OUR VISION

Our vision is that no human being, without any social or economic divide, should undergo suffering because of any cancer disease; either he / she should not develop a cancer at all or, even if he / she develops, with appropriate treatment, should be able to lead the remaining part of his / her life in good quality and to the normal duration.

OUR MISSION

To provide state of art treatment to any cancer patient irrespective of his / her social or economic status.

To carry out clinical, applied and fundamental research on all aspects of malignancy and its allied diseases including causation, course, prevention, detection, diagnosis, treatment and rehabilitation.

To spread out the knowledge on all aspects of cancer to medical, para-medical as well as general communities.

To concentrate on the preventive aspects of cancer in order to significantly reduce, if not totally eliminate, the incidence of cancer.

To establish tumor registries, both hospital and population based, to further the study of cancer and allied diseases.
Dr. Mrs. MUTHULAKSHMI REDDY
Our Founder

Dr. S. KRISHNAMURTHI (1919-2010)
Adviser – Research and Planning
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<tr>
<td>Dr. V. Shanta</td>
<td>Chairman</td>
<td>Cancer Institute (WIA), Adyar, Chennai – 600020</td>
</tr>
<tr>
<td>Hon. Justice P.R. Gokulakrishnan</td>
<td>Member</td>
<td>No.7, Anna Avenue, Bhaktavatsalam Nagar (Extn), Adyar, Chennai - 600020</td>
</tr>
<tr>
<td>Shri. R. Seshasayee</td>
<td>Vice Chairman</td>
<td>Chairman, Infosys Limited, Hardy Towers,, 3rd &amp; 4th Floors, TRIL Infopark Limited Rajiv Gandhi Salai (OMR), Tharamani, Chennai - 600113</td>
</tr>
<tr>
<td>Dr. R. Swaminathan, IAS</td>
<td>Member</td>
<td>Former Secretary, Asian Development Bank, T-84, 1st Floor, 29th Cross Street Besant Nagar, Chennai – 600090</td>
</tr>
<tr>
<td>Shri N. Sugal Chand Jain</td>
<td>Member</td>
<td>Slyat House, 4th Floor, 961, Poonamallee High Road, Chennai – 600084</td>
</tr>
<tr>
<td>Shri. T. Shankar</td>
<td>Member</td>
<td>Chief Executive Officer, Management Solutions Prasad Chambers, 169, Peters Road, Royapettah, Chennai – 600014</td>
</tr>
<tr>
<td>Shri M.A. Alagappan</td>
<td>Member</td>
<td>Adviser, Murugappa Group, 10, Chittaranjan Road, Teynampet, Chennai – 600018</td>
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<td>Mr. Ram Santhanam</td>
<td>Member</td>
<td>Chairman, Wheels India Limited, Chennai - Tiruvallur High Road, Padi, Chennai – 600050</td>
</tr>
<tr>
<td>Mrs. Mallika Srinivasan</td>
<td>Member</td>
<td>Chairman, Tractors &amp; Farms Equipments Limited (TAFE) 77, Nungambakkam High Road, Chennai – 600034</td>
</tr>
<tr>
<td>Shri M.K. Jain</td>
<td>Member</td>
<td>Managing Director, Asia(Chennai) Engg Company Pvt. Ltd. No.2, 1st Floor, Golden Bridge, Wheat Crofts Road, Nungambakkam, Chennai – 600034</td>
</tr>
<tr>
<td>Dr.A.V.Lakshmanan</td>
<td>Secretary</td>
<td>Adviser II, Cancer Institute (WIA), Adyar, Chennai – 600020</td>
</tr>
<tr>
<td>Ms. V. Susheela</td>
<td>Member</td>
<td>Member Secretary, Finance Board, Cancer Institute (WIA), Adyar, Chennai – 600020</td>
</tr>
<tr>
<td>Dr.E.Hemanth Raj</td>
<td>Member</td>
<td>Executive Vice Chairman, Cancer Institute (WIA), Adyar, Chennai – 600020</td>
</tr>
<tr>
<td>Dr.T.G.Sagar</td>
<td>Member</td>
<td>Director, Cancer Institute (WIA), Adyar, Chennai – 600020</td>
</tr>
<tr>
<td>Dr.A.Vasanthan</td>
<td>Member</td>
<td>Director (Admin) &amp; Dean, Cancer Institute (WIA), Adyar, Chennai – 600020</td>
</tr>
<tr>
<td>Addl Secretary &amp; Financial Adviser</td>
<td>Member</td>
<td>Govt. of India, Ministry of Health &amp; Family Welfare, Nirman Bhawan, New Delhi – 110011</td>
</tr>
<tr>
<td>Director of Medical Education</td>
<td>Member</td>
<td>Directorate of Medical Education, Govt.of Tamil Nadu, 162, Poonamallee High Road, Chennai – 600010</td>
</tr>
<tr>
<td>Dr.T.Ramasami</td>
<td>Member</td>
<td>Former Secretary, Department of Science and Technology B-5, Lake View Road, IIT Staff Quarters, Adyar, Chennai – 600036</td>
</tr>
<tr>
<td>Dr. Sowmya Swaminathan</td>
<td>Member</td>
<td>Director General, Indian Council of Medical Research, P.O.Box 4911, Ansari Nagar, New Delhi – 110029</td>
</tr>
</tbody>
</table>

M/s.R.Janakiraman & Co. Approved Auditors
Chairman : Dr. V. Shanta, M.D., D.G.O., FAMS, D.Sc
Adviser II : Dr. A.V. Lakshmanan, M.A., M.Sc., Ph.D (UK)
Member Secretary, Finance Board : Ms. V. Susheela
Executive Vice Chairman (D) : Dr. E. Hemanth Raj, M.S., M.Ch., Ph.D
Director : Dr. T.G. Sagar, M.D., D.M.
Director & Dean (Admn.) : Dr. A. Vasanthan, M.D., D.M.R.T.
Addl. Director : Dr. Selvaluxmy, MD, DMRT
Asst. Director : Dr. R. Swaminathan, M.Sc., Ph.D (Statistics, Epidemiology)

NURSING ADMINISTRATION
Matron
Ms. C.N. Janaki, Dip. in Nursing
Ms. Renuka Devi, Dip. in Nursing
Ms. Gana Sundari, Dip. in Nursing

Nursing Supervisor
Ms Sathyabala, B.Sc. Nursing

Nursing Tutor
Ms. Priya Kumari
Ms. R. Gnana Sundari

Accounts
General Manager – Finance & Accounts
Mr. Narasimhan, BBA, LLB, ACA, ACS

Senior Accountant
Ms. Srividhya Shankar, B.Com., AIICWAI

Assistant
Mrs. Parameswari, M.Com.
Ms. Vidhya A, M.Com.
Ms. Thahirunnissa, M.Com.
Mr. S. Balamurugan, B.Com.
Mr. M.A. Gokulnath, B.Sc., MCA

Typist
Mr. A. Gowthaman, B.A.

Clinical Research Associate
Mr. P.C. Reddy, B.Pharm., M.Tech., MHRM
Mr. N. Kannan, M.Sc, M.Phil

Dr. S.K. Campus
Senior Assistant
Mrs. Padma Subramoney, B.A., BLIS

Assistant
Ms. Maharani, +2
Ms. Aruna, B.Sc.
Ms. Uma Maheswari, B.Com.
Ms. R.V. Chitra, B.A.
Ms. Kalaimayil, M.Com.
Ms. D. Srilekha, B.Com., DCP
Ms. Suganthi Meenakshi, SSLC
Ms. Remani Mahendran, SSLC
Ms. B.V. Srividiya, MBA
Ms. Malarmathi, MBA
Mr. Maria Kulothungan, M.Sc.

General Administration
General Manager - Operations
Mr. G. Rajasegharan, Bachelor Degree in Rehabilitation, MBA (Hosp.Mgmt.)

Consultant - HR
Mr. G. Sasikaran, MA (HR)
General Manager – Patient Care
Mr. R. Rajasekhar, Exe.MBA
NABH – Asst. Coordinator
Ms. Sruvita Dash, MBA (HR&Mktg)
Spl. Secretary to Chairman
Mr. R. Dhanasekaran, B.A.
Secretary to Chairman
Ms. G. Priya, B.Com.
Ms. A.K. Shanthi, B.A.
Finance
Member Secretary – Finance Board
Ms. V. Susheela

Senior Assistant
Mrs. R. Shanthi, D.Com.

Assistant
Mrs. M. Bharathi, B.Com.

Telephone Operator
Mrs. R. Vedham, SSLC
Ms. S. Rosaline Mary, HSC
Ms. Mary Sylvia, B.A.
Ms. N.V. Varalakshmi, B.Com.
Ms. J. Ramya, B.Com.
Ms. Shoba, B.A.
Pharmacy
Chief Pharmacist
Ms. M. Padmavathi, D.Pharm

Pharmacist
Ms. M.A. Gayathri, D.Pharm
Ms. A.R. Valarmathi, B.Pharm
Ms. T. Lakshmi, D.Pharm
Ms. J. Muthulakshmi, B.Pharm
Ms. P. Rajalakshmi, B.Pharm
Ms. T. Rupavathi, D.Pharm

Dietician
Dr. Parvathy, M.Phil, Ph.D
Ms. Santhana Lakshmi, B.Sc.
Ms. M. Priya, M.Sc.

Supervisor
Ms. Jothimani M
Mr. Kurungudi Alwar
Ms. Nalini S, B.Com.
Ms. Nirmala
Ms. Malathi
Ms. Adhilaakshmi
P.A. To Chairman, SOG
Ms. S. Sasikala, BCA, MBA
Project - Jivdaya (Pediatric Oncology)
Medical Social Worker
Ms. S. Nandhini, M.Sc

Dietician
Ms. K.S. Sheena, M.Sc

Office Co-ordinator
Mr. V. Sundaram, B.A.

Steno Typist
Mr. V. Krishnakumar, +2

Hospital
Doctors
Scientific Asst.
Consultants
Students
Nurses
Technician
Drivers
Electrical Staff
Dietetics Staff
Other Staff

Research & Development
Consultant
Scientist
Scientific Assistant
ICMR – PBCR Staff
ICMR – HBCR Staff

Electrical
Electrical Engineer
Mr. P. Namachivayam, DEEE, B.E.(IT)
“C” License

Asst. Electrical Engineer
Mr. C. Mariappan, Dip. in E.E & B.E.
(EEE) “C” License

Civil Engineer - Maintenance
Mr. R. Kumaran, DCE
Mr. Thirunavukarasu
Bio-Medical Engineering
Biomedical Engineer
Mr. E. Venkatesan, M.E. (Applied
Electronics)
Ms. S. Vasantha Valli, B.E.(Biomedical Engineering)
Mr. Balan, DECE

Co-ordinator
Ms. Thamil Selvarani - GIPAP
Ms. Vanitha – MOG Transplant
Ms. S. Rekha Devi

Clinical Pharmacist
Ms. Akshaya Gowri, B.Pharm
Ms. Rohini Venkatesh, M.Sc
The Cancer Institute (WIA), Chennai was established more than 60 years ago by the Womens Indian Association Cancer Relief Fund under the leadership of Dr. Muthulakshmi Reddy, as a “Mission” to provide scientific treatment and promote health education amongst all sections of people. The ethos of the Cancer Institute (WIA) is “service to all” irrespective of social or economic class. It was established in the faith that selfless service would generate its own strength and funds would always be found. The Institute will not be confined to the four walls of a multi storey building but will strive to reach out to every nook & corner of the state. The Cancer Institute (WIA) shall aspire to be a symbol of man’s eternal quest to conquer disease and an inspiration that reaches out to humanity.

We thank all our donors for their generous support with whose help we continue to deliver quality service to our patients with the cutting edge technology and protocols on par with the world’s best.

IDBI has made a donation of Rs.1.0 core towards 1 floor of Day Care Building which consists of 4 floors – Clinical trial ward, General ward, Pediatric ward & Special ward.
L & T has financed and executed Construction of Nurses Hostel in Rashtrabathi Block (Male General Ward), 2nd & 3rd Floor to house 100 nurses.
Mahesh Memorial Trust are donating towards construction of 3rd floor Pediatric Block (MMT) for additional beds and consultants rooms etc increasing the in patient bed strength to 60.
M/s.Dymos Lear Automotive India Pvt. Ltd. subsidiary of Hyundai has donated Rs.50 lakhs towards the establishment of Fluorescence In Situ Hybridization (FISH) Laboratory in the Dept. of Oncopathology. Singhvi Charitable Trust has donated “ MAHAVEER ASHRAY” Palliative Care Centre, a unit of Cancer Institute (WIA) at Sriperumbudur with a 50 bedded facility at an estimated cost of Rs.25.0 crores and expected to be functional in July/August 2017.

The Institute made major strides in the year 2016 - 2017. The faculty, staff and students continue to bring laurels to the Institute, we congratulate every one of them. The Institute has comprehensive facilities for patient care, research both basic and clinical & teaching with teaching programmes in medical and para-medical courses both at the undergraduate and postgraduate levels are ever increasing. During the year, the faculty and the scientists of the institute published research papers in national and international journals, various departments organized conferences, workshops, CMEs, both national and international.

We have always been on the fore front on early detection, prevention of cancer and tobacco control, through out the year 2016 – 2017 we have been focusing on creating cancer prevention awareness. The Department of Preventive Oncology, launched the population based cancer screening project in Villupuram, targeting 1,04,000 women of age 30 - 59 years, for screening breast, cervix and oral cancers. This 5 year project is supported by Infosys Foundation. An independent cancer registration service in and around Villupuram district has been integrated with the program for unbiased evaluation of the success of the program. As a part of the Villupuram Screening Project, HPV-DNA testing is being offered as the primary screening test along with visual methods at the community level screening for the women aged 30 to 59 of Villupuram District. Cancer Institute is the first in India to launch this program on a community level. The highlight of this program is that the Health Workers
have been trained to run the HPV tests and interpret the results. Around 10595 women have been screened since February 2015, 9111 HPV samples have been tested out of which 42 pre-cancers and 6 cancers were detected.

Mammomobile project offers awareness and baseline screening for early detection & better diagnosis of breast cancer. All women of age 30 - 60 years are offered a baseline screening of breast with Clinical Breast Examination (CBE). Women who are above 40 years of age and who have any suspicious changes in the breast on CBE during primary screening are referred to the mobile imaging unit. USG breast and FNAC are done for any lump detected. If any cancer is detected during this process, the woman would be referred to the Cancer Institute. Awareness creation is again the major goal with monitors displaying messages being put up inside and outside of the bus. The project started in December 2016 in Villupuram Taluk and so far around 537 women have been screened with mobile mammogram.

With the Institute continuing its service above self over six decades, it is quite satisfying that we have always been able to deliver quality treatment affordable to all class of society without economic divide. We continue to march forward, not denying treatment to anyone for lack of resources.

The sudden and unexpected loss of the people’s Chief Minister of Tamil Nadu, Dr. Jayalalithaa is an irreparable loss not only to Tamil Nadu but to the Cancer Institute (WIA) also. She was a self made individual and a great leader. The strong hold that she had over the people of Tamil Nadu was phenomenal. She was charismatic beyond description. As an administrator, she was not only firm but took quick decisions, the only object being the interest of Tamil Nadu. Her welfare schemes for the under previledged will be remembered forever. Many other States have tried to replicate them. Former Chief Minister Jayalalithaa was indeed a unique personality. The Institute can never forget her contribution to the welfare of the Institute. She was the first and lone voice that broke the Government / Non – government divide which would not have been possible without her strong recommendation. Our deep gratitude to her for her benevolence.

We pray that her soul rest in peace.

A unique personality that was

Dr. J. Jayalalithaa
Former Chief Minister of Tamil Nadu
EVENTS

WORLD NO TOBACCO DAY – 31.05.2016

- The theme for the World No Tobacco Day (WNTD) - 2016 is “Get ready for plain packaging”. Cancer Institute (WIA) and Police Boys Club (HCLT) conducted awareness program on 31st May in 8 communities in Chennai: Issued IEC materials to all the shopkeepers and educated them about the Sections 4, 5, 6(a), 6(b) and 7 of COTPA act, importance of pictorial warning, ill effects of tobacco usage and second hand smoke.
- Cancer Institute (WIA), The Press Institute of India, and UNICEF Jointly organized a seminar for journalists on Tobacco Control on World No Tobacco Day 31.05.2016 at the Press Institute of India, Taramani, CPT.

ANNUAL REUNION DAY – 18.06.2016

- It is a celebration for those who have survived, a gathering of support for families and a special event for our patients, their families, care givers & staff to celebrate cancer survivorship. Reunion day provides an opportunity for all people living with a history of cancer to recognize those who have supported them along the way. Writer Mrs Sivasankari was the chief guest of the event. Cancer survivors paid rich tributes to the Institute & the staff. Several patients spoke about their battle with cancer and thanked all the doctors and staff who treated them. The doctors who spoke stressed that patients could lead normal lives after treatment, they usually dread entering cancer hospitals, the disease instills fear. But we want to convey this strong message, that “Cancer is Preventable and Curable”. Chairman Dr. Shanta added that awareness on cancer has increased among patients & survivors, “Our thrust is on quality of life, over 60% of patients continue to come in the late stages, we can cure 2 out of 3 cancer patients, but we are only curing 1 out of 3 now because they come in advanced stages.

REMEMBRANCE DAY 6th year after the passing away of our revered Advisor

Dr.S.Krishnamurthi – 02.07.2016

Dr.Krishnamurthi was virtually the creator of the Cancer Institute (WIA). It is his values and principles which we have tried to follow, emulate and practice that have been responsible for the continuing growth of the Institute. We dedicate whatever has been achieved to his memory and seek his blessings for more and more. He had strong convictions about medicare and education. He could never accept class difference in medicare. So the ethos of the Institute has always been “Service-Service without Social or Economic Divide”. It was again his dictum that no patient should be denied treatment for lack of money. Advisor was always passionate about Research, the often quoted mantra “Todays Research is Tomorrows Treatment and Todays Treatment is yesterdays Research” are his words.

His values and principles continue to guide us and has been a driving force to continue our efforts.
Dr. R. Sankaranarayanan, Special Advisor on Cancer Control & Head, Screening Group - International Agency for Research on Cancer, Lyon France delivered the 7th Dr. S. Krishnamurthi Memorial Oration.

Dr. Sankaranarayanan recalled the unique contributions of Dr. Krishnamurthi for promoting cancer control and in developing cancer treatment services in India and stressed that Cancer Institute is like a big temple and has been a pioneer in introducing multi-modality, quality assured and uniform treatment protocols for common cancers in India. He shared his thoughts on “What can we do further to reduce suffering from cancer?” Citing the ongoing efforts by the Cancer Institute in measuring and monitoring the cancer burden in Tamil Nadu, he indicated that as of now, around 55,000 new cancer cases are reported in Tamilnadu each year. He added that tobacco use in any form, alcohol drinking in any form, diet poor in vegetables, fruits, fibre and micronutrients, diets rich in red and processed meat, overweight and obesity, physical inactivity, chronic infections: HBV, HPV, helicobacter pylori, EBV etc, radiation, air pollution, occupational exposures to cancer causing agents and reproductive factors and hormones are the major cancer risk factors. WHO considers HPV vaccine as one of the best strategies in cervix cancer control and said that based on experience of clinical trials and national programmes, HPV vaccine is as safe as any other vaccine, unfortunately it is not used in India, he added. He stressed on breast awareness which makes every women aware of their normal breast which is key to find any abnormality in future at the earliest.

Cancer prevention is achieved by modulating exposure of individuals to cancer risk factors by: awareness, elimination of risk factors, supplementation of protective agents, vaccination, legislation, voluntary actions, early detection and treatment of potentially malignant precancerous lesions (e.g. CIN, leukoplakia, polyps). He emphasized on avoiding chewing tobacco in any form to further reduce suffering from cancer and stressed on choosing healthy life styles and appropriate health care seeking behavior which would substantially avoid suffering from cancer.

National Cancer Awareness Day was observed on November 7th 2016. Self-Help group women from 10 communities were identified and made to attend the awareness program held at Cancer Institute. Totally 60 members were educated on cancer myths and facts, screening and early detection of cancer and role of civil societies in cancer prevention.

World Cancer Day was observed on 4th February, 2017 with the theme “We Can, I Can”. Volunteers from various colleges and public were invited for the event. The event comprised the release of fact sheet of Tamil Nadu Tobacco Survey and the awareness video titled “வெளிப்புறம் குயிர்கள்” encompassing message on cancer prevention, healthy lifestyle & early detection.
The college is recognized by The Tamil Nadu Dr. M.G.R. Medical University for conducting super-speciality training in Medical Oncology, Surgical Oncology and Radiation Oncology courses and Bachelor degree courses in Radiotherapy Technology, Radiology & Imaging Technology and Nuclear Medicine Technology and Diploma in Operation Theatre & Anaesthesia Technology under Allied Health Courses. The college is also recognised by The Tamil Nadu Dr.M.G.R. Medical University and University of Madras for conducting Ph.D, M.Phil courses and M.Sc. Medical Physics course by the Anna University.

Degrees awarded in 2016

D.M. (Medical Oncology)  M.Ch (Surgical Oncology)
Dr. Aditya Murali       Dr. Anis
Dr. Nagendra Sharma     Dr. R.G.S. Madhu Priya
Dr. Anjana Joel         Dr. Balasubramanian
Dr. Prateek Tiwari      Dr. Balasubramanian
Dr. Saurav Mishra       Dr. P. Ravi Shankar
Dr. Harsh Vardan Atreya

M.D. (Radiotherapy)     DMRT
Dr Haripriya            Dr Krithikaa
Dr Pranav Aswin Shah
Dr Priyadarshini

No. of students registered for Degrees/Diplomas/Ph.D

M.Ch  15       M.Phil (Psycho Oncology)  5
D.M  15       M.Sc (Medical Physics)  28
MD(RT)  14     B.Sc course in Radiotherapy Technology  27
DMRT  4        B.Sc course in Radiology & Imaging  16
Ph.D (Mol. Oncology)  14     B.Sc course in Nuclear Medicine  8
Ph.D (Preventive Oncology)  5     Dip. in OT & Anaesthesia Tech.  1
Ph.D (Psycho- oncology)  3
Ph.D (Clinical Research)  6
RADIOLOGY ONCOLOGY

Dr. A. Vasanthan MD DMRT
Dr. Selvaluxmy Ganesharajah MD DMRT
Dr. Alexander John MD DMRT
Dr. B. Ananthi MD DMRT
Dr. Priya Iyer MD
Dr. M. N. Arunkumar MD
Dr. Vasanth Christopher Jayapal C MD
Dr. Harishkumar MD
Dr. Aswin A N MD
Dr. Ramanaiah MD
Dr. Rishan

Professor & Chairman
Professor & Head
Professor
Assistant Professor
Associate Professor
Assistant Professor
Assistant Professor
Assistant Professor
Assistant Professor
Lecturer

Radiation Technologists

Mr. Chelladurai  Ms. Ponni  Ms. Sarathy  Ms. Athimathy
Mr. Arulprakash  Ms. Sathya  Ms. Bavya  Mr. John Kishore
Ms. Shobhana  Ms. Priyadarshini  Ms. Durga devi
Ms. Sangeetha  Mr. Ramasubramanian

Supporting Staff

Ms. Kalai selvi  Ms. Vimala  Ms Anitha

Students registered for M.D. (Radiotherapy) Degree

Dr. Vijayaveeran  Dr. Grace Mercy Priscilla
Dr. Muthiah  Dr. Sivakumar
Dr. Geetha  Dr. Deepika
Dr. Vinuathan  Dr. Anupama
Dr. Ritesh  Dr. Bharathi
Dr. Sureshkumar  Dr. Krithikaa
Dr. Suresh  Dr. Kavishankar
Students registered for D. M. R. T.
Dr Vinod kumar       Dr Gowtham       Dr Sadanand       Dr Akshaya

Students registered for BSc (Radiotherapy Technology) Degree
Mr Judah J           Ms Sandeep        Mr. Abhishek
Ms Priyadarshini     Ms Sripriya       Ms. Mahalakshmi
Ms Thivitha          Ms Sinduja        Ms. Lavanya
Mr Premkumar         Mr Moovendan      Ms. Priya
Mr Deenadayalan      Ms Rupa           Ms Divya
Ms Kavitha           Ms Kalavani       Mr Thiyagarajan
Mr Umamaheswari      Mr Mohanraj       Ms Kavya
Mr John Kishore      Mr Karthik        Ms Sivasankari
Ms Kanishka          Mr Vinoth         Mr Tamil Selvan

Student passed M.D. (Radiotherapy) Degree
Dr. Haripriya        Dr. Pranav Aswin Shah       Dr. Priyadarshini

Student passed D.M.R.T. Degree
Dr. Krithikaa

Student passed B.Sc. Radiotherapy Technology Degree
Ms Praveena          Mr Udayakumar C       Mr Pachaiappan       Mr Jotheeswaran

<table>
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<tr>
<th>External beam therapy new cases</th>
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<tbody>
<tr>
<td>Total number of treatments delivered</td>
<td>55772</td>
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<tr>
<td>Total number of fields delivered</td>
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<tr>
<td>Conventional treatment planning</td>
<td>372</td>
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<td>Conventional treatment planning with shapers</td>
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<td>3D CRT</td>
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<td>IMRT</td>
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<tr>
<td>Rapid Arc therapy</td>
<td>40</td>
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<tr>
<td>Total skin Electron beam therapy</td>
<td>4</td>
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<tr>
<td>Total Body Radiation</td>
<td>8</td>
</tr>
<tr>
<td>Brachytherapy applications</td>
<td>969</td>
</tr>
</tbody>
</table>
Radiation Oncology Model Examination (ROME III) for all exam going students DMRT, MD and National Board (DNB) was organized in March. About 74 students participated from Tamil Nadu, Pondicherry, Kerala, Karnataka and Andhra Pradesh, the program included sections on exam oriented portions, clinical case presentations with viva and radiotherapy planning hands on was the highlight of the program, where the students were able to virtually plan cases with aid of 2D / 3D films, examiners were from Tamil Nadu, Kerala, Pondicherry, Bengaluru and CMC Vellore.

31st Annual Conference of the Radiation Oncologists of India TN & PY chapter in Chennai in November.

The theme of the conference being leading innovations and nurturing academics for consensus Dr. G. Selvaluxmy Prof and Head of Radiation Oncology and President of the association addressed the gathering.

