

## NICKEL SENSITIVITY TEST

XXXXXXXXXXXX

Date of birth: XXXXXXX

Code: XXXXXX

**WHAT THE REPORT INCLUDES**

- Detailed EXPLANATION of the test performed and recommendations to be followed.
- SUMMARY TABLE presenting the metabolic areas analysed and the results from the DNA analysis, providing a quick overview of an individual's overall health status and highlighting any potential issues.
- BIBLIOGRAPHY providing scientific references for the test.

**COLOURS USED**

It indicates that the variants identified in the analysis do not unfavourably alter enzymatic activity of the proteins they encode and/or the risk associated with certain diseases.



It indicates that the variants identified in the analysis slightly unfavourably alter enzyme activity and/or the risk associated with certain disorders or diseases.



It indicates that the variants identified in the analysis alter enzyme activity in a particularly unfavourable way, resulting in an increased risk of developing certain disorders or associated diseases.

The results shown, as well as the considerations and explanations contained in the following pages of this booklet, should not be regarded as a medical diagnosis. It is important to bear in mind that genetic information is only one part of the total information needed to gain a complete picture of a person's state of health, and the data reported here is therefore a tool available to the treating physician to formulate a correct assessment of the patient's physiological state and suggest an appropriate personalised treatment.

## INTRODUCTION

Nickel is a metal commonly found in foods, everyday objects, and the environment. While most people tolerate nickel exposure without issues, some individuals experience adverse reactions, ranging from **contact dermatitis** to **gastrointestinal disorders** and other systemic symptoms. Nickel sensitivity can be influenced by both **genetic predisposition** and **environmental factors**.

Genetic testing analyses specific variants in genes involved in **immune and inflammatory responses**, providing personalized insights into your susceptibility to nickel-related reactions. Understanding your genetic profile can help you better manage exposure and **minimize potential symptoms**.

Nickel intolerance can manifest in various ways, including:

- **Allergic Contact Dermatitis** – Skin irritation, itching, redness, and blistering after contact with nickel-containing items (e.g., jewellery, coins, watches, mobile phones).
- **Systemic Nickel Allergy Syndrome (SNAS)** – Digestive issues (bloating, nausea, diarrhoea, abdominal pain), headaches, chronic fatigue, and other systemic symptoms due to dietary nickel intake.
- **Aggravation of Pre-Existing Conditions** – Nickel exposure may worsen inflammatory conditions such as eczema, asthma, or intestinal disorders.

Identifying a genetic predisposition to nickel sensitivity can help you:

- ✓ **Reduce the risk of symptoms** by managing exposure more effectively.
- ✓ **Customize your diet** by limiting foods high in nickel.
- ✓ **Adopt preventive strategies** to avoid contact with nickel-containing materials.

The genetic test examines variants in genes linked to **inflammation and immune response**. Some genetic factors may **increase susceptibility** by amplifying inflammatory cytokine production or impairing the body's detoxification mechanisms.

### Important Note

This genetic test provides insights into **individual predisposition**, but it is **not a clinical diagnosis**. If you experience symptoms related to nickel sensitivity, consult a healthcare professional for further evaluation.

### Testing for nickel sensitivity


Genetic testing of the **FLG** and **TNF- $\alpha$**  genes provides valuable insights into an individual's susceptibility to nickel sensitivity.


- **FLG Gene (Filaggrin)** – Plays a key role in maintaining the **skin barrier function**. Mutations in this gene can weaken the skin's protective barrier, making it more **permeable to allergens**, including nickel. This increases the risk of **allergic contact dermatitis** and other skin-related reactions.
- **TNF- $\alpha$  Gene (Tumour Necrosis Factor Alpha)** – Encodes a **pro-inflammatory cytokine** that regulates immune responses. Certain genetic variants of **TNF- $\alpha$**  can lead to **excessive inflammation**, heightening sensitivity to allergens and increasing the likelihood of **systemic reactions** to nickel exposure.

By analysing these genetic markers, individuals can better understand their predisposition to nickel sensitivity and take proactive measures to minimize exposure and manage symptoms effectively.



## YOUR RESULT:

Lab ID	Gene	Allelic variants	Genotype		Result
NICKEL SENSITIVITY					
GTS044	FLG	ACTG	ACTG	ACTG	FAVOURABLE
(Filaggrin)		Delezione ACTG			
WHAT YOUR GENETICS SAY					
					
There is a FAVOURABLE genetic profile for the analyzed gene.					

Lab ID	Gene	Allelic variants	Genotype		Result
NICKEL SENSITIVITY					
GTS043	TNF-alfa	G	G	G	FAVOURABLE
(Tumour Necrosis Factor Alpha)		A			
WHAT YOUR GENETICS SAY					
					
There is a FAVOURABLE genetic profile for the analyzed gene.					

Impact of Unfavourable Variants in the FLG and TNF- $\alpha$  Genes

Genetic analysis of the **FLG** and **TNF- $\alpha$**  genes helps assess the predisposition to **nickel sensitivity**, particularly in relation to **contact dermatitis** and **Systemic Nickel Allergy Syndrome (SNAS)**.

## 1. Effects of Unfavourable FLG Gene Variants (Filaggrin)

The **FLG** gene is responsible for producing **filaggrin**, a key protein that maintains the skin barrier. Mutations in this gene can lead to:

- **Weakened Skin Barrier** – Increased permeability allows nickel and other allergens to penetrate more easily.
- **Higher Risk of Allergic Contact Dermatitis** – Direct contact with nickel-containing objects (e.g., jewellery, coins, mobile phones) may trigger irritation, redness, itching, and blistering.
- **Chronic Dryness and Inflammation** – A filaggrin deficiency leads to **drier, more sensitive skin**, increasing susceptibility to atopic eczema.
- **Delayed Skin Healing** – A compromised skin barrier has **reduced recovery ability**, making allergic reactions more persistent.

