

Health Protection Agency



Malaria Reference Laboratory

CPA accredited
Ref 2204

Laboratory User Handbook

2008

Department of Infectious and Tropical Diseases
London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT

DX address: HPA Malaria Reference Lab
DX 6641200
Tottenham Crt RD92WC

www.malaria-reference.co.uk

Tel: +44 (0)20 7927 2427
Fax: +44 (0)20 7637 0248

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A. INTRODUCTION

1. The Laboratory and outline of services

The HPA Malaria Reference Laboratory (MRL) is a CPA accredited laboratory based at the London School of Hygiene and Tropical Medicine, which is itself a centre of excellence for scientific research and postgraduate education. The MRL provides an extensive service to users throughout the United Kingdom to include malaria diagnosis, epidemiological data for the HPA Centre for Infections, prophylaxis advice for travellers and technical advice on methodology and laboratory procedures.

The services above are offered to all hospitals, HPA and NHS laboratories, General Practitioners and private medical laboratories throughout the UK and abroad.

Advice on the investigation of malaria and other parasitological diseases is always available; technical teaching sessions can also be arranged for small or large groups.

The laboratory processes around 2000 specimens annually, participates in the NEQAS quality assurance schemes for blood and faecal parasitology and is CPA accredited

2. Laboratory policy

Our policy is to offer a first class national diagnostic and reference facility for malaria and other blood parasites. We are also strongly committed to active research into malaria and its diagnosis and to the provision of training for pathology staffs, other healthcare professionals and those working in the control of infectious diseases.

3. Using this handbook

This handbook is designed to aid and advise the user on the appropriate use of the facilities to include diagnostic, teaching and advisory services. The sections are indexed to assist in understanding the structure of the laboratory, identification of staff, the diagnostic and advisory services offered and the specimens and investigations carried out by the laboratory.

Each section gives an outline of the specimens required for investigation and the tests carried out. This is not an exhaustive list and users not finding a specific requirement should contact the laboratory, which in most cases will be able to help and advise.

Further copies of this handbook can be downloaded from the MRL website at www.malaria-reference.co.uk, where other useful information and related links can also be found

B. LABORATORY AND STAFF

1. Laboratory opening times

The diagnostic laboratory is open between the hours of: -

Monday to Friday 9.00 am to 5.00 pm

when staff are available for advice, information, specimen reception and processing.

Most routine specimens are sent to us by post; any urgent specimens are usually delivered by courier and accepted during the hours stated. Please telephone urgent requests prior to despatch to inform us of their impending arrival and priority status.

Prophylaxis advice

The malaria prophylaxis advisory service is staffed as follows: -

Monday, Wednesday and Friday from 9.30 am to 3.30 pm

Health professionals can obtain advice and discuss appropriate malaria prophylaxis regimes by telephone. Days and times may vary on occasions.

Health Professionals:	020 7636 3924
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2. Out of hours and public holidays

We offer foremost a reference facility and therefore do not provide an on-call service. The majority of specimens we receive will have had preliminary diagnosis made by the sender or primary laboratory and so are usually non-urgent.

Where urgent diagnosis of malaria out of normal hours is required, specimens should be referred to: -

The Department of Clinical Parasitology at the Hospital for Tropical Diseases (HTD), telephone number: 0845 155 5000 and ask for the duty Tropical Medicine Doctor, who will liaise with the on-call Biomedical Scientist.

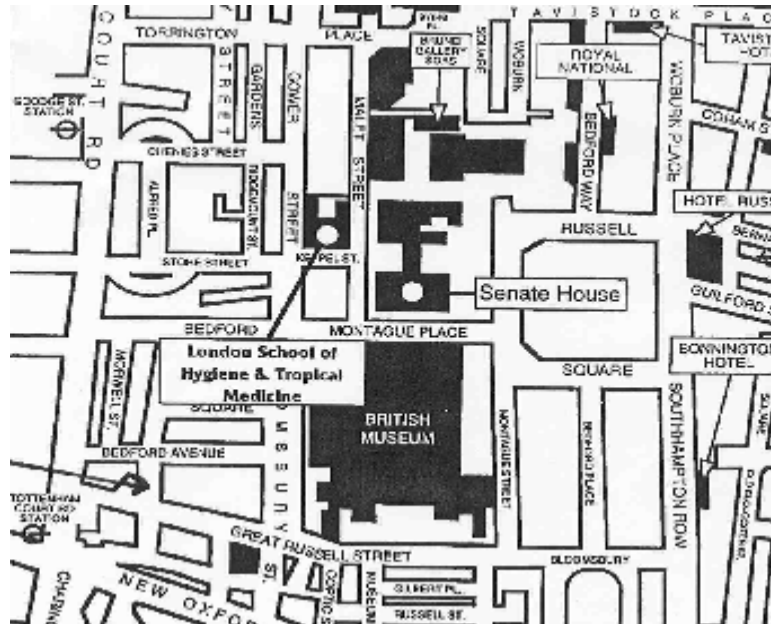
Depending on the origin of the specimen, a charge may be incurred for this service.