Faculty and staff delivered lectures

- Dr. Harish Kumar “Pre-operative chemo radiation in esophageal cancers”.
- Dr. AN Aswin “Challenges of Radiotherapy in post operative neck”.
- Dr. Sivakumar “Adaptive radiotherapy-an avant-garde in reducing Normal Tissue Complication Probability (NTCP) in Head and Neck Cancers”.
- Dr. Anupama Reddy “Assessment of radiological changes in lung after radiation therapy for breast cancer”.
- Dr. Deepika Balasubramaniam “Comparison of 3 different techniques in post operative radiotherapy for carcinoma parotid”.
- Dr. Krithikaa “Do we really need a shift to image guided brachytherapy in treating carcinoma uterine cervix?”
- Dr. Ritesh Santosham “Does concomitant boost using conformal therapy maximize local control in locally advanced stage iii.B cervical cancer”.
- Dr. Vijayaveeran “Hybrid simultaneous integrated boost technique in locally advanced tongue cancer”.
- Dr. Sureshkumar “case on Sweet's syndrome – MASS (Malignancy Associated Sweet syndrome)"

Poster presentations

- Dr. Kavi Sankar - Family history of cancer and risk of oral cavity cancer
- Knowledge, attitude and practice (kap) study on cervical cancer Awareness among men
- Group discussion as a modality of pre radiation counselling for Patients treated for cervical cancer
- Dr. Grace - Assessment of quality of life in survivors of cancer cervix treated with radiotherapy or concurrent chemoradiotherapy – a prospective Study
• Dr. C Suresh - Role of Radiotherapy in locally advanced vulval carcinomas

• Dr. Bharathi Srilatha - Study on effect of unplanned time gaps (natural disaster) during radiotherapy on local tumour control in carcinoma cervix

• Dr. K Muthiah - Neoadjuvant Chemoradiotherapy in Resectable Carcinoma Esophagus- Tolerability and pCR rates Cancer Institute Experience

**Awards & Prizes**

• Dr. DVLN Sastry award for best paper in Brachytherapy was awarded to Dr Krithikaa for the best paper on do we really need a shift to image guided brachytherapy in treating carcinoma uterine cervix?

• Dr. Jegadeesan best paper award was awarded to Dr Vijayaveeran for the paper on hybrid simultaneous integrated boost technique in locally advanced tongue cancer.

**Clinical Studies**

1. To evaluate the normal tissue complication probability (NTCP) and tumour control probability (TCP) in head and neck squamous cell carcinomas treated with IMRT using planning CT and CBCT images.

This is a retrospective dosimetric analysis of the prospective study done at our institute between June 2015 and August 2015 where we evaluated the TCP and NTCP calculated, based on the equivalent uniform dose EUD. CBCT images were taken for patients at 40Gy and the organs at risk namely spinal cord, brainstem, parotid gland, submandibular gland, pharyngeal constrictors and mandible were contoured by the same radiation oncologist on the CBCT image set and deformed to the initial planning CT. DVH generated for these structures from initial clinical plan was evaluated and NTCP and TCP calculated. Clinical data of this kind are required for development of adaptive strategies for replanning head and neck cancers with respect to action threshold, timing and frequency, export/import, dose calculation, contour propagation and DIR. The most significant change is observed around 20th fraction of radiation where changes in BMI, setup errors and morphology occur.

2. To study the incidence of radiographic abnormality following post-mastectomy loco-regional radiation.

This was a retrospective analysis of 30 patients treated with adjuvant post-mastectomy radiation from August to November 2014. All patients received loco-regional radiation using single isocentric photon three-dimensional conformal radiation to a total dose of 4680cGy. Two plans with and without addition of supraclavicular (SCL) region were also generated and Dose volume histogram (DVH) parameters including lung volume and Mean Lung Dose (MLD) were analyzed. Chest radiographs done prior and one year after completion of radiation were reviewed for radiation pneumonitis and scored as per Modified WHO Grading System for Radiographic Pulmonary Toxicity (RPT). Other patient related parameters like age, side of treatment, comorbid, chemotherapy details were noted. At a median follow up of 22 months, none had
symptomatic pneumonitis. At 1 year of completion of radiation, 8 patients developed RPT. The average MLD with and without SCL is 14.9Gy and 13.5Gy respectively. 7 developed RP in tangential field territory and 1 developed in SCL territory. Increased age was significantly associated with development (P<0.019) and severity (P<0.083) of RPT. The mean ipsilateral total lung volume was 900cc,

RPT was seen in 31% with < 900cc and 23% with >900cc. None of the DVH parameters were associated with the severity of RPT. There was no association with clinical parameters like comorbidities, type of chemotherapy, pre-existing lung disease. No significant association with side of treatment was observed, though total lung volume on left side compared with right side was lesser in 22 patients.

3. Comparison of 3 different techniques in Post Operative Radiotherapy for Carcinoma Parotid

The aim of the study was to compare radiation doses received by the target volume and the surrounding organs at risk using three different techniques aiming to achieve the optimum technique for adequate target coverage and sparing of surrounding organs at risk during post operative radiotherapy in carcinoma parotid. 15 patients diagnosed to have parotid cancer who underwent surgery were included in this study. Immobilization achieved using thermoplastic head and neck mould. CT simulation done and scans transferred to treatment planning system. Target volumes, contra lateral parotid cochlea, mandible spinal cord, brain stem were contoured, three plans were done one was with 3DCRT using field in field technique, second was ipsilateral oblique wedge photon pair and the third was ipsilateral mixed photon and electron beams. For the above mentioned plans, dose volume histograms (DVH) for target volume and organs at risk were compared and analyzed. PTV dose improvement index, homogeneity index and conformity index were also analyzed. Target dose coverage was comparable in terms of homogeneity, conformity, PTV dose improvement index considered to be best for 3DCRT using field in field technique and Ipsilateral oblique wedge photon pair when compared to Ipsilateral mixed photon and electron beams. Dose to OAR’S was higher in ipsilateral oblique wedge photon pair and ipsilateral mixed photon and electron beams when compared to 3DCRT using Field in Field technique.

4. Brachytherapy Study

To compare and analyze the variations in dose to target volume and OAR in orthogonal ICRU 38 recommendation based planning versus CT based volumetric planning in patients with differential response to EBRT and to identify the subgroup of patients in whom 2D based planning may be non-inferior to IGBT. 10 patients with carcinoma of the uterine cervix who underwent EBRT with or without chemotherapy were stratified to Arm A (No residue) or Arm B (Residual disease) based on the response to EBRT. At the time of first intracavitary application, both orthogonal point A based planning and CT based volumetric planning were done and variations in the dose to the Target volume (D90 & Dose to point A) and OAR (D2cc & ICRU Bladder and rectal points) were compared. The mean volume of GTV was higher in Arm 2. The tumour volume encompassed in the 97% isodose line was lesser in Arm 2. The mean D2cc and D5cc rectum and bladder doses when compared to the corresponding ICRU point doses had significant deviation in Arm 2. Also, we noticed that greater the tumour volume, more is such variation.
### SURGICAL ONCOLOGY

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<tbody>
<tr>
<td>Dr. E. Hemanth Raj</td>
<td>Chairman</td>
</tr>
<tr>
<td>Dr. Sridevi V</td>
<td>Professor</td>
</tr>
<tr>
<td>Dr. Arvind Krishnamurthy</td>
<td>Professor</td>
</tr>
<tr>
<td>Dr. A.S. Ramakrishnan</td>
<td>Professor</td>
</tr>
<tr>
<td>Dr. B.J. Sunil</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Dr. Anand Raja</td>
<td>Associate Professor</td>
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<tr>
<td>Dr. V. Venktesh</td>
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<tr>
<td>Dr. R. Radhika</td>
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<tr>
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<td>Dr. Khader Hussain</td>
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<td>Medical Gastroenterologist</td>
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<td>Dr. R.G.S. Madhu Priya</td>
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<tr>
<td>Dr. Bala Subramanian</td>
<td>Assistant Professor</td>
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<tr>
<td>Dr. P. Ravi Shankar</td>
<td>Assistant Professor</td>
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### Post Graduates

#### 3rd Year
- Dr. Abijit Das
- Dr. Gurav Das
- Dr. Ajit Aggarwal
- Dr. Niharika Agarwal
- Dr. Vinod Kumar Mudgal

#### 2nd Year
- Dr. Hemanth M
- Dr. B Rajkumar
- Dr. Kanuj Malik
- Dr. Srikanth Soma
- Dr. Mohan Raj

#### 1st Year
- Dr. Ramakrishna Reddy
- Dr. Yogesh Tiwari
- Dr. Surenda Kumar
- Dr. Shiva Shankar
- Dr. Saket Mittal
Passed out
Dr. Anis
Dr. R.G.S Madhu Priya
Dr. Bala Subramanian
Dr. P. Ravi Shankar

### Surgical Procedures

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<td>Head and Neck</td>
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<td>Breast</td>
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<td>Gastrointestinal</td>
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<td>Gynecology</td>
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<td>Bone &amp; Soft Tissue</td>
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### Under Local Anaesthesia

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### Endoscopies

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<td>OGD</td>
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<td>Bronchoscopy</td>
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<td>Colonoscopy</td>
<td>697</td>
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<tr>
<td>D &amp; C</td>
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<tr>
<td>Cystoscopy</td>
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<td>Polypectomy</td>
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<td>ENT</td>
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<td>RT Intubation</td>
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<td>NG tube</td>
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### Lectures

- Dr. E. Hemanth Raj delivered the PK Sen Oration, “Peritonectomy & HIPEC – An emerging treatment option” at the Association of Surgeons of India 2016.
Dr. Arvind Krishnamurthy


- “Nutritional Optimisation of Esophagus and OG Junction Tumors undergoing Surgery, When and how” Update on Upper GI Cancers. KASO -RCC CME Scientific Programme at Trivandrum in July.

- “Choosing the right patient for Esophagectomy” Update on Upper GI Cancers. KASO -RCC CME Scientific Programme at Trivandrum in July.

- “Optimal Nutrition Care in Cancer” nutriutsav 2016, 8th annual continuous nutrition education program, Madras Medical Mission at Chennai in September.

- “Surgical approaches and current trends in Oral cancer” CDE program on oral cancer, Meenakshi Ammal Dental College and Hospital at Chennai in September.


- “Current status and role of HPV in Head Neck Cancer in India”. Breakout Session in the 35th ICON Conference of Indian Cooperative Oncology Network Mumbai in September.

- Stapler Laryngectomy and Surgical rehabilitation of phonation in the SRMC - Head & Neck Surgery workshop at Chennai in December.


- Shifting Paradigm in staging of head neck cancers and HPV “Indo-Global summit on Head & Neck Oncology” (IGSHNO) at Jaipur in February.

- Role of Mediastinoscopy in the management of lung cancers and was a faculty for an Operative Surgery Workshop. “Novel Procedures in Thoracic Surgery Update -2017” at the Indo-American Cancer Centre at Hyderabad in March.

Dr. Ramakrishnan

- Faculty for HIPEC workshop at Max Hospitals. Was a panelist for a discussion on “HIPEC in India” at the workshop at New Delhi in April.

- “What is appropriate surgery for low rectal cancer- APR or ELAPE?” at the Asian Clinical Oncology Society conference at New Delhi in April.

- Video demonstration of Cytoreductive surgery and HIPEC at the Global Gastro Update held in Chennai in July.

- “ELAPE: what is it?” during IASGCON 2016 at Coimbatore in October.

- “Complications following gastrectomy for carcinoma stomach” at the ASICON 2016 at Mysore in December.

Dr. Sunil video on “Liver resection in Cirrhotic liver” at NATCON IASO 2016 at Jodhpur in September & a video on “Liver resection in Cirrhotic liver” at ASI TN & Pondy Chapter at Chennai in September.
Dr. Sridevi

- Breast Carcinoma screening- what Gynecologists should know-Refresh – SRMC in May.
- Borderline Ovarian tumors- current concepts- Kasturibai Gandhi Hospital in June.
- Institute of Reproductive Medicine - Screening for Ovarian Cancer and Role of complex endometrial hyperplasia in young unmarried in August
- ISMPCON- Meeting rare scenarios: Mucinous Carcinoma Ovary at New Delhi in November.

Dr. Anand Raja

- “Nerve Sparing Retroperitoneal Lymph Node Dissection in Post-Chemotherapy for Advanced NSGCT – Is it Safe and Useful” at the annual conference of the Indian association of surgical Oncology held at Jodhpur in September.
- Faculty at USICON at Mumbai in January and Faculty at Uro-oncology CME at Rewa, Madhya Pradesh in February.
- “Role of biopsy tract excision during surgery in extremity osteosarcoma after neoadjuvant chemotherapy”at the annual conference of the Indian Musculo-skeletal Oncology Society at Varasani in March.

International Conference

- Dr.Ramakrishnan, Poster “Cytoreductive surgery and hyperthermic intraperitoneal chemotherapy for peritoneal surface malignancies- initial experience at a regional cancer centre in India” at the 10th International Meeting of Peritoneal Surface Oncology in Washington DC, in November. He received a scholarship from the Appendix Cancer Pseudomyxoma Peritonei Foundation, USA and the International Travel Scheme (ITS) grant from the Science and Engineering Research Board (SERB), Govt. of India, New Delhi to attend the 10th International Meeting of Peritoneal Surface Oncology in Washington DC in November.
- Dr. Sunil, paper ‘Survival Outcomes after surgical resection in Hepatoblastoma’ at the 28th Meeting of Japanese Society of Hepato-Biliary-Pancreatic Surgery at Osaka, Japan in June. He received a travel grant from the Japanese Society of Hepatobiliary Surgery for this conference.
- Dr. Abhijit Das, Laparoscopic versus open surgery after neoadjuvant chemoradiation in rectal cancer: long-term outcomes of a matched case-control study at the Society of Surgical Oncology annual conference held in Seattle, USA in March.
- Dr. Chandra Kumar Krishnan, attended The 11th Meeting of the Asia Pacific Musculoskeletal Tumor Society (APMSTS) at Singapore in April. Innovations - Dr Chandra Kumar Krishnan: Recycling tumor containing bone by cryotherapy.

Paper and Poster Presentations

Dr. Abhijit Das  “Clinico-epidemiological Trends of Lung Cancer from a Premier Regional Cancer Centre in South India” NALCCON 2016. Bhubaneswar and won the second prize.
Dr. Balasubramanian


Dr. Ravishankar, An Institution Experience of Osteosarcoma of the Head and Neck Region.
IFHNOS Delhi 2016 & FHNO 2016

Dr. Suhail Deen, Review analysis of Primary Tracheo-oesophageal puncture for Voice rehabilitation in laryngectomy patients. IFHNOS Delhi 2016 & FHNO 2016

Dr. Niharika, Dr. Ramakrishnan

- ELAPE versus Conventional APR: A retrospective review at the NATCON IASO at Jodhpur in September.

- A prospective pilot randomised study comparing extralevator versus standard abdominoperineal excision in low rectal cancer at the ACRSI-ISUCRSCON 2016 at Mumbai in September - won best paper award.

Dr. Sivakumar, Dr. Ramakrishnan, Long-term functional and oncological outcomes following intersphincteric resection for low rectal cancers, NATCON IASO at Jodhpur in September.

Dr. Gaurav Das, Dr. Ramakrishnan

- Outcome of a series of patients with pseudomyxoma peritonei undergoing cytoreductive surgery and hyperthermic intraperitoneal chemotherapy at a tertiary cancer centre in India at the NATCON IASO at Jodhpur in September.

- Outcome of a series of patients with peritoneal surface malignancies treated with cytoreductive surgery and hyperthermic intraperitoneal chemotherapy at a tertiary cancer centre in India at IASGCON 2016 at Coimbatore in October.

Dr. Madhupriya, Dr. Ramakrishnan, Impact of Sphincter sparing surgery for rectal cancer on bowel function and quality of life at the NATCON IASO at Jodhpur in September.

Dr. Ramakrishnan, Abhijit Das, Laparoscopic versus open surgery after neoadjuvant chemoradiation in rectal cancer: long-term outcomes of a matched case-control study at the NATCON IASO at Jodhpur in September - won best poster award.

Dr. Ajith, Dr. Ramakrishnan, A series of patients with Peutz-Jeghers syndrome, at the NATCON IASO at Jodhpur in September.

Dr. Ramakrishnan

- Laparoscopic versus open surgery after neoadjuvant chemoradiation in rectal cancer: long-term outcomes of a matched case-control study at the ACRSI-ISUCRSCON 2016 at Mumbai in September.

- A prospective pilot randomised study comparing extralevator versus standard abdominoperineal excision in low rectal cancer at the IASGCON 2016 at Coimbatore - award paper session in October.
• Laparoscopic versus open surgery after neoadjuvant chemoradiation in rectal cancer: long-term outcomes of a matched case-control study at IASGCON 2016 at Coimbatore in October.

• Video on Cytoreductive surgery and HIPEC for pseudomyxoma peritonei at IASGCON 2016 at Coimbatore in October - won best video award.

  Dr. Vinod Mudgal, Dr. Ramakrishnan, Long-term functional and oncological outcomes following intersphincteric resection for low rectal cancers at IASGCON 2016 at Coimbatore in October.

  Dr. Gaurav Das, Mucinous Carcinoma Ovary – AGICON in November.

Dr. Sivakumar

• National conference: NATCON IASO Poster title: Osteosarcoma updates: New Delhi in November, Presented Institute osteosarcoma data held at Jodhpur in September.

  Role of preoperative concurrent chemoradiation in management of LABC

  Long term functional and oncological outcome following Intersphincteric resection for low rectal cancer

• Osteosarcoma updates: conducted by Rajiv Gandhi Cancer Hospital, presented institute 1998-2008 (10 years) osteosarcoma data held at New Delhi in November.

  Dr. Vishnu, Poster "Oncologic outcomes and prognostic factors for survival in patients with chondrosarcoma" IMSOS 2017 Varanasi- best poster medal in March.

Dr. Chandra Kumar Krishnan

• “Outcome After Surgery for Extremity Soft Tissue Sarcoma in Patients Presenting With Metastasis at Diagnosis” at Korean Bone and Joint Tumor Society meeting (KBJTS) Incheon, South Korea in April.

• “Outcome After Surgery for Extremity Soft Tissue Sarcoma in Patients Presenting With Metastasis at Diagnosis” at The 42nd annual meeting of the Korean Cancer Association with International Cancer Conference (KCA), Seoul in June.

• Poster “Outcome After Surgery for Extremity Soft Tissue Sarcoma in Patients Presenting With Metastasis at Diagnosis” at The 22nd annual meeting of the Connective Tissue Oncology Society (CTOS), Lisbon in November.

• “Factors Associated with Local Recurrence after Surgery for Bone Metastasis to the Extremities” at Korean Orthopaedic Association Fall Congress (KOA), Incheon, South Korea in October.

• “Factors Associated with Local Recurrence after Surgery for Bone Metastasis to the Extremities” at the 3rd Annual Conference of the Indian Musculoskeletal Oncology Society (IMSOS), at Varanasi in March.

• “Outcome after Surgery for Metastases to the Pelvic Bone: A Single Institutional Experience” at the 3rd Annual Conference of the Indian Musculoskeletal Oncology Society (IMSOS), at Varanasi in March.

• “Assessment of Symptom Interval in Musculoskeletal Neoplasms - A Hospital Based Observational Study” at the 3rd Annual Conference of the Indian Musculoskeletal Oncology Society (IMSOS) at Varanasi in March.
DEPARTMENT OF MEDICAL ONCOLOGY

DEPARTMENT OF PEDIATRIC ONCOLOGY
MEDICAL ONCOLOGY

Dr. T.G. Sagar, M.D, D.M Director, Chairman & Head

Dr. T.S.Ganesan, MD,MNAMS,FRCP,PHD(UK) Prof & Head, Clinical Research

Dr. K.Krishna Rathnam,M.D, D.M., FRCAP - Prof&Head, Stem Cell Transplant Unit

Dr.Prasanth Ganesan, MD, D.M. Associate Professor (Gr.I)

Dr R Venkatraman, MD, D.M. Associate Professor

Dr D Manikandan, MD, DM Assistant Professor

Dr Thanda Joshua, MD, DM Assistant Professor

Dr G.R.Jaikumar MD, DM Assistant Professor

Dr. Zainab Zaleena, MBBS Medical Officer

Students registered for D.M

I Year  4
II Year  5
III Year  6

Patient Coordinators Adult

Mr. P.C Reddy - Clinical Trial Associate
Ms. Tamil Selvarani- CML patient coordinator
Ms. Vanitha N- BMT patient coordinator and Lymphoma Data Coordinator
Ms. Rekha Devi S- Clinical Trial Coordinator

Total No .of Chemotherapy delivered (Day Care only)

General Ward – 5864
Special Ward – 4552

Total No .of Bone Marrow Transplants

Allogeneic- 20 (previous year 25)

Autologous- 40 (previous year 31)

Procedures
Lumbar Puncture: 851
Bone Marrow aspiration and biopsy:1129
Central line: 262
Pleural Tapping: 132
Academic Programs

- COPE 2017 - Refresher course for exam going post graduates in Medical Oncology all over India was conducted in February, attended by 50 students from various parts of the country.
- ISMPO Gold Medal Exam for the “Best outgoing medical oncology student”.

Ongoing clinical trials and research protocols

- A randomized trial evaluating daunorubicin and cytosine arabinoside versus daunorubicin and cytosine arabinoside and etoposide as induction therapy for acute myeloid leukaemia in children.
- A phase II study of metformin in patients with biochemical relapse of ovarian cancer.
- Role of HIPEC in recurrent epithelial ovarian cancer
- Role of HIPEC in recurrent colorectal cancer
- A randomized phase II trial of neoadjuvant versus interval chemotherapy in rectal adenocarcinoma
- Prospective study of early switch to nilotinib in patients with chronic myeloid leukemia on imatinib
- A randomized trial evaluating intraperitoneal therapy in epithelial ovarian cancer
- T regulatory cells in acute myeloid leukemia in children
- T regulatory cells in acute lymphoblastic leukemia in children
- Phase II study of GVDexa in refractory Hodgkin’s lymphoma
- Observational study of olanzapine among patients receiving highly emetogenic chemotherapy and failing aprepitant
- Predictors of outcomes in Lymphomas- use of PET based metrics for outcomes prediction
- Dose dense chemotherapy in breast cancer
- Olanzapine based anti-emetic regimen for prevention of CINV in patients receiving weekly cisplatin
- ICICLE: multicentre protocol for risk adapted treatment of ALL.

Future clinical trials

- A phase II trial of weekly cisplatin and trabectedin in recurrent epithelial ovarian cancer.
- A phase II trial of Mycidac in BCG refractory superficial transitional cell carcinoma of bladder.
- Phase I/II study of Lenalidomide with Oral metronomic Chemotherapy in advanced lymphomas
- Phase III study of Masitinib in patient suffering from relapsed or refractory peripheral T-Cell lymphoma

Guest lectures

Dr. Ian Tannock from the Princess Margaret Hospital Canada visited the Hospital and had multiple lectures and interactions with the students and faculty on various aspects of clinical trials, statistics, breast and prostate cancer in February (4 days).
Academic activities

Dr. T S Ganesan

- Dr. Rama Khoka, Professor and Director of Research from Princess Margaret Hospital visited the Institute and Dr. Ganesan's laboratory. She also gave an institutional lecture on Stem cells and breast cancer in September.
- ICMR expert committee on Stem cells and Regenerative medicine in September.
- Indogerman workshop childhood diseases between 27th and 28th October. This was preceded by a Science Circle lecture by Dr. Andreas Kulozik on childhood acute lymphoblastic leukemia in October at Taj Coromandel. The workshop was attended by scientists and clinicians from TMH, Mumbai; CMC, Vellore; IIT, Chennai; ILS, Bhubaneshwar; AIIMS, New Delhi; IICB, Kolkata. Our German colleagues were Dr. Andreas Kulozik, Dr. Martina Muckenthaler and Dr. Michaela Nathrath. There were 4 sessions over 2 days that included Acute lymphoblastic leukemia, acute myeloid leukemia, osteosarcoma and disorders of iron metabolism. The aims of the workshop was to explore possible collaborative projects between India and Germany. A draft paper has been circulated following the workshop. This workshop also gave an opportunity for residents to attend and hear opinions from various experts.
- Visit of Dr. Andrew Fry from National Cancer Institute, USA to discuss possible collaborations between Medical Oncology, Clinical Research and NCI on developing novel treatments for childhood acute lymphoblastic leukemia. He also gave an Institutional lecture on CAR T cells and acute lymphoblastic leukemia in November.
- Identification by mass spectrometry of unique phosphoproteins subsequent to signalling through c- ErbB2 - Dr. T. S. Ganesan.
- International Conference on Molecular signaling: From basics to applications held by Anna University and AU-KBC at Chennai.
  1) Presentations at Annual Meeting of Indian Association of Cancer research annual meeting at Amala Cancer Thrissur in February.
    c) Signaling through the hedgehog pathway in ovarian cancer - Sneha S, Nagare R. P, Krishna Priya S and Ganesan TS.
    d) Discovering new diagnostic and therapeutic strategies for liposarcoma using next generation sequencing, SNP array, shRNA screening and drug screening. Manoj Garg, Nachiyappan Venkatachalam, Deepika Kanojia, Anand Mayakonda, Trivadi S Ganesan, Erkan Baloglu, Sharon Shacham, Michael Kauffman and H. Phillip Koeffler - Awarded best poster for ‘Signaling through the hedgehog pathway in ovarian cancer’
  2) Conference on Predictive Oncology and molecular pathology under IAPM, held at Calicut Medical College in February. Invited lecture on Molecular Biology of breast & ovarian cancer - Dr. T. S. Ganesan
  3) Visiting Professor fro 2017 and COPE
Professor Ian Tannock from Princess Margaret Hospital Toronto in February.
Lectures to residents and staff

- Reading the literature with a critical eye: which Studies should influence my practice
- Recent advances in prostate cancer: Systemic treatment of bladder and kidney cancer
- Tumour microenvironment and drug resistance - Why I refuse to know my PSA but have undergone screening colonoscopy
- Recent advances in breast cancer - Targeted agents and personalized medicine: where is it going?

Presentations

- Targeting cancer stem cells in serous ovarian carcinoma using RP6530, a dual PI3 kinase delta/gamma inhibitor - S. Sneha, Nivetha, R. Nagare, RP, Viswanatha S, Swaroop V, Ganesan TS.

Dr. Prasanth Ganesan

- "Optimal strategies in interim assessment in malignant lymphomas" at the Asian Society of Oncology, ACOS conference, conducted at Hotel Ashok, New Delhi in April.
- “Does cell of origin impact treatment decision making in DLBCL” at the Asian Society of Oncology, ACOS conference, conducted at Hotel Ashok, New Delhi in April.
- “Clinical features of borderline ovarian cancers and low grade ovarian cancer” at the International Society of Gynecological Cancer Meeting at Lisbon, Portugal, in October.
- “Acute lymphoblastic leukemia in young adults” at the Indo-German workshop on childhood diseases conducted at the Cancer Institute, in October.
- “Management of Waldenstrom’s Macroglobulinemia” at the conference “Myeloma-state of the art” conducted at PGIMER, Chandigarh in October-November.
- Visited the Teenage and Young adult cancer unit under the department of hematology and BMT at the University College of London, UK, to learn about the working of an ADOELSCENT AND YOUNG ADULT focused cancer care unit in November.
- Technology in Oncology” during the symposium conducted by the National Hub for Healthcare instrumentation development under the department of science and technology, Govt of India at Kilpauk Medical College in January.
- “Management of Early breast cancer” and “locally advanced and metastatic breast cancer” At the CME In breast Cancer organized by Christian Fellowship Hospital and IARC, WHO at Ambilikai in February.
- “Taking individual responsibility for cancer prevention” to health care volunteers on the occasion of World Cancer Day at the Cancer Institute, Adyar, Chennai in February.
- Optimizing strategies after failure of rituximab in chronic lymphocytic leukemia” at the Indian Cooperative Oncology Network ICON meeting at Hyderabad in March.
- “Writing a concept outline for a clinical trial” and participated as faculty At the ASCO/ICON clinical trial workshop conducted along with the ICON meeting at Hyderabad in March.
Dr. Venkatraman Radhakrishnan

- Talk in Doordarshan on world no tobacco day in May.
- Colon cancer, Chennai, in May.
- Febrile neutropenia and pediatric solid tumor, ICON meeting, Mumbai, in September.
- Pediatric AML and ALL at Indo-German workshop, Cancer Institute, in October.
- Presented Cancer Institute data at Jivdaya meeting, New Delhi, in November.
- Nutrition in pediatric cancer, St Judes cure for kids online meeting, in December.
- Immunotherapy in lung cancer, Jipmer, in December.
- Infections in patients receiving chemotherapy, Chennai in January.
- Ceritinib. Chennai in February.
- Induction Chemotherapy in Head and Neck Cancer, Chennai in March.

