

ISRAEL HIGH-TECH & INVESTMENT REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES JOSEPH MORGENSTERN, PUBLISHER
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Perstare et Praestare!

"To move forward, Israel and its venture industry must more firmly embrace the global marketplace. Israel needs to promote itself in a more positive light to attract foreign investment and partners. The Israeli government must act to accommodate an easier flow of technology, investment and professional services across its borders to encourage commercial growth. Israeli venture investors need to reach out to quality US investors and others, to find new means of cooperation and to leverage the reach of Israeli venture funds.

Israeli companies operating in the US should be encouraged to adopt corporate advance successful exit opportunities. Finally, Israeli venture investors would be wise to actively pursue opportunities in China and elsewhere in Asia – either with US partners or on their own – to take advantage of those emerging markets. From my perspective, Israel can and should be more than a supplier of new technology solutions. Israel should strive for leadership in the global technology marketplace," stated attorney Gary L. Benton, a corporate lawyer and a partner with Coudert Brothers. He is based in the firm's Palo Alto, California office. We have met him on one of his many visits to Israel.

In turn, we would like to point out to you Gary and others like you, that over the 56 years of Israel's existence we have acted on advice from our friends and we will continue to do so.. In spite of occasionally stressful conditions Israelis have managed to be both creative and constructive. Perstare et Praestare. Persevere and Excel sums it all up. We are not without faults nor are we unaware of our shortcomings. However, on birthdays we like to take the liberty to list some of our achievements.

Israel, the 100th smallest country in the world, with less than 1/1000th of the world's population, can lay claim to the following:

The cell phone was developed in Israel by Israelis working in the Israeli branch of Motorola, which has its largest development center in Israel.

Most of the Windows NT and XP operating systems



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Israel Unveils Tiny Flying Machines

were developed by Microsoft-Israel.

The Pentium MMX Chip technology was designed in Israel at Intel. Both the Pentium-4 microprocessor and the Centrino processor were entirely designed, developed and produced in Israel.

The Pentium microprocessor in your computer was most likely made in Israel.

Voice mail technology was developed in Israel.

Both Microsoft and Cisco built their only R&D facilities outside the US in Israel!

The technology for the AOL Instant Messenger ICQ was developed in 1996 by four young Israelis.

According to industry officials, Israel designed the airline industry's most impenetrable flight security. U.S. officials now look to Israel for advice on how to handle airborne security threats.

Israel has the highest percentage in the world of home computers per capita.

Israel has the highest ratio of university degrees to the population in the world.

Israel produces more scientific papers per capita than any other nation by a large margin - 109 per 10,000 people — as well as one of the highest per capita rates of patents filed.

In proportion to its population, Israel has the largest number of startup companies in the world. In absolute terms, Israel has the largest number of startup companies than any other country in the world, except the U.S. (3,500 companies mostly in hi-tech).

With more than 3,000 high-tech companies and startups, Israel has the highest concentration of hi-tech companies in the world — apart from the Silicon Valley, U.S.

Israel is ranked #2 in the world for venture capital funds right behind the U.S.

Outside the United States and Canada, Israel has the largest number of NASDAQ listed companies.

Israel has the highest average living standards in the Middle East. The per capita income in 2000 was over \$17,500, exceeding that of the UK.

On a per capita basis, Israel has the largest number of biotech startups.

Twenty-four per cent of Israel's workforce holds university degrees — ranking third in the industrialized world, after the United States and Holland - and 12 per cent hold advanced degrees.

Israel is the only liberal democracy in the Middle East. In 1984 and 1991, Israel airlifted a total of 22,000 Ethiopian Jews at risk in Ethiopia, to safety in Israel. When the U.S. Embassy in Nairobi, Kenya was bombed in 1998, Israeli rescue teams were on the scene within a day — and saved three victims from the rubble.

Israel has the third highest rate of entrepreneurship — and the highest rate among women and among people over 55 - in the world.

Relative to its population, Israel is the largest immigrant-absorbing nation on earth. Immigrants come in search of democracy, religious freedom, and economic opportunity.

Israel was the first nation in the world to adopt the Kimberly process, an international standard that certifies diamonds as "conflict free."

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Israel has the world's second highest per capita of new books.

Israel is the only country in the world that entered the 21st century with a net gain in its number of trees, made more remarkable because this was achieved in an area considered mainly desert.

Israel has more museums per capita than any other country.

Medicine... Israeli scientists developed the first fully computerized, no-radiation, diagnostic instrumentation for breast cancer.

Researchers in Israel developed a new device that directly helps the heart pump blood, an innovation with the potential to save lives among those with heart failure. The new device is synchronized with the heart's mechanical operations through a sophisticated system of sensors.

Israel leads the world in the number of scientists and technicians in the workforce, with 145 per 10,000, as opposed to 85 in the U.S., over 70 in Japan, and less than 60 in Germany. With over 25% of its work force employed in technical professions. Israel places first in this category as well.

