VIT Vidyalankar Institute of Technology
Accredited A+ by NAAC

1-Day workshop on
"Technological Advancements and Challenges of Radiation Based Techniques in Diagnosis and Therapy of Cancer".

20 March 2021

Report

Preamble

Vidyalankar Institute of technology (VIT) always promotes interaction with industries and research laboratories to inculcate research culture among faculty and students. Biomedical department of VIT organizes workshops in various domains of Biomedical engineering, such as Biomedical Instrumentation, Image Processing, Rehabilitation, Wearable Devices etc. In this regard VIT had conducted workshops for three consecutive years jointly with Society for Radiation Research (SRR) in the field of Nuclear Medicine; namely,

1. "Application of Radiation and Radioisotopes in Diagnosis and Therapy of Cancer" on Saturday, 15 October 2016.
2. " Current Challenges in Diagnosis and Radiotherapy of Cancer "on 6 October 2018.
3. "Principles and Instrumentation of Radio-Diagnostic and Radiotherapy Techniques" 1 February 2020

Biomedical Engineering Department of VIT is keen to continue interaction with the SRR. In this year, 2021 since pandemic is going on it was decided to organize online session. Under the mentorship of Dr. Badri N. Pandey, Secretory of SRR it was decided to conduct a workshop on "Technological Advancements and Challenges of Radiation Based Techniques in Diagnosis and Therapy of Cancer" an area related to Nuclear Medicine. Dr. Badri invited with experts from India and abroad and decided to have 5 talks related to the area under two different themes namely,

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

A convenient date was proposed and agreed by VIT and SRR as 20 March 2021.

About Society for Radiation Research

Society for Radiation Research is a Society of Scientists, Clinicians, Students, Academia and Industries having interest in field of Radiation Research. The society is started with the following objectives:

1. To promote research in the areas of:
   Radiation biology with basic and applied aspects;
   Clinical radiation biology and oncology;
   Radiation hormesis and low dose radiation biology;

Environmental radiation biology, non-ionizing radiation effects;

Radiation medicine, radiation technologies;

Transnational research;

Terrestrial and space radiation biology and any other relevant research areas.

2. To facilitate integration and interaction of different radiation research areas.
3. To promote the diffusion of knowledge in these research areas through organizing meetings, conferences, workshops, awareness programs, scientific publications etc.
4. Promote discussion, interactions amongst scientist-public-industry and acting as liaison to communicate facts and research developments to public, government and regulatory bodies.
5. Integration of Society with other National and International Scientific Bodies.
6. Facilitate and promote research in areas of radiation research by various means. Encourage and promote young researchers and students to pursue research and build career in the areas of radiation research
7. Promote and facilitate education of radiation research in national Institutes and Universities.

About Biomedical Engineering Department, VIT

The Biomedical Engineering Department of VIT has a clear vision to become a **Center of Academic Excellence** in the field of Biomedical engineering where learners are nurtured in a scholarly environment to evolve into competent professionals to benefit society. Department has been accredited by National Board of Accreditation and has signed MoU with GE Healthcare for creating a Centre of Excellence lab under the leadership of current Head of Department Dr. Jitendra Toravi. VIT is also accredited with A+ grade by NAAC.

About the Workshop

As mentioned earlier, VIT had been organizing regular workshops in collaboration with SRR. This year due to pandemic it was decided to have on line one day workshop titled, "Technological Advancements and Challenges of Radiation Based Techniques in Diagnosis and Therapy of Cancer" on 20'th March 2021. Dr. Badri Pandey, Secretory of SRR was instrumental to arrange expert speakers in India and abroad to deliver the talk. Accordingly, a brochure was prepared and was circulated (on line)among VIT faculties and was also posted on SRR's official website. We received an overwhelming response and 200 participants registered for the workshop. The workshop was organized on the ZOOM link of Vidyalankar as per details below. IT was telecasted live on Vidyalankar's facebook.

