2017-2018



ANNUAL RESEARCH REPORT RESEARCH SUPPORT DIRECTORATE



CONTENTS

Director's Foreword	3
From the Chairperson's Desk	4
From the Co-Chairperson's Desk	5
Research Support Directorate- An overview	6
Research Support Directorate- Organisational structure	7
Department of Administration	8
Department of Anaesthesia & Critical Care	9
Department of Breast Oncology	
Department of Clinical Haematology	14
Department of Cytogenetics	
Department of Gastro Intestinal HPB Surgery	21
Department of Central Sterile Services	23
Department of Head & Neck	24
Department of Histopathology	27
Department of Medical Oncology	
Department of Microbiology	
Department of Molecular Genetics	
Department of Nursing	
Department of Paediatrics	44
Department of Psycho Oncology	
Department of Pulmonology	
Department of Plastic & Reconstructive Surgery	53
Department of Radiation Oncology	55
Department of Transfusion Medicine	63
Appendix 1: Publications – Tata Medical Centre	
Tata Translational Cancer Research Centre	
Annexure 1: RSD Checklist	

DIRECTOR'S FOREWORD

The Tata Medical Center was opened on the 16th of May 2011. I believe that we have come a long way over these past 8 years with a phenomenal increase in the services we provide to patients with cancer. In 2019 we have successfully completed the Phase II expansion which is a great piece of architecture with lovely gardens surrounding the building and a quantum increase in the infrastructure to treat cancer. But this will remain only a building unless we can staff it with competent, caring individuals who will transform it into a place of healing.

We have completed the two and half floors of TTCRC and the new academic block. This is now directly opposite the new education block with a state of the art auditorium and meeting rooms. I trust that the research output will make a difference to the understanding and treatment of cancer. Research is an integral part of a good cancer center and this means that we are constantly evaluating our performance and benchmarking it against the best centres in the world. Education is the only way we can extend our reach and I trust that in 2019 we will get approval for the courses which are pending with the National Board since we are now a 435 bed Hospital.

I would like to thank all staff who have worked to put Tata Medical Center on the map of Cancer in India. We are privileged to work in truly world class facilities and I trust that we will continue to work together to make TMC a place where each individual is valued and where patients can find not only the best treatment but also comfort and care.

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FROM THE CHAIRPERSON'S DESK

The annual report provides an overall picture of current research activity within Tata Medical Center, Kolkata. Quality research in health sciences requires collaboration and sharing of ideas, expertise and resources. There is good evidence that patient-centric research not only improves outcomes but also contributes to optimisation of care pathways. Experiences are shared both as presentations at conferences and in publications so others can benefit from the work carried out. The 2017-18 report amply illustrates the healthy intramural and extramural program of activity at our hospital.

With the rapid advances in all aspects of cancer, keeping up can be daunting and the high clinical workload can lead to progressive deskilling. While the impetus is left to the individual clinician, within a clinical centre as ours, research requires a structure similar to that of any other department within the hospital. First is dedicated space for research – this has been achieved both with the academic centre and TTCRC. The next is courses to help those who are research active. A number of such courses have been held by different departments and includes the research methodology course held earlier this year. Like any clinical speciality, research too is governed by rules, regulations and codes of practice. The research support directorate (RSD) has been set up to help researchers understand the frameworks that govern research excellence so that their work may have the maximum impact. Just like the clinical services, research too must generate income not only to fund the program of activity but also in clinical research it often helps subsidise patient care. It is important therefore that we obtain external funding and develop a resource within TMC to pump prime promising research questions. Finding external funding is a daunting process – who will fund, when to apply and the application process itself is often time consuming. RSD now has dedicated staff who can help with the process including structuring the grant proposal so it has the best chance of obtaining funding. Once you obtain a grant, managing the funding is also a difficult task. We have worked with HR, Finance, Estates etc. to set up a common framework so that budgets are realistic, use of existing resources are maximised and a successful grant is supported to the end. Finally, like any other service, how well the RSD functions will depend on how much it is used and the requirements made on it by the users. Please feel free to send suggestions, requests to the RSD. Membership of the RSD committee is not restricted and we encourage anyone who wishes to develop a robust research environment at TMC (even if it is for your own requirements) to join. The demands are not onerous, we meet once a month and share the tasks. The annual research report is an example of this shared effort though I need to acknowledge the efforts of Prateek Jain and Sukanya Guha who were responsible for compiling the final report.

barbar Jaha

FROM THE CO-CHAIPERSON'S DESK

From the time of Archimedes and Aryabhatta and perhaps even earlier, the aim of research was to generate new knowledge. However, the path followed by researchers of any generation have never been easy. Significantly, apart from the scientific and technical challenges the investigation of the unknown has often been characterized by the lack of resources and such mundane things like space, electricity and alchemy- not just at the chemical level but also at the psychological domain of competing researchers. Alexander the Great was not a man of science but he arguably understood the value of logistical organization in serious research by arranging for his teacher Aristotle, a zoo and a garden where the master along with his students could study Zoology and Botany. In the Golden Age of Islam, Caliph Harun al Rashid in Baghdad founded the House of Wisdom where perhaps a million scrolls were collected and copied by translators and scribes in an act which was essentially creating a database and information storage space for researchers. Much nearer to home in the ancient university of Nalanda lamp lighting and sleeping spaces where created for scholars who came from places as far as China. The fundamental thing in the Indian institute of Science established through the vision of Jamsedji Tata was more about the infrastructure that facilitated basic research than about its domains. All these historical examples teach us that for the creation, sustenance and implementation of knowledge that serves the interest of humankind a synergy of purpose must exist between the scientific, ethical and logistical arms of research. The Research Support Directorate has been conceived keeping in mind this basic aim. It would be as useful and as helpful as we want it to be. We look forward to your active support.

Bhattachanyay.

RESEARCH SUPPORT DIRECTORATE An Overview

Research Support Directorate (RSD) is set up with the broad aim of facilitating and supporting the wide range of research activities at the Tata Medical Center. This includes addressing the logistic requirements for the conduct of research, developing policies for research operations, facilitating development of collaborative research proposals especially in response to external grant calls, providing training and advice support especially for young investigators, conducting courses on various aspects of research (methodology, grant application etc.) for young researchers and communicating and summarising research activities carried out in the institution.

Our mission is to develop Tata Medical Center as one of the leading research institutions in the world and to provide a holistic environment for the training of the next generation of cancer researchers.

RESEARCH SUPPORT DIRECTORATE The Organizational Structure



DEPARTMENT OF ADMINISTRATION

Dr Aseem Mahajan

MBBS, MHA, Senior Medical Administrator

Ms Soumita Ghose

MpH, Senior Manager, Administration and Policy

RESEARCH PROJECTS

1. India's position in implementing the WHO Framework Convention on Tobacco Control – A Policy Analysis. (Investigator-initiated, PI Dr Soumitra Shankar Datta)

ABSTRACT PRESENTATION

 Knowledge, Attitude and Practices On Cancer and Its Prevention-A Cross Sectional Survey. Ghose S, Datta SS. Journal of Cancer Research & Therapeutics. 2017 Dec 2;13.

AWARDS / FELLOWSHIPS

1. Research Travel Grant, Tata Education and Development Trust.

DEPARTMENT OF ANAESTHESIA & CRITICAL CARE

Dr Jyotsna Goswami MBBS, MD, Senior Consultant & HOD

Dr Mayukh Chattopadhyay MBBS, MD, PDCC, FRCA, Senior Consultant

Dr Rakhi Khemka Mittal MBBS, MD, Senior Consultant

Dr Sonal Rastogi Das MBBS, MD, PDCC in Neuro Anaesthesia, Senior Consultant

Dr Anshuman Sarkar MBBS, MD, Associate Consultant

Dr Arunangshu Chakraborty MBBS, MD, Associate Consultant

Dr Aditi Gupta MBBS, FCARCSI, Consultant

Dr Viplab Patro MBBS, DNB, Associate Consultant

Dr Neha Desai MBBS, DA, DNB Anaesthesia, Junior consultant

Dr Angshuman R Pal MBBS, MD, Junior consultant

Dr Suparna Mitra Barman MBBS, MD, Junior consultant

Dr Sumantra Sarathi Banerjee MBBS, MD, Junior consultant

RESEARCH PROJECTS

- 2. Is COMBIPECS the answer to perioperative analgesia for breast surgery? A double blinded randomized controlled trial. (Investigator initiated, PI Dr Rakhi Khemka Mittal)
- 3. Pre-procedural ultrasound for IJV access-a pilot study (PUJA study). (Investigator initiated, PI Dr Sumantra Aarathi Banerjee)
- 4. Post-operative delirium in cancer patients: incidence and risk factors- a prospective observational cohort study (POD Can). (Investigator initiated, PI Dr Sudipta Mukherjee)
- 5. Role of sedation in EBUS-TBNA: A retrospective observational study. (Investigator initiated, PI Dr Ipshita Chattopadhyay)
- 6. Cytoreductive surgery and Hyperthermic intraperitoneal chemotherapy retrospective audit. (Investigator initiated, PI Dr Suparna Mitra)
- 7. Spontaneous respiration using intravenous anaesthesia and high flow nasal oxygen maintain oxygenation during tracheal stenting. (Investigator initiated, PI Dr Sayandeep Mandal)
- 8. Hypotension in patients using ACEI/ARBS undergoing major oncological surgeries- Retrospective audit. (Investigator initiated, PI Dr Swathi Byreddy)
- 9. Validation of P POSSUM and surgical APGAR score in adult cancer surgery patient. (Investigator initiated, PI Dr Ankit Agarwal)
- 10. Rapid diagnosis of carbapenem resistance: experience of a tertiary care cancer centre with multiplex PCR. (Investigator initiated, PI Dr Sudipta Mukherjee)
- 11. Role of sporadic procalcitonin testing in management of sepsis in cancer patients A prospective observational study. (Investigator initiated, PI Dr Sudipta Mukherjee)

RESEARCH PUBLICATIONS

- Perioperative management of patients with addiction to opioid and non-opioid medications. Thomas DA, Boominathan P, Goswami J, Mukherjee S, Vadivelu N. *Current Pain and Headache Reports*. 2018 Jun 14;22(7):52.
- Exploring the prescribing behaviours and the mind of antibiotic prescribers is critical for a successful antibiotic stewardship programme. Results of a survey from Eastern India. Ravi N, Laha A, Hmar L, Chatterjee S, Goswami J, Goel G, Dhar K, Ghosh T, Chatterjee S, Datta SS, Bhattacharya S. Indian J Med Microbiol. 2017; 35:299-301.
- 3. Indwelling tunnelled epidural catheter for analgesia in a terminal cancer patient: A case report. Chakraborty A, Datta T, Agrawal S. *JAICM*. 2017;4(2).
- 4. Quality of Life after Accidental Major Vascular Injury and Prolonged ICU Stay A Case Report. Mitra S, Supriya M, Subhabrata N, Asima M, Goswami J. J Case Rep Stud. 2018; 6(3): 307.
- 5. Anaesthesia Management of Patient with Idiopathic Thrombocytopenic Purpura A Case Series. Suparna M, Angshuman Rudra P, Jyotsna G. *J Anesth Ther*. 2018; 1: 105.

- Nasal ala pressure sores following head and neck reconstructive surgery: A retrospective analysis from a tertiary cancer hospital. Rastogi S, Bhutia T, Singh A, Arun P. Indian J Anaesth. 2017 Jan;61(1):74-76.
- 7. The impact of early tracheostomy in neuro-trauma patients: A retrospective study. Zirpe KG, Tambe DV, Deshmukh AM, Gurav SK. *Indian J Crit Care Med*. 2017 Jan;21(1):6-10.
- Correlation of neutrophil CD64 with clinical profile and outcome of sepsis patients during intensive care unit stay. Ghosh PS, Singh H, Azim A, Agarwal V, Chaturvedi S, Saran S, Mishra P, Gurjar M, Baronia AK, Poddar B, Singh RK, Mishra R. *Indian J Crit Care Med*. 2018 Aug; 22(8): 569–574.
- Speech and swallowing function outcome following early tracheostomy in patients who underwent neurosurgical intervention. Kumar VA, Reddy BU, Kiran Kumar VA, Pal R, Kumar RL, Jahnavi M, Agrawal A. Indian J Crit Care Med. 2018 Jun;22(6):427-430.
- Comparison of hemodynamic monitoring between trans-oesophageal Doppler and ultrasonographyguided inferior vena cava distensibility in supine versus prone position: A pilot study. Ghosh PS, Azim A, Saran S, Baronia AK, Poddar B, Singh RK, Gurjar M, Mishra P. *Indian J Crit Care Med*. 2018 Dec;22(12):836-841.
- 11. Trans-Oesophageal Doppler Assessment of Acute Hemodynamic Changes Due to Prone Positioning in Acute Respiratory Distress Syndrome Patients. Saran S, Gurjar M, Azim A, Mishra P, Ghosh PS, Baronia AK, Poddar B, Singh RK. *Shock.* 2018 Nov;20.

ACADEMIC MEETINGS

- 1. Adult difficult airway management (Workshop Jan, 2018)
- 2. Mechanical ventilation- update. (Workshop Oct, 2018)
- 3. Interventional Perioperative Sonography Association. (Conference Feb, 2018)
- 4. Departmental weekly academics. (Seminar, Every Saturday)
- 5. COLS- compression only life support. (Workshop Oct, 2018)
- 6. BCLS- Basic cardiac life support. (Workshop June, 2018)
- 7. CCLS- Comprehensive cardiac life support. (Workshop Dec, 2018)

AWARDS / FELLOWSHIPS

- 1. Dr Sudipta Mukherjee- 2nd Prize, Criticare 2018 (Quiz)
- 2. Dr Pralay Sankar Ghosh- 1st Prize, Criticare 2018 (Paper)

DEPARTMENT OF BREAST ONCOLOGY

Dr Rosina Ahmed

MBBS, MD (Sheffield), FRCS (Eng.), FRCS (Gen Surg), Senior Consultant

Dr Sanjit Agrawal,

MBBS, MS (Gen Surg), Fellowship in Surgical Oncology, Breast Surgery Qualification (European Board), Associate Consultant

Dr Avishek Sharma

MBBS, MS (Gen. Surg.), Fellowship in Oncoplastic, Breast Surgery (UK). Junior Consultant.

RESEARCH PROJECTS

- 1. RCT for effect of Trastuzumab + paclitaxel in metastatic setting as 1st line therapy. (Industry-sponsored, PI Dr Rosina Ahmed)
- 2. Multi-centric Screening of Breast Cancer Patients to determine efficacy and to assess sensitivity and accuracy of Pandora CDx Mammo-Alert in screening of breast Cancer. (Industry-sponsored, PI Dr Rosina Ahmed)
- 3. Operation Theatre time utilization: Defining Key Performance Indicators. (Investigator initiated, PI Dr Sanjit Kumar Agrawal)
- 4. Axillary management of breast cancer National practice survey. (Investigator initiated, PI Dr Sanjit Kumar Agrawal)

RESEARCH PUBLICATIONS

- Sentinel Lymph Node Biopsy After Initial Lumpectomy (SNAIL Study)—a Prospective Validation Study. Agrawal SK, Bansawal L, Arun I, Datta SS, Chatterjee S. Indian Journal of Surgical Oncology. 2018; Available from: https://doi.org/10.1007/s13193-018-0861-4
- Resource requirements and reduction in cardiac mortality from deep inspiration breath hold (DIBH) radiation therapy for left sided breast cancer patients: A prospective service development analysis. Chatterjee S, Chakraborty S, Moses A, Nallathambi C, Mahata A, Mandal S, Achari RB, Mallick I, Shrimali RK, Bhattacharyya T, Agrawal S, Ghosh J, Ahmed R. *Pract Radiat Oncol*. 2018; 8:382-387.
- Quality Indicators for Sentinel Lymph Node Biopsy in Breast Cancer: Applicability and Clinical Relevance in a Non-Screened Population. Agrawal SK, Shenoy SS, Nalawade N, Datta SS, Roy S, Chatterjee S, Arun I, Ahmed R. Indian J Surg Oncol. 2018; 9:312-317.
- 4. Antibiotic Prophylaxis for Breast Onco-surgery in a Setting with a High Prevalence of Multidrug-Resistant Bacteria: Common Sense Infection Control Measures Are More Important Than Prolonged

Antibiotics. Agarwal N, Agarwal SK, Bhattacharya S, Datta SS, Chatterjee S, Ahmed R. *Infect Control Hosp Epidemiol.* 2018; 39:498-500.

ACADEMIC MEETINGS

- 1. Skill Course 2-Biostatistics and Clinical Research Methodology. (Workshop in July, 2018)
- 2. Padakhep 1- Survivor group meeting (Every Month)
- 3. Padakhep 2 Helping patient during active treatment (Every Month)
- 4. European Society of Surgical Oncology (ESSO) Breast surgery and Surgical Oncology (online written Examination in June, 2018)

AWARDS / FELLOWSHIPS

- 1. Dr Sanjit Agarwal- Prize
- 2. Dr Sanjit Agarwal- Fellowship

DEPARTMENT OF CLINICAL HAEMATOLOGY

Prof Dr Mammen Chandy

M.D. Medicine, FRACP, FRCPA, FRCP

Prof Dr Reena Nair

M.D. (Medicine)

Dr Vivek S. Radhakrishnan

M.D., D.M., PDF (Clinical Hematology and BMT)

Dr Saurabh Bhave M.D.(Medicine), PDF (Clinical Hematology)

Dr Jeevan Kumar

M.D. Medicine, DNB (Clinical Hematology), PDF (Clinical Hematology and BMT)

RESEARCH PROJECTS

- A multicentre, retrospective medical record review study to describe real-world treatment patterns and safety among patients receiving rituximab [Mabthera or Reditux] to treat B-Cell non Hodgkin Lymphoma in India. (Industry-sponsored, PI Dr Reena Nair)
- 2. Myeloproliferative neoplasms Epidemiological Registry in Growing and Emerging Markets the Merge Study. (Industry-sponsored, PI Dr Deepak Mishra)
- Reditux Registry to compare Effectiveness, Safety, and Resource Utilization of Reditux vs the reference Medicinal product to treat Diffuse Large B –Cell lymphoma and Chronic Lymphatic Leukemia in Routine Clinical Practice. (Industry-sponsored, PI Dr Reena Nair)
- A multi-center, observational, data collection registry study to monitor the routine clinical use of MABTAS (rituximab 100 mg / 500 mg concentrate for solution for infusion, manufactured by Intas Pharmaceuticals ltd) in Indian patients. (Industry-sponsored, PI Dr Saurabh Jayant Bhave)
- A Phase 1 Study to Determine Safety, Tolerability, Pharmacokinetics, and Activity of K0706, a Novel Tyrosine Kinase Inhibitor (TKI), in Subjects with Chronic Myeloid Leukemia (CML) or Philadelphia Chromosome Positive Acute Lymphoblastic Leukemia (Ph+ ALL). (Industry-sponsored, PI Dr Vivek S Radhakrishnan)
- Phase 2, Open-Label Randomized Trial Evaluating the Efficacy and Safety of Two Dosages of Once Daily Oral CA-170 in Patients with Selected Relapsed Advanced Tumors (ASIAD). (Industry-sponsored, PI Dr Vivek S Radhakrishnan)

- A Phase 2b Open-Label Study of Selinexor (KPT-330) in Patients with Relapsed/Refractory Diffuse Large B-Cell Lymphoma. (Industry-sponsored, PI Dr Vivek S Radhakrishnan)
- A Randomized, Multi-centre, Double- blind, Parallel Group study to compare the pharmacokinetics, Pharmacodynamics, Safety and Efficacy of two anti- CD 20 monoclonal antibodies in combination with CHOP in patients with CD 20 – positive Diffuse Large B-Cell Lymphoma. (Industry-sponsored, PI Dr Reena Nair)
- A Randomized, Double-blind, Multicentre, Multinational Trial to Evaluate the Efficacy, Safety, and Immunogenicity of SAIT101 Versus Rituximab as a First-line Immunotherapy Treatment in Patients with Low Tumour Burden Follicular Lymphoma. (Industry-sponsored, PI Dr Vivek S Radhakrishnan)
- 10. A phase 3 randomized, controlled, open-label study of Selinexor, bortezomib, and dexamethasone (svd) versus bortezomib and dexamethasone (vd) in patients with relapsed or refractory multiple myeloma (rrmm) karyopharm. (Industry-sponsored, PI Dr Jeevan Kumar)
- 11. A Phase III Randomised, Double-Blind, controlled, parallel group study of intravenous volasertib in combination with subcutaneous low-dose cytarabine vs. placebo + low-dose cytarabine in patients ≥ 65 years with previously untreated acute myeloid Leukemia, who are ineligible for intensive remission induction therapy (POLO-AML-2 Study). (Industry-sponsored, PI Dr Anupam Charkrapani)
- 12. Imbruvica Study. (Industry-sponsored, PI Dr Vivek S Radhakrishnan)
- 13. Onco collect Lymphoma Group" Registry Project. (Investigator initiated, PI Dr Reena Nair)
- 14. IMAGe Registry Study. (Investigator initiated, PI Dr Jeevan Kumar)
- 15. CRIMSON Project: Cancer Immunotherapy and Precision Oncology. (Investigator Initiated, PI Dr Vivek S Radhakrishnan)
- 16. R-BED Study: Bortezomib, Etoposide, Dexamethasone combination therapy, with or without Rituximab, in Adult Relapsed or Refractory B-cell Acute Lymphoblastic Leukemia who are transplant ineligible. (Investigator Initiated, PI Dr Vivek Radhakrishnan, Dr Reena Nair)
- 17. ALTITUDE Study: Acute Myeloid Leukemia- Exploring the feasibility of Multimodal -OMICS based Genomic characterization, MRD evaluation and computational drug modelling to inform disease management. (Investigator Initiated, PI Dr Vivek Radhakrishnan, Dr Mammen Chandy)
- GIFT Study: Excavating the relationship between genomic alterations in gingivo-buccal oral cancer with tumour immune micro-environment to inform immunotherapy. (Investigator Initiated, DBT SyMEC project: Co-PI Dr Vivek S Radhakrishnan)
- 19. AML Therapy and Cost-Benefit Analysis. (Investigator Initiated, PI: Dr Vivek S Radhakrishnan)

RESEARCH PUBLICATIONS

 Whole Genome and Exome sequencing defines the Genetic Landscape of Hepatosplenic T Cell Lymphoma. Scotland P, Parihar M, Nair R, Sengar M, K. Naresh, Sandeep S. Dave. Cancer Discov. 2017; 7:369-379.