A new acne treatment developed in Israel, the ClearLight device, produces a high-intensity, ultraviolet-light-free, narrow-band blue light that causes acne bacteria to self-destruct — all without damaging surrounding skin or tissue.

An Israeli company was the first to develop and install a large-scale solar-powered and fully functional electricity generating plant, in southern California's Mojave desert.

Israelis have developed two blockbuster pharmaceuticals - Copaxone and Rebif.

Israeli engineers have developed miniature video cameras that are being applied for diagnostic testing.

Israeli cardiac stents have been adopted by major American medical firms.

Happy 56 Birthday !

NESS' Unique Technology for Limb Rehabilitation

NESS' core technology is based on the use of computerized "functional electrical stimulation" (FES). This can be used to activate paralyzed muscles and to restore partial movement. FES works by creating electrical pulses that are carried by small nerve fibers to the muscles, and cause the muscles to contract and release. This helps to relieve the effects of paralysis and facilitates the development of pathways for voluntary control

After 13 years of research and development that cost \$25m. NESS, an acronym for Neuromuscular Electrical Stimulation Systems (NESS) Ltd. is well on its way to commercialize its flagship product "The Handmaster".

The Handmaster, is a non-invasive system for paralyzed hands. It incorporates and integrates advanced upper limb rehabilitation technologies in a single system for patients' independent use.

FES or Functional Electrical Stimulation is a rehabilitation technology using electric current impulses applied to the neuromuscular system that activate the muscles and negotiate movement, increases local blood flow while lessening spasticity.

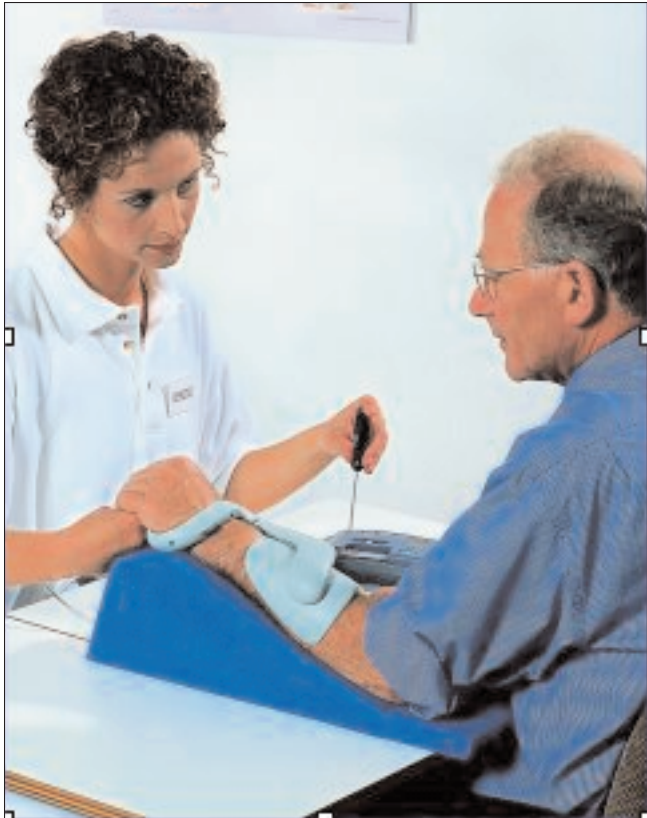
It is the first in a line of a planned range of products whose aim is to provide comprehensive treatment of the paralyzed hand and eventually other parts of the body.

The Handmaster consists of a size-adjustable splint that incorporates an integral electrode system and is connected by a cable to a small and user-friendly electronic control unit. The splint is easily applied and removed by the user and is designed for independent use at home.

The underlying technology was developed by Professor Roger Nathan of Ben-Gurion University who continues to guide the development program of the company.

Prior to the development of the technology by NESS, electricity has been used to reduce pain. Transcutaneous electrical nerve stimulation (TENS) is a technique sometimes used to relieve pain. Electrodes are attached to the skin and they send low amounts of electricity to the nerves. The TENS technique is of low intensity and does not have any effect on muscles

Interestingly enough, the use of electricity in pain control dates back to the pre-Christian era, when electric eels



and torpedo fish were applied to painful areas. Benjamin Franklin also experimented with electricity as an analgesic tool.

The Egyptians used an electric fish from the Nile River. They placed the fish over a painful area much like the electrical stimulator of today. While the use of

NESS backers will be called on again to supply funds of both marketing and the further expansion of research and development.

The company has proved its ability for obtaining financial backing. Early on in its history it was awarded a grant from the Office of the Chief Scientist of the Ministry of Industry and Trade. A year ago it received a grant from the BIRD-F Bi-National Research and Development Foundation.

