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### Assessing the enhancement of aqueous solubility of efavirenz via lyophilized milk based solid dispersion formulations

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## **Assessing the enhancement of aqueous solubility of efavirenz via lyophilized milk based solid dispersion formulations**

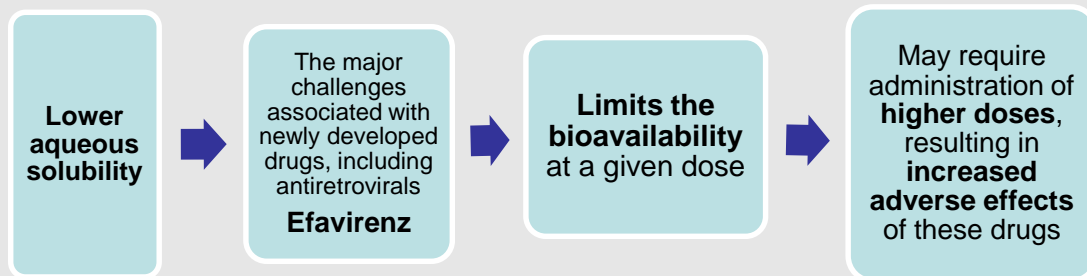
### **Disciplines**

Pharmacy and Pharmaceutical Sciences

### **Comments**

Poster presented at the American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition in Denver, Colorado, November 2016.

## PURPOSE



To investigate the enhancement of aqueous solubility of efavirenz by formulating lyophilized milk based solid dispersion.

## RESULTS

### Physicochemical Characterization

Table 1: Saturation Solubility Studies of Efavirenz and its Solid Dispersions

Formulation	Efavirenz: lyophilized milk (w:w)	Saturation solubility (µg/mL)
Pure efavirenz		7.93 ± 0.12
EM-1	1:1	53.71 ± 1.09
EM-2	1:2	82.34 ± 0.78
EM-3	1:3	111.57 ± 0.92
EM-4	1:4	97.07 ± 1.15

