Importance of nanoparticle technology has been established in various fields and it is of great use in pharmaceutical field. Nanoparticle formulation has been a proven fact as far as cancer treatment is concerned and like we have discussed in the literature the importance in anti-retroviral treatment is growing from the past decade.

Nanoparticle formulation if improved, developed and made available to patients will have tremendous results in terms of treatment and patient compliance. The nanoparticle formulations can cross the blood brain barriers, cerebrospinal fluid and other physiological barriers which otherwise is not possible by a conventional formulation. This will result in less drug resistance from virus and we can successfully prevent the relapse of infection in human body to a great extent.

Analytical method and Bioanalytical method were developed and validated as per the parameters given in ICH guidance documents and these methods were successfully adopted for the analysis of formulation invitro as well as invivo. The sensitivity of the developed methods was sufficient to work over a wide range of concentration.

Nanoparticle formulation of Tenofovir was developed by various methods and the final optimised formulation is taken for pharmacokinetic studies. This decision was taken considering the nanoparticle characterisation of particle size, zeta potential, drug entrapment, surface morphology and invitro studies. Stability of formulation was established as per the ICH guidelines.

Pharmacokinetic parameters were established in male wistar rats on control, optimised formulation and there was a good improvement of bioavailability of the formulated product than control. This fulfilled our main objective of our research undertaken.