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Company Nova - Business Summary

July 7, 2022

Company Nova: Novel predictive diagnostics and therapeutics platform in cancer metastasis and discovery of new targets and therapeutic agents

About Nova

Nova is a biotech company based out of Bangalore, India and Marlton, New Jersey, focused on developing novel platforms to address cancer metastasis-focused predictive diagnostics and novel drug discovery. The company is led by a team of Founders who hold PhDs in Cell Biology and Immunology and ~ 40 years of combined experience from organizations such as Johns Hopkins, Harvard Medical School and Bloomberg School of Public Health. The company has built several proprietary platforms that create a comprehensive *in vitro* to *in vivo* translational system for metastatic disease, normalized with real patient tumor data (patents pending). The company has successfully raised ~$0.5M from a combination of angel and venture funds, as well as non-dilutive Federal grants. Nova aims to raise a Series A round of $2M to advance their first discovery program on a first-in-class target, validated by their platform, and the first drug repurposing candidate, along with a larger clinical trial for validating their predictive diagnostics platform.

The Problem

Metastases are responsible for 90% of cancer-related deaths, as 5-year patient survival drops by fifty to ninety per cent for metastatic cancers. Currently, a single non-radioactive drug is approved to treat the process of metastasis and multiple clinical failures have led to the de-prioritization of metastasis-related drug discovery. In addition, medical oncologists are unable to predict which patients will have a higher probability of metastasis and no predictive diagnostics are available to date to address this key question.

Solution – The Nova platform

1. Nova has dissected the complete metastasis biology into twenty-two functional assays and multiple characterization steps, including cellular phenotyping and mechanobiology. The company has identified the distinct pattern differences between growing tumor cells and metastatic tumor cells on this platform, which has been further validated by genetic overexpression and CRISPR CAS engineering.

This pattern appears to be highly conserved across heterogeneous epithelial carcinomas and therefore has the potential across multiple solid tumors. The complete assay and characterization system is currently available. The data generated from this platform is further normalized with respect to patient samples which makes the platform robust and reproducible. Data set from patients is used to standardize a self-learning machine learning algorithm that attributes weightages to multiple steps, thereby helping select potent compounds in vitro, identifying key steps and targets and predicting the metastatic potential of primary tumors. For successful *in vitro* to *in vivo* translation, Nova has created a proprietary animal model that successfully measures orthotopic spontaneous metastasis with a 100% take rate in under six weeks, thereby decreasing the discovery turnaround time immensely.

2. Together these platforms have identified four novel first-in-class targets for cancer metastasis, one of which is validated via both genetic engineering and available tool compounds in cell lines and patient samples. Nova has also shown effective proof-of-concept in drug repurposing testing ten approved lifestyle drugs with no reported anti-metastasis activity on their assay platform. Successful compounds that translated through the platform were screened and a lead compound was progressed into the *in vivo* platform. This molecule abrogated liver metastasis without decreasing the tumor size thereby validating all three Nova platforms.

3. In another distinct approach, all patient tumor data, collected in the assay panel are being used in both supervised and unsupervised learning formats to predict metastatic potential of the primary tumors. A pilot study with fifteen patient samples has shown remarkable accuracy in the supervised models and currently another fifteen patient samples are being analyzed, following which a bigger study of eighty patient samples will be undertaken, with the objective to enhance accuracy and decrease data generation timeline by incorporating HCS and spatial proteomics. This would be a first-in-class product that will successfully predict the metastatic probability of primary tumors, having pathological grade M0, irrespective of their node status.

About LiteHaus360

Nova is housed within the LiteHaus360 incubator – a virtual ecosystem that offers entrepreneurs, start-ups as well as growth phase companies with key strategic, operational and financial advisory to advance on their objectives to bring novel technologies into the healthcare system and ultimately to bring life-saving medicines to patients.

LiteHaus360 offers a unique platform to founders by enabling them to showcase their businesses on the LiteHaus MarketPlace thereby reaching a global audience in their specific industry. Once listed on the StoreFront, LiteHaus assists incubatee companies network with the user community to spur adoption as well as raise capital by reaching an extensive network of biopharma companies, academic institutions and VC/PE funds.

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