

**Project Title:**

Advancing Healthcare Predictive Modeling: Leveraging AI-Driven **Label-Free Liquid Biopsy Platforms** for Early Disease Prediction and Personalized Care

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**Project Abstract/Proposal Summary:**

Abstract: In the era of digital healthcare, the convergence of artificial intelligence (AI), advanced modeling techniques, and microfluidic screening technologies hold immense promise for revolutionising cancer treatment. This research presents the PIEB-LIQB platform, an innovative approach that integrates AI-driven predictive modeling with microfluidic screening to enhance treatment prediction for cancer patients. By leveraging the power of AI, the PIEB-LIQB platform analyses vast datasets to identify patterns and predict patient responses to various treatments. Concurrently, the microfluidic component enables precise, high-throughput screening of cancer cells, mimicking the tumor microenvironment to evaluate the efficacy of potential therapies. This dual approach aims to improve the accuracy of treatment predictions and accelerates the development of personalised therapies, addressing cancer heterogeneity. Our research demonstrates the potential of PIEB-LIQB to transform oncology by providing clinicians with robust, data-driven tools for optimising treatment strategies, ultimately improving patient outcomes and advancing the field of personalised medicine.