“Our strongest backers are our investors who have provided us with the funds needed to reach our milestones,” says Samuel Shany, the company’s CEO, during an interview with IHTIR.

He was referring to NESS’ shareholders that include Teuza, an Israeli public venture capital fund associated with US-based Fairchild Group, Johnson and Johnson Development Corporation, ABN AMRO, Life Science Partners, a Dutch VC fund, and Dow Chemicals.

Equally important to the company’s progress have been the approvals obtained from governmental and regulatory bodies. NESS’s technology is patent protected. Its products have proved successful in clinical trials, and are cleared for use by FDA and European Union (CE Mark).

The Handmaster is already in use in the Netherlands. It is approved there for full reimbursement, and has

A Dutch patient relates her experience with the Handmaster, “I had my first stroke in May 1988, which paralysed my left side. At that time, the physicians told me that I should not count on recovery, but prepare myself for the worst. Because of the diagnosis I could not follow any form of therapy and during 6 months I did not receive therapeutic treatment. “In November 1996 I had a second stroke. In the first months after the stroke I wanted to give up as I could not imagine that I could become better. In October 1999 the patient gets the opportunity, together with another two patients to do a clinical test with the NESS Handmaster.

“Before I could start the training with the Handmaster, a physiotherapist of NESS has fitted the device to my hand. When she first activated the Handmaster I could not believe my eyes. The fingers of my hand bent and stretched very clearly. I was doing and I am still doing my exercises three times a day, every day and after a short while I got clearly more control over my hand and arm. Daily activities like putting on your coat and washing the dishes are much easier for me than in the past and sometimes I realise that some activities I can do now, are becoming natural to me.”

electricity may reduce pain it does not relieve the symptoms of paralysis or allow for a return of movement.

attracted wide interest from patients and therapists, alike.

More than 1,000 Handmasters have been delivered to

individuals and rehabilitation organizations. "The response has been very positive and I estimate that our sales will be in the millions of dollars, in the foreseeable future," predicts Shany.

The market for Ness' products is made up of individuals who have lost the use of their limbs as a result of paralysis caused by brain or spinal cord damage through injury or disease. Based on research and studies conducted in the US and Europe, the following are the relevant numbers of patients in developed countries per patient category:

The market for the company's products, based on generally accepted statistics, is massive. For the time being it is wide open to Ness, as there are no competitors in sight.

The big prize for Ness would be an entry into the American market. "We will not try to independently market our products in the U.S.A. Our goal is to find a marketing partner. I believe that it is a goal that we will reach in the near future", stated Samuel Shany.

Overview of Biotechnology Sector



Some 149-biotechnology companies were active in Israel in 2003, according to figures released yesterday by the Central Bureau of Statistics. (CBS) According to the CBS data, the companies employed a total of 3,900 workers and generated revenues of \$282m. Exports

accounted for \$212m. of the total sales. Research and development expenses totaled \$207m., approximately four percent of the national expenditure on R&D.

118 of the biotechnology companies were either start-ups or R&D institutes. The remaining 31 companies were active in the field of industry and most were involved in the development and manufacture of drugs for human and veterinary use.

Some 46 percent of the biotechnology workers were employed in R&D, 34 percent were involved in production and 20 percent worked in marketing and administration. Some 50 percent of the biotech work-

ers in 2002 were women, the CBS figures revealed. The cost of salaries of biotechnology workers amounted to \$135m. an average of \$3,333 a month per employee.

Some 50 percent of biotechnology revenues in 2002 came from firms operating in the field of drugs for human and veterinary use; 22 percent stemmed from research companies; and 29 percent came from companies involved in agriculture and foodstuffs.

Half of the companies involved in biotechnology in 2002 were active in the field of human medicine; 20 percent of the companies were involved in agricultural and marine biotechnology; 19 percent worked in the field of environmental biotechnology; and 7 percent focused on cosmetics. The remaining companies were involved in the production of foodstuffs.

FDA Approval for Device that Diagnoses and Treats Colon Cancer

SightLine Technologies, an Israeli medical device company that develops medical endoscopic systems for diagnosis of diseases of the large intestine, received approval from the US Food and Drug Administration (FDA), to market its product ColonoSight in the US.

The system is used to to diagnose and treat of colorectal cancer. ColonoSight® is a new power-assisted, non-fiber optic colonoscope that is fully disposable.

It moves easily once inside the colon, and is operated using a miniature video camera and light source that is inserted into the colon in order to locate polyps and growths. The system is based on the company's proprietary technology. It pulls the device into the colon as compared with a standard colonoscopy examination, in which the operator is required to push the device to obtain results. Patient discomfort and the likelihood of puncturing the colon are therefore reduced.

The system also enables swift diagnosis of growths in the colon, and can be used to remove polyps.

