



Molecular Biology and Genomics Centre

USER MANUAL

This manual is designed to give an overall view of the services available in Mbg centre. It is intended as a quick reference guide. This manual will be updated periodically, therefore any unauthorised printed copies are uncontrolled and care should be taken to ensure that the current version is utilised.

Table of Contents

1. LABORATORY INFORMATION	3
1.1. INTRODUCTION	3
1.2. LOCATION.....	3
1.3. CONTACT INFORMATION	3
1.4. MISSION and VISION STATEMENT	3
1.5. WORKING HOURS	3
1.6. REQUESTS.....	3
1.7. EMERGENCY/ OUT OF HOURS REQUESTS.....	4
1.8. ACCREDITION/ LICENSURE	4
1.9. CONFIDENTIALITY.....	4
1.10. Communicable Disease Notification Policy.....	5
2. SCOPE OF SERVICES PROVIDED.....	5
3. SENDING A SAMPLE	5
3.1. COMPLETING A REQUEST FORM	5
3.2. SERVICE AGREEMENT.....	6
3.3. SAMPLE COLLECTION AND TRANSPORT	6
3.4. INFECTION HAZARDS AND HIGH-RISK SAMPLES.....	7
3.5. ACCEPTANCE AND REJECTION CRITERIA.....	7
3.6. TURN-AROUND TIME	8
3.7. FACTORS THAT AFFECT THE PERFORMANCE OF THE ASSAY	8
3.8. REQUESTING ADDITIONAL EXAMINATIONS.....	9
4. RESULTS	9
5. REPORTING EMERGENCY/CRITICAL OR URGENT RESULTS.....	10
6. CUSTOMER SATISFACTION	10
7. VETERINARY MOLECULAR DIAGNOSTIC SERVICES	10
7.1. Pathogen Identification Assays.....	10
7.2. Avian Sexing	10
7.3. Animal Genotyping	11
7.4. Paternity Verification	11
7.5. Species identification	11
7.6. Genomic Services	11
7.7. Equine Coat Colour	11
8. MEDICAL DIAGNOSTIC SERVICES	11
8.1. Molecular Pathogen Identification Assays.....	11
8.2. Genomic Services	11
8.3. Immunology.....	12
9. CYTOGENETICS.....	12
10. REGENERATIVE STEM CELL THERAPY	12
11. MOLECULAR GENOMIC TECHNIQUES.....	12
12. RESEARCH AND DEVELOPMENT.....	13
13. EDUCATION AND TRAINING	13

1. LABORATORY INFORMATION

1.1. INTRODUCTION

The **M**olecular **B**iology and **G**enomics **C**entre (**MBG Centre**) is a modern facility designed to support an extensive and diverse range of scientific research. It includes large testing areas with state-of-the art equipment, safety features and office space. Our interests mainly surround the field of molecular biology, genetics, cell biology and genomics.

1.2. LOCATION

Address: Molecular Biology and Genomics Centre
17th Street, 2ndZa'abeel Road
Dubai, UAE
P.O Box: 597, Dubai, UAE



1.3. CONTACT INFORMATION

Advice or information on the list of assays offered by MBG Centre can be provided by contacting the laboratory in a number of ways:

Tel: +9714 337 2529

Email: info@mbg.ae

Information on services provided and contact numbers is also available on the Lab's web site: www.mbg.ae

1.4. MISSION AND VISION STATEMENT

Mission

To provide the highest quality of services in molecular diagnostic and genomic research for humans and animals, and pursue professional and technological advancement through continuous training, research and innovation.

Vision

To be a globally recognized genomic center in human healthcare and animal welfare.

1.5. WORKING HOURS

The laboratory is operational on Monday – Friday, 8:00 am – 4:00 pm.

Please refrain from sending samples outside the working hours unless in case of emergency.

1.6. REQUESTS

Routine samples which arrive in the laboratory after 11:00 am will not be processed until the next working day. If you wish for a sample to be analysed urgently, please contact the lab beforehand so that the necessary arrangements can be made. Also, make sure that the request form clearly states **urgent**. These samples will be handled separately and the result reported to the official contact person as soon as

possible. (Note: urgent requests may incur additional charges). Please request assays to be performed urgently only when it is clinically essential. All of our work is processed rapidly and the results are available in a timely manner. Turn-around times for routine assays can be found in Section 3.6. Urgent samples are processed in half the routine turn-around time.

1.7. EMERGENCY/ OUT OF HOURS REQUESTS

Critical/ Emergency requests demand rapid processing and prioritization will be used to process, analyse and report results. In case of emergency, please contact the Lab as far in advance as possible so that we can set up an emergency protocol suitable for your requirements.

