ESCMID Funded Observership in Clinical Microbiology at Tata Medical Center, Kolkata, India

https://tmckolkata.com/in/microbiology/

https://www.escmid.org/education/exchange-programmes/observership-programmes/funded-observership/

ESCMID

TATA MEDICAL CENTER

ESCMID Funded Observership in Tata Medical Center, Kolkata, India

The Tata Medical Center is a collaborative center of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID).

The ESCMID supports funded observerships in its collaborative centers in many countries and it includes:

Tata Medical Center in Kolkata, West Bengal, India

This Observership is in Clinical Microbiology

ESCMID

TATA MEDICAL CENTER

Details about this observership

- **The details about the ESCMID observership can be found in the following websites:**

- **Tata Medical Center- ESCMID funded observership: https://tmckolkata.com/in/microbiology/**

- **ESCMID website: https://www.escmid.org/education/exchange-programmes/observership-programmes/funded-observership/**

ESCMID Funded Observership in Tata Medical Center, Kolkata, India

- **ESCMID gives out:**
  - 100 observerships per year, hosted across 123 ESCMID Collaborative Centres (ECCs).
  - Tata Medical Center in Kolkata, West Bengal, India is one of these collaborative centers
- **Duration of observership: F**ive days to one month. (28 days).
- **Funding:**
  - Participants of observerships can receive funding of up to EURO 2000 to help ensure a smooth observership journey.

Objectives of the ESCMID funded Observership in Clinical Microbiology

ESCMID

1. To gain experience and exchange knowledge with colleagues across the fields of Clinical Microbiology (CM) and Infectious Diseases (ID).
2. To facilitate international training
3. To facilitate collaboration among Medical Microbiology/ Infectious Disease doctors and Young Scientist Members (YSM) fulfilling the criteria of Young Scientist Member.
4. To engage experts in Clinical Microbiology and Infectious Diseases through an international exchange program
5. To enable participants to improve clinical and laboratory practice in their host institutions through a dynamic synergy of shared knowledge and expertise.

Eligibility- Application-Selection- Funding- Report

- Interested applicants are advised to apply through ESCMID regarding:
- https://www.escmid.org/education/exchange-programmes/observership-programmes/funded-observership/

A. Details of the ESCMID Collaborative Centers
B. Eligibility criteria
C. Important dates
D. Application Process
E. Selection
F. Funding
G. Report

ESCMID

Observership opportunities at Tata Medical Center, Kolkata, India

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Observership in Clinical Microbiology

www.tmckolkata.com ;
https://tmckolkata.com/in/microbiology/


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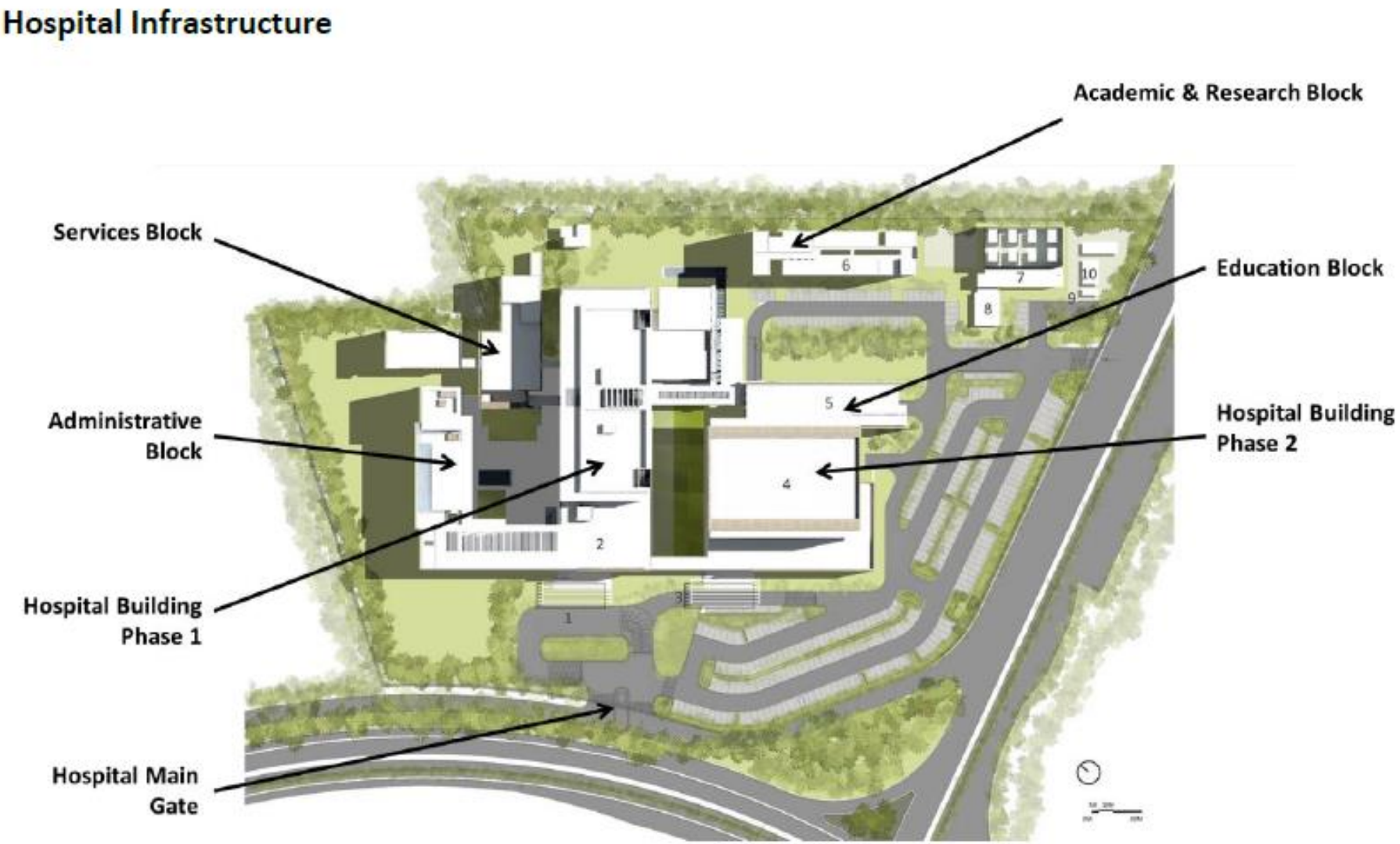
Tata Medical Center at Kolkata: a birds eye view