Colon cancer is the second most common type of cancer and the second highestcancer cause of death among the different types of cancer worldwide. The main cause for colon cancer has yet to be discovered, with exception of the known linkage to genetic causes. Awareness of this disease is rising in the western world, and growth of the colonoscopy market is estimated at 9-10% in the coming decade.



SightLine has raised \$16.0m., from Boston Scientific, Vitalife, the Fishman Group, InvenTech, Pamot and Isratech. The company employs 25 and is located in Haifa.

Pharmos Awarded \$3.1m. Government Grant

Pharmos Corporation (Nasdaq: PARS) announced it has been awarded a grant of up to US\$ 3.1 million by the Office of the Chief Scientist (OCS) of Israel's Ministry of Industry and Trade to help fund the Company's development of dexanabinol.

Approximately 93% of the funding is designated for the development of dexanabinol as a treatment for traumatic brain injury (TBI), currently in advanced Phase III clinical testing with patient enrollment completed and results expected by year end. The remaining portion of the grant will help fund the development of dexanabinol as a preventive agent against cognitive impairment in patients undergoing major heart surgery, in which patient enrollment in a Phase II study is underway.

Retalix to Meet or Beat Estimates

Israeli software firm Retalix (NasdaqNM:RTLX) said that first-quarter 2004 results will be meeting or beating analysts' consensus estimates.

It estimated that first quarter revenues will exceed \$25 million and earnings of 4 cents per share. The company also reaffirmed its 2004 view of 30 percent revenue growth, compared with 2003, and net income for 2004 of about \$5 million.

Visonic Completes London IPO

Visonic Technologies a provider of advanced alarm systems for homes and institutions, announced that it completed its London offering of shares.

The Israeli company tapped the London Stock Exchange for £9.5 million at a company valuation of £35 million.

Dawnay, Day, Cukierman and Durlacher accompanied the offering, in which Visonic issued 10.8 million shares, or 27% of its equity, for 88p per share.

Visonic had held road shows in England, France and Israel and was rewarded with oversubscription. The company said none of the board members mean to sell any of their shares before the company publishes its financial statements for 2004, during February 2005.

Dr. Avi Shachrai, president and CEO of Visonic, commented that the company was pleased with the success of its London IPO, which should open new doors of opportunity.

The proceeds will serve to further new product development and expand marketing, as well as financing growth through acquisitions.

The company was established in 1973. Aside from its Tel Aviv headquarters, it maintains facilities in Kiryat Gat. In 1996 it spun off Visonetix, and has a subsidiary in Carmiel called VisAccess. It also maintains sales offices in the U.S., Britain, Spain, Germany, Norway, Singapore and Australia. Visonic has 400 employees in Israel and elsewhere. Its clients include British Telecom, Spain's Telefonica, ADT, Honeywell, and Siemens.

Revenues in 2003 amounted to \$53 million, versus \$45 million in 2002. Pretax profit was \$4.7 million in 2003, versus \$3.7 million in 2002, an increase of 26%.

A year ago Visonic acquired Elpas, which develops asset tracking and management solutions, mainly for healthcare and educational institutions. The deal, a share swap, valued Elpas at \$6.5 million, while Visonic was valued at \$50 million.

\$8.9b. High-Tech Exports in 2003

Israel's hi-tech exports totaled \$8.9 billion in 2003, an increase of 0.8% from 2002, and in the current year hi-tech exports may increase 8% to 13%, as the U.S. and global appetite for Israeli hi-tech wares recovers,

stated Mr. Shraga Brosh, chairman of the Israel Export Institute.

Israel Evaluates System to Protect Buses

According to Jane 's Defense Weekly two Israeli companies have joined forces to devise a means of protecting public transport from attacks by suicide bombers. The system has been in trial service on buses operating in Jerusalem and Tel Aviv since the end of February.

The onboard system combines explosives detection, access control to check passengers before they embark and to regulate access to the vehicle.

Sensors located in the front entrance area of the bus are able to detect the presence of explosive materials at a distance of up to 1 meter. If explosives are detected, the system alerts the driver, who can then lock an electronically controlled rotating metal barrier to prevent passenger entry. An armored glass panel offers additional protection for the driver in event of a blast.

China Begins distribution of ID cards with OTI Technology

On Track Innovations, Ltd. (OTIV) : OT5), a developer and provider of contactless microprocessor-based smart card solutions, said that China has begun distribution of electronic ID cards that carry OTI's technology.

Xinhua News Agency, the state and worldwide news agency in China, reported earlier this week that, "Within the first half of this year, 200,000 residents of Shanghai's Jiading and Chongming districts will be issued new ID cards.

After that, the new cards will be distributed throughout the city, according to Zheng Shanhe, the deputy director of the Shanghai Public Security Bureau. Zheng estimated that by the end of 2008, the cards will be in use nationwide."

