NeuroSilica

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Executive Summary

Industry:

Medical device

Product:

Nanotechnology-based material for deep brain stimulation, artificial retina, and brain-computer interface

Management:

CEO:

Max Signaevsky, MD/PhD

Team:

Igor Yaroslavsky, PhD
Ophir Auslaender, PhD
Matthew Jurow, PhD

Advisors:

Irina Tanenbaum, MBA, COO Homeolux
Mark Stewart, MD/PhD, Dean, SUNY
Yana Bromberg, PhD, Assoc. Prof., Rutgers
Leo Grzhonko, BA, CEO, MonDevices

Funding:

Achieved: $110K in private funding to date

Sought:

- $300-500K in bridge funding to implement 12-18 month milestones: electrode prototyping and testing on laboratory animals *ex vivo*
- $2-3M in Seed/Series A funding to implement 2d-3d year milestones: device prototyping and testing on laboratory animals *in vivo*.

Focus:

The first objective is to develop and commercialize a nanotechnology-based electrode for neuroprosthetics. Such devices are used to treat patients with Parkinson's disease, epilepsy, and other neurological disorders.

The second objective is to develop and commercialize Artificial Retina: A nanotechnology-based interface between photo-sensitive electronic component and the optic system of the brain.

The primary goal is to improve patient safety and efficacy. The future goal is to expand the technology to a brain-computer interface, which is currently in laboratory development.

Neuroprosthetics Market:

Total Global Market size ~$14B (*Allied Market Research*)

- *Deep Brain Stimulation (DBS)*
  - Current prevalence for PD: US-1M, WW-6.5M
  - 160,000 DBS devices are implanted to date
  - GMV - $1B (2017); Projected - $2.3B (2025)
- *Artificial retina*
  - GMV - $7B (2018); Projected - $24.7B (2025)

Competition/Potential Partners

- Manufacturers: Medtronic, Abbott, Boston Scientific, Alcon
- R&D:
  - NeuraLink (brain-computer interface)
  - Nia Therapeutics, Lambda Vision, Nano Retina

Competitive Advantage of NeuroSilica Technology:

- Enhanced biocompatibility, high spatial resolution, low operational current ultimately resulting in better patient outcomes in terms of efficacy and safety

Product/Technology/Intellectual Property:

Issued: U. S. Patent No. 10,602,939 applied January 2017, issued March 2020

Pending 6 full patent applications:

- Basic technology: International: PCT/US18/15953 Jan 2018; Taiwan: 107103471 Jan 2018
- Adding a light-sensitive layer: USPTO 62/678,004 May 2018; International PCT/US19/34622 Nov 2018
- Adding quantum dots & fiber optics: USPTO: 16/685,260 Nov, 2018; International: PCT/US19/61874 Nov 2018

Business Model:

- Currently NeuroSilica in the R&D stage.
- Phase I: our “product” is our technology IP/Patents. Phase II: making a device prototype. Phase III: making medical devices (in partnership medical device manufacturing giants).
- Estimated manufacturing costs of our devices - less or equivalent to current devices. At the same time the electrodes and devices based on our technology will be far superior to the current devices in terms of efficacy and safety.
- It is expected that NeuroSilica technology will replace current technology in DBS devices as a new industry standard.
- NeuroSilica’s technology will be utilized in neuroprosthetics, artificial retina, brain stimulation and monitoring devices, brain-computer interface medical and industrial/military devices.
- Business models:
  - Partnership with a medical device manufacturer leveraging their regulatory, production, and marketing infrastructure
  - Independent development and commercialization of electrodes for neuroprosthetics