- Management of Lymphomas: Consensus Document 2018 by an Indian Expert Group. Nair R, Chandy M, Parihar M, Arora N, Basu R, Bhave S, Radhakrishnan V. Indian J Hematol Blood Transfus. 2018; 34:398-421.
- Clinical outcomes, Health care costs, and Length of Hospital stay among patients with blood stream infections and acute Leukemia in a cancer center in Eastern India. Muennichow CE, Goel G, Bhattacharya A, Nair R, Chandy M, Bhattacharya S. Infection Control and Hospital Epidemiology. 2018;1-2.
- 4. Cytomegalovirus reactivation and disease amongst patients with allogeneic haematopoietic stem cell transplantation in Eastern India: Epidemiology, outcome and healthcare cost. Kumar M, Roychowdhury M, Kumar J, Harishankar A, Sinha S, Bhave SJ, Chakrapani A, Radhakrishnan V, Nair R, Bhattacharya S, Chandy M. Indian Journal of Medical Microbiology. Jan 2018; 36(1):49.

ABSTRACT PRESENTATIONS

- 1. Single Center Experience with Autologous Stem Cell Transplantation for Multiple Myeloma: A Retrospective Analysis (2017).
- 2. Outcome of Acute Promyelocytic Leukemia (APL): Retrospective study from a tertiary enter. (2017).
- 3. Clinico-pathological Characteristics and Outcome in Patients of Primary CNS Lymphoma Treated with Modified De-Angelis Protocol: An Audit (2018).
- 4. Treatment outcomes of patients with diffuse large B cell lymphomas: an audit (2018).
- 5. Flow Cytometry DNA Ploidy Detects MRD Hyper diploid BCP-All Clone (2018).
- Phase 2 trial of CA-170, a novel oral small molecule dual inhibitor of immune checkpoints VISTA and PD-1, in patients (pts) with advanced solid tumor and Hodgkin lymphoma. Late Breaking Abstract. Abstract P714. SITC, Washington.
- Bridging R-ALL (Relapsed / Refractory Acute Lymphoblastic Leukemia) to a Haematopoietic Cell Transplant using Inotuzumab Ozagamycin HAEMATOCON 2018, International Conference and Annual meeting of the ISHBT, Kochi.
- Myeloablative Conditioning Followed by T-Cell Replete Haploidentical Related Donor Peripheral Blood Stem Cell Transplant Using Post-Transplant Cyclophosphamide Immune Tolerance Approach for High Risk Haematological Malignancies: An Indian Perspective. ASTCT & CIBMTR BMT Tandem meetings 2018, USA.
- 9. Outcomes of High Risk Myeloid Malignancies undergoing Hematopoietic Cell transplant in a tertiary care facility: Real world evidence from India. EBMT Annual Meeting 2018, Lisbon, Portugal.
- T-cell Replete Haploidentical Peripheral Blood Hematopoietic cell transplant is associated with high incidence of cytokine release syndrome: Single Centre experience from India. EBMT Annual Meeting 2018, Lisbon, Portugal.

BOOK CHAPTERS

- 1. Development of Biosimilar Rituximab and Clinical Experience. Biosimilars of Monoclonal Antibodies: A Practical Guide to Manufacturing, Preclinical and Clinical Development. Reena Nair. (2017)
- 2. Lymphoma and other Lymphoid Malignancies. [API Text book] Reena Nair. (2018)

ACADEMIC MEETINGS

- 1. ACORD Concept Workshop 2017. (Workshop in September, 2017)
- 2. Lymphoma Survivor day "Diagnosis and Coping with treatment. (Seminar in September, 2017)
- 3. Leukemia Meet 2017- Lessons learnt from the Leukemia Clinics. (Conference in September, 2017)
- 4. CML survivor day My PCR and After treatment. (Seminar in April, 2018)
- 5. Myeloma Meet 2018- Bridging the Gap. (Conference in September, 2018)
- 6. Lymphoma Survivor day- Coping with treatment. Formation of ASHRAY- patient advocacy Group of Lymphoma. (Seminar in September, 2018)

Dr Mayur Parihar

MBBS, MD, PDF (CGs)

RESEARCH PROJECTS

 "Tumour genome profiling and minimal residual disease estimation in acute haematological malignancies using single-platform next generation sequencing strategies". (Funded by DBT, Government Sponsored, PI Dr Mayur Parihar)

RESEARCH PUBLICATIONS

- A triple-probe FISH screening strategy for risk-stratified therapy of acute lymphoblastic leukaemia in low-resource settings. Parihar M, Singh MK, Islam R, Saha D, Mishra DK, Saha V, Krishnan S. Pediatr Blood Cancer. 2018 31: e27366.
- 3. The Genetic Basis of Hepatosplenic T-cell Lymphoma. McKinney M, Moffitt AB, Gaulard P, Travert M, De Leval L, Nicolae A, Raffeld M, Jaffe ES, Pittaluga S, Xi L, Heavican T, Iqbal J, Belhadj K, Delfau-Larue MH, Fataccioli V, Czader MB, Lossos IS, Chapman-Fredricks JR, Richards KL, Fedoriw Y, Ondrejka SL, Hsi ED, Low L, Weisenburger D, Chan WC, Mehta-Shah N, Horwitz S, Bernal-Mizrachi L, Flowers CR, Beaven AW, Parihar M, Baseggio L, Parrens M, Moreau A, Sujobert P, Pilichowska M, Evens AM, Chadburn A, Au-Yeung RK, Srivastava G, Choi WW, Goodlad JR, Aurer I, Basic-Kinda S, Gascoyne RD, Davis NS, Li G, Zhang J, Rajagopalan D, Reddy A, Love C, Levy S, Zhuang Y, Datta J, Dunson DB, Davé SS. *Cancer Discov*. 2017; 7:369-379.
- Mixed-phenotypic Acute Leukemia series from tertiary care center. Pawar RN, Banerjee S, Bramha S, Krishnan S, Bhattacharya A, Saha V, Chakrapani A, Bhave S, Chandy M, Nair R, Parihar M, Arora N, Mishra DK. Indian J Pathol Microbiol. 2017; 60:43-49.
- Tumours' Achilles' heel, that never was–Experience of re-biopsy on disease progression on EGFR-TKIs in lung cancer (NSCLC) patients from a Cancer Centre in Eastern India. Shrimali R, Bhargav J, Arora N, Midha D, Parihar M, Mishra D, Lingegowda D, Dabkara D, Chatterjee S. Lung Cancer, 2017;103: S1-81.
- 6. Flow Cytometric DNA Ploidy Detects MRD Hyper diploid BCP-All Clone. Rath A, Gupta N, Parihar M, Singh M, Shewale S. *Clinical Lymphoma, Myeloma and Leukemia*. 2018;18: S182-183.
- Granulocytic dysplasia: an indicator of clonal evolution in patients with chronic myeloid leukemia. Rajpal S, Nampoothiri RV, Sreedharanunni S, Parihar M, Malhotra P, Varma N. *Blood Res.* 2018;53:180-181.
- Management of Lymphomas: Consensus Document 2018 by an Indian Expert Group. Nair R, Chandy M, Parihar M, Arora N, Basu R, Bhave S, Radhakrishnan V. Indian J Hematol Blood Transfus. 2018; 34:398-421.

- Granulocytic dysplasia: an indicator of clonal evolution in patients with chronic myeloid leukemia. Rajpal S, Nampoothiri RV, Sreedharanunni S, Parihar M, Malhotra P, Varma N. *Blood Res.* 2018;53:180-181.
- TP53 Mutation, MYCN Amplification, and Large Cell/Anaplastic Histology in Medulloblastoma. Das A, Zameer L, Vinarkar S, Singh M, Parihar M, Arora N, Chandra A, Achari RB. *Indian J Pediatr.* 2018; 85:684-685.

ABSTRACT PRESENTATIONS

- Spectrum of MDS Patients from a Single Tertiary Care Cancer Center in India. Leukemia Research. 55. S86-S87. 10.1016/S0145-2126(17)30253-9. Gupta, N, Mishra, D, Parihar, Mayur, Arora, Neeraj, Singh, M, Sr Arun, Rath, Asish, Shewale, Sundar, Nair, R, Bhave, S, Chakrapani, A, Radhakrishnan, Vivek, Bhattacharyya, A, Krishnan, S, Das, Anirban, Saha, V, Chandy, M. (2017).
- Single Center Experience with Autologous Stem Cell Transplantation for Multiple Myeloma: A Retrospective Analysis. Clinical Lymphoma Myeloma and Leukemia. 17. e72. 10.1016/j.clml.2017.03.130. Kumar, Jeevan, Nair, Reena Chakrapani, Anupam Jayant Bhave, Saurabh, Patra, Sisir, Kumar, Meet, Arora, Neeraj Parihar Mayur kumar Mishra, Deepak Chandy, Mammen. (2017).
- Double whammy or double bonanza? Report of compound/double EGFR mutation in NSCLC patients from a cancer centre in Eastern India. Lung Cancer. 103. S36. 10.1016/S0169-5002(17)30126-5. Shrimali, Raj, Bhargav, J, Arora, Neeraj, Midha, D, Mishra, D, Parihar M, Lingegowda, Dayananda, Dabkara, D, Chatterjee, S. (2017). 76.
- Distinct heterogeneity in Indian patients with high hyperdiploid precursor B cell all identified by high density array analysis. M Parihar, MK Singh, R Islam, et al. Pediatric Hematology Oncology Journal 2 (2), S2.
- Development of a targeted sequencing panel for Indian patients with acute Lymphoblastic Leukaemia.
 D Ganguli, M Parihar, R Islam, et al. Pediatric Hematology Oncology Journal 2 (2), S3-S4.
- Double whammy or double bonanza? Report of compound/double EGFR mutation in NSCLC patients from a cancer centre in Eastern India. R Shrimali, J Bhargav, N Arora, D Midha, D Mishra, M Parihar, ...Lung Cancer 103, S36.
- Clinico pathological contributions at diagnosis of bilinear extra medullary blast proliferation SS Nayak, N Arora, M Parihar, I Arun - Oncology Journal of India, 2017.
- 8. Spectrum of Standard and Rare Cytogenetic Abnormalities in 392 Indian AML Patients. M Parihar, MK Singh, Sr Arun, N Arora, D Mishra... MOLECULAR CYTOGENETICS, 2017.
- 9. Stepwise FISH strategy to identify high risk Multiple Myeloma (MM) patients using CD138 positively selected plasma cells: TMC Experience. Sumanta K Patel, Sipra Rani Patel, Arun SR, Manish K Singh, Neeraj Arora, Deepak K Mishra, Jeevan Kumar, Saurabh J Bhave, Vivek S Radhakrishnan, Reena Nair, Mammen Chandy, Mayur Parihar. Abstract Indian Journal of Haematology and Blood Transfusion 2017.

- 10. Detection of Acute promyelocytic leukemia (APML) variant RARa translocation using standard dual colour/ dual fusion (DC/DF) PML-RARA FISH probe: A tale of two cases. Sipra Rani Patel, Sumanta Patel, Arun SR, Manish K Singh, Neeraj Arora, Deepak K Mishra, Jeevan Kumar, Saurabh J Bhave, Vivek S Radhakrishnan, Reena Nair, Mammen Chandy, Mayur Parihar. Abstract Indian Journal of Haematology and Blood Transfusion 2017.
- 11. Cytogenetic profile of Plasma Cell Neoplasm (PCN) patients using FISH analysis of CD138 positively selected plasma cells: TMC experience. Tanvi Gupta, Sumanta Patel, Neeraj Arora, Deepak Mishra, Jeevan Kumar, Saurabh Bhave, Vivek Radhakrishnan, Reena Nair, Mammen Chandy, Mayur Parihar. Abstract Indian Journal of Haematology and Blood Transfusion 2018.
- 12. C-Myc rearranged Precursor B Cell Acute Lymphoblastic Leukaemia: a brief report of 5 cases of this under diagnosed rare entity. Arun SR, Sipra Patel, Pranay Gurung, Neeraj Arora, Deepak Mishra, Shekhar Krishnan, Bhave Saurabh, Reena Nair, Mammen Chandy, Mayur Parihar. Abstract Indian Journal of Haematology and Blood Transfusion 2018.

ACADEMIC MEETINGS

- 1. 5th basic Molecular Pathology workshop. (Workshop in June, 2017)
- 2. 6th basic Molecular Pathology workshop 2018. (Workshop in June, 2018)
- 3. FISH on solid tumour and Haematological Malignancies. (Workshop in May, 2018)
- 4. FISH in Lung cancers (Lung Cancer Preceptorship). (Workshop, 2018)

AWARDS / FELLOWSHIPS

1. Dr Mayur Parihar

DEPARTMENT OF GASTRO INTESTINAL-HPB SURGERY

Dr Manas Roy

MS, FRCS, Mch

Dr Sudeep Banerjee

MS, DNB (GI-Surgery)

Dr Robin Thambudorai

MBBS, MS

Dr Atindriya Biswas

MS, MRCS, FRCS, FEBS

Dr Sumanta Dutta

MRCS, FRCS, MD

Dr Bipradas Roy

MS, MRCS

Dr Amrit Pipara

MS, MBBS, MS (Gen.Surg), PDF in Colorectal Surgery (CMC, Vellore), PDF GI-HPB Oncology (TMC, Kolkata)

RESEARCH PROJECTS

 Somatic mutation profile of TP53 and RAS genes and characterization of whole genome-wide SNP array pattern of pancreatic cancer in Indian population (PANGEN study) – in collaboration with Indian Statistical Institute. (Recruitment – ongoing)

RESEARCH PUBLICATIONS

- 1. Genetic Alterations of Periampullary and Pancreatic Ductal Adenocarcinoma: An Overview. Sikdar N, Saha G, Dutta A, Ghosh S, Shrikhande SV, Banerjee S. *Current Genomics*.2018 Sep;19(6):444-463.
- Prevalence estimation of microsatellite instability in colorectal cancers using tissue microarray based methods - A tertiary care center experience. Nayak SS, Roy P, Arora N, Arun I, Roy MK, Banerjee S, Mallick I, Mallath MK. *Indian J Pathol Microbiol*. 2018 Oct-Dec;61(4):520-525.

ABSTRACT PRESENTATIONS

- Pattern of recurrence after curative resection for periampullary malignancy. Lamichhane D, Roy B, Pipara A, Thambudorai R, Roy MK, Banerjee S. Indian Association of Surgical Gastroenterology, Chandigarh, 6-8 Oct 2018.
- 2. Quality assurance of laparoscopic and open resection for rectal cancer using histopathological parameters. Pipara A, Lamichhane D, Ragate AS, Roy P, Mallick I, Banerjee S, Roy MK. Indian Association of Surgical Gastroenterology, Chandigarh, 6-8 Oct 2018.
- Does lymph node positivity ratio correlate with survival following curative resection for gallbladder carcinoma: a prospective study. Lamichhane D, Gaurav R, Roy P, Thambudorai R, Roy MK, Banerjee S. Indian Association of Surgical Gastroenterology, Pondicherry 5-8 Oct 2017.
- Fibro lamellar hepatocellular carcinoma with biliary tumor thrombus. Lamichhane D, Banerjee S, Roy MK, Thambudorai R, De A, Sitaram V. Indian Association of Surgical Gastroenterology, Pondicherry 5-8 Oct 2017.
- Blood loss using water jet dissector for extended cholecystectomy in carcinoma gall bladder: initial results from a tertiary care cancer hospital in eastern India. De A, Banerjee S, Thambudorai R, Roy MK, Sinha S, Roy P, Sitaram V. Indian Association of Surgical Gastroenterology, Pondicherry 5-8 Oct 2017.
- Comparison of intraoperative bile culture sensitivity with post-operative peritoneal fluid and blood culture- sensitivity in stented patients undergoing pancreaticoduodenectomy. De A, Banerjee S, Thambudorai R, Sinha S, Goel G, Roy MK. Indian Association of Surgical Gastroenterology, Pondicherry 5-8 Oct 2017.
- Ileostomy closure not always a simple procedure. Pipara A, Bhutia TD, Thambi PV, Roy MK, Thambudorai R, Sinha S, Sitaram V, Banerjee S. Indian Association of Surgical Gastroenterology, Pondicherry 5-8 Oct 2017.
- 8. CROSS protocol: TMC experience. Pipara A, Thambudorai R, Banerjee S, Roy MK, Sitaram V. Indian Association of Surgical Gastroenterology, Pondicherry 5-8 Oct 2017.
- Childhood fibro lamellar hepatocellular carcinoma with bile duct tumour: a rare association. De A, Banerjee S, Thambudorai R, Sitaram V, Roy MK. West Bengal chapter of Association of Surgeons on India 24-26 Feb 2017.

Mr Debabrata Basu

B.Sc. Bioscience, M. Sc. Environmental Science, Associate Scientific Officer.

RESEARCH PUBLICATION

- Reason behind wet pack after steam sterilization and its consequences: An overview from Central Sterile Supply Department of a cancer center in eastern India. Basu D. J Infect Public Health. 2017;10(2):235-239.
- The importance of paper records and their preservation period in a Central Sterile Supply Department: An experience from an oncology center in eastern India. Basu D, Bag SC, Das A, Razario JD. J Infect Public Health. 2017;10(5):685-687.
- A comparative study on non-woven fabric and rigid container-based packaging system used in Central Sterile Supply Department: Experience from a cancer research centre in Eastern India. Basu D, Mukherjee S, Sanyal S, Mondal P, Goel G. J Acad Clin Microbiol. 2018; 20:46-8.
- Central Sterile Supply Department: TMC Website. Basu D. 2018; Available from: http://www.web.tmckolkata.com/page.php?pid=4&page_id=96.

ACADEMIC MEETINGS

- 1. Awareness program on proper CSSD processes. (Seminar, 2017)
- 2. Cleaning and Disinfection of surgical instruments. (Symposium, 2018)

AWARDS / FELLOWSHIPS

- 1. Debabrata Basu- Visiting Faculty of Molecular Medical Microbiology MSc-PhD course with IIT-Kharagpur.
- 2. Debabrata Basu- Visiting Faculty of Diploma in Operation Theatre Technology course with West Bengal State Medical Council.

Dr. Pattatheyil Arun MBBS, DLO, MS, MCh

Dr. Rajeev Sharan MBBS, MS, MCh

Dr. Kapila Manikantan MBBS, MS

Dr. Prateek Jain MBBS, MS, DNB

RESEARCH PROJECTS

- 1. Delay in Presentation and Treatment of Head and Neck Cancer in India: A Multi centre Prospective Analysis of Factors and Impact on Survival. (Investigator initiated, PI Dr Pattaheyil Arun)
- 2. Determination of genomic signatures associated with treatment failure in oral squamous cell carcinoma of the gingivobuccal region (OSCC-GB). (Government sponsored, PI Dr Pattatheyil Arun)
- 3. Efficacy of Baseline Measures for Predicting Early Recovery of Swallowing after Surgery for Tongue Cancer: A Prospective Study. (Investigator initiated, PI Dr Pattatheyil Arun)
- 4. Pre-operative speech score in Ca Tongue predicting post-operative speech outcome: A prospective Study. (Investigator Initiated, PI Dr Rajeev Sharan)
- 5. Free Thyroid Lobe Transfer for Prevention of Radiation Induced Hypothyroidism in patients of Oral carcinoma: A Phase I/II study. (Investigator initiated, PI Dr Kapila Manikantan)
- 6. Surviving beyond treatment completion assessing reliability and validity of standardized dysphagia of communication questionnaires in head and neck cancer. (Investigator Initiated, PI Ms. Dipanwita Roy)
- 7. Determinants of speech outcome following closure in tongue carcinoma- A retrospective study. (Investigator initiated, PI Dr Pattatheyil Arun)

RESEARCH PUBLICATION

 Factors affecting postoperative complications after reconstructive surgery in oral carcinoma patients: a prospective study of 100 patients. Jain PV, Bang B, Manikantan K, Sinha T, Biswas G, Arun p. Indian J Otolaryngol Head Neck Surg. 2018;70:1-7.

- Factors affecting postoperative removal of nasogastric tube and tracheostomy tube in oral carcinoma patients: a retrospective analysis of 234 patients. Jain PV, Manikantan K, Roy D, Tshering P, Arun P. Oral Cancer. 2018; 2: 77-81.
- 3. Role of Fluorodeoxy Glucose Positron Emission Tomography- Computed Tomography in thyroid malignancy. Manickam A, Bhutia TY, Manikantan K, Arun P. J Head Neck Physicians Surg. 2017;5:51-6.

