GLOSSARY Nº2: Immunological Tests

What type of **DIAGNOSTIC TESTS** can be done to measure/monitor **immunological parameters**?

BLOOD TESTS

SKIN TESTS

BREATH TESTS

Test name	How does it work?	What does it tell us?	Examples	What type of test is it?
Autoantibodies tests	Autoantibodies are antibodies (immune proteins) that attack one's own body. There are several tests that identify such antibodies, being the most common the **antinuclear antibody (ANA)** test.	It determines if a person's immune system is predisposed to attack their own body tissues. There are also autoantibody tests specific for one organ.	➢ Antineutrophil Cytoplasmic Antibodies (**ANCA**); ➢ Anti-Double Stranded DNA (**anti-dsDNA**); ➢ Anticentromere Antibodies (**ACA**); ➢ Cyclic Citrullinated Peptide Antibodies (**CCP**); ➢ Extractable Nuclear Antigen Antibodies (e.g., **anti-SS-A (Ro) and anti-SS-B (La), anti-RNP, anti-Jo-1, anti-Sm, Scl-70**); ➢ Rheumatoid Factor (**RF**).	Blood test

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Adhesion molecules/Surface markers tests	Measure the levels of each type of immune cell (identifies immune cells subsets).	If the cell counts are increased or decreased (**compared to reference values**), it can tell us if there is any underlying immunological problem.	➢ **CD45** (white blood cells); **CD4/CD8** (T cells); **CD19** (B cells); **ICAM-1** (Antibodies)	Blood test
Breath tests	Analyse the person's breath by measuring the amount of certain exhaled gases.	Help in the diagnose certain infections.	➢ **Urea test** assists in the diagnosis of infections by ***Helicobacter pylori***	Breath test
C-reactive protein (CRP)	Measures the levels of a substance produced by the liver in response to inflammation (the **C-reactive protein**).	↑ (high) **CRP count** can be indicative **infection** or autoimmune disease presence.	➢ It's **commonly measured** in the **complete blood count test**	Blood test
Challenges with T-dependent antigens and challenges with T-independent antigen	Determine if **B cells** (specialised immune antibody producing cells) and **T cells** (specialised immune cells) are **working** and **communicating well**.	Help establish the concrete cause of immune problems.	➢ Lymphocyte transformation test (**LTT**)	Blood test
Complete blood count (CBC)	It's one of the most routinely done tests. It measures the concentration of white blood cells (**WBC**), red blood cells (**RBC**), and **platelets** in the blood.	Assists in the diagnosis of **anemia** and **immune disorders**.	➢ **The following parameters usually appear in a CBC:** **RBC (red blood cells)** **Platelets** **WBC** (white blood cells) **Differential count (%)** Neutrophil **(NE)** Lymphocyte **(LY)** Monocyte **(MO)** Eosinophil **(EO)** Basophil **(BA)**	Blood test
Complement factors (e.g. C3, C3a, C3d C1q. C2) tests	Assays that measures the **activity of the complement system** (a set of immune proteins)	Each component of this system may be analysed, to determine if any is lacking or deficient.	➢ Complement fixation assay; ➢ Total complement activity assay (CH50)	Blood test

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Cytokines (e.g TNFα, IFN-γ,IL-10,IL-2)	Assays that **measure the levels of cytokines** (proteins that stimulate or repress the immune response).	Depending on the **amount** (in comparison with reference values) and **type** (anti/proinflammatory) **of cytokines present** it can help understand and monitor infection/inflammation/autoimmune disease.	Cytokine panel	Blood test
Delayed-type Hypersensitivity (DTH) skin test	The infection agent (or rather the portion of the infection agent that triggers an immune response) is injected under the skin.	Determines if the patient has been exposed or is infected by the germ under analysis	Tuberculin skin test (the most common. It determines if the patient has tuberculosis)	Skin test
Erythrocyte sedimentation rate (ESR or sed rate)	Measures the rate at which **red blood cells** (RBC) sediment (deposit) in a period of one hour.	A **simple, non-specific** and **inexpensive test** that detects **inflammation** associated with **infection** and/or **autoimmune diseases**.	Not applicable	Blood test
Immunoglobulin count/analysis (e.g. IgG, IgM, IgA, IgE)	**Count of immunoglobulins** (Ig) (antibodies) levels present in blood.	Higher or lower than normal/reference values can be signs of **infection** and **immune deficiency**, respectively.	Not applicable	Blood test
Leukogram (total leukocyte count/total white cell count)	It's the count and distribution of all the white blood cells (**WBC**) present in blood.	Counts that are **higher** or **lower** than reference values are indicative of **infection and immune deficiency**, respectively.	➢ **The following parameters usually appear in a leukogram:** **WBC** (white blood cells) **Differential count (%)** Neutrophil **(NE)** Lymphocyte **(LY)** Monocyte **(MO)** Eosinophil **(EO)** Basophil **(BA)**	Blood test
Lymphocyte proliferation assay	This assay measures the **capability of lymphocytes** (B and T cells) to **divide and multiply** upon exposure to substances that stimulate division.	<u>If the lymphocytes are normal they will divide as expected.</u> In certain immune diseases, lymphocytes ability to divide is impaired, thus leading to infections.	Not applicable	Blood test

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Oxidative burst test	The oxidative burst is a **crucial chemical reaction t**hat occurs in some immune cells. The **release of these chemicals** happens when specific immune cells are infected by bacteria or fungi.	Helps establish if the patient is suffering from an **infection.**	Not applicable	Blood test
Phagocytosis test	Some immune cells eliminate **germs** (microorganisms) by "**eating them**", as they engulf and digest the microorganisms. This process is called **phagocytosis** and it's one of the main innate immune responses.	Determines if this response (phagocytosis) is occurring, and the cells carrying it out are not impaired.	Microbicidal Activity Assay, Chemotaxis assay, NBT reduction Assay	Blood test
Skin prick test	This checks for **immediate allergic reactions** to different substances (e.g **pollen, mold, pet fur, dust mites or foods**).	Determines if the **patient suffers from allergies.**	Not applicable	Skin test