

**MEDIA RELEASE
FOR IMMEDIATE RELEASE**

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**GIS EXPANDS COLLABORATION WITH PACIFIC BIOSCIENCES TO ADVANCE
HEALTHCARE RESEARCH IN SINGAPORE**

SINGAPORE – A*STAR’s Genome Institute of Singapore (GIS) recently expanded their collaboration with Pacific Biosciences (PacBio), a California-based provider of the PacBio® RS II Sequencing System, based on novel Single Molecule, Real-Time (SMRT) technology. Together, GIS and PacBio will combine efforts to advance research in infectious diseases, genomics, sequence analysis, and translational healthcare in Singapore.

The collaboration builds on the complementary strengths of both the GIS and PacBio in the analysis and understanding of bacteria and viruses, including those that cause diseases such as diarrhoea, meningitis, urinary tract infection, dengue, and liver cancer, as well as those that we continuously live with, termed the microbiota. Understanding the dynamics of bacterial genomes is particularly relevant to address the growing challenge of antibiotic resistance in Singapore and the rest of the world.

Dr Swaine Chen, Dr Martin Hibberd, and Dr Niranjana Nagarajan from the GIS are spearheading the collaboration. Dr Chen said, “Working together with PacBio, we are able to fully sequence bacterial genomes and arrive at deeper insights into how bacteria cause disease”.

This latest collaboration extends and expands the previous one with PacBio. Earlier in the year, Dr Chen and Dr Hibberd completed an initial formal collaboration with PacBio - one that provided insights into how *E. coli* causes urinary tract infection, the results of which are anticipated for publication later this year.

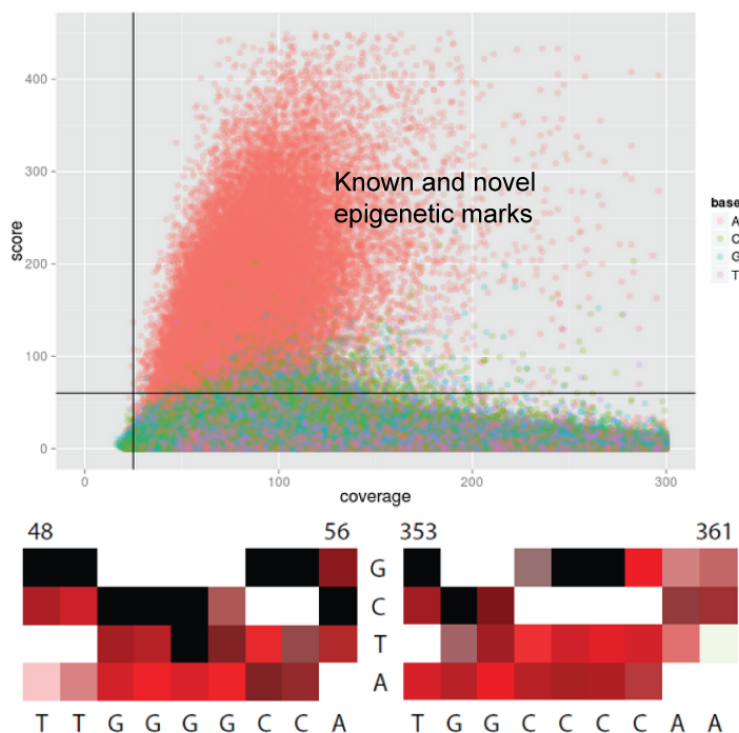
Ram Laxman, President and General Manager of Pacific Biosciences, Asia Pacific, commented, “SMRT® Sequencing technology is proving to be the Gold Standard in bacterial and viral sequencing due to its ability to fully resolve repeat regions and “finish” genomes. Other NGS technologies are not able to finish even the smallest of bacterial genomes due to their sequence context bias and very short sequencing reads. It’s like trying to complete a complex puzzle with missing puzzle pieces”. He also added that researchers started using PacBio RS II for tracking mutations in viruses that cause pandemics like MERS. The quick turnaround time, coupled with the highest consensus sequencing accuracy is crucial to track the spread and mutation rates on these viruses.

