stop bleeding and the oozing of body fluids.

Vivostat® PRF® autologous platelet rich fibrin is used to promote cell growth for a range of procedures e.g. orthopedic surgery and wound healing.

The company's products are sold via distributors mainly in Europe with the main focus being cardiac, thoracic and hepatic surgery applications. More than 95% of the company's products are exported. The company reported revenue of \$4.5 million in 2007 with a loss of \$1.5 million. It has thirteen employees.

Recent Developments

- The company changed its name from Vivolution A/S to Vivostat A/S. (June 18, 2008)
- Acquired extensive patent portfolio from Bristol-Meyers Squibb. The patent portfolio covered 66 issued and 20 pending patents covering numerous countries. (January 22, 2008)
- Established direct sales force in Germany and the UK for its Vivostat® System. (October 10, 2007)
- Received \$7 million in new financing from French based venture fund SEVENTURE to take the Vivostat® System to the US market. (February 5, 2007)

Investors

- Sunstone Capital
- DANSK Innovations Investering P/S
- Seventure Partners
- Vecata A/S
- Omega Funds

Z-Medica Corporation

Z-MEDICA

Headquarters: Wallingford, CT, US
 Exchange: unlisted
 Stock Price: NA
 Market Cap: NA
 Net Sales: USD 5.0 m (FY 2007)

www.z-medica.com

Company Profile

Z-Medica Corporation, founded in 2002, develops and manufactures hemostasis products to treat traumatic injuries. It has 20 employees and approximate 2007 net sales of \$5.0 million.

The company sells its products under the trademark QuikClot® which are mainly targeted to the US military, homeland security and paramedics. QuikClot® comes under several variants depending on its specialized application. The major products are QuikClot ACS™ and QuikClot ACS+™ in terms of revenue contribution. These help control severe blood loss, generally in trauma situations such as those encountered on the battlefield. The company's latest product release QuikClot 1st Response™ is targeted at first responders (firefighters, paramedic teams, etc.) and industrial medical staff. QuikClot® Sport™ and QuikClot® Sport™ Silver are the only products targeted at retail consumers. These help control blood loss arising from minor sporting injuries.

Recent Developments

- QuikClot® selected by the US Department of Defense for first line hemostatic treatment for all military services. (May 20, 2008)
- Announced availability of first consumer products QuikClot® Sport™ and QuikClot® Sport Silver™ at REI, the national retail cooperative. (February 12, 2008)
- New two year contract with US Air Force for additional 300,000 units of QuikClot® hemostatic agent. (December 3, 2007)
- MEDCO Supply Company to be its official distributor for QuikClot Sport™ & QuikClot Sport Silver™. (June 4, 2007)
- Launched QuikClot Sport™ & QuikClot Sport Silver™. (May 3, 2007)
- Source Medical to be its Canadian distribution partner. (April 25, 2007)

Investors

Not Available

Zymogenetics, Inc.



Headquarters: Seattle, WA, US
 Exchange: NASDAQ (ZGEN)
 Stock Price: USD 8.10 (8.20.08)
 Market Cap: USD 564.2 m (8.20.08)
 Net Sales: USD 38.48 m (FY 2007)

www.zymogenetics.com

Company Profile

ZymoGenetics, founded in 1981, is mainly focused on the discovery, development, manufacture and commercialization of therapeutic proteins for the treatment of autoimmune diseases and cancer.

