

SOCIETY FOR RADIATION RESEARCH (SRR)

*A Platform
for
Radiation Researchers...*

Report (2018-2022)



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About The Society

The Society for Radiation Research (SRR) is a scientific body of radiation researchers and individuals/students having interest in the area of radiation research. The SRR has been registered on December 15, 2014 in Mumbai by a group of scientists and clinicians.

Society for Radiation Research is aimed:

(i) To promote research in the areas of radiation biology with basic and applied aspects, clinical radiation biology and oncology, radiation hormesis & low dose radiation biology, environmental radiation biology, nuclear medicine, radiation technologies, translational research, terrestrial and space radiation biology, non-ionizing radiation effects and any other relevant research areas.

(ii) To facilitate integration and interaction of different radiation research areas.

(iii) To promote the diffusion of knowledge in these research areas through organizing meetings, conferences, workshops, awareness programs, scientific publications etc.

(iv) To promote discussion, interactions amongst scientist-public-industry and acting as liaison to communicate facts and research developments to public, government and regulatory bodies.

(v) To integrate Society with other National and International Scientific Bodies.

(vi) To encourage and promote young researchers and students to pursue research and build career in the areas of radiation and cancer research.

(vii) To promote and facilitate education of radiation sciences in National Institutes/Universities.

Governing Council

Founder President

Dr. K. P. Mishra

Ex-VC, NGBU,
Allahabad & Ex-Head,
RB&HSD, BARC,
Mumbai

Past President

Dr Nagraj Huilgo

Nanavati Hospital,
Mumbai

President

Dr. S. K. Shrivastava

Ex-TMH, Mumbai

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Dr. Sathees Raghavan

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Dr. B. N. Pandey

BARC, Mumbai

Treasurer

Dr. Chandan Kumar

BARC, Mumbai

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Chidambaram

Dr. Rajiv Sarin, ACTREC, Navi Mumbai

Dr S. D. Sharma, BARC, Mumbai

Dr V. Kannan, P.D. Hinduja Hosp, Mumbai

Dr Venkatachalam Perumal, SRMC Chennai

List of SRR Activities (Feb. 2018-Oct. 2022)

	Meeting/Symposium/Seminar	Venue	Date
1.	Pre-Conference workshop on “Basics of Radiation Biology”	School of Medical Sciences, University of Hyderabad, Hyderabad	Feb.1 ,2018
2.	International Conference on Radiation Research: Impact on Human Health and Environment(ICRR-HHE 2018) and Second Biennial Meeting of SRR	School of Medical Sciences, University of Hyderabad, Hyderabad	Feb.2-4, 2018
3.	Workshop on “Current Challenges in Diagnosis and Radiotherapy of Cancer”	Vidyalankar Institute of technology (VIT), Mumbai	Oct.6, 2018
4.	Special Lecture on Marie Curie; Topic: Life and Radiological Discoveries of Marie Curie: Role Model for Women in Science	Indian Women Scientists Association, Vashi, Navi Mumbai	Nov.1, 2018
5.	Public Lecture on “Diagnostic Radiology” .	University of Calcutta, Kolkata	Dec.15, 2018
6.	Guest Lecture on “Tomotherapy”	Pravara Institute of Medical Sciences, Loni	Oct.12, 2019
7.	Meeting on “Recent advances in Radiopharmaceuticals to overcome challenges in cancer therapy”	Nanavati Bhanuben College of Pharmacy, Mumbai	Oct.19, 2019
8.	Meeting on “Revisit of LNT and Radiation Hormesis”	Sun-N–Sand Hotel, Mumbai	Dec.7, 2019

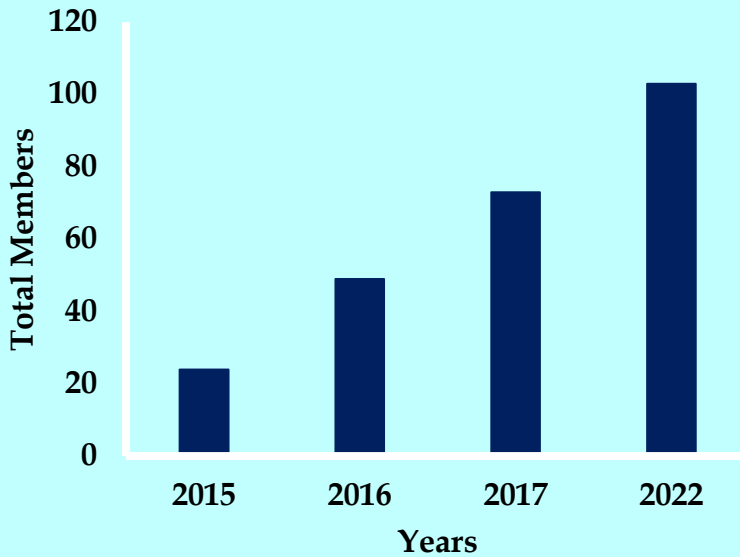
***Society with dynamism and active encouragement for
Radiation Research...***

List of SRR Activities (Feb. 2018-Aug. 2022)

	Meeting/Symposium/Seminar	Venue	Date
9.	Lecture on “Awareness and preparedness for radiation disaster”	Bhopal Memorial Hospital and Research Centre, Bhopal	Jan.11, 2020
10.	Workshop on “Principles and Instrumentation of Radio-diagnostic and Radiotherapy techniques for Biomedical Engineers”	Nanavati Hospital, Mumbai	Feb.1, 2020
11.	Webinar on “Genetics in Cancer and its therapy”	Online	Aug.1, 2020
12.	Second International School on Radiation Research	E-Conference (online)	Sep.6-20, 2020
13.	Workshop on “Technological advancements and challenges of radiation based techniques in diagnosis and therapy of cancer”	Online	Mar.20, 2020
14.	Workshop on "Advancements in Radio Diagnostic and Radiotherapy Equipment"	Nanavati Hospital, Mumbai	Aug 6, 2022

***Society with dynamism and active encouragement for
Radiation Research...***

Scientifically active and expanding Society...



Membership (As on Oct.8, 2022)

Membership Category	Number (as on Oct. 2022)
Full	54
Associate	24
Honorary	11
Student	18

A list of members is available on www.srrindia.org

A report on Pre-Conference Workshop on “Basics of Radiation Biology”

A Pre Conference Workshop on “*Basics of Radiation Biology*” was held in School of Medical Sciences, University of Hyderabad by Society for Radiation Research (SRR) with major target audience young researchers and students.

The program started with welcome address by **Dr. Geeta Vemuganti**, Dean, School of Medical Sciences, University of Hyderabad followed by an inaugural lecture by **Dr. M.R. Raju**, Mahatma Gandhi Memorial Medical Trust, PedaAmiram, Bhimavaram on the topic Radiation Research and Radiotherapy. The inaugural session lecture was Chaired by **Dr. K.P. Mishra** Former VC, Nehru Gram Bharati Univ., Allahabad and Former Head, Radiation Biology & Health Sciences Div., Bhabha Atomic Research Centre, Mumbai.

There were 3 technical sessions followed by Panel discussion. Session I of the workshop on the theme Basic Concepts in Radiation Biology had 2 lectures and the session was Chaired by **Dr.C. Rama Krishna Rao**, Government Hospital, Ananthapur and **Dr. P. Krishna Reddy**, MNJ Cancer Institute, Hyderabad. The first lecture was by **Dr. Amit Kumar**, Bhabha Atomic Research Centre, Mumbai on the topic “*The Concepts of Radiation Biology and Their Implications in Cancer Radiotherapy*” and the second lecture titled “*Radio Biology of DNA Damage Repair and Non-ionising Radiation*” was delivered by **Dr. NR Rajendra Prasad**, Annamalai University, Chidambaram.

Session II on Radiation in Diagnosis and Therapy was chaired by **Dr .P. Yadagiri Reddy**, AV College, Hyderabad and **Dr. PBLD Prasad**, KIMS Hospitals, Hyderabad. **Dr. Chandan Kumar**, Bhabha Atomic Research Centre, Mumbai delivered the first lecture of the session on *Nuclear Radiopharmacy from Receptor Mapping to Theranostics* followed by a lecture on Advances in Radiotherapy Practices by **Dr. K. R. Muralidhar**, American Oncology Institute, Hyderabad.

Post-lunch, Session III was held on the theme, “*Modifiers of Radiation Response*” chaired by **Dr. NVNM Sresty**, Indo-American Cancer Hospital, Hyderabad and **Dr. Mallikarjuna**, Asian Institute of Gastroenterology, Hyderabad. **Dr. R P Coppes**, University of Groningen, The Netherlands delivered the 1st lecture on “*Stem Cells as Modifiers of Radiation Response*” and **Dr. Shamik Sen**, Indian Institute of Technology, Mumbai delivered the last lecture of the session on “*Role of Cellular Physical Forces in Radiation Oncology*”.

