



## Obesity – Nutrition – Genetics

### Benefits of this Genetic Test:

There are a number of genes and gene variants that are associated with obesity and obesity-related disorders. Knowing your genetic profile will allow you to adopt a personalized diet and lifestyle plan that gives you the best chance of losing weight while protecting your health.

Nutri inCode® is a **personalized medicine** service that studies and integrates genetic and clinical data and information about patients' lifestyles in order to establish patients' predispositions to obesity and diseases related to it.

Persons with a genetic predisposition to weight gain will be more sensitive to environments that encourage people to eat unhealthily and not do enough exercise. The **genetic predisposition to common obesity** is complex; more than 80 genetic polymorphisms in more than 60 genes related to different nutritional aspects are analyzed. Below is an overview of the various aspects covered by the variants in genes tested in the Nutri inCode® test, based on which recommendations regarding diet and lifestyle will be made:

		SNPs*	GENES
Reduction	Caloric expenditure	11	10
	Satiating capacity	12	8
Response to	Low calorie diet	9	9
	Exercise	5	5
	Type of fatty acid	5	5
	Complex carbohydrates	1	1
	Mediterranean diet	1	1
Increased need for	Folates	1	1
Genetic risk	Hypercholesterolaemia (high LDL-C and/or low HDL-C)	14	9
	Hypertriglyceridaemia	9	6
	Diabetes / metabolic syndrome	14	14
	Osteoporosis	7	5
	Hypertension	4	3
	Obesity in general	32	24
	Abdominal obesity	11	9

variants analysed by the Nutri inCode  
 \*SNP: single-nucleotide polymorphism



## Obesity – Nutrition – Genetics

(continued)

**Who may benefit:** - Patients who have tried many diets with little success  
- Patients easily regain weight after weight-loss diets  
- Children or young people with unclear cause of obesity

**Indications:** Overweight and obesity are the most common cardiovascular risk factors among patients with diagnosed coronary disease. Obese persons have a lower quality of life and a shorter life expectancy than the average individual.

Obesity is also considered a causal factor for the following conditions:

- type 2 diabetes mellitus
- hypertension
- obstructive sleep apnea
- gastro-esophageal reflux
- degenerative joint disease
- non-alcohol related fatty liver disease

**Sample materials:** Saliva (tubes and swabs will be supplied to the patient in a collection box), serum and NaF-blood (fasting)

**Preanalytics:** Do not eat, smoke or chew gum for 30 minutes before collecting the saliva

**Method:** PCR

**TAT:** 4-6 weeks

**Note:** There is a personal questionnaire to be completed by the patient regarding the patient's history, eating and lifestyle habits.

Blood samples are required for a lipid profile (cholesterol, triglycerides), glucose and liver enzymes (GGT, AST, ALT, AP), which will be measured at FML.

**Report:** The report includes the individualized genetic profile risk for obesity and related metabolic disorders with recommendations, a personalized diet plan, and a personalized lifestyle plan.

### References:

1. Bell CG, Walley AJ, Froguel P. The genetics of human obesity. *Nat Rev Genet.* 2005 ;6:221-234.
2. Hinney A, Vogel CI, Hebebrand J. From monogenic to polygenic obesity: recent advances. *Eur Child Adolesc Psychiatry.* 2010 Mar;19(3):297-310.
3. Rankinen T, Zuberi A, Chagnon YC, Weisnagel SJ, Argyropoulos G, et al. The human obesity gene map: the 2005 update. *Obesity (Silver Spring).* 2006 Apr;14(4):529-644.
4. WHO: Obesity and overweight [internet]. Available at: <http://www.who.int/mediacentre/factsheets/fs311/es/> (access date: 11/3/2013).