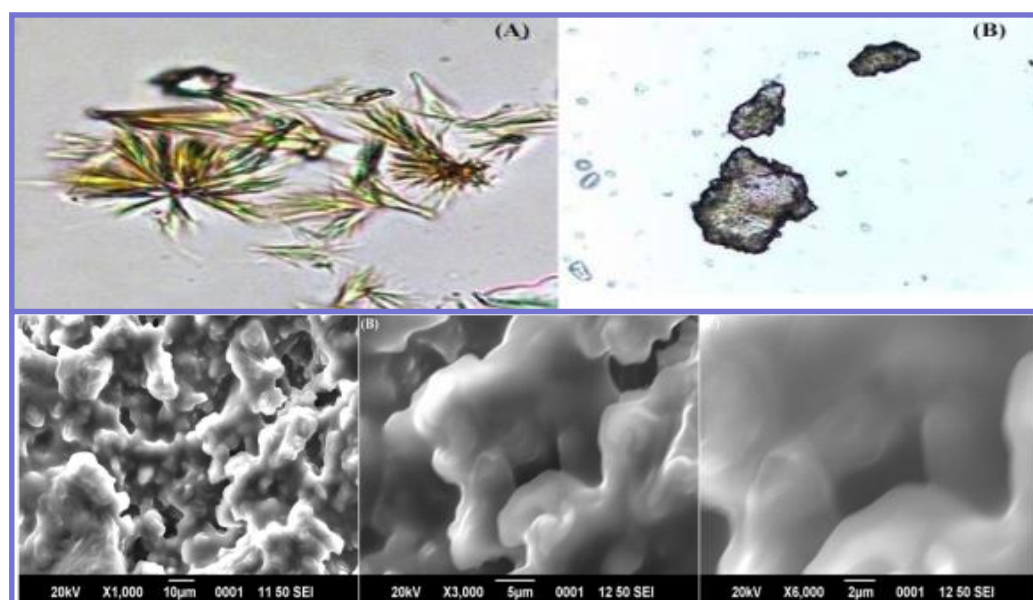


Figure 2: Microscopic and SEM views of (A) Pure EFZ and (B) EM-3

## METHOD

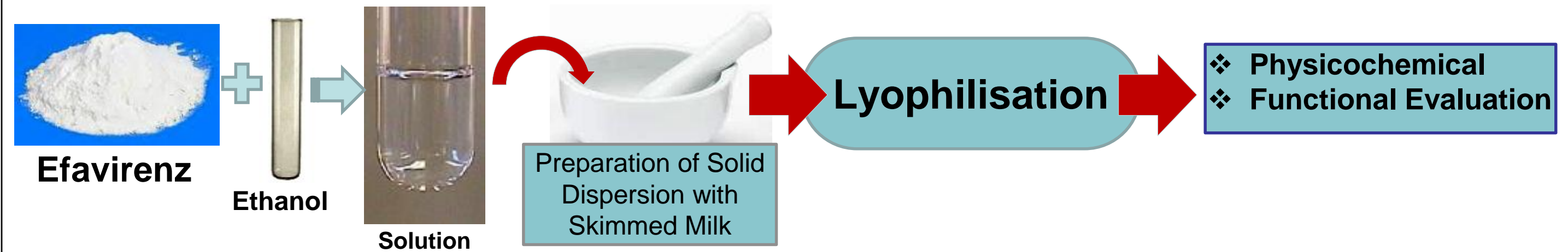


Figure 1: Schematic representation of the methodology adapted for the preparation of solid dispersion

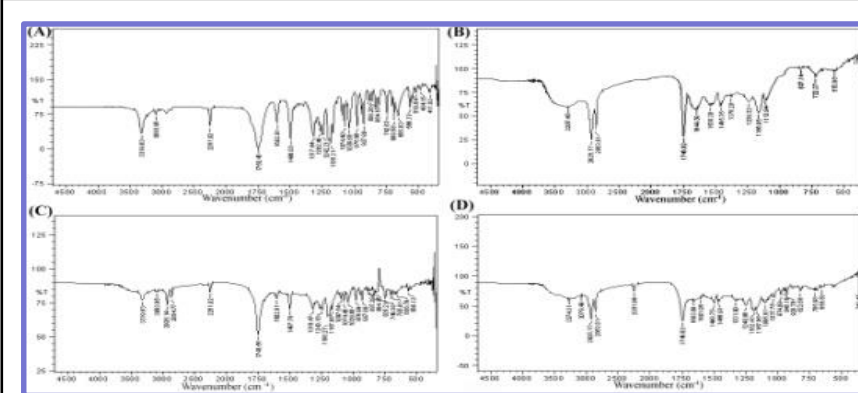


Figure 3: FTIR spectra of (A) Pure EFZ (B) Skimmed milk (C) PM (D) EM-3

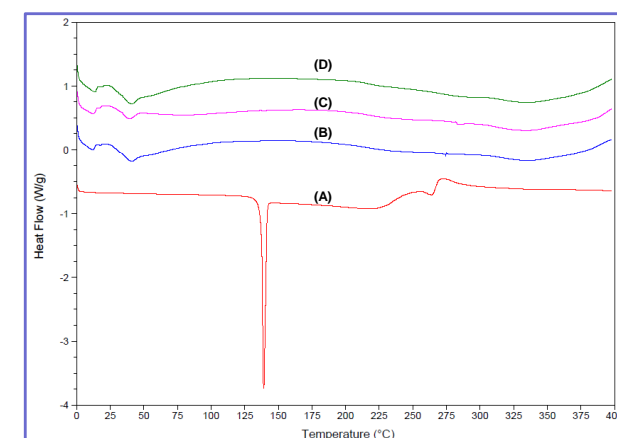


Figure 4: DSC thermograms of (A) Pure EFZ (B) Skimmed milk (C) Physical mixture (D) EM-3

