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Efficient hybrid design methodological approach: Optimizing the nanostructure lipid carrier system for tuberculosis

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Development of an effective formulation for antitubercular drug (Rifabutin) involves careful optimization of a number of excipient and process variables. Some times the number of variables is so large that even the most efficient optimization designs require a very large number of trials which put stress on costs as well as time. A creative and hybrid combination of a number of design methods leads to a smaller number of trials. This study was aimed at the development of Nano Structured Lipid Carriers (NLCs) by using a combination of different optimization methods. We screened using the full factorial design for their effects on formulation characteristics like particle size, entrapment efficiency, Zeta Potential and PDI. Few were found to have in-significant effects on the formulation parameters and hence were screened out. Out of the remaining variables, we found some of them have significant effects on the size of the particles while the other had a higher influence on the entrapment efficiency and other responses. The screened variables were optimized for their effect on size using the Taguchi orthogonal array. The optimized values of the surfactants and lipids were kept constant for the next stage, where the sonication time, phase ratio, and drug: lipid ratio were varied using the Box-Behnken design and response surface method to optimize the entrapment efficiency. Finally, by performing only very few number of trials, we have optimized very few variables for the development of Nano Lipid Carrier for Rifabutin.

Biography

A K Srivastava is working in the Department of Pharmaceutics, IIT-BHU as an Associate Professor, of Pharmaceutics. He completed his BPharm and MPharm degree from the Department of Pharmaceutics, IIT-BHU, Varanasi. Before joining the academics in the department, he has served in Pharma Industry in production. He has vast experience of teaching and research. He has more than 30 year of teaching experience. He has guided about 80 research scholars for MPharm including 3 PhD scholars. He has published around 35 research papers in national and international research journals of repute. He is a recipient of Indian Drug Manufacturer Association, Mumbai (IDMA) gold medal as well as gold medallist in BPharm and MPharm. Besides, he is involved actively in university administration in various capacities. His research area of interest is towards oral drug delivery under advance drug delivery system.

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