DermNet NZ

Authoritative facts about the skin from the New Zealand Dermatological Society Incorporated.

Home | Fungal

Laboratory tests for fungal infection

To establish or confirm the diagnosis of a fungal infection, skin, hair and nail tissue is collected for microscopy and culture (mycology).

Ultraviolet radiation (a Wood's light) can help identify some fungal infections of hair (tinea capitis) because the infected hair fluoresces green.

Specimen collection

Specimens for fungal microscopy and culture may be:

- Scrapings of scale, best taken from the leading edge of the rash after the skin has been cleaned with alcohol.
- Skin stripped off with adhesive tape, which is then stuck on a glass slide.
- Hair which has been pulled out from the roots.
- Brushings from an area of scaly scalp.
- Nail clippings.
- Skin biopsy.
- Moist swab from a mucosal surface (inside the mouth or vagina) in a special transport medium.
- A swab should be taken from pustules in case of secondary bacterial infection.

They are transported in a sterile container or a black paper envelope.

Direct microscopy

The material is examined by microscopy by one or more of these methods:

- Potassium hydroxide (KOH) preparation, stained with blue or black ink
- Unstained wet-mount
- Stained dried smear
- Histopathology of biopsy with special stains.

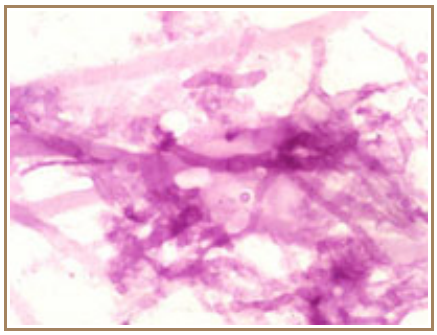
Microscopy can identify a dermatophyte by the presence of:

- Fungal hyphae (branched filaments) making up a mycelium
- Arthrospores (broken-off spores)
- Arthroconidia (specialised external spores)
- Spores inside a hair (endothrix) or outside a hair (ectothrix).

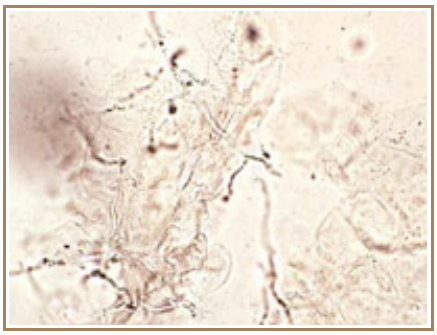
Fungal elements are sometimes difficult to find, especially if the tissue is very inflamed, so a negative result does not rule out fungal infection.

A yeast infection can be identified by the presence of:

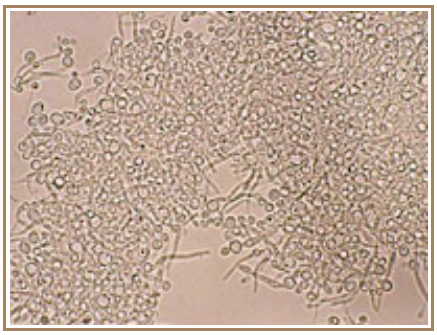
- Yeast cells, which may be dividing by budding
- Pseudohyphae (branched filaments similar to those of a dermatophyte) forming a pseudomycelium.



PAS stain of
aspergillus seen
in a skin biopsy



Potassium hydroxide
(KOH) preparation
of microsporum canis
showing hyphae



KOH preparation
of candida
showing pseudohyphae

Culture

Culture identifies which organism is responsible for the infection:

- To find out the source of infection e.g. a particular animal
- To select the most suitable treatment.

Growing the fungus in culture may take several weeks, incubated at 25-30°C. The specimen is inoculated into a medium such as Sabouraud's dextrose agar containing cycloheximide and chloramphenicol. The cycloheximide is left out if a mould requires identification.

A negative culture may arise because:

- The condition is not due to fungal infection.
- The specimen was not collected properly.
- Antifungal treatment had been used prior to collection of the specimen.
- There was a delay before the specimen reached the laboratory.
- The laboratory procedures were incorrect.
- The organism grows very slowly.

Culture of yeasts and moulds may be due to harmless colonisation rather than infection. The infection may be secondary to an underlying skin disesase such as psoriasis.

Blood tests

Blood tests are not useful for the diagnosis of superficial fungal infections. But in subcutaneous and systemic infection, several tests may be useful.

- Culture
- Antibodies (histoplasmosis, coccidioidomycosis)
- Antigen (cryptococcosis, aspergillus, candidosis, histoplasmosis)

Related information

On DermNet NZ:

- Introduction to fungal infections
- Dermatophytes
- Candida
- Malassezia
- Moulds

Books:

See the DermNet NZ bookstore

DermNet does not provide an on-line consultation service.
If you have any concerns with your skin or its treatment, see a dermatologist for advice.