Any specimens delivered to the Malaria Reference Laboratory out of normal hours and where no prior arrangement with us has been made will be held and dealt with the next working day. Laboratories are strongly urged to contact us by telephone if samples are likely to arrive after 5.00pm to prevent delay in diagnosis.

The laboratory is usually closed on public holidays; when there is an extended holiday period, for example Christmas and New Year, limited cover is arranged to deal with non-urgent postal specimens, and all users are informed of these arrangements prior to the holidays.

3. Location

The LSHTM is situated close to Tottenham Court Road, Goodge Street and Russell Square underground stations and is 10 minutes walk from Euston Main line station. Car parking is very restricted in the local area and expensive. The LSHTM has no parking facilities of its own



4. Visitors

Visitors should report to the reception desk in the LSHTM entrance foyer; reception staff will then inform the laboratory of their arrival. It is advisable to make appointments in advance. Members of the general public are not normally seen.

5. Staff and telephone numbers

Title or service	Name	Telephone number
<u>Director</u>	Professor P L Chiodini	020 7927 2427
<u>Senior Lecturer and Clinical Scientist</u>	Dr Colin Sutherland	020 7927 2338
<u>Clinical Scientist C</u>	John Williams	020 7927 2318
<u>BMSs grade 4</u>		
Head BMS/ Training Officer	Claire Rogers	020 7927 2318
	Dr Debbie Nolder	020 7927 2343
<u>BMSs grade 3</u>		
Laboratory Supervisor	Juliana Tucker	020 7927 2427
Quality Manager	Dawn Britten	020 7927 2427
<u>BMS grade 2</u>	Dr Martina Burke	020 7927 2343
<u>BMS grade 1</u>	Sarah Cheesman	020 7927 2424
<u>MLA</u>	Susan Passarelli	020 7927 2427
<u>MLA</u>	Emma Victory	020 7927 2427
<u>MLA</u>	Karen Osborne	020 7927 2427
<u>Results/enquiries</u> <u>(technical advice and forms,</u> <u>guidelines etc.)</u>	Laboratory	020 7927 2427
<u>Malaria prophylaxis</u> <u>advice</u>	Marie Blaze	020 7636 3924
	Valerie Smith	020 7636 3924
<u>Laboratory fax number</u>		020 7637 0248

C. DIAGNOSTIC AND ADVISORY SERVICES

1. Information and enquiries

For consultation on the investigation and diagnosis of malaria, interpretation of results and general information, please contact the laboratory on +44 (0)20 7927 2427 from where enquiries can be answered or referred to appropriate personnel.

For advice on malaria prophylaxis regimes please contact the Malaria Advisory Centre on 020 7636 3924. A weekday service is in operation and is available to health professionals who wish to obtain advice and discuss individual patient circumstances and requirements with our advisory staff.

Members of the public should consult their GP or a specialist travel clinic for advice. They may also visit the MRL web site at www.malaria-reference.co.uk, but this is not a substitute for individual advice from a registered healthcare practitioner.

2. Specimen containers

For the majority of investigations, the submitting laboratory or institution will refer specimens in an appropriate container of their choice.

See also pages 11 to 18 for guidelines as to appropriate specimen type for specific investigations

Please telephone us if in any doubt as to which container to use or to discuss specific requirements.

3. Request forms

A request form must accompany all specimens referred to the laboratory.

Malaria blood film diagnosis

The Malaria Reference Laboratory supplies forms (blue when hard copy) specifically designed to provide us with all relevant information. Where possible these forms should accompany all malaria blood film requests and should be completed as fully as possible. Copies may be downloaded from the MRL website at

www.malaria-reference.co.uk

MRL user handbook, October 2008

4. Minimum Data Set

As a guide, the following table sets our minimum data requirements to ensure patient safety. Where specimens/request forms are received that do not meet this criteria, we shall contact the sender for more information but reserve the right to reject the sample.

