

Essentials of Microbial Serology

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PREFACE

Dear Reader,

Serology has been one of the most powerful tools in diagnostic microbiology, providing critical insights into host-pathogen interactions via the study of antigen-antibody reactions. Notwithstanding the tremendous advancements in genomic identification techniques and molecular biology, serology still remains an indispensable tool for the identification, confirmation, and epidemiological understanding of infections.

This book, “The Essentials of Microbial Serology”, has been designed specifically to serve as a comprehensive guide for students and practitioners of undergraduate and postgraduate medical microbiology, with special focus on major domains like bacterial, viral, fungal, and parasitic serology. It provides concise yet meticulous description of classical as well as modern serological tests in diagnostic laboratories.

Each section introduces the underlying immunological principles, followed by practical aspects of the tests, interpretation of results, and clinical relevance. Emphasis has been accorded on the interpretation of serological tests in the context of disease dynamics.

This text bridges the gap between theory and practice, serving as an invaluable resource for undergraduate and postgraduate students of microbiology, as well as for laboratory professionals engaged in infectious disease diagnosis and public health surveillance. Given that serology is essential for practical laboratory work, this book, authored by Indian scholars, stands as a ready reference exclusively devoted to the serological techniques applied to various microorganisms. With its comprehensive content, lucid explanations, and practical approach, the book offers a thorough understanding of the diverse methodologies employed in the serological diagnosis of infectious diseases.

We hope this book not only strengthens the foundational understanding of serology but also inspires learners to appreciate their application in clinical microbiology and immunodiagnostics. The book is meant to cater to MBBS and Nursing students studying microbial serology. It will also be helpful for postgraduate students of medical Microbiology.

We welcome constructive feedback and suggestions from readers to further enhance and enrich future editions of this work.

Sincerely,

**Dr. Sayan Bhattacharyya, Dr. Anju Dinkar, Dr. Sneha Mohan,
Dr. Sujit Bharti, Dr. K.P. Anirima, Dr. Jitendra Singh**

About Author(s)

Dr. Sayan Bhattacharyya



Dr. Sayan Bhattacharyya is Professor in the Department of Microbiology, All India Institute of Hygiene and Public Health, Kolkata, India. He pursued his MBBS from Medical College Calcutta and MD from PGIMER, Chandigarh. Dr. Sayan has 122 publications and 7 book chapters to his credit and has won 4 awards so far. He has acted as judge in conferences like MICROCON 2025. He has acted as paper setter and external examiner for many examinations. He is chief Editor of Eastern Journal of Medical Sciences and managing editor of Indian Journal of Hygiene and Public Health. His career interests are Medical Mycology, AMR, foodborne infections and Parasitic Serology. His strengths are speed and innovation.

Dr. Anju Dinkar



Dr. Anju Dinkar (MBBS, MD, FICN) is an accomplished academician and clinical microbiologist, currently serving as Associate Professor at the Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India. She completed her M.D. in Microbiology from King George's Medical College following her M.B.B.S. from Moti Lal Nehru Medical College. With over a decade of dedicated teaching and research experience, she has held key academic positions at the Institute of Medical Sciences, BHU, where she served as Assistant Professor (2015–2019) and Associate Professor (2019–2023), before joining SGPGIMS. Her academic journey began with her senior residency at SGPGIMS, Lucknow, and her formative MD training at KGMU.

Her research interests are centred on infectious diseases, with a particular focus on vector-borne diseases such as dengue and chikungunya. Her MD thesis on fungal infections in pediatric cancer patients reflects her early commitment to clinically relevant microbiological research. She has made substantial scholarly contributions, with over 70 publications in indexed national and international journals, accumulating nearly 500 citations.

Recognized for her academic rigor and commitment to advancing microbiological sciences, she continues to contribute actively to teaching, research, and clinical microbiology, making her a respected voice in the field.

