WNT10A Gene Testing in Ectodermal Dysplasia

Also Includes: Odonto-onycho-dermal dysplasia (OODD), Schöpf-Schulz-Passarge Syndrome (SSPS)

Clinical Features:
A broad spectrum of clinical features has been found in ectodermal dysplasia patients who have compound heterozygous or homozygous variants in WNT10A, with the most consistent clinical feature being severe oligodontia of permanent teeth. Both generalized hypohidrosis and hyperhidrosis have been reported. Excessive or reduced sweating involving palms and soles can occur. Skin is usually dry, while nails may be normal in shape and texture, or thinned, flat, convex, slow growing, or even absent at birth but develop later in childhood. Palmoplantar findings range from normal skin to severe hyperkeratosis. Scalp, body, and facial hair may be sparse. Photophobia has been described in a few patients. Patients with OODD have, in addition to oligodontia and abnormal teeth, dystrophic nails, erythematous lesions of face, and palmoplantar hyperkeratosis with hyperhidrosis. Hair may or may not be involved. SSPS is characterized by hidrocystomas (eyelid cysts) in association with other findings of ectodermal dysplasia. Heterozygotes frequently manifest mild symptoms (see below).

Inheritance Pattern:
WNT10A belongs to a highly conserved gene family encoding secreted signaling molecules. While WNT10A variants are associated with autosomal recessive ectodermal dysplasia, it has been shown that over half of obligate heterozygotes for WNT10A variant display clinical symptoms of ectodermal dysplasia, including mild oligodontia or a few abnormally shaped permanent teeth, nail dystrophy, and other mild hair, skin, and palmoplantar symptoms of ectodermal dysplasia.

Test Methods:
Using genomic DNA obtained from the submitted biological material, bi-directional sequence of the 4 coding regions and splice sites of the WNT10A gene is analyzed. If a sequence change is identified, the variant is confirmed by a second analysis, using sequence, heteroduplex or restriction fragment analysis or another appropriate method.

Test Sensitivity:
Variants in the WNT10A gene have been reported in up to 25% of individuals with hypohidrotic ectodermal dysplasia who do not have an EDA1 gene variant, and 9% of unselected patients with ectodermal dysplasia. The method used by GeneDx to screen the WNT10A gene is expected to identify nearly all variants that occur in the coding and flanking splice sites of the gene.

References:

1. Bohring et al. Am J Hum Genet. 85:97-105, 2009
2. Adaimy et al. Am J Hum Genet. 81:821-828, 2007