2021 MGI DNBSEQ™ MPS Research Grant

Timetable for Grant Program

- 19th Aug.: Announcement of Call for Applications
- 8th Oct.: Deadline for Application Submission
- 11th—29th Oct.: Application Assessment
- 1st Nov.: Announcement of Winners and Projects
- 6th Dec.: Approximate Date of Project Commencement

MGI is pleased to announce a DNBSEQ™ MPS research grant in the Asia Pacific (APAC) region to award library preparation and sequencing for selected projects (the Project). The Grant includes ATOplex library, CoolMPS sequencing* and Twist Bioscience exome library (through a collaboration with Decode Science) on the DNBSEQ platforms* (DNBSEQ-G50, DNBSEQ-G400 and DNBSEQ-T7). The total value of the grant program is **$100,000** with each grant valued up to **$30,000**.

The goal of this Grant is to support APAC scientists to develop proof-of-concept programs towards an innovative idea or application, and to promote the utilization of cutting-edge DNBSEQ™ technology in basic science and translational research. The work of library construction and sequencing will be performed at MGI Australia Demonstration Laboratory.

Requirements and Conditions

Eligibility

1. Applicants must hold primary research positions or postdoctoral positions.
2. Applicants may not hold current rewards directly related to the Projects.
3. If selected, the DNA samples must be extracted and QC'd by the applicant and must meet the Demo Lab's sample submission requirements.

Conditions

1. By submitting an application, the applicant gives permission to the sponsors to contact the applicant regarding their products and services, whether or not the applicant is chosen as the successful recipient of the grant.
2. The grant cannot be combined with other discounts, offers, or promotions.
3. The grant may not be transferred or assigned; no substitutions or cash equivalents are allowed.
4. Upon award of the grant, the successful applicant agrees to provide the sponsors with permission to release the subject of the grant winner's application and experiment

results as part of a case study/poster/press release. More details will be communicated with grant winner's announcement.

5. The successful applicant agrees to:
   a) carry out the Projects diligently and competently and in accordance with generally accepted professional, scientific and ethical principles and standards;
   b) provide samples **within four (4) months** after the project commencement i.e. the signing date of the research agreement;
   c) comply with the time requirement to **complete the Project within one (1) year**;
   d) provide any reports on the Projects as reasonably requested by the sponsors;
   e) separately assign or licence intellectual property developed in the Projects to the sponsors (or such other entity nominated by the sponsors).

6. Subject to clause 5 and any disclosure in academic publication agreed by the sponsors, the successful applicant agrees to treat as confidential all confidential information received by the successful applicant in the course of carrying out the Projects.

7. The sponsors may, without limiting their rights, terminate the grant process and/or the Projects if an applicant breaches these terms and fails to remedy any breach within 30 days of a notice by the sponsors.

Application Details

Please download your application form [here](#) and fill out the information as required. You may either 1) submit your application on the webpage by attaching your form; alternatively, or 2) send your application form with the subject *DNBSEQ^{TM} MPS Grant 2021* by email to mgi_australia@mgi-tech.com. You may also visit [MGI website](#) for submission details.

Assessment Criteria and Process

Within three (3) weeks after the deadline all applications will be assessed by a committee of MGI product managers, technical specialists, laboratory managers, and researchers to evaluate their eligibility, feasibility, technical capability, research merit, academic influence and commercial value. The shortlisted applicants may be contacted for further clarifications or additional information in due course. Through a meticulous assessment process evaluating these criteria the committee will select up to five successful applicants, with whom we will mutually establish a collaborative research agreement that addresses sample shipping, material transfer, data ownership, and IP issues as appropriate to each Project. The successful winners will be announced on 1st Nov. 2021.

DNBSEQ^{TM} Sequencing Technology

MGI's gene-sequencing instruments* utilize the state-of-the-art core technology called DNBSEQ^{TM}. DNBs (DNA nanoballs) are pumped with by the fluidics system and loaded onto a Patterned Array chip. Sequencing primer is then added and hybridized to the adaptor region of the DNB. The sequencing reaction starts by pumping sequencing reagents containing fluorescently labeled dNTP probes and DNA polymerase.   Images are taken after the fluorescently labeled probes on the DNB are excited with lasers.   The images are then converted into a digital signal using MGI's propriety software. This information is then used to determine the DNA sequence of the sample.