Michael Hunkapiller, President and CEO of Pacific Biosciences, commented, “We

see a huge potential in working with world-renowned institutions like GIS to further broaden the applications of SMRT Sequencing, especially those that have direct impact on human health.”

Prof Ng Huck Hui, Executive Director of GIS said, “This expanded collaboration with PacBio® enables us to further our research towards improving public healthcare in Singapore. By acquiring a deeper understanding of bacterial genomes, we can tackle common infectious diseases and antibiotic resistance in an efficient manner, leading to better patient outcomes.”

IMAGES



Use of PacBio sequencing to detect new epigenetic marks (among the red dots) in a strain of *E. coli* that causes urinary tract infections.

Use of PacBio sequencing to characterize mutations that alter epigenetic regulation of gene expression in a strain of *E. coli* that causes urinary tract infections. Red boxes indicate stronger effects.

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About the Agency for Science, Technology and Research (A*STAR)

The Agency for Science, Technology and Research (A*STAR) is Singapore's lead public sector agency that spearheads economic oriented research to advance scientific discovery and develop innovative technology. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit society.

As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.

We play a key role in nurturing and developing a diversity of talent and leaders in our Agency and Research Institutes, the wider research community and industry. A*STAR oversees 18 biomedical sciences and physical sciences and engineering research entities primarily located in Biopolis and Fusionopolis.

For more information on A*STAR, please visit www.a-star.edu.sg

About the Genome Institute of Singapore (GIS)

The Genome Institute of Singapore (GIS) is an institute of the Agency for Science, Technology and Research (A*STAR). It has a global vision that seeks to use genomic sciences to achieve extraordinary improvements in human health and public prosperity. Established in 2000 as a centre for genomic discovery, the GIS will pursue the integration of technology, genetics and biology towards academic, economic and societal impact.

The key research areas at the GIS include Human Genetics, Infectious Diseases, Cancer Therapeutics and Stratified Oncology, Stem Cell and Regenerative Biology, Cancer Stem Cell Biology, Computational and Systems Biology, and Translational Research.

The genomics infrastructure at the GIS is utilised to train new scientific talent, to function as a bridge for academic and industrial research, and to explore scientific questions of high impact.

For more information about GIS, please visit: www.gis.a-star.edu.sg

About Pacific Biosciences

Pacific Biosciences of California, Inc. ([PACB](http://www.pacb.com)) offers the PacBio^(R) RS II Sequencing System to help scientists resolve genetically complex problems. Based on its novel Single Molecule, Real-Time (SMRT^(R)) technology, Pacific Biosciences' products enable: de novo genome assembly to finish genomes in order to more fully identify, annotate and decipher genomic structures; full-length transcript analysis to improve annotations in reference genomes, characterize alternatively spliced isoforms in important gene families, and find novel genes; targeted sequencing to more

comprehensively characterize genetic variations; and DNA base modification identification to help characterize epigenetic regulation and DNA damage. Pacific Biosciences' technology provides the industry's highest consensus accuracy over the longest read lengths in combination with the ability to detect real-time kinetic information. The PacBio RS II System, including consumables and software, provides a simple, fast, end-to-end workflow for SMRT Sequencing. More information is available at www.pacb.com.

Forward-Looking Statements

All statements in this press release that are not historical are forward-looking statements, including, among other things, statements relating to future uses or performance of products, the expected benefits of the collaboration agreement with the GIS and other future events. You should not place undue reliance on forward-looking statements because they involve known and unknown risks, uncertainties, changes in circumstances and other factors that are, in some cases, beyond Pacific Biosciences' control and could cause actual results to differ materially from the information expressed or implied by forward-looking statements made in this press release. Factors that could materially affect actual results can be found in Pacific Biosciences' most recent filings with the Securities and Exchange Commission, including Pacific Biosciences' most recent reports on Forms 8-K, 10-K and 10-Q, and include those listed under the caption "Risk Factors." Pacific Biosciences undertakes no obligation to revise or update information in this press release to reflect events or circumstances in the future, even if new information becomes available.