ABSTRACT PRESENTATIONS

- 1. Comparison of outcome between involved and close margins after surgical resection in oral squamous cell carcinoma. (2018)
- 2. Clinicopathologic determinants of outcome in pathologic T4A (pT4A) squamous cell carcinoma of the gingivobuccal sub site of oral cavity. (2018)
- 3. Factors affecting postoperative complications after reconstructive surgery in oral carcinoma patients: a prospective study of 100 patients. (2017)
- 4. Close and Involved margins: Can we solve the conundrum? (2017)
- 5. Salvage surgery for recurrent oral carcinoma: feasibility, outcomes and pattern of failure. (2017)
- 6. Pathological variables contributing to outcomes: tongue vs Gingivobuccal sulcus carcinoma-Retrospective single center experience. (2017)
- 7. Functional assessment of Infrahyoid Myocutaneous flap for reconstruction of oral cavity defect. (2017)
- Management of the Neck Evidence based Management Seminar. Tata Memorial Hospital, Mumbai 25 February 2017.
- Tongue and gingivo-buccal cancers need different Staging Criteria. International Academy of Oral Oncology. Bangalore. 20 May, 2017.
- 10. Neo adjuvant Chemotherapy is not an Integral Part of Managing Oral Cavity Cancer. CANCON .1 July 2017. Bangalore.
- Management guidelines for PNS Tumours: Advanced Paranasal Sinus and Skull base Tumours. CANCON.
 July 2017. Bangalore.
- 12. Arguments for Total Thyroidectomy in Differentiated Thyroid Cancer. FERCON Kolkata 10 July 2017
- Anatomy and Physiology of Swallowing. Annual Meeting of Phono surgeons of India 2018, Kochi. Feb 1, 2018.
- 14. Surgery is the Modality of Choice in Commissure Sparing T1/2 carcinoma of the glottis. Larynx, Hypopharynx and Salvage Workshop. Patel Hospital, Jalandhar. March 16-18, 2018.
- 15. Small Primary with Distant Metastases in Medullary Carcinoma of the Thyroid. Updates in Oncology. Controversies in Head and Neck Cancer. Sir Ganga Ram Hospital, New Delhi. 28 April. 2018
- 16. Prophylactic Central Compartment Dissection is not Recommended for Low Risk Differentiated Thyroid Cancer. CANCON, Bangalore. June 23, 2018.
- 17. Lasers versus radiotherapy for early Laryngeal Cancer: A rational approach beyond debate. Annual Meeting Foundation of Head and Neck Oncology, Kolkata 27 October 2018.

- 18. Current Trends in the Management of Carcinoma of the Larynx. Dhaka Head and Neck Cancer Conference, Dhaka, Bangladesh. November 6, 2018.
- 19. Assessment of Masticatory Efficiency and quality of life after treatment for oral cancer. (2018)

BOOK CHAPTERS

1. Tumours of the Upper Aero Digestive Tract. APSI Textbook of Plastic Surgery. Ed- Dr Karoon Agrawal

ACADEMIC MEETINGS

1. CURE -2018: Surgical Approaches to Thyroid: Open/ Endoscopic/ Robotic. (Workshop in April, 2018)

AWARDS / FELLOWSHIPS

- 1. Dr Prateek Jain Fellowship
- 2. Dr Annu Singh- Fellowship
- 3. Dr Tsewang Yougyal Bhutia- Fellowship
- 4. Dipanwita Roy- Fellowship
- 5. Dr Ajay Manickam- Prize

DEPARTMENT OF HISTOPATHOLOGY

Dr Geetashree Mukherjee

MD (Path)

Dr Paromita Roy MD Pathology

ind ratiology

Dr Indu Arun MBBS, MD, PDF

Dr Divya Midha MBBS, MD (Path), PDF

Dr Debdeep Dey

MBBS, FRCPath, CCT(UK)

Dr M A. Lateef Zameer MD Pathology

Dr Angad Singh MBBS, MD

RESEARCH PROJECTS

- 1. Excavating the relationship between genomic alterations and tumour immune microenvironment in oral squamous cell carcinoma gingivobuccal (OSCC-GB) to inform immunotherapy. (Investigator initiated, PI Dr Geetashree Mukherjee)
- Association of tumour-associated immune cell markers with lymph node metastasis in gingivobuccal oral carcinoma (GBOC) and their relationships to genomic drivers of metastasis: a retrospective study on formalin fixed paraffin embedded (FFPE) tissue. A collaborative study with NIBMG, Kalyani. (Investigator initiated, PI Dr Geetashree Mukherjee)
- 3. Using Differential RNA Expression in Serum Exosomes as A Tool to Understand Breast Cancer Recurrence. A collaborative study with NIBMG and University of Chicago.
- 4. (Investigator initiated, PI Dr Geetashree Mukherjee)

- Gene signatures predictive of pathological response to neo-adjuvant chemotherapy women with locally advanced triple negative breast cancer. This study is in collaboration with NIBMG, Kalyani. (Investigator initiated, PI Dr Geetashree Mukherjee)
- 6. Study of worst pattern on invasion and tumour budding in oral cancers. (Investigator initiated, PI Dr Paromita Roy)
- 7. Molecular profile of periampullary and pancreatic ductal adenocarcinoma. (Investigator initiated, PI Dr Paromita Roy)
- 8. Tumour budding in pancreatic and periampullary cancers. (Investigator initiated, PI Dr Paromita Roy)
- 9. A novel approach to Ki67 scoring in breast cancers using a new mobile phone based application method and its correlation with clinical outcome. (Investigator initiated, PI Dr Indu Arun)
- 10. Lymph Node Characteristics and Their Prognostic Significance in Oral Squamous Cell Carcinoma. (Investigator initiated, PI Dr Indu Arun)
- Pathological chemotherapy response score is prognostic in tubo-ovarian high-grade serous carcinoma: a systematic review and meta-analysis of individual patient data. (Investigator initiated, PI Dr Paul Cohen)
- 12. Clinical stratification of high-grade ovarian serous carcinoma using a panel of six biomarkers. (Investigator initiated, PI Dr Sharmila Bapat)
- 13. HYPORT-B: Hypo-fractionated Radiotherapy Schedule of 26 GY in 5 Fractions with Simultaneous Integrated Boost (6 GY) in Advanced Incurable Breast Cancer: A Prospective Phase I/II Study. (Investigator initiated, PI Dr Sanjoy Chatterjee)
- 14. A Phase III, Multicentre, randomised, double-blind, placebo-controlled study of Atezolizumab (anti-PD-L1 antibody) in combination with paclitaxel compared with placebo with paclitaxel for patients with previously untreated, inoperable locally advanced or metastatic Triple Negative Breast Cancer. (Investigator initiated, PI Dr Sanjoy Chatterjee)

RESEARCH PUBLICATIONS

- 1. Immune and Genomic signatures in Oral (head and neck) Cancer. P. Chakraborty, T. Karmakar, N. Arora and G. Mukherjee. *Heliyon*. 2018 Nov 2;4(10): e00880.
- Differential expression of microRNAs in breast cancers from four different ethnicities. Pollard J, Burns PA, Hughes TA, Ho-Yen C, Jones JL, Mukherjee G, Omoniyi-Esan GO, Titloye NA, Speirs V, Shaaban AM. Pathobiology. 2018;85(4):220-226.
- 3. JMJD6 induces HOTAIR, an oncogenic lincRNA, by physically interacting with its proximal promoter. Biswas A, Shettar A, Mukherjee G, Kondaiah P, Desai KV. *Biochem J*. 2018 Jan 15;475(1):355-371.
- Oestrogen Receptor-αbinds the FOXP3 promoter and modulates regulatory T-cell function in human cervical cancer. Adurthi S, Kumar MM, Vinodkumar HS, Mukherjee G, Krishnamurthy H, Acharya KK, Bafna UD, Uma DK, Abhishekh B, Krishna S, Parchure A, Alka M, Jayshree RS. *Sci Rep.* 2017 Dec 11;7(1):17289.

- DDX5/p68 associated IncRNA LOC284454 is differentially expressed in human cancers and modulates gene expression. Das M, Renganathan A, Dighe SN, Bhaduri U, Shettar A, Mukherjee G, Kondaiah P, Satyanarayana Rao MR. RNA Biol. 2018 Feb 1;15(2):214-230.
- Expression of tripartite motif-containing protein 28 in primary breast carcinoma predicts metastasis and is involved in the stemness, chemo-resistance, and tumour growth. Damineni S, Balaji SA, Shettar A, Nayanala S, Kumar N, Kruthika BS, Subramanian K, Vijayakumar M, Mukherjee G, Gupta V, Kondaiah P. *Tumour Biol*. 2017 Apr;39(4):1010428317695919.
- Vanishing Bile Duct Syndrome Following Cytomegalovirus Infection in a Child with Hodgkin Lymphoma. Das A, Mitra S, Ghosh D, Modi SK, Roy P, Das J, Bhattacharya S, Krishnan S, Das A, Bhattacharyya A. J Pediatr Hematol Oncol. 2018 Jan;40(1):83-84.
- Reporting of tumour budding in colorectal adenocarcinomas using ×40 objective: A practical approach for resource constrained set-ups. Roy P, Datta J, Roy M, Mallick I, Mohandas M. Indian J Cancer. 2017 Oct-Dec;54(4):640-645.
- Prevalence estimation of microsatellite instability in colorectal cancers using tissue microarray based methods - A tertiary care centre experience. Nayak SS, Roy P, Arora N, Arun I, Roy MK, Banerjee S, Mallick I, Mallath MK. *Indian J Pathol Microbiol*. 2018 Oct-Dec;61(4):520-525.
- Sentinel Lymph Node Biopsy After Initial Lumpectomy (SNAIL Study)—a Prospective Validation Study. Agrawal SK, Bansawal L, Arun I, Datta SS, Chatterjee S. Indian Journal of Surgical Oncology. 2018 Dec; Available from: https://doi.org/10.1007/s13193-018-0861-4
- 11. A subtype of cancer-associated fibroblasts with lower expression of alpha-smooth muscle actin suppresses stemness throughBMP4 in oral carcinoma. Patel AK, Vipparthi K, Thatikonda V, Arun I, Bhattacharjee S, Sharan R, Arun P, Singh S. *Oncogenesis.* 2018 Oct 5;7(10):78.
- 12. Cytological diagnosis of follicular dendritic cell sarcoma: A case report and review of literature. Dutta A, Arun P, Roy P, Arun I. *Cytopathology*. 2018 Oct;29(5):461-467.
- 13. SmartIHC-Analyzer: smartphone assisted microscopic image analytics for automated Ki-67 quantification in breast cancer evaluation. Tewary, Arun I, Ahmed R, Chatterjee S, Chakraborty C. *Analytical Methods*: 9 (43), 6161-6170.
- An Advanced Deep Learning Approach for Ki-67 Stained Hotspot Detection and Proliferation Rate Scoring for Prognostic Evaluation of Breast Cancer. Saha M, Chakraborty C, Arun I, Ahmed R, Chatterjee S. Sci Rep. 2017 Jun 12;7(1):3213.
- AutoIHC-scoring: a machine learning framework for automated Allred scoring of molecular expression in ER-and PR-stained breast cancer tissue. S Tewary, I Arun, R Ahmed, S Chatterjee, C Chakraborty. J Microsc. 2017 Nov;268(2):172-185.
- 16. Functional Balance between TCF21-Slug defines phenotypic plasticity and sub-classes in high-grade serous ovarian cancer. Varankar SS, Kamble SC, Mali AM, More M, Abraham A, Kumar B, Pansare KJ, Narayanan NJ, Sen A, Dhake RD, Joshi AN, Midha D, Jolly MK, Dong Y, Clements JA, Bapat SA. *BioRxiv* 307934; doi: https://doi.org/10.1101/307934

- A Rare Case Report of Primary Pure Pleomorphic Liposarcoma of Breast with Cytological and Histopathological Findings. Mukherjee A, Nath J, Dey D, Sinha S, Chatterjee T. J Cancer Sci Clin Oncol. 2017; 4(1): 102-105.
- High Grade Primary Intratesticular Leiomyosarcoma: A Very Rare Presentation. Mukherjee A, Nath J, Dey D, Sinha S, Chatterjee T. J Oncol Res Ther. 2017: J109.
- Challenges in the management of localized intracranial ependymoma in children: Experience from a referral oncology centre in Eastern India. Das A, Chowdhury SP, Achari RB, Zameer L, Sen S, Sukumaran RK, Bhattacharyya A. *Pediatr Hematol Oncol*. 2018 Aug- Sep;35(5-6):369-372.
- TP53 Mutation, MYCN Amplification, and Large Cell/Anaplastic Histology in Medulloblastoma. Das A, Zameer L, Vinarkar S, Singh M, Parihar M, Arora N, Chandra A, Achari RB. *Indian J Pediatr*. 2018 Aug;85(8):684-685.
- 21. Lymphoma in Rheumatoid Arthritis–Catastrophic Sequela of a Common Disease. Nagpal SD, Singh NP, Mishra P, Singh A. *Journal of The Association of Physicians of India*. 2018 Jul; 66:87.
- 22. Diffuse glioma–Rare homozygous IDH point mutation, is it an Onco-genetic mechanism? Singh A, Gurav M, Dhanavade S, Shetty O, Epari S. *Neuropathology*. 2017 Dec;37(6):582-585.

ABSTRACT PRESENTATIONS

- 1. Analytical validation of a standardized scoring protocol for Ki67 assessed on breast excision whole sections: An international multicentre collaboration; Cancer Research (2018).
- 2. Dr Saranya Prakash- Former Fellow, Department of Oncopathology, TMC.
- Title: A Novel Approach to Ki67 Scoring in Breast Cancers Using a Mobile Phone Based Counting Algorithm and Its Correlation with The Clinical Outcomes. Conference: Oral Paper presentation at APCON (Annual Congress 2018), Bareilly, UP. Award: Prof Dr K.C. BASU MALLIK AWARD.
- 4. Dr Rohit Tapadia- Current Fellow, Department of Oncopathology, TMC.
- 5. Title: Histopathological prognostic factors in Periampullary and Pancreatic Ductal Adenocarcinomas and their molecular correlation. Conference: Oral Paper presentation at APCON (Annual Congress 2018), Bareilly, UP. Award: BEST PAPER AWARD.
- 6. Dr Deval Parekh- Former Fellow, Department of Oncopathology, TMC.
- 7. Title: Prognostic significance of tumour budding and cell nest size in early stage oral cavity squamous cell carcinoma. Conference: APCON, 2017. Award: Prof Dr K.C. BASU MALLIK AWARD.

ACADEMIC MEETINGS

- International Symposium on Immunohistochemistry, hosted by Dept. of Pathology. (Symposium, January 4th – 7th, 2018)
- 2. Recent advances in the diagnosis of soft tissue tumours: International conference on Immunohistochemistry. (Conference, December 12th & 13th, 2018)
- 3. PDL-1 and other markers. KAPCON. (Conference, October 5th to 7th, 2018)

- PDL-1 staining in Lung Cancer: 2nd International Cancer Congress, Bangalore. (Conference, November 8th to 12th, 2017)
- Gestational Trophoblastic Tumours: The National Pathology Annual Conference (APCON), Bhopal. (Conference, October 6th to 10th, 2017)
- 6. Controversies in PDL-1 staining: International symposium in Lung cancer. (Seminar, July 2017)
- 7. Tissue Bio banking. (Conference January 2017)
- 8. Evidence based medicine GI Core group committee: TMH, Mumbai. (Conference, Feb 2017)
- Role of IHC in resolving diagnostic dilemma in head and neck tumours APCON2017. (Conference, November 2017)
- 10. APCON2018 CME on Germ cell tumour. (Conference, December 2018)
- 11. Post Chemotherapy Assessment of Breast Cancer, APCON 2018, Bareilly. (Symposium, November 2018)
- 12. Intra-operative Consultation Do's & Don'ts", at Sir. H N Reliance Foundation Hospital & Research Centre, Girgaum, Mumbai, India. (Conference, October 2018)
- 13. 18th National Meet of the Foundation of Head & Neck Oncology (FHNO) in Kolkata. (Symposium 25th to 28th October 2018)
- Best of SABCS India 2018 at India habitat Centre, Lodhi Road, Delhi. Speaker, Topic -HER2 testing -2017 guidelines for HER2 testing. (Conference, April 2018)
- 15. 2018 Australia and Asia Pacific Clinical Oncology Research Development (ACORD). (Workshop, September 2018)
- 16. Pre EBM CME Recent Advances Head and Neck Pathology Topic presented Interesting case presentation- Ewing sarcoma/PNET of salivary gland. (Conference, February 2018)
- 17. CME on Breast Pathology Update 2017, at College of Medicine and Sagore Dutta Hospital, Kolkata, Presentation in a panel discussion on molecular biology of breast cancer. (Conference, August 2017)
- Decoding Breast Cancer A recap of the Milan Breast Cancer Conference on 19/08/2017, Jehangir Breast Care Center, Presentation of a case as a part of breast cancer MDT team. (Conference, August 2017)
- APCON 2017, Preconference workshop and CME, Pot Pourri of interesting cases Head and neck cancer at Gandhi Medical College, Bhopal –Presented a rare case of Adenoid cystic carcinoma salivary gland with high grade transformation into a sarcoma. (Conference, December 2017)
- 20. Participated in Acord Workshop, at Tata Medical Centre. (Workshop, September 2017)
- 21. Mater class in Uro-Onco-Pathology. (Conference, November 2018)
- 22. Uropathology update. (Conference, November 2018)
- 23. LBC (Conference, April 2018)
- 24. Cytology in Lung cancer, Tata Medical Centre Kolkata. (Seminar, September 2018)
- 25. Autopsy case discussion APCON, Bareilly. (Conference, December 2018)
- 26. Caveats for the morphological diagnosis for osteosarcoma, Narayana hospital Howrah. (Seminar, April 2018)
- 27. Case based learning in breast Pathology. (Seminar, November 2018)

- 28. Does ROSE increase the diagnostic accuracy of EBUS? National Conference on Pulmonary Disease Conference, Science City, Kolkata. (Conference, November 2017)
- 29. International Symposium on Immunohistochemistry. (Conference, January 2018)
- 30. NPSICON, Lucknow. (Conference, February 2018)
- 31. APCON 2018, Bareilly
- 32. (Conference, November 2018)
- 33. APCON 2017, Bhopal Invited faculty for case presentation in workshop on 'Accessory cells: Hematolymphoid neoplasm'. (Conference, December 2017)
- 34. ALK & ROS IHC in Lung cancer, Tata Medical Centre Kolkata. (Seminar, September 2018)

DEPARTMENT OF MEDICAL ONCOLOGY

Dr Deepak Dabraka

MBBS, MD General Medicine, DM Medical Oncology

Dr Bivas Biswas

MD (Paediatrics), DM (Medical Oncology)

Dr Sandip Ganguly MBBS, MD General Medicine, DM Medical Oncology

Dr Joydeep Ghosh

MBBS, MD General Medicine, DM Medical Oncology

RESEARCH PROJECTS

- A phase III multicentre, randomized study of oral LDK378 versus standard chemotherapy in previously untreated adult patients with ALK rearranged (ALK-positive), stage IIIB or IV, non-squamous non-small cell lung cancer. (PI Dr Deepak Dabkara)
- 2. A Phase IV, multicentre, Open-label, single-arm study of Pertuzumab (in combination with Trastuzumab and Docetaxel) in first line treatment of Indian patients with HER2-Positive advanced (Metastatic or Locally recurrent) breast cancer. (PI Dr Deepak Dabkara)
- 3. An Open Label, Single Arm, Multicentre, Safety Study of Atezolizumab in Locally Advanced or Metastatic Urothelial or Non-Urothelial Carcinoma of the Urinary Tract". (PI Dr Bibhas Biswas)
- 4. An observational, multicentre, prospective study to evaluate concordance of detecting EGFR mutation by circulating tumour free DNA versus tissues biopsy in NSCLC (CONCORDANCE). (PI Dr Bibhas Biswas)
- PAzopanib Real-world Assessment of Clinical effectiveness and safety in patients who have Undergone Treatment in different settings in advanced renal cell carcinoma; a prospective, non-interventional, observational study". (PI Dr Bibhas Biswas)
- "A Multicentre Phase 4, Open-label, Single-arm, Safety and Efficacy Study of Enzalutamide in Indian Patients with Progressive Metastatic Castration-Resistant Prostate Cancer (mCRPC) Previously Treated with Docetaxel-Based Chemotherapy." (PI Dr Deepak Dabkara)
- 7. Single Arm study of Doceaqualip in first line metastatic gastric cancer. (0328-17). (PI Dr Joydeep Ghosh)
- 8. Distribution of XRCC1 polymorphis and PDL1 positivity in patients with triple negative breast cancer who have received curative therapy: retrospective observational. (PI Dr Joydeep Ghosh)

- A phase III, Double-blind, Placebo-controlled, multicentre international study of Neoadjuvant/Adjuvant Durvalumab for the Treatment of Patients with Resectable stages II and III non-small cell lung cancer (AEGEAN). IRB approved. due for enrolment. (PI Dr Bivas Biswas)
- 10. A randomized, double-blind, placebo-controlled, phase III study evaluating the efficacy and safety of pembrolizumab plus platinum-based doublet chemotherapy with or without canakinumab as first line therapy for locally advanced or metastatic non-squamous and squamous non-small cell lung cell lung cancer subjects (CANOPY-1). (PI Dr Sandip Ganguly) [IRB- submitted]
- 11. A prospective, multicentre, phase IV clinical trial to assess safety of TAGRISSOTM (Osimertinib) in Indian adult patients with metastatic epidermal growth factor receptor(EGFR) T790M mutation-positive non-small cell lung carcinoma (NSCLC) [IRB_ approved]. (PI Dr Deepak Dabkara)

RESEARCH PUBLICATIONS

- Metastatic Gastric cancer: Real world scenario from a developing country. Ganguly S, Biswas B, Ghosh J, Dabkara D. South Asian J Cancer. 2018 Jul-Sep;7(3):171-174.
- Metronomic therapy in metastatic castrate-resistant prostate cancer: Experience from a tertiary cancer care centre. Dabkara D, Ganguly S, Biswas B, Ghosh J. Indian J Cancer. 2018 Jan-Mar;55(1):94-97.

