

NEWSLETTER / DECEMBER 2010 ISSUE

Developers of the Future Life Science Trends are accelerating

Both the economy and society thrive on technological advances. The prosperity that a modern society enjoys hinges increasingly upon its ability to spark technology innovations. But where do these innovations come from that make the difference between economic advance or decline? When it comes to the Healthcare/Life Science sector, a trend soon becomes clear to see. Innovations are increasingly coming from small companies (start-ups), which are then often acquired by large corporate groups. This applies not only to the Pharma sector, but increasingly with respect to medical technology, as well. Even such conservative sectors as the Chemicals industry are increasingly employing biotechnological processes (industrial biotechnology) that were developed by young companies. A further trend is the convergence of technology fields. Medtech companies use Pharma products (drug eluting stents), molecular diagnostics are linked with imaging technologies (molecular imaging) and drug development is going hand in hand with new diagnostic methods (personalized medicine). In this complex environment, a company needs more than one Gyro Gearloose in order to be able to develop new products and processes. This is why interdisciplinary collaboration and teamwork are more important than ever. Rising demands are being placed upon young companies. It would seem that the trend toward a division of labor between young, innovative companies and large corporate groups has established itself across the board. The reason is obvious: Even a thousand specialists in the R&D department of a corporate giant cannot match the creative power of the broad mass of researchers and tinkerers throughout the entire world. The best

example of how far the division-of-labor process can go is Apple's App Store, which offers a business platform for developers from throughout the world. Things certainly won't come to that in the Healthcare sector, but this industry would today be inconceivable without start-ups, which offer outstanding opportunities for the Gyro Gearlooses of today. What we strive for at SHS is to turn entrepreneurs, especially in the Life Sciences and Medical Technology sector, into big players and to aid their ideas in making the breakthrough. On the following pages, we would again like to provide you with insight into this work.

Venture capital for innovative medical technology company

The medical technology industry is currently one of the most attractive sectors for venture capital investors. And this will remain so for the foreseeable future. The world market for medical technology currently amounts to some € 200 billion, with 45 percent of this total accounted for by the United States, 15 percent by Japan and 10 percent by Germany. The annual growth rate is stable at four to five percent. Demographic development, the increase in prosperity diseases and cost pressures in healthcare make it likely that demand for innovative medical technology equipment will continue to rise. And improvements

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SHS invests in phenox

phenox GmbH offers instruments for neuro-interventional stroke treatment. This is a form of treatment that removes blood clots in the brain by means of minimally invasive procedures. Based in Bochum, the company was founded in April 2005 by Dr. Ing. Hermann Monstadt. The procedure was invented in the 1990s and has

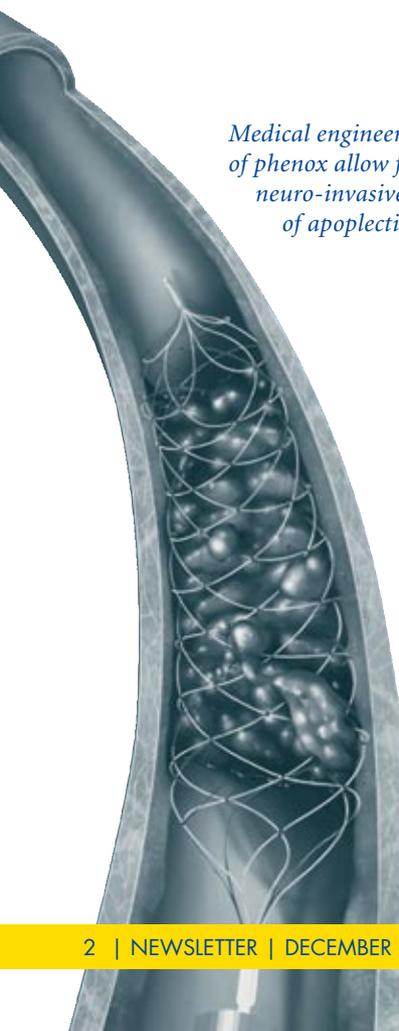
since established itself worldwide. There is a very high medical need for the company's products. "An acknowledged specialist in the field of stroke therapy, phenox is managed in an entrepreneurial and professional way. This is why we were pleased to invest in phenox GmbH and are supporting this company's strong growth," is the way

Dr. Bernhard Schirmers, Managing Partner at SHS Gesellschaft für Beteiligungsmanagement, explains the reasoning behind the investment by SHS.