The Scientific Sessions of the workshop came to an end with a Panel Discussion on “*Opportunities and Challenges of Career Development in Radiation Research in India*”.

A report on
**International Conference on Radiation Research: Impact on
Human Health and Environment(ICRR-HHE 2018)
and Second Biennial Meeting of SRR**

International Conference on Radiation Research: Impact on Human Health and Environment (ICRR-HHE 2018) and Second Biennial Meeting of SRR was held in School of Medical Sciences, University of Hyderabad by Society for Radiation Research (SRR).

Inauguration of the Conference was on the evening of Feb.1, 2018 followed by Dr. Gopal Ayengar Memorial Oration Lecture Session chaired by **Dr. K.P.Mishra** Former VC, Nehru Gram Bharati Univ., Allahabad and Former Head, Radiation Biology & Health Sciences Division., Bhabha Atomic Research Centre , Mumbai. He gave a brief introduction about Dr.A.R. Gopal Ayengar. A lecture titled *Global Health Security: Radiation Countermeasures for Acute Radiation Syndrome* was delivered by **L. Andrew Huff**, MD, MPH, Director, Armed Forces Radiobiology Research Institute, Uniformed Services University of the Health Sciences, Bethesda, USA followed by dinner.

There were nine scientific sessions spanned out during Feb 2 to Feb 4, 2018 on various themes namely “Radiation Protection and Radiation Countermeasure Approaches”, “Radiation Oncology and Radiotherapy: Biology to Clinics”, “Non-Targeted Radiation Effects and Radio-resistance In Cancer Therapy”, “Novel Approaches for Improvement of Cancer Radiotherapy”, “Radiopharmaceuticals and Radiation Technologies”, “Low dose and Environmental Radiation Biology” and “Space and Non-Human Biota Radiation Biology”.

There were two poster sessions, one Oral Presentation Award Session and one session of “SRR best Thesis Award Presentation”.

Followed by several brain storming scientific sessions the conference came to an end with award session and valedictory function on the evening of 4th Feb.



A report on workshop titled “Current Challenges in Diagnosis and Radiotherapy of Cancer”

Vidyalankar Institute of Technology (VIT) had conducted a workshop on “Application of Radiation and Radioisotopes in Diagnosis and Therapy of Cancer” on Saturday, 15 October 2016 under the aegis of Society for Radiation Research (SRR). This workshop was attended by about 60 participants including Doctors, Scientists, Faculty, Research students and Graduate students. There were also outstation participants from Mysore and Ahmadabad. There were 4 technical sessions.



The inauguration of the workshop was presided over by **Dr. K.P. Mishra**, Founder President, SRR, **Dr. B.N.Pandey**, BARC, and **Dr. Jitendra Toravi**, Head, Biomedical Engineering Department, VIT. A brief overview about department of Biomedical Engineering and its activities was given by **Dr. Jitendra Toravi**. This was followed by a brief by Dr. K. P. Mishra about the advancements in Radiation Therapy and Medicine. Following this Dr. B.N. Pandey elaborated on the purpose of the Society for Radiation Research and its objectives.



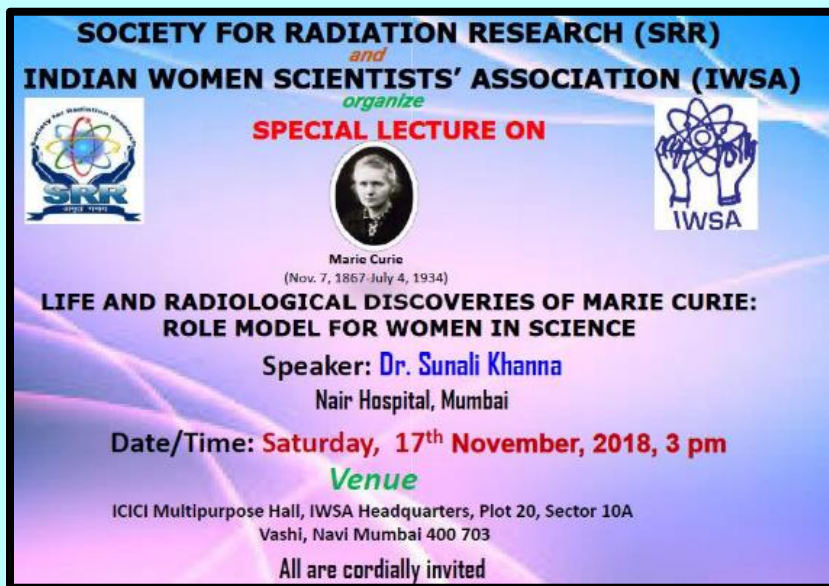
The first technical session was on “*PET-CT an Unique Modality in Management of Cancer*” by **Dr. Sunita Sonavane**, Radiation Medicine Centre (RMC). The second session was on “*Nuclear Medicine: Emerging Modality of Cancer Diagnosis and Treatment*” by **Dr. Chandan Kumar**, RPhD, BARC, Mumbai. The third session was on “*Applications of Accelerators in Cancer Radiotherapy*” by **Dr.S.D.Sharma**, Radiological Physics and Advisory Division (RP&AD), BARC, Mumbai. The last session was on “*Glimpsing the Future of Radiation Technologies in Multidisciplinary Cancer Care*” by **Dr. Shankar Vangipuram**, HCG Cancer Centre, Mumbai.






All the sessions were quite interactive .The session came to a conclusion with feedbacks from the participants.. A written feedback was taken from all the participants. This was followed by vote of thanks by Dr. Pandey, Secretary, SRR and Prof. Geetha Narayanan from VIT.

A report on Special Lecture on Marie Curie Life and Radiological Discoveries of Marie Curie: Role Model for Women in Science

Life and Radiological Discoveries of Marie Curie have been a constant source of inspiration for the generations of scientific and non-scientific community alike. Inspired by the life of Marie Curie, Society of Radiation Research decided to dedicate the first talk of the Women Special Lecture series to Marie Curie.



SOCIETY FOR RADIATION RESEARCH (SRR)
and
INDIAN WOMEN SCIENTISTS' ASSOCIATION (IWSA)
organize
SPECIAL LECTURE ON



Marie Curie
(Nov. 7, 1867-July 4, 1934)

**LIFE AND RADIOLOGICAL DISCOVERIES OF MARIE CURIE:
ROLE MODEL FOR WOMEN IN SCIENCE**

Speaker: **Dr. Sunali Khanna**
Nair Hospital, Mumbai

Date/Time: **Saturday, 17th November, 2018, 3 pm**

Venue
ICICI Multipurpose Hall, IWSA Headquarters, Plot 20, Sector 10A
Vashi, Navi Mumbai 400 703

All are cordially invited

The program started with a welcome speech by **Dr. S. Zingde**, former Deputy Director ACTREC, and President Executive Committee, IWSA. Dr. Zingde also briefed about the foundation, vision, mission and vast spectrum of social and scientific activities of IWSA. This was followed a brief overview about the purpose and objectives of Society for Radiation Research by **Dr. Rita Mukhopadhyaya**, Member, Executive Committee IWSA, and Head, Gene Technology Section, Molecular Biology Division, BARC, Mumbai. The lecture was attended Dr. Sudha Padhey, founder member of IWSA and several senior members of IWSA including Drs. Sunita Mahajan, Niyati Bhattacharya, Bhaktawar Mahajan, Sudha Rao, Srirupa Mujherjee among others. All the members of IWSA were felicitated by members of SRR. Following this, Dr. Shyamla Bhardwaj introduced the speaker **Dr. Sunali Khanna** to the audience.

Dr Sunali Khanna, BDS, MDS(Bom) DNB, PGDHHM, PGDMLS, CCR, PhD, is President Asian Academy of Oral and Maxillofacial Radiology, Vice President Indian Academy of Oral Medicine & Radiology, Member National Academy of Medical Sciences (India) and is affiliated to Nair Hospital Dental College, and Municipal Corporation of Greater Mumbai.



Dr.Sunali spoke about Life and Radiological Discoveries of Marie Curie. She elaborated the childhood, early education, career, personal life and struggles of Marie Curie. She also discussed about the discoveries and scientific accomplishments of Marie Curie and highlighted the fact that Marie overcame all the hurdles because of sheer perseverance and her passion for science and society. Dr. Sunali also inspired many young students to pursue their careers and dreams. The talk was followed by discussion.



