

Vision in venture

The Landes shortlist of promising Israeli technologies

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It's an efficient model in theory. Israeli medical research facilities generate big ideas. Big ideas generate startup companies. The startups are nurtured in Israel's incubator program, a public/private partnership between the government and the country's leading investment firms. After two years, the startups graduate the incubator and enter the marketplace. But securing the follow-on funding needed to make the transition from solid idea to viable product takes money, and finding that money is becoming increasingly difficult. Earlier this year, the Israeli government announced a program to

encourage Israeli institutional investors to put money into Israeli venture capital funds, which is expected to increase investment to about \$220 million over this year and next.

Still, Israeli biotech startups will need to expand their reach beyond Israeli VCs to access international capital if they are to deliver on promising new technologies. The amounts needed to reach the next rung on the development ladder—a few hundred thousand to a couple of million—are incredibly modest given the potential of the products. Here are five pitches we think will grab your attention.

Eran Ovadia



Eran Ovadia is CEO of Immunity Pharma, an independent drug development company he founded in 2007 together with biotech entrepreneur Dr. Oren Becker and renowned immunologist Dr. Irun Cohen. The company is developing peptide therapies based on technology licensed from the Weizmann Institute of Science. Mr. Ovadia's high-tech experience ranges from product management of strategic communications software and systems to management consulting for medical device and biotechnology firms.

"If our initial results hold up through clinical trials, we may have a breakthrough treatment for ALS using the AKT pathway to target the disease."

Technology

Novel immune-based approaches that employ switch peptides to develop therapies for neurodegenerative and inflammatory diseases. Switch peptides are chemical messengers that send specific signals to the immune system. Once the peptide delivers its message, it disappears. But the message it delivered continues to stimulate a self-healing response in the body for a period of time. The therapy is renewed as needed.

Problem It Solves

Immunity Pharma is employing novel approaches to develop a platform of drugs using proprietary compounds to stimulate the AKT pathway. This pathway has an important role in several important functions in the body, including mediating signals for cell growth and cell death. Drugs that stimulate specific substrates within the AKT pathway promise

effective therapies for age-related diseases such as Parkinson disease, Alzheimer disease, myocardial infarction and others.

The company's initial focus is on amyotrophic lateral sclerosis (Lou Gehrig disease), a disease of the nerve cells in the brain and spinal cord that control voluntary muscle movement. There is currently no cure, and death typically occurs within five years of diagnosis. After the onslaught of symptoms, the disease inhibits cellular self-healing mechanisms by impeding signals sent to activate the AKT pathway. Immunity Pharma's IPL334 peptide circumvents the impediment, activates the AKT pathway and triggers a process that protects the central nervous system.

Proof-of-Concept

Tests in 150 SOD1 mice, initiated after the animals developed symptoms of the disease, resulted in an unprecedented reduction in the

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DOI: 10.4161/cc.10.12.16719

progression rate of the disease. The drug was administered via injection, leading researchers to believe they have found a systemic mechanism that protects immune cells and triggers curative immune processes. Safety and toxicology studies in animals are underway and will be followed by pharmacological and cardiovascular studies. Within the next 18 months, the company hopes to have test results that indicate the efficacy of the drug in patients with ALS.

Seeking to Raise

ALS has orphan drug designation, qualifying the sponsor of the product for the tax credit and marketing incentives available under the Orphan

Drug Act. To date, Immunity Pharma has raised \$600,000 from angel investors, the IsrALS foundation and the Israeli government's NOFAR Fund. The company is currently seeking approximately \$3 million dollars to complete Phase I/II clinical trials in patients with ALS.

Details

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Ehud Nachtomy

Ehud Nachtomy is CEO of AmnioTix, one of only 13 portfolio companies in the prestigious Van Leer Ventures Technology Incubator. AmnioTix was formed in 2010 to develop and market medical devices based on technology licensed from the Sheba Medical Center, Israel's largest medical complex. Previously Mr. Nachtomy, 44, served as general manager of the European subsidiary of Medcon Telemedicine Technologies, now a McKesson company. He is a seasoned executive in the medical equipment and software industry, with over 15 years experience in international sales and operations.



"Women with post-term pregnancies, pregnancies that extend 42 weeks or longer, are our primary market. That's about ten percent of all women giving birth."

Do not distribute.