Dr. Sneha Mohan



Dr. Sneha Mohan is a distinguished microbiologist and academician whose career is defined by a blend of rigorous clinical expertise and a passion for medical education. She currently serves as an Assistant Professor in the Department of Microbiology at the Government Institute of Medical Sciences (GIMS), Greater Noida. Her journey in medicine began at a prestigious medical college in Nagpur, where she completed her MBBS before pursuing her MD in Microbiology at the world-renowned King George's Medical University (KGMU), Lucknow. With 12 years of dedicated teaching experience, she has been instrumental in shaping the careers of countless MBBS and postgraduate students. Her commitment to the field extends beyond the classroom into high-impact research and infrastructure development. She has played a pivotal role in the establishment of the Culture and Drug Susceptibility Testing (CDST) Tuberculosis Laboratory at GIMS, significantly enhancing the region's diagnostic capabilities for TB. An avid researcher with a keen analytical mind, she has authored over 30 research publications in leading medical journals. In recognition of her tireless efforts on the frontlines of the diagnostic field during the COVID-19 pandemic, she was honored with the Best Achievers Award. Her professional focus remains at the cutting edge of infectious disease, with specialized interests in Mycobacteriology, Medical Mycology, Antimicrobial Resistance (AMR), and Molecular Virology. She continues to bridge the gap between complex laboratory science and clinical application.

Dr. Sujit Bharti



Dr. Sujit Bharti is an Associate Professor in the Department of Microbiology, Homi Bhabha Cancer Hospital and Pandit Madan Mohan Malaviya Cancer Centre, Tata Memorial Centre, Varanasi. He pursued his MBBS from Grant Medical College, Mumbai and MD from Institute of Medical Sciences, Banaras Hindu University, Varanasi. Dr. Sujit has 19 publications and has won 2 awards and has many appreciations. He has contributed as a speaker in different conferences and CMEs. He has been an external examiner for different organizations. His career interests are Anti-Microbial Resistance, Infection Prevention and Control, Health Care Associated Infection, Mycology, Quality Control, Bacteriophage Therapy, Gut Microbiota. He is currently engaged in different research projects. He is a clinical microbiologist with keen interest in innovative research.

Dr. K.P. Anirima



Dr. K. P. Anirima, MBBS, MD, DIPC, MNAMS is a dedicated medical professional currently serving as a Senior Resident in the Department of Microbiology at the All India Institute of Medical Sciences (AIIMS), Patna. She completed her MBBS from Medical College, Calcutta, followed by an M.D. in Microbiology from AIIMS Patna, and also holds a DNB certification from the National Medical Commission (NMC). Her primary areas of interest include Medical Mycology, Parasitology, and Antimicrobial Resistance (AMR). Dr. Anirima has authored six research publications and continues to contribute actively to diagnostic and academic advancements in clinical microbiology. She is deeply committed to research, teaching, and the promotion of evidence-based laboratory practices in infectious disease management.

Dr. Jitendra Singh



Dr. Jitendra Singh is a dedicated clinician–academic and currently serves as Assistant Professor in the Department of General Medicine at King George’s Medical University, Lucknow, India. He completed his M.D. in Internal Medicine from KGMU following his MBBS from Ganesh Shankar Vidyarthi Memorial Medical College, Kanpur.

With extensive experience in teaching and clinical practice, he has actively contributed to undergraduate medical education through bedside teaching and academic mentoring. He completed his Senior Residency at KGMU and subsequently held academic positions in a reputed institution, the Institute of Medical Sciences, BHU, as an Associate Professor. He has also served as a practising internal medicine specialist in tertiary care settings, strengthening his clinical acumen.

His research interests focus on communicable & non-communicable diseases and their systemic impact. He had more than 82 publications and 646 citations. His postgraduate thesis explored pulmonary function abnormalities in patients with type 2 diabetes mellitus and their correlation with microvascular complications, reflecting his interest in integrated clinical research.

Dr. Singh combines strong clinical expertise in infectious diseases with academic commitment, contributing meaningfully to patient care, medical education, and research in internal medicine.

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