



# Mycology Reference Centre, Leeds

## Information for Service Users

### February 2011

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#### The Mycology Reference Centre

The Mycology Reference Centre is situated in the Old Medical School, within the Leeds Teaching Hospitals NHS Trust (LTHT) Department of Microbiology.

#### Contact details:

Mycology Reference Centre  
Old Medical School  
Thoresby Place  
LEEDS, LS1 3EX  
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**URL** [www.pathology.leedsth.nhs.uk/Pathology/](http://www.pathology.leedsth.nhs.uk/Pathology/)

#### and go to the Mycology Department

Hayes DX address: DX 6281504, Exchange LEEDS 90 LS.

Consultant in charge: Richard Hobson, Tel 0113 392 2835 or email [richard.hobson@leedsth.nhs.uk](mailto:richard.hobson@leedsth.nhs.uk)

Principal Clinical Scientists:

Ruth Ashbee, Tel: 0113 392 8732 or email [ruth.ashbee@leedsth.nhs.uk](mailto:ruth.ashbee@leedsth.nhs.uk)

Richard Barton, Tel 0113 3923390 or email [richard.barton@leedsth.nhs.uk](mailto:richard.barton@leedsth.nhs.uk)

Lead Biomedical Scientist: Chris Goodall Tel: 0113 392 8748 or email [christopher.goodall@leedsth.nhs.uk](mailto:christopher.goodall@leedsth.nhs.uk)

#### Opening hours:

The laboratory is open from 09:00-17:00 Monday to Friday. It may be possible to organise specific testing outside these times after discussion with senior staff.

#### Clinical/laboratory advice and report interpretation:

Advice is available from the staff members, above. The staff are also happy to advise on mycological issues that do not relate to samples submitted to the Mycology Reference Centre for processing, where possible.

#### Request Forms

Request forms should be filled in for every specimen sent to the laboratory. They should contain as much information as possible, as this may aid interpretation of test results. The minimum information required is: patient name, hospital number, date of birth, the place from which the specimen is being sent e.g. hospital, GP surgery, ward, specimen type and the tests requested.

Request Forms may be downloaded from the mycology website ([www.pathology.leedsth.nhs.uk/Pathology/](http://www.pathology.leedsth.nhs.uk/Pathology/) and go to the Mycology Department) or obtained by email from [christopher.goodall@leedsth.nhs.uk](mailto:christopher.goodall@leedsth.nhs.uk).

#### Specimen Transportation

Specimens should be sent by established transport networks. Specimens from within the Leeds Teaching Hospitals NHS Trust should be sent either via the air tube system or specimen shuttles from other sites. Specimens should be sent via the postal system or Hayes DX and be appropriately packaged. Specimens (tube or packet) must be clearly labelled with the patients name, and where appropriate a referring laboratory number.

#### Telephone Reporting of Results

The results of the following investigations will be phoned by the laboratory staff routinely:

- Requests marked "Urgent"
- Positive *Aspergillus* antigen result and any new or rising cryptococcal antigen titre
- Microscopy results of CSFs or peritoneal dialysis fluids from LTHT

- Positive urine microscopy results from LTHT
- Antifungal resistance in clinically significant isolates
- Azole assay results

## Fungal Microscopy and Culture

### Microscopy and Culture of Clinical Specimens

*Use(s):* Isolation and identification of all relevant fungi from the following sample types: skin, hair and nail specimens; oral and vaginal swabs; urine; peritoneal dialysis fluid; CSF; respiratory samples (e.g. sputum, broncho-alveolar lavage fluid). For most sample types (with the exception of skin, nail and hair), we would advise referring laboratories to process the primary sample and then send resultant fungal cultures for identification or further testing (See below)

*Description:* Microscopy for yeasts, mycelium, arthroconidia and other fungal elements; culture of any viable fungi present and identification of any clinically significant species. Antifungal susceptibility testing is undertaken where appropriate or requested (see below)

*Specimens:* Skin, nail and hair should be sent in Dermapaks or similar card packs designed for the purpose. Preferably wet specimens are processed locally.

*Results:* Microscopy is reported as "No fungus seen" or positive with a description of the fungal cells seen.

Culture is reported as the identity of any significant fungi isolated, estimation of amount of fungal growth (+, ++, +++) where relevant.