Technology

This invention is a first-of-its-kind medical device that uses a noninvasive optical probe and spectroscopic methods to detect the presence of fetal bowel content, meconium, in amniotic fluid. A disposable probe, inserted via the cervix, collects and analyzes fluorescent signal data then displays results on a screen. The easy-to-use device can be employed in a doctor's office, clinic or hospital setting.

Problem It Solves

Meconium, stool composed of biomaterials an infant ingests in utero, is normally stored in the intestines and excreted in the first few days after birth. However, in up to 20 percent of births, meconium is expelled into the amniotic fluid prior to birth or during labor and delivery, leading to a heighten risk of Meconium Aspiration Syndrome, a condition that can lead to serious breathing difficulties, even death. Currently meconium can be detected only after the amniotic sac is ruptured. Since MAS is often associated with fetal stress, testing for meconium enables medical personnel to closely monitor at-risk fetuses to lower the incidence of MAS and/or mitigate potential complications.

Proof-of-Concept

The Sheba Medical Center conducted the initial proof of concept with 45 women who were tested immediately before undergoing an amniotomy, forced rupture of the amniotic membrane, prior to giving birth. Testing proved the technology could accurately detect meconium in utero. AmnioTix has subsequently developed a prototype of the actual medical device and is currently testing it with a group of women who represent the target population: women in late-stage pregnancy with the cervix intact.

Seeking to Raise

AmnioTix, which is just completing its first year in the Van Leer incubator, has received roughly \$550,000 from the Israeli government and the incubator to fund initial development. The company is seeking to raise \$1 million in its next round of fundraising to commercialize the product, clear regulatory hurdles and finalize critical trials.

Details

INCUBATOR: Van Leer Technology Ventures Jerusalem

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Anat Eitan

Anat Eitan is founder and CEO of VacciGuard Ltd., a portfolio company within the Misgav Venture Accelerator, part of The Trendlines Group, which invests in the life sciences, agrotech, cleantech and other fields. Ms. Eitan launched VacciGuard in 2007 based on a novel technology platform developed by Dr. Irun Cohen of the renowned Weizmann Institute of Science. Ms. Eitan has more than 20 years direct management and consulting experience in industries ranging from drug development and technology transfer to biotech startups and investment firms.

"There are two large markets for our platform technology—preventive vaccines for infectious diseases, which is valued at over \$20 billion dollars a year, and a therapeutic vaccine for cancer, conservatively valued at nearly \$40 billion dollars annually."



Technology

A novel technology platform based on Heat Shock Protein 60 peptide conjugates that convert a weak antigen into a powerful immunogen. Proprietary peptide carriers derived from HSP-60 are combined with compounds existing on the surface of the target pathogen or the surface of a specific tumor to produce vaccines that activate the immune system, generating long-lasting immune memory. This technology can be used against infectious diseases or as a therapeutic cancer treatment.

Problem It Solves

Highly effective preventive vaccines are currently available against only a limited number of pathogens, partly due to the lack of effective antigens needed to generate an immunogenic response. As a result, infectious diseases kill more than 15 million people annually, roughly a third of them children under the age of five. The positive impact of a successful vaccination technology on world health would surpass even antibiotics in reducing death and disease. Vaccines for several types of cancer are equally promising. VacciGuard will initially target lung cancer because the five-year survival rate is less than 15 percent, making it the most common cause of cancer-related deaths. An effective lung cancer vaccine could prevent over 160,000 deaths annually in the United States alone.

Proof-of-Concept

Preventive vaccines have proven highly successful in mouse models with repeated tests of three bacterial (*Salmonella Typhi*, *Streptococcus Pneumoniae* (PS4) and *Neisseria Meningitidis* type B) and two viral pathogens (West Nile Virus and Murine Cytomegalovirus).

The lung cancer vaccine, based on a carrier comprised of 17 amino acids derived from HSP-60 combined with the tumor antigen, was also tested in a relevant mouse model. Mice were challenged with 10M tumor cells. Immunization with the antigen alone and the carrier alone served as control groups. Vaccinated mice developed small tumors that were subsequently rejected by 80 percent of the mice, while the tumors in the control groups continued to grow.