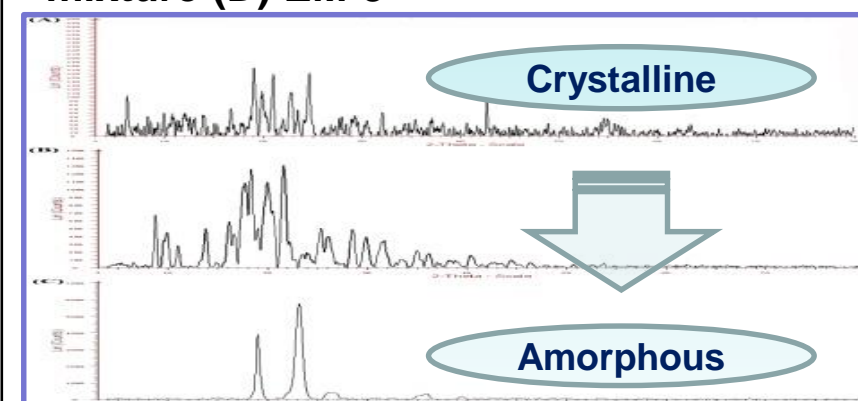


Figure 5: PXRD spectra of (A) Pure EFZ (B) PM (C) EM-3

### Functional Evaluation

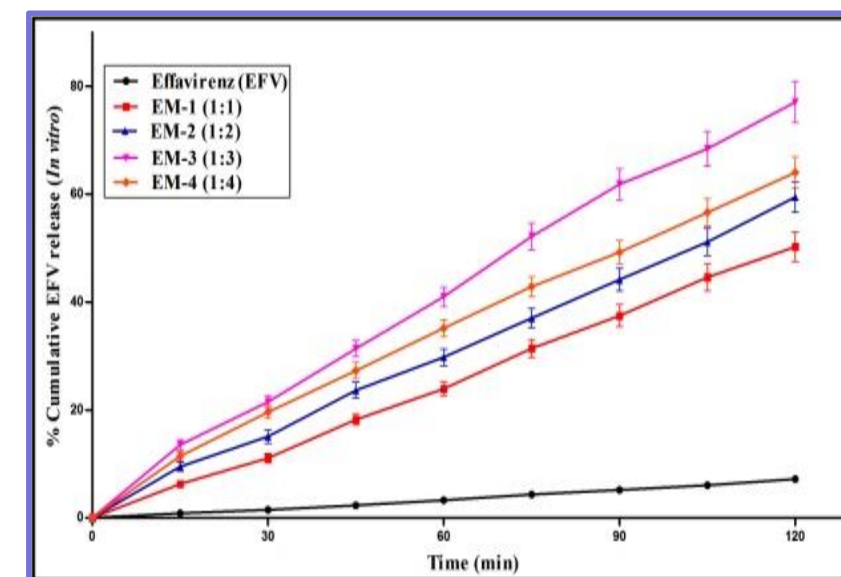


Figure 6: In-vitro dissolution study of EFZ, EM-1, 2, 3 and 4

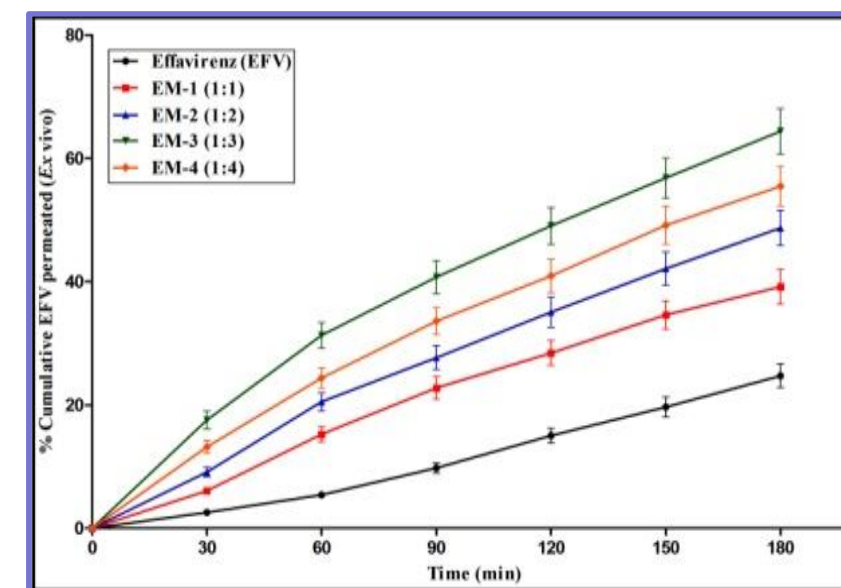


Figure 7: Ex-vivo permeability study of EFZ, EM-1, 2, 3 & 4

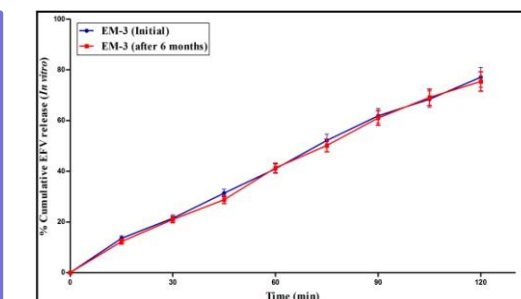


Figure 8: In-vitro dissolution profiles of the prepared EM-3 formulation before and after stability study (6 months) in phosphate buffer

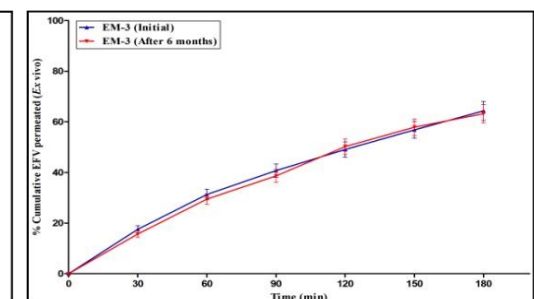


Figure 9: Ex-vivo permeability profiles of the prepared EM-3 formulation before and after stability study (6 months)

## CONCLUSION

- Study revealed the enhancement of the aqueous solubility, in vitro drug release as well as the permeability of model drug Efavirenz by the formulation of solid dispersion using Skimmed Milk.
- Enhancement of aqueous solubility of Efavirenz may improve the Pharmacokinetic profile of it and will be beneficial for safe and cost effective treatment of HIV patients.

## Acknowledgement

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