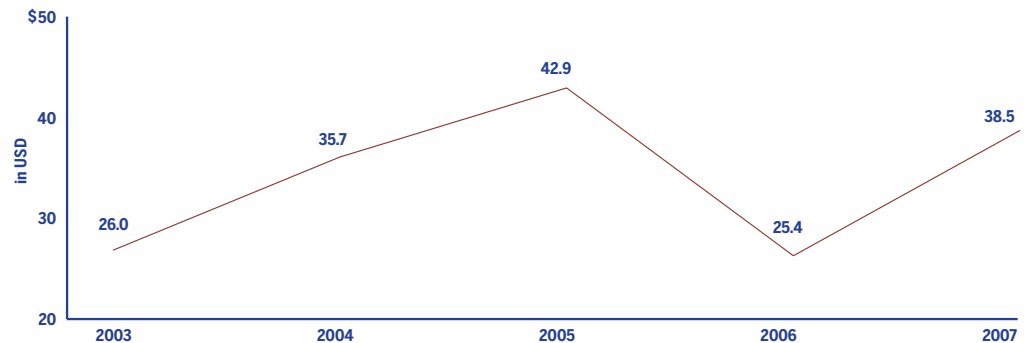
The company has a pipeline of potential immunotherapy products that could be developed independently or in collaboration with partners. Examples include Atacicept series, Interleukin (IL)-21 and IL-17 series. Most of them are in the phase 1 or phase 2 clinical trial stages. The sole commercial product of the company is RECO-THROM™, a hemostasis product approved by the FDA on Jan 17, 2008. Of the three thrombin based products in market, RECOTHROM™ is the only sealant with protein in the recombinant form, and is thus viewed as being safer than its counterparts. Zymogenetics also out-licenses a commercial wound healing product Regranex® to Johnson & Johnson.

The company has an extensive patent portfolio of therapeutic proteins, with more than 950 patents. During its 25 years of existence, the company has contributed to the discovery or development of six recombinant protein products currently marketed by companies such as Novo Nordisk, Johnson & Johnson, BioMimetic Therapeutics Inc., and Eisai Co. Ltd. These products have aggregate annual sales of more than \$3.0 billion.

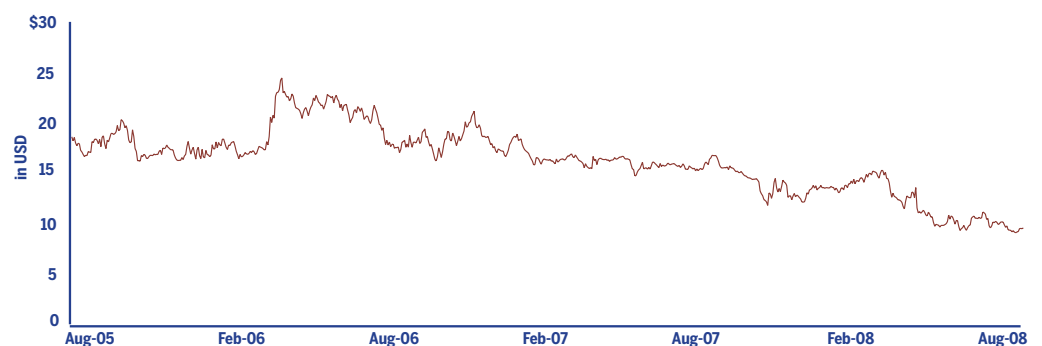
Recent Developments

- FDA warned ZymoGenetics over false promotions of RECOTHROM. (May 7, 2008)
- Warburg Pincus has increased its stake in ZymoGenetics from 10.5% to 13.7% (March 12, 2008)

5-Year Sales Chart



3-Year Stock Chart



4. Valuation Analysis

Valuation ratios across the surgical sealant space vary significantly. As shown in Table 2, Haemacure in particular is an outlier due to its minimal revenue.

Table 2: Valuation ratios of public companies profiled

Valuation Ratios*	ZymoGenetics	OMRIX Biopharmaceuticals (3.31.08)	Vascular Solutions	Haemacure (4.30.08)	CryoLife
EV/Revenue	9.55	2.49	1.93	209.51	3.68
EV/EBITDA	NA	27.61	22.41	NA	23.28
EV/EBIT	NA	35.41	32.29	NA	32.26
EV/Net Income	NA	15.22	.366	NA	32.84
Price/Revenue	10.45	3.77	2.00	227.86	3.78
Price/BV	10.90	2.60	9.10	4.52	5.40
Price/Diluted EPS	NA	22.94	379.33	NA	33.77
EV/Market Cap	.91	.66	.96	.92	.97

