To,

The Selection Committee

Sun Pharma Science Foundation

8C, 8 Floor, Hansalaya Building, 15-Barakhamba Road,

Connaught Place,

New Delhi-110 001

Subject: Summary about important discoveries in the field of pharmaceutical science

Dear Members of the Selection Committee,

Our pharmaceutical research has led to significant advancements in developing new therapeutic drugs and drug delivery systems. Notable achievements include the synthesis of coumarin–benzimidazole hybrids as potential antibacterial agents, creating nanoparticle-based therapies targeting oral cancer and biofilm inhibition, and introducing fish-derived peptides as a novel treatment for mucormycosis. We have also utilized zebrafish models to investigate the therapeutic efficacy of compounds such as Tanshinone IIA for PCOS, Daidzein for Parkinson's disease, and curcumin-mediated zinc oxide nanoparticles for oral squamous carcinoma. Furthermore, we have made significant strides in innovative drug delivery systems, including the co-encapsulation of apigenin and ascorbic acid for targeted PCOS treatment and the use of graphene oxide-decorated daidzein for treating osteoporosis. By applying for the Sun Pharma Science Foundation Research Fellowships in Pharmaceutical Sciences, we are eager to continue our innovation journey and contribute further to the field, thereby instilling confidence in the potential applications of our research and its future impact.

Top 10 research papers in pharmaceutical science:

1. Arya, C.G., Kishore, R., Gupta, P., Gondru, R., Arockiaraj, J., Pasupuleti, M., Chandrakanth, M., Punya, V.P. and Banothu, J., 2024. Identification of coumarin–

benzimidazole hybrids as potential antibacterial agents: Synthesis, in vitro and in vivo biological assessment, and ADMET prediction. Bioorganic & Medicinal Chemistry Letters, p.129881. https://doi.org/10.1016/j.bmcl.2024.129881 (IF – 2.5)

2. Shaik, M.R., Kandaswamy, K., Guru, A., Khan, H., Giri, J., Mallik, S., Shah, M.A. and Arockiaraj J., 2024. Targeted piperine-coated zinc oxide nanoparticle induces the biofilm inhibition of dental pathogens and apoptosis of oral cancer through the BCL-2/BAX/P53 signaling pathway. BMC Oral Health. https://doi.org/10.21203/rs.3.rs-3990413/v1 (IF – 2.6)*

3. Priyanka, G.L., Mahalakshmi, N.C., Almutairi, M.H., Almutairi, B.O., Sudhakaran, G., Premkumar, B. and Arockiaraj J., 2024. Tanshinone IIA from Salvia miltiorrhiza alleviates follicular maturation arrest symptoms in zebrafish via binding to the human androgen receptors and modulating Tox3 and Dennd1a. Tissue and Cell, p.102404. https://doi.org/10.1016/j.tice.2024.102404 (IF – 2.7)*

4. Haridevamuthu, B., Sudhakaran, G., Pachaiappan, R., Kathiravan, M.K., Manikandan, K., Almutairi, M.H., Almutairi, B.O., Arokiyaraj, S. and Arockiaraj J., 2024. Daidzein ameliorates nonmotor symptoms of manganese-induced Parkinsonism in zebrafish model: Behavioural and biochemical approach. British Journal of Pharmacology. https://doi.org/10.1111/bph.16382 (IF – 6.8)*

5. Velumani, K., Arasu, A., Issac, P.K., Kishore Kumar, M.S., Guru, A., Arockiaraj J.,2023. Advancements of fish-derived peptides for mucormycosis: a novel strategy to treat diabetic compilation. Molecular Biology Reports, pp.1-23. https://doi.org/10.1007/s11033-023-08882-8. (IF - 2.6)*

6. Nehru, S., Guru, A., Pachaiappan, R., Hatamleh, A.A., Al-Dosary, M.A., Arokiyaraj, S., Sundaramurthy, A. and Arockiaraj J., 2024. Co-encapsulation and release of apigenin and ascorbic acid in polyelectrolyte multilayer capsules for targeted polycystic ovary syndrome. International Journal of Pharmaceutics, 651, p.123749. https://doi.org/10.1016/j.ijpharm.2023.123749 (IF – 5.3)*

7. Sudhakaran, G., Chandran, A., Sreekutty, A.R., Madesh, S., Pachaiappan, R., Almutairi, B.O., Arokiyaraj, S., Kari, Z.A., Tellez-Isaias, G., Guru, A. and Arockiaraj J*., 2023. Ophthalmic Intervention of Naringenin Decreases Vascular Endothelial Growth Factor by Counteracting Oxidative Stress and Cellular Damage in In Vivo Zebrafish. Molecules, 28(14), p.5350. https://doi.org/10.3390/molecules28145350. (IF - 4.2)

8. Tayyeb, J.Z., Priya, M., Guru, A., Kishore Kumar, M.S., Giri, J., Garg, A., Agrawal, R., Mat, K.B. and Arockiaraj J*., 2024. Multifunctional curcumin mediated zinc oxide nanoparticle enhancing biofilm inhibition and targeting apoptotic specific pathway in oral squamous carcinoma cells. Molecular Biology Reports, 51(1), p.423. https://doi.org/10.1007/s11033-024-09407-7 (IF - 2.6)

9. Aswinanand, B., Nayak, S.R.R., Madesh, S., Subbarayudu, S., Kaliraj, S., Rajagopal, R., Alfarhan, A., Kathiravan, M.K. and Arockiaraj J*., 2024. Toxicity and therapeutic property of dioxopiperidin derivative SKT40 demonstrated in-vivo zebrafish model due to inflammatory bowel disease. Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology, p.109990. https://doi.org/10.1016/j.cbpc.2024.109990 (IF – 3.9)

10. Priya, P.S., Vaishnavi, S., Pavithra, V., Pachaiappan, R., Barathkumar, S., Almutairi, B.O., Arokiyaraj, S. and **Arockiaraj J***, 2023. Graphene oxide decorated daidzein as an oral drug to ameliorate the oxidative stress and glucocorticoid-induced osteoporosis in vivo zebrafish model. *Journal of Drug Delivery Science and Technology*, 81, p.104278. https://doi.org/10.1016/j.jddst.2023.104278 (IF - 4.5).