

Supplementary Materials: A Novel Rheological Method to Assess Drug-Polymer Interactions Regarding Miscibility and Crystallization of Drug in Amorphous Solid Dispersions for Oral Drug Delivery

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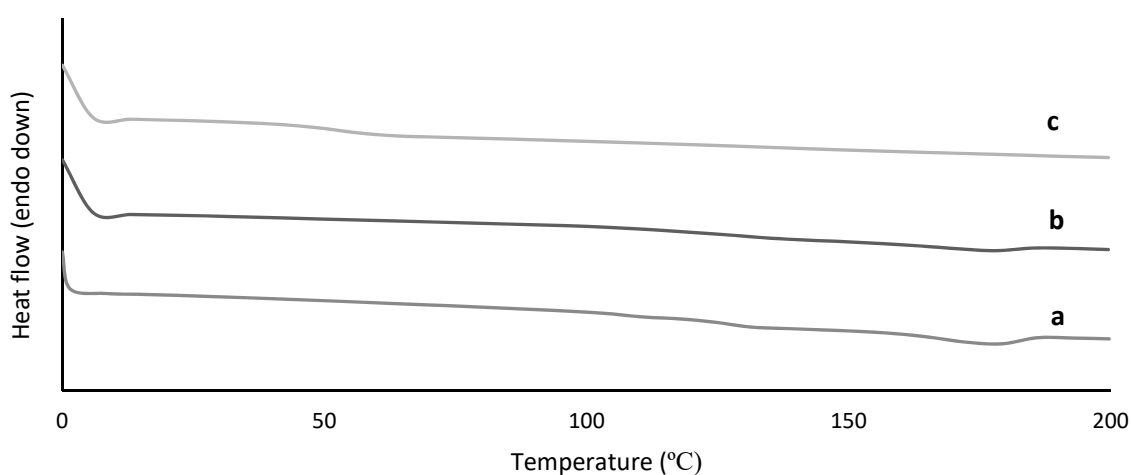


Figure S1. DSC thermographs for Ethylcellulose (EC) (a) 10% tacrolimus:EC, (b) and 90% tacrolimus:EC (c).

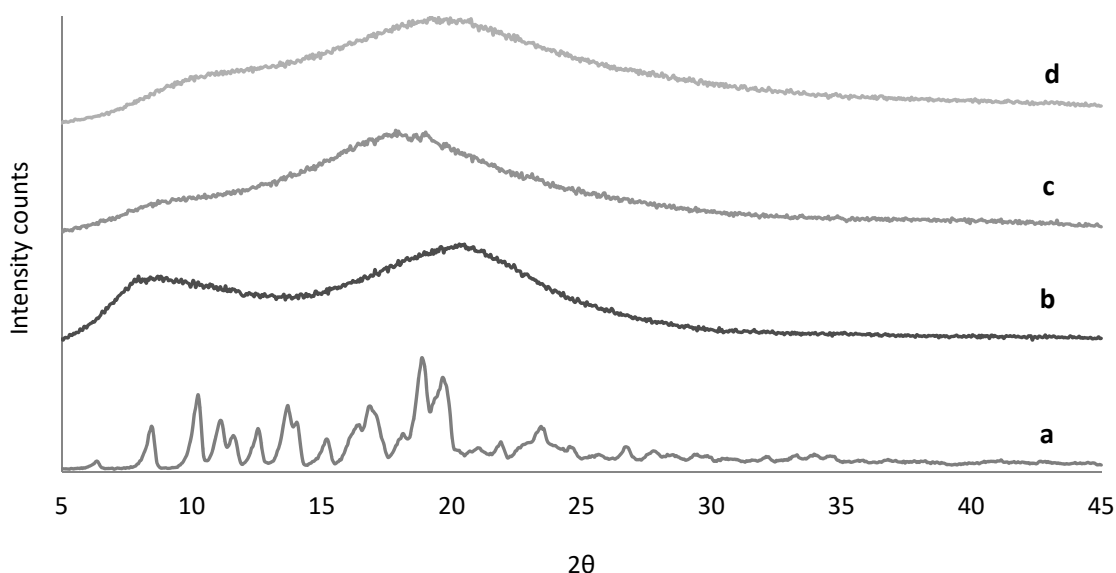


Figure S2. XRPD spectra of crystalline tacrolimus (a), Ethylcellulose (EC) (b) and of fresh tacrolimus formulations prepared via the film casting method of 90% tacrolimus:EC (c) and 90% tacrolimus:EC (d).

