GSTM1

GSTM1 (Glutathione S-Transferase Mu 1) Gene The **GSTM1** gene is located on **chromosome 1p13.3**. However, it's an important gene involved in detoxification processes in the human body.

Function of GSTM1 - The **GSTM1** gene encodes **Glutathione S-Transferase Mu 1 (GSTM1)**, an enzyme that plays a key role in **detoxification** by conjugating **glutathione (GSH)** to various harmful compounds, including:

1. Carcinogens
2. Drugs
3. Environmental toxins
4. Oxidative stress byproducts

- This enzyme helps in **phase II metabolism** of xenobiotics, making toxic compounds more water-soluble and easier to excrete.

GSTM1 Null Polymorphism One of the most notable features of **GSTM1** is its **common deletion polymorphism** (GSTM1 *null genotype*), which means: - Some individuals **completely lack** a functional **GSTM1** gene due to a **homozygous deletion**. - The absence of **GSTM1** enzyme activity is associated with **reduced detoxification capacity**.

Health Implications of the GSTM1 Null Genotype The **GSTM1 null genotype** has been linked to various health conditions, including:

Increased Cancer Risk - Individuals with **GSTM1 null** may have an **increased susceptibility** to cancers, particularly:

1. **Lung cancer** (especially in smokers)
2. **Bladder cancer**
3. **Breast cancer**
4. **Colorectal cancer**

Respiratory and Cardiovascular Diseases - Reduced detoxification of **airborne pollutants** and oxidative stress may contribute to:

1. **Asthma**
2. **Chronic Obstructive Pulmonary Disease (COPD)**
3. **Atherosclerosis**

Drug Metabolism - The GSTM1-null genotype can affect **drug metabolism**, influencing how individuals respond to **chemotherapy drugs** and other medications.

Neurodegenerative Disorders - Some studies suggest a link between **GSTM1-null** and **Parkinson's disease** or **Alzheimer's disease**, possibly due to impaired antioxidant defense.

Clinical and Genetic Testing - **GSTM1 deletion testing** is available as part of pharmacogenetic and cancer risk assessments. - Understanding GSTM1 status can help personalize **cancer prevention strategies**, **environmental exposure precautions**, and **drug therapy choices**.