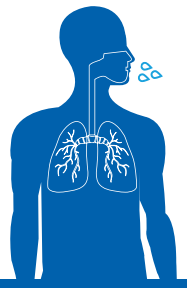
The diagnostic of tuberculosis

What are the current diagnostic methods for tuberculosis ?



Key figures

1.4 MILLION
people died of tuberculosis

10 MILLIONS
people have contracted the disease

WHO figures - 2019

2nd cause of death from an **infectious agent** in the world

Which methods?

Diagnostic types

CLINIC

The patient has symptoms (cough with sputum, fever, altered general condition, weight loss, etc). The patient's history should also be taken into account.

RADIOLOGY

X-rays of the lungs may show abnormal opacities suggestive of the disease (nodules, caverns, infiltrates).

IMMUNOLOGIC

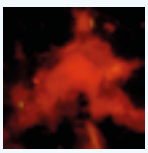
The immunologic tests used are an aid to diagnostic in order to determine wether the patient has latent tuberculosis. This can develop into active contagious tuberculosis.

BACTERIOLOGIC

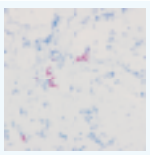
Bacteriology diagnostic makes it possible to confirm the disease and to identify an antibiotic resistance through several analyses (microscopy, PCR, antibiogram, etc).

Microscopic examination allows to show the presence of **acid-fast-bacilli** (AFB). It is a simple, quick and inexpensive test. Today, 2 stainings are used : the **Ziehl-Neelsen staining** to determine the morphology of the mycobacteria and the **Auramine staining** to quickly identify the presence of mycobacteria.

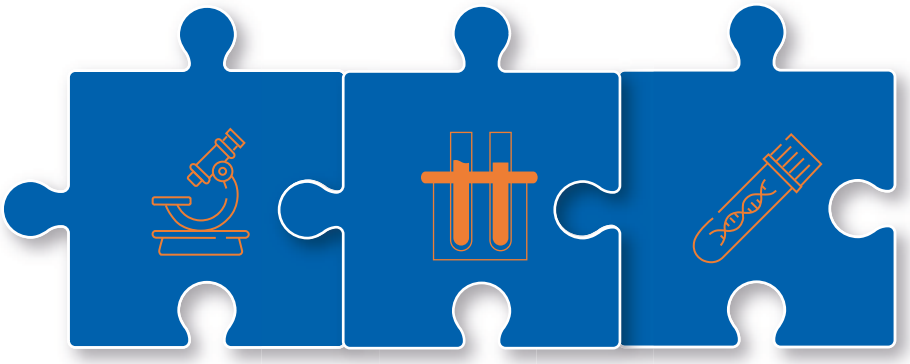
The **GeneXpert® test** (PCR technique) is a **reliable** and **rapid** method. This technique allows the detection of **mycobacteria** and their possible **resistance** to rifampicin within 2 hours.



Auramine staining



Ziehl-Neelsen staining



Culture allows the recognition of the mycobacterial strain and the confirmation of the diagnostic. Despite **slow growth**, the combination of solid and liquid cultures is the **most efficient method** with a detection threshold of **10 to 10^2 bacilli/mL** of sample.

To conclude

The emergence of **new rapid tests for tuberculosis** in recent years is a **real advance** in terms of faster treatment of patients. These tests are therefore **recommended as first-line intention** in tuberculosis **endemic areas**. However, they are expensive and require staff training. Moreover, a negative PCR result does not automatically exclude tuberculosis. **Staining** is therefore **recommended**, followed by **culture**, which remains the **essential step to confirm the diagnostic.** Currently, the diagnostic scheme for tuberculosis consists of a **combination of these three complementary techniques.**