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The Departments of Chemistry and Biosciences, SSSIHL conducted a one-day workshop titled **Emerging Trends in Multidisciplinary Approaches to Oncology** on 27 February 2016 at the Brindavan Campus.

The program started with students chanting Vedam followed by all the participants singing along the Universal prayer of the university. **Dr. C N Sundaresan**, Associate Professor, Dept. of Chemistry, SSSIHL delivered the welcome address. He established the status of the disease in the world and in the context of India, and supplemented the facts with data obtained from scientific literature. He called on the youngsters to use the resources available at their end, and use their intellect to solve the current problems in cancer research. He alluded them to think out of the box, and join hands in fighting the disease which is rampant in the world.

Dr. Gurnath Kilara, Director, HCG-MSR Cancer Centre, Vice-chairman, Centre of Psycho-oncology for Education and Research (COPER), Bengaluru, then delivered the keynote address on the topic, '**Cancer – A Conundrum**'. With his Clinical background and his experience in the field of oncology for 30 years, he beautifully brought out the picture of how Cancer is no longer a killer disease and that the advancements in various treatment methodologies has increased the rate of cure to two-third of the patients in 2015 as opposed to just 25% of the patient survival in the nineties. Dr. Kilara presented a bird's eye-view of the various radiation based treatment procedures available in the country, namely, IMRT, SRT, SRS, IGRT and Cyberknife technology. He stressed on the importance of quality of life of the patient post treatment as a major factor in cancer treatment, and reiterated the need for love and humanitarian touch in treatment procedures.

Dr. Sundaresh D C, Director, Sri Sathya Sai Institute of Higher Medical Sciences, Whitefield, Bangalore, Chief Guest of the Workshop, delivered his address, quoting the life of Dr. M S Valiathan, the renowned Cardiac Surgeon. The story revolved around how Dr. Valiathan overcame several odds on his way, met several failures and yet kept his spirits high and persevered in creating the most cost effective prosthetic valve. Dr. Sundaresh

advised the students that they should not be bogged down by failures and should march ahead in pursuit of their goals in serving mankind. The surgeon also narrated an interview with Swami, where Swami emphasized on treating patients with love. Love should be the undercurrent of every service activity, the speaker re-iterated.

Dr. Ramesh Sistla, Senior Lead Investigator, Computer Aided Drug Design, Biocon BMS R&D Center, Bengaluru was the next speaker and he focused on '**Drug resistance mechanisms in Cancer**'. He discussed his theme using the case study of the drug Imatinib (Gleevac), which was used in the treatment of chronic myelogenous leukemia (CML). Mutations that changed the amino acids in the drug binding pocket of the protein, led to lack of drug binding ability. This point mutation, led to the development of drug-resistance. In other words, this point mutation led to the lack of responsiveness of cancer cells to the drug in vitro and also in cancer patients.

He encouraged students to keep their interests wide open, and invited them to pursue various approaches and be willing to collaborate with experts in different fields. The speaker concluded his talk with a message 'Be thorough, Team-up, Ask Questions, Seek Answers'.

Dr. Manjunath Ramarao, Group Director and Head, Disease Sciences and Technology Bristol-Myers Squibb, Bengaluru, India gave a very engaging talk on '**Immuno-oncology – New Frontiers in Cancer Therapy**'. He interspersed his talks with videos explaining the various basic concepts in Immunology. His talk covered the various aspects of anti-cancer immunotherapy and dealt with Cytokine therapy, Immune check-point blockades, Adoptive cell transfer and Vaccination Strategies. He brought out Immune check point blockers are a breakthrough in the field of cancer treatment and illustrated how blocking the interaction of CTLA4 –B7, and PD1 and PD-L1 using antibodies, can prevent the suppression of the natural killer cells and CD8 cells, thereby they fulfill on their immune activity of eliminating the cancerous cells. This therapy has already been demonstrated to cure melanoma. This approach is to block the host molecules, and hence the problem of drug resistance mutations is circumvented.





This approach holds great promise in treating many forms of cancer.

Dr. Mukesh Doble, Professor, Department of Biotechnology, IIT Madras delivered his talk titled '**Design of small molecules as inhibitors of mPGES-1 for treating inflammation and cancer**'. He discussed how inflammation is a central manifestation in every disease and every cancer, and hence managing this is central to cancer treatment. He presented data on the over-expression levels of mPGE-1s in many cancers and is ubiquitous in tissue distribution. He presented their approach, which involved traditional and pharmacophore based scaffold hopping approach to design drug molecules. He explained the various computational tools used in ligand based virtual screening using finger prints and scanning the Zinc database with 8 million ligands and narrowing it down to a few lead molecules based on various parameters, nearest search method, ADME filters.

Dr. Nanduri Srinivas, Associate Professor, NIPER-Hyderabad, an alumnus of Sri Sathya Sai Institute then delivered his talk on '**Role of Kinase inhibitors in Cancer Treatment**'. He explained how it is very complicated to design drugs for a protein kinase, since there are 500 kinases present in the human system, which are similar in structure and share 60-90% homology. On the other hand, he also brought out that more than 28 drugs that have been approved by the FDA (USA) are small molecule inhibitors for Kinases.

Dr. Nanduri's work brought out the best of both the traditional approach and the computational approaches, and he explained how a researcher should have keen observation skills to build on from the cues that are obtained in the previous experiments.

Dr. Sreevalsam Gopinath, also an alumnus, currently Senior Scientist, Aurigene Discovery Technologies, spoke on the topic '**From a molecule to a drug**'. He elaborated on every aspect of drug development from the basics to the final phase three clinical trial. He brought out in detail every minute aspect that needs to be looked into, when a drug is being developed.

Of the various parameters that cause a failure of drug, he mentioned the most important ones are the lack of efficacy and the pharmacokinetics of the drug. He discussed in detail the ADME (Absorption, Distribution, Metabolism and Elimination) stages of drug development. He also brought out the drug-drug interactions, and the balance that one needs to strike between the pharmacology properties and the drug-like properties of a molecule. He brought out graphically how only a tiny fraction of the various potent molecules finally gains the status of a drug. He also elucidated the economic aspects associated with the drug development.

The seminar concluded with a vote of thanks delivered by **Dr. A Ashok**, Associate Professor, Dept. of Biosciences, SSSIHL and Mangala arati to Bhagawan Baba.