Also participating in the current round of financing is the NRW Bank which has already participated in the first financing round.

SHS takes equity stake in 4a medicom

Medical engineering devices of phenox allow for the neuro-invasive treatment of apoplectic seizures



4a medicom GmbH, which is headquartered in Traboch, Austria, was founded in 2006 with the objective of significantly simplifying what up until then had been complicated self-administered blood glucose monitoring. It is absolutely necessary for many diabetics to test their blood sugar level multiple times a day, which means that blood glucose self-testing represents a large market that continues to grow.

In contrast to today's customary measurement methods, in which several components are required, the product from 4a medicom GmbH integrates lancing device, lancet and test strip in one and the same unit. This means that patients can determine their blood sugar level in a single step. The advantages of this product are that it is largely pain-free and easy to use. This is of major significance, especially for the fast-growing group of older patients.

Because the unit is designed as a safety product, it additionally offers hospital personnel effective protection

against infections. Planning calls for the analytical system to be expanded in order to enable future blood parameters to be measured.

"4a medicom is a medical technology company with great growth potential. Its attractive product offers major patient benefits and will significantly simplify blood sugar testing in the future. We will support the growth of this start-up to the best of our ability," notes Reinhilde Spatscheck, Managing Partner at SHS Gesellschaft für Beteiligungsmanagement, in commenting on SHS' new portfolio company. SHS is the lead investor at 4a medicom GmbH.

"We are pleased to have found equity investors for our company who possess extensive experience with regard to innovative medical technology companies. So there are no further obstacles to 4a medicom's future growth," Reinhard Haffellner, founder and managing director of 4a medicom, comments on the company's successful growth financing.



Minapharm acquires ProBioGen AG

Minapharm Pharmaceuticals of Cairo has acquired Berlin-based cell line specialist ProBioGen AG, purchasing 95 percent of its shares. The purchase price totals € 30.4 million. ProBioGen will remain an independent service provider for international clients from the biopharmaceutical industry and will develop its own designer cell lines for the production of vaccines and proteins. ProBioGen's new Chief Executive Officer will be Dr. Wieland Wolf. Minapharm's CEO Dr. Wafik Bardissi will become the new Chairman of the ProBioGen Supervisory Board. Parting ProBioGen Supervisory Board Chairman Hubertus Leonhardt is pleased the sale turned out well and about the successful withdrawal of the prior investors: "ProBioGen couldn't have found a better partner. The combination of the two business models will benefit from a convincing strategic rationale as well as from any number of synergies." Among ProBioGen's former investors were the Venture Capital Fund of SHS Gesellschaft für Beteiligungsmanagement, along with the CFH/LBBW Group, IBG and tbg. With its production facilities in Ramadan City, Cairo-based Minapharm Pharmaceuticals numbers among the leading Pharma companies in Egypt and the Middle East in the field of prescription drugs.

Micropelt closes new round of financing

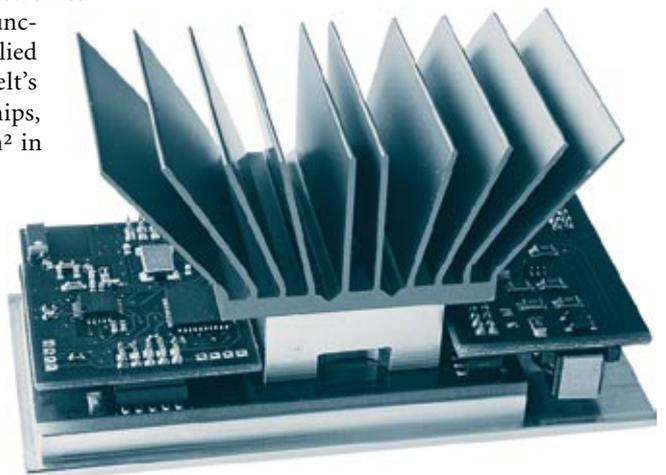
In the autumn of 2010, the Freiburg-based company closed a financing round involving a total of five million euros – including € 3.4 million in fresh liquidity. In addition to shareholders SHS, KfW, L-Bank, Magdeburg-based IBG/Goodvent and mbg Baden-Württemberg, the new financing partners are Investitionsbank Sachsen Anhalt, mbg Sachsen Anhalt and Saalesparkasse (Halle). This will enable the start-up of series production of thermoelectric chips in the second quarter of 2011. Up to ten million units can be produced here on a largely automated basis. Micropelt specializes in thermoelectrics and thermal energy harvesting. Converting waste heat of all types into electrical energy is opening up a steadily growing spectrum of potential applications. Moreover, the steady decline in the energy demand of microelectronics is offering more and more functionality, which can be supplied with energy from Micropelt's Thermogenerator (TEG) chips, which are less than 15 mm² in size.