All sequencing technologies relating to DNBs are part of DNBSEQ^{TM}. It includes DNA single strand circularization and DNB preparation technology, Patterned Arrays, DNB loading, cPAS (combinatorial Probe Anchor Synthesis), Pair-End Sequencing technology on DNBs, fluidics and imaging systems, and base calling algorithms.   cPAS technology has been widely used on various sequencing platforms including BGISEQ-50, BGISEQ-500, DNBSEQ-G50*, DNBSEQ-G400*, and DNBSEQ-T7*.

Compared to other existing sequencing platforms, DNBSEQ^{TM} sequencing technology combines the advantages from low amplification error rates from DNBs and high density patterned arrays. These advantages dramatically improve sequencing accuracy, and have much lower duplication rates in WGS/WES applications. When combined with the PCR-free library construction method, DNBSEQ^{TM} also has higher SNP and indel detection accuracy compared to other platforms. In addition, the index hopping rate in DNBSEQ^{TM} platforms is much lower as compared to that of other platforms.
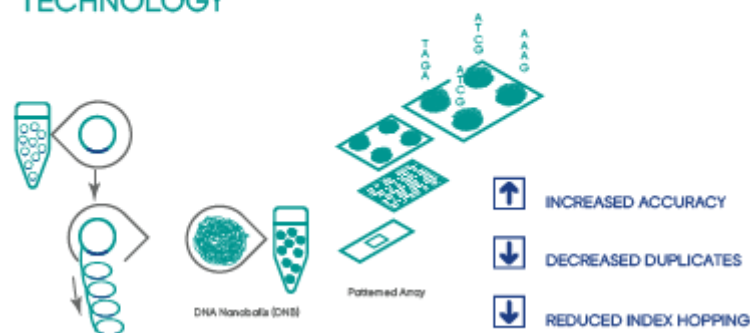
DNBSEQ-G50*

DNBSEQ-G50 is a compact and flexible benchtop genetic sequencer. With the design of two different Flow Cells, it creates an ideal balance between speed and affordability. FCS (Flow

Cell Small) allows short turnaround time for STAT samples. FCL (Flow Cell Large) enables lower cost per sample. DNBSEQ-G50 offers 3~4 read length options for both FCS and FCL, which support a wide range of research and clinical applications such as low-pass whole genome sequencing, targeted sequencing, small whole genome sequencing, RNA sequencing and whole exome sequencing.

DNBSEQ-G400*

DNBSEQ-G400 is a versatile benchtop sequencer providing users with comprehensive, flexible and efficient sequencing options. In addition to StandardMPS, the CoolMPS* high-throughput sequencing reagents provide more choices for users in pursuing higher sequencing quality. With stable high-intensity signals and random low sequencing error rate, CoolMPS reagents exhibit excellent performance in scientific and clinical applications, especially in the detection of low-frequency mutations in tumors. DNBSEQ-G400 sequencer supports a wide range of applications including scientific research, clinical research, disease prevention, environment, and agriculture.

DNBSEQ-T7*

As MGI's most powerful sequencer to date, DNBSEQ-T7 has achieved a number of technical breakthroughs: the first 4-chip sequencing platform, completing PE150 at full load within 24 hours, generating 6Tb of data per day, and completing up to 60 whole human genomes per day. It is suitable for a wide range of applications including whole genome sequencing, deep exome sequencing, epigenome sequencing, transcriptome sequencing, and targeted panel projects. Powered by DNBSEQ^{TM} Technology, DNBSEQ-T7 makes sequencing more efficient and productive with advantages in biochemistry, fluidics, and optics.