Biomedical Entrepreneur Pledges \$100m. to Technion

The American friends of the Israel Technion Institute of Technology in Haifa, have announced that Alfred E. Mann, chairman of Advanced Bionics Corporation, has pledged \$100-million to establish a biomedical-engineering institute at the school's campus.

According to the Forbes magazine, Mr. Mann, is worth in excess of \$1-billion and is one of the 400 wealthiest Americans. In addition to his role at Advanced Bionics, a Sylmar, Calif. company that makes implants to restore hearing, he also serves as chairman and chief executive officer of MannKind Corporation, in Valencia, Calif., a biopharmaceutical company that develops and distributes drugs that treat autoimmune and inflammatory diseases, cancer and diabetes.

Neovasc Medical Raises \$1.8m.

Neovasc Medical Ltd., has raised \$1.8 million in a seed round of financing. Participants in the round included Guidant Corporation, Israeli seed fund Peregrine Ventures, PureTech Ventures, Leon Recanati and the Shemrom Group.

Neovasc has developed an innovative, minimally invasive treatment for ischemic heart disease involving the implantation of a stent-like device designed to improve cardiovascular function and ease the suffering of such patients by increasing the supply of oxygenated blood to the myocardium (heart muscle). The company anticipates approximately 800,000 possible candidates for the Neovasc implant in the United States alone. The company is starting human pilot studies with its device. Neovasc advisors include renowned leaders in the field such as Martin Leon, Antonio Columbo, Eleazar Edelman, Thomas Ischinger, Gadi Keren, and Campbell Rogers.

Ben Muvhar, Neovasc's joint CEO, pointed out that: "Neovasc's advanced treatment is intended for patients suffering from ischemic heart disease that cannot be treated using conventional methods, such as cardiac catheterization or cardiac surgery, due to the anatomical nature of their heart disease or previous cardiac interventions."

Arotech Wins \$3.1m. Order for Armored Vehicles

Arotech Corporation (Nasdaq: ARTX) announced that its MDT vehicle-armoring subsidiary has received new orders of over \$3.1 million. Vehicles will be converted and armored in both the new Auburn, Alabama facility, and in the Israeli facility. MDT's backlog currently stands at over \$12 million.

"The recent events in Iraq and in other places around the world, are creating an increasing demand for our security and defense products, including armored vehicles," said Robert S. Ehrlich, Arotech Chairman

and CEO. "Both our armoring facilities are in position to grow and accommodate this demand."

MDT's vehicle armoring business has years of battlefield experience and has provided life-saving protection under extreme conditions, which include assault attacks by rifles and bomb blasts. MDT armors a variety of armored vehicles: SUV's such as the Toyota Land Cruiser, the Land Rover Defender and the GM Suburban; vans and buses - from an 8 passenger Ford Econoline to a 16 passenger Mercedes bus, as well as ambulances and other specialty vehicles.

Intel Israel Achieves Chip Innovation

A team of Israeli researchers at Intel has achieved a breakthrough in chip development that promises to change the world of computing and telecommunications within 5 to 10 years.

The team of researchers has successfully developed electro-optical chipsets based on silicon wafers capable of converting electronic signals to optic signals within the chip. They have the potential to be mass produced at the same cost as standard electronic chips. Presently, the manufacturing cost of an optical chip, not silicon based runs into hundreds of dollars.

According to Intel's assessment, the electro-optic chips developed during the past year and a half at the company's Jerusalem facility, will eventually replace the standard electronic chips used for communications between computer components, allowing this communication to be conducted at the speed of light - 10 times the current speed.

The Haaretz newspaper reported the contents of an Intel press release which explained how the new technology works: "Researchers split a beam of light into two separate beams as it passed through silicon, and then used a novel transistor-like device to hit one beam with an electric charge, inducing a 'phase shift.' When the two beams of light are recombined, the phase shift induced between the two arms makes the light exiting the chip, go on and off at over one gigahertz (one billion bits of data per second), 50 times faster than previously produced on silicon. This on and off pattern of light can be translated into the 1's and 0's needed to transmit data."

Patrick Gelsinger, senior vice president and chief technology officer at Intel, called this "a significant step toward building optical devices that move data around inside a computer at the speed of light. It is the kind of breakthrough that ripples across an industry over time, enabling other new devices and applications. It could help make the Internet run faster, build much faster high-performance computers and enable high bandwidth applications like ultra-high-definition displays or vision recognition systems."

Eli Hurvitz to Chair MindGuard

Former Teva Pharmaceuticals (Nasdaq:TEVA) chairman Eli Hurvitz is joining the MindGuard Medical Devices as its chairman of the board of directors. MindGuard, which is developing a product to prevent stroke,

Hurvitz previously served also as president and CEO of Teva for more than 25 years, presiding over the company's evolution into one of the biggest generic drug companies in the world. He replaces David Gal, who chaired MindGuard for the last two years.

