Institute of Pharmaceutical Technology and Regulatory Affairs

Faculty of Pharmacy

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I. Symposium of Young Researchers on Pharmaceutical Technology, Biotechnology and Regulatory Science

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Fabrication of pulmonary formulations containing hyaluronic acid and chitosan-based nanoparticles for drug delivery in tuberculosis

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Tuberculosis is the second most fatal disease in the world which is caused by Mycobacterium tuberculosis (MT) [1]. Different therapeutic regimens have been used in the past but drug resistance always led low patient compliance. As the bacteria resides inside macrophage during the disease phase, so developing a drug delivery system containing nanoparticles which can directly target the causative organism inside macrophage can prove to be the modern day anti TB therapy [2]. Various routes of drug administration have been explored using nanoparticles in the past but pulmonary route proves to be the most promising one [3, 4]. During nanoparticle formulation comprised of Hyaluronic acid (HA) or Chitosan, core can serve as a reservoir for various drugs for targeting macrophages in TB. Chitosan is mucoadhesive in nature and HA has an affinity for the macrophage, so these are the biodegradable polymers of choice [5]. Amoxicillin and various other drugs will be compared in terms of efficacy for reducing the symptoms of TB. Physicochemical tests including FT-IR, DSC, TGA, XRPD, SEM, size analyses and aerodynamic characterization can provide useful data about compatibility and stability of the nanoparticular system. Ex Vivo Drug Accumulation Studies on Cultured Alveolar Macrophages and stability of the formulation in Broncheo-Alveolar Lavage Fluid can be performed prior to the in vivo testing in Guinea pigs. Inhibition of bacilli growth in macrophage can reduce the production of pro inflammatory cytokines and chemokines.

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