On behalf of SRR, the vote of thanks was proposed by **Dr. Sagar Balla**, Scientist BARC and member SRR. On behalf of IWSA, the vote of thanks was proposed by **Mrs. Madhu Pahwa**, Executive Committee Member, IWSA. Dr. Shyamla presented a memento to Dr. Sunali Khanna. As a part of tradition of IWSA, Mrs. Pahwa also presented a small tulsi plant to Dr. Sunali Khanna. Dr.Rita Mukhopadhyay presented a memento to Dr. S. Zingde, President Executive Committee, IWSA. The session was followed by tea and discussion.

**A Report on
PUBLIC LECTURES
Organized by
SOCIETY FOR RADIATION RESEARCH (SRR)
on its Fourth Foundation Anniversary
jointly with
DEPARTMENT OF PHYSIOLOGY, UNIVERSITY OF CALCUTTA**

On 15th December 2018, on the auspicious occasion of fourth foundation anniversary of the Society of Radiation Research (SRR), organized “Public Lecture” in association with the Department of Physiology, University of Calcutta as one of its public outreach initiative. **Dr Rita Mukhopadhyaya**, Treasurer, SRR and Senior Scientist from the Molecular Biology Division, Bhabha Atomic Research Centre, Mumbai attended the meeting on behalf of SRR Governing Council. The event was held in the Seminar Room, Department of Physiology, University of Calcutta

The program commenced with a short introductory welcome speech by the compere, who also introduced **Dr. Rita Mukhopadhyaya** and **Prof. Sanjit Dey** to the audience. **Prof. Dey** gave an insightful speech as a tribute to Professor Meghnad Saha and Professor Satyendranath Bose on their 125th birth anniversaries.



Dr. Rita Mukhopadhyaya during her introductory speech and as a representative of SRR, explained about SRR, its formation, mandates, Governing Council members, journal publication and a road map of public outreach activities undertaken in the short span of time since its inception. Then Dr. Mukhopadhyaya chaired the session .

The first talk was by **Dr. Anup Sadhu**, who is Professor, EKO CT and MRI Scan Centre, Kolkata. Dr. Sadhu enlightened the audience on the hazards of radiation, safe value for exposure to radiation especially for paediatric unit and related issues in diagnostic radiology.



Our second speaker for the afternoon was **Dr. S.K. Mondal** who is Ex-Head, Department of Radiation Oncology, NRS Medical College, Kolkata. He told us about the past, present and future of cancer radiotherapy. He highlighted on the latest instruments that have been developed and are in use to give point focus therapeutic radiation and cause minimal damage to healthy tissues surrounding the cancerous tumor tissues.



The two speakers were felicitated by Professor Sanjit Dey and Dr. Rita Mukhopadhyaya. The enthralling session was ended by vote of thanks delivered by the comper followed by small refreshments for all the participants

A Report on
GUEST LECTURE
Organized by
SOCIETY FOR RADIATION RESEARCH (SRR)
Jointly with
DEPARTMENT OF RADIATION ONCOLOGY,
Pravara Institute of Medical Sciences – DU, LONI, (MS)

Society for Radiation Research jointly with Department of Radiation Oncology , Pravara Institute of Medical Sciences –DU, Loni organized a guest lecture on 12th October 2019. The theme of the lecture was Tomotherapy. The speaker of the session was **Dr. Rajesh. A. Kinhikar**, Professor & Head Department of Medical Physics, Tata Memorial Hospital, Mumbai.

The program commenced with a short introductory and welcome speech by the compere, followed by the felicitation ceremony of **Dr. Rajesh A. Kinhikar**, with the SRR memento by **Dr. Vandana Jain** Professor & Head, Department of Radiation Oncology PIMS, Loni, Mr. Mukund Sarje RSO & Medical Physicist Department of Radiation Oncology PIMS, Loni and Dr. Chaitali Waghmare, Associate Professor Department of Radiation Oncology PIMS, Loni. The participants were briefed about the SRR, its formation, mandates, Governing council Members, journal Publications and all the various activities undertaken in the short span of time since its inception by Dr. Vandana Jain.

Dr. Rajesh A. Kinhikar, started the lecture with great enthusiasm, the concept of Tomotherapy was explained from the beginning in great details. He highlighted the latest developments in the machines and the programming system. The lecture was very informative for all the participants. This is followed by a discussion session between Dr. Rajesh A. Kinhikar and the participants. The enthralling session was ended by vote of thanks to the management of Pravara Institute of Medical Sciences – DU, Honorable Dean of Rural Medical College, AVM (Retd.) Dr. Rajvir Bhalwar, and honorable Medical Superintendent Col. (Retd.) Dr. P. K. Thakur and our guest Dr. Rajesh A. Kinhikar.

**A Report on
Technology Reflection Series Lectures
“Recent Advances in Radiopharmaceuticals to overcome
Challenges in Cancer Diagnosis and Therapy”**

SVKM’s Dr. Bhanuben Nanavati College of Pharmacy, in association with the Society of Radiation Research (SRR), organized a seminar entitled **“Recent Advances in Radiopharmaceuticals to overcome Challenges in Cancer Diagnosis and Therapy”** under the Technology Reflection Series Lectures on Saturday, October 19th, 2019. The aim of these lectures series was to increase the awareness amongst the students towards the use of radiopharmaceuticals in cancer treatment as well as provide them insights to the well-known uses for diagnosis of various diseases. The target audience were post graduate students and faculty members.



The program was inaugurated by **Dr. Tabassum Khan**, Head of Pharmaceutical Chemistry and Quality Assurance Department and members of Society for Radiation Research, Dr. Badri Narain Pandey, Dr. Amit Kumar and Dr. Rohit Ranade. **Dr. B. N. Pandey** briefed the audience about the SRR and its activities.

The first talk was given by **Dr. Amit Kumar**, Scientific Officer F, Radiation biology and Health Science Division, BARC, Trombay. He spoke on *“Biological complexities of cancer and its therapeutic challenges”*. Dr. Amit presented the latest findings in the pathways identified for a tumour cell growth and the avenues available for the designing of newer molecules to control the same. He took the audience through the existing modalities of treatment and the clinical difficulties involved in drug resistant tumour treatment.

The second talk was by **Dr. Suresh Subramanian**, Radiopharmaceutical Division, BARC, Trombay. He spoke on “*Fundamentals of Radiopharmaceuticals development for cancer diagnosis and therapy*”. Dr. Suresh led the audience through the basics of radiation, radiation dosimetry and the making of radiopharmaceuticals using different radio isotopes (based on the emission of various particles by different radioisotopes). The end-use of these radiopharmaceuticals, he emphasized, was not limited to mere diagnosis, but also for treatment of some cancers.



The third talk was by **Dr. Rohit Ranade**, Head, Nuclear medicine, Nanavati Super specialty hospital. His talk on “*Clinical challenges in applications of radiopharmaceuticals in cancer management*” impressed upon the students the importance of radiopharmaceuticals in the treatment of some forms of cancers and how cure rates can be improved by use of the same. He discussed some clinical case studies of increase in survival rates of patients receiving radiation therapy by the use of radio labelled formulations.



The students appreciated the sessions and interacted with the resource persons. **Dr. Tabassum Khan** proposed the vote of thanks. Dr. B. N. Pandey gave his concluding remarks and once again stressed upon the importance of radiation in diagnosis and treatment of various cancer forms.

A Report of Meeting on

“Revisit of Linear No Threshold (LNT) and Radiation Hormesis”

Society for Radiation Research (SRR) in association of Society for Cancer Research and Communication (SCRAC) organized a Meeting on “*Revisit of LNT and Radiation Hormesis*” on Dec. 7, 2019 at Sun-N-Sand, Juhu, Mumbai. The meeting was one of the events in the series of activities organized by SRR during its 5th Foundation Year in 2019. The program was attended by about 40 eminent scientists, engineers, clinicians and other professionals from various Institutes and Hospitals (like BARC, NPCIL, AERB, ACTREC, TMH, IIT, Nanavati Hospital, Nair Hospital etc.) in Mumbai.

The poster is for a meeting organized by the Society for Radiation Research (SRR) in association with the Society for Cancer Research and Communication (SCRAC). The meeting is titled "Revisit of LNT and Radiation Hormesis" and is part of a series of scientific events during the 5th Foundation Year of SRR. It is scheduled for December 7, 2019 (Saturday) at 6:30 pm at Sun-N-Sand, Juhu, Mumbai. The poster features a central image of Jerry Cutler, Ontario, Canada, who is the speaker for the "TALK" titled "Linear No-Threshold Model of Radiation Risk Assessment: A Need to Balance Science Over Argument". Below the talk, there is a "PANEL DISCUSSION" on the same topic, featuring five panelists: Nagraj Huilgol (Chief Radiation Oncologist, Nanavati Hospital, Mumbai), K. P. Mishra (Ex-VC, NSRD, Alibababad, Ex-Head, RHCS, BARC, Mumbai), Pushparaja (Ex-Head, RRDS, BARC, Mumbai), B. S. Rao (Radiation Oncologist, ACTREC, Mumbai), and J. Sastry (TMC, Nair Mumbai). The poster also includes logos for SRR, SCRAC, Nanavati Hospital, and a stylized logo with the letters 'R' and 'N'.