Date: 20 March, 2021
Time: 10:00 AM Onwards
Venue: Zoom Platform
Join Zoom
Meeting: https://zoom.us/j/99957868146?pwd=dUNqL1RxUFNxL2ZxV1pTdjZNSU5nQT09
Meeting ID: 999 5786 8146
Passcode: 463429

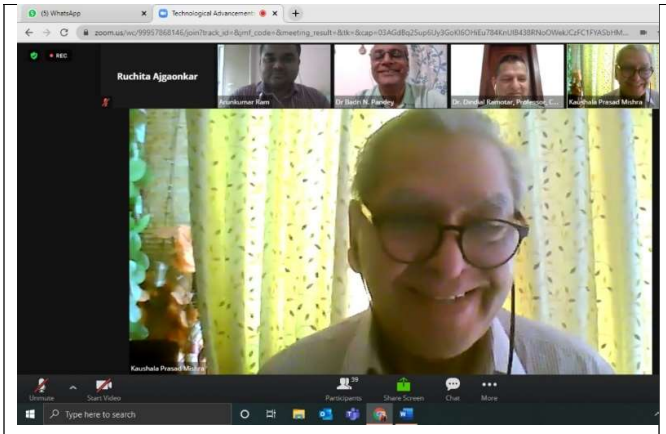
Schedule of the workshop

10.00 10.30am	**Welcome note:** Dr Saurabh Mehta- Chief Academic Officer VIT **Inaugural address:** Dr K. P. Mishra, Founder President, SRR **About Dept of Biomedical Engineering, VIT:** Dr. Jitendra Toravi, Head Biomedical Engineering, VIT **About SRR:** Dr Shayam Shrivastava, President, SRR
10:30 am- 13:30 pm	**Scientific Session I: PET-CT, Radiopharmaceuticals and Accelarators in Cancer Diganosis and Therapy** **(Chairperson: Dr Dindayal Ramotar, HBK University, Qatar)**
10.30– 11.30 am	**Applications and Challenges of PET-CT in Cancer Diagnosis** ***Dr Sunita Sonavane, RMC, BARC, Mumbai*** Session In-charge-Prof. Geetha Narayanan, VIT
11:30am- 12.30pm	**Advancement of Radiopharmaceuticals in Diagnosis and Therapy of Cancer *Dr. Jaya Shukla, PGIMER, Chandigarh*** Session In-charge-Prof. Suvarna Udgire, VIT
12.30-1.30pm	**Applications of Accelerators in Cancer Therapy** ***Dr Teerthraj Verma, King George's Medical University, Lucknow*** Session In-charge-Prof. Arunkumar Ram, VIT
1.30-2.30pm	***Lunch Break***
2.30-4.30pm	**Scientific Session II: Advances in Cancer Radiotherapy** **(Chairperson: Dr Nagraj Huilgol, Nanavati Hospital, Mumbai)**
2.30-3.30pm	**Brachytherapy in Cancer Radiotherapy** ***Dr T. K. Sharan, Manipal University, Manipal*** Session In-charge-Prof. Neelam Punjabi, VIT
3.30-4.30pm	**Advancement and Challenges of Teletherapy in Cancer Radiotherapy** ***Dr Jayant Sastri Goda, ACTREC, Tata Memorial Centre, Kharghar, Navi Mumbai*** Session In-charge-Prof. Priyanka Shrivastava, VIT

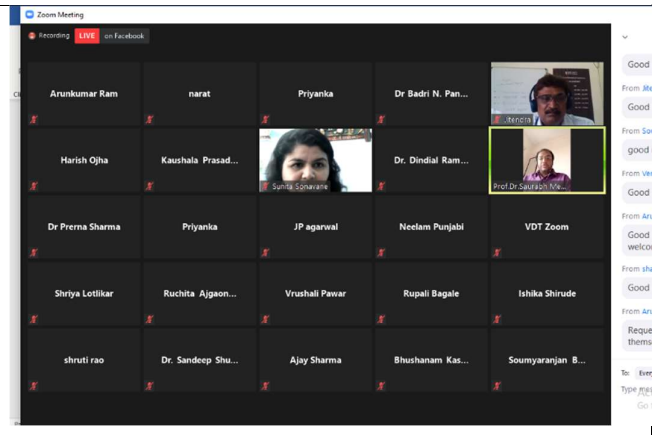
4.30pm	**Concluding Session and Valedictory Function** Comments and feedback by participants **Vote of thanks and concluding words** by Dr. B.N Pandey, Secretary, SRR **Vote of thanks and concluding words** by Dr. Gajanan Nagare Professor, Biomedical Engineering, VIT

