TSPYL1 Gene

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TSPY-like 1

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1. Normal Function

The TSPYL1 gene provides instructions for making a protein called TSPY-like 1. This protein is active in the brain, testes (in males), and other tissues, although its function is not well understood. TSPY-like 1 contains a region called a nucleosome assembly protein (NAP) domain, which is found in other proteins that help control cell division, copy (replicate) DNA, and regulate the activity of various genes. It is unknown whether TSPY-like 1 also has these functions.

Based on its role in a condition called sudden infant death with dysgenesis of the testes syndrome, researchers propose that TSPY-like 1 is involved in the development of the male reproductive system and the brain, including the brainstem. The brainstem is a part of the brain that is connected to the spinal cord. It regulates many basic body functions, including heart rate, breathing, eating, and sleeping. It also relays information about movement and the senses between the brain and the rest of the body.

2. Health Conditions Related to Genetic Changes

2.1. Sudden Infant Death with Dysgenesis of the Testes Syndrome

A single mutation in the *TSPYL1* gene has caused all identified cases of sudden infant death with dysgenesis of the testes syndrome (SIDDT), a condition that has been reported in an Old Order Amish community in Pennsylvania. The condition is fatal in the first year of life; its major features include abnormalities of the reproductive system in males, breathing problems, a slow or uneven heart rate, and feeding difficulties.

The mutation that causes SIDDT inserts a single DNA building block (nucleotide) into the *TSPYL1* gene. This mutation is written as 457_458insG. The extra nucleotide alters how the gene's instructions are used to make TSPY-like 1, which results in the production of an abnormally short, nonfunctional protein. A loss of TSPY-like 1 function appears to disrupt the normal development of the male reproductive system and the brain, including the brainstem. Abnormalities of brainstem function, particularly involving breathing and heart rate, are likely the cause of sudden death in affected infants.

Research findings suggest that mutations in the *TSPYL1* gene are not associated with sudden infant death syndrome (SIDS) in the general population. SIDS is a major cause of death in children younger than 1 year.

2.2. Other Disorders

Changes in the *TSPYL1* gene have been studied as a potential cause of infertility, which is the inability to have biological children. Variations in the gene have been identified in several infertile men and in at least one person who was genetically male (with one X chromosome and one Y chromosome in each cell) but had external genitalia that appeared female. However, it is unclear whether the *TSPYL1* gene variations were related to these abnormalities or occurred by coincidence. Changes in the *TSPYL1* gene are not thought to be a major cause of infertility.

3. Other Names for This Gene

- testis-specific Y-encoded-like protein 1
- TSPY-like 1
- TSPY-like protein 1

- TSPYL

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