DHH gene

desert hedgehog signaling molecule

Normal Function

The *DHH* gene provides instructions for making a member of the hedgehog protein family. Hedgehog proteins are important for early development in many parts of the body. The protein produced from the *DHH* gene is believed to be involved in male-typical sex development and in the formation of the perineurium, the protective membrane around each bundle of fibers within a nerve.

Health Conditions Related to Genetic Changes

Swyer syndrome

DHH gene variants (also called mutations) have been identified in a small number of people with Swyer syndrome, also known as 46,XY complete gonadal dysgenesis or 46, XY pure gonadal dysgenesis. Swyer syndrome is a condition that affects sex development. Affected individuals have two altered copies of the *DHH* gene in each cell.

Sex development usually follows a particular pattern based on an individual's chromosomes. People usually have 46 chromosomes in each cell. Two of the 46 chromosomes, known as X and Y, are called sex chromosomes because they help determine whether a person will develop male or female sex characteristics. Girls and women typically have two X chromosomes (46,XX karyotype), and boys and men typically have one X chromosome and one Y chromosome (46,XY karyotype). However, individuals with Swyer syndrome have a male-typical chromosome pattern (46,XY karyotype), but they develop female-typical sex characteristics.

Variants in the *DHH* gene in people with Swyer syndrome affect the process of sex development, preventing affected individuals with a 46,XY karyotype from developing male gonads (testes) and causing them to develop female reproductive structures (a uterus and fallopian tubes).

Other disorders

DHH gene variants have been identified in people with 46,XY disorder of sex development, also known as partial gonadal dysgenesis. These individuals have one altered *DHH* gene in each cell. They may have external genitalia that do not look clearly

male or clearly female or other changes in the genitals and reproductive organs.

Some people with the features of 46,XY disorder of sex development caused by *DHH* gene variants also have nerve abnormalities. This combination of features is a condition called 46,XY gonadal dysgenesis with minifascicular neuropathy. The nerve abnormalities affect nerves connecting the brain and spinal cord to muscles and sensory cells that detect sensations such as touch, pain, heat, and sound (the peripheral nervous system). Affected individuals may experience weakness and loss of sensation in their extremities (peripheral neuropathy).

Other Names for This Gene

- desert hedgehog homolog (Drosophila)
- DHH_HUMAN
- HHG-3
- MGC35145

Additional Information & Resources

Tests Listed in the Genetic Testing Registry

- Tests of DHH (https://www.ncbi.nlm.nih.gov/gtr/all/tests/?term=50846[geneid])

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28DHH%5BTIAB%5D%29+OR+%28desert+hedgehog%5BTIAB%5D%29+AND+%28%28Genes%5BMH%5D%29+OR+%28Genetic+Phenomena%5BMH%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D)

Catalog of Genes and Diseases from OMIM

- DESERT HEDGEHOG SIGNALING MOLECULE; DHH (https://omim.org/entry/605423)
- 46,XY GONADAL DYSGENESIS WITH MINIFASCICULAR NEUROPATHY; GDMN (https://omim.org/entry/607080)

Gene and Variant Databases

- NCBI Gene (https://www.ncbi.nlm.nih.gov/gene/50846)
- ClinVar (https://www.ncbi.nlm.nih.gov/clinvar?term=DHH[gene])

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Genomic Location

The *DHH* gene is found on chromosome 12 (https://medlineplus.gov/genetics/chromosome/12/).

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