DESTINATION STARTUP

Nano Magnetic Solutions

One-Sentence Summary of What You Do: Nano Magnetic Solutions developed a brain simulation toolbox for in vitro research for neurological disease treatments.

Affiliated Institution: Montana State University

Have you formed a company yet? Yes

Funding/Financing: Grant Funding, Direct/Indirect University Support

Please describe your company and the problem you are trying to solve: Neuron growth and behavior is highly dependent on pressure gradients within the brain. These forces are absent in vitro, making preclinical drug testing data poorly representative of drugs' effect in vivo. This makes research into brain diseases tricky and forces companies to waste billions on clinical trials. If in vivo forces could be simulated in the culture dish, researchers could increase the effectiveness and decrease the development cost of drugs and vaccines.

Our solution, ForceRing, is a device which snaps into place around the industry standard cell culture dish. When nano particles are added, the ring's proprietary magnetic field exerts a force gradient on the entire culture dish. This revolutionary design can apply millions of different gradients and force magnitudes to an entire culture at once without interfering with pipettes, imaging, or any other lab workflow activities. The magnetic design makes ForceRing the only product that can enable biomechanical force research on neuronal tissue.

Laboratory researchers studying tissue engineering need our product for experimental prototyping, and to enable new types of study designs. Because researchers work on new projects in serial, they justify buying new supplies to meet the demands of their study design during the grant writing process. NMS devices, compared to competing technologies like magnetic tweezers, and traction force microscopy, can affect whole batches of cells at once, simulating the type of environment found inside the human body. This makes NMS the only technology that can facilitate research which can be scaled up to actual medical treatments.

What is/was your go-to-market strategy? Between 2019 and 2021, slightly over 39,800 Journal articles have been reviewed and published concerning tissue engineering. (acc. pubmed.ncbi.nlm.nih.gov) These researchers represent somewhere between 10,000 and 12,000 academic research laboratories actively involved in tissue engineering (depending on how you define actively involved.) In addition to these researchers, there are 36 major independent biotechnology companies which may be involved in private sector tissue engineering research (which is not on the PubMed database.)

In total, the tissue engineering market is valued at more than 13.52 billion dollars with a CAGR of 16.52%. (Acc. Verified Market Research).

We can easily keyword search the NIH PubMed database to find recent tissue engineering articles. This will allow us to target advertisements and conduct in-person marketing at research conferences and at visits to the labs we identify. Sales will take place online direct-to-consumer through our website. Our software can also be accessed by license holders through our website. Integrated CRM can help us ensure customer satisfaction, track order fulfillment, and attend to those who need technical support. Once the technology is featured in more publications, we will have enough technical validation to approach large biotech and pharmaceutical companies in addition to nonprofit researchers. To sell to the more lucrative corporate market, we will hire a direct-selling team to negotiate with these companies' technical buyers (researchers) and economic buyers (product development managers). Orders will be fulfilled through the same process enumerated above.

How will/do you generate revenue? The software will be priced as an annual subscription with 6month, 1yr, and 5yr recurring payment plans. Long term commitment will be price incentivized. The software will also be scalable with pricing based on the number of terminals supported. The device itself will have a per-unit price. This scheme is designed to be scalable, allowing small labs to fit below their 5k grant writing limit, while large customers will pay the full value of the hundreds of devices and tens of computer terminals they will need to complete their work.

Based on our understanding of market size and on the pricing we believe we can command from treatment makers, we predict the following financials:

- Revenue for each of the first 6 years: $117,583.25, $239,462.58, $1,468,532.69, $3,881,511.44, $6,528,535.69, $9,584,624.69
- Cost of Sales: $14,809.98, $27,970.21, $107,216.24, $261,225.39, $442,218.26, $670,373.29
- Gross Profit: $102,773.26, $211,492.37, $1,361,316.45, $3,620,286.05, $6,086,317.43, $8,914,251.40
- EBITDA: -$204,969.90, -$62,765.79, $1,087,058.28, $3,346,027.88, $5,812,059.27, $8,639,993.23

How will this showcase benefit your company or technology? To get past the first two years, we will need $274,552.37 in angel investment. This will pay for technology development, offices and infrastructure, and marketing.

To sell at scale to research clients, we will need to acquire an office and assembly facility to make our devices, and buy an injection molding manufacturing contract for the device shells. We also need to complete the software development so we have a user friendly web app in place. Personnel costs include hiring a salesperson, an assembly technician, a product configuration and support engineer, a product development engineer, and a software engineer.

Once the infrastructure of the business is in place, we will need to aggressively spend on marketing. Specifically, we must pay for online advertising, a mass email marketing campaign, and demonstrations at international research conferences.

We believe that 5% is a fair number for this investment. If our valuation estimates are correct, the investor could expect to see their $274,552.37 investment grow to $2,159,998.31 in the first 6 years. This is an average 131% annual return on investment. We are also looking for advisors who have experience selling to biotech and pharmaceutical companies, as well as expertise selling lab tools. These sales people will help us refine our go to market strategy and create the marketing materials we will need prior to launch.

Who are the members of your team and why is this the right team to get the job done?
Dr. Anja Kunze - The head of the Kunze Neuro Engineering Lab, Anja is a PhD in Electrical engineering who has years of experience in cell research. Because of her unique combination of skills, she was able to approach the problem of force stimulation in a novel way and invent the NMS ForceRing. She also has extensive experience writing grants, and managing the logistics of a large laboratory.

Mackenna Landis - Mackenna is a PhD candidate in chemical and biological engineering who has advanced expertise in neuro tissue engineering research, and leads our effort to publish additional papers using the ForceRing. Mackenna also has personal experience with the effects of neurodegenerative diseases, and is very passionate about the social impact potential of NanoMagnetic.

Connor Beck - Connor is a PhD candidate studying electrical engineering. He is a very experienced engineer with expertise in fabrication, software, materials characterization, and the complicated physics that governs magnetic field gradients. Connor spearheads the product development program at NanoMagnetic.

Calvin Servheen - Calvin is studying Industrial and Management Systems Engineering and Business at Montana State. This combination of skills together with experience working on 2 other early stage startups, makes him effective at commercially validating highly technical engineering projects. Calvin leads the business development NMS. He has participated in the 406 Labs Business Incubator and the Early stage MT hyper accelerator.