The meeting started with a welcome note by Dr B. N. Pandey, Secretary, SRR. Dr Amit Kumar, one of the Founder Member of SRR and Scientist, BARC introduced Society for Radiation Research and its various activities after its foundation on Dec. 15, 2014. He highlighted some of the recent and upcoming activities of SRR. In addition, he also describes about Journal of Radiation and Cancer Research (JRCR), the official publication of SRR. Dr Kumar also welcomed audience for the 5th Asian Congress of Radiation Research (5th ACRR-2021) and 3rd Biennial Meeting of Society for Radiation Research to be held in Mumbai.

Dr Nagraj Huilgol, Radiation Oncologist, Nanavati Hospital, Mumbai and Ex-President, SRR during his introductory remarks highlighted about historical Muller’s radiobiological experiments using *Drosophila* at high doses of radiation, which was later used to extrapolate the effects at low doses and became the basis for LNT model for radiation risk assessment. He mentioned that such models created a fear against radiation in public and there is need to develop model, which at one side ensure safety of workers and public but should be also more rationale based on plenty of data available in low dose radiation biology.

An invited talk titled “*Linear No-Threshold Model of Radiation Risk Assessment: A Need to Balance Science Over Argument*” was delivered through Skype by **Dr Jerry Cuttler**, Cuttler & Associates Inc., Toronto, Ontario, Canada. The scientific session of his talk was Chaired by **Dr Vinay Kumar**, Head, Radiation Biology & Health Sciences Division, BARC, Mumbai. During the lucid and interesting talk, Dr Cuttler covered the historical aspects of medical treatments with low radiation doses and presented some recent case studies of low dose radiation-based treatment of ailments like cancer, inflammation and Alzheimer diseases.



The invited talk of Dr Cuttler followed a panel discussion on “*Revisit of LNT and Radiation Hormesis*” with eminent panelists (Dr K. P. Mishra, Ex-VC, NGBU, Allahabad & Ex-Head, RB&HSD, BARC, Mumbai, Dr Nagraj Huilgol, Chief Radiation Oncologist, Nanavati Hospital, Mumbai, Dr Pushparaja, Ex-Head, RHCS, BARC, Mumbai, Dr B. S. Rao, Ex-Head, RPAD, BARC, Mumbai, Dr J. Sastry, Radiation Oncologist, ACTREC TMC, Navi Mumbai), which was steered by **Dr B. N. Pandey**, Head, RSCBS, RB&HSD, BARC, Mumbai. The meeting concluded with note that evidences from in vitro, in vivo and epidemiological sources suggest that there is an urgent need to revisit the existing LNT model towards a threshold-based model for radiation risk assessment for applications of radiation and radiation-based technologies without any compromise of safety of public, patients and workers. The meeting ended with vote of thanks by Dr B. N. Pandey, Secretary, SRR.

A Report on Technology Reflection Lecture Series “Awareness and Preparedness for Radiation Disaster”

Bhopal Memorial Hospital & Research Centre, Department of Research, Bhopal, in association with the Society of Radiation Research (SRR), organized a seminar entitled “*Awareness and Preparedness for Radiation Disaster*” under the Technology Reflection Lecture Series on Saturday, January 11th, 2020. The aim of these lectures series was to increase the awareness amongst the students towards the use of radiopharmaceuticals in cancer treatment as well as provide them insights to the well-known uses for diagnosis of various diseases. The target audience were graduate and post graduate students (Students pursuing M. Sc., Nursing students), and faculty members.

The program was inaugurated by **Dr. Prabha Desikan**, Director, BMHRC, Bhopal. **Dr. R.M. Samartha**, Assistant Professor BMHRC and SRR member briefed the audience about the SRR and the types of activities it undertakes.



The first talk was given by **Dr. Himanshu Kumar**, Associate Professor, Laboratory of Immunology and Infectious Disease Biology, Department of Biological Sciences, Indian Institute of Science Education and Research (IISER), Bhopal. He spoke on “*Viruses: Friend or Foe in Cancer?*” Dr. Himanshu, through his simple and lucid presentation, presented the latest findings.

The second talk was by **Dr. A. Basu**, UGC-Assistant Professor, School of Pharmaceutical Sciences, Rajiv Gandhi Technical University, Bhopal (State Technological University of Madhya Pradesh, India). He spoke on “*An introduction to Radiopharmaceuticals: From development to delivery*”. Dr. Basu led the audience through the basics of radiation, radiation dosimetry and the making of radiopharmaceuticals using different radio isotopes (based on the emission of various particles by different radioisotopes). The end-use of these radiopharmaceuticals, he emphasised, is not limited to mere diagnosis, but also for treatment of some cancers.



The participants appreciated the sessions and interacted with the resource persons. **Dr. R.M. Samartha** proposed the vote of thanks. **Dr. Puneet Gandhi**, Head, Research Department, BMHRC, Bhopal gave her concluding remarks.

A report on Workshop for Biomedical Engineers on “Principles and Instrumentation of Radio-Diagnostic and Radiotherapy Techniques”

Vidyalankar Institute of technology (VIT) in association with the Society of Radiation Research (SRR), organized a **hands-on workshop on *Principles and Instrumentation of Radio-Diagnostic for Biomedical Engineers*** at Advanced Center For Radiation Oncology (ACRO), Balabhai Nanavati Hospital, Swami Vivekanand Road, Vile Parle West, Mumbai under guidance of Dr Nagaraj Huilgol, Chief Radiation Oncologist, ACRO on Feb 1, 2020.

<p style="text-align: center;">SOCIETY FOR RADIATION RESEARCH (SRR) <i>In Association of</i> Vidyalankar Institute of Technology Wadala, Mumbai</p> <p style="text-align: center;"> VIT Vidyalankar Institute of Technology Accredited A+ by NAAC</p> <p style="text-align: center; color: red;">organizes</p> <p style="text-align: center; color: red;">WORKSHOP FOR BIOMEDICAL ENGINEERS ON PRINCIPLES AND INSTRUMENTATION OF RADIO-DIAGNOSTIC AND RADIOTHERAPY TECHNIQUES</p> <p style="text-align: center; color: red;">DATE/TIME: FEBRUARY 1, 2020 (SATURDAY), 2-4 PM</p> <p style="text-align: center; color: green;">Venue</p> <p style="text-align: center; font-size: small;">Advanced Center For Radiation Oncology, Balabhai Nanavati Hospital Swami Vivekanand Road, Vile Parle West, Mumbai, Maharashtra 400056</p> <p style="font-size: x-small;">Limited Participants (First-Cum-First Basis)</p> <p style="text-align: center;"> Nanavati Super Speciality Hospital <i>a passion for healing...</i></p> <p style="text-align: right; font-size: x-small;">No Registration Fee</p>	<p style="text-align: center;"> Nanavati Super Speciality Hospital <i>a passion for healing...</i></p> <p style="text-align: center;"> VIT Vidyalankar Institute of Technology Accredited A+ by NAAC</p> <p style="text-align: center; color: red;">PROGRAM OUTLINE</p> <p>1. Brief Lecture Series on:</p> <ul style="list-style-type: none"> ➤ Principle, Instrumentation and Applications of Radio-Diagnostic Techniques (SPECT-CT & PET-CT) ➤ Radiotherapy Units (Cobalt Teletherapy, Accelerators) <p>2. Visit to Imaging Facilities</p> <p style="text-align: center; color: red;">REGISTRATION PROCESS</p> <ul style="list-style-type: none"> ➤ Workshop is mainly aimed for Students and Faculties of Biomedical Engineering. ➤ Number of participants is limited to 20 on first-cum-first basis. ➤ There is no registration fee. ➤ No travel support/accommodation provided to participants. <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td style="padding: 2px;"> <p style="text-align: center; font-weight: bold;">Contact details</p> <p>Prof. Geetha Narayanan, MEd: +91 9821854617 Email: geetha.narayanan@vit.edu.in Prof. Anurkumar Ram, MEd: +91 9821608918 Email: anurkumar.ram@vit.edu.in Registration can be done online Last Date for Registration: Jan. 25, 2020 Intimation of Selected Participants: 1 Jan. 27, 2020</p> </td> <td style="padding: 2px;"> <p style="text-align: center; font-weight: bold;">Society for Radiation Research (SRR)</p> <p>(Registration No., Maharashtra State, Mumbai 2286, 2314 68852) Registered Office: Advanced Centre for Radiation Oncology, Dr Balabhai Nanavati Hospital, Vile Parle West, Mumbai 400 056 Email: srrindia1315@gmail.com Web page: www.srrindia.org Facebook: https://www.facebook.com/SocietyforRadiationResearch-SRR-77127076129158/</p> </td> </tr> </table> <p style="text-align: center; color: red; font-weight: bold;">Registration Link: http://tiny.cc/SRRWS</p>	<p style="text-align: center; font-weight: bold;">Contact details</p> <p>Prof. Geetha Narayanan, MEd: +91 9821854617 Email: geetha.narayanan@vit.edu.in Prof. Anurkumar Ram, MEd: +91 9821608918 Email: anurkumar.ram@vit.edu.in Registration can be done online Last Date for Registration: Jan. 25, 2020 Intimation of Selected Participants: 1 Jan. 27, 2020</p>	<p style="text-align: center; font-weight: bold;">Society for Radiation Research (SRR)</p> <p>(Registration No., Maharashtra State, Mumbai 2286, 2314 68852) Registered Office: Advanced Centre for Radiation Oncology, Dr Balabhai Nanavati Hospital, Vile Parle West, Mumbai 400 056 Email: srrindia1315@gmail.com Web page: www.srrindia.org Facebook: https://www.facebook.com/SocietyforRadiationResearch-SRR-77127076129158/</p>
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The first session was by **Dr. Nagaraj Huilgol**, Chief Radiation Oncologist, Nanavati Super speciality Hospital and Centre for Hyperthermic Oncology & Medicine. Dr. Nagaraj talked about what is cancer and what are the different ways for treatment. He explained the role of Physicist and Biomedical Engineers in development and maintenance of high-end equipments in Medical field.