About the Hospital: Tata Medical Center

- Tertiary care oncology hospitals
- Comprehensive cancer care center
- Bone Marrow Transplantation center
- Not for Profit hospital
- General and private rate tariffs for healthcare provision
- Established in May 2011 and owned by the Tata Medical Centre Trust
- Bed strength: 437
- In-patient numbers: ~2000 per month
- Out patient numbers: ~850 per day
- Surgery: ~500 per month

- Clinical Specialties:
- Clinical Hematology and Cellular Therapy
- Medical Oncology
- Digestive Diseases
- Pediatric Oncology
- Surgical Oncology: Breast, GI-HPB, Thoracic, Urology, Gynecology, Plastic
- Onco-anesthesia
- Radiation Oncology
- Critical Care
- Nuclear Medicine
- Palliative Care
- Psycho-Oncology

Support Services: Tata Medical Center

- Department of Lab Sciences:
  - Hematology
  - Microbiology
  - Histopathology and Cytology
  - Biochemistry
  - Cytogenetics
  - Molecular Pathology
  - Flow Cytometry
- Imaging and radio-diagnosis
- Nuclear Medicine
- Transfusion Medicine
- Endoscopy services
- Hemodialysis
- Physiotherapy
- Nutrition
- Central Sterile Supply Department
- Food and beverages
- Laundry
- Water Treatment Plant
- Sewage Treatment Plant
- Effluent Treatment Plant
- Cleaning and Housekeeping
- Customer Care Services
- Security Services
- Bio-medical Engineering
- Materials Department
- Maintenance Engineering
- Information Technology

What the ESCMID observership offers in Tata Medical Center, Kolkata, India

1. Management of MDR/XDR Gram- negative bacterial infections
2. Infection Prevention and Control (IPC) challenges in settings with high prevalence of MDR/XDR pathogens
3. Antimicrobial stewardship challenges in immunocompromised cancer patients
4. Antimicrobial stewardship challenges in settings with high prevalence of MDR/XDR Gram negative bacterial infections
5. Use of Laboratory Developed low cost PCRs for detection of XDR pathogens
6. Use of DNA Sequencing in identification of pathogens
7. Air and water quality monitoring in hospitals
8. Management of tuberculosis in cancer patients
9. Management of infections in Pediatric Oncology, Bone Marrow Transplantation, Surgical Oncology and Critical Care Units

Microbiology Department: Staffing

- Clinical Microbiology Consultant: 2
- Infectious Disease Physician: 1
- Clinical and Molecular Microbiology Fellowship trainees: 3
- Scientific Officer: 5
  - PhD with training in Molecular Biology: 3
  - Bioinformatics trained: 1
  - Environmental Microbiology: 1
- Lab technologist: 7
- Infection Control Nurse: 2
- Antibiotic Pharmacist: 1 (research project)
- Research project staff: 6

Microbiology department Diagnostic Services:

1. Bacteriology
2. Mycobacteriology
3. Mycology
4. Serology
5. Virology
6. Parasitology
7. Environmental Microbiology: air and water quality monitoring
8. Sterility Testing: blood products, stem cells, bone marrow, medicines

Notable tests offered by Microbiology department:

