HPS3 Gene

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1. Introduction

The *HPS3* gene provides instructions for making a protein that forms part of a complex called biogenesis of lysosome-related organelles complex-2 (BLOC-2). This complex plays a role in the formation of a group of cellular structures called lysosome-related organelles (LROs). In particular, BLOC-2 controls the sorting and transport of proteins into LROs during their formation. LROs are very similar to compartments within the cell called lysosomes, which digest and recycle materials. However, LROs perform specialized functions and are found only in certain cell types.

Within pigment-producing cells (melanocytes), LROs called melanosomes produce and distribute melanin, which is the substance that gives skin, hair, and eyes their color. A different type of LRO is found in platelets, the blood cells involved in normal blood clotting. These LROs, called dense granules, release chemical signals that cause platelets to stick together and form a blood clot.

2. Health Conditions Related to Genetic Changes

2.1. Hermansky-Pudlak Syndrome

At least 7 mutations in the *HPS3* gene have been found to cause Hermansky-Pudlak syndrome type 3, which is a mild form of the condition. Affected individuals typically have oculocutaneous albinism, a condition characterized by fair skin, light-colored hair and eyes, and poor vision. They may also have bleeding problems. The *HPS3* gene mutations that cause Hermansky-Pudlak syndrome type 3 impair the normal function of BLOC-2, disrupting the size, structure, and function of LROs in cells throughout the body.

One common mutation results in a deletion of genetic material within the *HPS3* gene. This deletion includes approximately 3,900 DNA building blocks (nucleotides) and is known as the 3.9kb deletion. It is also written as 339_4260del3904. This mutation, which is found in affected individuals from the central region of Puerto Rico, prevents the production of any HPS3 protein.

Another mutation in the *HPS3* gene has been found in people with Central and Eastern European (Ashkenazi) Jewish background. This mutation, called a splice-site mutation, disrupts the way the gene's instructions are used to make the protein. This mutation, which is written as 1163+1G>A, results in an abnormally short protein.

Because the abnormal melanosomes do not distribute melanin properly, people with Hermansky-Pudlak syndrome have unusually light coloring of the skin, hair, and eyes (oculocutaneous albinism). The absence of dense granules within platelets leads to bleeding problems in affected individuals.

3. Other Names for This Gene

- BLOC2S1
- DKFZp686F0413
- FLJ22704
- Hermansky-Pudlak syndrome 3

- Hermansky-Pudlak syndrome 3 protein
- HPS3_HUMAN
- SUTAL

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