



Whole Genome Sequencing

Note: Clinical Information and Consent Form are required for MNGenome® Orders.

IMPORTANT: Please note if any additional samples will be shipped separately: _____

- (WGS001) MNGenome® Trio Sequencing (Proband + 2 Family Members)
 - (WGS002) MNGenome® Additional Comparator (only available when trio is ordered)
- (WGS003) MNGenome® Proband Only Sequencing (accepted when parents/family are unavailable)
- (WGS008) MNGenome® Duo Sequencing (Proband + 1 Family Member, when other family member unavailable)
 - + MNG Transcriptome™ Analysis (RNA001) (Please call MNG before ordering, can be added to Trio, Duo, or Proband at no cost)

MNGenome Xpress™ Sequencing - TAT 10-14 Days

- (WGS001X) MNGenome Xpress™ Trio Sequencing (Proband + 2 Family Members)
- (WGS003X) MNGenome Xpress™ Proband Only Sequencing (accepted when parents/family are unavailable)
- (WGS008X) MNGenome Xpress™ Duo Sequencing (Proband + 1 Family Member, when other family member unavailable)

Note: Trios are preferred because it enables the correlation of results between family members, which can aid in the interpretation of data.

Patient (Proband) and Specimen Information

Patient Last Name		Patient First Name	
Patient ID #		Date of Birth [MM/DD/YYYY]	
Diagnosis/ICD-10		Collection Date [MM/DD/YYYY]	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Specimen Type	<input type="checkbox"/> Whole Blood <input type="checkbox"/> Buccal Swab <input type="checkbox"/> Tissue (specify source): _____ <input type="checkbox"/> DNA (specify source): _____

Family Member 1 Information

Last Name		First Name	
Relationship to Proband		Date of Birth [MM/DD/YYYY]	
Affected?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure	Please attach any pertinent clinical information	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Specimen Type	<input type="checkbox"/> Whole Blood <input type="checkbox"/> Buccal Swab <input type="checkbox"/> Tissue (specify source): _____ <input type="checkbox"/> DNA (specify source): _____

Family Member 2 Information

Last Name		First Name	
Relationship to Proband		Date of Birth [MM/DD/YYYY]	
Affected?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure	Please attach any pertinent clinical information	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Specimen Type	<input type="checkbox"/> Whole Blood <input type="checkbox"/> Buccal Swab <input type="checkbox"/> Tissue (specify source): _____ <input type="checkbox"/> DNA (specify source): _____

Additional Comparator Information (if ordering WGS002)

Last Name		First Name	
Relationship to Proband		Date of Birth [MM/DD/YYYY]	
Affected?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure	Please attach any pertinent clinical information	
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	Specimen Type	<input type="checkbox"/> Whole Blood <input type="checkbox"/> Buccal Swab <input type="checkbox"/> Tissue (specify source): _____ <input type="checkbox"/> DNA (specify source): _____



MNG LABORATORIES
Neurogenetic Answers™

5424 Glenridge Drive NE
Atlanta, GA 30342 USA
toll-free: 844.TESTMNG
fax: 678.225.0212
mnglabs.com

**MNGenome® Sequencing
Test Request Form**

We gladly accept deliveries Monday-Saturday, excluding holidays
CLIA License #11D0703390; CAP License #1441004; State of Georgia License #060-381

Referring Physician Information

Referring Physician Name	Print	Signature
Referring Physician NPI # [Required] or international equivalent		
Facility / Organization	Phone	
Select and Provide Email or Fax for Report Delivery	<input type="checkbox"/> Email	<input type="checkbox"/> Fax

Billing Information (REQUIRED)

Self-Pay? <input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, MUST include payer contact name & details:
Facility Responsible for Payment	Phone
Facility Contact Person	Email
Facility Billing Address 1	Fax
Facility Billing Address 2	
City, State, Zip Code	

Results (sent by secure HIPAA-compliant email or fax)

Authorized Recipient Name	Authorized Recipient Name
Facility	Facility
Phone	Phone
<input type="checkbox"/> Fax <input type="checkbox"/> Email	<input type="checkbox"/> Fax <input type="checkbox"/> Email

All of the following are required before we will process Whole Genome Sequencing orders (please check the following):

