

**A REPORT ON**

**TECHNOLOGY REFLECTION LECTURE SERIES**

**“AWARENESS AND PREPAREDNESS FOR RADIATION DISASTER”**

**JANUARY 11, 2020**

**ORGANISED BY**



**BHOPAL MEMORIAL HOSPITAL & RESEARCH CENTRE,**

**DEPARTMENT OF RESEARCH,**

**BHOPAL**

**IN ASSOCIATION WITH**



**SOCIETY FOR RADIATION RESEARCH (SRR)**

**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 REFLECTIONS LECTURE SERIES on Saturday, January 11<sup>th</sup>, 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 was 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.



**Inauguration of event by Dr Prabha Desikan, Director BMHRC, Bhopal with Guest Speakers, Faculty and Invited Guests.**



**Dr. R.M. Samartha, briefing the audience about Society for Radiation Research.**

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 Oncolytic virus sensed by RLRs and induce production of type I interferons (IFN) and proinflammatory cytokines through a sole adaptor IPS-1 (also known as Cardif, MAVS and VISA) for antiviral innate immunity. These sensors also play a pivotal role in anti-cancer activity through induction of apoptosis, however, the mechanism for anti-cancer activity is poorly understood.



#### **Dr. Himanshu Kumar delivering lecture on “Viruses: Friend or Foe in Cancer?”**

In this talk, Dr. Himanshu discussed the anti-cancer vaccine adjuvant, Poly IC (sensed by MDA5) and oncolytic virus, New castle disease virus (sensed by RIG-I) induce anti-cancer activity. Ectopic expression of IPS-1 into type I IFN-responsive and non-responsive cancer cells induces anti-cancer activity via up-regulation of TRAIL and vice versa in IPS-1 knockdown stable cells. Furthermore, knockdown of IRF3 and IRF7 in IFN-nonresponsive cancer cells show reduces anti-cancer activity via suppression of apoptosis via TRAIL. Collectively, our study shows IPS-1 induces anti-cancer activity through upregulation of TRAIL via IRF3 and IRF7 in type I IFNs-dependent and independent manner. In this talk he also demonstrated the Oncogenic potential of HCMV. The herpesviral tegument protein known as UL48 has deubiquitinase activity playing a key role in carcinogenesis. The deubiquitinase is key in inducing enhanced cellular metabolic activity, upregulating expression of anti-apoptotic genes and downregulating pro-apoptotic genes expression. Furthermore, HCMVdeubiquitinase also inhibited PRR-mediated type I interferon via deubiquitination of TRAF6,TRAF3,

IRAK1, IRF7 and STING. Collectively, in the talk, I demonstrated that HCMV might induce oncogenesis by inhibiting innate immunity of the host.



**Dr. Basu delivering lecture on “AN INTRODUCTION TO RADIOPHARMACEUTICALS: FROM DEVELOPMENT TO DELIVERY”**

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, was not limited to mere diagnosis, by also for treatment of some cancers. Radiopharmaceuticals form the integral part of nuclear medicine and are widely used for diagnostic imaging and cancer therapy. Today's radiopharmaceuticals are considered as safe and cost-effective drugs where a single dose often helps achieve the desired activity. With little or no side-effects and allowing painless procedures to be performed at ease, these molecules can be used on any individual including children. As such radiopharmaceuticals have gained widespread popularity and enjoy a commendable market size globally. These molecules consist of radioactive isotopes tagged with ligands that can specifically bind to particular receptors of the target organ or tissues. The ligands used for the

purpose are specifically designed to undergo reversible interaction as a mono- or polyvalent linker to one or more receptors depending on the type of organ or tissue being targeted. The radio-isotopes used for imaging are carefully chosen such that their half-lives are just sufficient to perform the desired imaging or activity and not long-enough to initiate cytotoxicity. The corresponding doses of the same are decided based on the physical (radiation) and physiological half lives of the product. Considering the unique requirement for the usage of these products, special care needs to be taken for the manufacturing, supply and dispensing of these products where, as per mandate all actions need to be performed following guidelines related to Good Manufacturing Practices (GMP) and Good Radiation Practices (GRP). Moreover, owing to the short shelf-life of the attached radionuclide, a Just-in-Time like approach is preferable for the supply of these products which has led to the development of the modern Cold-Kits to overcome much of the hassles of the supply chain so that the product of desired purity efficacy and safety are made available for the patients at the time they need. Hence looking at the present situation, it seems that over the past four or five decades, we have come a long way to master the methods of handling radionuclides to be used as per our desired needs. However, we still need to go a long way to ensure safe and effective delivery of these drugs to the target organs. In fact concerted research efforts, though ongoing, are still needed to be directed towards identifying the biomarkers for the different diseases and the corresponding ligands which can specifically bind to the same for their accurate and effective diagnosis or treatment.



#### **The distinguished invitee and Guest speakers receiving SRR mementoes.**

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.

**Report prepared by**

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**Forwarded by**

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