**Mean Turnaround Time: 12 days (90% within 2 days) (microscopy reported within 3-4 days, positive cultures will take longer to report than negatives).**

## Identification and Antifungal Susceptibility Testing

### Yeast identification and sensitivity

*Use(s):* Identification of yeasts and assessment of susceptibility to antifungals

*Description:* Identification, usually to species level using a combination of morphological and nutritional/enzymatic tests. Molecular identification is carried out for those isolates which cannot be identified using phenotypic tests.

Susceptibility testing by CLSI M44A disc diffusion (fluconazole) or microbroth dilution (fluconazole, itraconazole, voriconazole, amphotericin B, flucytosine, caspofungin, posaconazole and ketoconazole). Specific antifungal(s) tested depend on the identity and source of the isolate and the clinical details supplied. Microbroth dilution testing is undertaken where indicated by isolate identity, disc diffusion results, or where requested specifically. The identity of the yeast isolate is always confirmed or carried out on isolates sent for sensitivity testing.

*Specimens:* Culture of yeast, ideally on a Sabouraud's agar slope in a bijoux or universal.

*Results:* Susceptible; Intermediate/Susceptible-dose dependent; Resistant/Non-susceptible (where breakpoints have been established). If microbroth dilution testing is carried out, a Minimum Inhibitory Concentration (MIC) can be reported on request.

Mean Turnaround Time 8.5 days (90% within 4.7 days).

### Mould Identification

*Use(s):* Identification of moulds

*Description:* Identification, usually to species level on the basis of macroscopic and microscopic morphology. Molecular identification is carried out for those isolates which cannot be identified using phenotypic tests.

*Specimens:* Culture of mould, ideally on a Sabouraud's agar slope in a bijoux or universal.

*Results:* Identity of the mould, usually to species level.

Mean Turnaround Time: 8 days (90% within 12 days).

*Note:* Susceptibility testing of mould isolates can be carried out on request.

### Identification of environmental fungi

Identification of yeasts and moulds from environmental sources can be carried out after discussing your requirement with the laboratory. Please contact Dr Richard Barton or Dr Ruth Ashbee to discuss.

*Note:* Culture of environmental specimens is carried out by prior arrangement and on medical or environmental health referral only. Costs are dependant on the extent and complexity of the investigations.

## Antibody Testing

*Note: For antibody tests, please send serum or clotted blood in a plain tube; EDTA blood is not suitable.*

### Aspergillus Antibodies

*Use(s):* Diagnosis of allergic bronchopulmonary aspergillosis, aspergilloma, paranasal sinus aspergillosis, other forms of aspergillosis in immunocompetent patients.

*Description:* Quantitation of IgG antibodies to *Aspergillus fumigatus* in serum using a commercial automated Fluorescent Immuno Enzyme Assay (ImmunoCAP).

*Specimens:* Serum 100 µl minimum or 1 mL clotted blood.

*Results:* Results are returned as mg Antibody per litre (mgA/L) and range from <2.0 to >200. Please see the mycology website (<http://path-2k3-dmz2/pathology/ClinicalInfo/ClinicalServices/MycologyServices/DiscussionofImmunoCAPtesting.aspx>) for comprehensive information on interpretation of Aspergillus ImmunoCAP results.

**Mean Turnaround Time: 3 days (90% within 5 days).**

### Farmers Lung Antibodies

*Use(s):* Detection of antibodies to *Saccharopolyspora rectivirgula* (previously known as *Micropolyspora faenii*) to diagnose Farmers' Lung.

*Description:* Determination of the presence of antibodies to *Saccharopolyspora rectivirgula*. (Detection of antibodies to *Thermactinomyces vulgaris* and *T. thalophilus* is no longer possible as antigens are not available).

*Specimens:* Serum 500 µl minimum or 2 mL clotted blood.

*Results:* Negative, Positive (weak, strong).

**Mean Turnaround Time 5 days (90% within 8 days).**

### Avian Antibodies

*Use(s):* Detection of antibodies to pigeon serum for diagnosis of Bird Fanciers' Lung.

*Description:* Determination of the presence and levels of IgG antibodies to pigeon serum. The method used is a commercial automated Fluorescent Immuno Enzyme Assay (ImmunoCAP).

*Specimens:* Serum 500 µl minimum or 2 mL clotted blood.

*Results:* Results are returned as mg Antibody per litre (mgA/L) and range from <2.0 to >200.

Please see the mycology website (<http://path-2k3-dmz2/pathology/ClinicalInfo/ClinicalServices/MycologyServices/DiscussionofImmunoCAPtesting.aspx>) for comprehensive information on interpretation of Avian ImmunoCAP results.

