Low-Pass Whole Genome Sequencing

What is Low-Pass Whole Genome Sequencing (LP-WGS)?

Low-Pass Whole Genome Sequencing is a high-throughput molecular testing technology to analyze the entire genome at low coverage. It is a useful and accurate tool for the detection of copy number variations (CNVs), including gains (duplications) or losses (deletions) of large DNA segments. Some CNVs could contribute to certain genetic conditions.

Indications for LP-WGS

Indications of LP-WGS testing include:

1) Children with intellectual disability, developmental delay, autism spectrum disorders or multiple congenital anomalies

2) Fetus with structural anomalies found in prenatal screening

Procedures of LP-WGS

1. Pre-test Consent

Clinical geneticist will explain the indication and procedures of LP-WGS testing before specimen collection. A consent form has to be signed by the patient or his/her parents if they agree to proceed.

2. Specimen Collection

3-5ml of blood will be collected from the patient. For some cases, samples from saliva or buccal swab may be preferred.

3. LP-WGS at Laboratory

Specimen will be sent to the Genetics & Genomics Laboratory for testing and analysis to detect any genetic changes or variants.

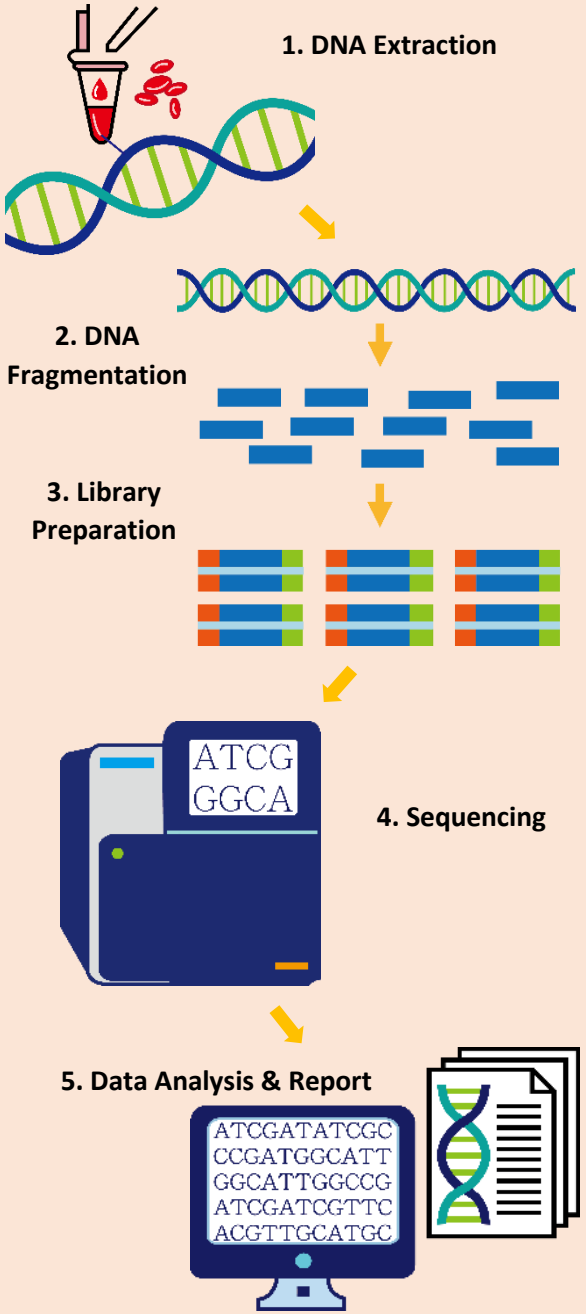
4. Report

If changes or variants are identified, they will be classified as benign (not disease causing), pathogenic (disease causing) or unclear clinical significance (VUS).

5. Post-test Counselling

Healthcare professionals will explain to you your LP-WGS test results and interpretation during your next follow-up appointment.

How does LP-WGS work? (Diagram)



Interpretation of LP-WGS

Result	Implications
Disease-causing variant(s) is found	The diagnosis of the disease being investigated is confirmed.
No disease-causing variant is found	The diagnosis of the disease being investigated is not confirmed. It may be due to limitations of the current techniques or other unknown factor(s). Nevertheless, the result does not mean total exclusion of the diagnosis.
Variant(s) of uncertain clinical significance is found	A variant is found. With the latest medical genetic knowledge, it is still unclear whether this variant will result in any disease or is just benign polymorphism. In this circumstance, further genetic studies may be necessary, or genetic counselling and testing for the parent(s) or other family member(s) may be indicated. Despite that, it is still possible that a conclusion cannot be drawn in the end.

LP-WGS may possibly reveal incidental findings implicating diagnoses that are unrelated to the original indications of testing, including hereditary cancer syndrome, carrier status of autosomal recessive disorders, late onset neurological disorders, etc. Such results may potentially affect patient and/or family members in terms of insurance, job and academic application, psychological and social issues.

Limitations of LP-WGS

1. LP-WGS cannot detect all genetic abnormalities, such as:
   - Some structural variations in chromosomes such as balanced translocations or inversions
   - Low-level mosaicism
   - Single-nucleotide variants / short insertions and deletions

2. Normal LP-WGS test results do not exclude other genetic causes. There are still chances that the patient is affected by other genetic diseases that are not detected.

3. The results and interpretations of LP-WGS are based on current genetic technology and knowledge. Future advances may provide further insight and possibly lead to amendment of the genetic report.

For further enquires, you may contact us.

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GENETICS AND GENOMICS CLINIC

DEPARTMENT OF CLINICAL GENETICS

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醫院管理局 HOSPITAL AUTHORITY