

THE MICROBIOTA

Definition :

The microbiota refers to all microorganisms (= microbes) in a given environment. Our body hosts such microbes in the intestine (the «intestinal microbiota»), but also on the skin, mucous membranes, and even in the lungs. These microbes can play beneficial roles, such as vitamin K synthesis, or on the contrary cause infections, or influence the functioning of our immune system.

In Rheumatoid Arthritis (RA)

There is a strong association between certain gum infections (periodontitis) and RA. Bacteria present in the oral microbiota may contribute to initiate immune system disorders. The stool composition of some patients in the early stages of RA also shows a certain «imbalance». It is difficult to say that this is directly related to RA; however, laboratory mice whose intestines are colonized by these «unbalanced microbiota» become more susceptible to the induction of autoimmune diseases. It is therefore assumed that a microbiota that is too «unbalanced» would cause chronic inflammation in the mucous membranes of the mouth, lungs or intestine, and that this phenomenon would allow or promote immune system dysfunctions leading to RA. This type of mechanism is also involved in other autoimmune diseases.

Our hopes

The aim of the research we are conducting is to better characterize these «imbalances» in the intestinal flora that may be involved in the development of RA. These phenomena are fairly well studied in mice, but we lack human data to support these hypotheses. A better understanding of these mechanisms would allow us to select individuals at higher risk of developing RA, or in early stages, and offer them more preventive interventions, such as periodontitis treatment, diet, use of specific pro/prebiotics, etc. Stool transplantation is sometimes performed by individuals outside Switzerland, but the current state of our knowledge does not allow us to propose such an intervention at this time.

Rheumatoid Factors (RFs)

RFs are immunoglobulins (IgG) that bind to our own antibodies (= autoantibodies). They are a kind of «anti-antibodies». RFs have a fairly good diagnostic value in rheumatoid arthritis (RA): they are present in about 80% of patients with RA (the test is said to be quite “sensitive”), but they are also sometimes present in healthy people, especially the elderly, or in other inflammatory diseases (especially in other types of arthritis and in some infections). There are different RF isotypes (IgM, IgA and IgG) and different laboratory tests have been developed to quantify them. As part of the SCREEN-RA study, we will send you the result associated with RFs, and we will tell you whether it is positive (RFs present) or negative (RFs absent).

ACPA (or «anti-CCP»)

ACPAs are autoantibodies that bind citrullinated proteins (“Anti-Citrullinated Peptide Antibodies”; ACPA). These citrullinated proteins are normal proteins that have been slightly modified by the body using the amino acid citrulline. Some people will react against these modified proteins by making antibodies against the citrullinated proteins, the ACPAs. ACPAs have a higher diagnostic value for RA than RFs. They are present in about 70-80% of patients with RA and are rarely present in healthy people or people with other diseases. There are several laboratory tests available to detect ACPA (e.g., anti-CCP2 test (most common), anti-CCP3 test). In the SCREEN-RA study, we will send you the serological result associated with several ACPA tests, and we will simply tell you whether the result is positive (ACPA present) or negative (ACPA absent). If you receive multiple emails from us regarding a result from an ACPA test, it simply means that we have confirmed the result with another ACPA test.

“Shared epitope”

There are several hereditary factors involved into the development of RA. The best-studied and most significant genetic marker for RA is a region of the HLA-DRB1 gene, known as the «shared epitope». The genetic variations of the «shared epitope» increase the ‘avidity’ of certain immune cells for citrullinated proteins, making them more able to recognize, or to «bind», citrullinated proteins. The shared epitope is, however, found in many people who will never develop RA, and the accuracy of genetic tests remains insufficient for use as a screening tool for RA. Each person has two copies of genes, one from the mother and one from the father. This means that one can have ‘zero’, ‘one’ or ‘two’ copies of the shared epitope. Only the presence of two copies significantly increases the risk of developing the disease. We will tell you the number of copies of the ‘shared epitope’ that we find in your blood sample: 0 or 1 or 2 copies.