1. 16S rRNA sequencing for bacterial identification (LDT)
2. ITS gene sequencing for fungal identification (LDT)
3. Carbapenem resistance gene PCR (Lab developed test)
4. Staphylococcus aureus, MRSA and van A PCR (Lab developed test)
5. Candida auris PCR (Lab developed test)
6. Beta D glucan assay
7. MALDI-TOF mass spectrometry for identification of bacteria, mycobacteria and yeasts
8. Surveillance culture for MDRO bacteria: stool, throat swab
9. Multiplex PCR for respiratory pathogen: Qiastat and Biofire
10. Microbroth dilution Test for colistin and antifungal susceptibility (yeast)
11. Identification of atypical Mycobacteria by DNA sequencing
12. Human Papilloma Virus Testing and Genotyping

Bacteriology: Diagnostic Services

- Gram stain
- Blood culture: Bact/ALERT system (Biomerieux)
- Bacterial ID: Vitek- 2 Compact system
- Antibiotic susceptibility testing:
  - VITEK-2 Compact system
  - Micro-broth dilution Test: Colistin
  - E-test
  - Disc diffusion (CLSI guidelines)
- Real- time PCR: Staph aureus, MRSA (mec A gene), VRE (vanA gene)
- End- point multiplex PCR: Carbapenem resistance gene detection:
  - NDM-1, OXA-48, KPC, IMP, VIM, OXA-23, OXA-24, OXA- 58
- Biofire (Biomerieux): pneumonia, meningitis/encephalitis, gastro-enteristis panel
- Atypical pathogen (Bordetella, Legionella, Mycoplasma): Qiastat (Qiagen)
- Clostrioides difficile ELISA (VIDAS) and PCR (BioFire)
- 16S rRNA sequencing: Sanger sequencer (Applied Biosystems 3500)

Mycobacteriology: Diagnostic Services

- Ziehl- Neelsen stain
- Mycobacterial culture: Bact/ALERT system (Biomerieux)
- Cartridge Based Nucleic Acid Amplification Test:
  - GeneXpert Ultra (Cepheid): MTB and Rifampicin resistance detection
- MPT64 antigen test
- Identification of atypical Mycobacteria using:
  - 16S rRNA sequencing: Sanger sequencer (Applied Biosystems 3500)

Mycology: Diagnostic Services

- Microscopy:
  - KOH wet count and Calcofluor White wet mount
  - India ink wet mount for Cryptococcus
  - LPCB wet mount for fungal ID from colonies
- Fungal Culture:
  - Blood Culture, SDA (37C and 25C)
- Anti-fungal susceptibility testing for yeasts:
  - Vitek and Microbroth Dilution
- Real-time PCR:
  - Pneumocystis jirovecii
  - Candida and Candida auris
  - Aspergillus
  - Cryptococcus in CSF (BioFire, Biomerieux)
- Antigen detection:
  - Beta- D glucan assay (serum)
  - Galactomannan (serum and BAL)
- Therapeutical Drug Level monitoring: Voriconazole (by Mass Spectroscopy)
- Fungal Identification by ITS gene sequencing: colony or FFPE tissue
  - Sanger sequencer (Applied Biosystems 3500)

Virology: Diagnostic Services

- Quantitative PCR:
  - CMV viral load (Qiagen)
  - HBV viral load (Cepheid GeneXpert)
  - HCV viral load (Cepheid GeneXpert)
  - BK viral load (True PCR)
- Qualitative PCR:
  - Influenza- A/B, RSV
  - SARS CoV-2
  - Human Papillomavirus
  - Adenovirus
- PCR for vesicular rash: HSV and VZV PCR
- Biofire (Biomerieux): pneumonia, meningitis/encephalitis, gastro-enteristis panel
- Qiastat (Qiagen): upper respiratory pathogen panel
- Viral antigen tests for gastro-enteritis viruses: Rota, Adeno, Astro, Noro

Serology: Diagnostic Services

- Vitros 7600 system (Ortho Clinical Diagnostics):
  - HIV- Ag+ Ab
  - HBsAg
  - HCV antibody
  - Hep B core Antibody (total)
  - Hep B surface antibody titer
  - CMV IgG and IgM
- VIDAS system (Biomerieux):
  - Dengue panel: NS1 antigen, IgM and IgG
  - VZV IgG
  - HBeAg and HBeAb

Parasitology: Diagnostic Services

- Peripheral smear for Malarial parasites
- Antigen test for malaria (*Plasmodium vivax* and *P. falciparum*):
  - Immuno-chromatography test
- Stool examination by Microscopy:
  - Ova- cyst parasites
  - Modified acid fast stain: for *Cryptosporidium, Isospora, Cyclospora* detection
- Multiplex PCR: Biofire (Biomerieux)
  - *Entamoeba histolytica*
  - *Giardia lamblia*

