

Clinical Exome Sequencing

A Patient Resource



Washington University Physicians®

Washington University School of Medicine in St. Louis

Pathology & Immunology

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Genetics Glossary

Proteins are the building blocks of our cells. Changes in, or loss of, proteins can affect how cells, tissues and bodies function.

DNA is the instruction manual that tells our bodies how to make proteins. Proteins are inherited from our parents. Changes in an individual's DNA can impact how protein is made.

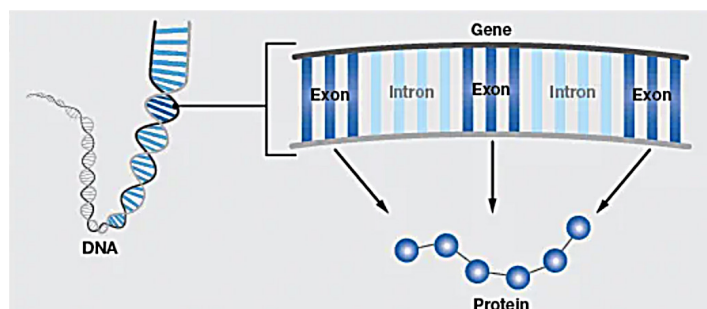
Genes provide the specific steps in the instruction manual. Genes are made of two types of building blocks:

- **Exons** are the pieces of DNA that come together to make proteins
- **Introns** are the pieces of DNA in between exons that are cut out when proteins are made

Sequencing is a laboratory method that can detect changes in genes. These changes are called **variants**.

What is exome sequencing?

The part of your DNA that tells the cell how to make proteins is the **exome**.



Exome sequencing is a test that a doctor may recommend if someone has a personal or family history of a medical concern that may be genetic. This test is a comprehensive analysis, and results could help form a diagnosis that guides care and medical management for doctors, patients, and families.

How is clinical sequencing done?



The patient's blood or a cheek swab specimen are sent to our laboratory.



Our laboratory takes DNA from the specimen. It sequences the DNA and uses specialized software to analyze the exome. During this analysis, the laboratory looks for differences in the patient's DNA compared to what is typically expected. These differences are called variants.



Experts review the variants to see if they may change the way the protein works, and if the change may be the cause of the patient's symptoms or features.

What is genetic counseling?

Genetic counseling provides information and support to patients and their family members who have or may be at risk for a genetic condition. Most individuals undergoing clinical exome sequencing will speak with a genetic counselor to understand the details of the testing process, provide consent for testing, and understand the results they get back.

Why test family members?

Since we share DNA with relatives, it is helpful to compare a patient's DNA with that of their family members. DNA from a patient's biological parents is usually best for analysis as it helps with the interpretation of variants found.

How will results be reported?

Clinical exome sequencing may take up to a few months for the lab to complete. Once completed, a report that explains the results will be sent to the healthcare provider who ordered the testing.



What type of results can be expected?

Positive

A variant in the DNA that is likely to be the cause of the patient's symptoms or observed features. Such a variant will be described as "Pathogenic" or "Likely Pathogenic."

Inconclusive

- Exome sequencing may detect a "Variant of Uncertain Significance," which means there is a change in the patient's DNA that is not easily explainable. We may suggest testing other members of your family to help figure out the meaning of the result.
- For some genes, both copies of a gene need to be changed in order for a medical condition to arise. If we see only one "Pathogenic" or "Likely Pathogenic" change in such a gene, we may report it as inconclusive and recommend additional testing.

Negative

No variants explaining the patient's symptoms were observed in the exome. This does not mean that the individual does not have a genetic condition. It is still possible that there is a genetic variant that was not found by this test.

Is there any other information included in the report?

The lab may report very rare variants in genes that are not yet associated with a disorder. These genes are called "candidate genes" because they share similarities with other genes known to cause related disorders.

Exome sequencing can also detect variants that are known to be useful health information but are not related to an individual's current symptoms. These are called secondary findings. The lab uses the secondary findings gene list recommended by the American College of Medical Genetics and Genomics. The list includes conditions for which treatment or prevention are available. Only clinically significant variants in these genes are reported. Patients and family members undergoing exome sequencing can decide during the consent process whether or not they wish to receive this information on their report.

Can clinical exome sequencing find all possible genetic causes of a symptom or feature?

Clinical exome sequencing does not find all possible causes of genetic disease. Some types of variants, including any variant outside of the exome, cannot be found by this test. It is best to consult with a healthcare provider about the best testing options for a patient and their family.

Will insurance cover this test?

Washington University accepts a variety of commercial insurance plans. We will contact the patient's health insurance provider to obtain approval for testing and an estimated out-of-pocket cost based on the patient and their family's benefits. For more information, please contact our Patient Accounts Office at 314-362-5641 or via email at path-billing@email.wustl.edu.

What if an individual does not have insurance?

Patients have options for payment even if they don't have insurance. For more information about pricing and payments, please contact our Patient Accounts Office at 314-362-5641 or via email at path-billing@email.wustl.edu.

About Washington University Genetic and Genomics Services

The next-generation sequencing laboratory at Washington University in St. Louis provides clinically validated next-generation sequencing for inherited and acquired genetic conditions. Located in a state-of-the-art facility, our CAP-accredited, and CLIA-certified laboratory delivers clinically validated testing supported by extensive clinical and genomic experience and advanced technologies. Sequencing results are interpreted by board-certified pathologists and clinical laboratory geneticists.

Contact Us

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