

EXATYPE: A PLATFORM TO ENABLE LOW COST DNA-BASED DIAGNOSTICS

Software solutions that reduce complex DNA sequencing data to valuable clinical information

BACKGROUND

Anti-microbial drug resistance (AMR), which includes TB, HIV and antibiotic drug resistance, currently costs health systems \$54 billion per year. And if no action is taken by 2050 AMR will have cost the global economy \$100 trillion and will result in 10 million deaths per year. There are currently nearly 24 million people on ARV's globally and HIV drug resistance is estimated to be present in approximately 10% of these. In South Africa, the rapid year-on-year growth of drug resistance, coupled with substantial numbers of HIV/TB co-infections, means that, if not addressed, drug resistance is a major threat to the continued success of HIV and TB treatment programmes. There is, therefore, a pressing need for affordable, accurate diagnostics to enable doctors to quickly identify people with drug resistant disease. Current DNA-based diagnostics, such as drug resistance testing, are expensive, do not scale well and are vulnerable to human error. As a result, HIV and TB drug resistance tests are typically restricted to specialised medical centers or resource-rich countries, meaning that tens of millions of people worldwide who would benefit from these diagnostics do not have access to them.

TECHNOLOGY DESCRIPTION

Exatype is a cloud-based software platform which enables the use of DNA sequencing for low cost, highly scalable diagnostics, translating complex DNA sequence data into clinically actionable reports. It has been developed as an extensible, disease agnostic platform meaning that it can be adapted to any DNA analysis problem where data complexity is an issue e.g. TB drug susceptibility testing, antimicrobial resistance testing and oncology tumor identification and profiling. The cloud-based nature of Exatype means that it can scale to support HIV drug resistance testing globally along with other disease lines.

VALUE PROPOSITION

Exatype is a unique cloud-based software platform that makes routine genetic diagnostics possible.

It is highly sensitive and has demonstrated 99% accuracy in calling HIV drug resistance in comparison with as little as 60% accuracy using other popular DNA analysis solutions.

It is scalable as the cloud-based infrastructure allows for elastic scaling without any human input/interaction. Analyses are completed in minutes rather than hours or days -for example Exatype TB takes 4 minutes to produce a report whereas, without Exatype, a manual analysis could take 3 days per report.

CURRENT STATUS

Exatype HIV is in the commercialization phase with revenue already being realized.

- Exatype HIV for NGS is used by one of the largest diagnostic lab networks in the US for their HIV pro-viral drug resistance testing.
- Exatype HIV for Sanger is being sold in conjunction with a low-cost HIV drug resistance assay by one of the largest global manufacturers of DNA diagnostics. They offer this sample to report solution to low income countries at a price which is about 25% of the current cost of other HIV drug resistance offerings.
- Exatype TB is in the final stages of development and has been tested on 120 MDR-TB samples and found to be highly sensitive and able to detect all 32 known resistance conferring mutations at very low prevalence. Exatype has also been adapted for detecting resistance to other organisms with a Staph Aureus prototype having been developed. The TB surveillance component of Exatype is currently in the development phase.

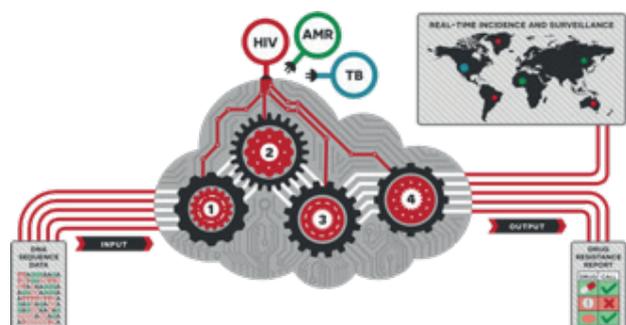
New Exatype product development for other disease lines are currently being explored.

INTELLECTUAL PROPERTY STATUS & PUBLICATIONS

South African patent -Patent number 2013/05467 S.A. Travers, N. Wood, R.K. Shrestha, I.A. Wright. Method and system for drug resistance data analysis.

OPPORTUNITIES

The technology developers are seeking funders who would be interested in social impact funding as well as looking for advocacy with global public health groups, government and key stakeholders to raise awareness of the impact of AMR and the availability of a cutting-edge solution to help address this.



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