Tools for monitoring air quality

Air Particle Counter

Anemometer

Agar plates- settle plates

Microbiological Air Sampler

Agar Strips for MAS

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Water quality monitoring

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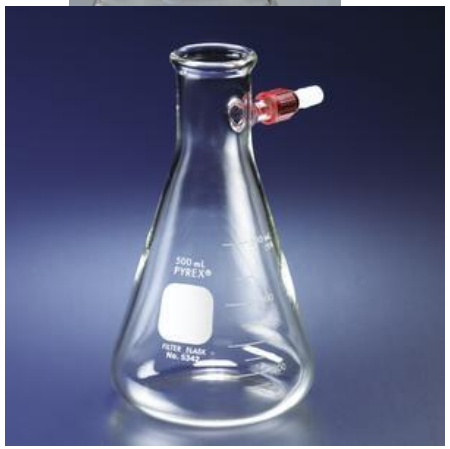


Water TDS-
total dissolved solids-
Conductivity meter;
CSSD target<10 mg/L

Water chlorine level-
Colorimeter
O-toluidine/
Electronic
Target: 0.2-0.5 ppm

Water microbiology
Membrane filtration
Target:
Coliforms- 0/100 ml
Pseudomonas- 0/100 mL

Clinical Services provided by Microbiology Department:

1. Antimicrobial Stewardship (AMS)
2. Diagnostic Stewardship (DS)
3. Infection Prevention and Control Stewardship (IPC)
4. Critical Care Unit daily ward rounds
5. Positive Blood Culture communication and ward rounds
6. Referral services: AMS, vaccination, occupational health
7. Telephonic consultation (24 x 7) on AMS, IPC, DS
8. Urgent and rapid testing services: 24 x 7:
   - Respiratory Virus PCR
   - HIV, HBV, HCV serology
   - Malaria and Dengue serology

Infection Prevention and Control services:

- Air quality monitoring: air particle count, settle plate (bacterial and fungal culture)
- Water quality monitoring: TDS, chlorine, microbiology
- Healthcare Associated Infection surveillance
- Outbreak control and management
- IPC audits: e.g. hand hygiene, toilet cleanliness, bio-medical waste segregation and management, food services and kitchen
- Infection Control Team: monthly meeting
- Hospital Infection Control Committee: quarterly meeting

Infectious Disease services

- Out-patient clinics- 5 days a week- by Infectious Diseases Consultants
- Vaccination clinics weekly
- Out-patient and in-patient services for the management of:
  - Tuberculosis
  - Malaria
  - Dengue
  - COVID
  - HIV
  - Complicated Bacterial and Fungal infections
  - Antimicrobial Stewardship

Occupational Health

- Staff are screening at the time of joining:
  - HIV-Ag+Ab
  - HBsAg
  - HCV antibody
  - Hepatitis B surface antibody titer
  - VZV IgG antibody
- Vaccinations recommended for staff:
  - Hepatitis B (provided free), Influenza, varicella
- Post exposure prophylaxis and follow up offered for:
  - HIV, HBV, HCV exposure
- Staff Health Department:
  - Annual health check up
  - Vaccination services
  - Post exposure assessment and follow up

Laboratory Infrastructure: Microbiology Department

- BSL- 2 Laboratory
- BSL-2 plus facility for Mycobacteriology
- Information Technology support: Hospital Information System (HIS) and Laboratory Information System (LIS)
- BACT/ALert system (blood and mycobacterial culture)
- Vitek- 2 Compact system
- MALDI-TOF: Bruker
- Automated Serology analyzers: Vitros (Ortho Clinical Diagnostics), VIDAS (Biomerieux)
- Lyophiliser

Molecular Microbiology infrastructure:

- Automated DNA/ RNA extraction systems: 2
- Real- time PCR systems: 4
- End point PCR systems: 2
- GeneXpert systems: 2 (Cepheid)
- Automated multiplex cartridge based PCR systems: 2 (Qiastat and Biofire)
- Gel- electrophoresis and gel documentation systems: 2
- Sanger DNA sequencer: 1 (Applied Biosystem: 3500)
- Next Generation Sequencer: 2 (MiSeq, Ion Torrent)
- Nanodrop, Qubit, Tape Station

Number of Lab Reports authorized by the Microbiology Department

Microbiology Section	2024	2023	2022	2021
Bacteriology	21086	18887	18361	14203
Bacteriology Stain	1667	1464	1302	1082
Serology	43841	40162	38065	34759
Virology	6491	5805	8891	20397
Mycology	2843	2433	2488	1735
Mycobacteriology	3042	2656	2618	1792
Parasitology	637	806	677	390
Total	79607	74236	72402	74398

Teaching and training programs offered:

- Fellowship program in Clinical and Molecular Microbiology: for medically qualified doctors with post-graduate (MD) degree in Medical Microbiology

- Molecular Medical Microbiology: MSc program with IIT- Kharagpur: 2 years
- PhD in Molecular Medical Microbiology: with IIT- Kharagpur

- Diploma in Medical Laboratory Technology: DMLT: 2 years
- Masters in Medical Laboratory Technology: 2 years