The next session was on treatment methods for cancer by **Dr. Gopal**, Centre for Hyperthermic Oncology & Medicine. He explained the various methods as Medical Oncology, Surgical Oncology and Radiation Therapy. In his opinion all treatments are not suited for everyone. He also explained the stages of treatment as Radiotherapy, Adjuvant, Neo adjuvant, Concurrent and Palliative. He had also explained when these treatments are selected depending upon the type of cancer and patient. Later he explained about the different equipment i.e. external beam radiation, basic linear accelerator and Brachytherapy.

This was followed by visit to various facilities available in the centre. Initially participants were taken to the treatment planning stages. First stage before starting the treatment is creating patient's moulds using biocompatible material to exactly direct the radiation or other treatments. This was explained by Ms. Leela at the centre. There were different moulds prepared for different affected areas.

The next session was demonstration of Brachytherapy equipment by **Ms. Anuradha**. She explained the process as keeping radiation material inside the body for some time. And this will irradiate only affected areas.

Next session was demonstration of linear accelerator by Mr. Anand. He explained the working and gave hands on demonstration of the machine. He had also opened the control circuitry and explained the electronics involved.



In the next session the participants were taken to treatment planning room where they were exposed to various algorithms like AAA algorithm, Monte Carlo Algorithm. As a Special case treatment process for treating brain tumour was explained with importance of avoiding radiation in key areas like optical nerve and hypothalamus in brain. A brief Q&A session was held where students asked about various aspects of treatment and radiation hazards etc. The session came to a conclusion with feedbacks from the participants. This was followed by a meeting and vote of thanks by **Dr. Jitendra Toravi**, Head Biomedical Department and **Prof. Geetha Narayanan** from VIT.

A Report on Webinar on “Genetics in Cancer and Its Therapy”

The Society of Radiation Research (SRR) organized a webinar on “*Genetics in Cancer and Its Therapy*” on Aug. 1, 2020 (Saturday) 4:00 pm Speaker: **Prof. Rajiv Sarin**, Tata Memorial Centre, Mumbai. Due to huge response from the audience/online registration (more than 300 from India/abroad), the Webinar was made Live on YouTube, which was co-ordinated by **Ms Pooja Melwani**, Radiation Biology & Health Sciences Division, BARC, Mumbai.

Dr **Shyam Kishore Shrivastava**, President, SRR, Ex-Head, Department of Radiation Oncology, Tata Memorial Hospital, Mumbai & Director, Radiation Oncology, Apollo Hospitals, Navi Mumbai delivered welcome address to audience, who joined from different parts of India and abroad.

Dr K. P. Mishra, Founder President, SRR, Ex-Head, RB&HSD, BARC, Mumbai, Ex-VC, Nehru Gram Bharati University, Allahabad highlighted about SRR and its activities. He mentioned about objectives of SRR and various scientific activities conducted/organized by SRR to promote radiation research in young scientists and students.

The scientific session was chaired by **Prof. Vijay K. Singh**, Armed Forces Radiobiology Research Institute, Uniformed Services University of the Health Sciences, USA.



Dr Sarin explained about environment-gene interaction in deciding the organism phenotype. He mentioned and given example of high penetrance genes like p53, BRCA, Rb with high life time risk of cancer and low penetrance genes like GST, CYP with low risk of cancer. Dr Sarin explained about two-hit hypothesis for hereditary and sporadic retinoblastoma cancer in children. He also mentioned about steps, legal aspects, myths and complications of genetic counselling. The lucid talk of Dr Sarin followed intense question and answer session with active participation by the audience.



Presented by
StreamYard

Genetic of Cancer & its Therapy

Prof. Rajiv Sarin, MD, FRCR (Clinical Oncology)
Professor Radiation Oncology & In-Charge Cancer Genetics Unit
TMH & ACTREC

drrajivsarin@gmail.com
rsarin@actrec.gov.in

Dr B. N. Pandey, Secretary, SRR & Head, Radiation Signalling and Cancer Biology Section, Radiation Biology & Health Sciences Division, BARC, Mumbai given mementos to Dr Sarin and Dr Singh. The webinar was ended with concluding remarks and vote of thanks of **Dr Nagraj Huilgol**, Ex-President, SRR, Chief Radiation Oncology, Advanced Centre for Radiation Oncology, Nanavati Hospital, Mumbai.

A Report on
Second International School on
Radiation Research (ISRR-2020)
Theme: Radiation Induced DNA Damage Response:
Mechanisms and Human Health Implications

SRR has taken initiative to organize International Schools with specific theme related to radiation research. The **Second International school on Radiation Research (ISRR-2020)** was organized as **E-Conference** mode during Sept. 6-20, 2020 under global pandemic situation of Covid-19. The School was participated by about 45 registered participants from India and abroad. A range of topics were covered through talks/special lectures by eminent faculties from India and abroad (Japan, USA, Germany, UK, Austria, Canada, Hungary, Singapore).

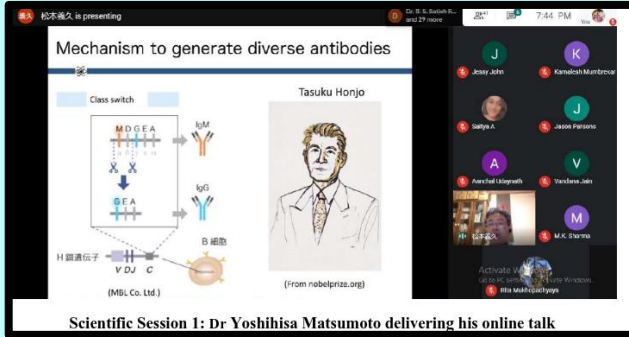
During inauguration session of the School on Sept. 6, 2020, **Dr Shyam Kishore Shrivastava** (Former Head, Dept. of Radiation Oncology, TMH, Mumbai, Director, Radiation Oncology, Apollo Hospitals, Navi Mumbai, President, SRR) delivered a welcome note to all delegates and participants of the School on Radiation Research. Dr Shrivastava also mentioned about the use of radiation for the human healthcare as well as the adverse health effects of radiation on human health especially on DNA damage. The brief introduction about the SRR and ISRR-2020 was given by Dr K. P. Mishra (Ex-Head, RB&HSD, BARC, Mumbai, Ex-VC, NGBU, Allahabad, Founder President, SRR).

The inaugural address was delivered by **Dr J. P. Mittal** (Former, Director, Chemistry and Isotope Group, Bhabha Atomic Research Centre, Distinguished Professor and Chairman, Academic Board, Centre for Excellence in Basic Sciences, DAE-University of Mumbai). Dr Mittal highlighted the importance of radiation biology, chemical and molecular effects of radiation on the human health. Dr Mittal emphasized the need for collaborative research amongst radiation biologists and radiation chemists for better understanding of the radiation effects.