1.8. ACCREDITATION/ LICENSURE

The Molecular Biology and Genomics Centre (MBG Centre) has been accredited by **Emirates International Accreditation Centre (EIAC)** under the recognition of the **International Laboratory Accreditation Cooperation (ILAC)** to international standards; **ISO15189:2022 and ISO17025:2017**. This demonstrates our continuing commitment to achieve the highest quality service for our customers.

MBG Centre services undergo continuous review through quality assurance and audit activities. The Lab is committed to performing its activities in accordance with the requirements including:

- Staff recruitment, training, development and retention at all levels to provide a full and effective service to its users.
- The proper procurement, validation and maintenance of equipment and other resources as are needed for the provision of the service.
- The collection, transport and handling of all samples in such a way as to ensure the correct performance of laboratory examinations.
- The use of accredited and validated examination procedures and assay methods that will ensure the highest achievable quality of all assays performed.
- The reporting of results in ways which are timely, accurate and clinically useful.
- The identification, documentation, investigation and resolution of anomalies.
- The assessment of user satisfaction surveys, in addition to internal audit and external quality assessment, in order to produce continual quality improvement.

1.9. CONFIDENTIALITY

Confidentiality of Lab results and information are maintained at all times. Sensitive client information is protected from unauthorized access at all times through the use of password protected secure Laboratory Information Management System (LIMS). MBG Centre is committed to maintaining the confidentiality of all patient information. MBG Centre has established a Confidentiality and non-disclosure policy to protect the confidentiality of information about clients. All staff are obliged to sign a legally binding confidentiality agreement upon commencement of their employment at MBG Centre.

1.10. COMMUNICABLE DISEASE NOTIFICATION POLICY

MBG Centre adheres to communicable disease notification policy mandated by the local regulation. By filling out and signing the request form, the Client/Patient consent MBG Centre to report navigable diseases to the concerned authority as required.

2. SCOPE OF SERVICES PROVIDED

- Molecular Diagnostics
- Genotyping services
- Next Generation Sequencing
- Molecular Cytogenetic
- MBG- Stem
- Research and Development
- Education And training

Refer to sections 7 to 13 for details of the services provided by the MBG Centre and to the [Veterinary Service List](#)/ [Medical Service List](#) available on MBG website for complete list of assays provided.

3. SENDING A SAMPLE

MBG Centre does not currently offer clinical advice on ordering of examinations or the interpretation of the results. Kindly consult your Veterinarian / Clinician to find out which assay you should request.

3.1. COMPLETING A REQUEST FORM

Request forms are available on the MBG Centre website or by contacting the lab.

An appropriate request form must accompany each sample and it is essential that it is filled out **legibly** and **completely** before samples can be processed. In order to meet our accreditation requirements the request form must have the following **essential** information:-

- Unique identity of the animal/patient including gender, date of birth, and location/Contact Details
- Name/unique identity of the authorized requester, along with their address
- Means and destination for reporting the results (Name, email id etc)
- Type of sample (and anatomic site of origin where appropriate)
- Examinations requested
- Clinical information relevant to the patient
- Identity of the person collecting the primary sample & Date and time of primary sample collection
- Date and time of receipt of samples by laboratory*

* Will be filled in by the Lab

3.2. SERVICE AGREEMENT

The contractual arrangement between the laboratory and its users is defined by the laboratory requisition form. Each request form (together with its relevant primary samples) is checked for conformity with the laboratory's test requirements which are made available to users via www.mbg.ae. By completing a requisition form, the user is agreeing to the terms and conditions provided in this user manual.

3.3. SAMPLE COLLECTION AND TRANSPORT

MBG Centre is not responsible for sample collection and transport for all Veterinary samples. On the other hand, facilities for human sample collection (Swab testing and Phlebotomy) are available in house.

The best results are obtained when an appropriate, well-taken sample, in the proper container, is delivered to the laboratory promptly and relevant clinical information provided on the request form.

Refer to the Sample Collection, storage; transport Guideline (Veterinary/Medical) and the Service List (Veterinary / Medical) for recommended sample type, sample container, sample volume, transport requirements and storage conditions. These can be found on the MBG Centre website. Please contact the lab if there is any doubt about the best sample to take or you have questions about any assay.

Instruction for collection activities

- Determine and verify identity of the patient.
- Verify that the patient meets any pre examination requirements.
- Ensure the sample type to be collected is appropriate for the assay.
- Samples for certain assays must be collected and transported in sample tubes containing transport medium.
- Use collection containers appropriate to the sample type being collected.
- Label the sample containers with at least 2 of the unique identifies (Name, unique ID number, Date of birth) for their appropriate identification and quick processing by the lab
- Identity of the person collecting the sample must be recorded along with collection date and time.
- Store samples as recommended in [Sample Collection, storage, transport Guideline](#).