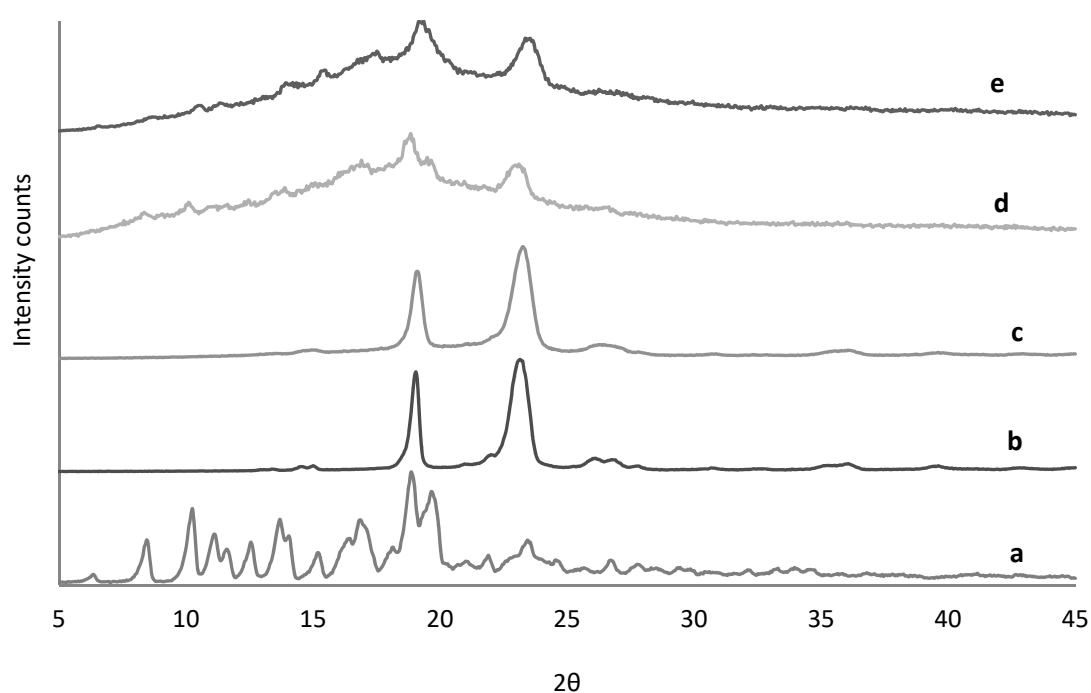


Figure S3. XRPD spectra of crystalline tacrolimus (a), Poloxamer-188 (b) and PEG 6000 (c) and of fresh tacrolimus formulations prepared via the film casting method of 90% tacrolimus:Poloxamer-188 (d) and 90% tacrolimus:PEG 6000 (e).

Table S1. Slope, intercept and R^2 values derived from the reduced concentration vs. concentration graphs for all tacrolimus:polymer combinations.

Polymer	Drug Loading	Slope	Intercept	R^2 value
Tacrolimus	N/A	0.22	0.12	0.93
HPC-L	10%	1.75	0.46	0.98
	25%	1.95	0.47	0.93
	50%	2.98	0.49	0.97
EC	10%	0.42	0.21	0.97
	25%	0.66	0.30	0.95
	50%	0.64	0.30	0.97
Soluplus®	10%	1.07	1.25	0.92
	25%	1.01	1.01	0.84
	50%	1.02	0.72	0.97
PEG 6000	10%	1.73	1.87	0.73
	25%	3.57	2.08	0.70
	50%	5.10	2.38	0.69
Poloxamer-188	10%	1.06	1.37	0.65
	25%	1.88	1.57	0.56
	50%	4.78	1.76	0.65
Eudragit® S100	10%	0.76	0.45	0.95
	25%	0.61	0.33	0.98
	50%	0.64	0.35	0.92

Table S2. Calculated ΔB and μ miscibility parameters for all tacrolimus:polymer combinations used in this study.

Polymer	Drug Loading	ΔB	μ
HPC-L	10%	0.06 (+)	0.22(+)
	25%	0.06 (+)	0.23 (+)
	50%	-0.22 (-)	-0.77 (-)
EC	10%	0.03 (+)	0.08 (+)
	25%	0.02 (+)	0.08 (+)
	50%	-0.05 (-)	-0.16 (-)
Soluplus®	10%	0.03 (+)	0.02 (+)
	25%	0.06 (+)	0.04 (+)
	50%	0.07 (+)	0.05 (+)
PEG 6000	10%	0.27 (+)	0.04 (+)
	25%	-0.23 (-)	-0.03 (-)
	50%	-0.50 (-)	-0.07 (-)
Poloxamer-188	10%	0.03 (+)	0.10 (+)
	25%	-0.05 (-)	-0.14 (-)
	50%	-0.31 (-)	-0.92 (-)
Eudragit® S100	10%	0.02 (+)	0.04 (+)
	25%	0.04 (+)	0.07 (+)
	50%	0.05 (+)	0.08 (+)