Dr B. Paul Thaliath (Director, Regional Cancer Centre, Kamala Nehru Memorial Hospital, Allahabad) delivered a special lecture on “*Radiotherapy of Cancer*”. Dr Thaliath highlighted the emerging concepts of radiotherapy and the recent advances in cancer treatment, and how advancement in biophysical techniques is helping in novel radiotherapies of cancer.

Dr B. N. Pandey (Convenor of ISRR-2020, Head, RSCBS, RB&HSD, BARC, Mumbai) has given vote of thanks to all the dignitaries for the inaugural session and for informative introductory lectures. Dr Pandey thanked all the participants, SRR Office bearers, Members and other colleagues of BARC for their whole hearted support to organize the School. Dr Pandey also thanked Mr Deepak Naik for helping to maintain the SRR website and ISRR 2020 online registration process. Dr Pandey thanked sponsor of the School.

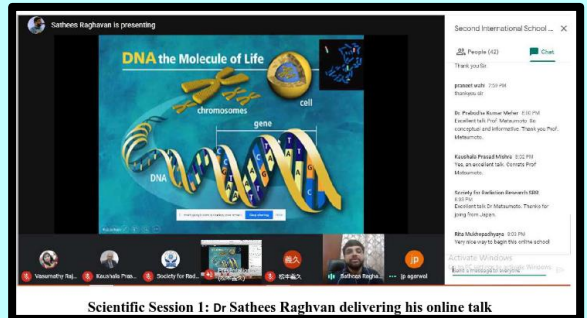
The first scientific session , *DNA Damage and Repair Mechanisms* was chaired by **Dr J.P. Agrawal** (Head, Department of Radiation Oncology, Tata Memorial Hospital, Mumbai).



Scientific Session 1: Dr Yoshihisa Matsumoto delivering his online talk

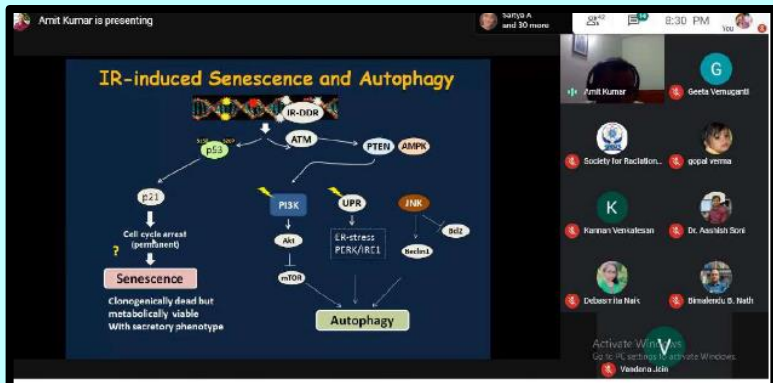
In this session, **Dr Yoshihisa Matsumoto** (Tokyo Institute of Technology, Tokyo, Japan) delivered the first lecture on *the basic mechanisms for DNA double-strand break repair*.

The second lecture in the session was delivered by **Dr Sathees Raghvan**, Indian Institute of Science, Bangalore, India on *DSB Repair mechanisms and its relevance in Cancer therapy*.



Scientific Session 1: Dr Sathees Raghvan delivering his online talk

The second scientific session was on the theme *Radiation Induced DNA Damage Signalling*. **Dr Aashish Soni**, University of Duisburg-Essen Medical School, Germany delivered the first lecture in the session on distinct roles of Double strand breaks repair pathways on the repair of chromosomal DSBs in G2 phase of the cell cycle. Followed by the talk by Dr. Soni, **Dr Amit Kumar**, Bhabha Atomic Research Centre, Mumbai, India talked on radiation induced DNA damage and its significance in cancer cell death and carcinogenesis.



Dr Edward J. Calabrese, University of Massachusetts, Amherst, USA delivered his first talk about *Linear No Threshold (LNT) Dose Response: Historical Foundations and its Widespread Risk Assessment Implications* and another lecture on *Hormesis: A Central Concept in Biology and Medicine* during the 3rd session DNA damage and low dose Radiation Biology. In his lecture, he described the LNT Dose Response model and its limitations in the risk assessment.

The fourth scientific session of the school was themed *High LET radiation induced DNA damage in cancer therapy*. The first lecture of this session was delivered by **Dr J.L. Parsons**, University of Liverpool, UK on the cellular response to complex DNA damage induced by high-LET radiation. He briefly discussed the mechanism of proton beam therapy in radiobiology. This talk was followed by a talk by **Dr Aruna Korde**, International Atomic Energy Agency, Vienna, Austria. She emphasized on the concept of alpha emitting radionuclides for therapy. In this talk, she gave brief introduction about radiopharmaceuticals which are suitable for both therapeutic and diagnostic purposes.

Dr Jean Cadet, University of Sherbrooke, Canada talked about *UV Induced DNA Damage and Repair and Mutagenic and Carcinogenic Effects of UV radiation*. In this lecture, he described the photochemistry of nucleic acid such as low intensity UVC, UVB and UVA photochemistry, high intensity UV laser photochemistry and photosensitized reactions. **Dr Prakash Hande**, National University of Singapore, Singapore delivered a lecture on *Telomere dysfunction and DNA repair deficiency: Markers of sensitivity to radiation and other mutagens*. He emphasized the structural and functional perspective of telomeres.

Three sessions were organised on the theme *Radiation Induced DNA damage Quantification Techniques*. **Dr T. Konishi**, National Institutes for Quantum and Radiological Science and Technology, Chiba, Japan has delivered a lecture on *advances in microbeam technology for single cell radio-biology*. In his lecture he described the detailed investigation on the radiation induced bystander effect in targeted and non targeted area relevant to cancer therapy. Induction of DSBs of cyto-targeted irradiation was result of cytoplasmic damage triggered signalling. Cyto-damage triggered cellular signals may also activate DSBs repair mechanism(s).

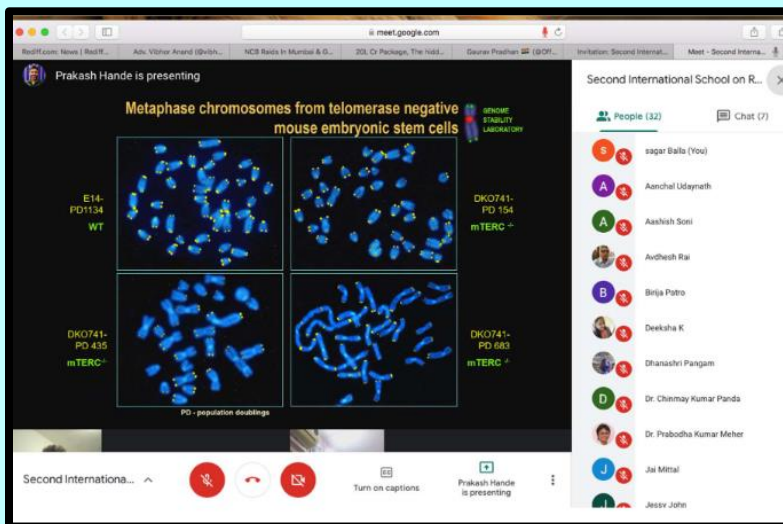
Dr Nagesh Bhatt, Bhabha Atomic Research Centre, Mumbai, India has delivered a talk on biological indicators of DNA damage by radiation, tools for medical application, research and radiation protection. He explained the concept of triage simulation in bio dosimetry and explained different bio-dosimetry techniques based on radiation induced DNA damages.

Dr Y. S. Rajpurohit, Bhabha Atomic Research Centre, Mumbai, India, talked about *radiation-induced DNA injury and damage detection*. He stated that *repair enzymes* may function as important biomarkers for predicting the response of tumours to genotoxic stress and for prognosis purpose. He emphasized on the strategies for DNA damage detection, which includes molecular strategies, fluorescent strategies, chemiluminescent strategies and analytical strategies and briefly described different techniques and assays for detection of DNA damage.

Dr N. R. Prasad, Annamalai University, Chidambaram, India delivered a lecture on *UV radiation-induced DNA damages in human and various analytical methods for its detection*. He briefly discussed the UV radiation induced DNA damage response pathways and the model systems for its experiments.

Dr B. S. Patro, Bhabha Atomic Research Centre, Mumbai, India has delivered a brief lecture on *emerging concepts of replication dynamics in the genome instability*. He briefly described about replication fork repair, different mechanism of replication fork repair, replication fork repair and its correlation with genomic instability, different methods to study replication repair, live cell imaging for double stranded break repair and assessment of different repair proteins at replication fork.

Dr Senthil Karunakaran, Merck Life Sciences, India delivered a technical talk on *proximity ligation assay to detect and visualize DNA damage-induced Protein Complexes*.