Research activities: Microbiology

1. Antimicrobial Resistance Surveillance with Indian Council of Medical Research
2. Healthcare Associated Infection Surveillance: CDC
3. Fungal PCR development: Department of Biotechnology (Govt of India)
4. Development of quantitative real-time PCR: CMV viral load (intra-mural)
5. Epidemiology of Infection in oncology and bone marrow transplantation (Clinical audits)
6. Genotyping of Human Papilloma Virus (HPV): DBT
7. Gut microbiome (Tata Trust)

Accreditations and certifications received by Tata Medical Center, Kolkata, India

- NABL: National Accreditation Board for Testing and Calibration Laboratories
- NABH: National Accreditation Board for Hospitals and Healthcare Providers:
  - Blood Bank
  - Nursing Excellence
  - Infection Control
  - Hospital
  - Institutional Review Board
- DSIR: Department of Scientific and Industrial Research (Govt of India)- as a Scientific Industrial Research Organization

Collaborations

- **Tata Memorial Centre, Mumbai**
  - **Staff training**
- **Indian Institute of Technology at Kharagpur**
  - **Molecular Medical Microbiology: MSc PhD program**
- **St. Jude Children's Research Hospital, Memphis, USA**
  - **Infection Control Course**
- **Duke University, USA**
  - **Nursing**
- **Christie Hospital, Manchester, UK**
  - **Translational Research**
- **Ramakrishna Mission Vivekananda Educational and Research Institute**
  - **Medical Laboratory Technology, MSc MLT course**

Selected Publications from the Department of Microbiology at Tata Medical Center, Kolkata, India

Contents lists available at ScienceDirect

Indian Journal of Medical Microbiology

journal homepage: www.journals.elsevier.com/indian-journal-of-medical-microbiology

A systematic review and meta-analysis to develop a landscape map of antibiotic resistance for six WHO priority pathogens in east and north-east India from 2011 to 2022

Simran Malik [a,b], Chetan Mahadev Shirvankar [a], Rahul Kurian Jacob [a], Debashree Guha Adhya [a], Subir Sinha [c], Sanjay Bhattacharya [b], Kamini Walia [d], Sangeeta Das Bhattacharya [e,*]

[a] School of Medical Science and Technology, Indian Institute of Technology, Kharagpur, West Bengal, India
[b] Department of Microbiology, Tata Medical Center, Kolkata, West Bengal, India
[c] Department of Statistics, Tata Medical Center, Kolkata, West Bengal, India
[d] Indian Council of Medical Research (Headquarters), New Delhi, India
[e] Christiana Care Health System, Newark, DE, USA

Infection Control & Hospital Epidemiology (2019), 1–2
doi:10.1017/ice.2019.79

SHEA
The Society for Healthcare Epidemiology of America

Letter to the Editor

Rapid and economical detection of eight carbapenem-resistance genes in *Enterobacteriaceae*, *Pseudomonas* spp, and *Acinetobacter* spp directly from positive blood cultures using an internally controlled multiplex-PCR assay

Surojit Das MSc, PhD[1], Subhanita Roy MSc[1], Samadrita Roy MSc[1], Gaurav Goel MD, DNB[1], Kamini Walia PhD, MPH[2], Sudipta Mukherjee MD, IDCCM, FNB, EDICM[3], Sanjay Bhattacharya MD, DNB, FRCPath[1] and Mammen Chandy MD FRCPA, FRACP, FRCP[4]

[1]Department of Microbiology, Tata Medical Center, Kolkata, India, [2]Indian Council of Medical Research, New Delhi, India, [3]Department of Critical Care, Tata Medical Center, Kolkata, India and [4]Department of Clinical Hematology, Tata Medical Center, Kolkata, India

Received: 25 December 2022 | Revised: 19 April 2023 | Accepted: 15 May 2023

DOI: 10.1111/tid.14072

TRANSPLANT INFECTIOUS DISEASE

ORIGINAL ARTICLE

Hematopoietic stem-cell transplantation in a zoo of multidrug-resistant organisms: Data from a cancer center in eastern India

Shouriyo Ghosh[1] | Sanjay Bhattacharya[2] | Gaurav Goel[2] | Rasika Avinash Deshmukh[2] | Rizwan Javed[1] | Mita Roychowdhury[1] | Subir Sinha[3] | Maitrayee Sarkar De[4] | Arijit Nag[1] | Jeevan Kumar[1] | Saurabh Jayant Bhave[1] | Reena Nair[1] | Mammen Chandy[1]

Infection Prevention in Practice 5 (2023) 100275

Available online at www.sciencedirect.com

Infection Prevention in Practice

journal homepage: www.elsevier.com/locate/ipip

Multi-drug resistant (MDR) and extensively drug-resistant (XDR) bacteraemia rates among cancer patients in an oncology hospital in eastern India: an 11-year retrospective observational study