MindGuard's Diverter device, installed at the main artery to the head, filters the bloodstream, diverting clots from the carotid to other vessels. The company has successfully implanted the device in three humans so far, as part of its clinical trials.

Founded in 2000, MindGuard has raised \$25 million to date. In June 2003 it raised \$15 million, in a round led by Medtronic, with which it has a collaboration agreement.

MindGuard's novel flagship device, the Diverter™ serves as the traffic police of blood flow, redirecting troublesome blood particles away from the brain to less hazardous place.

MindGuard's Diverter™, an easily implanted permanent mesh, produces the transparent but crucial result of stroke prevention.

MindGuard has started with patient recruitment for clinical trials.

Science Corner

Varying Perceptions

Research at the Weizmann Institute yields clues to the question: "Do we experience seeing in the same

way as others?”

A rose is a rose is a rose, but do we and the artist and poet all see the same flower in the same way? Scientists at the Weizmann Institute have now put this age-old philosophical question to the test.

To compare individual perceptions of visual experiences, Prof. Rafael Malach and Uri Hasson, along with their colleagues in the Neurobiology Department, showed volunteers a segment of a movie (in this case, the classic western “the Good, the Bad and the Ugly”) while they were undergoing brain scans with state-of-the-art functional MRI equipment. These scans allowed the researchers to see which areas of the subjects’ brains were active during love scenes or gunfights. Because a movie offers a wealth of different visual stimuli – scenery, faces, action, etc. – the researchers were able to track the brains’ response to a rich, dynamic scene. Showing the subjects a movie, rather than the typical visual stimuli used in such experiments – usually a series of carefully selected slides or photos – turned up some surprising results. Essentially, rather than presenting one type of stimulus and then looking for the response, the brain areas themselves were allowed to select their own fare from a smorgasbord of possibilities, and the scientists then took note of their selections.

What they found was a striking similarity between brain activity patterns in all the subjects; so much so that the patterns of one could be used to predict activity in other brains when viewing the same segment. “Despite our strong sense of individuality, such a high level of agreement between subjects implies that our brains ‘tick together’ when exposed to the same visual environment,” says Malach.

Surprisingly, reviewing the brain scans revealed that, if we all see literally the same movie, the active regions of our brains all view different movies. Because each area is activated by a specific kind of visual cue, it only picks up on those bits that “speak” directly to its specialized preference. For instance, a region that is known to be involved with face recognition lit up only when close-ups appeared on the screen, while scenery elicited a response from another part of the brain that helps us navigate in three-dimensional space. The scientists noted a third area that seemed to be activated when actors performed delicate hand motions, which they think may be part of a network of brain regions that we use to understand the actions and intentions of others. “Thus,” says Malach, “while you perceive a single, whole movie, different regions of your brain are each

processing a private motion picture of their own. The unified percept you experience is, in fact, the result of a tremendous, individualistic ‘jam session’ played by many different, highly specialized brain areas.”

Previously Unknown Kidney Functions are Revealed by New MRI Scan

Kidney disease may affect as many as one in twelve people, and causes millions of deaths each year. Currently, the diagnosis of kidney function relies mainly on blood and urine tests, an indirect means of figuring out how well they’re working.

Standard MRI scanners, used to view many organs of the body, do not always show the whole picture for kidneys. This is because the MRI equipment found in hospitals and clinics works by imaging water molecules in the body. But in water-logged kidneys, the image may not distinguish between different functional parts. Now, Prof. Hadassa Degani of the Biological Regulation Department and her lab team have found a way to see into the kidneys using magnetic resonance imaging (MRI) that scans sodium ions rather than water.

Their method takes advantage of a unique feature of kidney function. Kidneys filter the blood and maintain steady levels of materials such as sodium and potassium in the bloodstream. To sustain control, these organs employ a gradient – a rising concentration of sodium from the outer layer, called the cortex, (where concentrations are around those of normal body tissues), towards the center, where levels reach up to five times the norm.

Prof. Degani, together with doctoral students Nimrod Maril and Raanan Margalit, was intrigued by a small number of MRI experiments that focus on sodium to attain images of various tissues, and wondered if the kidneys’ sodium gradient could be imaged, and if so, what the image would reveal about kidney function. They enlisted the help of Dr. Joel Mispelter from the Institut Curie in France to help them build the special accessory needed to detect the sodium. Working at a high resolution allowed them to pick up the fine details of changing sodium concentration, particularly localized variations in the sodium gradient.

First the team imaged a healthy rat kidney, showing, for the first time, the shape of the sodium gradient as it rises in a smooth slope from the outer layers inward. Next, they continued their work on kidneys with

altered function to see how effective a diagnostic tool the sodium imaging is. When the kidneys were treated with one of two commonly used diuretic drugs, which increase water out-flow, not only did they see the gradient flatten, but they were able to trace, in detail, the actions of each drug over time.

