

Precision Medicine: Improving how diseases are treated

SingAREN facilitates large data transfers for the GenomeAsia 100K project through its resilient international links & high-speed fiber network



Photo credit: <http://www.genomeasia100k.com>

19 Jan 2017 - Every individual has a unique genomic make-up. In relation to this, there have been studies done for **precision medicine** in U.S.A. and U.K., an emerging approach for disease treatment that takes into account factors such as the individual's genomic make-up. It is of interest to accelerate precision medicine applications for Asian patients, which represents 40% of the world's population. The Asian population genome is currently underexplored relative to its size and diversity.

The **GenomeAsia 100K project** (<http://www.genomeasia100k.com>) aims to sequence 100,000 genomes from various South, North, and East Asia populations. The project started in the first quarter of 2016 and is expected to continue for 3 to 4 years. The project objective is to accelerate precision medicine and clinical application for Asian patients by leveraging new information and understanding from the 100,000 genomes.

Nanyang Technological University (NTU) acts as the host to the consortium. The GenomeAsia 100K project leverages on **National Supercomputing Centre (NSCC) Singapore's** petascale supercomputing capacity which provides computational resources for the initiative.

Singapore Advanced Research and Education Network (SingAREN) plays a key role in facilitating the large data transfers in relation to the GenomeAsia 100K project and international connections.

The genomic data from various Asian ethnicities is being generated from genomic sequencing companies in India, Korea, and U.S.A., and transferred to NSCC for computational analysis. The resulting analyzed data would then be transferred from NSCC to NTU for further analysis.

With SingAREN's 100Gbps connection to U.S.A which is co-funded by NSCC, it facilitates the large genomic data transfers from U.S.A. to Singapore.

The pilot phase of the project has processed 1,000+ human genomes, involving 1.9 terabytes data transfer in August 2016 between NSCC and NTU, with the process enhanced through SingAREN's high-speed fiber network between NSCC and NTU.

Professor Stephan Schuster, Scientific Chairman of the GenomeAsia 100K project, stated that with the GenomeAsia 100K project, Singapore establishes itself as a regional hub for research and IT infrastructure in supporting emerging population genomic study.

Professor Stephan Schuster said, "The NSCC infrastructure and technical team have been instrumental in enabling the GenomeAsia 100K project to go forward as planned. They have provided the expertise and facilitated the processing of hundreds of terabytes of data from collaborators in multiple countries, via the high-speed intercontinental network research links facilitated by SingAREN. We believe that the project would not proceed as efficiently as we would have liked, without the NSCC team's technical know-how."

Mr. Jon Lau, Deputy Director, NSCC, said, "The National Supercomputing Centre (NSCC) Singapore is partnering NTU and SingAREN to support this key national initiative in genome science, by providing the petascale computational power to analyse massive datasets and the high throughput data transfer from sequencing lab to supercomputer petabyte storage. This petascale resource has given GenomeAsia 100K the competitive edge and strategic advantage to position Singapore as an important node in Asian genome research."

Dr John Kan, President, SingAREN, said, "The GenomeAsia 100K project is a significant initiative towards accelerating precision medicine applications in Asia. SingAREN is dedicated in supporting the GenomeAsia 100K project through facilitating large data transfers via its resilient international links & high-speed fiber network."