ABSTRACT PRESENTATIONS

- Clinico-pathological Characteristics and Treatment Outcome in Small Cell Lung Cancer: A Single Institutional Experience. Presented in IASLC 2018, Toronto. October 2018. Journal of Thoracic Oncology 13(10): S580-S581.
- Outcome and Prognostic Factors in ALK+ve Metastatic Adenocarcinoma of Lung: Single Centre Experience from Eastern India. Presented in IASLC 2018, Toronto. October 2018. Journal of Thoracic Oncology 13(10): S580-S581.
- Lung cancer in adolescent & young adults: Single centre experience from Eastern India. Presented in ESMO Asia 2018. Annals of Oncology 2018. Patterns of recurrence in triple negative breast cancer patients (automated IHC): An Indian Tertiary Care Centre data. Presented in ASCO 2018. Published in JCO 2018.

ACADEMIC MEETINGS

- 1. Update on EGFR mutant adenocarcinoma- February 2018
- 2. Update on management of metastatic RCC-March 2018
- 3. Update on Gastric Cancer. August 2018
- 4. "Best of 4"-Lung cancer update. Nov 2018

DEPARTMENT OF MICROBIOLOGY

Dr Sanjay Bhattacharya,

MD, DNB, DipRCPath, FRCPath

Dr Gaurav Goel

MBBS, MD, DNB, MNAMS

RESEARCH PROJECTS

- 1. Application of real-time PCR for the diagnosis of invasive candidiasis and aspergillosis in immunocompromised patients in an oncology centre. (Government sponsored, PI Dr Sanjay Bhattacharya).
- 2. Invasive mould infections in Indian ICUs descriptive epidemiology, management and outcome (Industry sponsored, PI Dr Sanjay Bhattacharya).
- 3. Point Prevalence Surveillance Study of Antimicrobial Consumption and Resistance. (Industrysponsored, PI Dr Sanjay Bhattacharya).
- 4. Regional Centre for Antimicrobial Resistance Surveillance Network. Indian Council of Medical Research. (Government sponsored, PI Dr Sanjay Bhattacharya).
- 5. Capacity Building and Strengthening of Hospital Infection Control to detect and prevent antimicrobial resistance in India. (Government sponsored, PI Dr Sanjay Bhattacharya).
- Pharmacokinetics of voriconazole in neutropenic patients with hematologic malignancy. Effect of cytochrome P450 2C19 polymorphisms on drug metabolism in a population from eastern India. (Government sponsored, PI Dr Sanjay Bhattacharya).
- 7. Integrated Cervical cancer prevention and treatment stratification study: systems medicine cluster approach. (Government sponsored, PI Dr Sanjay Bhattacharya).
- Antimicrobial Stewardship Program (AMSP)- ICMR project. (Government sponsored, PI Dr Sanjay Bhattacharya).
- 9. Epidemiology of norovirus gastroenteritis in the immunocompromised population: a prospective 2-year study from eastern India. (Investigator initiated, PI Dr Sanjay Bhattacharya).

RESEARCH PUBLICATIONS

 Dominance of international high-risk clones in carbapenemase-producing Pseudomonas aeruginosa: Multicentric molecular epidemiology report from India. Pragasam AK, Veeraraghavan B, Anandan S, Narasiman V, Sistla S, Kapil A, Mathur P, Ray P, Wattal C, Bhattacharya S, Deotale V, Subramani K, Peter JV, Hariharan TD, Ramya I, Iniyan S, Walia K, Ohri VC. *Indian J Med Microbiol*. 2018 Jul-Sep;36(3):344-351.

- Postoperative infection rate and clinical outcome after oncosurgery for endometrial carcinoma in a patient population with high prevalence of multidrug-resistant organism colonization and multiple comorbidities. Bhaumik J, Mukhopadhyay A, Ghosh A, Bhattacharya S, Chakraborti B. Infect Control Hosp Epidemiol. 2018 Sep;39(9):1140-1141.
- 3. Limitations of the 2016 National AIDS Control Organization guidelines regarding Human Immunodeficiency Virus testing in India. Bhattacharya S, Sengupta K, Goel G. J Acad Clin Microbiol.2018; 20:57-9.
- Clinical Outcome, Healthcare Cost and Length of Hospital Stay Among Patients with Bloodstream Infections and Acute Leukemia in a Cancer Center in Eastern India. Muennichow CE, Goel G, Bhattacharyya A, Nair R, Chandy M, Bhattacharya S. Infect Control Hosp Epidemiol. 2018 Jun 18:1-2.
- 5. Why is dengue such an important public health problem in India? Bhattacharya S. J Acad Clin Microbiol.2018; 20:3-4.
- 6. Laboratory tests and clinical management of dengue in 26 healthcare institutions in India. Bhattacharya S, Goel G, George K, Shamsundar R, Lancy J, Sudarsana J, Devi S R, Sangeetha S, Kant K, Sathiavathy K A, Sarada Devi K L, Rejitha K, Shailaja T S, Raveendran G, John AP, Sohanlal T, Varghese G, Madhavan A, Sen B, Suseela K V, Ahmed SM, Mathew R, Pulikkottil SK, Philomina J B, Chinnan JP, Rani S, Iyer R, Maiti S, Nath SR, Balakrishnan SM, Raja K. J Acad Clin Microbiol.2018; 20:5-13.
- Antibiotic prophylaxis for Breast Onco-Surgery in a setting with high prevalence of multi-drug resistant bacteria: Common Sense Infection Control Measures are more important than Prolonged Antibiotics. Agarwal N, Agarwal SK, Bhattacharya S, Datta SS, Chatterjee S, Ahmed R. Infect Control Hosp Epidemiol. 2018 Apr; 39(4):498-500.
- Cytomegalovirus reactivation and disease amongst patients with allogeneic haematopoietic stem cell transplantation in Eastern India: Epidemiology, outcome and healthcare cost. Kumar M, Roychowdhury M, Kumar J, Harishankar A, Sinha S, Bhave SJ, Chakrapani A, Radhakrishnan V, Nair R, Bhattacharya S, Chandy M. Indian J Med Microbiol. 2018 Jan-Mar;36(1):49-53.
- Colistin: Pharmacology, drug resistance and clinical applications. Das P, Sengupta K, Goel G, Bhattacharya S.J Acad Clin Microbiol. 2017; 19:77-85.
- 10. Blood stream infections as a predictor of length of hospital stay and cost of care in patients with cancer. Devereux S, Goel G, Sengupta K, Bhattacharya S. *J Acad Clin Microbiol*. 2017; 19:118-20.
- 11. Discovery, research, and development of new antibiotics: the WHO priority list of antibiotic-resistant bacteria and tuberculosis. Tacconelli E, Carrara E, Savoldi A, Harbarth S, Mendelson M5, Monnet DL, Pulcini C, Kahlmeter G, Kluytmans J, Carmeli Y, Ouellette M, Outterson K, Patel J, Cavaleri M14, Cox EM, Houchens CR, Grayson ML, Hansen P, Singh N, Theuretzbacher U, Magrini N; WHO Pathogens Priority List Working Group. *Lancet Infect Dis*. 2018 Mar;18(3):318-327.
- Vanishing Bile Duct Syndrome Following Cytomegalovirus Infection in a Child with Hodgkin Lymphoma. Das A, Mitra S, Ghosh D, Modi SK, Roy P, Das J, Bhattacharya S, Krishnan S, Das A, Bhattacharyya A. J Pediatr Hematol Oncol. 2018 Jan;40(1):83-84.
- Colistin-Resistant Klebsiella Infections Among Pediatric Oncology and Hematopoietic Stem Cell Transplantation Patients in Eastern India. Chandy M, Das A, Bhattacharyya A, Banerjee S, Dhar K, Goel G, Bhattacharya S. Infect Control Hosp Epidemiol. 2018 Jan;39(1):118-121.
- Standardization of a two-step real time polymerase chain reaction based method for species-specific detection of medically important Aspergillus species. Das P, Pandey P, Harishankar A, Chandy M, Bhattacharya S, Chakrabarti A. Indian J Med Microbiol. 2017:35;381-8.
- 15. Mortality associated with candidemia in non-neutropenic cancer patients is not less compared to a neutropenic cohort of cancer patients. Goel G, Chandy M, Bhattacharyya A, Banerjee S, Chatterjee S, Mullick S, Sinha S, Sengupta K, Dhar K, Bhattacharya S, Rudramurthy S, Chakrabarti A. *Eur J Clin Microbiol Infect Dis.* 2017;36(12):2533-2535.
- 16. Exploring the prescribing behaviours and the mind of antibiotic prescribers is critical for a successful antibiotic stewardship programme: Results of a survey from Eastern India. Ravi N, Laha A, Hmar L, Chatterjee S, Goswami J, Goel G, Dhar K, Ghosh T, Chatterji S, Datta SS, Bhattacharya S. Indian J Med Microbiol. 2017;35: 299-301.
- 17. Soaps and infection control: From chemistry to microbiology. Goel G, Bhattacharya S, Chandy M. J Acad Clin Microbiol. 2017; 19:66-9.
- Comparison of antimicrobial susceptibility testing practices in 20 clinical microbiology laboratories in India. Raja K, Bhattacharya S, Philomina J B, Nagaraj S, Devi Sarada K L, Sathiavathy K A, Oommen S, Sangeetha A V, Sudarsana J, John R, Mathew R, Pillai A, Gopal K, Ahmed SM, Kurian S, Deepasankari T L, Madhavan A, Nair PK, Nair L, Hisham P P, Sheena K. J Acad Clin Microbiol. 2017; 19:5-11.
- Antibiotic resistance: What is so special about multidrug-resistant Gram-negative bacteria? Exner M, Bhattacharya S, Christiansen B, Gebel J, Goroncy-Bermes P, Hartemann P, Heeg P, Ilschner C, Kramer A, Larson E, Merkens W, Mielke M, Oltmanns P, Ross B, Rotter M. Schmithausen RM, Sonntag HG, Trautmann M. *GMS Hyg Infect Control*. 2017 Apr 10;12: Doc05.
- 20. Relative potency of different generic brands of Piperacillin-Tazobactam: Implications for public health. Das P, Mahto R, Goel G, Chandy M, Bhattacharya S. J Infect Public Health. 2017 Nov Dec;10(6):901-902.

ABSTRACT PRESENTATIONS

- 1. Application of 16s rDNA sequence-based identification of unidentified ambiguous bacteria: Experience from a cancer centre in eastern India. Das P, Chandy M, Bhattacharya S.
- Effect of standard precaution without patient isolation on bacteraemia rates among paediatric cancer patient in a setting with high prevalence of multi drug resistant organisms. Bhattacharya S, Bhattacharya A, Chandy M, Das P, Sarkar M, Goel G.
- European Society for Paediatric Infectious Diseases, ESPID 2017, Madrid, Spain, from 23-27 May, 2017. (E poster)

- 4. A comparative evaluation of relative potency of different brands of Fosfomycin available in India by agar diffusion method: implications for clinical management. Das P, Dhar K, Goel G, Chandy M, Bhattacharya S.
- European Society for Paediatric Infectious Diseases, ESPID 2017, Madrid, Spain, from 23-27 May, 2017. (E poster)
- 6. Blood stream infection due to Stenotrophomonas and Elizabethkingia in immunocompromised cancer patients. Dhar K, Das P, Mukherjee S, Das K, Bose S, Mahto R, Goel G, Bhattacharya S.
- 7. TRICON 2017. 4- 6th August 2017. Department of Microbiology Government Medical College, Kozhikode, Kerala, India. (Oral E poster)
- Correlation of conventional methods with real-time PCR among patients with proven, probable and possible invasive Aspergillosis in a tertiary care cancer hospital in eastern India. Das P, Mukherjee S, Bhattacharyya A, Chatterjee S, Sen S, Roy P, Goel G, Chandy M, Bhattacharya S.
- 9. Mycocon 2018, September 22 & 23, 2018, New Delhi. (Oral presentation)
- Standardization of efficient method for DNA extraction from Candida sp. In a medical laboratory setup.
 Das P, Harishankar A, Chandy M, Bhattacharya S.

OTHER PUBLICATIONS

- 1. Utility of Bacterial Surveillance Culture in the Intensive Care Unit for Choosing Empirical Antibiotic Therapy. Bhattacharya S, Dhar K, Ghosh T, Das S.
- 2. Antimicrobial Guidelines for prophylaxis and treatment of Infections in Bone Marrow Transplant settings. Chandy M, Bhattacharya S, Chawla T.
- 3. ICMR guideline on: Treatment Guidelines for Antimicrobial Use in Common Syndromes. Indian Council of Medical Research, Department of Health Research, New Delhi, India, 2017. Pages 20-32.
- 4. Microbiological Assessment before Surgical Intervention. Bhattacharya S, Bhalchandra R, Goel G, Hmar L.
- 5. Sterility testing. Bhattacharya S.

BOOK CHAPTER

- 1. "Critical Care Update 2018". Editors: Todi SK, Zirpe K, Kulkarni AP, Mehta Y. Chapter 35. Indian Society of Critical Care Medicine. Jaypee Brothers Medical Publishers, New Delhi. Pages 167-170.
- 2. Effects of Intellectual Property Rights on Innovation and Development. Bhattacharjee S, Bhattacharya S, Dutta SS. Roy K and Dutta SS (editors).

ACADEMIC MEETINGS

- Technology and Knowledge Bank in Modern Medical Practice. (Conference, December, 2018). Infections in Immunocompromised children. (Symposium, November, 2018).
- 2. ICMR Antimicrobial Stewardship Program. (Workshop, May, 2017).

AWARDS / FELLOWSHIPS

- 1. Sanjay Bhattacharya-member of members of the WHO Priority Pathogen List Working Group.
- 2. Sanjay Bhattacharya-member of members of the WHO Working Group on Environmental Cleaning and Disinfection for the prevention and control of Carbapenem-Resistant Organisms.
- 3. Sanjay Bhattacharya- Member of the Editorial Board of ICMR Bacteriology SOP.
- 4. Sanjay Bhattacharya- Member of the NCDC Expert Group on Infection Prevention and Control guidelines.
- 5. Sanjay Bhattacharya- Visiting Faculty and Program coordinator of Molecular Medical Microbiology MSc-PhD course with IIT-Kharagpur.
- 6. Gaurav Goel- Visiting Faculty of Molecular Medical Microbiology MSc-PhD course with IIT-Kharagpur.
- 7. Parijat Das- Associate Faculty of Molecular Medical Microbiology MSc-PhD course with IIT-Kharagpur.
- 8. Sanjay Bhattacharya- Editor in Chief, Journal of the Academy of Clinical Microbiologists.
- 9. Sanjay Bhattacharya- member of the Ethical Committee- Ramakrishna Mission Seva Pratisthan and Vivekandan Institute of Medical Sciences.
- 10. Sanjay Bhattacharya- Member of Research Support Directorate in Tata Medical Center, Kolkata.
- 11. Parijat Das- Best Oral Presentation: Correlation of conventional methods with real-time PCR among patients with proven, probable and possible invasive Aspergillosis in a tertiary care cancer hospital in eastern India. Mycocon 2018, September 22 & 23, 2018, New Delhi.

Dr D K Mishra

MBBS, MD (Pathology)

Dr Neeraj Arora

MBBS, MD (Pathology)

ABSTRACT PRESENTATIONS

- Mutational Profiling in Advanced Non-Small Cell Lung Cancer Patients: A Tertiary Care Study of 1052 Cases from Eastern India - Gupta P, Saha K, Vinarkar S, Banerjee S, Santra P, Chowdhury SS, Pal B, Srimali RK, Biswas B, Dabkara D, Ganguly S, Mukherjee G, Midha D, Parihar M, Arora N, Mishra DK. The Journal of Molecular Diagnostics. 2018;20(6).
- Molecular profiling in colorectal carcinoma: A tertiary centre experience from eastern India. Gupta P, Santra P, Chowdhury SS, Vinarkar S, Pal B, Saha K, Banerjee S, Roy P, Ganguly S, Ghosh J, Mallath MD, Arora N, Mishra D. The Journal of Molecular Diagnostics. 2018; 20:531.
- Abstract publication in MPAI 2019 Mumbai Philadelphia-negative myeloproliferative neoplasm (MPN)

 study from a tertiary care centre in Eastern India. Sourav Sarma Chowdhury, Pragya Gupta, Poonam Santra, Biswajoy Pal, Kollol Saha, Saheli Banerjee, Mayur Parihar, Neeraj Arora, Deepak Mishra.
- 4. Abstract publication in 59th HAEMATOCON 2018 Kochi A Comparative Analysis of Bcrabl / Abl Ratio in CML Patients by Droplet Digital PCR and an In-House Real Time PCR Assay Poonam Santra Pragya Gupta, Kallol Saha, Saheli Banerjee, Sourav Sarma Chowdhury, Biswajoy Pal, Mayur Parihar, Neeraj Arora and Deepak Kumar Mishra.
- Abstract publication in 67th Annual Conference of IAPM and IAD-ID APCON 2018 Bareli. Cell Free DNA Evaluation for Epidermal Growth Factor Receptor (EGFR) Mutations in Lung Cancer. Saheli Banerjee, Poonam Santra, Kallol Saha, Dr Neeraj Arora, Dr Mayur Parihar, Dr Divya Midha, Dr Bivas Biswas, Dr Deepak Kumar Mishra.
- Abstract of the paper presented at HAEMATOCON 2018 58th Annual Conference of Indian Society of Haematology & Blood Transfusion, Kochi, India. BCR-ABL Kinase Domain Mutation Profiling: A Tertiary Cancer Center Experience of 97 Cases Biswajoy Pal, Poonam Santra, Pragya Gupta, Kallol Saha, Sourav Sarma Chowdhury, Saheli Banerjee, Mayur Parihar, Neeraj Arora, Deepak Kumar Mishra Molecular Diagnostics, 2Cytogenetics, Tata Medical Center, Kolkata, India.
- Abstract of the paper presented at HAEMATOCON 2017 57th Annual Conference of Indian Society of Haematology & Blood Transfusion, Guwahati, India. Advantages of Short Tandem Repeat (STR) based Chimerism Analysis over VNTR based assays in quantitative estimation of post-transplant donor

engraftment. Biswajoy Pal, Deepak Mishra, Neeraj Arora. Mayur Parihar, Sourav Sarma Chowdhury, Saurabh Jayant Bhave, Vivek Radhakrishnan, Reena Nair, Sekhar Krishnan, Mammen Chandy.

- Abstract publication in 58th HAEMATOCON 2017 Guwahati Standardization and validation of bcr-abl fusion transcript by droplet digital PCR bcr- abl fusion transcript by droplet digital pcr: Poonam Santra Pragya Gupta, Kallol Saha, Saheli Banerjee, Sourav Sarma Chowdhury, Biswajoy Pal, Mayur Parihar, Neeraj Arora and Deepak Kumar Mishra.
- Abstract publication in MPAI 2017 KIIT Bhubaneswar KRAS/NRAS and BRAF mutation analysis in advanced colorectal carcinoma: A tertiary center experience from eastern India. Sourav Sarma Chowdhury, Dr Sushant Vinarkar, Biswajoy Pal, Poonam Santra, Kallol Saha, Saheli Banerjee, Paromita Roy, Mohan Das Mallath, Deepak Mishra, Neeraj Arora.
- 10. Abstract publication in 58th Annual Conference of the Indian Society of Haematology; Blood Transfusion - HAEMATOCON 2017 Guwahati The role of Donor Specific Antibody on the outcome of Tcell replete Haplo-identical Hematopoietic Stem Cell Transplantation Saheli Banerjee, Subhajit Brahma, Neeraj Arora, Deepak Kumar Mishra, Sanket Shah, Jeevan Kumar, Vivek Radhakrishnan, Mammen Chandy.
- 11. Abstract publication in 57thHaematocon 2016 Jaipur Standardization and optimization of bcr-abl quantitative pcr assay for clinical use: Poonam Santra Sourav Sarma Chowdhury, Kallol Saha, Saheli Banerjee, Biswajoy Pal, Mayur Parihar, Neeraj Arora and Deepak Kumar Mishra.
- 12. Abstract publication in 4th National Conference of Indian Society for Histocompatibility and Immunogenetics ISHICON 2016 Chandigarh - A pilot study highlighting the role of donor Killer cell immunoglobulin like receptor (KIR) typing on outcome of allogeneic Hematopoietic Stem Cell Transplantation (HSCT) in myeloid malignancies. Saheli Banerjee, Subhajit Brahma, Neeraj Arora, Deepak Kumar Mishra, Mita Roy chowdhury, Meet Kumar, Jeevan Kumar, Anupam Chakrapani, Mammen Chandy.
- 13. Abstract publication in APCON 2015, Kochi Frequency and spectrum of EGFR mutations, ALK rearrangements in non–small cell lung cancer (NSCLC) A north east single center experience: Sourabh Sarma, Dr Divya Midha, Dr Indu Arun, Dr Paromita Roy, Dr Satyakam Swaimoon, Dr Deepak Dabkara, Dr Sanjoy Chatterjee, Dr Raj Kumar Srimali, Dr Mayur Parihar, Dr Deepak Mishra, Dr. Neeraj Arora.
- 14. Abstract publication in APCON 2014 Pune Frequency and spectrum of EGFR mutations, ALK rearrangements in non–small cell lung cancer (NSCLC) A single center experience: Sourav Sarma Chowdhury, Divya Midha, Indu Arun, Paromita Roy, Satyakam Swaimoon, Deepak Dabkara, Sanjoy Chatterjee, Raj Kumar Srimali, Mayur Parihar, Deepak Mishra, Neeraj Arora.