Dr. Manikandan

- “Best of ASCO – Lung Cancer” at Puducherry in July.
- “Neoadjuvant chemotherapy – Evidence & Clinical Use” in Shri Mata Vaishno Devi Narayana Hospital, Katra, Jammu in September.
- Attended “Multidisciplinary Gastro-interstinal Conference” and “Best of Radiation Oncology – 2016” in Cleveland Clinic, Ohio in November.
- Selected for “Indo-American Cancer Association- John F Kapoor Travelling Fellowship” Observer in Solid tumor oncology in Taussig Cancer Institute, Cleveland Clinic, Ohio mentored by Dr. Jame Abraham, Director of Breast Medical Oncology from October – November.
- Awarded Prof. K. Ramachandra Endowment Gold Medal for securing highest marks in D.M (Medical Oncology) examination by Tamil Nadu Dr. M.G.R University in December.
- Selected for “ASCO - Virtual Mentor Program” mentored by Dr. Antony Elias – Director of Clinical Breast Oncology, University of Colorado, Denver in January.
- Presented Research Proposal on “Discontinuation of Imatinib in CML patients who achieve complete molecular response” and “Neoadjuvant Chemotherapy versus Neoadjuvant Chemoradiation in locally advanced breast cancer” in ICON & ASCO’s International Clinical Trials Workshop a Hyderabad in March.

Dr. Jayachandran

- Oral Presentation – Bonne Sante 2016, Mahabalipuram, Chennai in August. BONE MARROW TRANSPLANTATION CMCHIS insurance scheme- A boon to poor and needy.
- Poster: ICON 2017 Topic: - Fosefestrol- An underutilized option in metastasis castration resistant prostate cancer.
Dr. Nikitha Mehra

- Poster “Bendamustine in Relapsed or Refractory Multiple Myeloma: Experience from Cancer Institute” at the Myeloma: State of the Art 2016, PGI Chandigarh, in September & October.
- Poster “Assessing the Effectiveness of Olanzapine for the Prevention of Chemotherapy-Induced Nausea and Vomiting (CINV) in Patients Who Fail Therapy with Aprepitant while receiving Highly Emetogenic Chemotherapy” at the European Society of Medical Oncology (ESMO) Asia 2016 Congress, Singapore in December.
- “Bendamustine in Relapsed or Refractory Multiple Myeloma: Experience from Cancer Institute” at “An International Update on Plasma Cell Dyscrasias” conducted by KIDWAI, Bangalore in February.

Dr. Praveen Kumar Shenoy

- Attended conference on Multiple Myeloma “Myeloma State of the Art 2016” at PGI Chandigarh in September & October.
- Attended “The 20th Annual Conference of the Pediatric Hematology Oncology Chapter of IAP 2016 in November.
- “Outcomes in Multiple Myeloma post High Dose Chemotherapy and Autologous Stem Cell Transplantation from Cancer Institute, Chennai” at conference on Updates in Multiple Myeloma held at Bangalore (organized by Kidwai Memorial Institute of Oncology) in February.
- Poster “NEPHROBLASTOMA - SINGLE INSTITUTION EXPERIENCE FROM A TERTIARY CANCER CENTRE IN INDIA” at Systems Oncology - an International conference held at Kochi in March.

Dr. Manu Prasad

- Poster Bendamustine in B cell Lymphomas experience from a tertiary cancer centre Poster presentation Hematocon 2016 at Jaipur in November.
- E poster on Docetaxel Induced Lung Injury RGCON -16th annual international conference 2017 in New Delhi in February.

Dr. Krupa Shankar

- Management of prostate cancer in December.
- Gynecological Oncology "Best of 2016 & Master Class" - Mumbai - TMH – in January.
- COPE - Chennai - C.I (WIA) - Selected from the preliminary MCQ round - Overall 5th place in February.
- TYSA - Chennai - Qualified for the zonal round and for the national level round (to be held) in March.
- 36th ICON - Lucknow - Poster / Oral presentation - Prevalence of MDR organisms in stool of paediatric patients with acute leukemia and correlation with blood culture positivity - A single institution experience - 1st place in both Poster / Oral presentation in March.

Dr. Archit Joshi - Hairy cell leukemia (HCL) is a rare chronic leukemia which usually presents with pancytopenia and splenomegaly. Purine nucleoside analogue (cladribine) produces remarkably high remission rates.
Research activities DM residents’ dissertation completed in 2016

- Dr. Anjana - Outcomes of relapsed lymphomas- gemcitabine based salvage regimens
- Dr. Prateik Tiwari - Kinetics of delivery of High dose methotrexate during consolidation therapy of acute lymphoblastic leukemia
- Dr Aditya - Prevalence of ALK Mutation in adeno carcinoma lung and its clinical pathological characteristics in a treachery case
- Dr Sourav - Predictor of chemotherapy related toxicities in elderly cancer patients from treachery cancer center on southern India
- Dr Harsh - Phase II study of Metformin in patient with biomedical relapse with epithelial Ovarian Cancer
- Dr Nagender Sharma - Study of cancers in HIV positive patients

DM residents’ dissertation 2017

- Dr Nikitha Mehra - An Observational Study to Monitor the Effectiveness Of Olanzapine (Oln) For The Prevention Of Chemotherapy-Induced Nausea And Vomiting (Cinv) In Patients Who Fail Therapy With Aprepitant
- Dr Krupa Shankar - Identification of newer prognostic indicators for predicting outcomes in lymphomas
- Dr Jayachandran - Fosefestrol- An underutilized option in metastasis castration resistant prostate cancer - Evaluation of T regulatory cells in paediatric castration resistant prostate cancer
- Dr Soufeej - Outcome in paediatric non blastic non Hodgkin lymphoma from a tertiary cancer center
PEDIATRIC ONCOLOGY

Consultant: 2
Dr Venkatraman: Associate Professor, Incharge.
Dr Jaikumar Ramamoorthy, Assistant Professor

Nurses: 18
Data Manager (Jiv Daya Project): 1
Pharmacist (Jiv Daya Project): 1
Social Worker (Jiv Daya Project): 1
Dietician (Jiv Daya Project): 1
DM Medical Oncology Trainees: 2 in rotation every 2 months

The pediatric ward at main institute has a bed strength of 55 beds this includes 45 inpatient, 6 ICU and 4 day care beds.

Total New Patients: 347 (previous year: 289)
Total no of inpatients chemotherapy prepared- 7840
Total no of outpatients chemotherapy prepared- 6035

a) Transplant
Allogeneic- 5 (previous year 6)
Autologus- 11 (previous year 4)

b) Procedures
Lumbar puncture: 1723 (previous year 1402)
Bone marrow aspiration and biopsy:333 (previous year 329)
Central line: 170 (Previous year 190)

Ongoing projects
• ADE versus 3+7 induction in AML a phase 3 randomised multi-centric trial.
• Fosaprepitant for preventing CINV in pediatric patients a phase 3 randomised trial.
• Prospective multicentric study on pediatric Hodgkins lymphoma
• Prospective multi-centric study on out of pocket expenditure in pediatric cancer
• Prospective multicentric study on survival outcomes in pediatric cancer
• ICICLE: multicentre protocol for risk adapted treatment of ALL
• TREG cells in pediatric ALL
• TREG cells in pediatric AML
CLINICAL RESEARCH

Dr. T.S. Ganesan, MD, MNAMS, FRCP, PHD(UK)  Prof & Head, Clinical Research

Ph. D. Students
Mr. Rohit P Nagare ICMR SRF  
Ms Krishnapriya ICMR SRF  
Ms. Sneha, UGC SRF  
Mr. Sidhanth DBT SRF  
Mr. Bindhya ICMR SRF  
Ms Manasa INSPIRE SRF

Project Students
Ms Nivetha: Evaluation of RP6530 against cancer stem cells in serous adenocarcinoma ovary  
Ms Anna Cherian: Bioinformatic analysis of genes predisposing to dormancy

New appointments
Dr. Manoj Garg was appointed in May 2016 as Assistant Professor in the Department of Clinical Research after he was awarded the Ramalingaswami Fellowship for 5 years by DBT. His research is focused on the mechanistic understanding of the role the fusion transcript AML/ETO in acute myeloid leukemia. In addition he is also doing a project on pancreatic cancer examining the role of LAMC2.

Meetings and Committees
- American Association of Cancer Research Annual meeting at USA in April.  
- DM Medical Oncology, Examiner at JIPMER, Puducherry in August  
- ICMR Scientific advisory committee on Stem cells and Regenerative medicine at New Delhi in September  
- ICMR Expert Review Group on Stem Cells and Regenerative Medicine at New Delhi in September  
- Expert for appointments committee for Faculty in Medical Oncology at AIIMS, New Delhi in October  
- Invited expert for DBT task force on stem cells and regenerative medicine in November.  
- Convenor for DM Medical Oncology at Cancer Institute in February

Invited Lectures
- ‘Personalised medicine for Cancer’ at Cancer Conclave organised by ClinBio at SRMC in June.  
- Identification by mass spectrometry of unique phosphoproteins subsequent to signalling through c- ErbB2- International Conference on Molecular signaling: From basics to applications held by Anna University and AU-KBC at Chennai in January.
• Discovering new diagnostic and therapeutic strategies for liposarcoma using next generation sequencing, SNP array, shRNA screening and drug screening at the Annual Meeting of Indian Association of Cancer research annual meeting at Amala Cancer Thrissur in February.
• Conference on Predictive Oncology and molecular pathology under IAPM - Molecular Biology of breast and ovarian cancer, held at Calicut Medical College in February.
• ‘The complexity of the cancer genome and its application to the management of patients’ at the International Conference on Systems Oncology held at Kochi in March.

**Guest lectures and academic programmes conducted**

- Lecture by Dr. Rama Khoka, Director Research, Princess Margaret Hospital, Toronto on ‘Mammary stem cells and breast cancer” in October.
- Lecture by Dr. Terry Fry on ‘Beyond CD19: What next for CAR T cell immunotherapy in hematologic malignancies" at Cancer Institute in November.
- Prof. Ian Tannock Emeritus professor in Medical Oncology from Princess Margaret Hospital, Toronto in February.

**Collaborations**

- Indo-German workshop on Childhood disorders with Drs, Andreas Kulozik, Michaela Nathrath and Martina Muckenthaler from Heidelberg and Munich, Germany. Funded by German Ministry - in October
- Collaboration with Dr. Klaus Pors, Associate Professor, at Bradford, UK.

**Ongoing Clinical trials**

1. A randomised trial evaluating daunorubicin and cytosine arabinoside versus daunorubicin and cytosine arabinoside and etoposide as induction therapy for acute myeloid leukaemia in children.
3. Role of HIPEC in recurrent epithelial ovarian cancer
4. Role of HIPEC in recurrent colorectal cancer
5. A randomised phase II trial of neoadjuvant versus interval chemotherapy in rectal adenocarcinoma
6. Prospective study of early switch to nilotinib in patients with chronic myeloid leukaemia on imatinib

**Future clinical trials**

1. A phase II trial of weekly cisplatin and trabectedin in recurrent epithelial ovarian cancer.
2. A phase III trial of Intra-peritoneal versus intravenous chemotherapy after interval debulking in ovarian cancer

**DM residents’ dissertation**

1. T regulatory cells in acute myeloid leukemia in children Dr. Praveen
2. T regulatory cells in acute lymphoblastic leukemia in children Dr. Shaufejej
3. A trial of switching imatinib to nilotinib in chronic myeloid leukemia DR. Jayachandran
Grants received

- CD24 IgG-Fc fusion protein as a therapeutic approach for ovarian cancer - DBT 3.5 million INR
- Cancer Stem cells and tumour neoangiogenesis DBT 5.6 million INR
- Characterisation of basement membrane protein LAMC2 expression and its role in pancreatic adenocarcinoma DST 4.9 million INR

Presentations (peer reviewed)


5. Signaling through the hedgehog pathway in ovarian cancer - Sneha S, Nagare R. P, Krishna Priya S and Ganesan TS. Presented at the IACR annual conference at Trichur in February.


Significant achievements

We are focused as one major theme in the laboratory on understanding the role of cancer stem cells in the initiation, progression and recurrence of cancer. We have identified independently novel surface proteins CD9, CD24 and EPHA1 as putative cancer stem cell markers. We have shown that functional assays are better at identification of CSCs. The hedgehog signaling pathway is important in maintenance of stemness in CSCs and could be a target for future therapy. We have also shown in primary ovarian tumours that CSCs contribute to the origin of endothelial and pericytes. Finally, we have been able to develop induced pluripotent stem cells from a normal ovarian cancer cell line. By analysing data from TCGA we have been able to identify two novel genes implicated in the pathogenesis of ovarian cancer. These are RNF144b and PPP2R2A. We have also been able to identify tertiary aspects of signaling by c-erbB2. We have identified key intermediate enzymes in carbohydrate metabolism as downstream substrates. In addition we have shown for the first time that LASP1 an oncogene is phosphorylated in response to signaling by ErbB2.
All patients with leukemia both acute and chronic are evaluated for cytogenetic abnormalities in their tumour cells. In addition service is provided for other hematological abnormalities, including chimerism status in sex mismatched patients treated with allogeneic bone marrow transplantation. There is a Technician and a Research Assistant supported by Dr. Koshy who comes once a week from Ramachandra Medical College. Since 2014, the accuracy of karyotype has been improved and since 2015 the final result is verified independently by a qualified cytogeneticist. Currently only a small proportion of the total samples per year are being sent to the CMC.

### Overall data

<table>
<thead>
<tr>
<th>Year</th>
<th>Samples Received</th>
<th>Samples Analysed</th>
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<tbody>
<tr>
<td>2014</td>
<td>268</td>
<td>266</td>
</tr>
<tr>
<td>2015</td>
<td>521</td>
<td>204</td>
</tr>
<tr>
<td>2016</td>
<td>464</td>
<td>191</td>
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</table>

### Cancer Institute data

<table>
<thead>
<tr>
<th>Type</th>
<th>Normal</th>
<th>Abnormal</th>
<th>No Metaphase</th>
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<tbody>
<tr>
<td>AML</td>
<td>49</td>
<td>58</td>
<td>19</td>
</tr>
<tr>
<td>ALL</td>
<td>81</td>
<td>148</td>
<td>81</td>
</tr>
<tr>
<td>CML</td>
<td>29</td>
<td>89</td>
<td>51</td>
</tr>
<tr>
<td>Others</td>
<td>23</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>182</td>
<td>318</td>
<td>161 = 661</td>
</tr>
</tbody>
</table>

### Type of abnormalities

<table>
<thead>
<tr>
<th>Type</th>
<th>Translocation</th>
<th>Deletion</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>AML</td>
<td>21</td>
<td>8</td>
<td>29</td>
</tr>
<tr>
<td>ALL</td>
<td>31</td>
<td>23</td>
<td>94</td>
</tr>
<tr>
<td>CML</td>
<td>61</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>47</td>
<td>154 = 318</td>
</tr>
</tbody>
</table>
BLOOD BANK

Dr. B. Narmaddha M.B.B.S  
Dr. Y. Swapna, MBBS, DCP  
Dr. G. Deepa Devi M.D  
Mrs. T. Chandra Kumari  
Mrs. R. Inbaroja  
Mrs. A. Suseela, CMLT  
Mrs. T. Rajambiga, DMLT  
Ms. R. Bhavani, B.Sc  
Mrs. M. Manimala, DMLT  
Mrs. R. Sangeetha, DMLT  
Ms. S. Dhanalakshmi, DMLT  
Mrs. G. Gomathi, B.Sc  
Mr. K. Gnanamani, DMLT  
Mr. A. Baskar, DMLT

Medical Officer  
Medical Officer  
Medical Officer  
Vocational Nurse Training Technician  
Vocational Nurse Training Technician  
Technician  
Technician  
Staff Nurse  
Technician  
Technician  
Technician  
Data Entry Operator  
Technician  
Technician

Total Collections - 8647

Patients Statistics
Viral markers - 8160
Grouping/Rh typing - 32640
Cross matching - 8431
Component Statistics - 16708
Total camps - 51
Total camp collection - 4232 (50% of total blood collection)
Total plasma issued to Reliance life science - 5231 units
Stem cell collection { Autologous- 89, Allogenic -17}.
Therapeutic leucoreduction - 5
Granulocyte collection - 2
Therapeutic Plasma exchange - 3

Future Project

1. NAT Screening of the Donor Blood for HIV, HBV, HCV.
2. Phenotyping of the patient red blood cell to prevent alloimmunization in multiple transfused patients.
3. Corrected count increment in platelet count following platelet transfusion and evaluating the platelet refractoriness.
4. To establish S/CO ratio of HCV, HIV, HBV by ECLIA (Roche) to formulate cost cutting algorithms.
5. Pathogen Inactivation of Blood to provide safe blood to patient.
6. Patient antibody screening to avoid emergency crisis and facilitate safe transfusion.
Academic Programme

- Dr.G.Deepa Devi.,M.D attended a Symposium on Enhancing Blood Transfusion Safety Beyond the routine by Ortho Circle at Chennai in June.
- Dr Y Swapna and Dr B Narmadha poster – DEMING CYCLE IN BLOOD TRANSFUSION SERVICES at Indian Society of Blood Transfusion and Immunohematology conference meet at Pune in August.
- DR Y Swapna poster-TISSUE BANKS at ISBTI conference at Pune in August.
- Mrs.Chandra, and Mrs.Inbaroja Lab Tehnicians attended a seminar for the Blood Transfusion Service for Technical Staff at Mahabalipuram in November.
- Dr.G.Deepa Devi.,M.D attended the conference conducted by Indian Society of Transfusion Medicine ( Transmedcon 2016) at Bhopal in November and presented a Poster on Resolving blood grouping discrepancies in reverse grouping due to weak antibody production in oncology patients.
- Dr.B.Narmadha, Mrs.Chandra and Mrs.Inbaroja attended an Orientation meeting for Roll out of training programme on Strengthening Quality Management Systems (QMS) in NACO supported Blood Banks at TANSACS office, Chennai in December.
- Dr.G.Deepa Devi.,M.D has attended a CME on Transfusion Medicine at Sri Ramachandra Medical College, Porur in March.
- Dr.Y.Swapna attended National Conference on Hospital Infection Control at Balaji Medical College, Chennai in March.
- Dr.G.Deepa Devi.,M.D attended a CME on Obstetric Transfusion Practices at The Tamil Nadu Dr.M.G.R Medical University in March.

ANAESTHESIOLOGY

Dr.Kalpana Balakrishnan, MBBS, DA, DNB  Associate professor & HOD
Dr.Thendral Edwin, MBBS, DA  Assistant professor
Dr.Radhiya Dash, MD  Anaesthetist
Dr.Nivedhyaa, MD  Anaesthetist
Dr.Prasanna Vani, MD  Anaesthetist
Dr.Sridevi, DNB  Anaesthetist
Dr.Shuba, DNB  Anaesthetist
Dr.Indu Ravishankar, MD DNB  Fellowship in Pediatric Anesthesia
Dr Praveen Kumar, MD  Anaesthetist
Dr Dinesh Kumar, MD  Anaesthetist

Consultant

Dr.C.Punitha, DNB
Dr.V.V Meenakshi, MD, DNB
Diploma in Anesthesia and operation theatre technology completed -3 staff
Diploma in Anesthesia and operation theatre technology joined -1 staff
Details of Major OT in Annexe 2nd and 3rd floor
**Ultra sound guided procedures in OT**: 107

**Chronic pain procedures**: 13
- Nerve blocks (usg guided) - 4
- Alcoholic neurolysis (fluor guided) - 2
- Epidural steroid administration - 2
- Systemic desensitisation - 1

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Anesthesia</strong></td>
<td></td>
</tr>
<tr>
<td>a) Sedation</td>
<td>123</td>
</tr>
<tr>
<td>b) LMA</td>
<td>377</td>
</tr>
<tr>
<td>c) Oral ET Tube</td>
<td>762</td>
</tr>
<tr>
<td>d) Nasal ET</td>
<td>621</td>
</tr>
<tr>
<td>e) ET with Epidural</td>
<td>690</td>
</tr>
<tr>
<td>f) ET with Regional Blocks</td>
<td>112</td>
</tr>
<tr>
<td>g) Tracheostomy</td>
<td>39</td>
</tr>
<tr>
<td>h) ETT &amp; TT</td>
<td>57</td>
</tr>
<tr>
<td><strong>Regional Anesthesia</strong></td>
<td></td>
</tr>
<tr>
<td>a) SAB</td>
<td>107</td>
</tr>
<tr>
<td>b) Epidural</td>
<td>10</td>
</tr>
<tr>
<td>c) Combined Spinal Epidural</td>
<td>18</td>
</tr>
<tr>
<td>d) Nerve Blocks</td>
<td>16</td>
</tr>
<tr>
<td><strong>Double Lumen Tubes for VATS</strong></td>
<td></td>
</tr>
<tr>
<td>a) Pulmonary cases with Epidural</td>
<td>24</td>
</tr>
<tr>
<td>b) Pulmonary cases without Epidural</td>
<td>31</td>
</tr>
<tr>
<td>c) Trans Thoracic Esophagectomy</td>
<td>26</td>
</tr>
<tr>
<td>Central Lines</td>
<td>71</td>
</tr>
<tr>
<td>Arterial Lines</td>
<td>57</td>
</tr>
<tr>
<td>HIPEC</td>
<td>18</td>
</tr>
<tr>
<td>Pediatric cases (Major OT)</td>
<td>69</td>
</tr>
<tr>
<td>Major Vascular Procedures</td>
<td>5</td>
</tr>
<tr>
<td><strong>IORT</strong></td>
<td></td>
</tr>
<tr>
<td>a) ICA</td>
<td>883</td>
</tr>
<tr>
<td>b) Major</td>
<td>550</td>
</tr>
<tr>
<td>USG Guided procedures</td>
<td>107</td>
</tr>
<tr>
<td>Non-operating Room Anesthesia</td>
<td>85</td>
</tr>
<tr>
<td>Elective Post OP Ventilation</td>
<td>43</td>
</tr>
<tr>
<td>Interventional Chronic Pain Procedures</td>
<td>13</td>
</tr>
<tr>
<td><strong>Main Institute</strong></td>
<td></td>
</tr>
<tr>
<td>a) Minor Gynecology Procedures</td>
<td>164</td>
</tr>
<tr>
<td>b) Pediatric Minor Procedures</td>
<td>400</td>
</tr>
</tbody>
</table>

**Ultra sound guided procedures in OT** : 107

**Chronic pain procedures**: 13
- Nerve blocks (usg guided) - 4
- Alcoholic neurolysis (fluor guided) - 2
- Epidural steroid administration - 2
- Systemic desensitisation - 1
Radiology cases – 84
- CT guided biopsy - 58
- Nuclear medicine - 9
- MRI - 13
- RF ablation under GA - 4

Procedures in endoscopy room - 22
- PCN - 5
- PTBD - 16
- ERCP - 1
- Colonoscopy - 2
- Bronchoscopy with Laser - 2

Radiotherapy (IORT) - 942
- Selectron (ICA) - 888
- External beam radiation for children - 3

Main Institute cases - 230
Gynecology - D&C, Cone BX — 164
Paediatric ward procedures : 400

Major cases
- HIPEC (Hyperthermic intra peritoneal chemotherapy) - 18
- ASA emergencies - 43
- ASA IV emergency - 1
- Vascular reconstruction - 1
- Awake fibro-optic intubation - 18
- One lung ventilation - 74
- VATS Esophagectomies - 31
- Continuous cardiac output monitoring - 22

OP cases
- PAC - 5308
- Review cases - 2132
- New - 3176

Intensive care procedures
- Ventilatory support - 112
- Central line placement - 16
- Arterial line placement - 9

Completed projects
“Ethnicity and Upper Airway Measurements : A Study in South Indian Population” Dr Kalpana Balakrishnan, Dr C Punitha Submitted for publication.
Future projects

- “Perioperative Management of patients undergoing Colorectal surgery using the ERAS protocol.” - Dr. Kalpana Balakrishnan, Dr Nivedhyaa.S
- “Ultrasonographic Assessment of Diaphragmatic function as a predictor of Postoperative Pulmonary Complication following Upper GI surgery.” – Dr. Kalpana Balakrishnan Dr. Prasannavani.

Lectures

- Dr. Punitha, Dr.Thendral & Dr.Shubha attended “Ultrablock” usg workshop conducted by difficult airway society in August.
- Dr. Thendral & Dr.Shubha attended a workshop and conference on Interventional perioperative sonography in February.
- Dr.Kalpana, Dr.Meenakshi, Dr.Punitha, Dr.Sridevi attended the AIAOPA in March
- Dr.Shubha passed part one of Indian diploma in regional anaesthesia
- Dr.Prasanna Vani attended the RACE 2017 at Sri Ramachandra medical college, Obstetric anaesthesia conference at KGH, Chennai and passed the certificate course on health research fundamentals course of ICMR.

We did 18 cases of CRS with HIPEC. A new monitor EV 1000 was procured which has the capability of measuring Stroke volume variations and compute cardiac output from it with details of systemic vascular resistance and extra vascular lung water. This aids us in fluid therapy for prolonged cases with major volume loss.

PALLIATIVE CARE

Dr. Kalpana Balakrishnan, DNB  
HOD
Dr. Azar Husain, MD  
Consultant
Dr. Vijaya, MBBS  
Medical Officer
Dr. Thendral, DA
Dr. Meenakshi, MD
Dr. Nivedhya, MD
Dr. Prasanna, MD
Dr. Sri Devi, MD
Mr. Sathish Kumar, MSW, Social worker & PhD Scholar
Mrs. Divya, MSc (Psy Nurse), Staff Nurse
Mrs. Maheshwari, ANM
Cases seen in out-patient department

New cases  832
Review cases  894
Ward visits  366
Home visits  404
Bereavement visits  70
Total procedures done for pain  46
Total = 2612

Ongoing Projects

“Palliative care services in Tamil Nadu and Unmet needs of advanced cancer patients, caregivers, and health care professionals – An exploratory study”. study by Mr. Sathish Kumar for his PhD.

Academic Programs

- Successfully completed IAPC Courses in June and November.
- Dr. Meenakshi attended the train the trainers EPEC (education in palliative care and EOL Care) in February.