2. Effects of Unfavourable TNF- $\alpha$  Gene Variants (Tumour Necrosis Factor Alpha)

The **TNF- $\alpha$**  gene encodes a **pro-inflammatory cytokine** that regulates immune responses. Certain variants of **TNF- $\alpha$**  can result in:

- **Excessive Inflammatory Response** – Overproduction of **TNF- $\alpha$**  can intensify allergic reactions to nickel, causing **prolonged inflammation** and more severe symptoms.
- **Increased Risk of Allergic Dermatitis and Chronic Inflammation** – Overactivation of the immune system may worsen skin conditions, leading to **persistent eczema**.
- **Higher Susceptibility to Systemic Nickel Allergy Syndrome (SNAS)** – Individuals with **TNF- $\alpha$**  variants may react to dietary nickel, experiencing **gastrointestinal discomfort (bloating, diarrhoea, nausea), headaches, and chronic fatigue**.
- **Elevated Oxidative Stress and Tissue Damage** – Prolonged inflammation can increase **free radical production**, leading to **cellular damage** and worsening inflammatory conditions.

### Summary

- **FLG gene mutations** weaken the **skin barrier**, allowing nickel to penetrate more easily.
- **TNF- $\alpha$  gene variants** amplify the **inflammatory response**, increasing the severity of allergic reactions.
- **Individuals with both unfavourable variants** may have a heightened sensitivity to nickel and should take preventive measures.

### **Recommended Solutions for Managing Nickel Sensitivity**

If you have unfavourable variants in the **FLG** or **TNF- $\alpha$**  genes, you may be more prone to **nickel-induced allergic reactions**. The following strategies can help reduce symptoms and improve overall management.

#### 1. Minimizing Nickel Exposure

Since genetic susceptibility increases sensitivity to nickel, **reducing exposure** is key:

- **Avoid direct contact with nickel-containing objects** – Jewellery, watches, coins, kitchen utensils, and electronic devices may contain nickel. Opt for **nickel-free** alternatives such as stainless steel, titanium, or plastic.
- **Use nickel-free cosmetics** – Some skincare and hair products may contain traces of nickel. Choose **hypoallergenic** and **heavy-metal-free** options.
- **Wear protective clothing and accessories** – When handling objects that may contain nickel, consider using **gloves or protective covers**.

#### 2. Following a Low-Nickel Diet

If you have **FLG** and **TNF- $\alpha$**  variants, limiting dietary nickel intake may help prevent **systemic reactions**:

- **Avoid high-nickel foods**, such as **legumes (beans, lentils), chocolate, canned fruits, nuts, seeds, and some fish (tuna, mackerel)**.
- **Limit moderate-nickel foods**, including **tomatoes, spinach, potatoes, broccoli, and cauliflower**.
- **Check packaged food labels** – Many processed foods contain traces of nickel.
- **Choose fresh, whole foods** – Favour **fresh meat, rice, unprocessed grains, and low-nickel vegetables** over processed products.

#### 3. Strengthening the Skin Barrier

Since **FLG mutations** weaken skin protection, proper skincare is essential:

- **Use emollient and moisturizing creams** – Look for products with **ceramides, hyaluronic acid, and plant-based oils**. Avoid **alcohol or artificial fragrances**, which may cause irritation.
- **Choose mild cleansers** – Opt for **sulphate-free and paraben-free** soaps to prevent further damage to the skin.
- **Apply sunscreen daily** – A weakened skin barrier is more vulnerable to **UV damage**. Use **broad-spectrum SPF 30+ sunscreen**.
- **Wear soft, breathable fabrics** – Prefer **cotton or linen** to minimize skin irritation.

#### 4. Managing Inflammation

Since **TNF- $\alpha$  variants** may contribute to excessive inflammation, lifestyle changes can help reduce inflammatory responses:

- **Adopt an anti-inflammatory diet** – Eat foods rich in **omega-3 (salmon, flaxseeds, walnuts), antioxidants (berries, citrus, leafy greens), and anti-inflammatory spices (turmeric, ginger)**.
- **Avoid pro-inflammatory foods** – Reduce **refined sugars, trans fats, and processed foods**, which can worsen inflammation.
- **Consider targeted supplements** – In consultation with a doctor, supplements like **vitamin D, curcumin (turmeric extract), and probiotics** may help **modulate inflammation and support gut health**.
- **Stay physically active** – **Moderate** exercise reduces chronic inflammation and strengthens immune function.
- **Manage stress effectively** – Stress increases **inflammatory responses**. Techniques like **meditation, yoga, or breathing exercises** can help.

#### 5. Medical Monitoring & Consultation

- **Track symptoms regularly** – If you experience skin rashes, digestive issues, or fatigue, monitor your condition, and seek medical advice.
- **Consult a dermatologist** – If you have frequent skin reactions, a dermatologist may recommend **prescription treatments**.
- **Get allergy testing** – An allergist can confirm **nickel sensitivity** and provide **personalized management strategies**.

#### CONCLUSIONS:

Research suggests that individuals with unfavourable **FLG** and **TNF- $\alpha$  variants** are more prone to **nickel-induced allergic reactions and heightened inflammatory responses**. Adopting a **low-nickel diet, maintaining a strong skin barrier, and following an anti-inflammatory lifestyle** can significantly reduce symptoms and enhance overall well-being.

By taking proactive measures, you can **effectively manage nickel sensitivity and improve your quality of life**.

## BIBLIOGRAPHY

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Nickel Sensitivity Sample Report