* EV—Enterprise Value (defined as Market Capitalization + Net Debt + Preferred Equity + Minority Interest)

* BV—Book Value (defined as Total Assets – Total Liabilities – Preferred Stock – Intangible Assets)

* EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization

* EBIT – Earnings Before Interest and Taxes

* Revenue, EBITDA & EBIT for latest twelve months

* BV, Price & Market Cap as on June 30, 2008

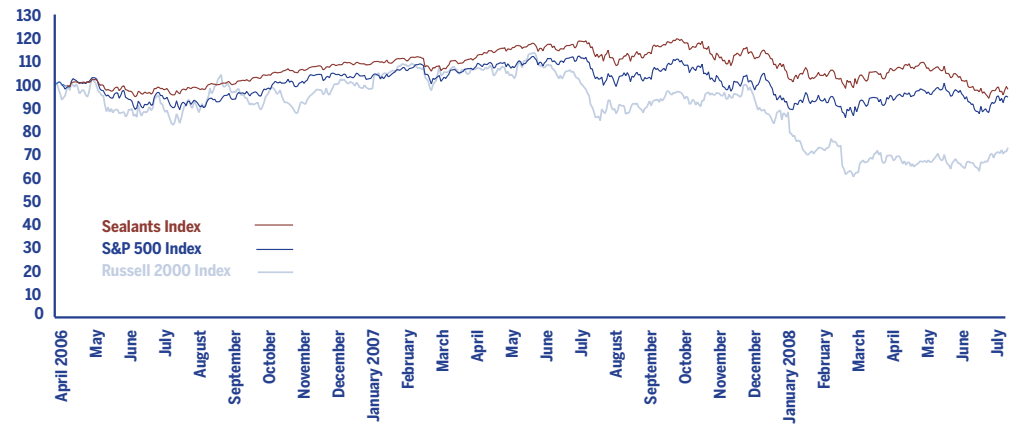
* EV, BV & Net Income as per the latest filing on June 30, 2008

Source: Capital IQ (as of 8/11/08)

5. Synthetic Index

Chart 1 shows a synthetic index comprised of the five profiled public companies. The index is market cap weighted and normalized to a base figure of 100.

Chart 1: Brocair Surgical Sealant Index (market cap weighted)

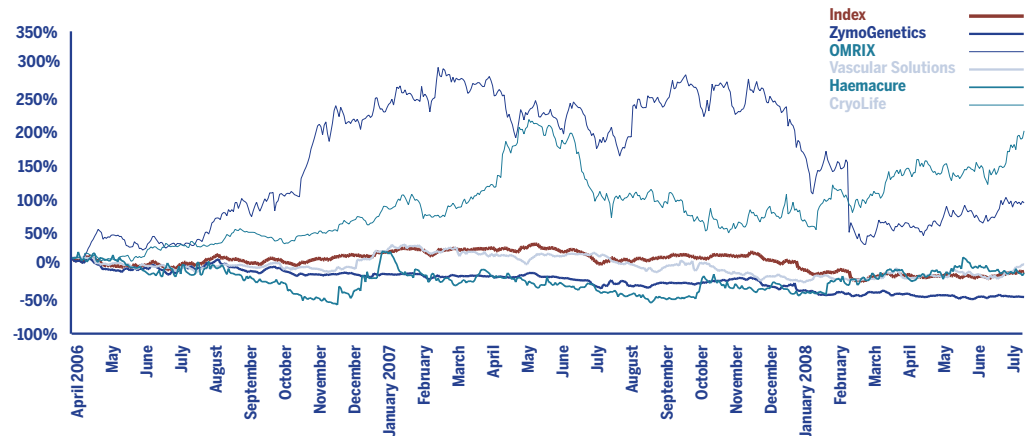


* Companies included in the index are: Vascular Solutions (VASC), Haemacure Corp (TSX:HAE), Cryolife (CRY), Omrix Biopharmaceuticals (OMRI) and Zymogenetics (ZGEN).

Performance Analysis

Chart 2 shows the performance of the profiled public companies relative to the Brocair Surgical Sealant Index. Zymogenetics is the largest contributor, while Haemacure is the smallest.