	ESSENTIAL	DESIRABLE
SAMPLE	<ol style="list-style-type: none"> 1. Full name OR other coded patient identifier 2. DOB &/or Hosp no./ Unit no./ NHS No. 	<ol style="list-style-type: none"> 1. Sending laboratory's ref no. 2. Date specimen taken
REQUEST FORM	<ol style="list-style-type: none"> 1. Full name OR other coded patient identifier 2. DOB &/or Hosp no. / Unit no./ NHS No. 3. Investigation required† 4. Name and address of requesting practitioner† 	<ol style="list-style-type: none"> 1. Sending laboratory's ref no. 2. Date specimen taken 3. Telephone/bleep no. of requesting practitioner 4. Gender 5. Sending lab's diagnosis 6. Clinical information*

† unless evident by nature of form used

**CLINICAL INFORMATION: -*

All relevant clinical details to include where available

- antimicrobial therapy
- travel history
- risk status if applicable
- date of onset and duration of illness
- epidemiological information, for example family/institutional outbreaks

THE ORIGIN OF THE REQUEST MUST BE AN AUTHORISED BODY AND NOT AN INDIVIDUAL MEMBER OF THE PUBLIC

5. Packaging

Packaging must comply fully with UK postal regulations for clinical specimens (UN 602/3373 regulations)

Specimens should be in an appropriate container, securely fastened and in a clear, sealed plastic specimen bag. The accompanying request form should be placed separately in the other pocket of the bag.

The outside of the package must be appropriately marked and clearly state:-

'PATHOLOGICAL SPECIMEN; FRAGILE – WITH CARE'

In those circumstances where specimens are unlabelled or inadequately labelled and the patient's identification is unclear, or if they have leaked or are contaminated, they may be unsuitable for testing. In such instances the requesting laboratory or doctor will always be informed immediately by telephone to discuss the matter and to arrange for repeat specimens if necessary.

As a reference laboratory we do appreciate that some specimens cannot be repeated and every effort is made to avoid the need for repeat requests.

6. High risk specimens and safety

Specimens are regarded as HIGH RISK if taken from patients known, suspected, or at risk of having serious infectious disease.

Of note are blood-borne agents such as hepatitis, HIV, or various viral haemorrhagic fevers or other infectious diseases such as tuberculosis or typhoid.

In addition to the standard packaging instructions above, all high risk specimens must be labelled as HIGH RISK both on the container and the request form, with a standard yellow 'DANGER OF INFECTION' sticker, and placed in a Biohazard bag.

Material from a patient with a known or suspected category 4 infection must be fixed according to appropriate guidelines (available on request) prior to despatch.

7. Specimen transport & reception

Most specimens are received via post or courier.

During normal working hours, all specimens should be taken to the LSHTM reception from where they are forwarded to the reference laboratory. Outside normal working hours, non-urgent specimens may be left at reception; urgent samples should not be left but sent to the HTD as detailed below.

7. Urgent investigations

Urgent specimens are usually delivered by courier and accepted during normal working hours. Please telephone urgent requests prior to despatch to inform us of their impending arrival and priority status.

Please package as described, and additionally mark clearly on the outside as 'URGENT'

Where urgent diagnosis of malaria *out of normal hours* is required, specimens should be referred to the Department of Clinical Parasitology at the Hospital for Tropical Disease (HTD), telephone number: 0845 155 5000 and ask for the duty Tropical Medicine Doctor, who will liaise with the on-call Biomedical Scientist.

Depending on the origin of the specimen, a charge may be incurred.

Any specimens delivered to the Malaria Reference Laboratory out of normal working hours and **where no prior arrangement** with us has been made, will not be dealt with until the following working day.

D. SPECIMENS AND INVESTIGATIONS

1. Specimen collection – general

As a reference laboratory, many specimens received have already had preliminary investigations carried out by a primary laboratory and are sent to us in due course.

In general, specimens should be collected or transferred into an appropriate container and or blood smears made, with an accompanying request form giving all relevant information, including laboratory findings and sent to us with minimal delay.

Please provide a specimen representative of the condition under investigation and in sufficient quantity to permit a full examination – see specific guidelines on pages 12 to 18

Blood

See specific parasitic diseases for guidelines on volume, anticoagulants, blood smears etc.

Serology

In general, a minimum of 1ml of serum is required for serological investigations.

Tissues and biopsies

Under aseptic conditions, transfer material to a sterile universal container. If the sample is very small, add 0.5ml of Ringers or sterile saline to prevent drying.

NB The above guidelines and the following specific parasitic diseases are not intended as an exhaustive list of parasitological investigations available; please contact the laboratory to discuss individual cases, specific requirements or investigations not listed

2. Parasitic diseases and their laboratory investigation

Malaria

Of human importance are *Plasmodium falciparum* (malignant tertian),
P. vivax (benign tertian), *P. ovale* (benign tertian) and *P. malariae* (quartan)

Diagnosis: microscopical examination of thin and thick blood films for malaria parasites and for speciation using Giemsa and Field's stain

parasitaemia estimation to indicate severity of infection and effectiveness of treatment

immunochromatographic techniques for the detection of malaria antigen in blood

PCR for malaria confirmation and species determination when required

serology is no longer performed by this laboratory, but may be obtained from the Department of Clinical Parasitology at the Hospital for Tropical Diseases, telephone number 0845 155 5000 ext. 5413

Specimens: 2 thick (unfixed) and 2 thin (methanol fixed) ready made films sent in a slide box and a sample of EDTA blood from which the initial diagnosis was made (minimum 100 microlitres) for PCR.