DEPARTMENT OF NURSING

Ms. Piyali Bose

Nursing Superintendent

Ms. Chitra Sengupta Deputy Nursing Superintendent

Ms. Chaitali Biswas

PG Co-Ordinator cum Principal

Ms. Sadhana Chattopadhyay

Nurse Educator

RESEARCH PUBLICATIONS

- 1. The Face Off ...!! The Impact of Body Image Disturbance in Head & Neck Cancer Patients. Thomas J. Indian Journal of Oncology Nursing.2017 Jan-Mar;(19).
- Case Study of a Patient with Thyroid Cancer A Nursing Perspective. Choini S. Indian Journal of Oncology Nursing .2017 Apr-Jun;(20).
- 3. Influence of Lemon Slices in Reducing Post Radioiodine: Therapy Side Effects in Patients with Thyroid Cancer. Mukherjee D. Indian Journal of Oncology Nursing. 2017 Apr-Jun; (20).
- 4. Cytomegalovirus reactivation and disease among patients with Allogeneic Hematopoietic Stem Cell Transplantation in eastern India: Epidemiology, outcome and healthcare cost. M, Roychowdhury, Kumar J, Harishankar A, Sinha S, Bhave SJ, Chakrapani A, Radhakrishnan V, Nair R, Bhattacharya S, Chandy M. Indian J Med Microbiol. 2018 Jan-Mar;36(1):49-53.

RESEARCH THESIS

- 1. A Study to assess the stress and coping strategies in parents of children with Haematological Cancer in selected Cancer Hospital of Kolkata. Evangeline Lyngkhoi. (2017).
- 2. A Study on oral cancer screening and its associated factors among tobacco users in selected community of east Sikkim. Archana Sharma. (2017).
- 3. A Study to assess the effect of interventional package on anxiety of patient entering palliative care at selected cancer Hospital, Kolkata. Pallabi Boruah. (2017).
- 4. A Study to assess the sleep patterns and sleep distractors of cancer patients admitted in surgical unit at Tata Medical Center, Kolkata. Shanjobeni Yanthan. (2017).

ACADEMIC ACTIVITIES

- 19th National Oncology Nursing Conference on Bench to Clinical Excellence in Oncology Nursing. (Conference 11th – 12th Oct 2018).
- 2. 4th Nursing education Workshop on "Fight Against Gynaecological Cancer" on 3rd June 2017.
- 3. 5th Nursing Education Workshop on "Cytotoxic Drugs- Handle with Care" on 22nd June 2018.
- 4. CVAD WORKSHOP.
- 5. Workshop on Palliative care- on 29th July 2017.
- 6. SCHOOL HEALTH PROGRAMME CPR AWARENESS.
- CANCER AWARENESS Program (Total- 4) INHOUSE AND IN SCHOOL and in rural COMMUNITY. (on Ca-Lung On 2017 and on Ca- Breast 2018).
- 8. STOMA WORKSHOP.
- 9. CVAD HANDLING & DRESSING PROGRAMME.
- 10. OSTOMATE MEET PROGRAMME STOMA CLINIC.
- 11. PERI OPERATIVE NURSING WORKSHOP OT.

AWARDS / FELLOWSHIPS

 Ms. Mita Roy Chowdhury (CNS, BMT Unit) from Josh Gottheil Memorial Bone Marrow Transplant Career Award \$2000 in BMT Tandem Meeting Feb'2018- Special Reward

DEPARTMENT OF PAEDIATRICS

Prof Vaskar Saha MBBS, DCH, MD (Paeds), FRCPCH, FRCPath, PhD

Dr Shekhar Krishnan MBBS, MRCP (Paeds), FRCPath, PhD

Dr Arpita Bhattacharyya MBBS, DCH, MRCP (Paeds)

Dr Niharendu Ghara MBBS, DCH, MD (Path), MRCPCH, FRCPath

Dr Anirban Das MBBS, MD (Paeds), DM (Paed Haem-Onc)

Dr Reghu KS MBBS, DCH, MD (Paeds), DM (Paed Onc)

Dr Parthasarathi Bhattacharyya MBBS, DCH, MRCP

RESEARCH PROJECTS

- The multicentre randomised clinical trial for treatment of children and adolescents with newlydiagnosed acute lymphoblastic leukaemia. InPOG-ALL-15-01 ICiCLe-ALL-14. (Investigator-initiated, CI -Prof Vaskar Saha; Five participating centres, TMC as coordinating centre, funding from the ICMR and National Cancer Grid, year of start 2016, pre-trial phase from 2013-2016, Clinical Trials Registry India CTRI/2015/12/006434).
- 2. The Indian Childhood Cancer Survivorship Study (C2S study). After treatment completion registry of childhood cancers: Multi-centre study InPOG-LE-16-01. (Investigator initiated, PI Dr Anirban Das).
- 3. Study of treatment and outcome of chronic myeloid leukaemia in children and adolescents in India. (Investigator initiated, PI Dr Anirban Das).
- Clinical Course, Pathological Spectrum and Outcomes in Paediatric Rare Tumours in India: A Prospective Observational Study (InPOG –RARE-17-01). (Investigator initiated, PI Dr Anirban Das).

 Indian Childhood Advanced Nasopharyngeal Carcinoma Study (ICANaPS): A multicentre, prospective, pilot study on use of platinum-based chemotherapy for Pediatric nasopharyngeal carcinoma and exploration of the role of plasma Epstein-Barr virus (EBV)-DNA PCR titers in predicting relapse. (Investigator initiated, PI Dr Anirban Das)

RESEARCH PUBLICATIONS

- Imatinib treatment of paediatric Philadelphia chromosome-positive acute lymphoblastic leukaemia (EsPhALL2010): a prospective, intergroup, open-label, single-arm clinical trial. Biondi A, Gandemer V, De Lorenzo P, Cario G, Campbell M, Castor A, Pieters R, Baruchel A, Vora A, Leoni V, Stary J, Escherich G, Li CK, Cazzaniga G, Cave H, Bradtke J, Conter V, Saha V, Schrappe M, Grazia Valsecchi M. Lancet Haematol. 2018 Dec;5(12): e641-e652.
- A triple-probe FISH screening strategy for risk-stratified therapy of acute lymphoblastic leukaemia in low- resource settings. Parihar M, Singh M, Islam R, Saha D, Mishra DK, Saha V, Krishnan S. *Pediatric Blood & Cancer.* 2018 2018 Dec;65(12): e27366.
- 3. Predictive value of minimal residual disease in Philadelphia-chromosome-positive acute lymphoblastic leukemia treated with Imatinib in the European intergroup study of post induction treatment of Philadelphia chromosome positive acute lymphoblastic leukemia, based on immunoglobulin / T cell receptor and BCR/ABL1 methodologies. Cazzaniga G, De Lorenzo P, Alten J, Röttgers S, Hancock J, Saha V, Castor A, Madsen HO, Gandemer V, Cavé H, Leoni V, Köhler R, Ferrari GM, Bleckmann K, Pieters R, van der Velden V, Stary J, Zuna J, Escherich G, Stadt UZ, Aricò M, Conter V, Schrappe M, Valsecchi MG, Biondi A. *Haematologica*.2018 Jan;103:107-115.
- Differential regulation of cell death pathways by the microenvironment correlates with chemoresistance and survival in leukaemia. Qattan MY, Bakker EY, Rajendran R, Chen DW, Saha V, Liu J, Zeef L, Schwartz JM, Mutti L, Demonacos C, Krstic-Demonacos M. *PLoS One*. 2017 Jun; 12:178606.
- Targeting the 5T4 oncofoetal glycoprotein with an antibody drug conjugate (A1mcmmaf) improves survival in patient derived xenograft models of acute lymphoblastic leukemia. McGinn OJ, Krishnan S, Bourquin JP, Sapra P, Dempsey C, Saha V, Stern PL. *Haematologica*. 2017 Jun; 102:1075-1084.
- Acute lymphoblastic leukaemia cells produce large extracellular vesicles containing organelles and an active cytoskeleton. Johnson SM, Dempsey C, Parker C, Mironov A, Bradley H, Saha V. J Extracell Vesicles. 2017 Mar; 6:1-12.
- 7. SOX7 promotes the maintenance and proliferation of B cell precursor acute lymphoblastic cells. Cuvertino S, Filiciotto G, Masurekar A, Saha V, Lacaud G, Kouskoff V. *Oncotarget*. 2017;8(39):64974-83.
- Ex vivo drug response profiling detects recurrent sensitivity patterns in drug-resistant acute lymphoblastic leukemia. Frismantas V, Dobay MP, Rinaldi A, Tchinda J, Dunn SH, Kunz J, Richter-Pechanska P, Marovca B, Pail O, Jenni S, Diaz-Flores E, Chang BH, Brown TJ, Collins RH, Uhrig S, Balasubramanian GP, Bandapalli oR, Higi S, Eugster S, Voegeli P, Delorenzi M, Cario G, Loh ML, Schrappe M, Stanulla M, Kulozik AE, Muckenthaler MU, Saha V, Irving JA, Meisel R, Radimerski T, Von Stackelberg A, Eckert C, Tyner JW, Horvath P, Bornhauser BC, Bourquin JP. *Blood*. 2017;129(11): e26-e37.

- Mixed-phenotypic acute leukemia series from tertiary care center. Pawar RN, Banerjee S, Bramha S, Krishnan S, Bhattacharya A, Saha V, Chakrapani A, Bhave S, Chandy M, Nair R, Parihar M, Arora N, Mishra DK. Indian J Pathol Microbiol. 2017;60(1):43-9.
- 10. Challenges of Treating Childhood Medulloblastoma in a Country with Limited Resources: 20 Years of Experience at a Single Tertiary Center in Malaysia. Revathi Rajagopal, Sayyidatul Abd-Ghafar, Dharmendra Ganesan, Anita Zarina Bustam Mainudin, Kum Thong Wong, Norlisah Ramli, Vida Jawin, Su Han Lum, Tsiao Yi Yap, Eric Bouffet, Ibrahim Qaddoumi, Shekhar Krishnan, HanyAriffin, and Wan Ariffin Abdullah. *Journal of Global Oncology*. 2017 Apr; 3(2): 143–156.
- 11. Treatment Refusal and Abandonment Remain Major Concerns Despite Good Outcomes with Multi-Modality Management in Pediatric Medulloblastoma: Experience from a Cancer Center in Eastern India. Das A, Achari RB, Zameer L, Sen S, Krishnan S, Bhattacharyya A. Indian J Med Paediatr Oncol. 2018.
- Challenges in the management of localized intracranial ependymoma in children: Experience from a referral oncology center in Eastern India. Das A, Chowdhury SP, Achari SP, Zameer L, Sen S, Sukumaran RK, Bhattacharyya A. *Pediatr Hematol Oncol*.2018 Aug - Sep;35(5-6):369-372.
- TP53 Mutation, MYCN Amplification, and Large Cell/Anaplastic Histology in Medulloblastoma. Das A, Zameer L, Vinarkar S, Singh M, Parihar M, Arora N, Chandra A, Achari RB. Indian J Pediatr. 2018 Aug;85(8):684-685.
- 14. Vanishing Bile Duct Syndrome Following Cytomegalovirus Infection in a Child with Hodgkin Lymphoma. Das A, Mitra S, Ghosh D, Modi SK, Roy P, Das J, Bhattacharya S, Krishnan S, Das A, Bhattacharyya A. J Pediatr Hematol Oncol. 2018 Jan;40(1):83-84.
- Invasive Fungal Disease in Pediatric Acute Leukemia in the Non-Transplant Setting: 8 Years' Experience from a Tertiary Care Center in North India. Das A, Oberoi S, Trehan A, Chakrabarti A, Bansal D, Saxena AK, Sodhi KS, Kakkar N, Srinivasan R. J Pediatr Hematol Oncol. 2018; 40:462-467.
- Risk Factors for Microbiologically-documented Infections, Mortality and Prolonged Hospital Stay in Children with Febrile Neutropenia. Das A, Trehan A, Bansal D. Indian Pediatr.2018 Oct 15;55(10):859-864.
- Colistin-Resistant Klebsiella Infections Among Pediatric Oncology and Hematopoietic Stem Cell Transplantation Patients in Eastern India. Infect Control Hosp Epidemiol. Chandy M, Das A, Bhattacharyya A, Banerjee S, Dhar K, Goel G, Bhattacharya S. Infect Control Hosp Epidemiol. 2018 Jan;39(1):118-121.
- Pediatric Rhabdomyosarcoma in India: A Single-center Experience. Bansal D, Das A, Trehan A, Kapoor R, Panda NK, Srinivasan R, Kakkar N, Sodhi KS, Saxena AK. Indian Pediatr. 2017 Sep 15;54(9):735-738.
- Undernutrition in Pediatric Malignancy. Das A, Ray R, Sinha T, Gogoi M, Krishnan S, Bhattacharyya A. Indian J Pediatr. 2017 Nov;84(11):875-876.
- 20. Can complications in febrile neutropenia be predicted? Report from a developing country. Oberoi S, Das A, Trehan A, Ray P, Bansal D. *Support Care Cancer*. 2017 Nov;25(11):3523-3528.

- 21. Growth Failure in Hereditary Spherocytosis and the Effect of Splenectomy. Das A, Bansal D, Trehan A, Das R. Indian Pediatr. 2017 Jul 15;54(7):563-566.
- 22. Encouraging Outcomes with Manageable Toxicity Using Neoadjuvant Chemotherapy and Intensitymodulated Radiotherapy in Advanced Pediatric Nasopharyngeal Carcinoma: Single-Center Experience from a Developing Country. Das A, Mallick I, Arun P, Midha D, Sen S, Krishnan S, Bhattacharyya A. J Pediatr Hematol Oncol. 2017 May;39(4):318-319.
- Next-generation sequencing unravels homozygous mutation in glucose-6-phosphate isomerase, GPIc.1040G>A (p. Arg347His) causing hemolysis in an Indian infant. Jamwal M, Aggarwal A, Das A, Maitra A, Sharma P, Krishnan S, Arora N, Bansal D, Das R. *Clin Chim Acta*. 2017 May; 468:81-84.
- 24. Validation of risk stratification for children with febrile neutropenia in a paediatric oncology unit in India. Das A, Trehan A, Oberoi S, Bansal D. *Pediatr Blood Cancer*. 2017 Jun;64(6).
- 25. Myeloablative Conditioning Followed by T-Cell Replete Haploidentical Related Donor Peripheral Blood Stem Cell Transplant Using Post-Transplant Cyclophosphamide Immune Tolerance Approach for High Risk Haematological Malignancies: An Indian Perspective. Shah SP, Radhakrishnan VS, Jaishetwar GS, Sukumaran RK, Roychowdhury M, Kumar J, Bhave SJ, Nair R, Chandy M. *Biol Blood Marrow Transplant*. 2018 Mar 1;24(3): S408–9.

ABSTRACT PRESENTATIONS

- Detection of cytogenetic aberrations using fish, and tp53 mutation using sanger sequencing in Pediatric Medulloblastoma: experience from an exploratory cohort at Tata Medical Center Kolkata. 22ndAnnual Conference of the Pediatric Hematology/Oncology Chapter of Indian Academy of Pediatrics, Bangalore, November 2018.
- Developing a collaborative retinoblastoma service in eastern India: early experience from a referral oncology center (Tata Medical Center) and two regional ophthalmic centres. 22ndAnnual Conference of the Pediatric Hematology/Oncology Chapter of Indian Academy of Pediatrics, Bangalore, November 2018.
- Outcome of early discharge in children with cancer and febrile neutropenia at low risk for invasive bacterial infection at a tertiary cancer center. 22ndAnnual Conference of the Pediatric Hematology/Oncology Chapter of Indian Academy of Pediatrics, Bangalore, November 2018.
- 4. Dedicated social support services reduce abandonment and treatment-refusal in Pediatric oncology: seven years' experience from a not-for-profit, referral oncology hospital (Tata Medical Center) in Eastern India. 22ndAnnual Conference of the Pediatric Hematology/Oncology Chapter of Indian Academy of Pediatrics, Bangalore, November 2018.
- Risk of progression/relapse in Pediatric intracranial ependymoma: single-center experience from a referral oncology center (Tata Medical Center) in Eastern India. International Symposium on Pediatric Neuro-Oncology (ISPNO), Denver, USA, June 2018.
- 6. Prolonged symptom-interval and high-risk disease predict treatment refusal/abandonment, while standard-risk disease maintains excellent survival: 7-years' experience of managing Pediatric

Medulloblastoma at Tata Medical Center (TMC), Kolkata. 10thAnnual Conference of the Indian Society of Neuro-Oncology (ISNOCON), AIIMS, New Delhi, April 2018.

 A single centre (Tata Medical Centre) experience of treating children with Burkitt lymphoma using FAB LMB protocol. 22ndAnnual Conference of the Pediatric Hematology/Oncology Chapter of Indian Academy of Pediatrics, Bangalore, November 2018.

AWARDS / SCHOLARSHIPS / FELLOWSHIPS

- 1. Dr Sheetal Kulkarni Modi. Travel scholarship-22ndAnnual Conference of the Pediatric Hem-Onc Chapter of IAP, Bangalore, November 2018.
- 2. Dr Avijeet Mishra. Travel scholarship- 22ndAnnual Conference of the Pediatric Hem-Onc Chapter of IAP, Bangalore, November 2018.
- 3. Dr Sucharita Tuladhar.1st prize in Haematology poster Section-22ndAnnual Conference of the Pediatric Hem-Onc Chapter of IAP, Bangalore, November 2018.
- 4. Dr Pritha Banerjee.1st prize in Oncology poster section-22ndAnnual Conference of the Pediatric Hem-Onc Chapter of IAP, Bangalore, November 2018.
- 5. Dr Arpita Bhattacharyya. Full Scholarship-Global Paediatric Medicine Infectious Diseases initiative, St Jude Children's Research Hospital, Memphis, US; 2018.

REGIONAL ACADEMIC ACTIVITIES & MEETINGS

- 1. 21Annual Conference (PHOCON) of the Pediatric Haemato-Oncology Chapter of Indian Academy of Paediatrics, Kolkata, November 2018- organizers.
- 2. FNB (Fellow of National Board) in Paediatric Haematology Oncology training program- Started 2017.
- 3. External academic postings of fellows to Haematology Department at NRS Medical College, Kolkata, for broader overview of non-malignant haematology.
- Dr Arpita Bhattacharyya East India coordinator for Paediatric Haemato-Oncology (PHO) chapter of Indian Academy of Paediatrics (IAP) and active member of Eastern Indian Paediatric Oncology Forum (EIPOF).
- 5. Dr Arpita Bhattacharyya and Dr Anirban Das designated Paediatric Haemato-Oncology (PHO) instructors of Indian Academy of Paediatrics (IAP) in paediatric oncology and haematology respectively.

Dr Soumitra Shankar Dutta

MD (CMC, Vellore), DPM, DNB, MRCPsych, CCT in Child Psychiatry (UK).

Dr Shrikant Atreya

MD (Community Medicine, TN Medical College, Mumbai), PDF (Palliative Medicine, TMH under HBNI Univ, Mumbai), Associate Consultant in Palliative Medicine.

Dr Gaurav Kumar

MD (Clinical Pharmacology, SCB Medical College, Cuttack), Diploma in Geriatric Medicine, Fellowship in Palliative Care (Tata Medical Center), ESMO Fellowship in Palliative Care (Wales, UK). Junior Consultant, Palliative Care.

Dr Arnab Mukherjee

DPM, MD Psychiatry (CMC, Vellore), Fellow of Indian Association of Psychiatry, Junior Consultant Psychiatrist.

RESEARCH PROJECTS

- India's position in implementing the WHO Framework Convention on Tobacco Control A Policy Analysis. (Investigator initiated, PI Dr Soumitra Shankar Datta)
- Wellbeing, emotional exhaustion and burnout in oncology clinicians. (Investigator initiated, PI Dr Soumitra Shankar Datta)
- 3. Following a mixed methods design, we studied wellbeing and emotional exhaustion in oncology clinicians and this work has been published in a peer reviewed journal. Occupational Mental Health interventions are being designed based on the findings of the study.
- 4. Adaptation and Reproducibility of ECOG Performance status scoring amongst Oncology clinicians (Investigator initiated, PI Dr Soumitra Shankar Datta)
- 5. Following a mixed methods design, we studied decision making in oncology. The paper has been published in an international peer reviewed journal.
- Perception of tobacco use in young adults of urban India: A qualitative exploration with relevant health policy analysis. (PI: Soumita Ghose, Co-Investigator: Soumitra S Datta) The paper has been published in an international peer reviewed journal.
- Relationship style and delay in presentation to oncologist in ovarian cancer. (Part funded by UCL, PI Dr Soumitra Shankar Datta, Co-Investigator – Usha Menon, UCL) Data analysis completed.
- Cancer Care in India (CCI) Accessibility, Affordability, Innovation: A qualitative exploration Funded by Kings College London, Site. (PI Dr Soumitra Shankar Datta, Collaborator in Kings – Dr Carlo Caduff) The data collection has been completed.

- Preference for Information Sharing and Participation in treatment decision Making of children and adolescents with Cancer and their parents (PRISM-HEALTH). (Investigator initiated, PI Dr Soumitra Shankar Datta, Collaboration with IIT Kharagpur and National AIDS Research Institute, NARI-ICMR) Data collection ongoing.
- 10. Implementation of Home-based Palliative Care in Limited Resource settings (National Institutes of Health, USA funded project in collaboration with Medical University of South Carolina, USA): This RCT has been submitted to ICMR-HMSC (Indian Council of Medical Research- Health Ministry Screening Committee) and TMC IRB. Upon approval shall start recruitment.
- 11. Cochrane systematic review on 'Psychological interventions for adolescents with psychosis' (This is affiliated to Cochrane Schizophrenia Group, Lead reviewer Soumitra S Datta, Co-reviewers: Ajit Kumar and Rhea Daruvala) The review is being written up.