Seeking to Raise

VaccGuard initially received approximately \$550,000 from the Israeli government's high-tech incubator program, the Misgav Venture Accelerator and a private investor. An additional \$1.4 million dollars was secured from Clal Biotechnology and two private investors for the development of a cytomegalovirus vaccine. The company is currently seeking to raise an additional \$2 million dollars to support Phase I clinical development of its lung cancer and West Nile virus vaccines.

Details

INCUBATOR: Misgav Venture Accelerator

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Galit Zuckerman

Galit Zuckerman is founder and CEO of Medasense Biometrics Ltd., an early stage medical device company with Ofakim Hi-Tech Ventures, one of two Israeli incubators operated by the Capital Point Group, a publically traded firm specializing in medical devices, biotechnology and environmental technologies. Ms. Zuckerman has over 10 years engineering and management experience in the Israeli high-tech industry. Before launching Medasense in 2008, she led a team of algorithms engineers at Applied Materials, worked at Nokia-Siemens, Nice Systems and consulted for several startup companies in the field of signal and image processing.



"Our revenue model will be based on deploying pain monitors and selling single-use sensors. We'll initially target those areas within medical facilities that deal with uncommunicative patients—operating and recovery rooms and intensive care units."

Technology

A novel medical device that combines biomedical signal processing, machine learning and pattern recognition algorithms to continuously measure pain levels with the ease and accuracy of patient monitoring devices like electrocardiograms and devices that measure blood oxygen saturation.

Problem It Solves

Provides a low-cost, continuous monitoring system with an objective scale for diagnosing and tracking pain levels. Currently, conscious patients verbally communicate pain levels using a scale of one to ten, with ten indicating extreme pain. Physicians estimate pain levels for uncommunicative patients. A valid, reliable pain-monitoring system can minimize the use of sedatives and analgesic drugs, shorten patient recovery times, diminish the risk of side effects and reduce both direct and indirect costs associated with pain management.

Proof-of-Concept

Medasense successfully tested its pain-monitoring prototype in feasibility trials conducted with 70 volunteers at Rambam Health Care Campus in Haifa. The company is currently conducting clinical trials in operating and recovery rooms at the same hospital.

Seeking to Raise

Medasense, which launched with roughly \$550,000 from the Israeli government's high-tech incubator program, is currently seeking to raise an additional \$700,000 to fund development of the latest version of the prototype and complete clinical trials. Ultimately the company will need an estimated \$3 million dollars to cover costs of commercializing the product and gaining the regulatory approvals required for marketing.

Details

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Dr. David Rosenblatt

Dr. David Rosenblatt, CEO, cofounded Next Dimension in 2006 with Dr. Marek Sternheim and retina specialist, Dr. Sara Krupsky. The experienced team has a background in retinal imaging, optics and instrumentation systems. Next Dimension is a portfolio company within Ofakim Hi-Tech Ventures, a subsidiary of the publically traded investment firm Capital Point.

"There's a multibillion dollar market for new drugs that can mitigate the retinal complications of diseases like glaucoma, age-related macular degeneration and diabetic retinopathy. Our plan is to co-market our system with these emerging drugs to offer a total solution."



Technology

A non-invasive diagnostic device that uses spectral imaging to map metabolic activity in the retina, enabling early diagnosis and precision monitoring of the efficacy of new drug therapies for vision-threatening diseases.

Problem It Solves

Retinal diseases such as diabetic retinopathy, glaucoma and age-related macular degeneration are rapidly increasing due to the current epidemic of diabetes and an aging population worldwide. As a result, there is a growing market for an end-to-end solution that combines early diagnosis with newly developed drugs and a precision tool for monitoring the effectiveness of treatment. For the first time, medical personnel will be able to examine the retina for evidence of disease at the biochemical versus anatomical level.

Proof-of-Concept

The startup has successfully measured blood oxygenation levels in retinas to prove the basic concept of the platform. Next it begins work with several U.S. medical facilities on research projects and clinical trials

designed to investigate the full potential of new drugs developed to treat vision-threatening diseases. By expanding its network of research partners, the company hopes to get more of its diagnostic tools into the field and to generate the data needed to create databases for multiple modalities.

Seeking to Raise

Next Dimension has received roughly \$550,000 from the Israeli government and the Ofakim incubator to fund initial development. The company is currently seeking to raise \$3 million dollars to fund further development of equipment and software over the next two to three years.

Details

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