- All specimens that will be analyzed must be received (each labeled with at least 2 patient identifiers)
Please note any samples shipping separately _____
- Whole Exome/Whole Genome Sequencing Consent form completed and signed
- Clinical Information form completed



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Patient Name _____ **DOB** _____ **Gender** Male Female

Clinical (Check All That Apply)

Eye <input type="checkbox"/> Retinitis Pigmentosa <input type="checkbox"/> Optic Atrophy <input type="checkbox"/> Other	Hearing <input type="checkbox"/> Sensorineural <input type="checkbox"/> Stickler <input type="checkbox"/> Usher	Neuronal Migration <input type="checkbox"/> Meckel <input type="checkbox"/> Joubert <input type="checkbox"/> Other	<input type="checkbox"/> Stroke
Cognitive/Neurobehavioral <input type="checkbox"/> Intellectual Disability (ID) <input type="checkbox"/> Syndromic ID <input type="checkbox"/> Nonsyndromic ID <input type="checkbox"/> Autism <input type="checkbox"/> Dementia			
Movement Disorders <input type="checkbox"/> Ataxia <input type="checkbox"/> Episodic Ataxia <input type="checkbox"/> Dystonia <input type="checkbox"/> Chorea/Athetosis <input type="checkbox"/> Parkinson Disease <input type="checkbox"/> L-Dopa Response			
Epilepsy <input type="checkbox"/> Myoclonic <input type="checkbox"/> Other <input type="checkbox"/> Absence <input type="checkbox"/> Tonic Clonic <input type="checkbox"/> Epileptic Encephalopathy	Spasticity <input type="checkbox"/> Spastic Paraplegia <input type="checkbox"/> Other <input type="checkbox"/> Spastic Quadriplegia	Connective Tissue & Bone <input type="checkbox"/> Ehlers Danlos <input type="checkbox"/> Marfan <input type="checkbox"/> Aneurysms <input type="checkbox"/> Other	
Neuromuscular <input type="checkbox"/> Distal <input type="checkbox"/> Proximal <input type="checkbox"/> Muscle Atrophy <input type="checkbox"/> Contractures <input type="checkbox"/> Malignant Hyperthermia <input type="checkbox"/> Arthrogryposis <input type="checkbox"/> Rhabdomyolysis <input type="checkbox"/> Periodic Paralysis <input type="checkbox"/> Statin Use <input type="checkbox"/> Myasthenia		Nerve/Anterior Horn Cell <input type="checkbox"/> Neurofibromas <input type="checkbox"/> Charcot-Marie-Tooth <input type="checkbox"/> Sensory <input type="checkbox"/> Autonomic <input type="checkbox"/> Pain <input type="checkbox"/> Motor <input type="checkbox"/> Nerve Conduction <input type="checkbox"/> Other	
Cardiomyopathy <input type="checkbox"/> Dilated <input type="checkbox"/> Hypertrophic <input type="checkbox"/> Noncompaction	Arrhythmias <input type="checkbox"/> Ventricular Tachycardia <input type="checkbox"/> Brugada <input type="checkbox"/> Long or Short QT <input type="checkbox"/> Conduction Defect	Congenital Heart Defects <input type="checkbox"/> Heterotaxy <input type="checkbox"/> Other	Endocrine <input type="checkbox"/> Hypothyroidism <input type="checkbox"/> Other <input type="checkbox"/> Diabetes Mellitus

Imaging (Check All That Apply)

Brain MRI
 Leigh Disease Basal Ganglia Calcification Stroke Cerebellar Atrophy Abnormal Myelin (describe) _____

EEG (Describe Findings)

EMG/NVC (Describe Findings)

Laboratory

Metabolic (Describe Findings) _____	Genetic (Describe Findings) _____
CPK Maximum _____ Minimum _____	<input type="checkbox"/> Chromosomal Microarray <input type="checkbox"/> Deletion/Insertion Testing <input type="checkbox"/> Other (comment)

Family History

Ethnicity (please check)

South Asian European (Non-Finnish) Latino Other (comment)
 East Asian European (Finnish) African

Affected Maternal Lineage	Affected Paternal Lineage	Siblings
Relationship to Proband	Relationship to Proband	Number (specify gender)
Symptoms	Symptoms	Healthy/Affected

Additional Comments



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**Informed Consent:
Whole Exome &
Whole Genome Sequencing**

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Notice to Health Care Practitioner:

This document is a consent form for clinical whole exome or whole genome sequencing. Currently, the laboratory will only accept whole exome and whole genome test requests after the patient/parent or legal guardian/next of kin has received genetic counseling from a Healthcare Provider with experience in counseling patients for such a test. Please be aware of any applicable state laws in regards to counseling needs related to the current condition, the possibilities of detecting unsuspected conditions as well as other issues related to health insurance, and possible effects on life insurance. Please explain this consent to the patient, or authorized representative/guardian, and obtain an informed consent. Please explain the list of potential incidental findings that may be reported to the patient.