Overview of the Workshop

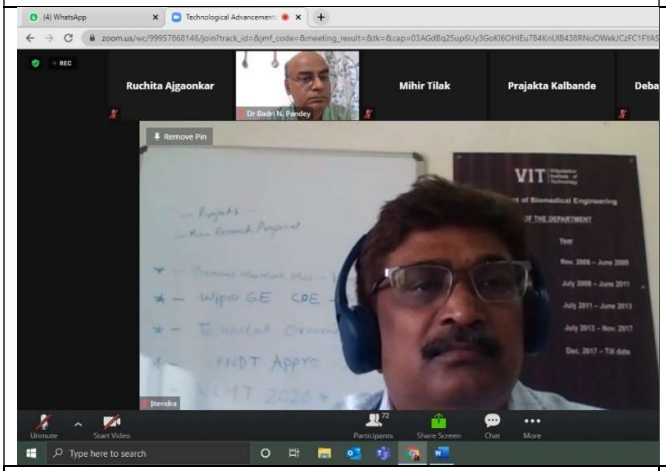
The participants were joined the ZOOM link well in advance. The program started with a simple inaugural function which was presided over by honoured guests Dr. K.P. Mishra Founder President, SRR, Dr. Badri Pandey, Secretory SRR, and Scientific officer BARC, Dr. Saurabh Mehta, Chief Academic Officer, VIT, Dr. Jitendra Toravi, Head Biomedical Engineering Department, VIT. 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.



Inaugural address by Dr K. P. Mishra



Welcome address by Dr Saurabh Mehta



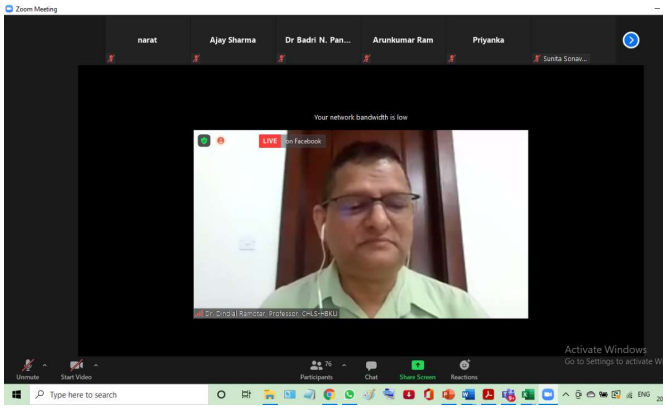
Dr Jitendra Toravi

Dr B.N.Pandey

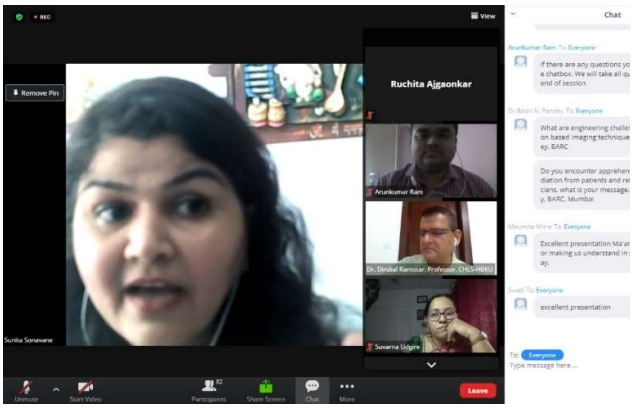
The first Scientific Session was on **: PET-CT, Radiopharmaceuticals and Accelarators in Cancer Diagnosis and Therapy Chaired by Dr Dindayal Ramotar, HBK University, Qatar**

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. According to her, cost and scarcity of trained personal are major limitations for Nuclear Imaging. She also explained about the 2 types of cancer as Haematological and Solid Tumor type. Then she also talked about the role of engineers in the treatment and elaborated on facilities at RMC.

