

FZD6 Gene

Subjects: Genetics & Heredity

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Frizzled class receptor 6

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1. Normal Function

The *FZD6* gene provides instructions for making a protein called frizzled-6. This protein is embedded in the outer membrane of cells, where it is involved in transmitting chemical signals from outside the cell to the cell's nucleus.

Specifically, frizzled-6 participates in the Wnt signaling pathway, a series of steps that affect the way cells and tissues develop. Wnt signaling is important for cell division (proliferation), attachment of cells to one another (adhesion), cell movement (migration), and many other cellular activities. At the cell surface, frizzled-6 attaches (binds) to certain proteins, which triggers the frizzled-6 protein to send signals into the cell and initiate the Wnt signaling pathway.

Frizzled-6 is active in many tissues. During early development it plays a critical role in the growth and development of nails, particularly the attachment of the nail to the nail bed. Studies suggest that frizzled-6 is also involved in hair growth.

2. Health Conditions Related to Genetic Changes

2.1 Nonsyndromic Congenital Nail Disorder 10

At least three mutations in the *FZD6* gene have been found to cause nonsyndromic congenital nail disorder 10. This condition is characterized by abnormally thick fingernails and toenails that may appear claw-like. The mutations lead to the production of a frizzled-6 protein that cannot get to the cell membrane where it is needed or that cannot transmit signals into the cell. As a result, Wnt signaling is disrupted and the growth and development of nails is poorly regulated, which leads to separation of the nail from the underlying nail bed (onycholysis) and other abnormalities of the fingernails and toenails.

3. Other Names for This Gene

- frizzled 6, seven transmembrane spanning receptor
 - frizzled family receptor 6
 - frizzled homolog 6
 - FZ-6
 - FZ6
 - HFZ6
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References

1. Fröjmark AS, Schuster J, Sobol M, Entesarian M, Kilander MBC, Gabrikova D, Nawaz S, Baig SM, Schulte G, Klar J, Dahl N. Mutations in Frizzled 6 cause isolated autosomal-recessive nail dysplasia. *Am J Hum Genet.* 2011 Jun;88(6):852-860. doi: 10.1016/j.ajhg.2011.05.013.
2. Guo N, Hawkins C, Nathans J. Frizzled6 controls hair patterning in mice. *Proc Natl Acad Sci U S A.* 2004 Jun 22;101(25):9277-81.

3. Naz G, Pasternack SM, Perrin C, Mattheisen M, Refke M, Khan S, Gul A, SimonsM, Ahmad W, Betz RC. FZD6 encoding the Wnt receptor frizzled 6 is mutated in autosomal-recessive nail dysplasia. *Br J Dermatol.* 2012 May;166(5):1088-94. doi: 10.1111/j.1365-2133.2011.10800.x.
 4. Raza SI, Muhammad N, Khan S, Ahmad W. A novel missense mutation in the gene FZD6 underlies autosomal recessive nail dysplasia. *Br J Dermatol.* 2013 Feb;168(2):422-5. doi: 10.1111/j.1365-2133.2012.11203.x.
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