The next session was themed *Epigenetics and Chromosomal Aberrations in Radiation Induced DNA Damage Response*. **Dr Sanjay Gupta**, Advanced Centre for Treatment Research and Education in Cancer, Navi Mumbai, India delivered the first lecture on this theme. He discussed about the dynamic alterations of histone H3 phosphorylation correlate with radio-sensitivity of mitotic cells during DNA damage.

Dr V. Perumal, Sri Ramachandra Institute of Higher Edu. & Res., Chennai, India delivered a lecture on Radiation Induced Chromosomal Aberrations and Health Implications. In this lecture, he provided information about different types of chromosomal aberrations in response to radiation and its detection methods.

Dr V. Raavi, Sri Devaraj Urs Academy of Higher Education and Research, Kolar and **Dr. Krishna Sharan**, Kasturba Medical College, Manipal presented lectures on the theme *DNA Damage as Biomarker and Cancer*. **Dr. Raavi** briefly discussed about the mechanism of gamma H2AX as a marker of DSBs and its determination techniques. Apart from γ H2AX, and other gene-based marker and miRNA-based markers are used as biomarker of radiation exposure. He briefly discussed the mechanism of these markers in the detection of radiation induced DNA damage. **Dr. Krishna Sharan**, had briefly described about Radiation-Induced DNA Damage in Cancer Radiotherapy and how it can be further exploited in improvement of cancer therapy.

The next session was themed “*Interplay of Immune Response in Radiation Induced DNA Damage*”. **Dr K. Lumniczky**, National Public Health Center, Budapest, Hungary delivered a brief lecture on Ionizing radiation effects on the immune response. she discussed the different types of changes in immune parameters like, increased frequency of chromosomal aberrations, oxidative stress, inflammation and release of immune modulatory factors, activation of radiation responsive signal transduction pathways, increased mutational frequency and increased cell death. **Dr. Bhavani Shankar**, Bhabha Atomic Research Centre, Mumbai, India talked about Synergistic effects of radiotherapy and immunotherapy and its underlying principles and challenges.

The last scientific session of the school was themed “*DNA Damage Response in Cancer Radiotherapy*”. **Dr. Sastry**, Advanced Centre for Treatment Research and Education in Cancer, Navi Mumbai, India delivered a brief lecture on Diagnostic, Prognostic and Predictive Ability of DNA damage and repair in clinical radiation oncology. **Dr. S. Laskar**, Tata Memorial Hospital, Mumbai, India delivered a brief lecture on Excitements and Challenges of Carbon Ion Radiotherapy.

Dr. Roger Howell, New Jersey Medical School, Cancer Institute of New Jersey, Newark, USA delivered a special lecture on Radiopharmaceutical therapy elicits radiation-induced bystander effects that cause DNA damage and growth delay of tumor cells.

UVB and UVA-induced oxidatively generated damage to cellular DNA

UVA → Photosensitized reactions → 1O_2 , $O_2^{\cdot -}$ → 8-oxo-7,8-dihydroguanine, Strand breaks

UVB → Biochemical responses → NO^{\cdot} , $ONOO^-$ → Oxidized bases, Modified guanine, Interstrand crosslinks, DNA-protein crosslinks

Chat messages:

- Society for Radiation Research SRR: For UVA photochemistry is oxygen independent. Is it related to density of ionization like high LET radiation?
- For UVA photochemistry is oxygen independent. Is it related to density of ionization like high LET radiation? (Dr B N Pandey)
- prabhakar dongre: What type of UV radiation (A/B/C) emit during solar eclipse?
- You: Does any of UV radiation type has effect on COVID-19 or viruses for sterilization application??
- vinod jaiswal: Is the damage is repairable by photolysis. What is dose limit of UVA/UVB that can be repaired by it?
- Susmita Majumder: In which cases will the predominance of TT CPDs be increased - UVA/UVB/sunlight?

Role of replication in genomic instability

Cell cycle phases: G1, S, G2, M

Key processes and issues:

- DNA damage Rearrangement
- Replication Stress
- Stalled fork
- DNA-rep dysfunctional fork
- Broken fork
- Unrepaired fork
- Unrepaired fork
- Unrepaired fork

Issues:

- Origin firing issues
- Late replicated regions
- Impaired homologous recombination

Dr. Nagaraj Huilgol Chief Radiation Oncologist, **Dr. Balabhai Nanavati** Hospital, Mumbai, **Dr. B. B. Singh**, Ex-Head, RB&BCD, BARC, Mumbai and **Prof Hiroshi Yasuda**, Research Institute for Radiation Biology and Medicine, Hiroshima University, Japan addressed the audience during Award and Valedictory function of the school. . They appreciated the efforts of SRR to successfully conduct ISRR 2020. The Session was addressed by Chief guest of function **Dr. Avinash Pandey**, Director, Inter University Accelerator Centre, New Delhi. Later **Dr. Avinash Pandey**, **Prof. Roger Howell**, and **Prof. K. P. Mishra** distributed the awards. They also highly praised the efforts to conduct such a meeting. **Prof. K. P. Mishra** has invited all of the participants for the 5th Asian Congress on Radiation Research (5th ACRR 2021) to be held in Mumbai. Best participation awards were selected by a jury which was conferred during award and valedictory function. Vote of thanks was delivered by **Dr. Chandan Kumar**, Bhabha Atomic Research Centre, Mumbai and Treasurer, SRR.

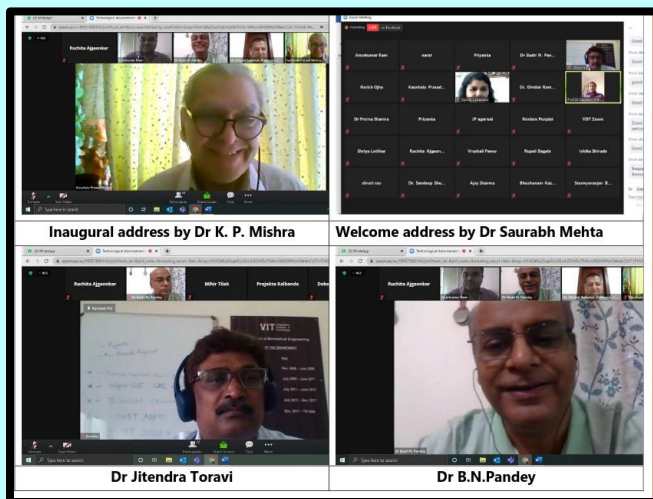
A Report on One Day workshop on “Technological Advancements and Challenges of Radiation Based Techniques in Diagnosis and Therapy of Cancer”

Vidyalankar Institute of technology (VIT) in association with the Society of Radiation Research (SRR), organized a one day workshop on *“Technological Advancements and Challenges of Radiation Based Techniques in Diagnosis and Therapy of Cancer”* an area related to Nuclear Medicine on 20 March 2021. Five talks related to the area were organised under two different themes namely,

- PET-CT, Radiopharmaceuticals and Accelerators in Cancer Diagnosis and Therapy, Chaired by **Dr Dindayal Ramotar**, HBK University, Qatar .
- Advances in Cancer Radiotherapy, chaired by **Dr Nagraj Huilgol**, Nanavati Hospital, Mumbai

The workshop was organized on the ZOOM link of Vidyalankar it was telecasted live on Vidyalankar’s Facebook. There were 200 participants registered for the workshop.

The function started with welcome address by **Dr. Saurabh Mehta**, Chief Academic Officer VIT. This was followed by Inaugural address by Dr. K. P. Mishra in which he spoke about emerging applications of radiation and therapy of many diseases, application of radiation in production of energy and cancer treatment. It was followed by a brief overview about Department of Biomedical Engineering and its activities by **Dr. Jitendra Toravi** Head of Biomedical Department. Following this Dr. Pandey elaborated on the purpose of the Society for Radiation Research, its objectives and various activities.



The first Scientific Session was on : *PET-CT, Radiopharmaceuticals and Accelerators in Cancer Diagnosis and Therapy* Chaired by **Dr Dindayal Ramotar**, HBK University, Qatar In this session the first talk was on “*Applications and Challenges of PET-CT in Cancer Diagnosis*” by **Dr. Sunita Sonavane**, Radiation Medicine Centre (RMC), Mumbai. She started with molecular imaging, advantages and limitations of Nuclear Imaging. She also talked about the role of engineers in the treatment and elaborated on facilities at RMC.

The next talk was on *Advancement of Radiopharmaceuticals in Diagnosis and Therapy of Cancer* by **Dr. Jaya Shukla**, PGIMER, Chandigarh. Speaker started with the introduction of radiopharmaceuticals as they permit the mapping of physiological function and metabolic activities of malfunctioning of different organs, as well as the diagnosis of common cancers. With the precision of PET scans, these results are becoming the standard of care for cancer diagnosis. She also explained on key side effects of radiopharmaceuticals.