To ensure appropriate processing of samples, the requester must ensure that:

- Samples are transported at the temperature specified in [Sample Collection, storage; transport Guideline](#) to ensure integrity of the sample.
- Samples are transported to the laboratory without delay and within the time frame specified.
- Samples are transported in a closed container to ensure safety of the carrier, public and receiving laboratory.
- Transport to the lab must comply with UN Hazard Classifications such as UN 2900 or UN 3373

3.4. INFECTION HAZARDS AND HIGH-RISK SAMPLES

It is the responsibility of those sending samples to the lab to convey to the lab suitable and sufficient information of any potential hazards. Please help to minimize the risk to lab staff by:

- Discarding cracked tubes or those with tops off,
- Avoid overfilling and contaminating the outside of containers, and
- Make sure that tubes and bottles are securely sealed.



It is important that samples from patients known or suspected to be infected with dangerous pathogens such as blood borne viruses (BBV) are appropriately labelled. The use of “Danger of Infection” or “Biohazard” label (as shown) would be appropriate with sufficient detail on the request form to identify the nature of the risk. The sample and request form may be placed in an envelope to maintain patient confidentiality whilst in transit. Failure to properly label a sample may result in the analysis being delayed or refused.

3.5. ACCEPTANCE AND REJECTION CRITERIA

Acceptance criteria:

Samples shall be accepted only if:

- Sample is intact and container not damaged
- The request form contains all the required information, filled legibly
- Sample is clearly labelled with at least 2 unique identifiers
- The sample type and volume are as recommended
- The sample is collected in the recommended container type
- The sample is stored and transported as recommended
- The sample arrives at lab within recommended time frame after collection.

Rejection Criteria:

The receipt of unsuitable samples may result in either sample rejection or delays in testing/ results. The sample(s) may be rejected if there is:

- The wrong type of sample container
- Sample container is broken or damaged.
- No label, illegible label or it is missing unique identifiers.
- Missing request form.
- Discrepancy between information on the container and/or request form.
- Incorrect/insufficient sample received or sample deemed too old for analysis.

A rejection Form shall be filled for the rejected samples, and is send to the client along with a copy of request form, stating the reason(s) for rejection.

Exclusions to acceptance/rejection criteria

Exclusions to acceptance and rejection criteria exist and include the following:

- The primary sample is irretrievable or critical
- Repeat sampling may cause the patient undue pain, stress or inconvenience.
- Extra consideration is also given to samples from bleeding patients, paediatrics, geriatrics and palliative care patients.

In such cases, the report shall clearly state the deviation from the recommendation.

3.6. TURN-AROUND TIME

Turn-around Time offers the user a time-frame (from the receipt of the samples by the lab) within which the Report of Results will be generated. A general outline of the turn-around times for the various services offered by MBG Centre is provided in Table 2.

Table2. List of Different Services and their Turn-Around Times for Normal Samples as well as Urgent or Emergency/Critical Samples

Assay Type	Normal Turn-Around Time (working days)	Urgent or Emergency/Critical (working days)*
Pathogen Identification	Not exceeding 5 working days	Not exceeding 3 working days
Multiplex-PCR based tests	Not exceeding 5 working days	Not exceeding 3 working days
Avian Sexing & Avian Species Identification	Not exceeding 5 working days	Not exceeding 3 working days
Animal Genotyping & Paternity Verification	Not exceeding 5 working days	Not exceeding 3 working days
Cytogenetics	Contact MBG Centre	Contact MBG Centre
Regenerative Stem Cell Therapy	Contact MBG Centre	Contact MBG Centre
Immunology	Not exceeding 1 working day	-

***For more accurate Turn-Around Time, please visit our service lists.**

***Incase of Urgent Samples, samples received before 11am only will be processed on the same day. Samples received after 11am will be processed the next working day.**

3.7. FACTORS THAT AFFECT THE PERFORMANCE OF THE ASSAY

There are a number of factors that can affect the performance of the assay resulting in spurious results. These are as follows:

- Sample type provided is not recommended
- Sample collection For RNA testing is not done in RNA transport media
- Samples are not stored or transported at the recommended temperature.
- Samples are not delivered within the recommended time frame after collection.

- Swabs are not collected from the site of infection.

