

## Why is the QuantiFERON-TB Gold (QFT) TB screening blood test used?

It is important to exclude the possibility of tuberculosis (TB) infection in members of the University who, as part of their work or research, will be coming into contact with patients or other vulnerable groups. A QFT test may be required if:

- BCG vaccination history is unclear, or a BCG vaccine has never been given.
- The individual has had possible contact with TB through their work, family or social network.
- The individual has lived in a country with a high prevalence of TB for more than three months (consecutively or cumulatively), or was born in a high TB prevalent country. For additional country information (use v to search country) see: [https://worldhealthorg.shinyapps.io/tb\\_profiles/?inputs\\_entity\\_type=%22country%22&iso2=%22AF%22&lan=%22EN%22](https://worldhealthorg.shinyapps.io/tb_profiles/?inputs_entity_type=%22country%22&iso2=%22AF%22&lan=%22EN%22)

## What is the QFT test?

The QFT is a type of Interferon Gamma Release Assay (IGRA) test. It is a screening blood test used to identify whether an individual is currently infected with TB, either active or latent.

The QFT/IGRA test **does not** show immunity to TB, whether acquired by either BCG immunisation or natural immunity.

## Active and latent TB

Pulmonary TB (TB in the lungs or throat) is infectious. Transmission usually occurs through the inhalation of infectious droplets and usually requires prolonged close contact with an infectious person. Some surgical and post mortem procedures can also increase the risk of TB transmission. In most healthy people the immune system kills the bacteria (*Mycobacterium tuberculosis*) and no symptoms develop.

Active TB - the immune system fails to kill the bacteria, it spreads within the lungs/throat or other parts of the body (non-pulmonary TB) and can have serious consequences if left untreated. Symptoms develop within a few weeks, or can take several months. Non-pulmonary TB is not infectious to others.

Latent TB - the immune system does not completely kill the bacteria, but prevents it spreading in the body. It remains dormant in either the lungs or other sites in the body. No symptoms develop and people with latent TB are not infectious. If circumstances are favourable, particularly if the immune system becomes weakened, latent TB can 'reactivate' into active TB. This may be after many years have elapsed. About one in ten latent infections eventually progress to active disease which, if left untreated, can have serious consequences.

## The QuantiFERON-TB Gold (QFT)

The QFT test kit consists of four sample tubes which are lined either with the TB antigens ESAT-6, CFP-10 or with control substances that enable any reaction to be measured and analysed. When a blood sample is taken from an individual with latent or active TB infection it contains T cells that are only present in a person with a current infection. These T cells are not present in the blood of individuals who are not infected or who have recovered from TB in the past. When these TB specific T cells come into contact with the TB antigens lining the QFT sample tubes they release the cytokine Interferon-gamma (IFN-  $\gamma$ ). The QFT test measures the level of Interferon-gamma (IFN-  $\gamma$ ) in the blood sample and from this the likelihood of current TB infection is calculated.

## Interpreting the QFT test result

A negative result indicates that active or latent TB infection is unlikely. No further action is required.

A positive result indicates that an individual has been exposed to and infected by TB in the past. A chest x-ray and referral to the Chest Clinic by Occupational Health are the first steps to establish whether the TB is latent or active and if treatment is required. TB is usually curable with a course of antibiotic treatment over a number of months. Further advice will be provided by the Chest Clinic.

An indeterminate result indicates that the test did not give a definitive negative or positive result, therefore, the likelihood of TB infection could not be ascertained. This could be due to difficulties with sample processing, the effect of certain medications e.g. immunosuppressives, or a problem with the individual's immune system.

An equivocal result indicates a borderline positive result

Following an indeterminate or equivocal QFT result, the test is repeated. The test is repeated as directed by the pathology laboratory, this can be immediately or after two to eight weeks.

If the test is still indeterminate or equivocal, advice from Chest Clinic (Clinic 2a, Respiratory Medicine) at Addenbrooke's Hospital is sought and referral made as needed.

## Useful websites

<https://www.nhs.uk/conditions/tuberculosis-tb/>

<https://www.thetruthabouttb.org/>

Should you have any further questions please contact:

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**Occupational Health**

**QuantiFERON-TB Gold (QFT)**  
**Tuberculosis screening blood tests**

**OHL12**