The next talk was on *Applications of Accelerators in Cancer Therapy*, by **Dr Teerthraj Verma**, King George’s Medical University, Lucknow. In the session Dr Teerthraj explained about fundamentals of Radiotherapy. He elaborated on different accelerators used in radiotherapy like, LINAC and Betatron. He also explained the workflow of radiation beam and patient. He had also mentioned Flash Radiotherapy as a paradigm shift in radiotherapy. This session was followed by lunch break.



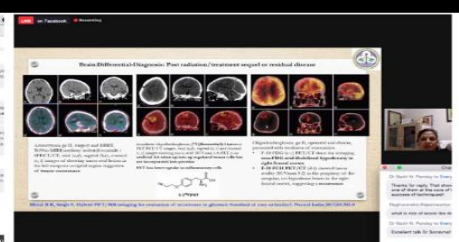
Dr Dindayal Ramotar, HBK University, Qatar



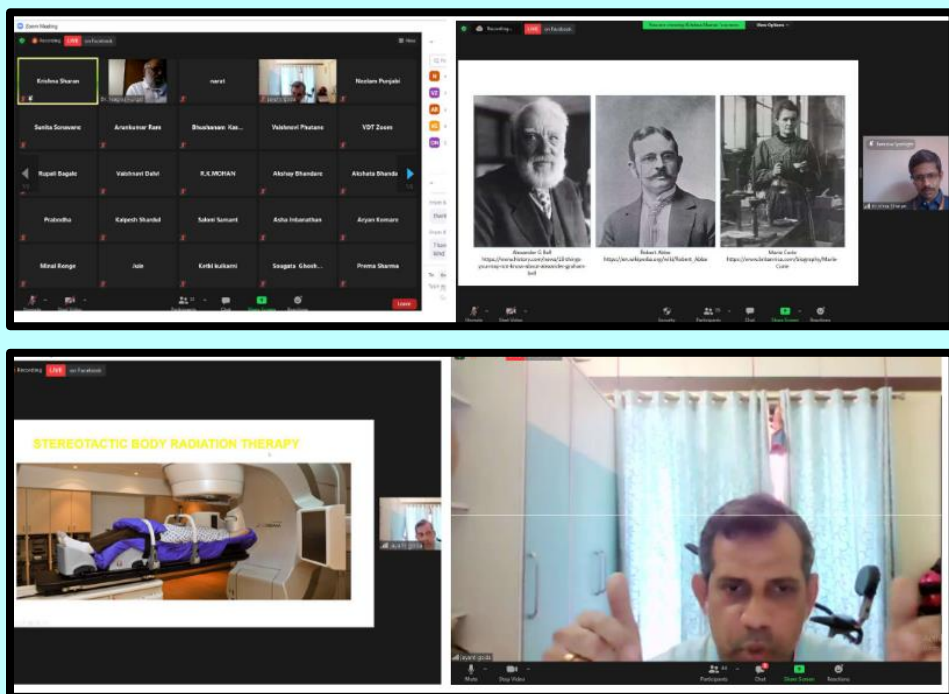
Dr Sunita Sonavane, Radiation Medicine Centre, Mumbai



Dr Jaya Shukla, PGIMER, Chandigarh on Advancement of Radiopharmaceuticals in Diagnosis and Therapy of Cancer



The second Scientific Session after lunch was on *Advances in Cancer Radiotherapy*, Chaired by **Dr Nagraj Huilgol**, Nanavati Hospital, Mumbai. In this the first talk was on Brachytherapy in Cancer Radiotherapy, by **Dr T. K. Sharan**, Manipal University, Manipal. In this session, Dr. Sharan started with history of Brachytherapy and rationale for the therapy. The last session of the program was on *Advancement and Challenges of Teletherapy in Cancer Radiotherapy*, **Dr Jayant Sastri Goda**, ACTREC, Tata Memorial Centre, Kharghar, Navi Mumbai. He started with radiation therapy, the 5 Rs of radiation. He covered a vast area of Radiotherapy and many advanced methods like Stereotactic Body radiation Therapy, Cyberknife, Helical Tomography, Volumetric Arc Radiotherapy, Ultra high dose rate radiotherapy, Silver Bullet etc. to name a few. The session was very exhaustive with a lot of pictures and various methods.



The workshop concluded with feedbacks from the participants. A written feedback was taken from all the participants. This was followed by vote of thanks by **Dr. Pandey** from Society and **Prof. Geetha Narayanan** from VIT.

A Report on Workshop

on

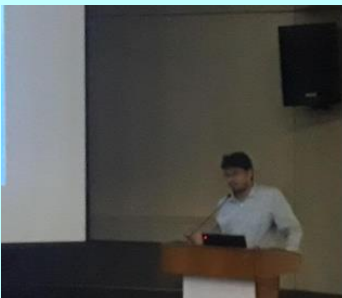
"Advancements in Radio-Diagnostic and Radiotherapy Equipment"

Vidyalankar Institute of technology (VIT) in association with the Society of Radiation Research (SRR), organized a workshop on "*Advancements in Radio-Diagnostic and Radiotherapy Equipment*" collaborating with Dr. Nagaraj Huilgol at Advanced Centre for Radiation Oncology, Nanavati Max Super Speciality Hospital, Swami Vivekanand Road, Vile Parle West, Mumbai on 6th August 2022.

Initially a visit was arranged to the treatment planning facilities. In the session the participant were taken to treatment planning room where we were explained the various algorithms like AAA algorithm, Monte Carlo Algorithm. The session was held in two separate groups with **Mr. Anand and Ms. Shubhangi**. As a Special case treatment process for treating brain tumour was explained with importance of avoiding radiation in key areas like optical nerve and hypothalamus in brain. A brief Q&A session was held where students asked about various aspects of treatment and radiation hazards etc.

First stage before starting the treatment is creating patient's moulds using biocompatible material to exactly direct the radiation or other treatments. This was explained by **Mrs. Anuradha Singh**, Chief and Sr. Medical Physicist, at the centre. There were different moulds prepared for different affected areas

This was followed by sessions on Radiation Therapy Equipments in the auditorium. The first session was by **Dr. Gopal Pemmaraju**, Consultant Radiation Oncologist, Advanced Centre for Radiation Oncology, Nanavati Max Super Speciality Hospital. Dr. Gopal talked about what is cancer and what are the different ways for treatment. He started with history of Radiology and went to radiation treatment and advanced Radiological Equipment.



Dr. Gopal Pemmaraju on
Radiation Therapy Equipment



Ms. Shubhangi on
Treatment planning



Mr. Anand Parab on
Radiotherapy
Machines

The next session was on Radiotherapy Machines by **Mr. Anand Parab**. He started with different generations of Linear Accelerators. He elaborated on basic structure and working of Linear Accelerators. He also explained the facilities available in the new accelerators. The session was followed by Treatment planning Session by Ms. Shubhangi. She explained about different radiation treatments for different types of cancers. She focussed on what type of treatment works for a particular case.



Next session was demonstration of linear accelerator by Mr. Anand. He has explained the working and hands on demonstration of the machine. He had also opened the control circuitry and explained the electronics involved. Later Ms. Shubhangi explained about the treatment room where radiations so for the safety walls of the room are of radiation AERB standards like 2 metre thick. The treatment is patient specific and they do phantom study on models to verify the effectiveness. She has elaborated on various approvals required for setting up radiation therapy room. Ms. Shubhangi also explained about the treatment table and how patients are made to sit/sleep.

This was followed by a brief session by **Dr. Nagraj Huilgol** on Radiation-its implications and Hormesis. He also focussed on different possibilities for Biomedical Engineers and inspired students to do projects/study on current real life problems. A group photograph was taken at the end of the session.

All the sessions were quite interactive. The session concluded with feedbacks from the participants. This was followed by a meeting and vote of thanks by faculty from VIT.

Upcoming SRR Events

	Meeting/Symposium/Seminar	Venue	Date
1.	5th Asian Congress of Radiation Research (ACRR-2022) and third Biennial Meeting of SRR	DAE Convention Centre, Anushakti Nagar, Mumbai	Nov.17-20, 2022
2.	International Conference On Multifunctional Materials And Radiation Measurements (ICMMRM-2023)	Sri Sivasubramaniya Nadar College of Engineering	Jan.27-28, 2023
3.	Third International School on Radiation Research	To be Announced	2023
4.	International Conference on Radiation Research: Its Impact on Human Health and Environment (ICRR-HHE 2024) and Fourth Biennial Meeting of SRR	To be Announced	2024

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