**Mean Turnaround Time 3 days (90% within 5 days).**

### Histoplasma and Coccidioides Antibodies

*Use(s):* Diagnosis of histoplasmosis and coccidioidomycosis.

*Description: Histoplasma:* Determination of the presence of antibodies to *Histoplasma capsulatum* by immunodiffusion (mycelial antigen) and complement fixation test (CFT; mycelial and yeast antigens).

*Coccidioides:* Determination of the presence of antibodies to *Coccidioides* species by immunodiffusion and CFT.

*Specimens:* Serum 500 µl (*Histoplasma*) or 1ml (*Coccidioides*) minimum or 2 mL clotted blood.

*Results: Histoplasma:* Immunodiffusion: Negative, Positive (M or M+H band); CFT: Negative, Positive (Titre) to mycelial and/or yeast antigens.  
*Coccidioides:* Immunodiffusion: Negative, Positive; CFT: Negative, Positive (Titre).

The CFT is only carried out once a week.

**Mean Turnaround Time *Histoplasma* 7 days (90% within 12 days). *Coccidioides* 8 days (90% within 12 days).**

*Note: Inclusion of travel history is useful for confirming potential exposure to these fungi.*

### Blastomyces and Paracoccidioides Antibodies

*Use(s):* Diagnosis of blastomycosis or paracoccidioidomycosis.

*Description:* Determination of the presence of antibodies to *Blastomyces dermatitidis* or *Paracoccidioides brasiliensis* by immunodiffusion.

*Specimens:* Serum 500 µl minimum or 2 mL clotted blood.

*Results:* Negative, Positive.

**Mean Turnaround Time 4 days (90% within 4 days).**

*Note:* Inclusion of travel history is useful for confirming potential exposure to these fungi.

### Antigen Testing

*Note:* For the following tests, please send serum or clotted blood in a plain tube; EDTA blood is not suitable.

#### **Aspergillus Antigen (Galactomannan)**

*Use(s):* Diagnosis of invasive aspergillosis usually in immunocompromised patients.

*Description:* Determination of the presence of *Aspergillus* galactomannan in serum or BAL by ELISA.

*Specimens:* Serum or BAL 700 µl minimum or 5 mL clotted blood.

*Results:* Negative; Positive with the index value (indicating the relative concentration of galactomannan)

**Mean Turnaround Time: 2 days (90% within 3 days).**

*Note:* Positive results are confirmed before reporting by re-testing the specimen submitted. To improve specificity positives should be confirmed by submission of a second specimen.

#### **Cryptococcal antigen**

*Use(s):* Diagnosis of cryptococcal meningitis, systemic cryptococcosis in both immunocompetent and immunocompromised patients.

*Description:* Determination of the presence of cryptococcal antigen and the titre in the specimen, by latex agglutination.

*Specimen:* Serum or CSF, 300 µl minimum or 2 mL clotted blood.

*Results:* Negative, Positive (Titre).

**Mean Turnaround Time <1 day (90% within 1 day).**

### Antifungal Drug Assays

**Antifungal agents are assayed by liquid chromatography-tandem mass spectroscopy (LC-MS-MS). The results are highly specific and are not influenced by the use of antifungal combination therapy.**

#### **Itraconazole, Posaconazole, Voriconazole**

*Use(s):* Confirmation of adequate levels and alerting to toxic levels in patients receiving antifungal azoles for treatment or prophylaxis of fungal disease.

*Specimens:* Serum 200 µl minimum or 2 mL clotted blood

*Results:* Drug concentration in mg/L, with advice on target levels.

**Mean Turnaround Time: 2.5 - 3.5 days (90% within 4-6 days).**

*Note:* The assay is currently carried out twice weekly on Monday and Thursday, although specimens need to be received the preceding day for processing.

### External Quality Assurance

The Mycology Reference Centre participates in the following EQA schemes: UKNEQAS Fungal Identification; UKNEQAS Antifungal Susceptibility; UKNEQAS Fungal Serology; SKML scheme for antifungal drug assay. We also operate an informal EQA scheme (serum exchange programme) with the Mayo Clinic for endemic mycoses, as no formal EQA scheme is available.

### Further information

**Further copies of this document may be downloaded from**

[www.pathology.leedsth.nhs.uk/Pathology/](http://www.pathology.leedsth.nhs.uk/Pathology/) and go to the Mycology Department (internet) or obtained by email from [christopher.goodall@leedsth.nhs.uk](mailto:christopher.goodall@leedsth.nhs.uk)

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