SERVICE DEVELOPMENT PROJECTS

- Development of training curriculum for Family Medicine and primary care physicians of India. This is done in collaboration with Indian Association of Palliative Care and Association of Family Physicians of India. This project includes both National and International faculties. (PI-Dr Shrikant Atreya).
- Starting the "End of life nursing education consortium" (ELNEC) in collaboration with American Association of Colleges of Nursing and City of Hope Medical Center, USA. (PI-Dr. Shrikant Y Atreya and CO-I Sister Sunipa Gupta. This involves dissemination of training min palliative care nursing across Kolkata and West Bengal in a phasic manner.
- PC-PAICE is a quality improvement project started jointly by Stanford University and Tata Trust. Dr. Shrikant Atreya and Dr. Soumitra S Datta are working on service improvement at the time of discharge. The project will look at identifying the causes of delays at discharge and provide guided interventions to reduce the discharge time.

RESEARCH PUBLICATIONS

- Ethics of Cancer Care in India Beyond Biology and Medicine. Ghose S, Radhakrisnan V, Bhattacharya S. https://doi.org/10.3332/ecancer.2019.911
- Perception of tobacco use in young adults of urban India: A qualitative exploration with relevant health policy analysis. Ghose S, Sardar A, Shiva S, Mullan B E, Datta S S. *Journal of Global Oncology*. 2018; 4:198s-198s.
- Joint position statement Indian association of palliative care and academy of family physicians of India – The way forward for developing community-based palliative care program throughout India: Policy, education, and service delivery considerations. Jeba J¹, Atreya S², Chakraborty S³, Pease N⁴, Thyle A⁵, Ganesh A, Palat G, Matthew L, Anbarasi S, Kumar R, Muckaden MA, Barnard A, Leng M, Munday D, Murray SA. *J Family Med Prim Care*. 2018; 7:291-302.

- 4. An observational study to assess the socioeconomic status and demographic profile of advanced cancer patients receiving palliative care in a tertiary-level cancer hospital of Eastern India. Kumar G, Panda N, Roy R, Bhattacharjee G. *Indian J Palliat Care*. 2018; 24:496-9.
- A Study to Assess the Feasibility of Introducing Early Palliative Care in Ambulatory Patients with Advanced Lung Cancer. Deodhar JK, Noronha V, Muckaden MA, Atreya S, Joshi A, Tandon SP, Ghoshal A, Salins NS, Patil VM, Prabhash K. Indian J Palliat Care. 2017; 23(3):261-267.
- 6. **Commentary.** Atreya S. *Indian J Palliat Care*. 2017; 23(4):361-362.
- 7. Referral Patterns of Gynaecological Cancer Patients to a Palliative Medicine Unit: A 2 Years Retrospective Analysis. Atreya S. Indian J Palliat Care. 2017; 23(4):409-412.
- Pivotal role of families in doctor-patient communication in oncology: a qualitative study of patients, their relatives and cancer clinicians. Datta SS, Tripathi L, Varghese R, Logan J, Gessler S, Chatterjee S, Bhaumik J, Menon U. *Eur J Cancer Care*. 2017;26(5).

ABSTRACT PRESENTATIONS

- 1. Knowledge, Attitude and Practices On Cancer and Its Prevention-A Cross Sectional Survey (Presented in World Cancer Congress by Soumita Ghose).
- Use of an International Online Educational Resource to Optimize Psycho Oncology Support in Palliative Care (Presented by Devi Nanda Kumar in Congress of International Psycho-oncology Society – IPOS 2018, Hong Kong).
- 3. Psychological distress in Head Neck cancer (Work done by Devi Nanda Kumar in Kerala, presented in IPOS 2018)

AWARDS / FELLOWSHIPS

1. Ms. Soumita Ghose- Travel Grant from Tata Trust for attending World Cancer Congress 2018, Hong Kong.

Dr Tiyas Sen

MBBS, DNB (Respiratory Medicine)

RESEARCH PUBLICATIONS

- 1. An unusual case of hoarseness of voice. Singh R, Sen T, Pattari S. *Respir Med Case Rep.* 2018 Feb 2;23:128-130.
- Diagnostic and Therapeutic Pleuroscopy Using a Flexible Fiberoptic Bronchoscope for Resource-poor Environments: A Case Series. Dutt TS, Tousheed SZ, Murali Mohan BV. Indian J Chest Dis Allied Sci. 2017; 59:13-16.

DEPARTMENT OF PLASTIC & RECONSTRUCTIVE SURGERY

Dr Gautam Biswas

MBBS, MS (General Surgery), MCh (Plastic and Reconstructive Surgery), DNB.

Dr Karnav Panchal

MBBS, DNB (Plastic and Reconstructive Surgery)

RESEARCH PROJECTS

1. Speech outcome in tongue reconstruction by free flap. (PI Dr Rajeev Sharan, Dr Gautam Biswas)

RESEARCH PUBLICATIONS

 Computed tomography angiographic study of internal mammary perforators and their use as recipient vessels for free tissue transfer in breast reconstruction. Kanoi AV, Panchal KB, Sen S, Biswas G. Indian J Plast Surg. 2017 Jan-Apr;50(1):50-55.

ACADEMIC MEETINGS

- 1. Asian Society of Breast Plastic and Reconstructive Surgery (ASBPRS) International Conference.
- 2. (Conference, December 9th 11th, 2017)
- 3. West Bengal State Chapter Plastic Surgery meet. (Conference in January, 2018).
- Association of Plastic Surgeons of India (APSI) Accredited Hands on Perforator course. (Workshop, February 9th & 10th, 2018)
- 5. World society of Reconstructive Microsurgery, Seoul. Reconstruction in Extremity Sarcoma. Fabricated Flaps. (Conference June, 2017)
- 6. Bangladesh Society, Dhaka: Reconstruction in Head and Neck Cancer- The past and the present. (Symposium).
- Asian Pacific Society of Reconstructive Microsurgery. Challenges in Head and Neck reconstruction, where we are today and what we need to address. Fabricated flaps. Challenges in Extremity Reconstruction in Sarcoma. (Conference May 9th – 13th, 2018)
- 7. Indian Society of Peripheral Nerve Surgery, Chandigarh: Cadaveric Workshop demonstration. Convenor: Facial palsy session. (Conference March, 2017)
- APSI Accredited course on flaps in Plastic Surgery, Pune. LD & TDAP Flaps. Free groin and SCIP Flap. (Workshop, May, 2017)
- Association of Plastic Surgeons of Telangana, Hyderabad. R R Choudhury Endowment Lecture. Perforator based flaps in head and neck reconstruction. DIEP Flap in Breast Reconstruction. (Conference September, 2017)

- 10. North Zone Association of Plastic Surgeons Meeting, SKIMS Srinagar. Operative demonstration Facial Palsy reconstruction. Perforator Flaps in Head and Neck Reconstruction. (Conference October, 2017)
- 11. Association of Plastic Surgeons of India, Kochi. CT Angio in Perforator based Breast Reconstruction. Double free flaps in Head and Neck Reconstruction. (Conference November, 2017)
- 12. APSI Accredited Course on Perforator Course, TATA MEDICAL CENTER, Kolkata. DIEP Flap. PAP Flap. SCIP Flap. Perforator flap in chest wall. (Workshop, February, 2018)
- 13. Indian Society for Reconstructive Microsurgery, Mumbai. Master class- Maxillary Reconstruction. Art and Plastic Surgery. (Conference February, 2018)
- 14. Indian Society for peripheral nerve Surgery, New Delhi. Facial palsy reconstruction. (Conference February, 2018)
- 15. Update in Plastic Surgery, AIIMS Delhi. Mandibular reconstruction. Facial palsy. (Conference, 2018)
- 16. Indian Society for Surgery of the Hand, Coimbatore. Dilemmas in management of malignant Hand Tumors. Vascular malformations of the hand. (Conference, October 2018)
- 17. Annual conference of the association of Plastic Surgeons of West Bengal: Limb preserving surgery for lower extremity bone sarcomas in the Pediatric population. (Conference February, 2017)
- Indian Society for Reconstructive Microsurgery, Mumbai. Complications in perforator based free flaps and factors affecting salvage. Titled maxillary reconstruction using double flaps. (Conference, March 2018)

DEPARTMENT OF RADIATION ONCOLOGY

Dr Sanjoy Chatterjee

MRCP (Lond), FRCP (Edin), FRCR (UK), PGCE (Dundee), FHEA (UK), CCT (Clin Onc), Senior Consultant

Dr Rimpa Basu Achari

M.D, Radiation Oncology, Senior consultant

Dr Indranil Mallick M.D, DNB Radiation Oncology, Senior consultant

Dr Santam Chakraborty

M.D, Radiation Oncology, Senior consultant

Dr Moses Arunsingh

M.D, Radiation Oncology FRCR Clinical Oncology, Junior consultant

Dr Tapesh Bhattacharryya

M.D, Radiation Oncology, Junior consultant

RESEARCH PROJECTS

- Patient's Perspective On Radiotherapy Treatment Decision in Locally Advanced (stage III/IV) cancer of the Head and Neck (PORDLA). (PI Dr Sanjoy Chatterjee). A study assessing patient decision making on treatment toxicities versus improvement in outcomes in intensive treatment of advanced head and neck cancer. (Completed recruitment and results presented at ESTRO 2015, full text under review).
- Breast Cancer project exploring ER/PR/Her2/Ki 67 pre and post chemotherapy and their effect on cancer outcomes (EXIPAR). (PI: Dr Sanjoy Chatterjee/Dr Animesh Sah). (Completed recruitment and full text published). An analysis of important immunohistochemistry based prognostic and predictive markers before and after Neoadjuvant chemotherapy for breast cancer.
- 3. Collaborative study on breast cancer exploring technology for quick diagnosis and better prognosticating breast cancer. Use of novel image processing tools to diagnose and prognosticate breast cancer from breast pathology slides. (PI Dr Sanjoy Chatterjee). Funded by IIT-Ministry of Human Resources Development collaboration. Status: Completed, Publication made in Nature 2017.
- 4. HYPO-FRACTIONATED RADIOTHERAPY SCHEDULE OF 35GY IN 10 FRACTIONS IN ADVANCED INCURABLE BREAST CANCER: A PROSPECTIVE PHASE I/II STUDY (HYPORT Study). (PI Dr Sanjoy Chatterjee). Funded by TMC RT department. (Recruitment completed Results being analysed, Translational work being

done, Oral Presentation made in International meetings, now being written up for peer review publications).

- 5. Carotid artery sparing radiotherapy in early laryngeal carcinoma (CARSREL). A clinical trial assessing the impact of conformal avoidance of carotid arteries in Radiotherapy for early glottic cancer with a view to reduction of the risk of stroke in the long term. (PI Dr Sanjoy Chatterjee). Funded by TMC RT Department. (Recruitment completed Results being analysed, Oral Presentation made in International meetings, now being written up for peer review publications).
- 6. Collaborative study on Lung cancer: Developing a response predictive algorithm based on changes identified in the daily Cone Beam CT scans (CBCT) for treatment decision making in non-small cell lung cancer. (Study Ongoing). (PI Dr Sanjoy Chatterjee). Funded by IIT-Ministry of Human Resources Development collaboration. Development on a cone beam CT based decision algorithm on shrinkage of lung tumors during radiotherapy and adaptation of their treatment plan when necessary. (Results analysed, Oral Presentation made in International meeting, now being written up for peer review publications).
- Biologically targeted Radiotherapy dose escalation in Laryngo-pharyngeal cancers. (INTELHOPE study). (PI Dr Sanjoy Chatterjee). (Started recruitment Dec 2015). Funded by the Nag Foundation and Tata Medical Center. Randomized controlled trial on dose escalation based on PET imaging in HPV negative loco regionally advanced laryngopharyngeal cancers.
- 8. Parotid Sparing Adaptive Radiotherapy in Head and Neck Cancer Patients A Study Evaluating the Resource Intensiveness and Impact on Quality of Life (PARITY). (PI Dr Moses Arunsingh, CO PI- Sanjoy Chatterjee). Clinical trial looking at whether adaptation of a radiotherapy plan during a course of radiotherapy in head and neck cancers to reduce parotid doses is cost-effective and results in clinical and quality of life benefits for the patient.

Multicentric Systemic Therapy Studies:

- 9. An Open Label, multicenter, Phase IIIb Study to assess the safety and efficacy of ribociclib (LEE011) in combination with letrozole for the treatment of men and pre/postmenopausal women with hormone receptor positive (HR+) HER2-negative (HER2-) advanced breast cancer (aBC) with no Prior hormonal therapy for advanced disease CLEE011A2404. (Site specific PI- Sanjoy Chatterjee) Funded by Novartis.
- 10. Buparlasib in metastatic Head and Neck Cancers. (PI Sanjoy Chatterjee). Funded by Novartis (recruitment complete)
- 11. A Phase III Randomised, Double-Blind, Parallel Group, Multicentre Study to Compare the Efficacy, Safety, Pharmacokinetics and Immunogenicity between SB3 (proposed trastuzumab biosimilar) and Herceptin[®] in Women with Newly Diagnosed HER2 Positive Early or Locally Advanced Breast Cancer in Neoadjuvant Setting. (PI Sanjoy Chatterjee). Funded by Samsung Bioepis.
- 12. A Phase II, multicenter, open-label, two-cohort, non-comparative study to assess the efficacy and safety of alpelisib plus fulvestrant or letrozole in patients with PIK3CA mutant, hormone receptor (HR)

positive, HER2 – negative advanced breast cancer (aBC), who have progressed on or after CDK 4/6 inhibitor treatment. (PI Sanjoy Chatterjee). Funded by Novartis.

- 13. A Phase III, Multicentre, randomised, double-blind, placebo-controlled study of Atezolizumab (anti-PD-L1 antibody) in combination with paclitaxel compared with placebo with paclitaxel for patients with previously untreated, inoperable locally advanced or metastatic Triple Negative Breast Cancer. (PI Sanjoy Chatterjee). Funded by Roche.
- 14. A Phase III, Open-Label, Multicenter, Randomized Study to Investigate the Efficacy and Safety of Atezolizumab compared with Chemotherapy in Patients with Treatment-Naïve Advanced or Recurrent (Stage IIIB not amenable for multimodality treatment) or Metastatic (Stage IV) Non-Small Cell Lung Cancer who are deemed unsuitable for Platinum-Containing therapy. (PI Dr. Moses Arunsingh S). Funded by Roche.
- A Phase III, double blind, placebo-controlled, randomized trial assessing the effects of aspirin on disease recurrence and survival after primary therapy in common non-metastatic solid tumours. (Add Aspirin Study). (PI Dr. Indranil Mallick). Funded by TMH Mumbai.
- 16. HYPO Fractionated Radiation Therapy comparing a standard radiotherapy schedule (over three weeks) with a novel one-week schedule in Adjuvant Breast Cancer: an open label randomized controlled study (Hyport Adjuvant). (PI Sanjoy Chatterjee).
- 17. A Randomized, Double-Blind, Multi-Centre, Parallel Group Study Comparing Two Humanized Monoclonal Antibodies that Target HER2 Receptors in Combination with Paclitaxel Administered as First-Line Treatment in Patients with HER2-Positive Metastatic Breast Cancer. (PI Dr. Rosina Ahmed). Funded by DRL.
- 18. HYPO-FRACTIONATED RADIOTHERAPY SCHEDULE OF 26 GY IN 5 FRACTIONS WITH SIMULTANEOUS INTEGRATED BOOST (6 GY) IN ADVANCED INCURABLE BREAST CANCER: A PROSPECTIVE PHASE I/II STUDY. (PI Dr. Sanjoy Chatterjee). Fund from Breast Fund
- 19. Phase II study to evaluate toxicity and clinical outcomes of definitive Helical Tomotherapy for primarily unresected carcinoma cervix using Fluorodeoxy glucose Positron Emission Tomography based radiotherapy planning. (PI Dr. Rimpa Basu Achari). Fund from DBT fund.

RESEARCH PUBLICATIONS

- Actual gains in dosimetry and treatment delivery efficiency from volumetric modulated arc radiotherapy for inoperable, locally advanced lung cancer over five-field forward-planned intensitymodulated radiotherapy. Shrimali RK, Arunsingh M, Reddy GD, Mandal S, Arun B, Prasath S, Sinha S, Mallick I, Achari R, Chatterjee S. Indian J Cancer. 2017 Jan-Mar;54(1):155-160.
- Continuous hyper fractionated accelerated radiotherapy using modern radiotherapy techniques for nonsmall cell lung cancer patients unsuitable for chemoradiation. Shrimali RK, Arunsingh M, Das A, Mallick I, Mahata A, Prasath S, Achari R, Chatterjee S. *Indian J Cancer*. 2017 Jan-Mar;54(1):120-126.

- Pivotal role of families in doctor patient communication in oncology: a qualitative study of patients, their relatives and cancer clinicians. Datta SS, Tripathi L, Varghese R, Logan J, Gessler S, Chatterjee S, Bhaumik J, Menon U. *Eur J Cancer Care (Engl)*. 2017 Sep;26(5).
- 4. Stigma Perceived by women following surgery for breast cancer. Tripathi L, Datta S, Agrawal S, Chatterjee S, Ahmed R. *Indian J Med Paediatr Oncol.* 2017 Apr-Jun;38(2):146-152.
- An Advanced Deep Learning Approach for Ki-67 Stained Hotspot Detection and Proliferation Rate Scoring for Prognostic evaluation of Breast Cancer. Saha M, Chakrabarty C, Indu A, Ahmed R, Chatterjee S. Nature (Sci Rep. 2017). June 2017. DOI:10.1038/s41598-017-03405-5.
- Mortality associated with candidemia in non-neutropenic cancer patients is not less compared to a neutropenic cohort of cancer patients. Goel G, Chandy M, Bhattacharyya A, Banerjee S, Chatterjee S, Mullick S, Sinha S, Sengupta K, Dhar K, Bhattacharya S, Rudramurthy S, Chakrabarti A. *Eur J Clin Microbiol Infect Dis*. 2017 Dec;36(12):2533-2535.
- 7. Exploring the prescribing behaviours and the mind of antibiotic prescribers is critical for a successful antibiotic stewardship programme: Results of a survey from Eastern India. Ravi N, Laha A, Hmar L, Chatterjee S, Goswami J, Goel G, Dhar K, Ghosh T, Chatterjee S, Datta SS, Bhattacharya S. Indian J Med Microbiol. 2017 Apr-Jun;35(2):299-301.
- 8. NK/T Cell Lymphoma: A Tertiary Centre Experience. Arora N, Mehta A, Ravichandran S, Arun I, Achari RB, Chakrapani A, Bhave SJ, Chandy M, Nair R. *Indian J Hematol Blood Transfus*. 2017 Mar;33(1):69-73.
- 9. Discordance in Immunohistochemical Status of Breast Cancer Post Neoadjuvant Chemotherapy. Agrawal SK, Chatterjee S, Arun I, Ahmed R. *Indian J Surg Oncol*. 2017 Jun;8(2):245-246
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Dr Sabita Biswas

MBBS, MD (Path)

RESEARCH PROJECTS

1. Comparison of quality of apheresis platelets stored in Platelet additive solution versus stored in plasma. (Investigator initiated, PI Dr Sabita Biswas)

RESEARCH PUBLICATIONS

- Clinical and laboratory profile of anti M. Basu D, Basu S, Reddy M, Gupta K, Chandy M. Immunohematology. 2017 Dec;33(4):165-169.
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ACADEMIC MEETINGS

- 1. Transmedcon National congress on Transfusion Medicine, (Conference, November, 2017)
- 2. International congress of ISBT of Transfusion Medicine, (Conference, June, 2017)
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- 4. ISHICON National conference on histocompatibility, (Conference, November, 2018)
- 5. Transmedcon National congress on Transfusion Medicine, (Conference, November, 2018)
- 6. Immuno-HAEMATOCON, (Seminar, August, 2017)
- 7. CME on Immunohematology and TTI, (Seminar, February, 2018)
- 8. Workshop on GCP, (June, 2017)
- 9. Workshop on GCP organised by ACCORD, (September, 2017)
- 10. Training programme on NABH, (Others, March 2017)
- 11. Training programme on Ortho Vision, (Others, November 2018)

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TATA TRANSLATIONAL CANCER RESEARCH CENTRE





TATA TRANSLATIONAL CANCER RESEARCH CENTRE

Kolkata, India

Annual Scientific Report 2018



Contents

TTCRC an overview	Page 3	
The Director's Desk	Page 4	
The Associate Director's desk	Page 5	
Clinical research unit	Page 7	
TiMBR-The Biorepository	Page 8	
Cytogenetics	Page 9	
Genomics Laboratory	Page 11	
Computational Biology	Page 13	
TCS@TTCRC	Page 15	
India Alliance Wellcome-DBT Fellows	Page 19	
Cell Biology Laboratory	Page 20	
Head & Neck Cancer	Page 23	
Gynaecological Oncology	Page 24	
Administration	Page 26	
External seminar speakers	Page 28	
Publications	Page 32	
TTCRC organizational structure	Page 35	

Tata Translational Cancer Research Centre (TTCRC) – An Overview

The Tata Translational Cancer Research Centre(TTCRC) is a dedicated research facility embedded within the Tata Medical Center. Initiated in 2014, it moved into dedicated facilities in April 2018. TTCRC creates an environment for clinicians, scientists and researchers to work together within a cancer hospital. The purpose is to develop innovative partnerships capable of delivering novel solutions for patients with cancer in India. Our work is open source and we freely share data and resources that are generated through our research.