Blocked kidneys showed disruptions in sodium patterns as well, and the team was able to identify sections of kidney that retained healthy functioning and could return to normal once the block was removed, as opposed to those that had permanent damage.

While today's methods give estimates of kidney function in percentages, tomorrow's doctors, using this painless, non-invasive MRI technique, may be able to pinpoint exactly where a problem lies, reveal a disease before symptoms occur, or evaluate how a drug affects a patient.

"If we were able to see so much in a tiny rat kidney, think of how much more we can see in a human kidney," says Degani. "The method is so logical, it's a wonder it had not been applied before."

Wet Scans

The scanning electron microscope (SEM) has been a basic research tool for fifty years, and for those fifty years, scientists have been looking for better ways to observe biological samples under its beam. The problem is that the viewing chamber of the SEM must contain a vacuum (in which liquid water in tissues "boils" away). To overcome this difficulty, scientists have had to resort to all sorts of complicated procedures, including coating the specimens with an ultra-fine layer of gold, quick-freezing samples in special deep-freezes, or treating them with drying solvents.

Now, scientists at the Weizmann Institute of Science have found a way to view samples of biological materials in their natural, "wet" state. Their secret lies in the production of a very thin but tough polymer capsule to enclose the sample, allowing it to withstand the force of the vacuum. Says Dr. Ory Zik, who worked on the capsule with Professor Elisha Moses of the Physics of Complex Systems Department: "The material for the capsule is a result of advances in the area of semiconductors. We came across it while researching ways to apply automation techniques used in the semiconductor industry to the life sciences' scanning electron

microscopes."

The capsule's polymer is unique in that it allows the electrons with which a SEM works to pass through unobstructed, giving scientists a clear view of what lies within, without the use of tricky, tissue-distorting procedures. Researchers hope the new method will advance the studies of biological materials, such as the lipids that make up fat, which are easily destroyed by the old sample preparation methods.

Since the discovery was made, Zik, in cooperation with Yeda, the business arm of the Weizmann Institute, has founded a company, called QuantomiX, based on this technology. The findings of the team were published in the March 9 Proceedings of the National Academy of Sciences, USA (PNAS).

Parametric to invest \$20m.

US company Parametric Technology Corporation (Nasdaq: PMTC) will substantially expand the business of its Israeli subsidiary. Parametric by setting up a plant for new products. Senior company representatives made the announcement recently at a meeting in Jerusalem with Minister of Industry, Trade, and Labor Ehud Olmert. Parametric's investment in Israel follows a strategic decision to move its business outside the US. The company has set up a development center in India.

Parametric develops, markets, and installs sophisticated software solutions that enable manufacturers to produce innovative, profitable, and high-quality products very quickly. Its Israeli customers include Motorola Israel, Nike Israel, BMW, Hewlett Packard (NYSE: HPQ), Airbus, and Lockheed-Martin (NYSE: LMT). Parametric has 3,200 employees worldwide, and a market cap of \$1.3 billion.

Challenge Launches Homeland Security Fund

The Israeli Challenge Fund will make investments across the globe but the majority of its portfolio companies are expected to have a strong Israeli connection. The firm will look at companies researching electrooptics, biochemistry, aviation security, marine and container protection, and imaging and voice recognition products, according to a report by Venture Wire.

The firm currently manages around \$250m. Its first fund, launched in 1995, is almost fully invested. The Challenge fund II was launched in 1999.

Embryonic Tissues are New Source in Organ Transplantation

Tissera, Inc. (OTCBB:TSSR) announced the identification of the optimal gestational 'window' to harvest and dissect embryonic tissue in pigs to differentiate between teratoma (a tumor which is made up of a heterogeneous mixture of tissues, cartilage and muscle) producing tissue as opposed to precursor tissue which leads to heart, liver and pancreas development without teratoma. The specific embryonic anatomical sites which serve as tissue precursors for different organs exhibit different 'windows'. This discovery, by Professor Yair Reisner, chairman of Tissera's Scientific Advisory Board, and his team at the Weizmann Institute of Science in Israel, is a critical milestone in establishing embryonic tissues as a new source in organ transplantation. This research is an extension of Professor Reisner's 2002 breakthrough work on human and porcine embryonic tissue that distinguished between teratoma producing tissue and precursor tissue for the full development of a functioning kidney in a mouse.

Tissera, a biotechnology company dedicated to the development and commercialization of tissue transplantation therapies utilizing novel tissue precursor regeneration technologies for the treatment of disease and organ transplantation, has sponsored the research and has the worldwide license of the intellectual property of the team's discoveries.

"This is a significant milestone in our ability to eventually develop and grow organs for transplantation in humans," said Vicki Rabenou, CEO of Tissera. "Our ability to identify exactly when a cell is committed to developing into a specific organ enables our team to harvest precursor cells that have a predetermined destiny and control and influence their growth. It is an important stepping stone in reaching our goal to develop a reliable source of viable organs for transplantation."