Satyam Mukherjee [a], Maitrayee Sarkar De [b], Gaurav Goel [a], Arpita Bhattacharyya [c], Indranil Mallick [d], Deepak Dabkara [e], Jaydip Bhaumik [f], Manas Kumar Roy [g], Piyali Bose Majumdar [b], Soumyadip Chatterji [h], Sudipta Mukherjee [i], Sanjay Bhattacharya [a,*], Mammen Chandy [j]

Indian Journal of Medical Microbiology, (2015) 33(4): 482-490

Special Article

How to develop an in-house real-time quantitative cytomegalovirus polymerase chain reaction: Insights from a cancer centre in Eastern India

Anusha Harishankar, Mammen Chandy, *Sanjay Bhattacharya

Abstract

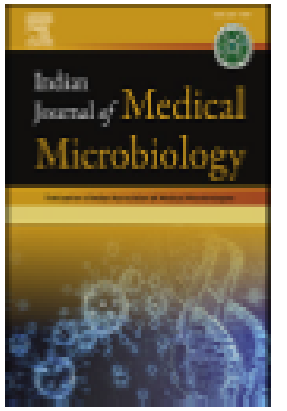
Development of a reliable, cost-effective cytomegalovirus quantitative polymerase chain reaction (QPCR) is a priority for developing countries. Manufactured kits are expensive, and availability can be inconsistent. Development of an in-house QPCR kit that is reliable and quality assured requires significant effort and initial investment. However, the rewards of such an enterprise are manifold and include an in-depth understanding of molecular reactions, and expertise in the development of further low-cost molecular kits. The experience of an oncology centre in Eastern India has been shared. Hopefully, this would provide a brief roadmap for such an initiative. Staff with adequate understanding of molecular processes are essential along with vital infrastructure for molecular research and development.

Key words: *Cytomegalovirus, standardisation, troubleshooting, validation, viral load*

Contents lists available at ScienceDirect

Indian Journal of Medical Microbiology

journal homepage: www.journals.elsevier.com/indian-journal-of-medical-microbiology



Original Research Article

Molecular epidemiology of SARS-CoV-2 in healthcare workers and identification of viral genomic correlates of transmissibility and vaccine break through infection: A retrospective observational study from a cancer hospital in eastern India

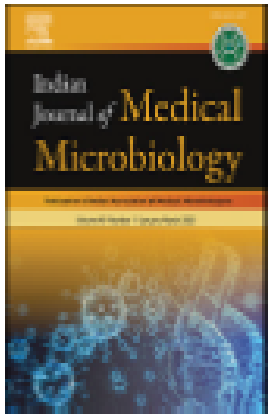
Sanjay Bhattacharya [a], Soumyadip Chatterji [b,*], Mammen Chandy [c], Aseem Yogishwar Mahajan [d], Gaurav Goel [a], Deepak Mishra [e], Priyanka Vivek [f], Parijat Das [a], Sudipto Mandal [a], Anup Chugani [g], Antra Mittal [g], Rajadurai Chinnasamy Perumal [g], Vedam L. Ramprasad [g], Ravi Gupta [g]

Indian Journal of Medical Microbiology 40 (2022) 81–85

Contents lists available at ScienceDirect

Indian Journal of Medical Microbiology

journal homepage: www.journals.elsevier.com/indian-journal-of-medical-microbiology



Original Research Article

An analysis of the standard curve parameters of cytomegalovirus, BK virus and hepatitis B virus quantitative polymerase chain reaction from a clinical virology laboratory in eastern India

Sunanda Sahoo [a], Sudipto Mandal [a], Parijat Das [a], Sanjay Bhattacharya [a,*], Mammen Chandy [b]

[a] Department of Microbiology, Tata Medical Center, Kolkata, India

[b] Department of Clinical Hematology, Tata Medical Center, Kolkata, India

› Infect Control Hosp Epidemiol. 2019 Jan;40(1):122-124. doi: 10.1017/ice.2018.284.

The economics of managing tuberculosis in cancer patients in an oncology center in eastern India

Zoe Bennett [1], Raja Dhar [2], Kingshuk Dhar [3], Krishnendu Das [3], Anusha Harishankar [3], Sanjay Bhattacharya [3], Mammen Chandy [4]

Affiliations – collapse

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2 2Department of Pulmonology,Tata Medical Center,Kolkata,India.
3 3Department of Microbiology,Tata Medical Center,Kolkata,India.