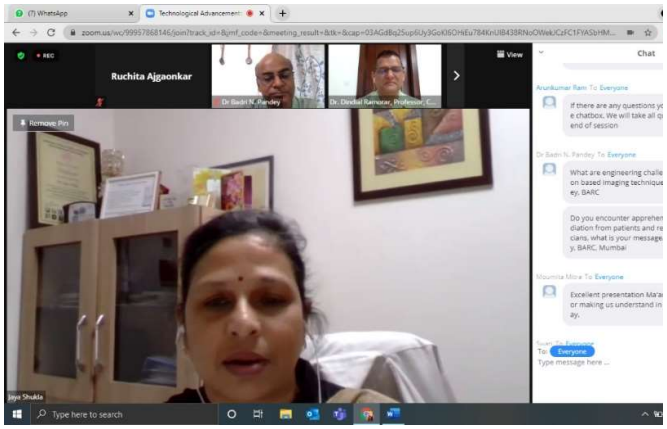
The next talk was on ***Advancement of Radiopharmaceuticals in Diagnosis and Therapy of Cancer by Dr. Jaya Shukla, PGIMER, Chandigarh.*** Speaker started with the introduction of radiopharmaceuticals as they permit the mapping of physiological function and metabolic activities of malfunctioning of different 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.

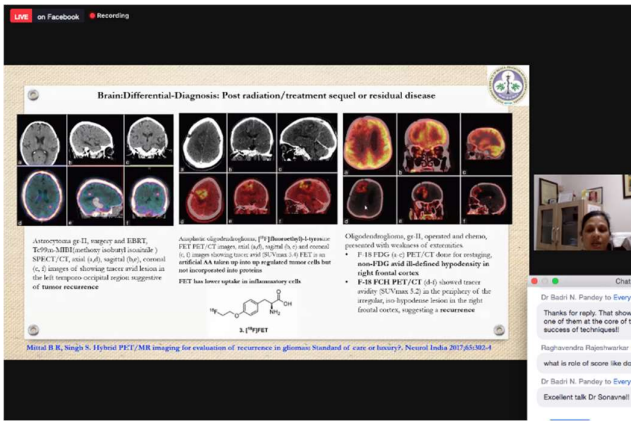


Dr Dindayal Ramotar, HBK University, Qatar



Dr Sunita Sonavane, Radiation Medicine Centre, Mumbai

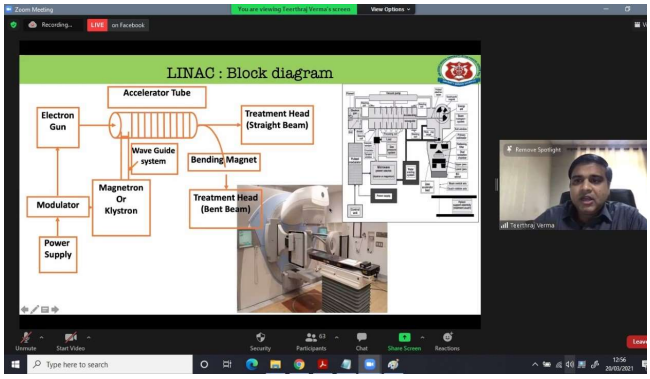


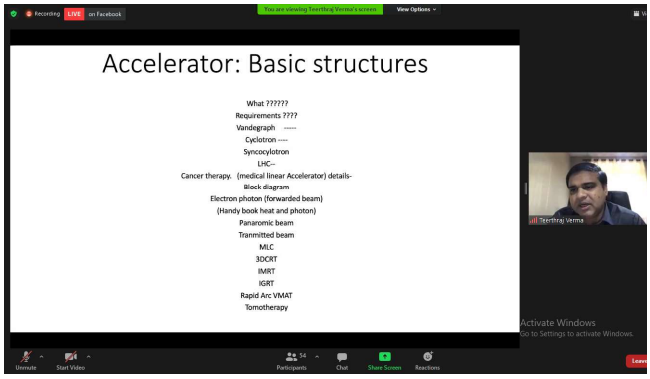


Dr Jaya Shukla, PGIMER, Chandigarh on Advancement of Radiopharmaceuticals in Diagnosis and Therapy of Cancer

The 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.