To facilitate research groups, TTCRC has a modular design, shown below, with each module designed to provide core support for researchers. This includes project design, implementation and analysis. A dedicated biorepository and clinical research unit (CRU) underline downstream core activities. These include high throughput genomics, proteomics and microscopy platforms. Data driven engines link data generated from the laboratory with patient information.

TTCRC - TMC



Page | 3



The Director's Desk

2018 is a landmark year for TTCRC, as we complete 4years of existence from conception in 2014. We spent 2014-

18, housed in the HLA-Lab (courtesy Drs Biswas & Mishra) and moved into dedicated facility spread over 3 floors in April 2018. In a short while, we have set up dedicated facilities for next generation sequencing, high throughput microscopy and now a QTRAP mass spectrometer.

With the increased availability of space, we were finally able to begin to recruit to existing vacancies. So in 2018, we welcomed Manash and Sayan to CRU; Shivani and Ritam to the Biobank; Jaydeep and Avisek to cellular biology and Arunima to proteomics; Anindyajit and Sangramjit to informatics and Sukanya to the administrative setup. Mayur had two new recruits, Rashmi and Piyali who joined genomics along with Satyam. Mou and Arindam have moved onto greener pastures and we thank them for their work in getting us to where we are now.

From a research perspective, Jasmeet and Asima were awarded India Alliance Fellowships, joining Arunabha, Pritha and myself. I received an exceptional fellow award as well from India Alliance. We had a number of excellent visiting speakers and hosted a visiting team from the University of Manchester.

The work of the genomics lab underpins management of high risk leukaemia patients. Shekhar has been working in collaborative links with IIT-Kharagpur and Indian Statistical Institute to develop novel analytical tools to analyse outpatient Physician and patient compliance. He is co-supervising a IIT-KGP PhD student, Tushar Mungle, with Profs Sangeeta Bhattacharya and Jayanta Mukhopadhyay investigating physician compliance. Professor Kironmoy Das of ISI is helping in developing tools to correlate this data with patient outcome. The long standing collaboration with TCS life sciences has established pipelines for targeted exomic and RNA sequencing. An integrated platform capable of data capture, integration and innovative analysis have been created and installed, and a new version of the clinical trial management system is undergoing testing. There are proposed national collaboration in gall bladder cancer, establishing centralised clinical research units and a centralised small animal facility. International collaborations have resulted in a number of publications this year in Ph⁺ and relapsed lymphoblastic acute leukaemia. Arunabha is currently training in the clinical Proteomics facility Whetton at the University of Manchester. Pritha is also to spend a year working with Patricia Muller, CRUK-Manchester Institute. TTCRC has made good progress since 2014 and has great potential.

Many challenges lie ahead. A closer integration with the hospital is required so more clinicians/researchers are able to take advantage of the core facilities. We need to secure a stable long term funding strategy, recruit PIs and establish a graduate training program.

Finally, we join in with all our colleagues on congratulating Dr Mammen Chandy on being awarded the Padma Shri. He has established the standards we have to aim for!

The Associate Director's Desk

2018 was a watershed year for TTCRC. The year saw TTCRC's transition from a

virtual organisation to a tangible bricks-andmortar entity. Two floors were constructed atop the hospital's 2-storey LDU building and the southern halves of the second and ground floors were additionally repurposed to house the research centre. Purpose-built laboratories have been developed in the second and third floors, while office and meeting spaces have been created in the fourth and ground floors. The specifications for the laboratories were inspired by observations and inputs from a wide range of high-quality research facilities, nationally and internationally. The research facilities include specialised areas for advanced analyses (genomics, proteomics, microscopy, cell sorting, informatics) and shared spaces for molecular and cell biology studies.

From the first draft of the design drawings (August 2013), construction of the research centre has been a decidedly hands-on experience, demanding the active participation of all in the research group. It has been an exacting enterprise, has involved a steep learning curve, and has required close communication and obsessive attention to detail at all stages of construction. A silver lining has been the esprit-de-corps arising from this shared sense of mission, something that will hopefully endure and intensify as the research centre grows. The success of this enterprise would not have been possible without the extraordinary support of the many people involved in this project, both within the TMC fraternity and from outside - no words can do justice to their contributions. I would like to especially acknowledge the invaluable support from the Tata Consultancy Services, including from the Infrastructure Planning & Development team at TCS Gitanjali Park (Mr Kaushik Basu, Mr Sanket Mitra and Mr Parijat Mukherjee).

The actual hard work begins now. The management and operation of the research facility will need to be streamlined to ensure optimal use of resources. Information systems are being developed to enable this. The specialised research facilities will need to be developed so as to be able to support research projects within and outside the institution. A strategy for sustainable operation and costefficient management of the research centre will need to be crafted. In all this, we will need to stay true to the vision of high-quality, internationally competitive, impactful, openaccess research. These are the formidable challenges that will occupy our energies in the years ahead.

TTCRC construction timelines

2013

August: First draft of drawings for the research centre in the LDU

2015

March: Invitation to bid for building works

Nov: Building works begin

2016

Jan - Dec: Building work continues

June: Visit to NCBS Bengaluru to view research facilities

2017

July: Delivery of modular laboratory furniture (Waldner GmbH)

July: Delivery of Featherlite office furniture (temporarily housed at Premashraya)

July: First consignment of laboratory equipment (flow cell sorter, ultracentrifuge)

Sep: Laboratory furniture installation works begin

Dec: Near-completion of mechanical, electrical and plumbing works

2018

Feb: Installation of equipment for high-throughput genomics

Feb: Research group moves into TTCRC (initially occupying the second floor)

March: Office space millwork near-complete; research group moves to the office floor

March: Conference room functional

April: Completion of laboratory millwork

June: Cell sorter relocation and installation

Aug: Equipment for mass-spectrometry proteomics

Sep: High-content microscopy system

Dec: Ground floor lobby lift to upper floors operational

2019

Jan: Ground floor space near-complete



Dr. Shekhar Krishnan Paediatric Oncologist CRU Head



Prakriti Roy CRU Data Analyst



Manash Pratim Gogoi CRU Data Manager



Sayan Chaterjee CRU Data Manager



Mou Das Clinical Trial Manager Till 2018



Saikat Pal TCS



Bindu Abraham TCS



Tushar Mungle IIT Kharagpur

Clinical Research Unit

The Clinical Research Unit (CRU) in TTCRC established in November 2013 and over the years played a major role in coordinating clinical studies linked with the translational research. The team includes CRU Head, Clinical Trials manager, Data Analyst, Data Managers and seconded personnel from Tata Consultancy Services (TCS).

Multicentre Clinical Trial in Childhood ALL

Started with the multicentre Pre Trial study for the InPOG-ALL-15-01 ICiCLe-ALL-14 in august 2013 followed by ICiCLe-ALL-14 Trial, the first national multicentre randomised controlled trial in Childhood acute lymphoblastic leukaemia launched in October 2016 with the aim of Improving outcome by using modernised standardised risk stratified therapy which is locally accessible and cost effective to the patients. Till now over 3000 patients have been enrolled in the study within the country. Preliminary analysis showed survival rates of 90% with low intensity treatment for a group of patients with low risk disease conforming that risk stratification is the most effective method for better outcome and is effective in reduction of treatment related deaths and relapses.

Maintenance Therapy

The CRU supervises the maintenance phase of therapy in children with ALL receiving treatment at TMC. The aim is to optimise the antimetabolite drugs. In collaboration with IIT-Kharagpur we have audited practice and developed monitoring tools and to optimise maintenance dosing. We are working towards development of app based system for dosing advise and computerised dosing algorithm system. The unit also contributes towards laboratory studies in ALL, such as genetic characterisations and therapeutic drug monitoring.

Relapsed ALL

A strategy for managing children with relapsed ALL has been piloted and developed. The protocol, named TMC ALLR1, is being developed as a multicentre registry study within the Indian Pediatric Oncology Group (InPOG).

Data Development

The CRU works closely with the TCS in the development of the tools needed for various clinical and laboratory studies such as Clinical Trials management system (CTMS) supporting the data management for the trial which enables remote data entry, data capture, trial randomisation and decision support. A Data Management System (IDM 4.0) is being developed for TMC ALLR1. Working with TCS, we are using data extraction tools like Apache cTakes to mine data from Hospital Management System. Data discovery tools like i2b2 as cohort creation tool and Kibana as data visualisation tool are being evaluated for future studies.



Dr Shivani Bhagwat Administrative Lead



Soumosree Tapadar Biobank Technologist



Ritam Siddhanta Biobank Technologist

Tata Medical Center biorepository (TiMBR) is a centralized facility of Tata Medical Center (TMC) catering to the unique heterogeneity of cancer. It provides an interface between high quality clinical samples and diverse research objectives. Holistically designed infrastructure, workflows, SOPs, LIMS and quality checks exhibit its competence. It has a dedicated and trained workforce, specialized processing and storage facility possessing -

TiMBR- The Biorepository

80 freezers, liquid nitrogen (LN) storage and supply tanks to support long term sample preservation. It is stationed in proximity to hospital's LN plant to manage any unforeseen deficit.

IRB approved projects and ethically consented patients are recruited and biomaterial is collected based on preanalytical standards. Based on ISBER guidelines, surrogate time points have been implemented to offset processing delays. Information accession between hospital management system (HMS) and Labvantage 6.0.1 (Laboratory information management system; LIMS) creates comprehensively pseudo-anonymization of biospecimen. LIMS supports operation management including processing logs, compliance reports, workflows and traceability of stored samples. Lately, it helped resolve unfiled and unknown samples kept at unspecified locations and discrepancies of non-uniform sample processing. Implementation of standard workflow for every project, electronic sample requisition, material transfer agreement, regular internal audits are now

in place to make the operations consistent and eventually been linked to LIMS as well.

TiMBR is a project based repository where samples are accessed through research collaborations. In 2018, more than 2000 patients were recruited under ten active studies across six departments at TMC. Key areas of research at TiMBR includes paediatric oncology, gynaecological (ovarian & cervix) malignancies, breast oncology, adult haematology, Head & neck oncology and radiation oncology.

The facility houses more than 15,000 sample derivatives. It comprises 2D barcoded tissues (FFPE, SNAP frozen and in RNA later), plasma, serum, cell blocks, cell pellets, DNA, RNA, cryo MNCs and paired normal tissues for unbiased study cohorts. Periodic quality checks and stringent checkpoints accredit the quality of samples being used for in-house translational research. Recently, a gall bladder cancer project has been initiated where epidemiological database, sample flow, processing SOPs and documentation has been initiated to support active biobanking of excess material.

With growing sample size and number of projects, expansion of infrastructure, upgradation of Labvantage 8.3 and development of hub and spoke model is in place to facilitate inter-hospital and academic institution research collaborations. The use of a of web-based LIMS solutions will allow the us to participate in national and international biobank networks.



Cytogenetics

Dr Mayur Parihar Haemato-pathologist and Head Cytogenetics



Arun SR

Arun SR Scientific Officer



Sumanta Patel Scientific Officer



Sipra Rani Patel Scientific Officer





The Cytogenetics team at Tata Medical Center/TTCRC has been working to provide low cost, efficient, sensitive and effective solutions not only for the patients being treated at Tata Medical Center but also for other centres.

As a group we have been working to improve outcomes in childhood leukaemia through risk stratified therapy based on genetic characterisation of tumor cells and response to treatment. The Cytogenetic Lab at Tata Medical Center is the reference lab for the National trial on childhood Acute Lymphoblastic Leukaemia (InPOG-ALL-15-01 ICiCLe-ALL-14 trial).

As there is a lack of established cytogenetic laboratories and trained cytogenetics personnel in India cytogenetic strategy based on fluorescent in situ hybridisation (FISH) was developed to categorise patients with B-cell precursor ALL (BCP-ALL) as Standard, Intermediate or High Risk (SR, IR, HR). FISH testing was chosen as the technique is easily learnt, does not require live cells, is relatively inexpensive and allows transport of



CEP Probes

CEP17

samples for testing to referral laboratories. FISH microscopy images can also be reviewed centrally to ensure standardisation and diagnostic accuracy across treatment centres. A 3-probe FISH testing strategy has been established to identify the principal genetic subtypes in BCP-ALL. Our experience demonstrates the utility of this approach in providing modern standardised diagnostic services for ALL in resource-limited settings. TTCRC has been instrumental in helping other centres set up

Cytogenetic strategy

FISH based analyses for childhood ALL across the country.

Along with identification of prognostically important intra-gene deletions (e.g., *IKZF1*) we have identified a constellation of copy number alterations and fusions in the B-

Analyses of the ICiCLe patient cohort, identified an increased proportion of



Cytogenetic Heterogeneity in Childhood ALL

patients with High-Hyperdiploid (HeH) and B-other karyotype when compared with reports from the west. Given the numbers of patients, we also observed that HeH and B-others comprised the largest group in relapsed ALL and a many of these patients were not identified as high risk MRD at the end of induction. Along with the genomics group we have further characterized the HeH and B-other patients.

We investigated whole genome copy number alterations (CNAs) using the CytoScan HD array (ThermoFisher, USA). other cohort. Early observations from high density SNP array analysis shows a distinct and heterogeneous pattern of copy number alterations in high hyperdiploid BCP-ALL compared to reports in western patients. Our ongoing studies are focused on correlating these variations with observed variations in treatment response in children with ALL treated on the InPOG-ALL-15-01-ICiCLe-ALL-14 clinical study to further optimise genetic risk stratification.



Genomics Laboratory

TTCRC provides a core genomics facility for

both laboratory and clinical research. The

genomics lab works in close cooperation

Dr Debdutta Ganguli Administrative Lead



Dr Binuja Verma TCS Life Science Sr. Scientist



Dr Satyam Banerjee Post-Doc Fellow



Debparna Saha Research Assistant



Rubina Islam Research Assistant



Piyali Sarkar Research Assistant

Minimal Residual Disease (MRD)

with the CRU.

After successfully optimising the protocols at our centre, we joined the Euro-MRD consortium in Nov 2015, taking part in the biannual quality control rounds held every year for continued accreditation.

Representative figure showing PCR-MRD



based MRD workflow: (a) Amplification plot of informative clonal marker using serial dilutions of diagnostic DNA, (b) PCR-MRD quantification of follow-up time point, (c) Standard curve defining quantitative range and assay sensitivity.

Over the last year, we have retrospectively evaluated the PCR-MRD vs flow-MRD findings on 55 BCP-ALL patient samples banked. MRD $\geq 10^{-4}$ is interpreted as high by both approaches. In about one-third of patients analysed as negative by flow-MRD, Ig/TCR is able to detect disease at below the 10^{-4} threshold. The clinical significance of this observation will need prospective evaluation. Currently the PCR-MRD is being done in real time for patients on TMC ALLR1 who are eligible for transplantation.

Targeted Exome Sequencing

In close collaboration with cytogenetics, we designed a targeted panel of 95 genes using the Agilent Sure Design software based on all reported mutations in BCP-ALL patients as reported in PubMed and reported on the St. Jude - Washington University Pediatric Cancer Genome Project. Our probe design included 102966 amplicons covering 1.977 million bases; all coding exons, intron-exon bounderies and average 1000 bp upstream promoter and 3" UTR sequences within selected genes. The target regions were captured using Agilent HaloPlex High-Sensitivity Target Enrichment kit. The unique feature of this HaloPlex High-Sensitivity technology is the presence of more than a million unique 10-nt sequences or molecular barcodes embedded within each probe for higher sensitivity of detecting mutations present at below 1% allele frequency in a genetically heterogeneous sample. The enriched DNA fragments were amplified by followed PCR by deep paired-end sequencing using Illumina (Illumina, San Diego, CA, USA) Next-Seq 550 platform. A total of 32 HeH and 30 B-other samples have now been analysed.



RNA-Sequencing

We have standardized a workflow for whole transcriptome sequencing approach using Next-Seq 550 to identify the geneexpression signatures and novel fusion transcripts in these patients. TruSeq stranded Total RNA library prep kit (Illumina) was used for whole-transcriptome library preparation. Paired-end sequencing was performed using the Illumina Next-seq 550 platform with 75– or 150- bp reads. We are supported by our in-house bioinformatics team as well as the TCS LifeSciences for developing bioinformatics pipeline to analyze the high-throughput omics data. The future goal is to integrate the RNA-Seq data with mutations and copy number variations to predict the significantly altered pathways in Indian ALL patients.





Dr.Anindyajit Banerjee Post-Doc Fellow



Sangramjit Basu Bioinformatics Technologist



Amit Saxena Head, TCS Genomics Initiative



Computational Biology

Computational biology at TTCRC is a collaboration between TCS and TTCRC. This is facilitated by a dedicated server link between TCS, Noida and TTCRC Kolkata. In 2018, we set up the server facility in close association with the IT group at Tata Medical Centre.

Targeted Exome Sequencing

The analysis workflow for Targeted Exome Sequencing has been standardised. This includes correcting mapping fragment reads around indel locations followed by variant calling from multiple tools like SureCall, MuTect2, HaplotypeCaller, VarScan2 and Vardict. The process of variant calling in hyperdiploidy population can be problematical due to inconsistent zygosity and contributions from sub-clonal population. To this end we examined each of the putative mutations in Integrated Genomic Viewer (IGV).

RNA Sequencing

The RNASeq pipeline consists of both direct transcript quantification and quantification of transcript through genomic locus expression following transcript match. The genomic method is mediated by New Tuxedo pipeline wherein the mapping to genome is done using Hisat2 and the transcript assembly and quantification is done using StringTie2 and the Differential Gene Expression is done using BallGown/DESeq2 or optionally using FPKM values using in-house scripts. The direct quantification method is done using Salmon/Kallisto. Though these methods are quick and useful for known transcript quantification, these are not very dependable for novel gene or splice variant detection/quantification and that is where the Tuxedo pipeline is valuable.

The RNASeq data is being used to call the variants in the mutations called from TES genomics data. The bioinformatics team have also used data from SRA NCBI archive to exercise and establish workflow to carry out analysis of ChIP-seq and Methylation-Seq data. The team have also established pipelines to work with genomic data produced from Nanopore MinION platform which will primarily be useful for the detecting genic rearrangement for MRD detection group and for detecting Fusion-transcripts with high confidence.

High Throughput Microscopy and Proteomics

Currently data is being generated by a high throughput microscopy system which requires the development of analytical tools. A Absciex QTRAP is to generate SWATH data for correlation with RNAseq.





TCS @ TTCRC

Amit Saxena Head, TCS Genomics Lab



Anju Goel Program Manager, TCS Life Sciences





Divya Narayan Program Manager, TCS Life Sciences TCS is contributing to accelerate research initiatives by deploying platform and solutions for Translational Research. The Translational Research Platform allows for collecting and integrating clinical research data , molecular data , patient Electronic Medical Records (EMR) followed by cataloguing of data and creation of research database. The platform further has functionality to capture research hypothesis and generate hypothesis based patient cohorts . Specific concepts extracted from the research database can be used for exploratory analysis and visualisation or pattern mining and analytics for validating any scientific hypotheses.

TCS has also provided support to enable necessary IT infrastructure including server configuration for genomic data processing, platform deployment and a 50Mbps ILL link to its Noida center.

Core functionalities of the Translational Research Platform include integration of clinical and molecular data into a patient research database, hypothesis management and discovery analytics using features of natural language processing (NLP) and machine learning. The platform integrates molecular data from genome sequencing with phenotype and clinical information from EMR and clinical trials.

Functionalities and solutions implemented as components of Translational Research Platform:

- 1. Data Ingestion System developed and deployed to extract data from electronic medical records in TMC's HMS system and upload into the research database as per the needs of clinicians / researchers.
- **2. HMS mirror** setup for TTCRC to facilitate clinical data extraction from HMS
- 3. i2b2*: Implementation of open source i2b2 so that data extracted from EMR is integrated into i2b2 and is available for query through i2b2 web client and workbench. I2b2 is used for patient cohort creation, where queries can be performed on patient clinical and molecular data together as well download data necessary for proving a hypothesis.

 NLP based extraction implemented using cTAKES[™]. Extract information from unstructured data sources like reports and doctors notes e.g. FISH, Karyotype, Immunophenotype, Ultrasound and Chest X-Ray reports, Examination and Advice texts.



5. Kibana: Stack of ELK* (Elasticsearch, Logstash, Kibana) implemented for visualization and analysis of extracted patient cohorts / concepts. Kibana has been used for visualization of integrated clinical and molecular data as well.

6. Data Driven Discovery – One touch Analytics Platform within TRP: Module catering to data analytics needs of researchers integrated within TRP to work in both Hypothesis driven as well as Data Driven modes.

🔕 Genomics Lab					Q Search Ge	Q Search Genomics Lab	
							Help v atul s2 v
TCS Translational Research Pla	atform						Validate Hypothesis
Hypothesis	For ALL patients - chance	s to be able to pred •					
Cohort	ALLPatients_DataSet						
Clinical File	MRDfromOtherDetails.csv &Download file for offline analysis						
Adhoc Data Visualization	Statistical Analysis	Add Results	Back		TRP Menu		
Choose from the tools below							
	Data Correlation	Classification Model	Predict Class	RStudio	Jupyter		

7. LIMS: Deployment of Equipment & Consumables Inventory Modules. Complete details of Equipment Demos, Installation,

Calibration, SOPs, Routine Maintenance, Equipment Breakdown, Incident management, Equipment Repair and Equipment AMC details, etc. can be maintained and referred to as per need.

