AKESOgen

Using sequegenics technology

PHYSICIAN / INSTITUTION

CLIENT'S NAME: Sample # 1
CLIENT'S COMPANY NAME: MAWI DNA Technologies LLC.
CLIENT'S ADDRESS: 26203 Production ave, Suite #3
Hayward, CA, USA, 94545

SPECIMEN

Specimen Type: **DNA extracted**
Specimen size: **1 Sample**
Reception Date: **7-Jul-17**
Report Date: **30-Jul-17**

EXPERIMENT IDENTIFIERS

m170727_005317_42157_c101209842550000001823282911021774

HLA TYPING RESULTS

No.	sample name	Loci	Allele 1	Allele 2	Barcode ID
1	**Sample 1**	**HLA-A**	A*24:02:01:01	A*24:02:01:01	**2 / 16**
		HLA-B	B*40:01:02	B*46:01:01	**2 / 3 / 5**
		HLA-C	C*01:02:01:01	C*04:82	**2 / 3 / 5**
		DRB1	DRB1*09:01:02	DRB1*14:04:01	**12 / 10 / 15**
		DPB1	DPB1*02:02:01:02	DPB1*05:01:01	**12 / 13 / 15**
		DQB1	DQB1*03:03:02:02 / 03	DQB1*05:03:01:01 / 02	**2 / 13 / 5**

HLA Sequencing Based Typing Workflow:

A- ***Sample Collection: iSWAB-Discovery (Mawi DNA Technologies)***

- Sample was transported by standard US postal services mail, no cold chain of any sort was involved
- The sample reached the lab after 7 days and then processed on day 8
- Long transit times does not affect the gDNA sample quality from iSWAB-Discovery

B- ***gDNA extraction***

- Magbio genomics Blood & Tissue gDNA extraction kit

C- ***Sample Preparation for HLA sequencing by Akesogen***:

- SEQUEGENICS HLA sequencing kit

D- ***DNA Sequencing Platform at Akesogen***:

- Pacific Biosciences Single Molecule Real Time (SMRT) technology on a RSII system

E- ***Data analysis and HLA typification by Akesogen***:

- SEQUEGENICS proprietary algorithms

About the Technology providers:

AKESOgen is a premier provider of Genetic Analysis Contract Research and Clinical Diagnostic and Clinical Trial Services for Pharmaceutical, Biotech, Academic and Government Research Institutions. More than a provider of services, AKESOgen is a colleague, a collaborator with our customers. Providing scientific expertise, the best in genomic analysis services and unparalleled, personalized customer service, **we are partners in your process.**

http://www.akesogen.com/benefits/

SEQUEGENICS: Throughout the last years we have designed and optimized our own PCR primers which are validated against reference samples from the International Histocompatibility Working Group. Having our own primers give us the big advantage of not having to buy them from other companies (because of the complexity of the HLA region, it is not easy to design primers that work for every allele and therefore HLA primers are considered trade secret and companies in the HLA business sell them at a good price). In addition, having our own primers let us put our barcodes in the primers themselves which let us reduce the costs even more as we can use one single generic PacBio adapter to make the library instead of the expensive "barcoded" adapters, which PacBio prices in a way that kills the benefits from multiplexing, making the cost of sequencing proportional to the number of samples being multiplexed. Using our approach, the more samples we multiplex, the lower the cost per sample. That is also a huge advantage against any other "big" competitor in the HLA market (like Histogenetics or LabCorp).Finally, because we have our own barcoded primers we've had the possibility of optimizing the sequence of the barcode itself in order to improve phasing of reads by designing the barcode sequence that is more compatible with the principles that our algorithm implements to classify the sequencing reads (which are fundamentally different than the ones developed by PacBio). Having our own algorithms give us the flexibility to adapt them very quick to sequence anything else or customize them for specific applications.

www.sequegenics.com

Mawi DNA Technologies was established in late 2013, following an extensive 9 year period of dedicated R&D from concept to commercialization. Calling upon decades of experience in the areas of sample collection and processing, our founders recognized an unmet customer need for making the collection step simple and accessible to a wide range of recipients/donors/volunteers regardless of their physical status or age. Also, any collection method needs to preserve samples at the point of collection to allow for the most accurate representation possible of the sample status at the assay level. Our mission is to improve human and animal health assessment by enabling efficient non-invasive biological sample collection and preservation by non-specialized personnel for Genomics & Proteomics applications. We have a goal of establishing Mawi DNA Technologies'non-invasive sample collection technology as an integral part of genomics and proteomics based assays for forensics, clinical diagnostics, bio-defense, drug screening, veterinary, and life sciences research testing.

www.mawidna.com

MagBio Genomics develops and commercializes magnetic bead-based products for nucleic acids isolation including biomarkers as tools for liquid biopsy. Our current focus encompasses products that allow both safeguarding integrity of bio-samples and efficient isolation of circulating biomarkers from biological samples for human genetic research including cancer studies and non-invasive prenatal testing (NIPT). Our core platform allows efficiency in the nucleic acids sequencing methods including Sanger and Next Generation Sequencing (NGS) in both manual and automated workflow. Our corporate mission is to help our customers generate quality data faster at an affordable cost.

www.magbiogenomics.com