Short Communication

Access this article online

Quick Response Code:

Website:
www.jacmjournal.org

DOI:

Blood stream infections as a predictor of length of hospital stay and cost of care in patients with cancer

Sara Devereux, Gaurav Goel[1], Kasturi Sengupta[1], Sanjay Bhattacharya[1]

Abstract:

Brief Communication

Arterial Blood Gas as a Prognostic Indicator in Patients with Sepsis

Sayan Mukherjee, Suvrajyoti Das, Sudipta Mukherjee[1], Pralay Shankar Ghosh[1], Sanjay Bhattacharya

Departments of Microbiology and [1]Critical Care Medicine, Tata Medical Center, Kolkata, West Bengal, India

Abstract

Abnormal arterial blood gas (ABG) among patients with sepsis is an important prognostic indicator. All-cause mortality was the highest among patients with respiratory acidosis (4/9 = 44.4%), followed by those having metabolic acidosis (3/8 = 37.5%). Median length of hospital and intensive care unit stay was 15.75 days and 6.25 days for those with abnormal ABG and 11 and 3.5 days among those with normal ABG. Median health-care expenditure at the time of discharge or death of the patient was the highest in patients with respiratory acidosis ($14,473) and least in patients with normal ABG ($3,384) (average expenditure among patients with abnormal ABG was [$10,059]).

Keywords: Arterial blood gas, health-care expenditure, hospital stay, mortality, sepsis

J Infect Public Health. 2017 Nov-Dec;10(6):901-902. doi: 10.1016/j.jiph.2016.10.005. Epub 2017 Feb 10.

Relative potency of different generic brands of Piperacillin-Tazobactam: Implications for public health

Parijat Das [1], Rajkumar Mahto [1], Gaurav Goel [1], Mammen Chandy [2], Sanjay Bhattacharya [3]

Affiliations – collapse

Affiliations

1 Department of Microbiology, Tata Medical Center, Kolkata, India.

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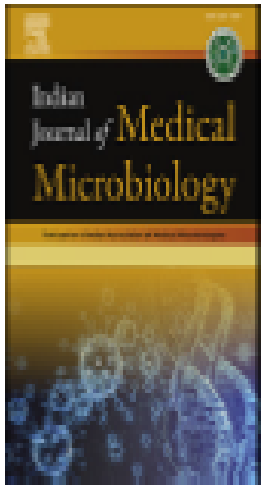
Indian Journal of Medical Microbiology

journal homepage: www.journals.elsevier.com/indian-journal-of-medical-microbiology



Special Article

How to write a research grant proposal

Sanjay Bhattacharya [a,*], Vaskar Saha [b]

[a] Department of Microbiology, Tata Medical Center, Kolkata, India
[b] Tata Translational Cancer Research Centre, Kolkata, India

Eur J Clin Microbiol Infect Dis
DOI 10.1007/s10096-017-3078-5

LETTER TO THE EDITOR

Mortality associated with candidemia in non-neutropenic cancer patients is not less compared to a neutropenic cohort of cancer patients

G. Goel[1] · M. Chandy[2] · A. Bhattacharyya[3] · S. Banerjee[4] · S. Chatterjee[5] · S. Mullick[6] · S. Sinha[7] · K. Sengupta[1] · K. Dhar[1] · S. Bhattacharya[1] · S. Rudramurthy[8] · A. Chakrabarti[8]

Received: 11 July 2017 / Accepted: 24 July 2017

Journal of Medical Mycology 32 (2022) 101279

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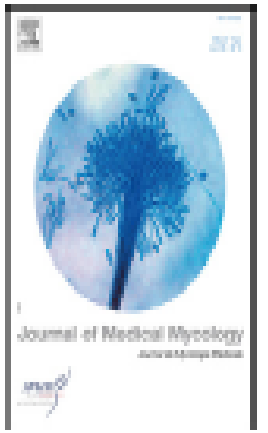
Contents lists available at ScienceDirect

Journal of Medical Mycology

journal homepage: www.elsevier.com



Case report

Pythiosis in a patient with Acute Myeloid Leukemia: Diagnosis and clinical course

Parijat Das[a,*], Arpita Bhattacharyya[b], Parthasarathi Bhattacharyya[b], Kingshuk Dhar[a], Krishnendu Das[a], Sanjay Bhattacharya[a]

[a] Department of Microbiology, Tata Medical Center, Kolkata, India
[b] Department of Pediatric Oncology, Tata Medical Center, Kolkata, India

BRIEF COMMUNICATION

Role of water quality assessments in hospital infection control: Experience from a new oncology center in eastern India

Ramkrishna Bhalchandra, Mammen Chandy[1], Venkata Raman Ramanan[1], Aseem Mahajan[1], Jeeva Ratnam Soundaranayagam[2], Subrata Garai[2], Sanjay Bhattacharya

