



COMPANY OVERVIEW

June 06, 2023

Company Name: MED PNC LTD. (MEDPNC)

Key Stake Holders: Goldman Hirsh Partners Ltd.; Yissum Technology Transfer Company of the Hebrew University Ltd.

Fields of Activity: Life Sciences/Diagnostics/ Precision Cancer Treatment.

MEDPNC was selected as one of the 32 “one to watch” companies in the prestigious 2020 Spinoff Prize, organized by Nature Research and Merck.

Team

The team possesses a powerful combination of research, clinical and management skills. Their expertise has equipped them with a deep understanding of the latest advancements in medical technology, diagnostics, and data analysis. They have a proven track record of conducting rigorous scientific research, publishing in reputable journals, collaborating with leading experts, and successfully leading technology startups.

The Need

Cancer is a devastating disease that takes the lives of millions of people every year. Patients tumor heterogeneity has been established, and it is now known that if two patients suffer from cancer at the same anatomical site, from the molecular point of view these two tumors may be different. Due to disease heterogeneity, standard treatments, such as chemotherapy or radiation, are effective in only a subset of the patient population. Tumors can have different underlying genetic causes and may express different proteins in one patient versus another. This inherent variability of cancer lends itself to the growing field of precision and personalized medicine (PM), in order to be able to link these differences to effective therapies. It is clear that PM cancer treatments can result in immense benefits to individual patients, as well as to healthcare systems. Some individuals will only require one type of drug, but most often, a combination of drugs has to be used to tackle the resistant nature of cancer. It is necessary to identify the specific characteristics of each individual tumor in order to be able to predict optimal treatment. Genomic data is inadequate for this purpose, as it does not fully reflect and provide the actual active information that can be obtained from investigating and analyzing the role of proteins (the functional molecules within the cells), and their network relationships.

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The Solution

MEDPNC is developing a diagnostic test using a quantitative approach that maps each tumor accurately and unambiguously based on its molecular disruptions, in a way that allows adapting drug combinations to treat each patient optimally.

Existing solutions in the market are based on the analysis of overexpression of oncogenic biomarkers only and lack important information regarding the interplay between these markers. Without the accurate mapping of the protein-biomarkers within an altered subnetwork, their relationships with other proteins as well as other subnetworks in the unbalanced state may be overlooked, leading to wrong decisions regarding therapy combinations. Consequently, the selected therapeutic regimen may lack long-term efficacy resulting from partial targeting of the tumor imbalance.

Large-scale cancer datasets have been rapidly accumulating over the past years. The challenge has now become to find a way to obtain useful information from this data that will allow for the determination of which combination of approved drugs is best suited to treat each specific tumor. Various statistical analyses are being developed to extract significant signals from cancer datasets. However, tumors are still being assigned to predefined categories, conceptually contradicting the vast heterogeneity that is known to exist among tumors, and likely overlooking unique tumors that must be addressed and treated individually.

MEDPNC uses a thermodynamic-based information theoretic approach that, rather than searching for what makes a tumor similar to other tumors, addresses tumors individually. The algorithm maps every malignancy precisely and unbiasedly according to the protein network reorganization in each tumor, namely the patient-specific signaling signature (PaSSS). This PaSSS contains unbalanced molecular processes in each tumor which should be targeted, in order to return the processes to the stable state. The obtained PaSSS, contains essential information for predicting the response of the tumor-specific network to different therapeutic modalities, and allows the rational design of smart, personalized drug combinations. Thus, this approach is superior to more common statistical analyses used currently which extrapolates knowledge about a subpopulation of patients to the entire population.

MEDPNC's product uses proteomic datasets obtained from multiple patients suffering from several types of cancer and recommends the optimal treatment combination based on each patient's PaSSS and not on the anatomical origin of the tumor.

Tumors from different origins may share the same PaSSS. Thus, the treatment is designed to target the particular PaSSS instead of using the conventional treatment focusing on particular cancer types and the anatomical site of the tumor.

For the validation of this approach MEDPNC researched several cancer types such as breast and melanoma, and showed that the therapies predicted achieved significantly higher rates of killing than the clinically prescribed treatments.

Moreover, MEDPNC demonstrated that within the same type of cancer, e.g melanoma, different treatment combinations should be used according to each PaSSS in order to achieve selectivity and specificity of the treatment. Thus, this research scheme has a high potential to be translated rapidly into a computational approach that is expected to fill the currently unmet need for an accurate and predictive framework for the rational design of optimal anti-cancer personalized therapy.

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Business Opportunity

The Global Cancer Diagnostics Market size was valued at USD 136 billion in 2022 and is expected to register a CAGR of 9% over the period 2023 to 2032, reaching a projected USD 324 billion in 2032.

There were an estimated 19 million new cases of cancer worldwide and 10 million deaths from cancer in 2020. The number of new cancer cases worldwide is expected to increase to over 28 million in 2040.

According to studies, targeted treatments for the oncology segment are expected to show significant growth in the coming years. This growth is attributed to the increasing incidence of cancer in both the developed and the developing countries. The growth in the incidence of cancer, as well as only partial effectiveness in dealing with the disease, are expected to cause an increase in the general demand for validated targeted treatment procedures.

Status

- Preclinical POC studies have demonstrated the improved efficacy of MEDPNC's predicted drug combinations when compared to the current treatment standards.
- The product was validated in:
 - Triple Negative Breast Cancer (TNBC)
 - Melanoma
 - Lung Cancer
 - Head and Neck squamous carcinoma
- Ongoing R&D:
 - Single-cell computational analysis using at least 100,000 tumor cells.
 - POC, overcoming drug resistance using single cell analysis.
 - Preclinical studies and barcode match investigation.
 - Helsinki approval and samples collection.
 - Software validation, completion and deployment.
 - Clinical trials.
 - Regulatory approval completion (FDA and CE).
- IP:
 - Method for Selecting Patient's Specific Therapy. US National Stage Application US17051363 – Pub. Date 09.06.2022; . EP3788626A Pub Date 10.03.2021.
 - Methods of Determining Cancer Therapy. International Filing PCT/IB2021/056136 – filed 08.07.2021; EP 4179331, published 17.05.2023.

Development Pipeline

- Additional cancers.
- Additional diseases (e.g. neurological).
- Drug development in cooperation with pharma companies.

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Market Strategy

Provide efficient and accurate cancer diagnostics using an innovative SaaS platform, addressing the diverse needs of the beneficiaries (patients, physicians, hospital administrations, HMO's, health insurers, pharma companies), the end users (physicians), and the payers (health insurers, HMO's, medical centers, and patients).

Multiple marketing channels will be employed:

- Digital Marketing: Utilize online advertising, social media platforms, and targeted content marketing to reach beneficiaries, end users, and payers.
- Medical Conferences and Events: Participate in relevant industry conferences and events to showcase the SaaS platform and network with potential customers and partners.
- Direct Sales: Distributors will build dedicated sales teams to establish relationships with physicians, hospital administrations, and payers.
- Customer Education and Support: Provide comprehensive training programs and support for end users to ensure smooth adoption and maximum utilization of the platform.

Strategic partnerships will be established:

- Collaboration with payers to integrate the platform into their existing systems.
- Partner with pharmaceutical companies to provide them with real-time data insights for clinical trials and drug development.

Investment Proposal

The information contained in this overview is non-binding and is intended solely as a basis for further discussions.

We at MEDPNC look forward to our upcoming discussions following which we will be happy to prepare a detailed investment proposal accordingly.

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