Lecture

- “Quality of death in advanced cancer patients and bereavement support to their family members during home visits in the neighbourhood of Chennai” presented by Dr. Vijaya, Medical Officer at IAPC Conference 2017, Coimbatore.
- “An analysis of referral pattern to Palliative clinic” presented by Mrs. Divya, Staff Nurse at IAPC conference 2017, Coimbatore.
- Dr. Therndral Edwin - Different models of palliative care - Institutional Model.
- Dr. Kalpana Balakrishnan Chaired the workshop on different models of palliative care and “Concepts of Palliative care” in Empower 2016 at Stanley medical college in September

Workshop

On the occasion of World Hospice & Palliative Care Day, we conducted TEAM” (Together Everyone Achieve More) program on 15th October, 2016. We discussed about the palliative care and home care services offered by the Institute and enlightened the needs of the patients and requested the NGO’s to help the needy. Finally we had a tie up 14 different NGO’s around Chennai.

Departmental Events

- TEAM workshop on the occasion of WHPCC
- Conducted IAPC certificate course in June and November. 10 students attended in June and 13 in November.
MOLECULAR ONCOLOGY

Dr. T. Rajkumar, MD., DM., PhD., DSc., D.Sc [Hon Causa], FAMS - Professor and Head
Dr K Sabitha Ph.D. - Associate Professor
Dr. G. Gopal Ph.D. - Associate Professor
Dr. Samson Mani Ph.D - Assistant Professor
Dr. R Balaji Ph.D - Assistant Professor
Dr Priya R Ph.D - Senior Lecturer
Dr. Mayilvahanan Bose M.Phil., Ph.D - Lecturer
Dr. U. Mahalingaraja M.Phil., Ph.D - Lecturer
Mrs. B Meenakumari M.Sc - Scientific Assistant
Mr. S. Jayavelu M.Sc., M.Phil - Scientific Assistant
Mr. P. Muthu BBA DMLT - Lab Assistant

DST R & D Staff
Ms. T. Sangeetha M.Sc - Lab Technologist
Ms. E. Anitha B.Tech - Lab Technician

Post doctoral fellow
Dr. A K Deva Magendhra Rao Ph.D - Research Associate

Senior Research Fellow
Mrs. Valliyammai N. M.Sc
Mrs. Amudha Periasamy M.Tech
Ms. Hemavathi Dhandapani M.Sc
Ms. Hascitha Jaikumar M.Sc
Ms. T. V. Krishnapriya M.Sc., M.Phil
Ms. Pavithra Dhayalan M.Tech
Ms. N. Aparna M.Tech

Junior Research Fellow
Ms. Aarthi Raghu M.Tech
Ms. Prarthana G. M.Sc
Ms. Amritha Sathyanarayanan M.Sc
Ms. R. P. Oviya B. Tech M.S (By research)
Mr. V. R. Arvinden M.Sc
Ms. Abirami S M.Sc
No. of samples analyzed for BCR – ABL Qualitative testing : n=125
No. of samples analyzed for BCR – ABL Qualitative testing : n=746
No. of samples analyzed for EWS-FLI testing : n=10

Mutation analysis for BRCA1, BRCA2 and Tp53 genes

Molecular diagnostic unit (MDU) is providing service for mutation analysis in BRCA1, BRCA2 and Tp53 genes using Ion torrent PGM next generation sequencing system. Till date MDU has analysed 200 breast cancer patients, of which 7.5% of the patients had deleterious and unknown significant mutations in any one of the genes.

Completed projects

In vivo assessment of toxicity and efficacy of MPP hydrochloride and Epigallocatechin-gallate in Cervical Cancer A number of epidemiological evidences indicate that, repeated parity and chronic oral contraceptive usage are the major life style observations that are speculated to be one of the factors responsible for increasing cervical cancer risk. With a recent increase of knowledge in this field, Selective Estrogen Receptor Modulators are considered to be suggestive as potential therapeutic options. Hence, two compounds are taken into consideration to test this hypothesis. MPP is a specific antagonist of ERα and show 200 times more selectivity to ERα than ERβ. The behavior of this specific standard compound was compared with a non-specific natural compound, EGCG. EGCG was known to act through a variety of mechanisms and basically functions as an antioxidant and works by cleaving free radicals. EGCG has proven anti-tumour activity in several diverse cancer cell lines through a variety of pathways and also known to inhibit ERα expression. But this inhibition potential through ERα still not well established. A variety of studies were carried out to understand the basic dosing, pharmacokinetics, toxicology assessment, followed by establishment of in vivo proof of concept to inhibit endogenous ERα. This project has been completed with an important clue that hormone dependant cervical cancers are responsive to ERα specific inhibitors in heterotrophic cervical cancer xenografts as an in vivo model.

Ongoing projects

(1) Efficacy of peptide targeting and functional studies on the fusion region of ews-fl1 chimeric protein and characterization of anti-cd99 monoclonal antibody”.

Ewing’s sarcoma Family of Tumors (ESFT’s) are undifferentiated tumors that can occur anywhere in the body, most often in the second and third decade of life. ESFTs often respond well to initial chemotherapy, yet 40% of patients will develop lethal recurrent diseases. ESFTs contains a well characterized chromosomal translocation the fuses the amino half of EWS to the carboxy half of an ETS family of DNA binding proteins. The most common fusion protein is the oncogenic transcription factor EWS-FLI1. Elimination of EWS-FLI1 through anti-sense and siRNA approach results in prolonged survival of ESFT xenograft bearing mice, but this approach lacks translation to clinical therapy. As EWS-FLI1 lacks intrinsic enzymatic activity, small molecules or peptides directed towards the disruption of EWS-FLI1 from established transcription complexes would be an effective strategy to treat Ewing’s sarcoma. In order to understand the role of the junction
region (a.a. 251-280) sequence of EWS-FLI1, which was previously shown to inhibit the tumorigenic properties of Ewing’s sarcoma cells, the amino acids corresponding to this region were introduced into Ewing’s sarcoma cells along with the TAT/NLS sequence and the resulting TAT/NLS/EWS-PEP effects were studied. The peptide sequence was found to localize into the nucleus and inhibited the growth properties of Ewing’s sarcoma cells. The peptide was found to interact with the EWS-FLI1 complex and GGAA nucleotide-protein complex known to contain EWS-FLI1 protein. nLC/MS/MS showed that the proteins uniquely present in the TAT/NLS/EWS-PEP peptide pull-downs were previously reported to potentially interact with EWS-FLI1 protein. For instance, one of the proteins identified in the pull-downs was Nucleophosmin (NPM) which is over expressed in various cancers. Based on our data we could potentially hypothesize that the binding of the peptide could disrupt the interaction of EWS-FLI1 with nucleophosmin or peptide’s interactions with nucleophosmin on its own effect the inhibition of tumorigenic properties of Ewing’s sarcoma cells. Monoclonal antibodies have been raised against CD99. The antibodies needs to be purified and further characterized using various techniques, before it can be used for targeting TAT/NLS/EWS peptide to the cancer cells in vivo.

(2) “A randomised controlled trial of neoadjuvant chemotherapy with fec vs concurrent chemo-radiation with fec in locally advanced breast cancer and identification of predictive biomarkers for pathologic complete response.”

Breast cancer is the most common cancer among urban Indian women and nearly 50% of the patients present with locally advanced cancers to the Institute. The standard treatment involves use of neo-adjuvant treatment which helps to downstage the tumour making it suitable for surgery. In the Institute, the pathologic complete response (pCR) rates following concurrent chemoradiotherapy is around 29% ; while with the use of neo-adjuvant chemotherapy alone, the pCR rates have ranged from 13 – 25% depending on the drugs used. Since most of the patients treated in the Institute are from the lower socio-economic group optimization of the treatment modalities is essential. To this end the project proposes to perform a randomized clinical trial to compare the clinical efficacy of neo-adjuvant chemotherapy as against neo-adjuvant concurrent chemoradiation in Locally Advanced Breast Cancer (LABC), and identification of predictive biomarkers using proteomic techniques which can help predict Pathologic Complete Response (pCR). A total of 94 patients have been enrolled into the trial in the two arms. Tissue samples were collected from each of the patient during the core needle biopsy. 5 patients in the concurrent chemoradiation arm and 1 patient in the chemotherapy arm have attained pathological complete response. Methods for the simultaneous estimation of the triple drug combination of FEC and their metabolites in the plasma of the patients have been standardized. Methods for Protein isolation from tissues, estimation and magnetic bead based fractionation of the isolated proteins have been standardized. The different beads fractionate proteins based on the following properties, Hydophobic interaction (HiC8), Ion exchange (WCX and SCX). For the quatitative proteomics, Isotope coded Protein labeling (ICPL) was used and the procedure was performed as per the manufacturer’s guidelines. The labeled proteins were digested using trypsin overnight and offline fractionation using High Performance Liquid Chromatography (HPLC) was done and the fraction were collected, pooled, dried and were analyzed by Liquid chromatography- Mass Spectrometry (LC-MS).

(3) “Mapping of protein-protein interactions of mitochondiral ribosomal small subunit proteins using affinity chromatography and mass spectrometry.”
The mitoribosome of mammals are 55-60S particles and are composed of small 28S and large 39S subunits. All of the Mitochondrial ribosomal proteins (MRP) are encoded by nuclear genes. Mutations or deficiencies of ribosome assembly proteins or other essential proteins were reported as potential candidates for several diseases including cancer. Though mammalian mitoribosomes have homologous counterparts in the bacterial ribosome there are considerable differences. In addition to losing some of the proteins found in bacterial ribosomes, it has lost nearly half the RNA present in bacterial ribosomes which have been compensated by an extra set of proteins acquired from nuclear genes. Despite their lower RNA content, they are actually larger than bacterial (Escherichia coli) ribosomes, both on the basis of particle mass and physical dimensions, because of all the additional proteins they contain. A very important aspect that has come to light is that some of the proteins of small 28S subunit appear to be bifunctional, endowed with extraribosomal functions. We propose to employ a platform which combines affinity pull downs using recombinant tagged proteins as baits and High-Throughput Mass Spectrometry analysis of complex protein mixtures to rapidly identify novel protein-protein interactions for MRP small subunit proteins. The 30 genes of MRPS protein family were cloned into GST-expression vector (pGEX-6P-3) and expressed in BL21 bacterial cells. The fusion proteins were purified by affinity chromatography using either fast protein liquid chromatography (FPLC) or by batch method using Glutathione-agarose beads. GST-pulldown analysis was performed for 15 genes (MRPS6, MRPS9, MRPS10, MRPS11, MRPS14, MRPS18B, MRPS23, MRPS27, MRPS28, MRPS31, MRPS33, MRPS35, MRPS37, MRPS38, and MRPS39). using the recombinant GST-MRPS proteins as bait and HEK293 whole cell lysates as anchor proteins. The pulldown fractions were being analyzed using LC/MS analysis. The interacting proteins are being used to construct protein-protein interaction network. Our aim is to assess whether these proteins can form part of cellular signaling networks to identify a potential role for MRPS genes in cancer.

(4) Identification of aberrantly expressed non-coding RNAs (LncRNA/microRNA) in early stage breast cancer

Non-coding RNAs have emerged as a novel class of gene regulators and are of potential diagnostic and prognostic significance. The non-coding RNA can be differentiated into long >200bp (long non-coding RNA) and short <30bp (eg: microRNA) based on the size of transcript. The deregulation of non-coding RNA has been implicated in many cancers including breast cancer that not only characterizes specific tumor phenotype but also involved in tumorigenesis and tumor progression. Both IncRNAs and miRNAs may either function as oncogenes or tumor suppressors depending on the effect they exert on their target gene. Therefore, identification of IncRNA/miRNAs and their targets would pave way in understanding the molecular mechanism associated with tumorigenesis and IncRNA/miRNAs may serve as biomarkers for tumor diagnosis and prognosis. In this study, early staged breast tumor tissues and paired normal tissues have been used to identify the differentially regulated IncRNAs and miRNAs through next generation sequencing (NGS) on Illumina Hiseq 2500 platform. The pipeline of bioinformatics analysis involve steps like adapter trimming, read assembly and alignment and differential expression analysis to identify statistically significant IncRNAs (i.e. Fold change >= 1.5 and <=-1.5 with p-value of 0.05). We have found 21 IncRNAs between tumors and paired normal samples and 30 IncRNAs between DCIS and apparent normal that are differentially expressed. We have further converged on 9 upregulated and 10 downregulated IncRNAs that are statistically significant and common to the compared groups. These IncRNAs are being validated in 100
tumor and normal tissues using Taqman gene expression assays to confirm the differential expression status. Also functional studies on these IncRNAs will be carried out by gene silencing and editing methods using breast cancer cell lines to elucidate their mechanism of gene regulation. In the same set of breast tissues used for NGS analysis, miRNAs were isolated by enrichment and RNA sequencing has been completed. Bioinformatic analysis is being carried out to identify the dysregulated miRNAs.

(5) Identification of small molecule inhibitors for Synovial Sarcoma fusion proteins (SYT-SSX1 & SYT-SSX2) by In silico, In vitro & In vivo studies.

Top most compounds were selected based on computational analysis such as Glide score, Glide energy and hydrogen bond interaction and the best nine (n=9) hit compounds were selected for in vitro studies. The nine synthetic compounds were procured from vendor SPECS (Netherland) and reconstituted in DMSO. The compounds were screened in synovial sarcoma cell lines such as YAMATO and ASKA in 4 time points such as 24hours,48 hours, 72 hours and 96 hours. The compound SYT-SSX1 V showed toxicity to the synovial sarcoma cell lines and then further screened in normal cell line HEK293 and other sarcoma cell lines such as 143B and A673 to check their specificity. We found that compound SYT-SSX1V was more toxic in synovial sarcoma than other sarcoma and normal cell lines. Following the hit screening, the LD50 toxicity was performed using 4 to 6 weeks old female BALB/c mice. The main test was carried out as per the directions of dose limits specified by the software OECD.425 as; with doses of 2000, 550, 175 mg/kg body weight. The treated animals were observed for short and long- term adverse effects and sacrificed on day 14. From the acute toxicity study, it was inferred that the compound is well tolerated with a LD50 of 2000mg/kg/ oral route. No significant treatment related abnormalities were observed in the biochemical and hematological parameters.

(6) Understanding the role of 5hydroxymethylcytosine in breast cancer

Breast cancer is the most heterogeneous and common cancer among women worldwide. The molecular mechanism behind breast cancer development is not clearly understood, but is associated with the accumulation of genetic and epigenetic aberrations, leading to widespread gene-expression changes in breast cells. DNA methylation at cytosine’s 5th position is an important epigenetic DNA modification regulating various biological processes and their deregulation has also been implicated in carcinogenesis. 5-hydroxymethylcytosine (5Hmc) is the oxidative modification product of 5-methylcytosine (5mC) and is recognised as the sixth base of DNA. Oxidation of 5mC to 5Hmc by the ten-eleven translocation (TET) enzyme may play a role in cytosine demethylation. The functional consequence of the 5Hmc modification is still unclear. Like 5mC, 5hmC also contains binding proteins suggests its role additional to demethylation. There is an incomplete knowledge on locus specific enrichment pattern of 5Hmc in breast cancer. The marked difference in global 5Hmc levels observed between normal human tissues versus tumour could also reflect in differences to locus specific gene enrichment patterns of 5Hmc. Many studies on DNA methylation in many cancers have identified genes (both tumour suppressors and oncogenes), which are aberrantly methylated in tumours. In this study to address the potential biological significance of putative Cytosine: 5mCi5Hmc:C methylation/demethylation pathway, analysis of locus specific enrichment pattern along with global levels of 5Hmc and 5mC and correlating it with TET gene expression in the different stages of breast cancer becomes
mandatory in order to identify genes, which are enriched with 5HmC and 5mC content and to study the functional implication in tumorigenesis. We have compared the levels of 5hmC and 5mC in genomic DNA of breast tumor tissue with its paired normal, similar to other findings we also observe a significant loss of 5mC, 5hmC and TET 2 gene expression in tumor compared to its paired normal. Sequencing of methylated and hydroxy methylated region enriched DNA will provide information on locus specific changes and further validating the candidates provide us its role in the breast cancer. The below figure is a representation of sequencing saturation, coverage, annotated regions and differentially methylated / hydroxymethylated region.

(7) Role of Circulating Nucleic Acids in Breast Cancer

Liquid biopsy is a term used to describe non-invasive tests, which provide information about disease conditions through analysis of circulating nucleic acids and circulating tumour cells from peripheral blood samples. Tumours release nucleic acids into circulation due to cell death or by active release. This results in increase in levels of DNA, RNA and microRNA in the circulation. Biopsy of a tumour with intra- and inter-tumour heterogeneity does not provide a complete genetic picture of the tumour, as only a part of the tumour is tested. Furthermore, the diversity between primary tumours and metastatic tumours makes it difficult to highlight mutations, which can increase the metastatic ability of cancer cells. Circulating nucleic acids can be used as biomarkers for cancer patients when tumour tissue is not available. Circulating cell-free DNA has immense potential as a cancer biomarker. Inclusion of non-invasive cell-free DNA assays would be helpful in cancer diagnostics, assessing disease status, and monitoring treatment response. In this study, we will be doing a pilot evaluation of the use of cell-free DNA as a follow-up marker for assessment of breast cancer. Circulating miRNAs have some advantages as clinical markers compared with other forms of cell-free RNA, since they have a remarkable resistance to endogenous and exogenous ribonuclease activity, extreme pH conditions, and freeze–thaw cycles. Altered expression levels of circulating miRNAs are associated with pathological features of breast cancer. We will also evaluate levels of circulating microRNAs MiR-21, MiR-155, MiR-205, MiR-133a and non-coding MALAT1 RNA as prognostic and follow-up markers for breast cancer. We are currently studying expression of microRNAs MiR-21, MiR-155, MiR-205 and MiR-133a in presentation blood samples from breast cancer patients. The expression of these microRNAs will be measured in follow-up blood samples of these patients. MicroRNAs levels measured in plasma from healthy controls are used to establish a reference range. Comparison of circulating microRNA expression levels in presentation and follow-up patient samples will enable identification of circulating microRNAs as prognostic and follow up markers for breast cancer.

(8) Dendritic cell vaccines for cervical cancer

Dendritic cells (DCs) are the most potent antigen presenting cells which can mediate a firm cellular immune response by cross presenting HPV antigens to the adaptive immune system, resulting in tumor elimination. The Cancer Testis (CT) antigen family of proteins is aberrantly expressed in several tumours. One such protein – the Sperm associated antigen (SPAG)-9 protein was previously found to be aberrantly expressed in cervical cancers. We received rhSPAG9 from Dr. Anil Suri, NII, in March 2016, to prepare rhSPAG9 primed DCs. As standardised for tumour lysate primed DCs which was mentioned in our earlier report, we...
performed dosimetry experiments to arrive at the right dose of rhSPAG9 and evaluated their phenotypic and functional characteristics. Our studies identified 750ng/ml as being optimal in inducing phenotypically and functionally competent mature primed DCs. When we compared the rhSPAG9 primed DCs with the autologous tumour lysate primed DCs, both the matured DCs were equally good in phenotypic expression of HLA and co-stimulatory markers. In addition, both the primed DCs induced proliferation and secretion of IL12p40 and IFN\(\gamma\). Based on our phase I trial and our in vitro study results, in Jan 2017 we have initiated a phase II clinical trial which is a randomized double blind study in stage IIIIB cervical cancer and has three arms.

Arm I: conventional concurrent chemotheradiotherapy with placebo

Arm II: conventional concurrent chemotheradiotherapy with DCs primed with patients’ own whole tumour cell lysate

Arm III: conventional concurrent chemotheradiotherapy with DCs primed with recombinant rhSPAG9.

The above placebo and DC vaccines will be given intradermally. In each arm we plan to recruit 18 patients and hence a total of 54 patients will be included in our study. Each patient will receive up to 10 vaccinations over a period of eight months. Until April 2017, we have recruited 6 patients. The trial is ongoing and will be recruiting patients.

(9) Immune Dysfunction in Cervical cancer

Immune perturbation in cervical cancer has been widely reported; but the pathological interaction between tumor and immune cells within the tumor microenvironment which creates an immunosuppressive network promoting tumor growth, needs to be studied in order to tailor therapies accordingly. The role of the enzymes Indoleamine 2,3 dioxygenase (IDO 1 and 2) in immunosuppression at the tissue level has not been studied so far. The study has so far measured the levels of the aminoacid- tryptophan and its metabolite kynurenine as surrogate markers for the enzyme activity. IDO (1 and 2) expression at the RNA level in 65 cervical punch biopsy tissues has been completed so far. IDO1 mRNA levels were upregulated and IDO2A were downregulated in cervical cancer patients compared to normal cervix. Flow cytometry panel for analysing tumor and infiltrating cell status and IDO expression has also been optimized and analysed in 80 patients tumor samples. Expression Immunosuppressive cells like T regulatory cells and tumor associated macrophages were high in patients sample when compared to normals. A reversal of CD4/CD8 ratio has been observed in most of the patient’s sample. The goal of the study is to identify the clinical significance of the immunosuppressive infiltrating cells with respect to complete response (CR), disease free survival (DFS) and overall survival (OS) until the completion of study.

(10) Biomarkers for early diagnosis of ovarian cancer

We employed TMT-based quantitative proteomic approach to identify differentially expressed proteins in plasma of patients with ovarian serous adenocarcinoma. Plasma samples from patients with ovarian serous adenocarcinoma and healthy volunteers were depleted of 14 high abundant proteins, labelled with TMT reagents and fractionated by C18 basic RPLC. LC-MS analysis mass spectrometry led to the acquisition of 2,15,587 MS/MS spectra from set1 and 1,93,656 spectra from set2. The schematic of the work flow is shown in Figure 6. MS/MS search
against Human RefSeq 65 database using Mascot and SequestHT search algorithms led to the identification of 55,386 peptides in set1 and 92,492 peptides in set2 corresponding to total of 3,163 proteins. A total of 552 proteins were identified to be differentially regulated of which 483 were up-regulated (TMT ratios of \( \geq 1.7 \)) and 69 were down-regulated (TMT ratios of \( \leq 0.5 \)) in minimum 4 samples out of 7. We then proceeded to validate the dysregulated proteins from LCMS analysis in the serous ovarian cancer plasma samples (n=77) and healthy control plasma samples (n=157). We used the Quantibody array, which is based on the principle of sandwich ELISA to determine the protein levels of 21 cytokines, chemokines and growth factors. The Median values and the Range of the levels are given in Table 2. CA125 median levels were found to be higher in tumours compared to the levels in normal. IGFBP2, SPP1/OPN, ICAM1, CystatinC, and LYVE1 levels also increased in tumours compared to normal. CA125 \( (p=0) \), IGFBP2 \( (p=0.00022) \), SPP1/OPN \( (p=0.00988) \), ICAM1 \( (p=0.01552) \), CystatinC \( (p=0.0088) \), and LYVE1 \( (p=0.01596) \) levels were significantly different (Mann Whitney U test) between tumours versus normal. We next proceeded to validate the dysregulated proteins from Quantibody array analysis in the ovarian cancer plasma samples which included serous, mucinous, clear cell, germ cell tumor (n=138) and age matched healthy control plasma samples (n=137). We also included benign samples in this validation phase. We selected nine proteins for validation using standard ELISA method. These proteins were selected based on the multivariate analysis of Quantibody array data. These proteins showed distinct expression change in serous ovarian cancer compared to healthy control. A five marker panel consisting of CA125+SPP1+IGFBP2+ADIPSIN+TSP1 was found to have better sensitivity and specificity compared to CA125 alone.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Model</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CA125</td>
<td>63.56%</td>
<td>94.16%</td>
</tr>
<tr>
<td>2</td>
<td>CA125+IGFBP2+SPP1+TSP1+ADI</td>
<td>82.20%</td>
<td>91.24%</td>
</tr>
<tr>
<td>3</td>
<td>CA125+IGFBP2+SPP1+TSP1</td>
<td>84.75%</td>
<td>90.51%</td>
</tr>
<tr>
<td>4</td>
<td>CA125+IGFBP2</td>
<td>83.90%</td>
<td>88.32%</td>
</tr>
</tbody>
</table>

A patent was filed titled “Biomarkers for early diagnosis of ovarian cancer”. [Application number 201741011879]. This is the 3rd patent application from the Department.

(11) Mutation analysis in hereditary cancers using NGS

Next-Generation Sequencing (NGS), a fundamentally different approach to sequencing that triggered numerous ground-breaking discoveries and ignited a revolution in genomic science. NGS provides a high degree of flexibility for the level of resolution required for a given experiment. A sequencing run can be tailored to produce more or less data, zoom in with high resolution on particular regions of the genome, or provide a more expensive view with lower resolution. We did the mutation analysis in hereditary cancer cases by NGS approach for the known genes associated with hereditary cancers [such as BRCA1, BRCA2, TP53, MSH2, MLH1, PTEN, STK11, VHL etc] as well as genes involved in DNA repair mechanism. Initially 30 genes were studied by targeted resequencing and then this was increased to 56 genes. So far we have done targeted resequencing analysis for 519 hereditary cancer cases, which includes 346 hereditary breast and ovarian cancer cases (HBOC), 112 hereditary colorectal cancer cases (including HNPCC, FAP etc), 32 cases of VHL, Pheochromocytoma, Ganglioneuromas and 30 of other hereditary cancer cases.
Results: Table showing total number of samples analyzed using NGS and targeted re-sequencing

<table>
<thead>
<tr>
<th>No of Samples</th>
<th>HBOC</th>
<th>Colorectal &amp; Lynch syndrome</th>
<th>VHL/Phaeo chromocytoma</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>519</td>
<td>346</td>
<td>112</td>
<td>32</td>
</tr>
<tr>
<td>Deleterious Mutations</td>
<td>164</td>
<td>108</td>
<td>31</td>
<td>18</td>
</tr>
</tbody>
</table>

Most common mutation seen in HBC/HBOC/HOC

Between 2002-2012, mutation analysis was done using PCR-dHPLC and this was restricted to BRCA1 and BRCA2 for the HBC/HBOC/HOC cancers. Including the samples analyzed using PCR-dHPLC, we have a total of 408 families/patients who were studied. The details are given below:

- Total number of HBC/HBOC studied = 408
- No: of deleterious mutations detected = 129**[^#] [32%]
- BRCA1, BRCA2 = 93**[^#]
- BRCA1 = 66
- BRCA2 = 27
- p53 = 8^[^]
- RAD50 = 2
- RAD52 = 2
- ATM = 2
- ATR = 5
- RAD51C = 1
- NBN = 1
- TP53BP1 = 3^[^]
- MSH2 = 1
- MSH6 = 3^[#]
- SMC1A = 1
- PMS1 = 1
- FANCA = 1
- ERCC2 = 1
- PALB2 = 1
- WT1 = 1
- BARD1 = 1
*- One patient had BRCA2 and a TP53BP1 deleterious mutation; another had BRCA2 and TP53 mutation; one had BRCA1 and MSH6 deleterious mutations. Additional patients had the low risk allele BRCA2 K3326X

The most common deleterious mutation seen in our hereditary breast/ovarian cancers is the BRCA1: NM_007294.3: c.68_69del; p.Glu23Valfs*17 mutation. This is also called as Ashkenazi Mutation seen commonly in Jews. However, in our population this is not a founder mutation. Of the 93 BRCA1 and BRCA2 mutations seen, 26 were the BRCA1: NM_007294.3: c.68_69del; p.Glu23Valfs*17 mutation as shown below.

