Nano Retina

Revolutionary Sight Restoration

Industry
Medical Devices – Ophthalmology

The product
Bio-Retina - Functional Level Artificial Retina

Core Competence
Ultra-Low-Power ASIC
Miniaturized Mechanics
Neuron Stimulation
Wireless Energy Transfer

Year Founded – 2009
Addressable Market
More than $1B annually

Management Team
Efi Cohen Arazi, Chairman
Yaakov Milstain, CEO

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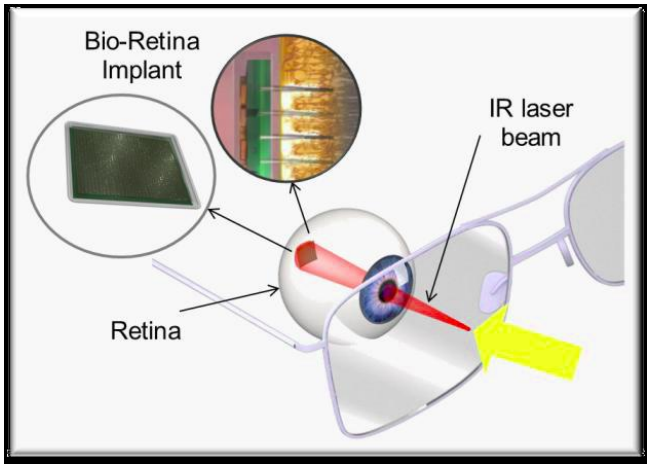
Restoring eyesight to the blind has, until now, mainly been the province of science fiction, exemplified by futuristic devices featured in popular movies and TV shows such as The Six Million Dollar Man and Star Trek.

Nano Retina's objective is to make sight restoration a reality.

Age-related macular degeneration (AMD), retinitis Pigmentosa, cataracts, glaucoma and diabetic retinopathy are among the causes of degenerative blindness. According to the National Federation of the Blind, 50,000 people in the United States go blind annually. In addition, there are currently 3.6 million Americans aged 40 and older who are legally blind; this number will rise as baby boomers continue to age.

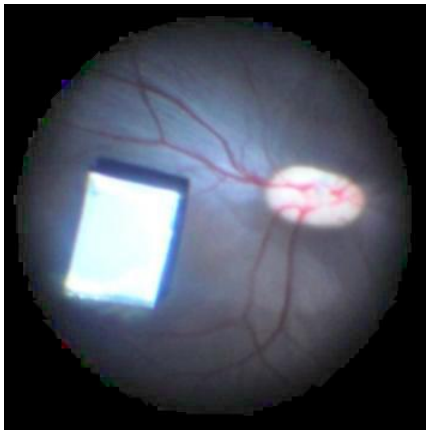
Fast Forward to the Future: Nano Retina's Bio-Retina
Nano Retina, a joint venture of Zyvex Labs (www.zyvexlabs.com), and Rainbow Medical (www.rainbowmedical.co.il), is developing Bio-Retina, a bionic retina designed to restore sight to those suffering from retinal degenerative diseases. Bio-Retina incorporates various nano-size components in one tiny implant, approximating the size of a child's fingernail bed. Its simple implant procedure requires local anesthesia, a small incision and positioning of the device to the damaged retina. Recovery time is estimated at up to one week and sight can be restored and provide functional vision.

How Bio-Retina Works



Bio-Retina is designed to replace the damaged photoreceptor in the eye with the equivalent of a 500 pixel (first generation) or 2,000 pixel (second generation) retinal implant. Bio-Retina transforms naturally received light into an electrical signal that stimulates the neurons, which send the pictures received by Bio-Retina to the brain. Bio-Retina works harmoniously with the natural functionalities of the eye, including pupil dilation and eyeball movement. Patients will be able to look from side to side with their eyes rather than needing to turn their heads, as required by competing technologies. A rechargeable, battery-powered mini laser, situated on a pair of eyeglasses, efficiently powers the implant wirelessly.

Development, Market Launch and Market Projections



During 2012, the Nano Retina concept was successful validated in chronic *in-vivo* studies and in functional *in-vitro* studies of our miniaturized prototype. Our development of a human prototype was accompanied by cutting edge, world leading achievements, such as: first successful demonstration of an ocular penetrating electrode array in live animals, ultralow power consumption 100 times less than other artificial retinas, and realization of a superior means to durably and hermetically seal our artificial retina.

Following clinical trials, Nano Retina intends to pursue an accelerated route to market. Expectations for success are high: technological and medical experts agree that development and clinical goals are attainable.

By a conservative estimate, the addressable retinal prosthesis market will reach 180,000 units annually by 2015. With a $60K target price for Bio-Retina, Nano Retina expects to achieve annual sales of more than $1 Billion.

The Talent Behind the Technology

Nano Retina was founded by Yossi Gross and Jim R. Von Ehr, who serve as company directors; Efi Cohen-Arazi, the company's chairman; and Ra'anan Gefen, the company's managing director. All are industry experts in their respective fields:

Yossi Gross, a medical device industry visionary, has filed more than 500 U.S. patents and founded and co-founded more than 27 medical device companies. He is a co-founder of Rainbow Medical, which seeds and grows Israel's most promising medical device companies, which build upon his inventions.

Jim Von Ehr, an icon of the nanotechnology industry, is the founder and current chairman of Zyvex Performance Materials and Zyvex Labs, leading nanotechnology developers. Von Ehr played a leading role in the establishment of the University of Texas NanoTech Institute and the founding of the Texas Nanotechnology Initiative. The recipient of many prestigious awards for his nanotechnology leadership, he is also a member of the Nanotechnology Technical Advisory Group (NTAG) to the U.S. President's Council of Advisors on Science and Technology (PCAST).

Efi Cohen-Arazi is a veteran of the biotechnology and medical device industries. Prior to Rainbow Medical, he served as CEO of Intec Pharma, Israel, as well as VP corporate manufacturing of Amgen Corporation in California. Cohen-Arazi also held senior positions at Immunex in the U.S. and Merck-Serono in Switzerland.

Yaakov Milstain 35+ years of management and hands on experience in development of multidisciplinary high-tech products. Prior to joining Nano Retina, was head of the development of Infrared detectors and cameras in SCD. Prior to SCD he served as VP and GM of design services in TowerJazz and before that as Corporate VP and GM of Custom IC business in Cadence Design Systems. Yaakov also help senior engineering development positions at Intel and National Semiconductors.

The Competition

In recent years, less than half a dozen efforts, funded by government grants (U.S., German, Australian, Japanese and Korean) and private capital, have been made to restore some measure of sight to the blind. Systems currently being researched require general anesthesia and a six-hour operation to implant surgically, construct and connect multiple pieces of hardware in the eye, or alternatively, to insert surgically an implant into the eye which is connected to a wire passing through the patient's skull. Patients wear eyeglasses with an external camera and transmitter as well as a belt with a video processor and battery that charges the system. The patient is able to see forward, but must move the head to change the field of view. These systems provide up to 60 pixels of sight capacity (less than 10x10 as illustrated in the picture above), i.e. a patient can differentiate between dark and light and perhaps identify the existence of an object. The first of these systems, Argus II of Second Sight, is selling in Europe for more than $100K.

Against this background, it is clear to see the many advantages of Bio-Retina in terms of deliverables, cost and return on investment.