Warning.
Although genetic testing can provide important information for the diagnosis, treatment, and prevention of health conditions, there are limitations. For example, if you are a healthy person, a positive genetic test result does not mean that you will develop a health condition other than your current one. On the other hand, in some situations, a negative result does not guarantee that you will not have a certain disorder. Test results are intended for educational purposes only and not for diagnostic use. Any results from the analysis of genome sequence information that may be considered medically relevant must be confirmed using other tests (analysis). If you have questions or concerns about what you learn from these informative genome sequence tests, you should talk to your doctor or a licensed genetic counselor.

Ruling out celiac disease in symptomatic individuals.

The role of evolution.
Despite its low nutritional value, gluten has an important structural role because it allows flour to be baked. Over the last 5,000 years, that is, since man evolved from a hunter and gatherer and therefore a consumer of meat, fish and fruit to a farmer and consumer of wheat, wheat species have been selected for a single specific quality: the quantity of gluten. The protein constitutes up to 50 percent of the total proteins in the wheat used today. Not everyone has adapted to this rapid change and approximately 1 percent of the population develops gluten intolerance. Although the pathogenesis of celiac enteropathy is not yet completely clear, it is now established that the trigger of the disease requires both endogenous elements (genetic predisposition) and exogenous elements (gluten). The role of the hereditary component is demonstrated by the following observations:

- 8-10% of celiac first-degree relatives are silently affected by the disease,
- there is a 75% concordance in monozygotic twins.

The genetics of celiac disease.
The predisposition to gluten intolerance is transmitted through the alleles of the major histocompatibility complex class II. The sum of the frequencies of the HLA genes DQA1*0501, DQB1*0201 (DQ2) and DQA1*0310 and DQB1*0302 (DQ8) are found in 90% of celiac patients. The DQ2 complex is also present in 25% of the general population. While on the one hand this genetic test does NOT allow the confirmation of celiac disease, on the other hand it allows it to be excluded in individuals with symptoms and manifestations such as diarrhea (malabsorption), weight loss, abdominal pain after consuming wheat, growth arrest in children, anemia, or bone fragility. In fact, **if neither of the two genes tested (HLA-DQ2 or HLA-DQ8) is present, celiac disease can be excluded**.
HLA testing can therefore be used to:

- Virtually rule out celiac disease in symptomatic patients who have self-initiated a gluten-free diet.
- HLA testing can also be useful in clarifying a diagnosis. For example, in those with equivocal serology or biopsy results.
- It can be used to rule out celiac disease if the HLA-DQ2 or DQ8 genetic test is absent and would warrant further testing if DQ2 or DQ8 were found.
- It is used in screening tests of the general population.
- Genetic testing can be used to identify individuals at risk, particularly first-degree relatives of patients with celiac disease. Although the 2013 American College of Gastroenterology guidelines do not recommend routine testing of relatives, the European Society for Pediatric Gastroenterology, Hepatology and Nutrition guidelines endorse HLA testing in high-risk groups, including first-degree relatives, based on the high negative predictive value.

As we all know, DNA is a double helix, which contains two copies of the genome, one that comes from the mother and is contained in her oocytes, and the other from the father in his spermatozoa. At the time of conception, the two copies unite in the maternal oocyte, after the spermatozoon has injected its copy into the oocyte itself to give life to a new organism. The test analyzes the DNA for the presence of the two genes of the histocompatibility complex DQ2 and DQ8 which may be present or absent and in the latter case therefore exclude celiac disease.

Scientific literature.
Brown NK., Guandalini S., Semrad C. and Kupfer SS.(2019). A Clinician's Guide to Celiac Disease HLA Genetics. Am. J. Gastroenterol. 114 (10): 1587-92. doi: 10.14309/ajg.0000000000000310.