HLA-DR3 Associations

Human leukocyte antigen, or HLA, encode for several major histocompatibility complex proteins. HLA-DR, -DQ, -DP are involved in MHC class II. Genetic alterations in HLA-DR3 can increase the risk of developing several autoimmune diseases. These include type 1 diabetes mellitus, lupus, Hashimoto thyroiditis, Graves disease, and Addison disease.

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Characteristics

MHC II

MHC complex with (2) Tutu

MHCs, or major histocompatibility complexes, are molecules that are critical for the immune system. They enable the body to identify and respond to pathogens. MHCs are found on the surface of every cell and are crucial for presenting antigens (foreign substances) to T cells, resulting in the initiation of an immune response. There are two classes of MHCs: MHC-I and MHC-II. HLA-DR is a type of MHC-II molecule. HLA-DR is highly heterogeneous in humans and has many numerical variants, one of which is HLA-DR3.

Autoimmune Diseases

Auto-in-moon

The presence of HLA-DR3 in patients is associated with an increased risk of developing many autoimmune diseases. The exact mechanism underlying this association is unknown, but the link between certain HLA molecules and the development of autoimmune diseases is strong.

Associations

Type 1 Diabetes

(1) Wand and Dyed-bead-pancreas

The HLA-DR3 gene is associated with type 1 diabetes mellitus, which is an autoimmune disease which attacks insulin producing cells in the pancreas. Patients with HLA-DR3 have about a six-fold increase in the risk of the development of type 1 diabetes mellitus.

Systemic Lupus Erythematosus (SLE)

Loopy-butterfly

Systemic Lupus Erythematosus (SLE) is associated with HLA-DR3. This disease is linked not only to HLA-DR3 but also to HLA-DR2. SLE is a complex, multisystem disease that mostly involves arthralgias, photosensitivity, and the destruction of all three blood lines: red blood cells, white blood cells, and thrombocytes. But SLE can cause many more clinical manifestations

Hashimoto's Thyroiditis

Hashtag-Moto Thigh-droid-on-fire

Hashimoto's thyroiditis is linked to both HLA-DR3 and HLA-DR5. This disease results from self-reactive T-cells that target and destroy thyroid peroxidase. The main manifestation of Hashimoto's thyroiditis is hypothyroidism, but in the beginning, it can present with a transient hyperthyroid

phase where pre-formed thyroid hormones are released into the blood.

Graves Disease

Broken Grave

The presence of HLA-DR3 increases the likelihood of developing Graves' disease. As with other autoimmune diseases and disorders associated with HLA-DR3, the exact mechanism underlying this association is unknown. Graves' disease presents with a diffusely enlarged thyroid and hyperthyroidism.

Addison's Disease (Primary Adrenal Insufficiency)

Add-sun

Addison's Disease, or primary adrenal insufficiency, is associated with the presence of HLA-DR3. This condition results from an autoimmune attack on the cells of the adrenal cortex. Patients typically present with fatigue, weight loss, orthostatic hypotension, hyperpigmentation, and/or electrolyte abnormalities.