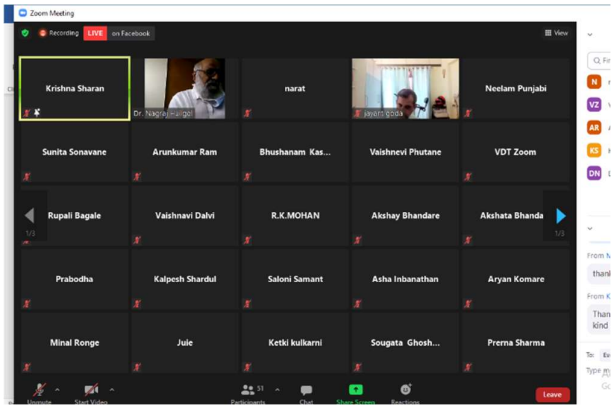


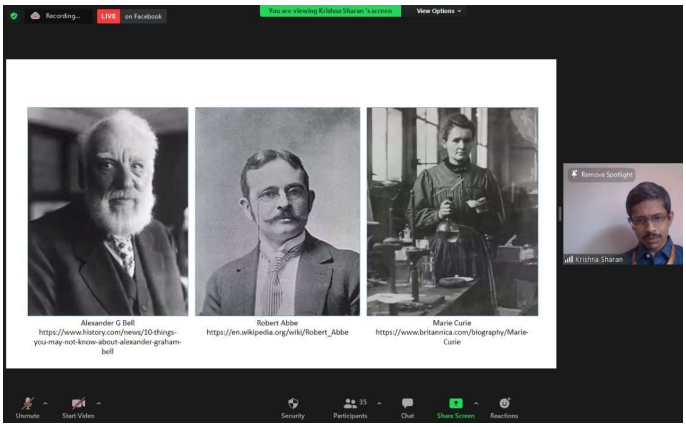
Applications of Accelerators in Cancer Therapy, by Dr Teerthraj Verma, King George's Medical University, Lucknow

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. Later he elaborated that there are two ways through which ionising radiations are transferred: External Beam Radiation and Brachytherapy. According to Dr. Sharan Brachytherapy allows doctors to deliver higher doses of radiation to more-specific areas of the body, compared with the conventional form of radiation therapy (external beam radiation) that projects radiation from a machine outside of your body.

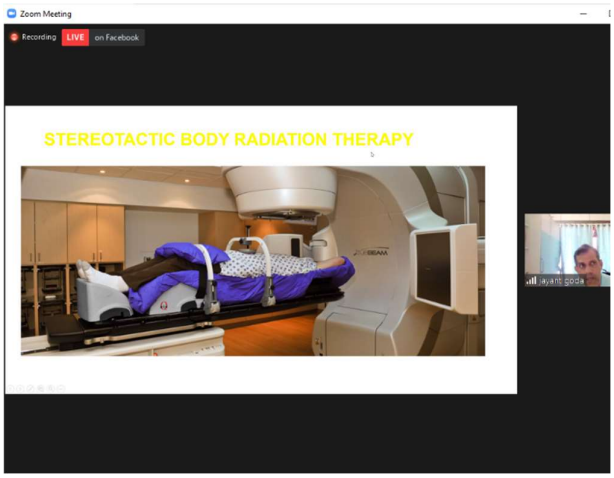
The last session of the program was on ***Advancement and Challenges of Teletherapy in Cancer Radiotherapy, Dr Jayant Sastri Goda, ACTREC, Tata Memorial Centre, Kharghar, Navi Mumbai***. He started with radiation therapy, the 5 Rs of radiation. He covered a vast area of Radiotherapy and many advanced 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





Advances in Cancer Radiotherapy chaired by Dr Nagraj Huilgol, Nanavati Hospital, Mumbai

Brachytherapy in Cancer Radiotherapy, by Dr T. K. Sharan, Manipal University, Manipal.



Advancement and Challenges of Teletherapy in Cancer Radiotherapy, Dr Jayant Sastri Goda, ACTREC, Tata Memorial Centre, Kharghar, Navi Mumbai

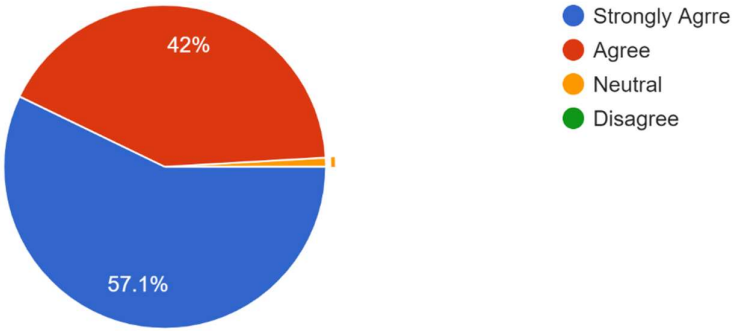
The workshop concluded with feedbacks from the participants. One of the participant Ms Sharma had expressed that the workshop made her know advancements in the field Nuclear Medicine. Session Chair Dr. Ramotar also gave a feedback to reduce the duration of the sessions. Another participant Mr. Harish Ojha pointed out these types of programs make the participants aware of new developments in the field cancer treatment. 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.