Features

High Speed: 24~30 hrs for PE150 sequencing

High Flexibility: 4 Flow Cells, PE150, and PE100 at the same time

Ultra-high Throughput: up to 6 TB per day; high quality data around the clock

CoolMPS*

With more complete sequencing reaction, lower error rates and longer sequencing lengths, CoolMPS High-throughput Sequencing Set is a novel antibody-based sequencing product. The dNTPs of CoolMPS are without fluorescent labelled (called cold dNTPs) which are incorporated into

the sequencing strand by DNA polymerase, and base calling is achieved by specific binding of fluorescently labelled antibodies. During this process, the incorporated bases are unmodified, ultimately resulting in clearer base calling. The performance of CoolMPS sequencing based on DNBSEQ^{TM} platform shows improved data quality and read accuracy.
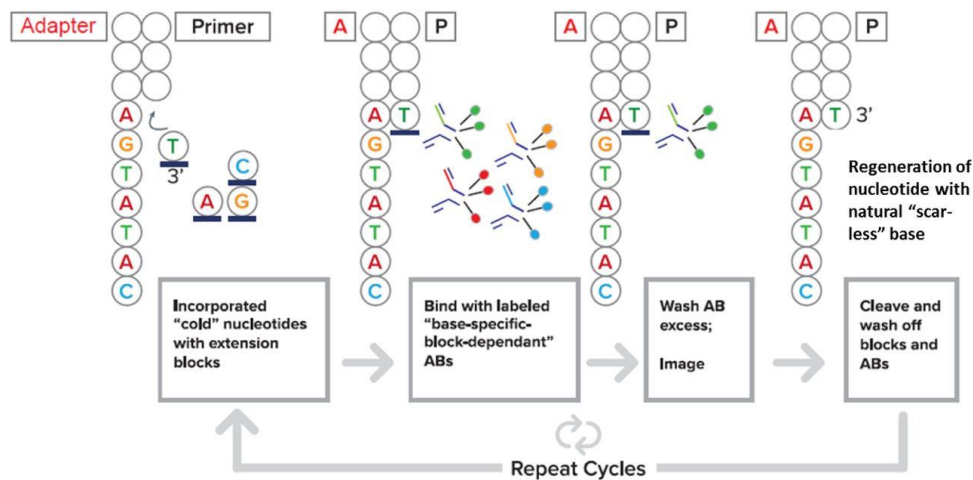

ATOplex

ATOPlex is a massively parallel sequencing (MPS) platform that applies MGI proprietary ultra-high multiplex PCR-based enrichment technique in customized panel design. MGI provides customised sequencing packages including product design, library construction kits, automated workflow and sequencing. ATOPlex RNA Library Prep Set is a 2-step multiplex PCR-based library preparation set and is suitable for SASR-CoV-2 whole genome enrichment. Combined with DNBSEQ-based high-throughput sequencing platform, it can obtain the full-length genome sequences of SARS-CoV-2 and achieve relative quantification of SARS-CoV-2 for population-scale virus detection, surveillance and tracing.

■ Workflow

ATOPlex RNA Library Prep Set utilizes a 2-step multiplex PCR method to amplify the entire genome of SARS-CoV-2 in one tube. It converts the extracted RNA into a DNA library for subsequent DNB making and sequencing (Figure 1).
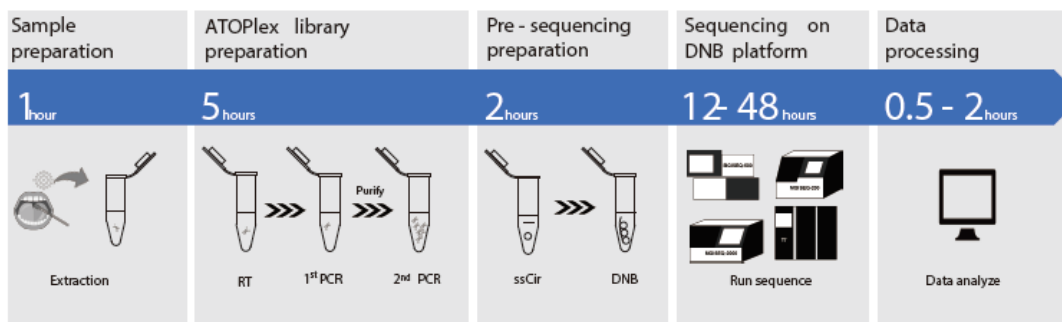
*Unless otherwise informed, all sequencers and sequencing reagents are not available in Germany, USA, Spain, UK, Hong Kong, Sweden, and Belgium.

MGI Australia, Room 3, L6 CBCRC Building, 300 Herston Road, Herston, Qld 4006
Email: mgi_australia@mgi-tech.com

Thank you for your interest. Please contact us at mgi_australia@mgi-tech.com if you have any questions regarding this grant program.

MGI Australia
August 2021