

Supplementary Information

The biorelevant concentration of Tween 80 solution is a simple alternative medium to the simulated fasted state intestinal fluid

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Table S1 Experimental equilibrium solubility data of model drugs in FaSSIF and SDS solutions.

compound	Equilibrium solubility ($\mu\text{g/mL}$)					
	FaSSIF	0.05%SDS	0.07%SDS	0.10%SDS	0.30%SDS	0.50%SDS
Lacidipine	4.56 \pm 0.11	2.43 \pm 0.01	4.24 \pm 0.05	6.87 \pm 0.14	28.5 \pm 0.09	61.0 \pm 0.18
Carbamazepine	192 \pm 3.06	216 \pm 7.09	218 \pm 4.65	310 \pm 5.44	7170 \pm 63.6	9604 \pm 229
Spironolactone	36.8 \pm 0.26	71.2 \pm 1.21	92.8 \pm 39.0	130 \pm 0.46	457 \pm 2.12	598 \pm 6.07
Glimepiride	2.38 \pm 0.03	3.67 \pm 0.02	4.74 \pm 0.05	6.26 \pm 0.08	18.8 \pm 0.03	31.32 \pm 0.06
Indomethacin	788 \pm 3.62	679 \pm 18.1	708 \pm 7.29	791 \pm 12.0	1135 \pm 11.8	1167 \pm 12.5
Carvedilol	76.5 \pm 9.03	12.1 \pm 0.57	9.04 \pm 2.78	8.03 \pm 1.26	173 \pm 1.48	461 \pm 4.99
Itraconazole	0.11 \pm 0.03	3.16 \pm 0.03	5.09 \pm 1.35	8.16 \pm 0.33	26.8 \pm 0.24	32.9 \pm 0.23

Table S2. Experimental equilibrium solubility data of model drugs in FaSSIF and Tween 80 solutions .

Compound	Equilibrium solubility ($\mu\text{g/mL}$)							
	FaSSIF	0.01% Tween 80	0.03% Tween 80	0.05% Tween 80	0.07% Tween 80	0.10% Tween 80	0.20% Tween 80	0.30% Tween 80
Lacidipine	4.56 \pm 0.11	0.43 \pm 0.00	1.37 \pm 0.02	2.28 \pm 0.01	3.19 \pm 0.02	4.59 \pm 0.03	9.21 \pm 0.04	14.1 \pm 0.08
Carbamazepine	192 \pm 3.06	162 \pm 4.56	173 \pm 2.83	173 \pm 11.5	179 \pm 0.76	176 \pm 3.00	191 \pm 1.85	206 \pm 0.93
Spironolactone	36.8 \pm 1.35	28.0 \pm 0.27	29.1 \pm 0.81	30.8 \pm 0.48	32.4 \pm 0.19	36.6 \pm 0.46	41.8 \pm 0.61	51.5 \pm 0.19
Glimepiride	2.38 \pm 0.03	2.07 \pm 0.02	1.96 \pm 0.10	2.02 \pm 0.02	2.48 \pm 0.08	2.31 \pm 0.03	2.54 \pm 0.08	2.96 \pm 0.02
Indomethacin	788 \pm 3.62	593 \pm 34.0	686 \pm 3.10	700 \pm 4.75	758 \pm 6.28	778 \pm 3.23	840 \pm 10.9	925 \pm 28.6
Carvedilol	76.5 \pm 9.0	33.2 \pm 0.31	39.6 \pm 0.25	48.6 \pm 0.70	54.5 \pm 0.11	67.6 \pm 0.24	117 \pm 0.91	167 \pm 1.67
Itraconazole	0.11 \pm 0.03	0.00	0.02 \pm 0.02	0.07 \pm 0.03	0.15 \pm 0.03	0.28 \pm 0.02	0.50 \pm 0.02	0.80 \pm 0.01

Table S3 Composition of blank FaSSIF, FaSSIF, series of Tween 80 and SDS solutions.

Composition	Blank FaSSIF	FaSSIF	SDS	Tween 80
Sodium taurocholate	—	3 mM	—	—
Lecithin	—	0.75 mM	—	—
NaH ₂ PO ₄	1.719 g	1.719 g	1.719 g	1.719 g
NaCl	3.093 g	3.093 g	3.093 g	3.093 g
NaOH	0.174 g	0.174 g	0.174 g	0.174 g
Tween 80	—	—	—	0.05~1.50 g
SDS	—	—	0.25~2.50 g	—
pH	6.5	6.5	6.5	6.5
Deionized water	500 ml	500 ml	500 ml	500 ml

Table S4 The chromatographic condition used in solubility and dissolution experiments.

Drug	Column	Mobile Phase	Flow rate (mL/min)	Detection wavelength(nm)
Lacidipine	ECOSIL® C18, 5 µm, 4.6 × 250 mm (Guangzhou Lubex Biological Technology Co. Ltd., China)	methanol-water (85:15, v/v)	1.0	284
Carbamazepine	Zorbax SB-CN, 5 µm, 4.6 × 250 mm (Agilent Technologies Inc., America)	a 1000 mL mixture of water, methanol, and tetrahydrofuran (85:12:3), add 0.22 mL of formic acid and 0.5 mL of triethylamine	2.0	230
Spironolactone	Thermo C18, 5 µm, 4.6 × 250 mm (Thermo Fisher Scientific.)	Acetonitrile-water (70:30, v/v)	1.0	238
Glimepiride	ECOSIL® C18, 5 µm, 4.6 × 250 mm (Guangzhou Lubex Biological Technology Co. Ltd., China)	methanol-0.01M ammonium dihydrogen phosphate solution (pH 3.5) (70:30, v/v)	1.0	228
Indomethacin	COSMOSIL C18, 5µm, 4.6 × 150 mm (NACALAI TESQUE, INC.)	Acetonitrile-0.1M ethanoicacid solution (50:50, v/v)	1.0	228
Carvedilol	ECOSIL® C18, 5 µm, 4.6 × 250 mm (Guangzhou Lubex Biological Technology Co. Ltd., China)	Acetonitrile-0.02M potassium dihydrogen phosphate solution (pH 3.5) (65:35, v/v)	1.0	241
Itraconazole	Phenomenex C18, 5 µm, 4.6 × 250 mm (Phenomenex Technology Inc.)	Acetonitrile-0.05% Diethanolamine solution (60:40, v/v)	1.0	261