*The recording of the program is available on facebook page of VIT.

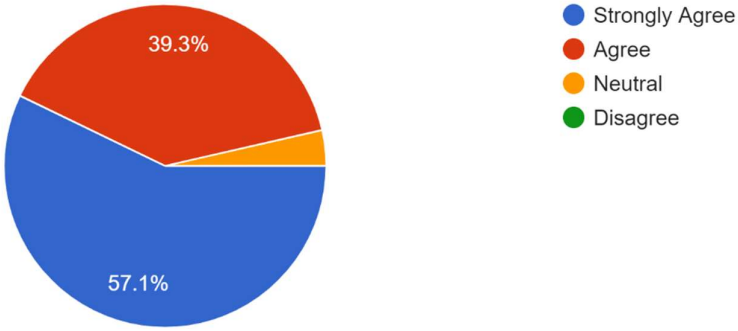
Feedbacks on various aspects of the workshop

A total of 112 participants have given feedback to the session on various aspects as given below.

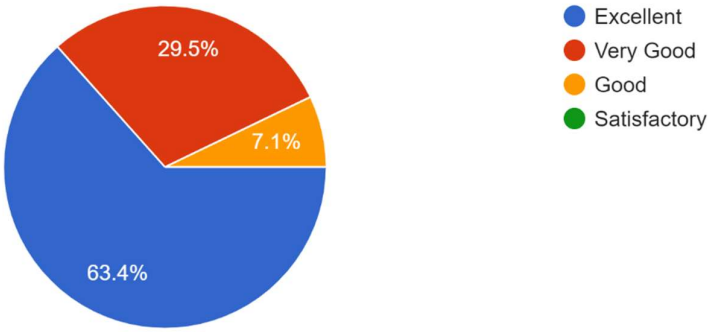
The Workshop helped me to understand the Technological Advancements and Challenges of Radiation Based Techniques



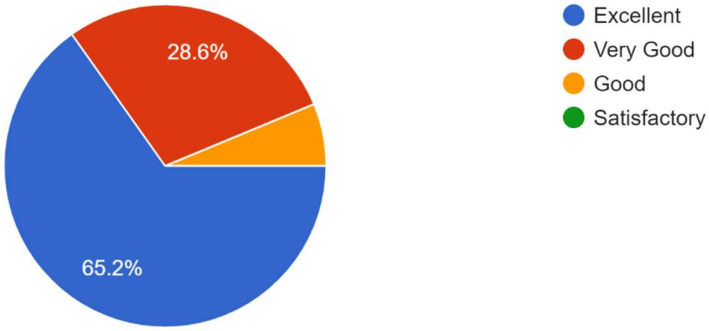
The Resource Person and Experts were able to explain the concepts and helped solve my queries



Rate the content and presentations shared by the Experts



How would your Rate the workshop overall



Some of the Individual Suggestions and Comments given by the Participants

- Workshop was extremely useful and illuminating. I would like to attend such workshops in future too.
- Talks need to be shorter keeping time for discussion.
- It was well organised and conducted smoothly.
- Keeping this pandemic in mind, if situation is same then a live online tour to hospital would be nice. Live working of machines directly from hospitals.
- Yeah. This kind of workshops should be taken once in a while. For the betterment of our students. Thank you! As all the concepts regarding this topic were cleared.
- Yes indeed. It would be best to have 25 mins presentation with 5 mins discussion to accommodate more participants.
- The synchrony of the talks in this workshops were nice. Excellent planning by SRR team for focusing the clinical aspects, specially the use of technologies in radiation oncology is quite helpful. It was very informative for a basic radiation biology researcher like me to get further advancement in my knowledge on "technological advancements and challenges of

radiation based techniques". Lot of thanks to VIT Biomedical engineering group for their superb execution of the workshop.

- Looking forward to participated in such excellent Work Shop, or relevant events in near future.

*The recording of the program is available on facebook page of VIT.

Convener

Head Biomedical Engineering