On the basis of environmentally friendly, maintenance-free energy supply from free waste heat, it is for example possible to operate radio sensors without any batteries. The information obtained from autonomously operating

radio sensors at low non-recurring cost provides a variety of benefits: The data can be used to optimize processes, for example, or to increase energy efficiency, reduce maintenance costs, lower operating risks, reduce materials inputs and minimize the impact on the environment.

Micropelt's partnerships with STMicroelectronics, ABB, A. Raymond, Shell/Emerson and other leading players demonstrate the high potential that is offered by energy harvesting technology.

The small Micropelt generators produce power from the waste heat of industrial facilities (Thermoharvesting)





FRESH FROM YESTERDAY

The food industry is more and more frequently using enzymes as an aid – to detoxify cookies, to make margarine more easily digestible and to give a fresh taste to old bread.

By Susanne Donner

“Fresh since 1891,” “Your favorite baker for the past 33 years”: The slogans used by bread bakers would seem to relate more to tradition than innovation. Yet that’s deceiving – recent years have seen recipes from crusty rye bread to thick pretzel sticks being systematically re-written. Long gone are the days when the only ingredients in rolls were flour, water, salt and yeast. Today, the crucial ingredients tend to be amylase, hemicellulase, lipase. A roll can often enough contain a cocktail of twenty aids. In no other food are so many enzymes used.

For Lutz Popper, who heads product research operations at baking aid manufacturer SternEnzym in Ahrensburg, not far from Hamburg, enzymes are a “piano that you can use to fine tune baking properties.” In his book, “The Future of Flour,” he describes how to play this instrument. Amylases break down the starch in sugar and assure that the dough will rise quickly and that the roll will be light and airy. Hemicellulases break down the structural substances from the grain. They’re actually valuable fibers, but short, small molecules are preferred over their bulky cousins for use in kneaders. That way, they lend elasticity to the dough. The ready-to-bake dough rises better prior to baking. Lipases, in turn, break down vegetable fats in the grain. The products of decomposition act like emulsifiers. They stabilize the air bubbles in the roll. “It makes the crust softer, the pores finer. This gives the inside of the rolls a brighter look,” is the way Popper describes the cosmetic effect. The longer you listen to Popper, the more the rolls we eat each day would seem to be a biotech miracle. And the recipe revolution is still in full swing. After the EU directive on food enzymes went into force

in January 2009, “the market picked up speed,” observes Marc Struhalla, the general manager of Leipzig-based enzyme producer c-LEcta. Since then, enzymes for foods have needed approval from the European authority Efsa. Although the procedure costs several hundred thousand euros per enzyme and takes two to three years, there’s nevertheless more and more going on in the research laboratories.

Around fifty different classes of enzymes are used in foods, estimates Robert Rastall from the University of Reading near London, with each class consisting of innumerable representatives. Lipase, for example, isn’t always lipase. While all lipases do break down fats, they break down different kinds of fats and often under different conditions. Manufacturers’ products therefore number in the hundreds. In a few years, Efsa will have an overview of all of the branches of this market, once all producers have gone through the approval process. But that’s still not the case yet.