Note: Measurement of uncertainty (MoU) is one of the major potential contributors to the uncertainty of results interpretation. Please contact MBG Centre for full details. (info@mbg.ae)

Note: Contingency plans have been developed for key processes identified by MBG Centre. In the event of contingency failure re-sampling may be required.

3.8. REQUESTING ADDITIONAL EXAMINATIONS

Additional tests may be added to the original request by contacting the laboratory and submitting a second completed request form.

Any additional Test must be requested within 1 week from the date of sample collection. MBG Centre is usually able to perform further tests on stored samples as long as the additional request is made within the appropriate timeframe. However, our ability to produce a valid result from the add-on test will be dependent on the availability of the appropriate sample, the stability of the analytic, how the sample has been stored, and the remaining sample volume.

4. RESULTS

The main method of reporting results originating from this lab is by the production of an electronic copy of the signed report (encrypted emails). Original reports, once signed by authorized personnel, are available for collection in person from the Lab. An electronic copy of all these reports is held on MBG Centre's Laboratory Information Management System (LIMS). The results are also sent to the e-mail specified on the request form. If this section of the request form was not completed, the results shall be made available as a hard copy only to the requester. If a person other than the requester (E.g. hospital driver) picks up the result from MBG Centre, it is the responsibility of the person releasing the report to ensure that the report reaches safely to the authorized person. Such reports are provided in a sealed envelope to ensure confidentiality of the client.

Any interpretations of the results, if required, are clearly mentioned in the report. MBG Centre offers no further interpretation.

Where statements of conformity are made in each MBG Centre report, the following decision rules are applied:

PASS

Results \pm expanded uncertainty within limits/specifications

FAIL

Results \pm expanded uncertainty exceeds limits/specifications

UNCERTAIN

Re-sampling Recommended

- Results are within limits/specifications but overlap when expanded uncertainty is taken into account
- Results exceed limits/specifications but overlap when expanded uncertainty is taken into account

5. REPORTING EMERGENCY/CRITICAL OR URGENT RESULTS

In case of urgent or emergency/critical requests, the results are brought to the immediate attention of the authorized requesting person. This is usually done by calling the authorized person using the contact number provided on the request form. A copy of the original report may also be sent through an encrypted e-mail.

6. CUSTOMER SATISFACTION

We are continually improving our services and value the opinion of our users in order to provide a service that reflects the highest of standards while also being user friendly. We issue our users with 'Customer feedback form' for completion. The customers can drop a hardcopy of the form at our reception or give a feedback through email or telephone. We also welcome any feedback/complaints you have regarding the services at any time using our [Client Satisfaction Survey Form/ Online Survey](#) on our website (www.mbg.ae). [Client Satisfaction Survey Form/ Online Survey\(https://www.mbg.ae/login.php?err=ok\)](https://www.mbg.ae/login.php?err=ok) database link is being checked by the Admin twice a week, specifically on Mondays and Thursdays. These surveys will be acknowledged and a written response will be given to the plaintiff concerning the investigations and actions taken by the laboratory to rectify any issue (if there is any). An appropriate timeline is provided to the complainant for resolution of the issue. Any new concerns are promptly addressed to quality team. All complaints are monitored and if there is any, this is discussed during weekly lab meeting and brought to the notice of management during annual reviews.

7. VETERINARY MOLECULAR DIAGNOSTIC SERVICES

7.1. PATHOGEN IDENTIFICATION ASSAYS

MBG Centre offers several different assays to detect various pathogenic bacteria, viruses and parasites from different biological samples. The majority of our Pathogen ID assays are accredited according to ISO 17025:2017.

7.2. AVIAN SEXING

DNA based avian sexing is the method of choice for bird owners worldwide. This is determined by amplifying specific genes on the sex chromosomes. A range of different techniques are utilized for different avian species all of which have been accredited to ISO 17025: 2017.

7.3. ANIMAL GENOTYPING

Breeders are often required to prove the true identity of an animal through a verified genotyping certificate. At MBG Centre, this is done using microsatellite markers that are used to genotype different animals such as equine, camel, bovine, ovine, falcon, dolphin, lion, tiger, chicken, houbara, feline, hyena, penguin, canine etc. Our Genotyping service has been ranked 1 by ISAG for a range of animals including Camel, Llama, and Equine. We are ready to add more species to our portfolio as per request by the clients.

7.4. PATERNITY VERIFICATION

Accurate pedigree information is important for animal breeders and is often required to resolve paternity of disputed cases. MBG Centre provides Genotyping and Parentage Verification assays for all the above mentioned species.