No: of BRCA1/BRCA2 mutations = 93 [BRCA1 66; BRCA2 27]
No: of Ashkenazi mutations = 26
% of Ashkenazi mutations in BRCA1 = 26/66 [39%]
% of Ashkenazi mutations in BRCA1/2 = 26/93 [28%]

Eight of the 26 mutations were seen in women with no family history of cancer. Additionally, the patients are from different ethnic groups/caste/religion etc. indicating that it is unlikely to be a founder mutation. Haplotype analysis done on some samples in ACTREC indicated that they are not founder mutation as well.

In view of the fact that nearly 40% of all BRCA1 mutation positive patients have the so called Ashkenazi mutation, it is proposed to look for this mutation first in patient’s sample and if negative, then do the full spectrum targeted re-sequencing. This will make it cost-effective and also provide the results in 2 days.

(12) National network program on lichens: Bioprospecting its secondary compounds and establishing cultures and collections

As part of the national network program on lichens, 62 extracts were obtained by Cancer Institute. These were to be screened for their anti-cancer activity according to NCI protocol in three cancer cell lines [breast cancer, lung cancer and glioblastoma]. In addition, two control cell lines [one immortalized fibroblast and the other a immortalized keratinocyte cell line]. A total of 62 extracts were screened for their anti-cancer activity by Cancer Institute, Chennai. Out of these 62 extracts, 39 of them did not show any anti-cancer activity even at the highest concentration of 100µg/ml and 16 other extracts showed non-specific activity ie they suppressed the growth of both cancer as well as control cells at concentration between 10-100µg/ml. Hence these 55 extracts (39+16) are being excluded from the study (“no go basket”). Seven extracts exhibits differential toxicity at concentration between 20-60µg/ml in one or two cancer cell lines without inhibiting the growth of control cells at that specific concentration. The priority for taking the extracts for further analysis is as follows:

Rank 1: MSSRF/L8/Se1
Rank 2: MSSRF/L10/Se1
Rank 3: ARI/L2A/Se1
Rank 4: NBRI/L10/Se1
Rank 5: NBRI/L1A/Ha1
Rank 6: NBRI/L4/Ha1
Rank 7: ARI/L5A/Se1 and ARI/L5/Se1 [duplicates]
(13) Validation of potential biomarkers for early diagnosis of breast cancer

The main objective of this work is to conduct a case-control study with regard to identifying potential plasma-based diagnostic and follow-up biomarkers for breast cancer. A Case-Control Study will be performed to validate the levels of 15 proteins (previously identified in breast tumour tissue samples by DNA microarray and confirmed by Quantibody array) in plasma samples from breast cancer patients and healthy individuals using Quantibody array. We have collected blood samples from 200 patients diagnosed with breast cancer (HPE confirmed cases) and 200 age-matched controls after prior informed consent. Additionally, 36 patients with surgically confirmed benign breast disease were also recruited. Apart from this, blood samples were also collected from 50 breast cancer patients, who have undergone initial surgery followed by adjuvant therapy and 50 patients with locally advanced breast cancer, who have undergone initial neo-adjuvant treatment followed by surgery. Samples were collected at presentation and after completion of each treatment module. A detailed questionnaire encompassing personal history, lifestyle and dietary practices was obtained at the time of recruitment. Currently, we have analyzed the levels of 15 proteins in 50 cases and 50 controls. The patients recruited under the categories of adjuvant therapy and neo-adjuvant therapy are being followed up and samples will be collected for analysis, if they have a relapse during their annual follow-up investigations.

(14) Comparison of aetiopathogenesis of gastric cancer in Tripura and South India with validation of biomarkers for early diagnosis.

Aim of the project is (i) to conduct a case-control study to study the aetio-pathogenesis of gastric cancer in 200 biopsy proven cases and 400 controls (age and gender matched with cases), (ii) to study the role of SNPs –TGFB C509T, TGFB T869C, XRCC1 Arg 194 Trp, IL4 C590T and IKBa C642T in gastric cancer risk and (iii) to evaluate the concentration of 15 Proteins (Adipsin, ENA78, EPCAM, IL8, IP10, MIG, MIP1a, MIP1B, MIP3A, MMP3, Pepsinogen 1, Pepsinogen 2, OPN, TIMP1, PDGFRB) in cases and controls to identify a potent biomarker. Peripheral blood of 10 ml was collected from 200 cases and 400 controls after an interview with the subjects about their lifestyle, dietary habits using a structured questionnaire and informed consent. Univariate and multivariate analysis for the lifestyle and dietary factors showed significant association with gastric cancer risk for some of the factors. Taqman allelic discrimination assay was performed for DNA isolated from the lymphocytes of all the samples and statistical analysis revealed that no significant association was observed with gastric cancer risk. Quantibody array was performed for all 200 cases and 400 controls for 15 proteins out of which 8 proteins were found to have significant difference in its concentration between cases and controls. Further validation experiment has to be carried out to identify proteins which can be used as biomarker for early diagnosis of gastric cancer.

(15) Validation of plasma biomarkers for follow-up in gastric cancer patients who undergo curative surgery

The objective of this study is to identify potential prognostic biomarkers for followup in gastric cancer. Under the Center of excellence project, in gastric cancers, we identified a set of 15 cytokine/chemokine/growth factor proteins to be differentially expressed in gastric cancer patient plasma. In 8 gastric cancer patients who underwent radical surgery, pre and post-operative blood samples were collected and the levels of these proteins were analysed using Quantibody arrays. The levels of several of these markers decreased in the post surgical period.
To further study the utility of these potential markers, we have selected 11 proteins which showed a concordant drop in the post surgical period. We have planned to analyse the levels of these markers in plasma samples from 100 gastric cancer patients at presentation and during their followup visits (a minimum of 4 followup samples will be collected). At present, we have collected blood samples from 70 gastric cancer patients, more patients are being enrolled and follow up samples are being collected. The results obtained from this study will be further validated in a fresh cohort of gastric cancer patient plasma samples.

Dr. T. Rajkumar has been nominated as a Member of the following committees

i. DBT Nanobiotechnology Task Force Committee
ii. DST SERB Project Advisory Committee on Health Sciences Core-Member
iii. Member, Board of Research Studies, The TN Dr MGR Medical University.

Patents

Patent application - A patent was filed titled “Biomarkers for early diagnosis of ovarian cancer”. [Application number 201741011879]. This is the 3rd patent application from the Department.

Academics

Lectures

Dr. T. Rajkumar

- “Circulating tumor DNA in breast cancer” – in Molecular Pathology Conference in Tata Medical Centre, Kolkata in October.
- Dendritic cell vaccine for cervical cancer in ICRB Conference, SRM University in November.
- Precision Medicine – The Future in MMC, Chennai in November.
- Nanobiotechnology - A technology with immense potential but has it delivered? in the Nanobiotek conference in AIIMS, New Delhi in November.
- Panel discussion on “Establishing Cancer Genetic Services for affordable, actionable & timely genetic testing, cancer screening for those at high hereditary risk and the Ethical Legal & Social issues”. In ICGS conference in ACTREC, Navi Mumbai in December.
- Keynote lecture on “Germline genetic alterations and choice of systemic therapy” in ICGS conference in ACTREC, Navi Mumbai in December.
- “Identify the Cancer Story Hidden in Your Genes” in the International Conference on Genetic and Molecular Diagnostics in Modern Medicine, held at KIMS, Narketpally in December.
- Symposium lecture titled “Peptide-based targeting of Ewing’s sarcoma - A role for nano-formulations” in March
- Another lecture titled "Dendritic cell vaccine for cervical cancer - Cancer Institute [WIA] experience" in the Systems Oncology Conference at Cochin in March.
- Mr. Mukesh Poddar from BioRad gave a lecture on “Luminex technology and BioPlex platform” in November.
• Prof Jagat Kanwar, Faculty of Health, Geelong, Deakin University, gave lecture on Promises of Nanomedicine to target cancer and inflammation in February.

• Dr. N. Jeyakumar, M.Sc., Ph.D., (UK), Professor & Head, Dept. of Bioinformatics, Bharathiar University gave on lecture on “Data Mining and Text Mining Applications in Microarrays and Bioinformatics” in March.

Dr. Samson

• Attended an “Indo-UK workshop on Genomics medicine” at National Institute for research in tuberculosis, Chennai in November.

• “Second conference on Next Generation Sequencing” organized at CCMB, Hyderabad in February.

• Dr. Mayil vahanan Bose - “Biomarkers for early diagnosis and therapeutic target in cervical cancer” at UGC-NRCBS XXX Winter School on Advances in Molecular Diagnostic Techniques: Madurai Kamaraj University, in December.

• Dr. Sabitha R & Dr Priya R were invited to teach research methodology course work at the Rajiv Gandhi Center for Biotechnology, Trivandrum, Kerala in May, June & October.

• Dr. Priya R - “Cancer Immunotherapy - The Cutting Edge” Frontiers in Oncology CME programme conducted by the Department of Biochemistry, Saveetha Dental College and Hospitals, in December.

Dr. Sabitha R

• Attended “International Conference on Drug Discovery” conducted by Schrodinger at JNU, New Delhi in April.

• Training programme titled “Indian patenting, Filing procedure and Various proceeding of patent Act, Patent search & International patent filing procedure” conducted by RGNIPM, Nagpur in November.

• Invited to teach research methodology course work at ICAR-Central Institute of Fisheries Technology, Cochin in March.

Dr. R. Balaji

• Symposium on “Using High Quality Rodent Disease Models in Pharma R&D”, at Hyderabad in August.

• Received partial grant from NIH to attend “25th annual short course on experimental models of human cancer” and presenting a poster entitled “Molecular modeling and docking of small molecule Inhibitors against NEK2” in Barharbor, ME, USA in August.

• Mrs Meena Kumari & Ms. Aparna N - Attended 4 days workshop on “Methods in Molecular genetic analysis” at the 3rd Indian Cancer Genetics Conference and Workshop (ICGC 2016) at Advanced Centre for Treatment Research & Education in Cancer (ACTREC) Tata Memorial Centre, Navi Mumbai, India in December.

• R.P. Oviya - Attended Workshop on “High-Resolution Respirometry” held at CSIR-Centre for Cellular and Molecular Biology, Hyderabad jointly organized by CCMB, SMRM & OROBOROS in February.

• There was a Demonstration of AuthorCafe, An Authoring and Publishing Services Platform, by Mr. MV Bhaskar, Product Owner, AuthorCafe in March.

• Mr Pichaimuthu received “Nila Kavignar” award and title from “Nila Mutram” Tamil literary society in September.
Poster Presentation

- Mrs. Meena Kumari Poster entitled “Improving Mutation screening of Hereditary breast and/or Ovarian cancer Syndrome by Next generation sequencing” in 3rd Indian Cancer Genetics Conference and Workshop (ICGC 2016) at Advanced Centre for Treatment Research & Education in Cancer (ACTREC) Tata Memorial Centre, Navi Mumbai, India (Poster was selected for Oral Presentation) in December.

- Mrs. D. Pavithra - Received KINGCA Week 2016 & 6th APGCC Travel Grant for presenting poster titled “Identification of genetic polymorphisms for gastric cancer in South Indian population” at Korean International Gastric cancer week 2016, Seoul, Korea in April.

- Ms. Aparna N Poster titled “Identification of candidate genes in hereditary colorectal cancers by next generation sequencing in comparison to denaturing high performance liquid chromatography” at the 3rd Indian Cancer Genetics Conference and Workshop (ICGC 2016) at Advanced Centre for Treatment Research & Education in Cancer (ACTREC) Tata Memorial Centre, Navi Mumbai, India in December.


The Department of Molecular Oncology, Cancer Institute (WIA), conducted a “Hands on training in Liquid biopsy” with special emphasis on application of Next generation sequencing (NGS) in liquid biopsy. The five days hand on training workshop was provided to the participants from various academic institutions and research laboratories from the country in October.

Achievements

The Phase II dendritic cell vaccine clinical trial was inaugurated by Prof. G.K. Rath, Chief, B.R.A.IRCH, AIIMS and Director, National Cancer Institute, AIIMS, Jhajjar at the Cancer Institute (WIA), Dr. S. Krishnamurthi Campus auditorium in January. Dr. Anil Suri, Deputy Director, National Institute of Immunology and collaborator for the clinical trial addressed the gathering about his experience in bringing SPAG9 to the clinic.

New equipment installed

AKTA Start a Fast Protein Liquid Chromatographic system (FPLC system) from GE Life sciences for protein purification was installed.

International Fellows

- Dr. Laure Brigitte Kouitcheu Mabeku from Cameroon was awarded the C.V. Raman International Fellowship for African Researchers and was posted in the Molecular Oncology Department for training for 6 months.

- Ms. Tatsha Bholah Chandra from Mauritius was awarded the RTF-DCS Training Fellowship to undergo training in the Molecular Oncology Department for 6 months.

- Dr. Mary-Claire King - An American human geneticist and professor at the University of Washington, visited Molecular Oncology department and interacted with the faculty and students of the department in February.
PREVENTIVE ONCOLOGY (RESEARCH DIVISION)

Dr R Vijayalakshmi, M.Sc., Ph.D., Associate Professor & Laboratory – InCharge
Mrs A Kanchana B.Sc., DMLT., Laboratory Technician
Ms T Soundara Viveka M.Sc., Senior Research Fellow
Ms Pavitra Bimal Desai, M.S (Research), Germany Junior Research Fellow
Ms Latha Durai, M.S (Research) UK DST Women Scientist

Part Time PhD Scholars
Dr Vidya Rani Shyam Sundar, MDS
Dr Divyambika Srinivas, MDS

Project Assistant
Dr Divyambika Srinivas, MDS

High Risk Molecular Testing for HPV No of tests offered: 56
HLA Matching testing offered for Bone Marrow Transplant No of patients and donors tested: 55

Completed Project

Validation of the SNPs involved in promoting Genetic Susceptibility to Oral Cancer among long term tobacco chewers identified in the North Eastern Indian Population

India is the largest consumer of smokeless tobacco products, the single most important cause of high incidence of oral squamous cell carcinoma (OSCC). In Northeast India, incidence of tobacco-related OSCC was about 33%. This justifies studying the Northeast Indian population for identifying the potential causes of higher prevalence. Germline variants play crucial role in genetic susceptibility, prognosis, development and progression of OSCC. This study was undertaken to assess the potential germline variants, protective or risk, associated with tobacco-related OSCC along with the role of HPV in prolonged tobacco-chewers. The targeted re-sequencing of 170 target regions from 75 genes was done on 60 case-control samples (discovery set) in Ion-PGM™ platform. Furthermore, the result was validated and replicated in an independent 116 case-control samples (confirmation set) using the Sequenom iPLEX MassARRAY platform. Finally, estimation of population structure along with PCR-based HPV typing, followed by MLR, MDR and bioinformatics analysis were performed to identify significant SNPs.

Salient Findings: One NMD transcript variant, rs2237306 in DFNA5 region associated with Benzo(a)pyrene has emerged as protective (OR=0.33; :0.009) and four harmful (OR>2.5; p<0.05) intronic SNPs, rs182361, rs290974 and rs169724 in SYK and rs1670661 in NELL1 region involved in HPV-mediated oncogenesis were identified. Interestingly, two SNPs (rs182361 and rs1670661) were found to be common in both the types of oral cancer. Moreover, the identified SNPs present in SYK region were in complete linkage disequilibrium (D’ = 1) and co-represented (r2 > 0.8). The heterogeneous study samples were clustered into the five major language families as Indo-Aryan, Austro-Asiatic, Sino-Tibetan, Kuki-Chin and Tibeto-Burman thus, the population structure was estimated. Based on this knowledge, MLR analysis was performed to assess the
risk of the factors considered in this study. MLR analysis showed HPV18 conferred 12.63-fold more risk of tobacco-related OSCC. Apart from these physical factors, a significant 3.58-fold increased risk of tobacco-related OSCC was observed in the case of risk-allele-containing genotypes CA+CC of rs2237306 as compared to homozygous AA genotype. In addition, the risk-allele-containing genotypes TC+CC of rs1670661 were found to be associated with 6.57-folds and 2.67-folds more risk of tobacco as well as non-tobacco related OSCC respectively, and heterozygous TC genotype was found to be associated with 6.33-folds more risk of tobacco-related OSCC as compared to homozygous TT genotype. This result reconfirmed that the variant rs1670661 from NELL1 region associated with both the types of OSCC. However, the variants rs2237306 from DFNA5 region was associated with tobacco-related OSCC and the variant rs182361 from SYK region was associated with non-tobacco-related OSCC. MDR analysis suggested interactions among HPV, rs1670661 along with age and gender increased the risk of both the types of OSCC. This approach will help in predicting the population-specific significant SNPs associated with tobacco-related OSCC in any heterogeneous populations. The publication of this work is under peer review.

Ongoing Project

1. Study of Molecular Markers for Oral Tongue Squamous Cell carcinoma

Oral Tongue Squamous cell carcinoma (OTSCC), the most frequently affected oral cancer subsite, is associated with a poor therapeutic outcome and survival despite aggressive multi-modality management. Till date, there are no established biomarkers to indicate prognosis and outcome in patients presenting with tongue cancer. There is an urgent need for reliable molecular prognostic factors to enable identification of patients with high risk of recurrence and treatment failure in OTSCC management. In this study we propose to derive a comprehensive molecular portrait of tongue cancer biology.

Salient Findings: We have completed the meta-analysis of OTSCC microarray based gene expression profiles studying 5 gene expression profiling data sets available on exclusively oral tongue subsite comprising of sample size; n=190, consisting of 111 tumors and 79 normals. We have derived the relevant genes and pathways which can be pursued further to derive novel, tailored therapeutics as well as for prognostication. The meta-analysis results showed 2405 genes differentially regulated comparing OTSCC tumor and normal. The top up regulated genes were found to be involved in Extracellular matrix degradation (ECM) and Epithelial to mesenchymal transition (EMT) pathways. The top down regulated genes were found to be involved in detoxication pathways. Prospectively, we have completed comprehensive genetic analysis of gingivo-buccal and tongue squamous cell carcinomas identifying both common and distinct pathways by exome and transcriptome sequencing. The prospective study has been done on patients diagnosed with gingivo-buccal (n= 15) and tongue (n=12) squamous cell carcinomas. Targeted exome sequencing revealed frequent and common mutations in TP53, PIK3CA, NOTCH1 and CDKN2A genes in both subtypes. Truncation mutations in the CASP8 gene correlated with tobacco use. Patients with TP53 gene mutations also had increased copy number of the CCND1 gene (Ch 11q). 80% of buccal tumors and 81% alcohol abusing patients had deleterious truncation mutations. RNA expression analysis revealed enrichment of pathways in tongue carcinomas related to neutrophil degranulation and extracellular matrix degradation, with
overexpression of several MMP genes. MMP12 expression was specifically higher in tongue cancer patients who were tobacco smokers. This was a confirmation of our meta-analysis results. The collagen degradation pathway was enriched in buccal carcinomas where both MAP-kinase and PI3K-AKT pathways were enriched. Based on RNA expression, we predict that buccal carcinomas are likely to elicit an immune response via MHC class 1 peptide presentation, while tongue carcinoma patients could respond to both MHC class 1 and MHC class 2 loaded peptides thereby offering a wider range of therapeutic options. Our findings offer new areas to gain a better understanding of the biologic basis of oral cancers which could open new avenues for the exploration and development of new therapies.

2. Study of BRAF mutations and promoter methylation of genes associated in Thyroid Cancers pertaining to its role in modulating Radioablation by 131 I by Invitro and Invivo studies

The mainstay of current medical treatment for Thyroid Cancers after thyroidectomy is radioiodine ablation therapy. The radioablation success is affected by factors like absorption and transport of radioiodine to the thyroid cells, Sodium Iodide Symporter (NIS) expression heterogeneity, radiosensitivity of the thyroid cell, residual tissue etc. All these are related to the presence of the BRAF mutation and the epigenetic modifications associated with the disease progression. Clinicopathological risk factors like extrathyroidal invasion, lymph node metastasis and advanced stages most reliably predict thyroid cancer progression, recurrence, aggressiveness leading to higher morbidity and mortality. Interestingly, BRAF mutation is most commonly associated with these risk factors. Various genes involved in the control of cell proliferation and invasion as well as genes specific for thyroid differentiation are epigenetically silenced in thyroid cancer. This study aims to understand the role of methylation of genes in the presence and absence of BRAF mutations, to modulate the treatment using radioiodine 131 I in thyroid cell line models.

Salient Findings: Four different thyroid cell lines N-Thy, T238, SW1736 and OGKM were treated with varying concentrations of the drug Vemurafenib. Following the drug treatment, MTT assay was performed in order to determine the IC-50 value of the drug. Literature reports reveal the IC-50 value for the drug to be around 50 to 100 nM depending on the cell line. We found resistance to Vemurafenib even at 100 µM drug concentration. It shows that there is a need of testing other compounds in the presence of BRAF mutation to improve the cell kill and we propose to use compound Berberin, and determine its effect on the previously mentioned cell lines. Additional to the MTT assay, we performed promoter methylation studies to determine if the promoters of the genes that are involved in the thyroid metabolism (NIS, TSHR and FOXE1) were methylated. For that purpose, we isolated genomic DNA from the thyroid cell lines and performed bisulfite conversion followed by methylation specific PCRs. We observed that the methylation status of the three genes varied across the different cell lines. NIS was completely methylated in N-Thy and T238 cell lines whereas in SW1736 NIS seems to be hemi-methylated and unmethylated in OGKM cell lines. TSHR and FOXE1 were hemi-methylated in all cell lines. Further experiments to confirm the observed data is underway. We plan to treat the cell lines with 5-Aza cytidine to reverse the process of methylation and test if Berberin can be used as an alternative treatment option for patients with thyroid cancer and for that purpose we will determine its cytotoxic effects on the various thyroid cancer cell lines, its role in the methylation of the thyroid metabolism genes and radioiodine uptake will be assessed shortly.
3. Identification of prevalence of BRAF mutations in papillary thyroid cancers from Indian Population

With improved diagnostics, papillary thyroid cancer (PTC) is more frequently diagnosed. Though the well differentiated PTC is relatively indolent and highly curable, well differentiated PTC can become poorly differentiated and become resistant to conventional therapies. BRAF mutation has been demonstrated as poor prognostic indicator for persistence of the disease independent from other clinical pathological features in low risk intrathyroid PTC patients. This retrospective study aims to evaluate BRAF mutation in PTC by real time PCR and immunohistochemisty to study its prevalence in our series of cases. We have completed qPCR based BRAF mutation detection from FFPE samples along with Immunohistochemistry for BRAF.

Salient Findings: Patients who were managed for well differentiated thyroid cancers during 2005-2006 were included in the study. BRAF V600E mutation analysis was done by real time PCR after extracting genomic DNA from the representative archived formalin fixed paraffin embedded tumor tissue. Of the 79 patients of well differentiated thyroid cancers included in the study, 31% harbored BRAF V600E mutation; the mutation prevalence was 39.6% in the cohort of conventional PTCs. Our study emphatically states that BRAF V600E mutation status is a significant predictor of adverse outcomes in patients with conventional PTCs. Our study further suggests a possible risk stratified approach using age, BRAF V600E mutation status and extra thyroidal spread can be used to personalize the management of patients with conventional PTCs. The result of our study adds to the growing consensus that BRAF V600E mutational status should be analyzed in correlation with other molecular and clinico-pathological prognostic factors for a better risk stratification.

Additionally, we have evaluated the high fidelity of the RM8 antibody specific for the BRAF V600E and compared its accuracy with the current gold standard for detection of BRAF V600E mutation by PCR. All the tissues were assessed by hematoxylene and eosin staining to ensure the presence of tumour and was evaluated by qualified surgical pathologist who was blinded to the results of the qPCR. Mutant BRAF V600E antibody was studied in 79 tissue sections. Optimization of the staining was done using the antibody on melanoma sections known to harbour BRAF V600E mutation (as shown by qPCR) and this was used as a positive control. Of the 22 BRAF V600E positive (27.8%) patients, BRAF staining was moderate in 11 (50%), strong in 9 (40%) and very strong in 2(9%) of sections stained. There was a statistically significant concordance (p=0.000) between the qPCR for BRAF mutant taken as standard as compared to the IHC staining (kappa=0.881) Further, the receiver operating characteristics (ROC) curves showed that IHC can be used as a comparable standard to the qPCR, the highest possible sensitivity of 95% and specificity of 93.4% could be achieved by considering the cytoplasmic positivity of greater than 25% of cells with moderate to strong intensity (AUC=0.911). We find IHC using RM8 antibody for detection of the BRAF V600E mutant protein expression in well differentiated thyroid cancers showing an acceptable sensitivity and specificity. Further, this approach may be a practical as well as a cost effective strategy, which may help guide the treating clinician in the management of well differentiated thyroid cancers.
4. Targetting cAMP dependent CREB signalling in lung cancers harboring mutant KRAS

Oncogenic mutations in KRAS occurs in 15%-30% of non-small cell lung cancer (NSCLC). Despite decades of intensive research, there is still no direct KRAS inhibitor with clinically proven efficacy.

Lung

Cancers harboring mutant forms of KRAS pose a significant therapeutic challenge due to treatment resistance and poor prognosis. Direct pharmacologic targeting of activated KRAS mutant protein has been unsuccessful so far, thus we are working on alternative approaches to block KRAS activation signaling pathway. We have engineered a mammalian transgene control device with a synthetic gene network design. This can modulate the cyclic AMP pathway increasing the cAMP levels via Adenyl Cyclase modulated by Forskolin based induction thus controlling the protein kinase A levels in mammalian invitro system. This synthetic novel construct has been engineered using the bacterial gene CRP (coding Cyclic AMP receptor protein), VP16 which has a minimal promoter that activates transcription of the genes with CRE elements. Mutant KRAS drives activation of cyclic-AMP response element-binding (CREB) through RAF/MEK/ERK signaling pathway to force cancer cell growth and survival..

Salient findings: We used this engineered construct in a novel assay to monitor the presence of cAMP irrespective of PKA and CREB signaling. This reporter assay worked well and can be useful to identify agonists/antagonists for GPCR and to screen the inhibitors of cAMP production. We are also able to manipulate this simple direct reporter assay in different cancer cell lines (lung, colon, breast) when there is a deregulated cAMP signaling that complicates the direct measurement of intracellular cAMP. Our preliminary results show that novel construct is able modulate the cAMP mediated protein kinase A and is currently being tested in lung cancers with KRAS mutations for dominant negative effects on CREB-CBP. We are exploring to target this activator-coactivator complex amenable to small molecule intervention

5. Antifibrotic activity Bioflavonoids in Oral Sub mucous Fibrosis

Pathogenesis of OSMF is directly related to arecoline present in arecanut causing alterations in various pathways and molecules leading to accumulation of collagen. Of the multiple mechanisms involved, TGF – β1 induced epithelial mesenchymal transition type II plays a crucial role in fibrosis associated with the disease. Epithelial–Mesenchymal Transition (EMT) has gained much attention recently due to its important implication in cancer and fibrosis.