Dashboard showing status of various pending/ongoing activities is made available. Project wise Consumable

requirements and usage can be maintained. Stock of all lab consumables can be maintained and reports indicating levels below minimum stock required can be generated for critical items.

le LIMS	Welcome Page Equipment Consumables Project Management
Laboratory Information Management System. Image: Constraint of the system of	This Lab Inventory System is developed for Equipments and Consumables Inventory Management. Core Functionalities- • Equipment • Inventory • Maintenance • Consumables • Inventory • Ordering • Project Management • Project and Experiment • Budget & Expenses

- 8. Patient Cohort Creation: Capability allows scientific users to mine clinical findings from EMR and other real world data sources to extract patient cohorts for hypothesis testing. Also, allows for cohort creation based on molecular data along with clinical data.
- 9. Search & Visualization: Allows for scientific community and relevant stakeholders to perform enterprise search on raw, curated and analytical assets (includes data and metadata) and create adhoc visualizations for better insights.
- 10. **Discovery Analytics:** This includes analyzing extracted datasets using functionalities of basic and advanced statistical modeling, predictive analytics and exploratory analysis with tools like R (R Studio and EZR) & Jupyter.

- 11. Clinical Trial Management : For clinical trial management TCS has deployed IDM platform for ICiCLE trial where TCS IDM 3.0 is being used at 5 centers and ~ 1000 patients enrolled currently in existing trial. Some of the features of IDM include :
 - a. Complex eCRF's and edit checks
 - b. Block level randomisation
 - c. Dashboards for site level and all India coordinator level with enhanced user requested reports.
 - d. JIRA tool implementation done for better monitoring and faster ticket resolution.
 - e. Separate Platform Support team for L1 / L2 ticket resolution.
 - f. Development activity of TCS IDM4.0 platform for new trial development on relapsed ALL

patients is completed and UAT is in progress.

Some of the ongoing projects where components of TRP have been used include hypothesis related to HD MTX Infusion Episodes Management, extraction of drug dosages for improvement in ALL maintenance therapy, Project on Gall Bladder Cancer, Hypothesis related to Effect of Weight Gain on the outcome of treatment for ALL patients etc.

* i2b2 (Informatics for Integrating Biology and the Bedside, <u>http://www.i2b2.org</u>)

* ELK : Open source Elasticsearch, Kibana and Logstash

etc.



India Alliance Wellcome-DBT Fellows

Dr Arunabha Chakrabarti IA Early Career Fellow (2016)



Dr Pritha Paul IA Early Career Fellow (2017)



Dr Jasmeet Sidhu Clinical Research Fellow IA Early Career Fellow (2018)

We are delighted to host Wellcome DBT India Alliance Early Career Fellows in three consecutive years.

Dr Arunabha Chakrabarti (2016) is presently at the CRUK-MI facility at the University of Manchester from June 2018 for one year. Here, he is developing leukaemia cell lines with different Ikaros status (wild type IK1 and isoforms IK6 carrying deletion of exon 4-7) by using CRISPR-CAS9 based sgRNA for *IKZF1* for knock down Ikaros in leukaemia cells and introducing the isoforms of interest in those cell lines. He will also perform experiments on the Sciex 6600 Mass

Spectrometer in Prof. Anthony D. Whetton's lab at the University of Manchester, where he will earn to run and analyse SWATH proteomics. His research focus is to understand the differential proteogenomics characterisation of Ikaros altered BCP-ALL subtypes and their response to therapy.

Dr Pritha Paul (2017) is working on *TP53* alterations, present in about 2-3% of children with acute lymphoblastic leukaemia (ALL) at initial diagnosis, but increases to ~13-15% at relapse and have been identified as the most significant sub-clonal mutation associated with recurrent therapeutic failure in ALL. These patients most often relapse early ontherapy. Another group of patients with

similar clinical phenotype of early relapses, despite wild-type TP53, supports the hypothesis that common aberrant signalling pathways regulated either epigenetically in TP53 wild-type or by gain-of-function in TP53 altered ALL cells have an unexplored role in therapeutic failure addition, recent publications have offered insights into how the microenvironment influences cancer cell behaviour and in turn is influenced by the cancer cells to create a favourable niche. She will be travelling to CRUK-MI in Manchester in March 2019, to work with Dr Patricia Muller.



 Chemosensitive bulk tumour
Chemoresistant redox adapted cells (Liu, Saha et al., 2015)
Reprogrammed BMSCs demonstrated altered mitochondrial metabolism (Johnson, Saha et al., 2016)

 Chemoresistant redox adapted cells survive as minimal residual disease (MRD) MRD cells are quiescent, have stem cell-like properties (Ebinger, Jeremias et al., 2016) Oysregulated p53 signaling in MRD cells

 Dysregulated p53 signaling cooperates with additional subclonal mutations
Altered glucose metabolism and mitochondrial respiration supports cell survival
Relapsed tumour is a composite of chemo-sensitive and resistant cells

Dr Jasmeet Sidhu (2018) has been awarded with an early career fellowship last year and concentrating to start her research work as per proposal. Initially she was a Post-Doctoral Fellow in Cell Biology Team. Her research interest includes optimisation of L Asparaginase (Asnase) used in treating childhood ALL and identifying alternative induction agents in genetic subgroups prevalent in Indian children.





Dr Anindita Dutta Administrative Lead



Avisek Banerjee Post-Doc Fellow Metabolism



Dr Arunima Maiti Research Assistant Tumour stroma



Jaydeep Das Research Assistant Metabolism



Priyanka Bose Research Assistant Therapeutic response

Cell Biology Laboratory

Cell Biology facilities have been developed at TTCRC from April 2018. We have a dedicated tissue culture facility, organoid laboratory and high throughput fluorescent microscopy. Facilities for cell transduction will be developed in 2019. To complement genomics, a high throughput mass spectrometer has been installed. Our work is focused on the interactions within the tumour microenvironment.



Organoid Culture



We are developing primary tissue organoids from patients, starting with ovarian and gall bladder cancer. We intend to generate both tumour organoids as well as tumour-on-chip for phenotypic drug discovery. We are working with collaborators at IIT-Mumbai and the University of Manchester to develop biomimetic substrates and microfluidic systems to support organoid development.

Extracellular Vesicles

Our previous work has demonstrated that a variety of extracellular vesicles are exchanged between stroma and tumour cells within the leukaemic microenvironment. We have developed processes to isolate extracellular vesicles from cell culture and body fluids. Characterisation has confirmed release of exosomes by released cancer cells (Figure 1). We have observed that exchange of extracellular vesicles between tumour Stroma interaction in ovarian cancer (Figure 2 & 3). We are investigating the effect of vesical exchange in disease progression and therapeutic response.

Metabolism

In ALL we are investigating the functional aspects of mutations and copy number alterations, identified by the genomics team as present in high risk patients. We hypothesise that the metabolic changes that occur as a result of these genetic aberrations and leads/cause variations in therapeutic response.

Phenotypic Drug Assay

A phenotypic drug discovery system has been set up using a high throughput microscope (Figure 4). This is system is being developed both for direct drug assay as well as for studying the behaviour of cells within their microenvironment.



Figure 1: *Characterisation of cancer cell derived extracellular vesicles*. Exosomes were isolated from ovarian cancer cell, SKOV3, cultured either in exosome free FBS (complete media) or serum starved media. Following lysis of both SKOV3 cells and its secreted exosomes at indicated conditions, cell extracts were analysed by Western blot with antibodies against GM130, Cytochrome (Cyt) p450 (as negative controls for exosome lysates) and other indicated antibodies to check enrichment of targeted proteins within the released exosomes corresponding to the cell lysates.



Figure 2: *Vesicles released from ovarian cancer cell line Kuramochi are taken up by normal mesothelial cells (Met5A)*. Kuramochi cells cultured in exosome free FBS were labelled with PKH-red fluorescent dye (Red). Vesicle containing conditioned media (CM) at indicated conditions from cancer cells were collected at 72 hours and incubated with Met5A (Green) cells for indicated time points. Fluorescence



Peritoneal mesothelial cells Met5A

Figure 3: *internalisation of cancer cell derived vesicles by stromal* cell. Vesicles released from ovarian cancer cell line, SKOV3, are taken up by normal mesothelial cells (Met5A). SKOV3 cells cultured in exosome free FBS were labelled with PKH-red fluorescent dye (Red). Conditioned media (CM) containing extracellular vesicles from cancer cells are fed to mesothelial stromal cells. Internalisation of vesicles (Red) by stromal cells (Green) are observed after 24 hr.



Primary ascites culture from patients with high-grade serous ovarian cancer

Figure 4: *Phenotypic drug assay in patient derived ascitic fluid culture*. Primary cells from patient with high-grade serous ovarian cancer were treated with indicated doses of cisplatin for 72 hours. Total nuclei were quantified using high-throughput fluorescence image analyser (ImageXpress). In parallel plates, anti-proliferative effect of cisplatin was measured by metabolic assay (top). Representative images of control and cisplatin treated cells are shown (bottom).



Head & Neck Cancer

Dr. Ruma Dey Ghosh DHR Woman Scientist



Akash Bararia Biobank Technician

Our research interest is focused on translational research for patient benefit. We are working around the development of biomarkers for oral cancer that will make diagnosis more precise, offer tailored therapy, and reduce the burden of over treatment and improve outcome. Currently I am working on oral squamous cell carcinoma (OSCC) to understand the clinical impact of different non-coding RNAs in different stages of cancers specifically, initiation, progression, and metastasis. We are trying to explore their regulatory effect on stem cell biology and drug resistance mechanisms which ultimately result differential prognostic outcome.

Oral cancer is the leading cause of cancerrelated death in Indian male population. OSCC develops from epithelial lining of the mucosal surfaces of the oral cavity. Surgery first-line of treatment, is whereas radiotherapy and chemotherapy are used as adjuvant therapies in OSCC. Still the detection and prediction of disease-risk is not an easy thing and post-operative treatment strategies are determined mainly on the basis of histopathology report and tumour-staging. If fails, the general time to recurrence is within 24 months after treatment. Currently, there is no molecular biomarker for the prediction of OSCC-patient's risk (failure: recurrence and metastasis) analysis.

Our prediction is that the changes in the molecular-profile of malignant-tissues could produce a common detectable/testable molecular-profile in blood and other body fluids. Therefore, altered level of these analysts in circulation could be used as molecular-biomarker to predict patients-prognosis in OSCC. It will help clinicians to provide high efficiency treatment-strategies for OSCC.

As miRNA are known to be very stablemolecule in circulation, we are exploring the idea that the tumour-associated cellfree miRNAs from peripheral blood plasma will allow us to predict OSCC patient prognosis at diagnosis. In our current investigation we are aiming to develop new miRNA biomarkers by analysing a patient cohort for the detection of disease risk with accurate subcategorization at diagnosis to provide appropriate treatment for OSCC patients. Subsequently, we are also trying to understand the miRNA mediated molecular pathways which may involve in the OSCC-prognostication.



Dr Asima Mukhopadhyay Senior Consultant and Academic Lead in Gynaecological Oncology IA Fellow (2018)

Gynaecological Oncology

The key areas of clinical and lab research include: I. Establishing cytoreductive surgical services in ovarian cancer in low resource settings (optimizing surgical tools/techniques and quality assurance) ii. Therapeutic applications and of homologous recombination (HR)/BRCAness in Gynaecological Cancers. Her previous research led to a discovery that 50% of epithelial ovarian cancers are HR deficient and respond to PARP inhibitors; she is a contributor to the Newcastle Drug development and Discovery team that has led to FDA approval of the PARP inhibitor currently known as Rucaparib. Her current work at TTCRC and at Newcastle University focuses on generation of 2D and 3D primary culture models in ovarian and cervical cancers. estimation of functional homologous recombination status in

primary culture models, study of tumourinteraction/intra/extra-cellular stromal micro-environmental differences in HR stratified tumours and developing therapeutic targets/ tailored surgical approaches in HR stratified cancers. Her research group in TMC/TTCRC currently has 34 members (clinical and lab research) and is working on the PROVAT (project ovarian translational) group of studies (PI) in ovarian cancer and SyMEC (Systems Medicine Cluster) project (Co-I) in cervical cancer. She is the founder of the Kolkata Gynaecological Oncology Trials and Research Group Translational which focuses on development and conduct of regional academic clinical trials/ studies and participation in major International collaborative group trials.









Dr. Susri Ray Chaudhuri Administrator Operations



Sukanya Guha Administrative Assistant

Administration

This year had been a very rich learning experience for me as part of the administrative team that provides the necessary infrastructure and services to facilitate the running of the Institute. It involves coordinating and planning very closely with the departments of Finance, Purchase, IT, Estates, Logistics, Health & safety and HR. The responsibility also includes involvement in all aspects of administration, communication and act as the primary point of operational contact within the Institute for both TTCRC and TMC.

Scientific Operations and General Administration

The office provides administrative support to the Director in order to facilitate the day-today running of the Institute. The team is also responsible for producing a variety of scientific communications for the Institute including TTCRC, TCS and Margdarshi Annual Reports.

In addition, the department has assisted the organisation for several events over the course of the year, including the successful Annual Review of the Institute on December 2018. Administrative support is provided for the internal seminar series called Radium, which has continued to be a great success in 2014-2018, hosting around one seminar per week. The seminars serve to foster collaboration and encourage positive interaction within the wider scientific community. We aim to provide a platform for a wide spectrum of national and international speakers deliberating unique aspects of their scientific research.

The administration team is responsible for planning, coordinating and implementing

the entire infrastructure of the LDU-TTCRC unit and make the new office and lab setup operational on the year 2018. It involves rigorous engagement with multiple vendors and suppliers, coordinating the logistics, setting and monitoring of the deadlines, managing the occasional slip-ups and facilitating a state of art infrastructure.

Finance

The administration team carries the responsibility of coordinating with the finance in preparation and placing the budget on the table of the Director. It involves management of funds from the various sources and in ensuring that the funds are purposefully utilised. The team supports the research groups by providing effective and efficient professional advice when preparing the financial viability of new research proposals and contracts.

Human Resources

Over the past year, the administrative team has successfully coordinated with the HR department to deliver a high quality proactive service to the Institute and its staff. The admin team has provided the relevant information to the staff on all employment related matters advice and guidance to managers and staff on all employmentrelated matters such as recruitment, policy guidance, and best practice methods in concurrence with the HR department.

During 2017-18, 14 individuals were interviewed and appointed to facilitate the work of the Institute. Also, the smart

objective based appraisal of the TTCRC staff were organised and implemented this year.

The transport network for the staff working late for Biobank sample processing and for the invited speakers were also organised in coordination with the HR department.

Information Technology

The administration team has worked in tandem with the IT team in providing a full catalogue of IT services based on which our researchers depend for most aspects of their work. In 2018 we have introduced our new storage solution and server facility.

Logistics (store)

This year the admin team along with the TMC logistics team had to deal with new challenges including the relocation of the team to the LDU-TTCRC Building. In the later part of the year we were able to establish small stores in the TTCRC building to deliver an efficient and effective service providing support for the research carried out. This includes the ordering, PO generation, indenting, issue acceptance and stock maintenance. We continue to make savings by procuring in bulk from suppliers and achieving the economies of scale and thereby guaranteeing a stable stock.



External Radium Speakers and Visits

The internal seminar series called Radium which take place on every Wednesday at 8.30am is a bridge between the TTCRC researchers, clinicians and national and international researchers working in the field of cancer biology. We have enjoyed the scientific interaction throughout the year and with an excellent set of internationally renowned speakers visiting the Institute. Following are the details of Invited speakers in the year (2017-2018).

1. Dr. Asit Manna (National Cancer Institute, NIH, USA)

Multi protein complexes involved in TCRmediated signalling: composition & cooperativity

4th Oct 2017

 Dr Santasree Banerjee (Dept of Human Medical Genetics, R & D Group, Beijing Genomic Institute, China)

Next Generation Sequencing & Cancer

11th Oct 2017

 Dr Debabrata Biswas (Wellcome-DBT Intermediate Fellow, Priniciple Scientist, IICB Kolkata)

Mechanistic understanding of role of MLL-Fusion and Fusion partner protein in Transcriptional regulation leukemogenesis.

18th Oct 2017

4. Dr Sandip Paul (Structural Biology & Bioinformatics Division, IICB,Kolkata)

Adaptive Evolution in Human Microbiome

13th Dec 2017

5. Dr Dipanjan Choudhury (Harvard School, Dana Farber Cancer Institute) Micro RNA in Cancer Biology

20th Dec 2017

 Dr Sounak Bakshi (Dept of Cell & Molecular Biology, Karolinska Institute, Stockholm, Sweden)

Alpha-Synuclein Moduletes Retinel Iron Homeostasis by RPE

17th Jan 2018

7. Prof Nicola Curtin (Newcastle University, UK)

Exploiting DNA Damage Response in Gynaecological Cancers

31st Jan 2018

 Dr Kaushik Biswas (Associate Prof, Division of Molecular Medicine, Bose Institute,Kolkata)

Understanding The Role of ganglioside Gm2 in Tumorigenesis

7th Mar 2018

9. Dr Kaustabh Kumar Maity (CSIR-NIIST, Trivandrum)

Emerging Trends in Diagnostic & Theraputic Molecular & Nano Carrier Probes for Cancer Management

11th Apr 2018

10. Dr Saikat Chakrabarti (Indian Institute of Chemical Biology, Kolkata)

Analysis of Bio-Molecular Interactions: An Integrative Approach

25th Jul 2018

11. Dr Partha Sarathi Choudhury (Kyoto University)

Fighting cancer by unleashing

1st Aug 2018

12. Dr Sagar Sengupta (NII New Delhi)

Usage of Multiple Mechanisms to Maintain Genome Stability 31st Oct 2018

13. Dr Amit Dutt (Scientist F, ACTREC, Mumbai)

Translating Cancer Genomics to Medicine in Gall Bladder and Lung Cancer

19th Dec 2018



Visit by University of Oxford Jan 2018



April 2018



Visit by Dr Sagar Sengupta & Prof. Nicola Curtin, Oct 2018



Annual Review Dinner TTCRC, Dec 2018



Visit by Dr Rob Wynn, Nov 2018



Visit by Team of scientists from University of Manchester, Dec 2017

TTCRC – Tata Medical Centre

Publications - TTCRC

1. Catriona Parker, **Shekhar Krishnan**, Lina Hamadeh, Julie A E Irving, Roland P Kuiper, Tamas Révész, Peter Hoogerbrugge, Jeremy Hancock, Rosemary Sutton, Anthony V Moorman, **Vaskar Saha**. Outcomes of patients with childhood B-cell precursor acute lymphoblastic leukaemia with late bone marrow relapses: long-term follow-up of the ALLR3 open-label randomised trial. **Lancet Haematol. 2019** Feb 27; S2352-3026(19)30003-1

2. Biondi A, Gandemer V, De Lorenzo P, Cario G, Campbell M, Castor A, Pieters R, Baruchel A, Vora A, Leoni V, Stary J, Escherich G, Li CK, Cazzaniga G, Cave H, Bradtke J, Conter V, **Saha V**, Schrappe M, Grazia Valsecchi M. Imatinib treatment of paediatric Philadelphia chromosomepositive acute lymphoblastic leukaemia (EsPhALL2010): a prospective, intergroup, open-label, single-arm clinical trial. **Lancet Haematol. 2018**;5(12): e641-e52.

3. **Mukhopadhyay A**, Drew Y, Matheson E, Salehan M, Gentles L, Pachter J, Curtin N. Evaluating the potential of kinase inhibitors to suppress DNA repair and sensitise ovarian cancer cells to PARP inhibitors. **Biochemical Pharmacology. 2018** https://doi.org/10.1016/j.bcp.2018.10.011

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TTCRC - The Organizational Structure



(IV) Histopathology

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Research Support Directorate: Project Checklist

Name of the project			
Principal Investigator			
Mobile:	Extension:	Email:	
Co-Investigators:			
Departments involved			
Duration of the project in years/months:	Start date:	End date:	
Human Resources required			
New staff:	Existing staff:	New workstation if required for staff:	
Laboratory space required			
To use existing lab space: Yes/No	Lab Department:	Need additional Lab space:	
Office space required			
To use existing office space: Yes/No	Space name:	Need additional Office space:	
Clinical space required			
To use existing clinical space: Yes/No	Space name: OPD/ward/OT/BMT	Need additional Clinical space:	
Storage Facility Required			
Cold storage required: Yes/No	Document storage required: Yes/No	Bio-Banking required: Yes/No	
Dry storage required: Yes/No	Equipment storage required: Yes/No	Offsite storage required: Yes/No	
Medical Equipment required (Clinical)			
To use existing Medical Equipment: Yes/No	Need additional Medical Equipment: Yes/No	Name of equipment:	
Medical Equipment required (Diagnostic Laboratory)			
To use existing Diagnostic Lab Equipment: Yes/No	Need additional Diagnostic Lab Equipment: Yes/No	Name of Lab equipment:	
Medical Equipment required (Diagnostic Imaging)			
To use existing Diagnostic Imaging Equipment: Yes/No	Need additional Diagnostic Imaging Equipment: Yes/No	Name of equipment:	
Medical Equipment required (Research Laboratory)			
To use existing Research Lab Equipment: Yes/No	Need additional Research Lab Equipment: Yes/No	Name of Research Lab equipment:	

RSD checklist; Version 2; 17th September 2018;

Information Technology requirement			
Desktop: existing/additional	Printer: existing/additional	Storage Space (bytes): Gigabyte/Terabyte	
Software: existing/additional	Scanner: existing/additional	Photocopier: existing/additional	
Finance Department (Bookkeeping and Audit Support) requirement			
Total project budget:	Number of audited financial reports required per year:	External audit requirement: Yes/No	
Funding agency			
Number of projects currently being handed by the PI: (details)			
Any other information you would like to add:			
Date:	Signature:	Date within which you would prefer to receive a feedback:	

Please Email to: rsd@tmckolkata.com; Note: attach additional sheet if required