

Company name: Pangea Biomed * Website: www.pangeabiomed.com *

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AI Tapestry: Optimizing the Interaction of AI and Biopharma

- **Title of the Presentation:**

ENLIGHT: Predicting response to targeted and immune therapies from the tumor transcriptome using RNAseq or digital histopathology

- **Executive Summary / Investment Rational**

Pangea Biomed's ENLIGHT is a pan-cancer computational platform that aims to predict individual response to any drug with a known mechanism of action, in terms of inhibited or activated targets. ENLIGHT is based on analysis of functional interactions between gene pairs across the human genome. A large cancer interactome was built using cancer big data from in-vitro, in-vivo and clinical sources. Using that mapping, any targeted drug can be matched with a network of genes whose activation levels are predictive of response to the treatment. Notably, this approach relieves the need for large clinical drug-response datasets as a prerequisite for developing predictive biomarkers, thus removing one of the key hurdles facing AI technologies in the precision oncology field. We tested this approach using two ways to measure gene activation levels: (1) RNA quantification methods, namely RNAseq and microarrays and (2) DeepPT - our novel approach for inferring gene expression levels through Deep Learning analysis of scanned pathology slides stained with Hematoxylin & Eosin (H&E slides).

Evaluating ENLIGHT's performance on 21 blinded clinical trial datasets, using only pre-treatment expression levels as input, we show that it can effectively predict a patient's treatment response across multiple therapies and cancer types. The overall odds ratio for response (N=697 patients) was 2.59. ENLIGHT's prediction accuracy is better than previously published transcriptomics-based signatures and comparable to that of supervised predictors developed for specific indications and drugs. Testing on six independent cohorts of diverse cancer types and treatments, using only pre-treatment H&E slides as input, ENLIGHT-DeepPT successfully predicted true responders with odds ratios of 1.5 – 4.5 in five of the cohorts.

Pangea collaborates with biotech and pharma companies, big and small, harnessing the predictive power of ENLIGHT to improve clinical programs and bring better drugs to the market faster. Questions tackled in these collaborations range from basic understanding of drug Mechanism of action, through optimized clinical trial design and combination therapy choice, all the way to label expansion through biomarker-guided analysis of past clinical trials. In parallel, the company is being used by oncologists in Israel, the US and Europe to support treatment decisions in late stage patients who have exhausted the standard treatment guidelines - a service offered pro-bono to patients with suitable molecular profiling results from one of several established sequencing labs. The company's management team comprises highly experienced executives from the biotech, AI and computational biology fields.

- **Core Technology**

ENLIGHT is a pan-cancer, pan-treatment response prediction platform that relieves the dependence on rarely available clinical response data in the development of predictive biomarkers.