Salient findings: Expression profiling of 5 oral submucous fibrosis and along with 5 pooled normals were completed using the Affymetrix Human Transriptome Arrays. The list of upregulated and downregulated genes in OSMF have been derived. Validation of the genes is ongoing in clinical OSMF samples. EMT markers are being explored in OSMF currently.

6. Molecular Markers for Oral Premalignant disease

Screening for Oral potentially malignant disease is confounded by difficulty in discriminating between reactive, inflammatory lesions and lesions that are premalignant. Histologic diagnosis of dysplasia is subjective and prone to different interpretation. There are no definite validated criteria existing to predict the course of dysplastic oral lesions progressing to oral cancer. This study focuses on molecular biomarkers that can be help identifying a subset of disease most likely to progress eliminating the clinical diagnostic dilemma. Patient samples have been collected after acquiring the mandatory clearances of the Institutional Ethical Committee. None of the OPML...
lesions had HPV infection and we find that p16 is not a surrogate marker for HPV in Oral precancers and cancers. EMT markers E-Cadherin, Vimentin, N Cadherin along with other markers like OPN, LAMC2, GLUT, Cox2, survivin, alpha SMA, Cyclin D1, VEGF have been completed so far in the clinical samples. We are currently working on promoter methylation of p16, DAPK and MGMT in OPMLs.

Salient findings: Patients presenting with OPML and Oral Cancers (n=250) have been collected in used for studying the presence of HPV DNA and p16 expression. We have additionally studied the expression of HPV 16 E6 and E7 expression in the tissue sections. We have observed that p16 expression cannot be assumed to a surrogate marker for presence of HPV in oral cancers. We did not find HPV DNA in oral cavity lesions studied however presence of p16 was observed. The EMT marker studies mentioned above have been completed and data is being analysed.

7. Comparison of different EML4-ALK testing methods in Non-small Cell carcinomas of lung – a pilot Study The project has got cleared by Institutional Review Board and sample collection is ongoing.

Workshops

A 4 day Internal Auditing and Quality Management Training Program for Clinical Diagnostics and Laboratories accredited by NABET was conducted in October. This program was awarded 30 credit points for participation from Tamilnadu Dr MGR Medical University. 30 participants from medical labs of the Medical and Dental Colleges of Chennai, including 17 technical staff of Cancer Institute(WIA) were certified as Internal Auditors for the quality management in their respective laboratories. Dr R Vijayalakshmi was the Organising Secretary of this program.

Academics

Dr Vijayalakshmi Ramshankar

• “Applications of Nanotechnology in Oncology” in Centre for Nanotechnology and Nanosciences in VIT Vellore in March and “ Risk Reduction Strategies for Breast Cancer Prevention” at Saveetha Dental College, Saveetha university in February.

• Selected in the Research Advisory Board, for Centre of Nanotechnology, VIT, Vellore

• Dr Vidya Rani Shymasundar & Mrs. A. Kanchana - Certified as an Internal Auditor in the QMS training program as per the ISO15189, at Cancer Institute (WIA)
EPIDEMIOLOGY, BIO-STATISTICS &
CANCER REGISTRY (EBCR)

Dr. Swaminathan R, M.Sc., Ph.D (Stats), Ph.D. (Epide)
Dr. Rama R, M.Sc., Ph.D

**OPD Counters**
Mr. Bhuvanendra Babu R B, B.Sc., M.A., MBA
Ms. Gayathri S, M.S.W
Ms. Shanthakumari A, B.Sc.
Ms. Kasthuri B, M.A. DHM

**OP Assistant**
Ms. Anusuya V, B.A.
Mr. Balasubramaniam S, M.B.A.
Ms. Deepa C, B.A. *
Mr. Govarthanan S, B.Com., M.A.
Mr. Muralidharan P, B.A.
Ms. Padmavathy V, HSC
Ms. Ranisree S S, M. Corp. Sec.
Mr. Sathish B, BBA
Ms. Sreekala Ajith, B.A.
Mr. Suresh S G, B.Sc
Ms. Thavamani P, B.Sc., DHM
Ms. Ushanandini V, B.Com
Mr. Vijayashankar B, MA
Ms. Devika B, B.Sc.
Ms. Kushpoo S, B.A
Ms. Manimozhi M, B.Com
Mr. Satheesh P K, B.Sc., M.A., MBA., HDSE.,

**Records Section**
Ms. Lakshmi Dhanasekar, B.A.
Mr. Sivakumar M, PUC
Ms. Dharanya G, B.Sc

**Data Entry Operator**
Ms. Dharanya G, B.Sc
Ms. Maheswari V, B.B.A
Ms. Mohana G, HSLC *
Mr. Rajagopal R, HSLC
Mr. Ravi R, HSLC
Mr. Sambandam S, HSLC *
Ms. Shobana V.R., HSLC
Ms. Sriveyi R.S, B.Com
Mr. Venkatesh R, B.Com *

**Assistant Director & Head**
Assistant Prof & S.Bio-Stat

**PRO & Section In-Charge**
Social Investigator
Medical Record Technician
Clerk

**Social Investigator**

**Assistant**

**Clerk**

**Medical Record Technician**

**Records Section**

**Data Entry Operator**

**Assistant**

**Social Investigator (MRD)**

**Assistant**

**Assistant**

**Assistant**

**Assistant**

**Assistant**
Typing Section – Annexe
Ms. Lakshmi Gurjale, B.A.          Section In-Charge
Mr. Chidambaramkrishnan S, M.C.A Computer Operator
Ms. Hemalatha T, DCP., B.Com Steno Typist
Mr. Rajasekar N, M.Com., DBM, MBA Steno Typist
Ms. Dhanalakshmi P, M.Com Steno Typist
Ms. Alima Bee.M. HSLC Data Entry Operator
Ms. Sethumeenakshi K, HSLC Data Entry Operator
Mr. Thilak P.K, HSLC Data Entry Operator
Mr. Thirunavukarasu S, B.Com Data Entry Operator

Clinical Secretariat
Ms. Shanthi.P. M.A, M.Phil, DPS Section In-Charge (T & DQ)
Ms. Kalyani M.S.M.B.A Data Manager (HBCR Proj.)

HBCR
Ms. Joan of Arc A, M.A. Dip MRT Medical Record Clerk
Ms. Bhuvarneswari S B. Sc. Social Investigator
Ms. Sahaya Delma C B.A. Dip.SW Social Investigator
Mr. Sivakumar P, M.Sc. Social Investigator
Ms. Alamelu R B.A Data Entry Operator
Ms. Padmapriya V, B.A(English) Data Entry Operator

Scanning Section
Ms. Thilagavathi.B.,B.A. Data Entry Operator
Ms. Santhi S, B.Com. Assistant

Tumour Registry – MI
Ms. Jeyalakshmi .R, B. Sc. Section In-Charge
Ms. Narmatha. P, B.A., Data Entry Operator
Ms. Radha M, HSLC Data Entry Operator
Ms. Gomathi G, B.Com Data Entry Operator
Ms. Saradha.K, S.S.L.C Typist

In-patient section – Annexe Ward Secretary
Ms. Bakkiyalakshmi K B.Sc Ms. Sophiya M , B.A
Ms. Latha J, M.Sc Ms. Rajalakshmi G, B.A
Ms. Neelambal M, B.Com Ms. Abinaya A, B.C.A
Ms. Arulmozhi P, B.C.A Ms. Usha S, M.Sc

Day Care OPD – MI Ward Secretary
Ms Umamaheswari R D.C.A
Mr. Gopinath.B, DCIM

In-patient section – MI Ward Secretary
Ms. Joyce Kripa E, H.S.LC Ms. Jayalakshmi V, B.Sc
Ms. Sridevi M, D.ELED Ms. Kalaivani R, HSLC
Mr. Praveen C, BBA
Demographic Cancer Registry Social Investigator
D. Gandeeban, M.A. B.Ed, M.Phil
K. Veeramani, M.A., M.Phil

PROJECTS

I. MADRAS METROPOLITAN TUMOUR REGISTRY (MMTR) - ICMR
Mr. Balasubramanian S., B.Sc
Mr. Sampath P, M.Sc
Senior Investigator
Mr. Murugaiyan J., B.Sc, M.A.
Mr. Sambandam T S, B.A.
Mr. Selvakumaran R, B.Sc, M.A, B.Ed.
Mr. Dharumadurai V., M.A., M.Phil
Computer Programmer
Statistical Assistant

Data Entry Operator
Ms. Bagyalakshmi P, B.Com
Ms. Anandhi T, B.Sc., I.S.M
Ms. Chandrakala T., B.Com

II. HOSPITAL BASED CANCER REGISTRY – ICMR
Social Investigator
Ms. Vidhya J, M.A.

III. DINDIGUL AMBILIKKAI CANCER REGISTRY (DACR) PROJECT – IARC
Social Investigator
Mr. Elumalai A, M.A., M.Phil.
Mr. Jerome Prabhu C, B.Com., M.A
Mr. Jerome Prabhu C B.Com., M.A Mr. Ravichandran K., M.A., M.Phil

IV. PATTERNS OF CARE (POC) PROJECT – ICMR
Social Investigator
Ms. Jayabharathi J, M.Sc.(Zoo), B.Ed.
Mr. Thiagarajan K, B.Sc
Ms. Deepa Ramani, B.A., PGDSE

V. TAMIL NADU CANCER REGISTRY PROJECT
Social Investigator
Mr. Bharathiselvan A, M.Sc., B.Ed
Mr. Dhanapal K, B.Com., PGDCA
Mr. Gowri Shankar G, MSW
Data Entry Operator
Ms. Mahalakshmi N, MCA
Ms. Sakila S, B.Sc

VI. KALPAKKAM AND KUDANKULAM AREA CANCER REGISTRY PROJECT
Social Investigator
Mr. Balamurugan R, B.Sc
Mr. Palanikumar P, B.Sc
Mr. Sankaranarayanan N, M.Sc.,
Ms. Subajini M.R, B.A., B.Ed
Mr. Thiruvenkadham T.S, B.Sc., B.Ed
Mr. Kartick K, MSW
VII. R.V. TRUST HBCR PROJECT

Social Investigator
Ms. Anu R M.Sc
Ms. Devi N, M.Sc., M.Ed.
Ms. Divya S, B.E.,

The HCR has been in existence since 1954. The main functions include OP registration of cases, medical record documentation and maintenance, abstraction of data in specific formats for special studies, lifetime follow up of treated cases and providing statistics for the administration and research.

Hospital Statistics, 2016-17

<table>
<thead>
<tr>
<th>Statistics 2016-17</th>
<th>No. of Cases</th>
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<tbody>
<tr>
<td>Total patients seen</td>
<td>163571</td>
</tr>
<tr>
<td>New registration</td>
<td>16280</td>
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<tr>
<td>Follow up</td>
<td>147291</td>
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<tr>
<td>Total Admissions</td>
<td>12262</td>
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<tr>
<td>New Admission</td>
<td>4411</td>
</tr>
<tr>
<td>Readmission</td>
<td>7851</td>
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<tr>
<td><strong>New cancer cases</strong></td>
<td><strong>12019</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regionwise distribution of new registration cases</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamil Nadu (excl. Chennai)</td>
<td>9497</td>
<td>58.3</td>
</tr>
<tr>
<td>Chennai city &amp; suburbs</td>
<td>3787</td>
<td>23.3</td>
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<tr>
<td>Andhra Pradesh</td>
<td>1959</td>
<td>12.0</td>
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<tr>
<td>Pondicherry</td>
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<tr>
<td>Assam</td>
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<td>0.9</td>
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<tr>
<td>Karnataka</td>
<td>125</td>
<td>0.8</td>
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<tr>
<td>Kerala</td>
<td>117</td>
<td>0.7</td>
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<tr>
<td>Outside India</td>
<td>94</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16280</strong></td>
<td>100</td>
</tr>
</tbody>
</table>

Volunteers’ contribution

Historically, the department had availed the services of many volunteers from outside ranging from students to retired persons. A total of 45 volunteers are currently serving the department in different capacities in OP counters and record section. From last year, a team of 86 volunteers from M/s iNnautix Technologies India Private Limited, Chennai, are undertaking data entry of HBCR and other study forms. This work is in collaboration with Bank of New York Mellon CyberGrants LLC, USA, through which, remuneration for the voluntary services rendered are transmitted as donation to the institute from their donor program.

Ongoing projects/studies

(i) HCR – partly funded by National Cancer Registry Program (NCRP), Indian Council of Medical Research (ICMR) - Principal Investigator: Dr. R. Swaminathan

It is a long-term project since 1984 and data is continued to be abstracted following ICMR norms. It provides data to many demographic registries in India especially in North Eastern region and other research projects at the institute. In 2016, 12,019 cancer cases were registered; common cancers were oral cavity, stomach and lung among men and cervix, breast and oral cavity among women.
(ii) Madras Metropolitan Tumour Registry (MMTR) – Population based cancer registry (PBCR) partly funded by NCRP of ICMR – Principal Investigator: Dr. R. Swaminathan

It is a long-term project since 1982 and data is continued to be collected on new cancer cases among the resident population of Chennai city from >275 medical institutions. MMTR formed the basis for many research activities in the department including population based cancer survival, development of cancer atlas in India, starting of rural and state cancer registries and many descriptive epidemiological studies. MMTR’s expertise was utilized to design international and national studies on cancer survival and analysis. A total of 7,460 cases diagnosed in 2015 have been registered till date. Data collection and processing are continuing.

(iii) ICMR project on “Patterns of Care and Survival (POCS) Studies of Cancers of the Cervix, Breast and Head/Neck”- Principal Investigator: Dr.R.Swaminathan.

This is a prospective cohort study of outcome of breast, cervix and head/neck cancer cases treated since 2006 at the institute. Data abstraction is elaborate following ICMR norms. Data on 14,403 cases treated in 2006-14 have been submitted to ICMR. Follow up at 5 years from diagnosis was >90% for cervix, breast and head/neck cancers, the highest among all participating centres from all over the country. Descriptive statistics along with overall survival are available in NCRP website. Data processing and analysis for the year 2015 and forward are in progress.

(iv) International Agency for Research on Cancer (IARC) project on “Dindigul Ambilikai Cancer Registry (DACR)”- Principal Investigator: Dr.R.Swaminathan

DACR is a demographic registry covering the entire Dindigul district in Tamil Nadu state. Its field office functions at the Christian Fellowship Community Health Centre, Ambilikai, in Dindigul district with four staff members. The sources of data collection are 165 and spread over ten districts of Tamil Nadu. A total of 1429 cases of 2015 and for the year 2016 288 were registered till date. Common cancers were stomach, oral cavity, esophagus among men and cervix, breast and oral cavity among women.

(v) Cancer Institute (WIA) project in collaboration with Department of Health and Family Welfare, Government of Tamil Nadu – Tamil Nadu Cancer Registry Project (TNCRP). Mentor Dr. V. Shanta; In-charge: Dr. R. Swaminathan

An administrative order (G. O. (Ms) No. 132 of the Health and Family Welfare (G) Department dated 17.04.2012) has been issued to facilitate the registry operations. TNCRP also has the unique honour of emerging as the cancer registry to cover a population of 75 million, the largest in the world. TNCRP is aimed at generating reliable cancer incidence and burden annually based on enumeration of all new cancer cases occurring in Tamil Nadu. The crude incidence rate for all cancers together in 2012-14 was 63.1 per 100,000 men, 84.2 per 100,000 women and 73.6 per 100,000 population both sexes together. A total of 62,374 cases, diagnosed in 2015 have been registered from 1,458 sources in 32 districts in Tamil Nadu and Pondicherry, including government and private hospitals, till date. The figures for the year 2016 stand at 19,367 till date. Data abstraction for the year 2015 and processing for previous years are continuing.

(vi) International Agency for Research on Cancer (IARC) project on “Population based Childhood Cancer Registry”- Principal Investigator: Dr.R.Swaminathan

PBCCR is a special registry conceived to collect more pertinent data including follow up on all incident childhood cancers occurring among the resident population catered to by MMTR from potential sources in and around Chennai city. The crude incidence rate was 15.4 per 100,000 boys and 11.2 per 100,000 girls. A total of 121 cases in 2014, 182 cases in 2015 and 44 cases in 2016 have been registered so far. Data abstraction and processing are continuing.
(vii) Tata Memorial Hospital project on “Kalpakkam and Kudankulam Area Cancer Registry (KKACR) – Principal Investigator: Dr. R. Swaminathan

KKACR was initiated in 2013 to generate cancer incidence statistics in districts where nuclear installations in Tamil Nadu were located, viz. Kalpakkam in Kanchipuram district and Kudankulam in Tirunelveli districts. Mapping of cases located in proximity of 5 -10 km radius from the installations is planned. The provisional age-standardized rate in 2012-14 for Kanchipuram district was 96.4 per 100,000 men and 112.3 per 100,000 women. The corresponding figures for Tirunelveli district were 59.5 and 67.5 respectively. A total of 4,720 cases in 2015 and 1,841 in 2016 have been registered so far from both districts. Data abstraction and data processing are continuing.

(viii) RV Trust–HBCR project – Developing an electronic database on 22 cancers treated 1985 onwards – Study Group: Dr. V. Shanta, Dr. R. Swaminathan, Dr. R. Rama, Ms. P. Shanthi, Mrs. M. S. Kalyani on behalf of other registry staff

This project is continuing for high-resolution data abstraction on 22 cancers treated at the institute on a prospective basis. Out of a total of 83,560 treated cases during 1985-2015, data abstraction is completed for 81,222 (97.2%) cases. Data updating for follow up, data entry and unifying different data formats for the same cancer site are under progress.

Dr. R. Swaminathan

Organized a Workshop on “Basic Statistics and Epidemiology” on behalf of the Association of Oncologists of North-East India (AONEI) at Cachar Cancer Hospital, Silchar, January 28-29, 2017. The topics covered were Research methodology, Descriptive and analytical epidemiology and Basic statistics. A total of 5 faculty members and 25 graduate/PG students of medicine, statistics and life-sciences attended.

• “Cancer registration in Tamil Nadu since 2012: Challenges and opportunities” in the meeting on Introduction of HPV vaccine in Tamil Nadu and implementing research priorities” held at NIRT, Chennai, in April.

• “Cancer registration in Tamil Nadu: Incidence, Pattern and trend” in the Start-up Initiative on Comprehensive Early Detection of Cancer by Dr. Kamakshi Institute of Medical Sciences and Research, in Chennai, in May.

• Faculty for the feasibility workshop on “Development of PBCRs in urban population mid-size and large-size cities along Ganga river”, to present FOUR lectures covering cancer registration principles, techniques, operations and importance, held at Kamala Nehru Hospital, Allahabad, Uttar Pradesh, in September.

• Presentation on “Cancer incidence pattern and trends in Tamil Nadu” in EMPOWER 2016 – An international Medical Students’ Research Congress, Government Stanley Hospital, Chennai, in September.

• Faculty for an international workshop on “Cancer survival methods for population-based registries in low-and-middle income countries” and delivered the inaugural lecture on “Population based survival studies in low-and-middle income countries: History and impact” and a plenary lecture on “Organizing population-based survival studies in low-and-middle income countries” held in Marrakech, Morocco, in October.

• Lecture on “Cancer registries and cancer outcomes in less-developed countries” in the 38th Scientific Conference of the International Association of Cancer Registries (IACR) in Marrakech, Morocco, in October.
• Served as an examiner and participated in the review meetings as an external expert for three PhD students of Epidemiology department in Tata Memorial Hospital, Mumbai, during April, August and October.

• Served as the lead panelist in the session on “Data quality indices with reference to the IARC CI5 scientific publication series” and also delivered two oral presentations on the “Data highlights and progress reports of PBCR and HBCR” in 32nd Annual Review Meeting of ICMR National Cancer Registry Program, Kohima, Nagaland, in November.

• “Role of cancer registries in cancer control” in the 13th Annual Meeting of AONEI, Silchar, Assam, in January.

• “Tobacco related cancers: Incidence, pattern and trends” in the Intensive workshop on “Tobacco cessation methodologies” held in the Cancer Institute (W.I.A), Chennai, in August and February.

• Lecture on “Tamil Nadu Cancer Registry Project (TNCRP): An overview” in MEDRECON 2017 held in GKNM Hospital, Coimbatore, in February.

• Participated as the lead consultant for the scientists in NCDIR for the national-level upcoming project on “Survival from cancers of the breast, cervix and head/neck cancers in PBCRs in India” and presented a talk on “population-based survival” lessons learnt from studies done in Chennai”, Bengaluru, in March.

• Participated in the Consultation meeting to develop the research framework for “Ca Res NER – A Multidisciplinary Research Programme for Prevention and Control of Cancer in the North Eastern States in India”, NCDIR, Bengaluru, in March.

• Lecture on “Cancer registries in cancer control” in the CME for medical Officers on “Cancer burden and Siddha management” held in National Siddha Institute, Chennai, in March.

Training/Internship offered

• Five graduate students of statistics from Tiruchi and Chennai city and three post-graduate students of statistics had undergone internship program of variable duration ranging 2-4 weeks in the department. The program comprised observer training in primary data collection, secondary data collection, hands-on training in data processing and analysis using statistical software.

• Two medical doctors from Kolkata, West Bengal, Dr. Gopeswar Mukherjee and Dr. Bose underwent training during May and Dr. Debashish Gope, Medical officer from Agartala, Tripura, underwent training for one month during July in “Cancer Registration Principles and Methods” under ministry of Development of North-East Region (DONER). The training comprised lectures, discussions, data abstraction/coding exercises, on-site visits to hospitals and vital statistics division for PBCR/HBCR routine and special studies besides hands-on training in HBCR software.

• Three record section staff from GKNM Hospital, Coimbatore, during September and one data abstractor from Madras Cancer Care Foundation (MCCF), Kumaran Hospital, Chennai, during October, underwent training in high resolution data abstraction for HBCCR and coding exercises in ICD-O and ICD-10.

• Four post-graduate community medicine junior residents from JIPMER Hospital, Pondicherry, underwent observer training in PBCR/HBCR operations for one day in November.
PREVENTIVE ONCOLOGY
PREVENTIVE ONCOLOGY

Dr. J.S. Malliga, MD(O&G)  Head-Incharge
Dr. Premila Grace, BSMS, MA  Medical Officer
Dr. Sarthaj Begum, BSMS, MD(S)  Medical Officer
Ms. D. Delmina Anitha, B.Sc  Social Investigator
Ms. S. Karthika, M.Sc  Social Worker
Ms. Kannaghi, DCE / Nursing Aid  Social Worker
Ms. Vinotha, B.Com.  Data Entry Operator

ANM
Ms. Amsa  Driver
Ms. M. Shakthipriya  Mr. Maruthu Pandy
Ms. Srivithiya  Mr. Iyappan
Ms. Seetha  Mr. Bakkiyaraj
Ms. M. Kamatchi  

Gummidipoondi Project
Ms. Ruby, M.Sc  Social Worker
Ms. Rajakumari, ANM & MPHW  ANM
Ms. Shoba, DNA  Health Worker
Ms. Asha, Nursing Assistant  Health Worker
Ms. Sivagami, ANM & MPHW  ANM

Villupuram Project
Dr. Suganya, BHMS  Medical Officer
Dr. Sughija, MBBS  Medical Officer
Dr. Sindhu, MBBS  Medical Officer
Ms. Kalpana, MA  Programme Manager
Mr. M. A. Mohammad Adil, M.Sc  Biostatistician

Social Worker
Mr. Subash, B.Sc.  Ms. Revathi, MA
Mr. Guru Raghavendra, B.E.  Ms. Lavanya, MCA
Ms. Abirami, B.Sc.  Staff Nurse

Health Worker
Ms. Lakshmi Devi, DNA  Ms. Vinitha, DNA
Ms. Saranya, DNA  Ms. Mangayarkarasi, DNA
Ms. Ezhilarasi, DNA  Ms. P. Nandhini, B.Sc.
Ms. Kiruba, DNA  Ms. Chandraleka, DPN
Ms. Bharathi, DNA  Ms. Selin, DNA
Ms. Saritha, DNA  Ms. Tamilyelakiya, DNA
Mammomobile Project
Ms. Logeshwari, DPRA Radiographer
Ms. Salmabi, GNM Staff Nurse
Ms. Kavitha, MA, B.Ed Data Entry Operator

Cancer Awareness Programs
Total Community based : 92
Total Members attended : 4386

Ongoing Projects
1. District Cancer Screening Program, Chennai [2008 Onwards]
2. Villupuram Cancer Screening Project, Villupuram [Sep 2014 Onwards]
3. HPVDNA test cervix cancer screening-Villupuram Cancer Screening Project [Jan 2015 Onwards]
4. Gummipoondi Project [April 2016 onwards]
5. ACS – Cancer Awareness Project, Villupuram [Aug 2016 onwards]
6. Mammomobile Project, [Dec 2016 onwards]

Future Projects

1. Satellite Screening Centres
The goal is to setup screening clinics, as satellite centers of Cancer Institute, providing preventive and primary cancer care to general public in remote areas. Comprehensive screening services for common accessible cancers across the State- Satellite centers in each district. Proposed in Pudukottai and Dindugal.

2. Centralised Data Entry and Monitoring
A mobile application for data entry and monitoring has been developed which can be applied to all the 32 districts in the State and a centralized data storage facility has been developed. The mobile application for android platform called “CASCADE” (Cancer Screening Application and Data Entry) is under pilot implementation for real time data entry and monitoring.

District Cancer Screening Program, Chennai

Screening Programs
• Total number of persons screened : 5517
• Total number of men : 53
• Total number of women : 5464
• Total number of refusals (women) : 16
• Total number of women screened : 5448

Clinical Outcome
• Oral cancers : NIL
• Breast Cancer : 02 (Under treatment at CI – 2)
• Cervical Cancers :
Pre-cancers (CIN 2+) : 15
Number of cases treated : 09 (Cone & Follow up-03, Observation- 04, Treated Outside - 02)
Invasive Cancer : 03 (Stage 3b – Under Treatment/follow up)
Lectures
Dr. J S Malliga
• DTCC - Enterprise Data & Analytic Services – Awareness on Breast Cancer in March.
• Vivekananda School (Teachers) – Awareness on Women cancers in March.
• Dr. Premila Grace - Cancer Awareness Program - Thirumullaivoyal in April, Koilpathagai in June, Thirupanthiyur in August, Thiruvottiyur in September, Avadi in January & Saligramam in March.

Villupuram Cancer Screening Project, Villupuram
The Department of Preventive Oncology, launched the population based cancer screening project in Villupuram, targeting 1,04,000 women of age 30 - 59 years, for screening breast, cervix and oral cancers. This five year project is supported by Infosys Foundation. An independent cancer registration service in and around Villupuram district has been integrated with the program for unbiased evaluation of the success of the program.

