सी.एस.आई.आर. - हिमालय जैवसंपदा प्रौद्योगिकी संस्थान

CSIR - Institute of Himalayan Bioresource Technology

CSIR-IHBT

Post Box. No. 06, Palampur - 176061 (H.P.) INDIA

28th August, 2024

To Whom It May Concern

Justification Letter in favour of Ms. Ruchika application for the "Sun Pharma Science Scholar Award"

It gives me immense pleasure to recommend Ms. Ruchika **for "Sun Pharma Science Scholar Award"**. Ms. Ruchika is a CSIR-SRF fellow and joined her PhD under AcSIR in August 2020 at CSIR-Institute of Himalayan Bioresource Technology and working under my supervision.

As a student, Ruchika has a good understanding of the fundamental in her subjects and demonstrated highest level of commitment towards research with intellectual stability to achieve the targets. Her positive attitude and ability to work untiringly towards her goals have enabled her to overcome any difficulty that came in her way. While working in my laboratory, she is working on development of novel formulations such as conjugating GRAS excipients to bioactive leads for augmenting their therapeutic efficacy. More specifically, she is working on polymer-drug conjugation approach, electrospun nanofibers, solid dispersions, hydrogels, sustainable and biodegradable packaging films and self-emulsifying formulations. She has a tool kit of interdisciplinary scientific skills involving conjugation chemistry, nanoformulation, pharmacology, analytical and characterization techniques (ELISA, Western blotting, HPLC, SEM, TEM, NMR and molecular biology). She has also worked on mice, rat and zebrafish animal models and has enough knowledge of animal handling. Her hard work and dedication yielded research as well as review articles in peer reviewed journals of international repute. She has also received prestigious IGSTC-PhD Industrial Fellowship - 2022, awarded by Department of Science and Technology (DST), Government of India and the Federal Ministry of Education and Research (BMBF), Government of Germany.

Significance of Ruchika's research work for pharmaceutical application

Lipoic acid, a naturally occurring antioxidant, holds significant pharmaceutical potential due to its role in energy metabolism and its capacity to neutralize free radicals, which can mitigate oxidative stress-related disorders. However, its therapeutic efficacy is often limited by poor bioavailability, rapid degradation, and low solubility. Nanotechnology offers a promising solution to these challenges by enhancing the stability, bioavailability, and targeted delivery of lipoic acid. This approach not only improves the efficacy of lipoic acid but

सी.एस.आई.आर. - हिमालय जैवसंपदा प्रौद्योगिकी संस्थान

CSIR - Institute of Himalayan Bioresource Technology

CSIR-IHBT

Post Box. No. 06, Palampur - 176061 (H.P.) INDIA

also reduces the required dosage and minimizes side effects, making nanotechnology a crucial tool in optimizing the clinical applications of such natural molecules.

In this regard, the work submitted by Ms. Ruchika for this prestigious award entitled "**Overcoming Formulation Challenges of a Universal Antioxidant: Crafting Stability and Therapeutic Efficiency**" is the perfect example of interdisciplinary research for ameliorating the therapeutic efficacy of lipoic acid *via* utilizing different formulation approaches. This work highlights the significance of three approaches (**polymer-drug conjugation, solid dispersion, inclusion complexation and nanofiber technology**) in ameliorating the solubility and stability of universal antioxidant. The synthesized conjugate, developed nanofiber and solid dispersion demonstrated enhanced solubility, stability, rapid release and enhanced therapeutic potential of lipoic acid at lower doses in three different conditions, epilepsy, inflammation and allergic asthma, respectively. The study has opened new avenues in terms of noble, sustainable and effective approach for ameliorating the therapeutic potential of bioactive leads.

I wholeheartedly support her application for Sun Pharma Science Scholar Award and wish her the best. I remain available for any additional enquiries.

Sincerely Yours,

Ankit Saneja 28/08/2020

Dr. Ankit Saneja, PhD
Scientist
Dietetics and Nutrition Technology Division
CSIR- Institute of Himalayan Bioresource Technology,
Palampur (HP) -176061, India