7.5. SPECIES IDENTIFICATION

MBG Centre has developed a real-time PCR multiplex assay accredited to ISO 17025:2017 that identifies and quantifies minute amounts of mixed-species nuclear DNA of horse (*Equuscaballus*), goat (*Capra hircus*)/sheep (*Ovisaries*), pig (*Susscrofa*), camel (*Camelusdromedarius*) and bovine (*Bostaurus*) in a species-specific manner. The assay's ability to accurately detect and identify target DNA in multi-species mixtures is crucial when the target specimen may be overwhelmed by non-target specimen. **This assay is not for forensic purposes.**

7.6. GENOMIC SERVICES

Our extensively validated genomic services are in compliance with international NGS Nex-StoCT guidelines. We provide Microbial whole genome shotgun sequencing, 16S rRNA metagenomic analysis and population studies using mitochondrial genome sequencing.

7.7. EQUINE COAT COLOUR

Horse coat colour genetics is important for offspring selection by horse breeders. Several Single Nucleotide Polymorphism's (SNP's) as well as mutations in genes linked to coat colour are analysed at MBG Centre to ascertain specific coat colour phenotype.

8. MEDICAL DIAGNOSTIC SERVICES

8.1. MOLECULAR PATHOGEN IDENTIFICATION ASSAYS

MBG Centre offers several different assays to detect various pathogenic bacteria, viruses and parasites from different biological samples, accredited service ISO 15189:2022.

8.2. GENOMIC SERVICES

MBG Centre is taking Clinical Diagnostics to the Next Level with Next Generation Sequencing. Our genomic services have undergone extensive validation and are also in compliance with international NGS Nex-StoCT

guidelines. Our validated bespoke bioinformatics pipelines ensure all information is securely stored on data servers in house. Our services include:

- Whole Genome Sequencing (WGS)
- Whole Exome Sequencing (WES)
- Targeted Gene Panels- Specifically structured to aid clinicians confirm the Genetic diagnosis of over 25 different disorders; including Epilepsy, Muscular dystrophy, Neurological disorders, Diabetes and Autism (please refer to our service list for full list of all the gene panels available).
- Germ line Inherited comprehensive Cancer Panels
- Somatic Tumour testing
- Mitochondrial DNA Sequencing

8.3. IMMUNOLOGY

MBG Centre offers several immunology assays; we use ECL (Electrochemiluminescence) technology for immunoassay detection, which results in high sensitivity and specificity.

9. CYTOGENETICS

At MBG Centre, chromosomal analysis is done for variety of species such as Human, Equine, Camelids etc. Techniques applied at MBG Centre include

- Classical Karyotyping
- Fluorescent in Situ Hybridization
- Sperm Viability Test

10. REGENERATIVE STEM CELL THERAPY

- **MBG-Stem**
MBG-Stem Regenerative cells are your animal's own natural healing cells that help regenerate injured tissues. These cells are isolated from the animal's adipose (fat) tissue and consist of stem cells, progenitor cells and other bioactive cells which enable a more natural healing process.
- **Platelet – Rich Plasma**
Another service provided under MBG-Stem is Platelet-rich Plasma or PRP. This is an exceptional way to treat joints and other injuries and interestingly it can be administered to the injured animal in conjunction with Stem cell therapy for a better outcome.
- **Banking of regenerative cells**

11. MOLECULAR GENOMIC TECHNIQUES

MBG Centre carries out a variety of molecular genetics techniques for both research and diagnostic purposes. Some of the services we offer include:

- Next Generation Sequencing
- STR Analysis
- Sequencing

- SNP Genotyping
- Gene Expression Profiling
- Construction of genomic and cDNA libraries

12. RESEARCH AND DEVELOPMENT

MBG Centre's research theme include the areas of diagnostics and genomics covering genotype & phenotype association studies, mitochondrial genome, gene regulation and expression, infectious diseases, functional genomics, fertility studies, developing species specific probes and chromosome karyotyping.

Mbg centre provides a full spectrum of research training opportunities with the underlying common theme of Molecular Genetics. Please do not hesitate to contact us for further details and potential collaborations.

13. EDUCATION AND TRAINING

Being one of the best-equipped genetic laboratories in the country, we are proud to offer technical and hands-on courses for various molecular biology applications. These courses are given in a long or short form depending on the choice of the students. A certificate of completion will be furnished upon completion of training. We also support research students in their projects.

The six different core molecular genetics courses are:

- a- Nucleic acid extraction**
- b- PCR, Real time PCR and Gel Electrophoresis**
- c- Sequencing**
- d- Cytogenetics and FISH**
- e- Microarray**
- f- Genotyping**

Kindly refer to MBG Centre Website for more details on the courses.