Screening Program
Total number of eligible households contacted : 21410
Total number of households not surveyed due to refusal / emigration / people screened outside : 9565
Number of eligible women invited for screening : 11845
Number of women screened : 10585
Compliance rate for screening : 89.4
Net population out reached per village : 49.5 %

Screening details
• Total number of persons screened : 10595
• Total number of men screened : 10
• Total number of women screened : 10585
• Tobacco users (men & women) : 607

Clinical Outcome
Oral cancers : 01 (T4bn2b – 1)
Breast Cancer : 03 (Treated(CT3N2M0) – 1, Under Evaluation-1, Treated Outside – 1)
Cervical Cancers
Pre-cancers (CIN 2+) : 42
Completed Treatment at CI : 17 (Cone & Followup-13, Observation-04)
Invasive Cancer : 05 (2a2 – 1, 3b – 4, Under Treatment/follow up)

HPV-DNA Testing in Villupuram Cancer Screening Project, Villupuram
As a part of the Villupuram Screening Project, HPV-DNA testing is being offered as the primary screening test along with visual methods at the community level screening for the women aged 30
to 59 of Villupuram District. Cancer Institute (WIA) is the first in India to launch this program on a community level. The highlight of this program is that the Health Workers have been trained to run the HPV tests and interpret the results. Starting from 9th February 2015, around 10595 women have been screened, 9111 HPV samples have been collected and run from which 42 pre-cancers and 6 cancers were detected.

**District Cancer Screening, Gummidipoondi**

**Cancer Awareness Programs**

- Total Community based: 79
- Total Members attended: 4425

**Screening Programs**

- Total number of persons screened: 3308
- Total number of men: 94
- Total number of women: 3214
- Total number of refusals (women): 12
- Total number of women screened: 3202

**Clinical Outcome**

- Oral cancers: NIL
- Breast Cancer: NIL
- Cervical Cancers:
  - Pre-cancers (CIN 2+): 16
  - Number of cases treated: 06 (Cone & Follow up - 02, Observation- 04)
  - Invasive Cancer: 03(1-2a1, Treated at CI, 2-3b, defaulted)

1. **American Cancer Society (ACS) Awareness Project**

Self Help Group (SHG) - A new implementation strategy to improve coverage and screening compliance by Community Health Volunteer (CHV). CHV- Self Help Group woman from each village (1 per 200 households) acts as a bridge between the health provider and the community. They also provide individual counseling to non-compliant women and also motivate and assist the women to get screened and also in follow up of screen positive women. The project started from August 2016 in Villupuram Taluk, and with the help of SHG there is an increase in coverage rate by 7% in a Pilot study in Bidagam Panchayat in Villupuram.

2. **Mammomobile Project**

The aim of the project is to offer awareness and baseline screening for early detection of breast cancer. All women of age 30 - 60 years are offered a baseline screening of breast with Clinical Breast Examination (CBE). Women who are above 40 years of age and who have any suspicious changes in the breast on CBE during primary screening are referred to the mobile imaging unit. USG breast and FNAC will be done for any lump detected. If any cancer is detected during this process, the woman will be referred to the Cancer Institute. Awareness creation is again the major goal with monitors displaying messages being put up inside and outside of the bus. The project started from December 2016 in Villupuram Taluk, in that 537 women have been screened with mobile mammogram until now.
PSYCHO-ONCOLOGY & RESOURCE CENTER FOR TOBACCO CONTROL (RCTC)

Dr. E. Vidhubala, M.A., Ph.D Associate Professor
Dr. V. Surendran, M.Phil., PhD., Assistant Professor & In-charge
Dr. C. Sundarmoorthy, Ph.D., Assistant Professor
Mr. D. S. Divyaraj Prabhakar, M.Sc., M.Phil., Psychologist
Ms. S. Deepika, M.Sc., Psychologist
Mrs. G. Vidhya M.Sc., M.Phil., Psycho-oncologist
Ms. S. Revathy M.Sc., M.Phil., Psycho-oncologist
Ms. Rajeshwari, B.Sc, Data Entry Operator

Students registered for M.Phil course : 5
Students passed out for M.Phil course : 4

Patient Care: (Psycho-Social Support)

Clinical Work - Patients ward visit – 1581, patients were given brief or intensive intervention to overcome psychosocial issues. Patients were referred by the treating physicians (from MOG, SOG, ROG Gynaec and Pediatric departments) for psycho-oncological consultation. Reasons for referral were management of distress, depression, anxiety and adjustment problems that interfere with cancer treatment, tobacco cessation, and psychological fitness for BMT, amputation and other surgical procedures and assessments.

Assessments

The Department has been carrying out assessments including quality of life of LABC patients, QoL of rectal cancer patients, QoL of patients with lymphedema and CML adherence as part of various studies.

<table>
<thead>
<tr>
<th>Name of the assessment</th>
<th>Total No.of patients screened</th>
</tr>
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<tbody>
<tr>
<td>QOL of patients with LABC</td>
<td>100</td>
</tr>
<tr>
<td>QOL of patients with rectal cancer</td>
<td>60</td>
</tr>
<tr>
<td>QOL of patients with Lymphedema</td>
<td>80</td>
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<tr>
<td>CML Adherence</td>
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International Meetings

Dr. E. Vidhubala attended the Autumn Quality of Life Group meeting held in Manchester, UK in September.

International Conference

- Ms. Revathy S poster on “Quality of Death of patients with advanced cancer- An exploratory study” at Asia Pacific Psycho-Oncology Network (APPON) conference held at Singapore in November.
- Ms. Fida Naseem poster on “Caregiver Quality of Life among paediatric cancer patients- A cross-sectional study” at Asia Pacific Psycho-Oncology Network (APPON) conference held at Singapore in November.

Lectures

Dr. Surendran

- “Managing Stress” at the District Institute of Education and Training in May.
- “Role of a Psycho-oncologist” at The Banyan Academy of Leadership in Mental Health (BALM), Kovalam, Chennai in August.
- Trained the District medical officers and PA to DDHs on “Tobacco Cessation Strategies” in the state level workshop organized by the State Tobacco Control Cell, Government of Tamil Nadu in November.
- “Psycho-oncology” at the Department of Psychology, University of Madras, Chennai in November.
- “Psycho-oncology in India” at The Department of Psychology, Manonmaniam Sundaranar University, Tirunelveli in November.
- Was judge for the Intramural exhibition competition in the Silver Jubilee Celebrations at MOP Vaishnav College, Chennai, in March.
- Presented a report and proposal for the project “Tobacco Free Community & Dr. MLR Cancer support group” in the HCL Foundation NGO Partners Meet organized in Shiv Nadar University, Noida in March.

Dr. E. Vidhubala

- Invited as a resource person at the pre-conference workshop on “Pediatric Psycho-oncology” organized by the Pediatric Hematology Oncology Chapter (PHO) of The Indian Academy of Pediatrics (IAP) during PHOSSCON 2016 conference in November at Zion Hospital, Mumbai and delivered a lecture on ‘Research advances and limitations in Pediatric Psycho-oncology’.
- Attended the steering group meeting organized by Public Health Foundation of India to adapt a road map for India by conducting a situation analysis on implementation of Framework Convention on Tobacco Control (FCTC) at New Delhi in December.

Guest Lecture

Professor. Karen Kayser, Editor, Journal of Psychosocial Oncology and Chair of Oncology Social Work,
University of Louisville delivered a lecture on “Publishing research in Peer Reviewed Journals” at Auditorium, Dr. S K Campus, Cancer Institute (WIA) in July.

Ph.D. Programme in Psycho-Oncology affiliated to University of Madras

No. of Research Scholars – 3
1. Mr. Sathish Kumar (Full-time)
2. Mr. Vijay Srinivasan (Part-time)
3. Mr. M. S. Sathish (Part-time)

Hands on Training

Hands-on training was provided to a total of 31 students hailing from various colleges from Tamil Nadu and Karnataka with psychology and social work background.

Academics

The Department of Psycho-oncology & RCTC has exhibited models on cancer awareness, tobacco control and health hazards in the Science City Festival organized by the Department of Science & Technology, Govt. of Tamil Nadu at Queen Mary’s college in February, 2017.

1. Pre-chemo Meeting

Pre-chemo orientation meeting is being conducted to educate the patients and care givers about the side effects of chemotherapy and its management. A team consisting of an oncologist, dietician and a psycho-oncologist orient the patients on chemotherapy and various issues associated with it. A total of 366 patients have been benefitted in the 33 meetings conducted during this period.

2. Pre-radiation Therapy Meeting

The meeting is organized to educate the patients and care givers about the side effects of radiation therapy. There are three Pre-radiation therapy meetings conducted for three different groups on separate days:

a) The Pre-RT meeting for gynecology ward is conducted on Saturdays every week. A total of 33 meetings have been conducted, where 545 patients participated and benefited.

b) Similarly Pre-RT meeting for head and neck patients in male ward is being organized on Saturdays of every week. More than 751 patients have been benefitted from the 48 meetings conducted from April to March, 2017.

c) The Pre-RT meeting for head and neck patients in female ward is conducted on Wednesday of every week. Similarly 27 meetings have been organized till date during the period of April, 2016 to March, 2017 from which 347 patients have been benefitted.
RESOURCE CENTRE FOR TOBACCO CONTROL (RCTC)

A total of 156 (Tobacco users) have registered at the Tobacco Cessation clinic from the 1st of April, 2016 to the 31st of March 2017. These clients were offered individual intervention in the form of behavioral counseling, medication, and nicotine replacement therapy at the clinic. All the clients were followed up through a phone call to know the status of their tobacco use and they were also stressed on the importance of long term one to one counseling for an effective outcome.

Completed projects

Tamil Nadu Adult Tobacco Survey

Over one lakh tobacco users (both current and past) and non-users were identified from 32 districts of Tamil Nadu. The status of the tobacco usage across the state was assessed using the data obtained and the fact sheet of the same was released to the public by Dr. V. Shanta on World Cancer Day, which was observed in February, 2017.

Ongoing project

Tobacco Free Community & Dr. MLR Cancer Support Group

A total of 42 areas with high prevalence of smoking was identified from 12 slums in Chennai. The shopkeepers and the public were educated about the ill-effects of tobacco, COTPA and were sensitized on issues related to passive smoking. School students and Heads of the Institutions were educated about non-communicable diseases and tobacco. Similarly, a total of 82 Shopkeepers were sensitized on the tobacco control laws namely Section 4, 5, 6a and 6b and were encouraged to display the signage boards at their shops as per the act. Model signage boards were issued. As a result, 63 tobacco selling shops displayed the boards in compliance to the section 4 and 6a of COTPA. Similarly, a number of support group meetings targeting various patient groups are being carried out in the wards for both patients and the caregivers.

Workshops

Three day intensive workshop on Tobacco Cessation Intervention was conducted from 4th to 6th August, 2016 for health professionals at Cancer Institute (WIA). Around 19 health professionals from Dental colleges, NGO s and Institutions participated.

A three day intensive workshop on Tobacco Cessation Intervention was conducted from 16th to 18th February, 2017 for health care professionals at Cancer Institute (WIA). Around 15 health professionals including dentists and psychologists from various dental colleges, NGOs and other institutions participated.

85% Saves lives

An awareness program comprising a human chain and sand art was conducted at Marina Beach on 30th April, 2016. It was organized by the Department of Psycho-oncology & RCTC as a means of appreciating and welcoming the 85% of pictorial warning on the packets of tobacco product.

Oral Cancer Screening

The oral cancer screening camp has been conducted by the Department of Psycho-oncology & RCTC, in six communities namely Korattur, Koyembedu, Arumbakkam, Rajamangalam, Ambattur and Pattravakkam. 277 tobacco users were identified and screened, of which 42 clients who presented with pre-malignant lesions were referred to TCC for further intervention.
Oral Screening at the Community
Similarly, an oral cancer screening camp was also conducted at Allison transmission at Sriperumbudur, through which 75 tobacco users were screened, of which 2 presented with premalignant lesion.

Awareness programs conducted throughout the year, around 6000 participants have benefitted

Focused group discussion and counseling
Following the awareness programs conducted at educational institutions, the teachers have become sensitive to the issue and have identified 21 students using tobacco and brought them for tobacco cessation program at the Cancer Institute. A focused group discussion was facilitated by a trained psychologist and a discussion on how they initiated the tobacco habit, reasons for continuing the usage, difficulties faced during the cessation attempts, if any, the perceived risks of using tobacco and the benefits of quitting was carried out. The students are being monitored regularly and are being followed-up by the project team.

RADIO-DIAGNOSIS AND IMAGING

Dr. Vandana, M.B.B.S., DNB
Radiologist (Part-time)
Dr. Thanaraj
Dr. Sarojini Prahlad
Dr. Nesam Manivannan
Dr. S.Vijayalakshmi
Sonologist
Dr. Kavitha Sampathkumar
Cardiologist (Part-time)
Dr. Balaguru
Radiographers
Mr. Palanivelu
Ms. Banumathi
Mr. Jothibabu
Mr. Vikrambabu
Mr. Kamalakannan
Mr. Baskar
Ms. Suguna
Mr. Dineshkumar
Ms. Florence

Incharge

Interventional Radiologist (Part-time)
Dr. Roy Santhosham
Dr. Sathish Ramamurthy
Radiologist
Dr. Rishab Metha
Technicians
Ms. Chellam
Ms. Pushpalatha
Ms. Dhamayanthi
Ms. Jeeva Bharathy
Technologist
Mr. Yogananthem
Mr. Shankar ANM
Ms. Revathi Ms. Podiamma
Mrs. Vidya Data Entry Operator
Ms. Abirami

Main Institute – Total number of X-Ray cases 3016
Dr. S.K. Campus – Total number of X-Ray cases (Digital) 27510
Total number of Conventional x-ray cases 1073
Special procedures + C-Arm 465
Main Institute ECG 2554
Dr. S.K. Campus ECG 17603
Mammogram (Digital) cases 5226
Mammogram (Non-digital) cases ---
Hispeed CT (Dual) 719
Bright Speed CT (16 Slice) 5578
MRI 1922
USG cases 24878

Conferences attended
- Dr. Vandana Mahajan panel discussion on Management of Esophageal Cancer in 12th International Conference of Asian Clinical Oncology (ACOS) held in New Delhi in April.
- Dr. Sarojini Prahlad talk on awareness of Breast Cancer to female staff of GE at GE premises in October.
- Dr. Susila Krishnan lecture on “MDCT in Internal Hernia” in the 69th Annual Conference of the IRIA, TN & PY chapter at SRMC, Porur, Chennai in December.
- Many doctors from other centers are being trained in mammography, sonomammography, CT and MRI.
- Doctors and technicians are also being trained in the mammography, sonomammography for work in peripheral screening projects of the Cancer Institute (W.I.A).
- In addition to routine invasive procedures in the department, radiofrequency ablations and intratumoral alcohol injections are also being done wherever required, at times with intraoperated ultrasound guidance.
- The ultrasound unit in the pediatric ward has been extremely helpful in bedside assessment of sick pediatric cases and also in the guidance of intravascular line placements.
- In collaboration with Perfint Health Care the department conducted a half day CME in September, “Recent Trends in Ablation and Pain management” was conducted. Dr. Anandakumar, Interventional Radiologist, TNGMSS Hospital, Omandurar Garden, Chennai. Dr. Mathan Kumar, Pain Specialist, Global Hospital, Chennai.
MEDICAL PHYSICS

Dr. Vivekanandan. N, PhD.  Professor & Head, RSO
Medical Physicist  Lecturer
Mr. SamDevaKumar .J.M.Sc.  Dr. Dhanabalan.R. PhD.
Ms. K. Saranya. M.Sc  Dr. K. Vijayalakshmi, PhD
Mrs. Kaviyarasi. M.Sc.
Mr. ArulPandiyan. R. M.Sc.  Conventional Radiotherapy Planning : 985
IMRT Planning : 92
Rapid Arc Planning : 40
HDR Brachytherapy Planning : 435

Completed Projects

(i) Measurement of dosimetric leaf gaps by different methods

DLG is one of the important MLC dosimetric parameters that has to be precisely measured and input into TPS for accurate IMRT and RapidArc treatment planning. Two different methods namely charity and Varian methods are used in this study. The results will be compared and the best or average value will be considered depending upon the clinical results and validation.

(ii) MU Calculations for 6 MV X-rays based on AAPM TG 71 Recommendations

Recently the AAPM TG71 has recommended guidelines to be followed for MU verifications for photons and electrons as well as for advanced techniques as part of quality assurance. MU calculations for 6 MV X-rays of all the four linear accelerators are carried out and compared with and without beam modifiers for SAD set-up.

(iii) A study on influence of DLG values in IMRT and VMAT planning.

The influence of DLG values in IMRT and VMAT planning is studied by simulating errors in the MLC dosimetric parameter and planning. The TPS calculated dose and measured dose using Octavius 4D phantom are compared and analyzed for few head&neck, thoracic and pelvic IMRT and RapidArc plans.

Ongoing Projects

(i) A dosimetric study of different radiotherapy techniques used in treating left breast cancers

Patients with left sided breast cancer, who haven’t undergone any mastectomy has been taken for this study. Each case has been planned for different treatment modalities. The techniques in
which the dosimetric parameters have been compared are Conventional Radiotherapy, 3D Conformal Radiotherapy (field-in-field technique), Intensity Modulated Radiation Therapy (IMRT), and Volumetric Modulated Arc Therapy (VMAT). The plans were generated and optimization was done in Eclipse Treatment Planning System version.

ii) Dosimetric study of coplanar and non-coplanar intensity modulated treatment techniques for glioma

Coplanar and non-coplanar IMRT and VMAT plans for 5 patients with Glioma were analysed using DVH parameters and treatment delivery parameters. Plans were created for four techniques and they were evaluated using various DVH parameters and patient specific QA parameters. With equal target coverage, similar PTV doses, non-coplanar VMAT can be chosen favourably for treatments with lower OAR doses.

(iii) Dosimetric comparison of flat and unflat volumetric modulated arc therapy in the treatment of bilateral breast carcinoma

To explore the clinical use of unflat beam based Volumetric Modulated Arc Therapy (Rapid Arc) in bilateral breast carcinoma and to compare the dosimetric parameters with conventional flat beams based Volumetric Modulated Arc Therapy (Rapid Arc). Dosimetric Parameters were calculated as per ICRU 83. The Parameters that have been compared includes homogeneity index (HI), conformity index (CI), mean lung dose, mean heart dose, V20Gy and V5Gy. For bilateral breast carcinoma, Volumetric Modulated Arc Therapy (Rapid Arc) technique using Unflat beam can result in significant OAR sparing and minimal lung and cardiac toxicity.

Mrs.K.Vijayalakshmi was awarded PhD for her thesis work titled “Comparison between in-house developed and commercial software for monitor unit verification calculation in volumetric modulated arc therapy plans” in November.

**Intern students passed out**

2. C. Bhuvaneswari
3. Pradeepkumar.S
4. S.Kaviyarasan

**Intern students joined**

1. Alice Gnana Francita
2. Naslun Subitha
3. Asif Ahmed
4. Tamilarasan
NUCLEAR MEDICINE

Dr. R. Krishna Kumar, M.D, DMRT, DRM  Professor & HOD
Mr. G.K. Rangarajan, ANMT, M.Sc  Scientific Assistant, RSO
Miss. M. Lavanya, MSc  Medical Physicist
Mrs. N. Anandhi, DMLT, BSc  Technologist
Miss. D. Divya, BSc  Technologist
Mr. K. Ramesh, DMLT  Technician

B.Sc (Nuclear Medicine Technology)
Students passed out  2
Students registered
I Year  2
II Year  3
III Year  3

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<tr>
<td>Renal Scan</td>
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<tr>
<td>Liver Scan- Hemangioma</td>
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<tr>
<td>Sentinel Node</td>
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<tr>
<td>GI Bleed Scan</td>
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Thyroid Scan

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<td>I-131 WBI scan</td>
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<td>I-131 MIBG scan</td>
<td>60</td>
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<tr>
<td>I-131 Post Therapy Scan</td>
<td>226</td>
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<tr>
<td>HYNIC TOC Scan</td>
<td>16</td>
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<td>Para thyroid Scan</td>
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Future Projects

1. Randomized controlled trial of I-131 Tositumomab (Bexxar) radio-immunotherapy versus rituximab immunotherapy with relapsed or refractory low grade, follicular or transformed B-cell Non-Hodgkin’s Lymphoma.

Non-Hodgkin’s Lymphoma (NHL) is a heterogeneous group of cancers affecting the lymphatic system – divided in to two prognostic groups.

1. Indolent or low grade lymphoma with a long median survival. Majority of lymphoma fall into this group. They are incurable at advanced stages with a median survival of 8 – 10 years.
2. Aggressive or high grade lymphoma these have a short natural history and a 50 – 60% cure rate.

The Technology

I-131 Tositumomab (Bexxar) is Iodine labeled monoclonal antibody for the treatment of patient with CD 20 positive follicular low grade NHL, including relapsed, refractory or transformed low grade NHL. The monoclonal antibody targets and binds to CD 20 on the surface of the B cells. Once bound antibody inhibits tumor cells directly and / or recruits the immune system to attack the targeted cells. Simultaneously the radio isotope delivers radiation directly to the B cells. I-131 tositumomab has been in clinical trials as an adjunct to chemotherapy and for the treatment of patients who relapse after an initial response. Administration of I-131 tositumomab requires dosing based on the patient body mass, tumor size and metabolism of the drug. It is delivered intravenously and usually given in 2 separate doses on the same day or 2 doses one week apart. After the second dose the patient needs to stay in hospital for a few days because they may be a radiation risk for other people.

The results of clinical trials show that for follicular NHL, treatment with radiolabelled antibodies would require re-treatment at 14 months for most of the patients. Using conventional chemotherapy however would require re-treatment at 5 months. In addition 20% of patients treated with a single dose of I-131 Bexxar were tumor free at 3 years compared to none in the group of patients having repeated chemotherapy. There are literature reports of response rates of 57% (complete response 32%) with I-131 Tositumomab for chemotherapy refractory, low grade and transformed low grade NHL. The median duration of complete response has been reported as 20 months.
Financial Implication

At present I-131 Tositumomab labeling procedure is being analyzed by Board of Radiation in Isotope Technology (Radiopharmaceuticals). BRIT is planning to conduct a multi-centre clinical trial in India. Therefore for 10-15 NHL patients a year we can conduct an approved clinical trial using Bexxar. The budgetary provision would be worked out in a few months in co-ordination with BRIT, Mumbai.

2. Comparison of F-18 FDG PET with Tc99m – GHA uptake in Ca.breast and Ca.Lung evaluation:

Proposing a prospective comparative study to learn the usefulness of Tc 99m GHA a SPECT analogue of FDG for detection of glucometabolism in stage III Carcinoma lung and breast, with FDG PET images.

Recently lot of reports compare the uptake of FDG in intracranial tumors with uptake of Tc-99m labeled Glucoheptonate. Whole body PET-CT with 18 FDG is a metabolic imaging which gives plenty of information for nodes, primary besides metastases assessment.

This has been found useful in Ca Breast and Ca.Lung patients. We have to do a prospective trial incorporating theses 2 scans for about 25 patients of Ca. Breast [stage III preferably] and Ca lung-NSCLC [Stage III].

PET-CT will be done and later they will be undergoing Tc-99m GHA whole body imaging with SPECT of the involved area/whole body SPECT.

The results can be compared and if Tc-99m GHA is found to be equivalent Then these patients can be imaged at a relatively lesser cost.

Academics

- Observership Training given for post graduate of M.Sc.(Medical physics) of Govt.Arignar Anna Cancer Hospital, Karapettai, Kanchipuram in our nuclear medicine department for a period of 1 month.

- Two students had successfully completed B.Sc. Nuclear medicine technology course in October.

Dr R Krishnakumar

- Participated in “Sentinel node imaging and biopsy workshop” organized by ANMPI at AIMS, Cochin in August.

- Lecture on “Therapeutic Nuclear Oncology” at Dr.Kamatshi Memorial Hospital in October.

- Invited as an external expert of Thesis for DNB, NM of Apollo Hospitals in May. Was Chairperson on Ga 68PSMA session ,CME on Nuclear Medicine conducted by CMC Vellore in February.

- N.Anandi (Technologist) -Attended “CME on Nuclear medicine “conducted by CMC Vellore in February.

- CME was conducted on “PET CT in Oncology” at Cancer Institute in March.
ONCOPATHOLOGY

Dr. S. Shirley, MD, DNB, MNAMS  
Dr. K. Murhekar, MD

**Pathologist**
Dr. G. Nandini, MD  
Dr. Sithara Venkateshwar, MD  
Dr. N. Ramya, MD, DNB  
Dr. P. U. Swathy, MD  
Dr. N. Poornima, MD  
Dr. Deepa Ramakrishnan, MD

**Professor & Head**  
Dr. S. Shirley, MD, DNB, MNAMS

**Additional Professor**  
Dr. K. Murhekar, MD

**Post Doctoral Fellowship students**
Dr. Jhansi Rani, MD, DNB  
Dr. Priya T. Rajan, MD  
Dr. P. Mellonie, MD

**Technologist**
Mrs. K. Mullaikodi, B.Sc., PGDMLT

**Scientific Assistant**
Mr. K. Murugan, M.Sc., M.Phil., B.Ed., PGDMLT  
Mrs. A. R. Abitha, M.Sc., M.Phil., PGDMLT  
Mrs. N. Anuratha, M.Sc., M.Ed.  
Mr. G. Sakthivelou, M.Sc., M.Phil.  
Mr. A. Vinod Kumar, M.Sc., M.Phil  
Mr. K. N. Madhu Kumar, M.Sc., PGDMLT  
Mrs. M. N. Sangeetha Priya, M.Sc., M.Phil., PGDMLT  
Mrs. Sheela Benedict, M.Sc., M.Phil., B.Ed.,  
Mrs. Reshmi P. Nair, M.Sc.,  
Mrs. T. Premalatha, D.C.P., B.Com.,

**Cytotechnologist**
Mrs. B. Bhanu Priya, M.Sc.,

**Grade I Technician**
Mr. N. Nambi Arasu, B.Sc., DMLT, M.A., M.Sc., M.Phil., PGDHA  
Mr. G. Alexander, B.Sc, DMLT  
Mrs. T. Kavitha, DMLT, B.A.,  
Mrs. R. Jothi, DMLT, B.Sc.,

**Typist**
Mrs. D. Latha, B.B.A.,

**Lab Technician**
Mrs. S. Krishnaveni, DMLT  
Mr. P. Ramasamy, DMLT  
Mrs. B. Naveena Sarojini, DMLT  
Mr. A. R. Lakshmi Narayanan, CMLT  
Ms. B. Kalaivani, DMLT, B.Sc.,  
Mrs. M. A. S. Bharathi, DMLT, B.Sc,  
Mrs. B. Bharadha Devi, DMLT, B.Sc,  
Mrs. S. Vettri Selvi, DMLT  
Mrs. S. K. Basheerunisa, CMLT, B.Sc.,  
Mrs. A. Mariammal, CMLT, B.Sc.,  
Mrs. M. Devi, DMLT

**Mr. B. Dinesh Karthi, D.E.C.E., DMLT**  
Ms. L. Sasikala, B.Sc., DMLT  
Ms. S. Rupavathi, B.Sc. (MLT)  
Mr. S. Bhuvaneshwaran, DMLT  
Mr. C. Swaminathan, M.Sc., DMLT  
Mrs. S. Prasana Devi, DMLT, B.Sc.  
Mr. R. R. Shankar, CMLT, DCA, B.B.A., B.Sc.,  
Mr. S. Siva, DMLT  
Mrs. S. Ramya, DMLT  
Ms. R. Deepa, DMLT  
Ms. S. Lavanya, DMLT, B.Sc.,  
Mr. A. Prabhu, B.Sc., PGDMLT
Histopathology 33664 Cytopathology 22714
Haemato Pathology 10447 Clinical Pathology 497281
24 Hours Laboratory Cases
Haemogram 2873
Blood sugar 7
LFT 211
RFT 394
Electrolytes 549
Uric acid 44
Amylase 1
CK 8
CKMB 7
Coagulation profile 155
Total 4249

**Ongoing Projects**

i) Establishment of Tumour Bank at the Cancer Institute (WIA), Adyar, Chennai

After obtaining informed consent from patients, normal and tumour bearing areas from resected specimens are identified and collected under sterile conditions in labeled cryovials. These are snap frozen in liquid nitrogen and transferred to -80° C (ultra low freezer) or -186° C (Liquid Nitrogen) for storage.