The company-sponsored research over the past year measured and tested the potential risk for teratoma on the one hand and the growth potential on the other hand in order to define the precise gestational timeline for producing specific organs. The scientists' identification of the precise gestational window for timely harvesting future heart, liver and pancreas in pigs has significant impact on Tissera's ability to begin the next stage of research on the establishment of embryonic precursor tissues as a new source for organ transplantation.

The team's experiments in normal mice suggest that immune rejection of early embryonic tissues still represent a barrier and the scientists are currently focused on discovering the optimal immune suppression protocol to inhibit rejection without interfering with embryonic development. Data from studies of growth potential in immune deficient mice also indicate that implants of different embryonic tissues exhibit different durability. This could be affected by several factors among which are cell dose as well as different routes of transplantation.

AudioCodes Reports Solid Gains in Q1 2004 Results

AudioCodes (Nasdaq: AUDC), a leading provider of Voice over Packet (VoP) technologies and Voice Network products, financial results announced financial results for the first quarter ended March 31, 2004. Sales and profits exceeded analysts' projections.. Revenues for the first quarter ended March 31, 2004 were \$15.3 million compared to \$13.5 million for the quarter ended December 31, 2003 and \$8.4 million for the quarter ended March 31, 2003. First quarter revenues grew 13% sequentially and increased 82% compared to the first quarter of 2003.

Net loss for the first quarter of 2004 was \$43,000, or \$(0.00) per share, compared to a net loss of \$2.5 million, or \$(0.07) per share, for the corresponding period last year.

"We are pleased to report that we achieved our tenth sequential growth quarter, as well as a breakeven level earlier than planned" said Shabtai Adlersberg, President, Chairman and CEO of AudioCodes.

Backpack UAVs Fly Through Windows To Hunt Terrorists

IDF soldiers are being armed with miniature, highly portable UAVs including the newest 100-gram "Mosquito" with a wingspan of just 13 inches. Developed by Israeli Aircraft Industries, the "Mosquito" carries a tiny camera and communication hardware allowing operators to gather intelligence in real time.

Given the small size of the UAVs, single troops can carry and operate the vehicle and can literally fly it into occupied buildings through open windows. The

"Mosquito," which can fly for approximately one hour and has a range of 1,600 meters, is undetectable to radar and is almost impossible to detect with the naked eye. Other UAVs included the three-pound "Birdy" operated via laptop with a range of three miles - and the 500-gram "Mosquito 1.5."

Biotech Israel 2004 - 3rd National Biotechnology Conference

The conference will include four plenary lectures, three by visiting scientists and business leaders and one by a leading Israeli industrialist. It will include sessions on gene diseases, devices in medicine, stem cells and therapy, gene therapy, immunotherapy, neurobiology, nanobiotech, bioinformatics, agricultural biotech, and structural biology. It will also include a special session on future challenges in biotechnology and a round table on the tortuous progress in biotech.

The business track will provide an overview of the state of the global biotech industry, with specific emphasis on key pharma and biotech trends. It will also focus on the challenges and opportunities facing the Israeli industry, and propose a framework for value generation. The conference will also provide the audience with an opportunity to interact with some of Israel's most promising biotech companies.

EI AI Asks U.S. Approval for use of FlightGuard

Israel has requested from the United States to allow EI AI planes to land in its airports while equipped with new "FlightGuard" which is a novel system designed to protect civil aircraft from missiles.

An initial test of the FlightGuard system on EI AI aircraft is scheduled for this coming June. Israel's Transportation Ministry intends to equip all civilian aircraft with the missile defense system; as a first stage, the FlightGuard equipment is slated for installation on six EI AI planes by the end of 2004.



KEEP YOUR FINGER ON THE PULSE OF ISRAEL'S TECHNOLOGICAL PROGRESS

When you get the latest news about Israel, you know how difficult it is to find an authoritative source of intelligence on technology.

Israel High-Tech Report analyzes them in detail and gives insights into their past performance, current operations and future expectations. The prior performance of these shares is monitored on a continuous basis. Interviews with top executives provide deeper understanding as to what makes their companies "tick" and what may be expected in the future.

Did you know, for instance, that Israel has developed:

- UAV Pilots/e-aircraft (New report on enemy positions)
- Medical lasers used in interocular surgery
- Laser systems used for night-time vision
- Vision guidance systems for robots
- Monoclonal antibody health care diagnostic kits
- Telecom systems which double or quadruple telephone line capacity

Each month, Israel High-Tech Report takes you inside the R&D labs of Israel's leading academic institutions. New products representing industrial technological breakthroughs are examined. Companies seeking marketing connections or financing are identified and described in detail. A growing number of Israeli high-tech companies are publicly owned and their shares are traded on the U.S. securities exchanges or on the Tel Aviv Stock Exchange.

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