Blood is ideally collected during fever, however parasites are found at all stages of the infection and therefore blood films **without delay** are mandatory in all cases of suspected malaria. If the first films are negative, blood should be taken and films made and checked at least two times over the first 24 hours and further films examined every 12 hours after that if strongly clinically indicated.

Blood taken into anticoagulant (EDTA should be used) should have films made as soon as possible to minimise morphological changes in the parasites, and certainly within 2 hours. However, parasites can be detected even after extended exposure to anticoagulant (exceptionally up to 24 hours) and no sample will be rejected unexamined.

NB serology is useful for evidence of current or past infection and is indicated in blood donor screening and in cases of pyrexia of unknown origin and cryptic malaria. It has **no place in the diagnosis of acute malaria.**

BLOOD FILMS ARE ESSENTIAL IN CASES OF ACUTE FEVER OR OTHER SYMPTOMS WHERE MALARIA IS SUSPECTED

Other blood parasites

The Malaria Reference Laboratory (MRL) will deal with all malaria related requests; other blood parasite infections such as American and African Trypanosomiasis, Babesiosis, Filariasis and Leishmaniasis are dealt with by the Diagnostic Parasitology Laboratory (DPL), which is located in the same department as the MRL and shares the same address and telephone number.

For information regarding the organisms, the tests carried out and the specimens required for diagnosis, please refer to the DPL user manual which can be accessed and downloaded at www.parasite-referencelab.co.uk or contact the laboratory staff by telephone on +44 020 7927 2427

3. Laboratory Schedule

Generally, specimen processing is begun on the day of receipt. Specimens that require microscopy only, will often have results available that same day whereas investigations normally processed in batches will take variable periods of time. When complete, final reports are typed and posted the same or next working day - interim reports are available upon request.

Results of any urgent investigations will be telephoned to the requesting laboratory immediately.

As a guideline:-

Malaria:-

Diagnosis by blood film and/or immunochromatographic techniques:
processed fully on day of receipt - results reported within 1-2 working days.
Diagnosis by PCR will take 2 – 10 working days.

Serology:-

Malaria antibodies

Specimens are now processed by the Parasitology Reference Laboratory at the HTD and those received by the MRL will be forwarded to the HTD, or laboratories can send specimens directly to the HTD at the following address:
The Department of Clinical Parasitology, Hospital for Tropical Diseases,
Mortimer Market, Capper Street, London, WC1E 6JB; Tel. 0845 155 5000 ext. 5413

4. Charges

At present all testing carried out by the reference laboratory for National Health Laboratories and HPA laboratories within England and Wales is without charge. Similar laboratories outside England and Wales will be subject to charge and these can be made available on request

Should there be any change to this, all laboratories will be given a minimum of 3 months advance notice.

There is a charge made for work received from private laboratories and other institutions and these can be obtained on application.

E. RESULTS AND REPORTS

1. Written reports

Reports are printed and despatched each working day.

In most cases it can be assumed that the written report is final, however if further results are to follow, or if a repeat specimen is required, this will be clearly stated. Interim reports, where necessary, will normally be given by telephone and confirmed in a full and final written report.

Interpretation of results and comments on individual cases will be given where required.

Please contact the laboratory on 020 7927 2427 to obtain results or to arrange for copies of reports.

2. Telephone reports

Results of urgent investigations, those which may aid immediate patient management, or any results specifically requested by the sending laboratory will be telephoned as soon as they become available.

The member of staff who has undertaken the investigation will usually give the telephone report; the name and status of the person to whom results are given will be required for our records. The Clinical Scientist or Laboratory Director will telephone to discuss results where interpretation or advice is required.

The results of some investigations may be rapidly available and to aid the management of certain infections will be telephoned immediately. Examples are:

- Primary diagnosis of malaria by microscopy and/or immunochromatographic techniques
- *P. falciparum* where undiagnosed by the requesting laboratory
- Any other pathogen where prompt initiation of treatment is considered necessary.

All telephoned reports, whether initiated by the reference laboratory or the requesting laboratory, will be confirmed with a written report.

Please contact the laboratory on 020 7927 2427 to obtain results.

MRL user handbook, October 2008

3. Fax results

Should the submitting laboratory require, the reference laboratory can fax interim and final results to a secure fax line.

4. Archiving of reports

All reference laboratory copies of written reports (to which the original request form is attached) are held in secure, locked storage for a minimum period of 5 years.

5. Obtaining information and results

Staff are always available during laboratory opening hours to discuss results and to give advice and information.

Please contact the laboratory on 020 7927 2427 from where queries can be answered or referred to the Clinical Scientist or Laboratory Director as appropriate.