Chart 2: Performance of profiled public companies with respect to the index



Omrix and Cryolife have outperformed the index while Zymogenetics was the largest underperformer. Cryolife experienced a rapid increase in tissue processing revenues and the steady increase in the sales of its core product, Bioglu, beginning in 2007. The FDA approved its novel CryoValve(R) SG pulmonary human heart valve implantation process in March 2008. Omrix's 2006 revenue was up 131% over 2005. However, in 2008 the company missed its Q4 earnings target due to the cancellation of a French government contract for its lead immunotherapy product. Zymogenetics has seen royalties from insulin and gucagon patents decline since 2004 due to patent expirations in certain countries.

6. Transaction Overview

Table 3 shows some of the major transactions that have occurred in the surgical sealant space since 2005

Table 3: Transaction overview.

Date	Target/Issuer	Transaction Type	Total Value (USD M)	Buyers/Investors	Sellers
8.11.08	SurgRx, Inc.	Mergers/ Acquisitions	-	Alta Partners, California Technology Ventures LLC, Magnetar Capital LLC, New Enterprise Associates, Prospect Venture Partners, Trellis Health Ventures, CTV I, L.P. (Fund)	-
8.5.08	Curacyte Discovery GmbH	Mergers/ Acquisitions	38.7	Medicines Co. Curacyte AG	-
7.18.08	HaloSource, Inc.	Private Placement	11.5	Origo Resource Partners, Origo Sino-India Plc, Unilever Technology Ventures	-
6.26.08	Zymogenetics, Inc.	Private Placement	100.0	Deerfield Management	-
6.13.08	Haemacure Corporation	Private Placement	-	-	-
5.19.08	Baxter International Inc.	Public Offering	498.5	-	-
4.28.08	SurgRx, Inc.	Private Placement	20.0	Alta Partners, California Technology Ventures LLC, Magnetar Capital LLC, New Enterprise Associates	-
2.7.08	GTC Biotherapeutics	Mergers/ Acquisitions	6.0	-	-
1.17.08	Haemacure Corporation	Private Placement	12.5	-	-
11.14.07	Possis Medical Inc.	Mergers/ Acquisitions	360.3	MEDRAD, Inc.	-
8.14.07	Tenaxis Medical, Inc.	Private Placement	4.5	-	-
8.9.07	Vascular Solutions Inc.	Public Offering Follow-on Equity Offering	20.9	-	-
7.27.07	HaloSource, Inc	Private Placement	15.0	CSFB Customized Fund Investment Group	-
7.11.07	Neomend, Inc.	Private Placement	6.0	Prospect Venture Partners, Sanderling Ventures	-
6.18.07	Theragenics Corporation	Public Offering	4.0	-	-