Meanwhile, the opportunities that are offered by food cosmetics can only be imagined, such as systematically tweaking deep-frozen soft pretzels, apple juice and candy bars. Phospholipases deslime vegetable oils, lipases prevent noodles from sticking, invertases liquefy candy fillings. Pektinases, hemicellulases, xylanases and cellulases enable more juice to be squeezed out of fruits. The beverage is then clarified with laccases. These enzymes can even make beer more aromatic. One innovative amylase is the flagship product from biotech player Novozymes in Denmark. It’s an enzyme that extends the shelf life of bread and baked goods. “This Novamyl technology is already very widespread in Europe



and the United States,” says Anders Espe Kristensen, who’s in charge of marketing for the enzyme segment at Novozymes. Less bread gets thrown away, which enables the baking cycles to be modified and reduces shipping costs. “Six billion loaves of bread are consumed each year in the United States. If Novamyl were utilized for each of these loaves, it would eliminate 300,000 tons of carbon dioxide emissions per year. This represents the exhaust from 75,000 cars,” is the way Kristensen does the math.

When asked how long old bread with Novamyl would still taste good, the marketing expert prefers to dodge the question. That would depend upon the dosage of the additive, he says vaguely. But one of the company’s websites says that two-week-old slices of toast bread made with the enzyme taste as if they had just been baked. So will an allegedly fresh loaf of bread from the month before soon be foisted on customers? Will customers be swindled left and right with enzyme cosmetics? Novozymes plays down the issue. The pastries would have to be in proper hygienic condition and satisfy the highest taste expectations. Yet consumers are unable to identify products that have been treated with enzymes. If the end product no longer contains the enzyme, which has served only as a processing aid, it does not have to be declared.

However it would be a mistake to cast suspicion upon all enzymes because of the opportunities for fraud. Not every aid is intended to merely make foods look more attractive or younger. “What’s new is the trend toward using enzymes to avoid the formation of harmful substances,” stresses Struhalla. His company has applied for approval for its “4-LEss Acryl” asparaginase. This enzyme reduces the formation of acrylamide by up to 90 percent – this substance is suspected of causing cancer. In Germany, there is a requirement to minimize its use. Chips, zwieback, crisp bread, French fries, cookies and coffee should contain as little of it as possible. But that’s easier said than done. Because acrylamide is formed from the amino acid asparagine and sugar as soon as food is heated to more than 120 degrees Celsius. While gentle roasting and frying can reduce the share of toxic substances by several percentage points, it does not totally eliminate the risk.

One major advance, on the other hand, is succeeding with the enzyme asparaginase. It converts asparagine into aspartic acid, thus preventing it from forming acrylamide. Levels decline by at least one half in cookies and soft pretzels, and sometimes

even by 90 percent. Two of these detoxifiers are already on the market: “Acrylaway” is the name Novozymes gave its product. Netherlands-based biotech competitor DSM followed suit with “PreventAse.” And c-LEcta in Leipzig, with its workforce of forty people, is now the third entrant. “Our enzyme is especially stable under heat and does its best work in the temperature window between 80 and 100 degrees Celsius,” explains Marc Struhalla. Competitive products work at lower temperatures, he says. That’s why asparaginase from Leipzig is capable of detoxifying any food in which asparagine doesn’t form until it is subjected to heat. In experiments, according to Struhalla, it has been possible to cut the level of the toxin acrylamide by at least one half in coffee.

Enzymes to combat harmful substances – this is the principle that Novozymes, too, is following with an innovative lipase. It removes the harmful trans fats from margarine that are produced during industrial hardening of vegetable oils and are responsible for high blood cholesterol. In addition to margarines, baked goods, snacks and puff pastries that are made from margarines also contain high levels of these harmful substances. However, consumers can read nowhere which margarine features reduced trans fats. Producers are categorically silent about the use of enzymes. In conjunction with the reform of the EU directive, consumer protection organizations are urging that their declaration be made mandatory. Yet these efforts have failed.

Industry representatives then gave a sigh of relief. “We’re very pleased about it,” said Marc Struhalla. “Otherwise, the employment of enzymes would have been avoided.” The reason: According to a study by the VDI Technology Center, at least 50 percent of all food enzymes are produced from genetically altered bacteria or fungi. Even though the microbial producers do not end up in the food, a goodly number of consumers would probably prefer to avoid these kinds of foods if they knew about their genetically engineered origins.

