Report on the Popular Science Lecture Organized by IWSA, Baroda Branch on 21st September 2023

A "Popular Science Lecture" was organized by the **Indian Women Scientists' Association (IWSA)**, Baroda branch in association with the Department of Biochemistry, The Maharaja Sayajirao University of Baroda, Vadodara on 21st September 2023. The programme was organised by the coordinator Prof. C. Ratna Prabha, who is also the Co-Convener of IWSA, Baroda branch under the guidance and encouragement of the Convener Mrs. Hemlata Pavagadi and former Convener Prof. Sandhya Garge, in the C. V. Ramakrishnan Seminar Hall of Biochemistry Department. Around 120 students, faculty members from three different universities and pharma industries attended the lecture.

Prof. Krutika Sawant, Head of the Department of Pharmacy, Maharaja Sayajirao University delivered a talk on "**Lymphatic delivery: A new paradigm for systemic and site-specific drug delivery**". Several routes for the administration of drugs exist and all have their advantages and drawbacks, however, the oral route of administration remains by far the most convenient route for patients. Drugs administered via this route undergo first-pass metabolism, significantly reducing the plasma drug concentration and as a result, effectivity. A classical method to bypass this is to administer a prodrug. Prof. Sawant introduced the students to a distinct alternative to prodrug administration.

The lymphatic system has long been overlooked as a route for drug administration, she shed light on ways to exploit this system to deliver drugs such as methotrexate and cefotaxime of low bioavailability and low water solubility. She briefly discussed approaches of delivery to the lymphatic system via pulmonary, intestinal, intraperitoneal, and intradermal/ subcutaneous routes using nano-sized drug delivery systems and their success in comparison to conventional oral and IV routes.

Prof. Sawant combined the aforementioned approaches to improve drug administration. She discussed the encapsulation of drug molecules in particular drug carriers such as NLCs (Nanostructure lipid carriers), SLNs (Solid lipid nanoparticles), and Polymeric nanoparticles. These methods of encapsulation protect the drug from first-pass metabolism and allow the drugs to be directly taken up by the intestinal lymphatic system, thereby increasing bioavailability.

Prof. Sawant explained a few of the case studies related to drug delivery utilizing the lymphatic pathway. Highlights of those studies include, (i) Intestinal lymphatic transport of LH SLNs enhanced the bioavailability by reducing the first-pass metabolism. Pharmacokinetics results showed the improved oral bioavailability of LH over 5.16 folds after incorporation into SLNs as compared to LH suspension. (ii) Pharmacodynamics study on schizophrenia-induced rats

proved that the cognitive function of these rats was improved which confirmed the antipsychotic potential of LH-SLNs in the treatment of schizophrenia. In conclusion, the SLNs demonstrated a great potential for oral delivery of poorly water-soluble and lower bioavailability drugs like LH.

In summary the lecture explained clearly the routes of drug administration, the problems faced in drug availability and what are modern advances to overcome the problems and how drugs can be effectively administered. The lecture was appreciated for its invaluable information content and immense clarity.