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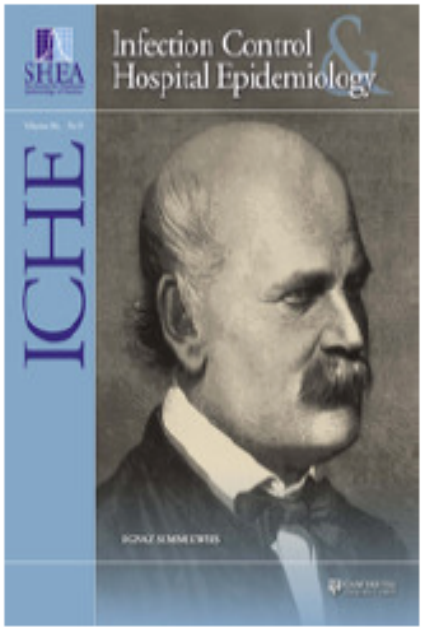
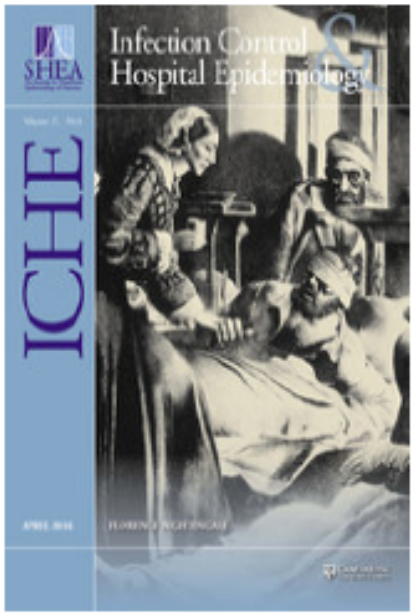


Importance of Air Particle Counts in Hospital Infection Control: Insights From a Cancer Center in Eastern India

Ramkrishna Bhalchandra, Sanjay Bhattacharya, Jeeva Ratnam Soundaranayagam, Subrata Garai and Mammen Chandy

Infection Control & Hospital Epidemiology / Volume 36 / Issue 09 / September 2015, pp 1115 - 1117
DOI: 10.1017/ice.2015.157, Published online: 08 July 2015



Low Incidence of Central Venous Catheter–Related Bloodstream Infections in Stem Cell Transplant Patients in Eastern India Despite High Community Burden of Multidrug-Resistant Pathogens

Mita Roychowdhury, Jeevan Kumar, Anupam Chakrapani, Saurabh Jayant Bhave, Shekhar Krishnan, Robin Thambudorai, Sanjay Bhattacharya and Mammen Chandy

Infection Control & Hospital Epidemiology / Volume 37 / Issue 05 / May 2016, pp 619 - 620
DOI: 10.1017/ice.2016.18, Published online: 09 February 2016

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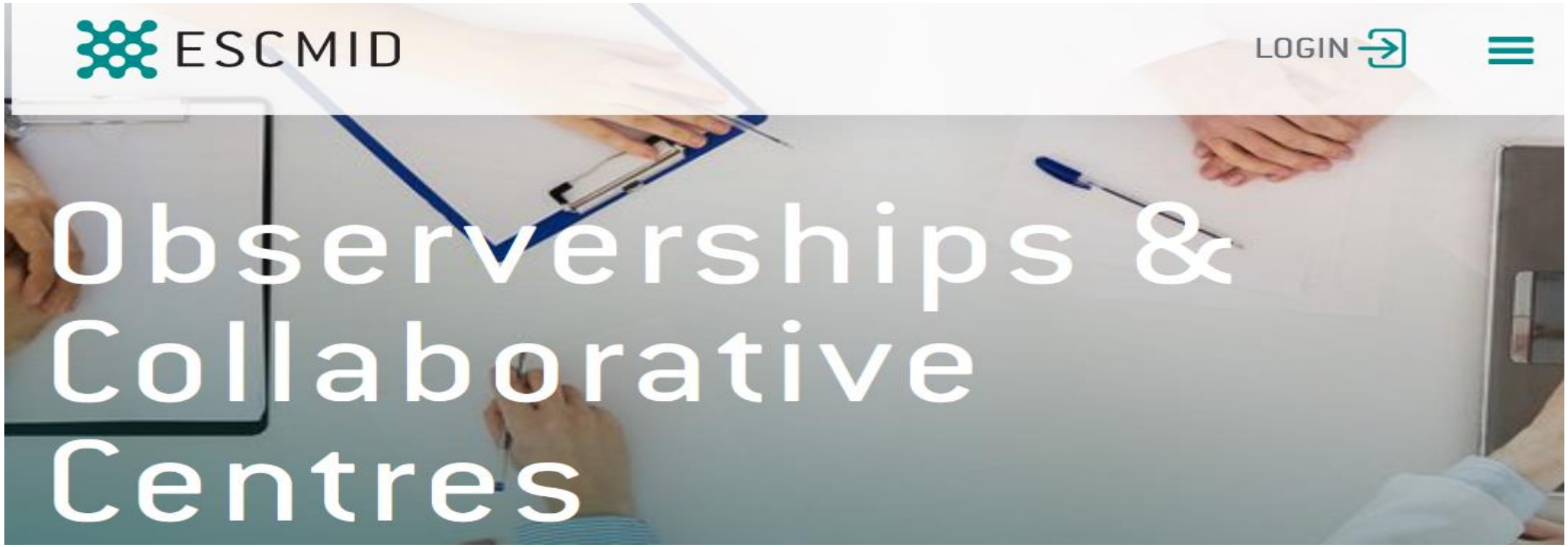

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