Date	Target/Issuer	Transaction Type	Total Value (USD M)	Buyers/Investors	Sellers
6.15.07	Vivostat A/S	Mergers/ Acquisitions	NA	Omega Fund LLP	Dansk Kaptialanlæg, Aktieselskab, Dansk Kapitalanlæg
6.5.07	3M Innovative Properties Company	Mergers/ Acquisitions	NA	Neomend, Inc.	3M Innovative Properties Company
6.4.07	Lumenis Ltd.	Private Placement	23.4	Ofer Hi-Tech	-
5.2.07	GTC Biotherapeutics, Inc.	Public Offering	6.0	-	-
4.20.07	SurgRx, Inc.	Private Placement	20.0	Alta Partners, New Enterprise Associates, Prospect Venture Partners, California Technology Ventures, LLC, Magnetar Capital LLC	-
2.16.07	HaloSource, Inc.	Private Placement	6.0	Alexander Hutton Venture Partners, WRF Capital, Britannia Holdings Ltd., Unilever Technology Ventures	-
2.5.07	Vivotstat A/S	Private Placement	9.5	Dansk Innovationsinvestering P/S, Dansk Kaptialanlæg Aktieselskab, Seventure Partners, Vaekstfonden, Vecata A/S	-
12.11.06	Haemacure Corporation	Private Placement	10.7	FGS Advisors, Firebird Global Master Fund II Ltd., Firebird Global Master Fund Ltd.	-
12.4.06	Omrix Biopharmaceuticals Inc.	Public Offering Follow-on Equity Offering	67.7	-	-
10.3.06	Lumenis Ltd.	Private Placement	120.0	Ofer Hi-Tech	-
9.29.06	GTC Biotherapeutics, Inc.	Private Placement	25.0	LFB Biotechnologies S.A.S.U.	-
7.18.06	GTC Biotherapeutics, Inc.	Private Placement	17.5	William Harris Investors, Inc.	-
6.15.06	GTC Biotherapeutics, Inc.	Public Offering	17.5	-	-
5.25.06	Hemostasis range of products	Mergers/ Acquisitions	51.9	Trinity Biotech plc (NasdaqNM:TRIB) (NasdaqNM:TRIB)	BioMérieux S.A. (ENXTPA:BIM)
3.31.06	Hemostasis device business	Mergers/ Acquisitions	1.5	Merit Medical Systems Inc. (NasdaqNM: MMSI)	Millimed A/S
2.10.06	Instrumentation Laboratory SpA	Mergers/ Acquisitions	0.7	Izasa, S.A.	

1.18.06	Omrix Biopharmaceuticals Inc.	Public Offering IPO	32.0	-	-
12.7.05	GTC Biotherapeutics, Inc.	Private Placement	16.2	-	-
11.21.05	Thermogenesis Corporation	Public Offering	32.0	-	-
10.21.05	GTC Biotherapeutics, Inc.	Public Offering	16.7	-	-
8.19.05	GTC Biotherapeutics, Inc.	Public Offering	11.7	-	Highbridge Capital Management, LLC, Downsview Capital, Inc., Omicron Capital L.P., Iroquois Capital, LP, Bluegrass Growth Fund Partners, LLC
8.8.05	GTC Biotherapeutics, Inc.	Private Placement	8.0	Highbridge Capital Management, LLC, Downsview Capital, Inc., Omicron Capital, L.P., Iroquois Capital, LP, Bluegrass Growth Fund Partners, LLC	-
7.25.05	SurgRx, Inc.	Private Placement	21.0	Alta Partners, New Enterprise Associates, Prospect Venture Partners, California Technology Ventures, LLC	-
6.17.05	Zymogenetics, Inc.	Public Offering Follow-on Equity Offering	126.9	-	-
3.31.05	Protein Polymer Technologies, Inc.	Private Placement	7.8	Gryphon Management Partners, Catalytix LDC, Enable Capital Management, Gemini Investment Strategies, LLC, Sunrise Equity Partners, L.P., Array Capital Management LLC, Nite Capital Management, LLC, Andrew Carter Capital, Inc.	-
3.8.05	Cryolife, Inc.	Public Offering Fixed-Income Offering	18.8	-	-
3.4.05	Closure Medical Corporation	Mergers/Acquisitions	387.7	Johnson & Johnson (NYSE:JNJ)	-
2.7.05	Omrix Biopharmaceuticals Inc.	Mergers/Acquisitions	1.63	Catalyst Investments L.P.	Savient Pharmaceuticals Inc.
1.25.05	HyperBranch Medical Technology	Private Placement	6.0	H.I.G. Ventures, The Aurora Funds, Inc.	-
1.14.05	Haemacure Corporation	Private Placement	NA	Pinetree Capital Corporation	-

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Contact Information

Brocair Partners LLC, based in New York, was formed in 2004 to provide mergers & acquisitions advisory services, equity and debt placement services, and strategic advice to middle-market public and private healthcare companies. Brocair Partners has advised a range of public and private companies across healthcare segments that include pharmaceuticals, medical devices, nutrition and pharmacosmetics, healthcare business services and information technology, and pharmaceutical ingredients and intermediates, both in North America and abroad. Brocair Partners is the exclusive healthcare sector member firm covering North America within Mergers Alliance.

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