



Next Generation Sensitivity & Patient Selection Biomarkers for Targeted & Immune Therapies

Key benefits

- Accurate ranking of the kinase activities in a patient's tumour to provide comprehensive cell signalling insights
- Patient specific therapies identified that can effectively treat haematological and other cancers
- Three patent families that cover unique algorithms for KScan™ platform – a powerful suite of advanced proprietary bioinformatic and phosphoproteomic analytical methods, for direct activity measurements of multiple endogenous kinases and comprehensive cell signalling pathway coverage.
- End result is a greater market size of likely drug responders compared to that achieved by current companion diagnostic tests
- First CDx in development to predict AML patients' response to therapy

Kinomica Ltd. completed first round investment in 2019 and has in-licensed the Queen Mary University patent portfolio in kinase activity analysis and associated databases.

Executive Summary

Kinomica Ltd operates as an R & D and contract - for - Services Company in the field of Precision Medicine for cancer. **KScan™** is based on computational tools that extract clinically relevant information from mass spectrometry - based phosphoproteomics data, following analysis of tumour biopsies. Using KScan more accurate patient selection biomarkers are identified that can help pharma have improved efficacy in clinical trials

Economic incentives for superior companion diagnostics are compelling: (i) drug developers can achieve more rapid route to market with less costly clinical trials; (ii) regulators see the potential for more directed regulatory submissions with fewer adverse events; (iii) patients are more appropriately treated; and (iv) payers see the potential reduced cost of unnecessary treatments.

Although **Kinomica™** will initially focus on cancer, the approach can also be applied to other therapeutic areas such as autoimmune diseases, rheumatoid arthritis and neurological diseases.

The kinase inhibitors market is expected to see huge growth, from market value of ~ \$36 billion in 2018 (Transparency market research)

Background

- Kinases are involved in key signalling pathways that regulate cell replication, growth, metabolism and death
- Signaling pathways dysregulated in cancer, autoimmune and inflammatory diseases
- Aberrant phosphorylation profiles associated with diseased state and progression
- Kinase inhibitor drugs can reduce cancer cell viability where tumour cells are dependent on or addicted to the targeted kinase for proliferation and spreading
- Kinase signaling pathway activity measurements can identify novel drug targets and predictive biomarkers
- Precision medicine approach to stratify patients based on the kinase addiction for the tumour



The Market - the case for accurate protein kinase profiling

- Important drug targets (Gleevec \$4.7B in 2014, Mekinist predicted \$2.4 billion by 2020)
- Oncaspar used to treat ALL(acute lymphoid leukaemia) costs \$146,000 per patient – Trametenib costs \$200,000 p.a.
- US Food and Drug Administration (FDA) has approved Rydapt® (midostaurin) for the treatment of acute myeloid leukemia (AML) in newly diagnosed patients who are FMS-like tyrosine kinase 3 mutation-positive (FLT3+), as detected by an FDA-approved test. Rydapt sales 2018 est. \$351M
- 42 drugs targeting kinases approved (100+ in pipeline) - indications in cancer, autoimmune and inflammatory diseases
- A wider market exists for some kinase inhibitors in additional cancer types and COVID-19 drug discovery
- Existing Kinomica pharma customers include AZ, Eli Lilly, Novartis and Gilead

Patents Summary

- Unique method of providing automated, rapid analysis of kinase activities
- Unique drug characterization capacity – including elucidation of mode of action and identification of resistance mechanisms through activity measurements of target and compensatory signalling pathways
- Platform technology has identified panel of novel biomarkers that can identify AML patient response to Kinase inhibitors. Method for predicting whether AML can be effectively treated with one or more kinase inhibitors including those that target FLT3, PAK, MAPK and RAS downstream kinases
- Significant pharma pipeline of kinase inhibitor drugs that can be tested using this technology
- Ability to characterise kinase activity either in single samples or comparators

1. Method of systematic identification of regulatory protein kinases (KSCORE) (PCT) Application No: PCT/EP2016/077845 Cutillas et al.
2. Method WO 2013/132075 A1; Kinase Substrate enrichment analysis (KSEA) Granted in EU, JP and US
3. A method of assessing protein modification status and identifying biomarkers linked to cell signalling pathways PCT/GB2016/0516319 Granted in EU. Pending applications in the US and JP.
4. Stratification of AML patients for sensitivity to kinase pathway inhibitor treatment PCT/EP2018/066472

Link to inventor's website; <https://www.bci.qmul.ac.uk/en/staff/item/pedro-cutillas>

- World leading specialists & facilities; Barts Cancer Institute is the largest recruiter in clinical trials in UK
- Close ties with Barts Health Trust - serving over 3M people
- Access to the large bio-bank of cancer tissues
- Team with clinical oncology, proteomics and commercial management experience

Kinomica is seeking to establish additional partnerships with pharma companies and investors to support core resources and planned R&D programmes. The Kinomica Business Plan is available on request.

For further information, please contact CEO Jane Theaker j.theaker@kinomica.com