Frozen sections are done on all collected samples to ensure the presence and percentage of tumour cells.

Periodical DNA/RNA isolation is done to validate the specimen quality.

ii) Prognostic Marker studies in Breast Cancer

ER, PR, C-erb B2, CK 5/6 and Ki 67 studies are routinely being carried in breast cancer tissues.

iii) IHC categorization of tumours

<table>
<thead>
<tr>
<th>Tumour Type</th>
<th>Count</th>
</tr>
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<tbody>
<tr>
<td>Hodgkin Lymphomas</td>
<td>94</td>
</tr>
<tr>
<td>Non Hodgkin Lymphomas</td>
<td>278</td>
</tr>
<tr>
<td>Poorly Differentiated Tumours</td>
<td>153</td>
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<tr>
<td>Metastatic Tumours</td>
<td>213</td>
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<tr>
<td>Sarcomas</td>
<td>125</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>775</td>
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<tr>
<td>Prognostic marker study in breast</td>
<td>1173</td>
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<tr>
<td>ER, PR study other than breast</td>
<td>67</td>
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<tr>
<td>Total</td>
<td>2878</td>
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iv) Immunophenotyping of haematolymphoid malignancies

<p>| | |</p>
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<tbody>
<tr>
<td>Acute Lymphoblastic Leukaemia</td>
<td>202</td>
</tr>
<tr>
<td>Acute Myeloid Leukaemia</td>
<td>112</td>
</tr>
<tr>
<td>Lymphoproliferative disorder</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>339</td>
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</tbody>
</table>

v) Intra-operative frozen section consultation of head and neck tumours; a prospective analysis.

vi) The value of intraoperative frozen section analysis of margin status in breast conservation surgery in a cancer centre.

**Academics**

Dr. S. Shirley

- “Cancer Diagnosis: Laboratory Perspective” at 7th Annual Paramedical Day at Dr. Mehta Hospitals & Dr. Mehta’s Clinical Laboratory, Chennai in April.
- “An Ideal Pap Smear” at Refresh 2016 at Sri Ramachandra University, Chennai in May.
- “Colorectal Tumours: An Uptake” at Kaleidoscope of Pathology – II (A Post-graduate oriented CME) at Chengalpattu Medical College, Chengalpattu in July.
- “QC Practices in Cytology Practice” at CME in Quality Management in Clinical Laboratories (SMART LAB) at MIOT Hospitals, Chennai in November.
- “WHO Classification of Lymphoid Neoplasms – 2016” at CHETPATHCON 2016, “LYMPHOMA – An Uptake” at Chettinad Hospital & Research Institute, Kanchipuram District in November.
- “Classification and Pronostication of Diffuse Large B-cell Lymphoma” at CHETPATHCON 2016, “LYMPHOMA – An Uptake” at Chettinad Hospital & Research Institute, Kanchipuram District in November.
- “Slide Discussion” at CHETPATHCON 2016, “LYMPHOMA – An Update” at Chettinad Hospital & Research Institute, Kanchipuram District in November.
- “Specimen Handling” at CME on Immunohistochemistry in December at Cancer Institute (WIA),
- “Slide Discussion” at CME program on Targeted Therapy in Lung Cancer at Stanley Medical College, Chennai in February.
- Cytokeratin positive interstitial reticulum cell sarcoma of the breast at 5th South India Lymphoma Group Meeting at G.Kuppuswamy Naidu Memorial Hospital, Coimbatore in May.
- Dr. G. Nandini - Hodgkin lymphoma of the anal canal at 5th South India Lymphoma Group Meeting at
- G.Kuppuswamy Naidu Memorial Hospital, Coimbatore in May.
- Dr. P.S. Shobhanaa - Hepatosplenic T-cell lymphoma at 5th South India Lymphoma Group Meeting at G.Kuppuswamy Naidu Memorial Hospital, Coimbatore in May.
- CME on Immunohistochemistry at Cancer Institute (WIA), Chennai in December.
The clinical Bio Chemistry Department offers all routine investigations as well as Special tests like Tumor Markers, Electrophoresis and MTX drug assays. On an average of 370 samples processed per day and more than 3000-3500 tests performed every day with around 45 different parameters.

### Tests Number

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<td>RFT</td>
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<td>Coag.Pro.</td>
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<td>Oth Inves.</td>
<td>56357</td>
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<td>633846</td>
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### Academics

Dr. R. Arivazhagan & Mr. N. Sivakumar

- Attended the South Zone regional Conference of ACBI as Resource person & Mr. N. Sivakumar presented a poster on “Tumor Marker Evaluation in Child hood Cancer” at CMC, Vellore in September.
- CME program on “Quality Management in Clinical Laboratories (SMART LAB)” conducted by MIOT Hospital in November.
- 43rd ACBI National Conference “conducted by Bio Chemistry Department, KMC, Mangalore as invited speaker in December.
- Attended a three days ISO 15189:2012 international Workshop on GCLP held at SRMC, Porur in March.
• “TRITICUM ‘17” a two days National level symposium conducted by the Dept. of Genetic Engineering, Bharath University, Selaiyur, and delivered a lecture on “Cancer- Basics” in March.

Internship training for 1 year M.Sc. students from outside institutions, around 24 M.Sc. students and 8 B.Tech. (Bio-Tech) students.

The department has conducted a half day CME VI program with the Tamil Nadu Chapter of ACBI in November. Dr. Malliga Ravindran, M.Sc., Ph.D., Director- Lab services, Anderson Diagnostic Services, Chennai gave a talk on “The Role of HE4 & ROMA In the management of Patients presenting with pelvic Mass” & Dr. Malliga J. Subramanian, M.D., DGO, Head, Preventive Oncology Department, Cancer Institute, gave a talk on “Screening of Common Cancers”.

**CLINICAL MICROBIOLOGY**

Dr. R. Manjula, MD  
Consultant Microbiologist  
Mrs. Varalakshmi, M.Sc  
Head  
Mrs. R. Harini, M.Sc  
Scientific Assistant  
Ms. S. Saraswathy, M.Sc  
Scientific Assistant  

**Technician**  
Mr. B. V. Ramana Rao, CMLT  
Mrs. Valarmathi, B.Sc, DMLT  
Mrs. A. Meena, B.Sc, DMLT  
Mr. P. Vijayaragavan, DMLT  

The microbiology department is involved in diagnostic service, handling clinical samples for culture and sensitivity, microscopy and serological studies. A wide range of samples like blood, body fluids, urine, pus, respiratory secretions, pre op swabs, catheter tips, tissues, stool etc are received for culture. The department has BacT alert automated systems for blood culture specific for adults & pediatric patients there by reducing the turn around time and results being available after a shortened incubation period of four hours instead of the conventional 24 hrs. Department also has a Vitek 2 Compact system for identification and susceptibility testing of bacteria and fungus. Anaerobic, fungal and Mycobacterial culture of various clinical samples are performed. Aspergillus Galactomannan antigen detection using ELISA for Diagnosis of Invasive Aspergillosis is performed. HPV DNA assay using capture technique and genotyping using linear array is conducted. The department is actively involved in surveillance of operation theatres, ICU’s, BMT unit, various wards, CSSD, health care personnel and biomedical waste management for better infection control.

Total number of specimens  55443
Antibiotic Susceptibility Profile

Staphylococcus aureus

- Incidence of MRSA is around 10% - 12% (SSI)
- Linezolid, Vancomycin, Teicoplanin shows 100% Susceptibility for MRSA
- Clindamycin shows 100% Susceptibility for MSSA, while 40% for MRSA
- Netilmicin shows 96% Susceptibility for MRSA
- Amikacin shows 90% Susceptibility for MRSA.

Enterococcus (MDR) : Mostly isolated from Stool.

- Linezolid shows 100% Susceptibility.
- Vancomycin, Teicoplanin shows 87% Susceptibility
- Vancomycin, Teicoplanin resistance (VRE) seen mostly with Enterococcus faecium.

Escherichia coli / Klebsiella

- Colistin & Tigecycline shows 100% Susceptibility.
- Susceptibility to Imipenem – 80%, Meropenem is around 73%
- Ecoli / Klebsiella reported from stool is 100% MDR.
- Susceptibility to 1st, 2nd & 3rd génération Cephalosporin is around 20% only.
- Piperacillin/tazobactum shows 63% while Cefaperazone/sulbactum & Amikacin shows 78% susceptibility.
- ESBL Positivity is around 35 to 40%
- MBL Positivity is around 8-10%

Academics

- Mrs Varalakshmi & Mr Ramana Rao were certified as an Internal Auditor in the QMS training program as per the ISO15189, at Cancer Institute (WIA) in October.
- Scientific assistants Mrs R. Harini & Ms S Saraswathy completed the training programme on Quality management systems and internal Audit in Medical labs as per ISO - (15189-2012) in March Conducted by 360 Diagnostic & Health Services Pvt Ltd.
- A training in association with BD was conducted at our Institute in March on “Safe injection & Needle precaution”. Around 50 nurses attended.
- A training in association with 3M was conducted at our institute in March on “Pressure ulcer prevention”. Around 30 nurses attended.
- CME on “ANTIBIOTIC RESISTANCE MANAGEMENT” in March. Following were discussed, Antibiotic Resistance Trends in India by Mrs Varalakshmi, Antibiotics for bad bugs - How to Treat? By Dr Prashanth Ganesan & Antimicrobial Stewardship Implementation & Digital Mobile APP by Dr. Hemal Patel, Senior Manager – Medical Affairs, MSD.
Completed project

Antibiotic Stewardship Programme – co-ordinated interventions to measure appropriate use of antibiotics to help control infections by drug resistant pathogens in hospitals. Resource Centre: Cancer Institute (WIA) Participating Centre: Rajiv Gandhi Government General Hospital (RGGH), Microbiology Department – MMC.

An effective approach to improving antimicrobial use in hospitals is known as Antibiotic stewardship. Antibiotic stewardship refers to coordinated interventions designed to improve and measure the appropriate use of antibiotics – right dose, right duration of therapy, and right route of administration.

The primary goal of stewardship is to raise awareness among health care workers about the escalating problem of resistance in hospitals and community. There is evidence to show that the reduction in the use of antibiotics also brings down the incidence of resistance. It then becomes possible to reduce antibiotics use without compromising patient safety. Antibiotic stewardship is the effort to improve antibiotic prescribing by clinicians. Hospitals can influence antibiotic use with improved, prudent antibiotic prescription, as up to 50% of prescribed antibiotics may be inappropriate or even unnecessary.

To curb the increasing resistance, hospitals should start antibiotic stewardship programs as quality initiatives for infection control. Good antibiotic stewardship involves selecting an appropriate drug and optimizing its dose and duration to cure an infection while minimizing toxicity and conditions for selection of resistant bacterial strains.

Compliance with hand hygiene and other infection prevention and control measures is vital for controlling antibiotic resistance. Implementation of an effective stewardship requires a multidisciplinary approach with core team staff working together to achieve good outcomes. It is recommended that the core team should include a clinician, pharmacist, microbiologist and an infection control specialist. These programs help clinicians improve the quality of patient care by reducing hospital infection rates and antibiotic resistance thereby decreasing treatment failures significantly.

Strategies followed at Microbiology laboratory to help clinicians with rational antibiotic prescribing:

- Early identification of the pathogen and susceptibility using automated microbiology system keeping in mind that clinicians must strike a early administration of appropriate antibiotic knowing the likely pathogen & resistance percentage.

- We developed a system to recognize trends in antibiotic resistance and to report them promptly to doctors, to help with rational antibiotic prescribing - direct, personalized communication to clinicians / duty nurses was done for MDR infections. All this was apart from the reports typed in the hospital information system.

- Monthly surveillance of antibiotic resistance was done & discussed in infection control meetings, this helped clinicians know their unit specific local data.

- We prepared cumulative antibiogram which summarizes the susceptibility of microorganisms to antibiotics helpful in formulating antibiotic policy

- Auditing compliance with care bundles CLABSI, SSI, UTI & VAP was done.
Strategies followed by Clinicians - Clinician supervises therapeutic guidelines, antimicrobial restrictions policies, gives second option on higher end antibiotic usage and ensures dose optimization for life saving antibiotics used in treating MDR infections, enforces the approval system of restricted antibiotics and ensures safe use of medication to reduce adverse events. It is now imperative for the clinicians to play a greater role in conserving the efficiency of the currently available agents for which containment of resistance is required.

Clinicians carry out the following:

- Review of indication for antibiotic and compliance with antibiotic policy.
- Review appropriate antibiotic choice, dose, route and duration.
- Review drug allergies & adverse events.
- Review therapy based on culture results.

At the Institute we have a hospital formulary – containing an overview of indications and favourable antibiotic treatment & stringent policy for use of broad-spectrum antibiotics with approval for restricted antibiotics by consultants.

Antibiotic Prescribing - Good Practices at Cancer Institute

1. There is bedside chart - antibiotic order forms with justification
2. Combination therapy is started empirically when delay in initiating therapy to await culture results would be life threatening
3. Antibiotic Time Out: Clinicians revisit selection of empiric antibiotics after more clinical data are available by 48 hrs
4. Second opinion of a senior consultant for high end antibiotics, Doctors are careful not to treat colonization or contamination
5. Antibiotic initiations is done after sending cultures. Clinician steps down to narrow spectrum, if there is no step down availed, the reason is documented
6. Compliance with antibiotic policy & formulary is reviewed, any exception is recorded
7. Antibiotic related adverse events, factors affecting drug choice & dose - renal function, interactions, allergy etc are reviewed
8. Core team clinician along with pharmacist reviewed patients

The stewardship study patient tracking forms with clinician notes were reviewed weekly by the core team clinician along with the pharmacist. This exercise improved the communication between the core team.

Clinicians followed front end and back end approach

- Front end - pre prescription - Pre authorization, formulary restriction & reduction in unnecessary use. Restriction implemented : Consultant approval, pre approval, telephonic consent etc
• Back end – post prescription - Prospective audit, review of broad-spectrum empirical therapy & timely de-escalation based on culture and clinical status of patient.

Strategies followed by Pharmacist - Pharmacist have a responsibility to take prominent roles in antibiotic stewardship programs in hospitals. In our study the pharmacist collected and analyzed consumption of antibiotics, measured antibiotic use as defined daily dose, kept track on usage of higher end antibiotics in wards. Data collection and analysis of antibiotic use and expenditure was undertaken regularly. Pharmacist reviewed antibiotic orders, provide feedback to doctors, and coordinated the activities of hospitals antibiotic stewardship program in collaboration with the antibiotic stewardship core members.

Pharmacist discusses with core team clinicians and gives feedbacks and in implementing and auditing activities that promote safe and appropriate use of antibiotics. Generating and analyzing quantitative data on antibiotic drug use to perform clinical outcome analyses is a major responsibility. Pharmacist worked closely with the microbiology department to ensure that appropriate microbial susceptibility tests are reported on individual patient in timely manner and collaborates with the laboratory and utilizes hospital information technology to enhance antibiotic stewardship program.

Collection and analysis of local consumption in particular wards was correlated with the infection rates in that ward using microbiology data, antibiotics raised against patient hospital number but suspended (i.e. returned to the stores) was analyzed to get the actual consumption of antibiotics by that particular patient. Data on antibiotics suspended was collected with the help of Hospital Information System. The role of pharmacists is useful for any stewardship programme as he/ she contributes to monitoring the effective use of antibiotics & 1 Pharmacist was appointed specifically for this study.

Patients admitted in the following wards were included in the study:

ICU – Medical oncology block, Post operative ward, Children ward, it is well known that the particular area within any hospitals that have the highest rates of antibiotic resistance are the various intensive care units, that’s the main reason for tracking the ICU patients.

Moreover increase in the duration of patient exposure to antibiotics increases the likelihood of colonization with resistant organisms endogenously and their propensity to spread to other patients and into the community as well upon their discharge. Other Wards – Induction & BMT were also been tracked.

Antibiotic use data was collected and analyzed by us as follows:

• Antibiotic use by patients through the Hospital Information System (electronic prescription) i.e total grams of antibiotic used for specific duration were captured for 11 antibiotics & 3 antifungals.
• Monthly data from pharmacy computer was collected, this showed antibiotics indented by each ward for patients.
• Any increase in antibiotic consumption in a particular ward was correlated with infection rates in that ward using Microbiology data.
• Antibiotics raised against patients UHID but suspended was analyzed to get the actual consumption by a patient. Data on antibiotics suspended was collected with the help of TCS.
• Resistance and sensitivity percentage ward wise for major antibiotics has been analyzed for both adults and children.

• DDD - Defined Daily Dose for adults and pediatric patients is being calculated.

DDD represents the average daily maintenance dose of an antibiotic, this is already there in the tracking sheet, this was used as a reference to calculate the DDD actually delivered for few restricted antibiotics like Colistin, Tigecycline, Carbapenem, Extended spectrum beta lactum antibiotics (piperacillin/Cefoperaone).

• Monthly expenditure on antibiotics – report item wise from pharmacy.

Impact of Antibiotic Stewardship Study

• In our experience infection control interventions was the main strategy for antibiotic resistance containment. We saw the reduction in incidence of MDR infections whenever infection control measures were stepped up.

• The study increased the awareness about resistance among all clinicians and post graduates, it gave us a scope to continuously monitor the infection control practices & better adherence to guidelines.

• Accountability - Unit wise antibiotic purchases were monitored & antibiotics used for patients were quantified and this was discussed with concerned units.

• Decreased inappropriate antibiotic use - we have antibiotic order form with prescriber to justify antibiotic use.

• Continues discussion on handling infections caused by MDR bacteria was happening between the core members & clinicians.

• Periodic review of resistance data, surveillance of MDR infections & clinical outcomes – improvement at the level of individual infected patient.

• Close monitoring of empirical high end antibiotics was done.

• De escalation was done meticulously - once laboratory results are available with identification of pathogen along with susceptibility data, every attempt was made to de escalate the antibiotics.

• Ongoing monitoring and prospective audits helped us whether guidelines are followed as expected. Adherence to institutional antibiotic policy with evidence based antibiotic choice.

• Initially we felt it as an additional burden to our already heavy workload, but as the study proceeded we were seeing the benefits for ourselves and realized that it should be regarded as a routine standard of care.

• Study increased awareness about resistance among us, clinicians started working closely with Pharmacist and Microbiologist, we are talking!!

No single intervention can solve resistance, our experience has shown that improving infection control practices & the appropriate use of antibiotics plays an important role in addressing this issue.

In our experience infection control interventions was the main strategy for containment of resistance, whenever we tightened infection control measures resistance decreased. We at the Institute see this study as an antibiotic management study and the study becomes even more
significant when we look beyond just saving money, when patients are out of infection completing treatment successfully, discharge early & the bed available for another patient.

**Future Project**

**Study on Drug Resistance Index**

**Drug Resistance Index - DRI is a method of aggregating bacterial resistance to multiple antibiotics.**

The resulting drug resistance index is expected to show antibiotic resistance and consumption trends. Primary aim is to: Prepare antibiotic data, Prepare antibiotic utilization data & Collating information and calculating DRI. With this objective we have started analyzing identification & Susceptibility profile for all bacterial isolates from blood and wound specimens for a period of 3 year from January 2015. Benefit of calculating the index is it would help clinicians to tailor antibiotic purchasing and antibiotic prescribing policy and also the index will track if we are over using antibiotics.

**ELECTRON MICROSCOPY**

Dr. Pushpa Viswanathan, Ph.D, FABMS, PGDHM  
Professor & Head

K. Vadivel, +2, DMLT  
Lab. Technician

94 samples have been collected and processed for Transmission Electron Microscopy.

**Completed Projects**

Assessing the usefulness of paraffin block sections for diagnostic electron microscopy

Paraffin block sections can also be processed for Transmission electron microscopy after removal of paraffin. Ultrathin sections from reprocessed paraffin block sections reveal ultrastructural details which can aid in the diagnosis of tumors. A few such samples have been assessed for the usefulness of this technique. It is inferred that the usefulness of these samples depend mainly on the initial processing carried out for the preparations of the paraffin blocks.

**Academics**

- Dr. Pushpa Viswanathan lecture on “Biological Applications of Electron Microscopy” at Annamalai University, Chidambaram under the UGC-SAP Programme in March.
- A Memorandum of Understanding (MoU) is signed with Madras Medical Mission Hospital for carrying out electron microscopic studies on their renal and peritoneal biopsy samples for diagnostic and research purposes.
- 79 students have undergone one-week ‘Observership training programme’ in the department including medical postgraduates.
- 25 students have visited the department as one-day observers.
PHYSIOTHERAPY

Mr. Srinivasan Vijay, MPT(ortho), PGDSM, PGDTC  
Chief Physiotherapist

Physiotherapist
Mr. M.S.Satish MPT(Neuro), MSc(Psy), D.Ac
Mrs.Anitha, BPT
Ms.Ramalakshmi, BPT

In Patient (SOG+MOG+ROG) 34657
Out Patients 11450
-------
Total 46107
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Internship Students - 59 students
Clinical posting - 49 students

Ongoing projects
- The Impact of Kinesiotherapy on cancer related fatigue in oral cavity cancer patients.
- Factors Determining Shoulder Dysfunction and Effectiveness of Prehabilitation on Physical and Psychological Problems in Breast Cancer Patients with Modified Radical Mastectomy.

Guest lectures
Mr.Srinivasan Vijay
- “Physiotherapy in Palliative care” at CME organised by A.J.College of Physiotherapy, Chennai in October.
- “Role of physiotherapy following mastectomy and Lymphodema management for breast Cancer patients at Dept of Physiotherapy, Govt Stanley Medical College and Hospital, Chennai in March.

Mr.M.S.Satish
- ‘Significance of a physiotherapist in cancer management team’ at the state level meet of Indian Association of Physiotherapist held at Arakonam in September.
- Selected for the CRDO Workshop -2017 and presented his abstract and transformed it as a research proposal held in Lonavala in February.
- Moderated the International Workshop on ‘Medical Screening and differential diagnostic skills in critical medical and musculoskeletal conditions for physiotherapists’ organised by VMKV Medical College and hospitals, Salem in March.
- “Principles of onco-rehabilitation & scope of physiotherapy in musculoskeletal oncology’ at Dept of Physiotherapy, Govt Stanley Medical College and Hospital, Chennai in March.

Dental & Maxifacial Unit  Total Cases 1,481
## Library

Mr. E.K.S. Hema Nalini, M.Sc., M.L.I.S., M.Phil., H.D.C.A.
Librarian

Mr. T.S. Dinakaran, B.A., M.L.I.S., PGDCA
Assistant Librarian

Mr. M. Ravichandran, M.A., M.L.I.S., DCA
Assistant Librarian

### Total number of stack volume

- **Books**: 7744

### Periodicals

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### Technical Services

Book Stack is classified and catalogued according to the Dewey Decimal Classification and Computerized respectively.


• Mutational profiling of acute lymphoblastic leukemia with testicular relapse.

• Molecular mechanism and therapeutic implications of selinexor (KPT-330) in liposarcoma.

• Mutational Landscape of Pediatric Acute Lymphoblastic Leukemia.


• Kumar AS, Jagadeeshan S, Pitani RS, Ramshankar V, Venkatasamy K, Venkataraman G, Rayala SK. Snail modulated microRNA 493 forms a negative feedback loop with the insulin-like growth factor 1 receptor pathway and blocks Tumorigenesis. Mol Cell Biol 2017, 37(6), 510-516


• Ramakrishnan A S, Olivier Glehen. The role of hyperthermic intraperitoneal chemotherapy in gastric cancer. Indian Journal of Surgical Oncology 2016;7:198-207


• Krishnamurthy Arvind, Ramshankar V. Recent advances in our understanding of well differentiated thyroid cancers. Indian J Surg Oncol March 2017 DOI: 10.1007/s13193-017-0644-3

• Das Abhijit, Krishnamurthy Arvind P1.01-055 Clinicoepidemiological Trends of Lung Cancer from a Premier Regional Cancer Centre in South India. Journal of Thoracic Oncology January 2017 DOI: 10.1016/j.jtho.2016.11.579

• Krishnamurthy Arvind, Arunandhichelvan A. The Management Challenges in an Unusual Case of Primary Osteosarcoma of the Rib in an Adult Patient, Indian Journal of Surgery January 2017 DOI: 10.1007/s12262-017-1591-5


• A study of chronic pelvic pain after radiotherapy in survivors of locally advanced carcinoma of cervix - beyond WHO ladder. Med e journal The Tamil Nadu Dr MGR Medical University, – Dr.Grace Mercy Priscilla.B , Dr.Vasanth Christopher Jayapaul, Dr G.Selvaluxmy,

• Difficulties in radiation treatment precision while treating paediatric malignancies. Med e journal The Tamil Nadu Dr MGR Medical University, – Dr Muthiah, Dr Alexander.

• Spinal cord astrocytoma with pulmonary metastasis: A case report. Med e journal The Tamil Nadu Dr MGR Medical University, – Dr Geetha, Dr Arunkumar.

• Synchronous Hodgkins Lymphoma and adenocarcinoma lung with metachronous squamous cell carcinoma of esophagus - a rare case report. Med e journal The Tamil Nadu Dr MGR Medical University, – Dr Aswin, Dr Alexander, Dr G Selvaluxmy.
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| Mr Ganeshan V                  | Mr. Kannan                       |
| Ms Saramathi                   | Ms. Latha Ramakrishnan           |
| Ms Kamala Balachander          | Ms. Ranga Kumar                  |
ACKNOWLEDGEMENTS

The Institute has great pleasure and honor to acknowledge with gratitude the sympathy and help it received from many quarters. Prominent among those friends, whose consistent moral and material support has helped to sustain and fortify the Institute through more than five decades of trials and turmoil have been Shri Sugalchand Jain and family, Amalgamation and Sanmar Group, The TVS Family, Kalyani Memorial Trust, Sun Foundation, Mahesh Memorial trust, Cancer Institute Foundation (CIF), California to name only a few.

We thank our Governing Body members, senior consultants, volunteers well-wishers and all our staff for their commitment. The Institute has survived and grown as a principled voluntary organization, mainly due to tireless work by our staff in providing best patient care, our alumni, our Bankers, our committed donors, media, print and electronic.

We also thank State Government of Tamil Nadu, their officers, staff for financial grants towards treatment of underprivileged cancer patients.

The Cancer Institute (WIA) is an unique institution, continuing its ethos enunciated 61 years ago by the founders despite significant changes in concepts in medicare, in an environment of corporate ethos and still continuing as a nonprofit voluntary charitable institution, providing state of the art treatment to all patients irrespective of social or economic divide.

Special note of thanks to our donors who have been supporting us:

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