The SHS portfolio company c-LEcta produces enzymes, which substantially reduce carcinogenic substances in food. c-LEcta has won recently the FutureSax 2010 Award for innovative high-growth companies. The article of Susanne Donner was first published in Technology Review.



Progress in clinical studies

Three SHS III Fund portfolio companies have announced first progress in clinical studies

AMW

will conclude the first two approval studies for oncological pharmaceuticals by the end of this year. An initial analysis shows that the end points are being achieved and the drugs are well-tolerated by patients. The application for approval is expected to be submitted next year, with marketing beginning toward the end of the year.

Epionics

is also able to publish initial results from a large-scale study that was conducted at

the Charité Hospital in Berlin. More than 500 back pain patients and healthy test persons were measured with Epionics SPINE, a device for short- and long-term measurement of mobility functions in the lumbar region. The results show that Epionics SPINE can clearly differentiate between healthy and abnormal mobility functions. This means that for the first time there is now a diagnostic option that assesses lumbar mobility and can verify or falsify decisions to operate, for example.

Lipofit

is in an approval study for a kidney test following a successful pilot study. The kidney test shows very quickly and precisely the extent to which a transplanted kidney is threatened by rejection or failure. Serious complications can thus be reduced, with less need for repeat transplants.



Spinelab wins prestigious Spine Technology Award for its Elaspine implant system

Spinelab AG has received the award as the “Best New Technology for Spine Care in 2010” for its “Elaspine” product. The award was presented prior to the annual convention of the North American Spine Society in Orlando, Florida. Elaspine, a pedicle screw-based motion-preservation system for the spinal column, won the award as the best new technology in the “Motion Preservation” category for its originality and medical significance.

“This award is a tremendous honor for Elaspine, and we are extremely pleased to have received it from leading North

American experts. Up until now, our clinical activities have focused on Europe, where we have already successfully conducted and documented over twenty Elaspine operations,” says Spinelab President & CEO Thomas Zehnder. The Spine Technology Awards are sponsored annually by “Orthopedics This Week,” one of the most widely read periodicals in the orthopedic sector. The jury that selects the award-winners is made up of acknowledged specialists from the field of spinal surgery.



Continued from page 1

in healthcare in the threshold countries of Asia and South America are sparking additional growth in this industry.

Enormous technology advances are often being made today, especially in medical technology. With the increasing convergence of different technology sectors, innovative companies are developing brand new applications. At the same time, though, the challenges facing providers of medical technology products are also on the rise. The regulatory systems differ greatly in the various markets. Often enough, high investments in clinical studies are necessary in order to obtain

market approval. In addition, the products also have to be eligible to be covered by health insurance providers. So in addition to technology know-how, a very precise knowledge of the healthcare systems in the various markets is needed in order to make a product successful. Young companies often cannot master this challenge on their own, even though they possess an outstanding product. A seasoned venture capital firm with industry experience like SHS can not only provide innovative medical technology players with the capital they need to enter the market, but can also help to overcome the difficulties that could

stand in the way of economic success.

SHS invests in “larger” companies

Through its current SHS III Fund, SHS is investing in innovative companies from the field of Life Sciences and Medical Technology. We are repeatedly being asked whether we would also invest in companies that are already recording seven-digit sales revenues. Of course we would: We are pleased to support the expansion of fast-growing companies with sales revenues of up to € 20 million.



Manfred Ulmer-Weber strengthens the SHS team:

On September 1, 2010, we welcomed Mr. Manfred Ulmer-Weber at SHS as an investment manager. Mr. Ulmer-Weber studied international business administration in Tübingen and Strasbourg, concentrating on corporate finance, taxation, accounting and econometrics, and concluded his studies with the academic degrees of “Diplom-Kaufmann” and “Master Grande Ecole.” His thesis dealt with fund yields. He had already been able to get to know SHS during his studies in connection with a lengthy internship.

A film about SHS:

SHS is now on the Internet in moving pictures, as well. A new film on the SHS homepage showcases SHS, its strategy and its people.

See it at www.shsvc.net/shsfilm.htm

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