Informed Consent for Patients and/or Legal Guardians:

What is whole exome sequencing (WES) and whole genome sequencing (WGS)?

Whole exome sequencing (WES) and whole genome sequencing (WGS) are genetic tests. They are performed on DNA extracted from 3 ml of blood or other acceptable tissue type. Their purpose is to identify a heritable cause of a disorder. WES examines the “exome” or coding regions of DNA, the most important information containing segment of the genome, and will often identify the cause of disease. WGS examines all of the DNA in the human genetic code including coding and non-coding regions.

The sensitivity of both tests is improved if blood is submitted from biological parents or siblings of the patient. The goal of both tests is to identify the genetic cause of the disease for which the patient is presenting. For this reason, it is crucial that a detailed description of the clinical symptoms of the patient and other affected family members is provided. Results will only be reported on the patient. Because WES and WGS results have potential consequences for the patient’s family, we recommend that the consenting and ordering process be performed with the assistance of a genetic counselor and/or the ordering physician.

What kind of results are reported?

1. Positive: Variant(s) have been identified that are known to cause the disease symptoms based on the available scientific evidence at the time of testing.
2. Indeterminate: Variant(s) have been identified that are likely to cause the disease symptoms based on the available scientific evidence at the time of testing, but there is a lack of definitive scientific evidence available to prove it.
3. Negative: No variant has been identified that is known or likely to cause the disease symptoms based on the available scientific evidence at the time of testing.

What implications do positive and negative results have?

When WES/WGS detects known disease causing variants, the test result is highly accurate. A positive result will help your clinician to better predict the course of the condition and provide you with treatment options, if they exist. The results will also help determine the risk of recurrence of the condition in other children. An indeterminate result will point to a probable cause of a condition, but you may wish to consult a genetic counselor or your physician and undergo further independent testing to confirm or rule out the proposed role. A negative result does not indicate the absence of a genetic cause and will not change the clinical diagnosis.

Are there limitations to WES and WGS testing?

WES and WGS are screening tests. There is a possibility a genetic variant caused a condition that is not identified by the WES/WGS tests either because of the technical limitations of the assays, or because of incomplete understanding of the significance of variants detected. Although WES/WGS testing is highly accurate, the interpretation of the report is based on current medical knowledge, which is not complete.

1. WES may not be able to detect genetic disorders that are caused by expansion of repetitive regions of the genome. One example is Fragile X Syndrome. If one of these types of conditions is suspected, your physician should order the appropriate test.
2. Not all regions in the human genome can be sequenced due to limitations in technology, so some variants in such regions might go undetected with WGS methodologies.



What are incidental findings?

During testing, disease causing variants can be identified that are not related to the patient’s condition for which the testing was done. These are referred to as “Incidental Findings” and indicate the presence of previously undiagnosed, potentially serious conditions that can be prevented or treated if diagnosed. A list of such conditions based on the recommendation of the American College of Medical Genetics (ACMG) is provided on our website. Please state whether you want to be informed about incidental findings in relation to the conditions listed.

- _____ (initials) I would like to learn of incidental findings to the conditions listed (Proband Only)
- _____ (initials) I would like to learn of incidental findings to the conditions listed (Proband + Parents)
- _____ (initials) I would NOT like to learn of incidental findings to the conditions listed.

Are there results that will not be reported?

1. Samples from the patient’s relatives may be used to help diagnose the patient’s condition, but results for these relatives will not be reported independently. They will only be referred to in the report for the patient if they are directly relevant to the patient’s condition. However, the patient’s genetic results may have implications for their relatives, and it is important that these implications are discussed with a genetic counselor.
2. Variations in genes that affect susceptibility to a condition, but do not cause the person to develop the condition, will not be reported.
3. Carrier status for recessive disorders will not be reported. Most people carry variants that are not disease causing but could become disease causing if that person had children with someone who was healthy, but had the same variant. This is referred to as being a “carrier” for a disease. If you are concerned about carrier status for conditions that might run in your family, you should get tested separately for carrier status. You should discuss these implications with your genetic counselor.

