Supporting Information

Crystallization Inhibition Properties of Cellulose Esters and Ethers for a Group of Chemically Diverse Drugs - Experimental and Computational Insight

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Table S1. Experimental conditions used in nucleation induction time experiments

Drug	Stock (mg/mL)	Solvent used for Stock Solution	Drug concentration in supersaturated solution (µg/mL)	UV Probe used	Maximum Wavelength (nm)	Baseline Wavelength (nm)	Supplier
Ritonavir	6	Methanol	20	1 cm	240	450	ChemShuttle
Atazanavir	10	Methanol	60	1 cm	280	450	ChemShuttle
Telaprevir	7	Methanol	150	0.5 cm	270	370	Attix Pharmaceuticals
Nifedipine	10	Methanol	40	1 cm	352	450	Sigma Aldrich
Nevirapine	55	DMSO	500	0.2 cm	249	450	Chempacific
Griseofulvin	10	DMF	70	1 cm	330	450	Hawkins
Celecoxib	5	Methanol	22	1 cm	245	450	Attix Pharmaceuticals
Ezetimibe	5	Methanol	10	1 cm	248	450	Attix Pharmaceuticals
Danazol	5	Methanol	10	1 cm	288	450	Euroasia Chemicals

Table S2. Crystalline and amorphous solubility values for model compounds studied

Drug	Crystalline Solubility (µg/mL)	LLPS/GLPS Concentration (µg/mL)
Ritonavir	1.5[1]	28[1]
Atazanavir	1.04[2]	66[2]
Telaprevir	4.6[3]	90[3]
Nifedipine	10[4]	73[4]
Nevirapine	105[5]	874[5]
Griseofulvin	11.5[6]	357[6]
Celecoxib	1.5[7]	22[7]
Ezetimibe	0.97[8]	20[8]
Danazol	0.9[9]	13[9]

Table S3. Physicochemical properties of polymers employed during nucleation induction time experiments.

Polymer abbreviation	Molecular weight (kg/mol)	Tg (C)	Aqueous solubility (mg/mL)
CA-A5a-079	-[a]	63	Not determined
CA-A5b-067	-[a]	6, 89	< 0.5
ECA-0.69	20.0	126	1
ECB-0.69	-[a]	92	11.1
ECD-0.69	60.5	92, 152	11.0

[a]Polymer molecular weight data unavailable due to polymer aggregation and/or polymer-column interaction.

The synthesis method used (cross-metathesis and thiol-Michael addition) was mild and modular. Thus, similar weight distribution is expected. Consequently, the variations in nucleation induction times cannot be attributed to changes in the viscosity of the solutions, or the polymer molecular weight; but to the different substitution patterns.

The molecular weight distribution cannot be precisely measured by gel permeation chromatography (GPS) for some of the carboxyl-containing polymers (CA-A5a-079, CA-A5b-067, and ECB) because they have strong polymer-polymer aggregation, thus affecting the analytical assay. However, the reaction conditions (temperature, solvents, and time) are mild and similar for the carboxyl-containing and the non-carboxylic-containing polymers. As a result, not drastic differences in molecular weight and distribution would be expected between the different cellulose derivatives shown in this article.

References

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