Who will have access to the results?

Test results are maintained electronically by the laboratory. The results are provided to the ordering physician and/or healthcare facility that ordered the test. Results may also be made available to individuals/organizations with a legal right of access under applicable Federal and/or State law, or as authorized by the patient or the patient’s representative. Patient privacy is of utmost concern to us, and as a CAP certified facility we are prepared to safeguard Protected Health Information.

How long are WES and WGS results kept in the testing lab?

The laboratory may keep the identified WES/WGS raw data in the lab indefinitely. This helps us improve our diagnostic capabilities and will help others with similar conditions. To advance the understanding of genetic disorders, your results might be analyzed and published in scientific articles in a de-identified manner consistent with HIPAA guidelines.

- _____ (initials) We agree that our WES/WGS data may be stored indefinitely
- _____ (initials) We agree that our WES/WGS data may be used for scientific publication in a de-identified manner

What will happen to my DNA sample?

No additional tests will be performed on these samples, without specific, signed authorization by the individual(s). After 60 days, unless consent is given below, the sample will be destroyed.

_____ (initials- Proband) Please keep my DNA used for WGS/WES for future testing should I desire such testing or if I want to participate in research in the future. I understand no additional genetic tests will be performed without my specific consent/instructions, but my DNA may be used for quality control purposes. I understand that there is no guarantee of availability of my DNA after 60 days.

_____ (initials- Parents(s)) Please keep our DNA used for WGS/WES for future testing should we desire such testing or if we want to participate in research in the future. We understand no additional genetic tests will be performed without our specific consent/instructions, but our DNA may be used for quality control purposes. We understand that there is no guarantee of availability of our DNA after 60 days.

Next>>>



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What are the risks of testing?

1. Non-paternity (when the reported father of the child is not the biological father) or half sibling-ships (when siblings do not share the same father AND mother) would be detected. We do not report these findings unless they have direct clinical significance.
2. Genetic non-discrimination law prevents insurance companies from using your genetic information to deny health insurance coverage, but the law does not cover life insurance, disability insurance or long-term care insurance. The detection of an incidental condition may affect your future ability to buy these forms of insurance or get the best insurance rates. Please be aware of any applicable State laws and applicable terms of any active insurance policies in regards to consent and the release of these results to insurance companies.
3. WES/WGS may identify serious and/or untreatable genetic conditions. It can result in unexpected psychological trauma, both for you and your family. The detection of such a condition or conditions could also affect the health or healthcare needs of your siblings, children, or other close relatives.
4. Although WES/WGS is highly accurate, the interpretation of the report is based on current medical knowledge, which is not complete. We do not report out changes in interpretation of variants automatically, but we do have mechanisms to issue an updated report if requested by the patient's physician.

Consent for WES and WGS Testing

All of the above has been explained to me, to my satisfaction, and my signature below attests to the same. I understand that this is a voluntary test, and I have had the opportunity to ask questions about alternative testing.

Whole Exome or Whole Genome Sequencing Participant (Parent/Guardian of child being tested):

Print Name: _____ Date: _____
Signature: _____ Date of Birth: _____

I have provided genetic counseling and have explained the risks, benefits, and limitations of WES testing to the patient/parent/guardian.

Health Care Provider Obtaining Consent:

Print Name: _____ Date: _____
Signature: _____ NPI#: _____

Consent of family members submitting a sample for evaluation of patient's results

I understand that I am submitting my sample to help evaluate the results obtained on the person being tested, and that results obtained from my sample will be used solely for this purpose. I will NOT be informed of any test results on my sample. If I request any test results, I will have to be tested separately. If questioned by an insurance carrier, I can state that I have not been tested personally for any conditions.

Name of Family Member: _____ Relationship to Proband: _____

Signature: _____ Date: _____

Name of Family Member: _____ Relationship to Proband: _____

Signature: _____ Date: _____

Name of Family Member: _____ Relationship to Proband: _____

Signature: _____ Date: _____