

**Supplementary Table S1** Retention time (RT), MRM transitions, collision energies, internal standards (IS) and ionization mode for the 11 glucuronides and their parent drug.

Analyte	RT (min)	MRM 1 (m/z)	CE 1 (eV)	MRM 2 (m/z)	CE 2 (eV)	Internal standard	MRM 1 (m/z)	Ionization mode
Amitriptyline	7.67	278 > 233	16	278 > 91	24	Amitriptyline-d6	284 > 91	ESI+
Amitriptyline glucuronide	7.39	454 > 233	18	454 > 105	32	Amitriptyline-d6	284 > 91	ESI+
Buprenorphine	7.26	468 > 84	40	468 > 55	40	Amitriptyline-d6	284 > 91	ESI+
Buprenorphin glucuconide	6.39	644 > 468	42	644 > 414	50	Amitriptyline-d6	284 > 91	ESI+
Codeine	3.52	300 > 165	48	300 > 215	24	Codeine-d6	306 > 218	ESI+
Codeine-6-glucuronide	3.32	476 > 300	28	476 > 282	22	Codeine-d6	306 > 218	ESI+
Diphenhydramine	6.98	256 > 167	12	256 > 152	36	Amitriptyline-d6	284 > 91	ESI+
Diphenhydramine glucuronide	6.82	432 > 256	20	432 > 167	24	Amitriptyline-d6	284 > 91	ESI+
Doxylamine	4.67	271 > 182	20	271 > 167	38	Morphine-d6	292 > 201	ESI+
Doxylamine glucuronide	4.15	447 > 226	16	447 > 182	30	Morphine-d6	292 > 201	ESI+
Lorazepam	7.94	323 > 231	29	323 > 229	29	Amitriptyline-d6	284 > 91	ESI+
Lorazepam glucuronide	7.31	496 > 320	12	496 > 274	36	Amitriptyline-d6	284 > 91	ESI+
Morphine	2.31	286 > 201	24	286 > 165	38	Morphine-d6	292 > 201	ESI+
Morphine-3-glucuronide	1.82	462 > 285	26	462 > 152	74	Morphine-d6	292 > 201	ESI+
Morphine-6-glucuronid	2.31	462 > 286	30	462 > 201	40	Morphine-d6	292 > 201	ESI+
Oxymorphone	3.49	302 > 227	28	302 > 198	42	Morphine-d6	292 > 201	ESI+
Oxymorphone-3-glucuronide	1.81	478 > 284	24	478 > 227	42	Morphine-d6	292 > 201	ESI+
Scopolamin	3.87	304 > 138	20	304 > 156	14	Morphine-d6	292 > 201	ESI+
Scopolamine glucuronide	3.71	478 > 175	18	478 > 113	22	Morphine-d6	292 > 201	ESI+
Temazepam	8.23	301 > 177	36	301 > 255	22	Temazepam-d5	306 > 260	ESI+
Temazepam glucuronide	7.51	477 > 301	15	477 > 283	25	Temazepam-d5	306 > 260	ESI+

**Supplementary Table S2** Retention time (RT), MRM transitions, collision energies, internal standards (IS) and ionization mode for the 141 drugs and metabolites included in the stability experiment.

Analyte	RT (min)	MRM 1 (m/z)	CE 1 (eV)	MRM 2 (m/z)	CE 2 (eV)	Ionization mode
10,11-Dihydro-10-hydroxycarbazepine	6.55	255 > 237	8	255 > 194	18	ESI+
6-MAM	4.01	328 > 165	26	328 > 211	34	ESI+
7-Aminoclonazepam	5.06	286 > 222	24	286 > 121	30	ESI+
7-Aminoflunitrazepam	5.86	284 > 135	26	284 > 227	25	ESI+
7-Aminonitrazepam	3.53	252 > 121	20	252 > 94	36	ESI+
9-Hydroxyrisperidone	6.23	427 > 207	27	427 > 110	49	ESI+
Acepromazine	2.04	129 > 75	26	129 > 93	16	ESI+
Alpha-hydroxyalprazolam	7.83	325 > 243	26	325 > 279	34	ESI+
Alpha-hydroxymidazolam	7.12	342 > 16	42			ESI+
Alprazolam	8.10	309 > 281	24	309 > 205	38	ESI+
Amphetamine	3.82	136 > 119	6	136 > 91	14	ESI+
Amisulpride	4.59	370 > 242	26	370 > 196	38	ESI+
Amitriptyline	7.67	278 > 233	16	278 > 91	24	ESI+
Amitriptyline glucuronide	7.39	454 > 233	18	454 > 105	32	ESI+
Amlodipine	7.67	409 > 238	11	409 > 294	13	ESI+
Aripiprazole	7.60	448 > 285	26	448 > 176	31	ESI+
Atropine	4.73	290 > 124	25	290 > 103	50	ESI+
Baclofen	4.05	214 > 116	29	214 > 151	18	ESI+
Benzoylecgonine	5.01	290 > 105	30	290 > 168	18	ESI+
Bromazepam	7.27	318 > 182	30	318 > 209	25	ESI+
Buprenorphine	7.26	468 > 84	40	468 > 55	40	ESI+
Buprenorphine glucuronide	6.39	644 > 468	42	644 > 414	50	ESI+
Carbamazepine	7.59	237 > 194	18	237 > 179	34	ESI+
Carbamazepine-10,11-epoxide	6.86	253 > 180	24	253 > 210	14	ESI+
Carisoprodol	7.91	261 > 55	28	261 > 176	10	ESI+
Cathine	3.03	152 > 134	8	152 > 117	16	ESI+
Cathinone	3.10	150 > 117	18	150 > 105	16	ESI+
Cetirizine	7.80	389 > 201	19	389 > 166	63	ESI+
Chlordiazepoxide	5.03	300 > 227	24	300 > 283	23	ESI+
Chlorpheniramine	6.41	275 > 230	16	275 > 167	36	ESI+
Chlorprothixene	7.98	316 > 231	28	316 > 271	18	ESI+
Cinnarizine	8.24	369 > 167	19	369 > 152	53	ESI+
Citalopram	7.02	325 > 109	26	325 > 262	18	ESI+

Analyte	RT (min)	MRM 1 (m/z)	CE 1 (eV)	MRM 2 (m/z)	CE 2 (eV)	Ionization mode
Clemastine	8.21	344 > 215	18	344 > 130	10	ESI+
Clobazam	8.17	301 > 224	32	301 > 259	20	ESI+
Clomipramine	8.01	315 > 86	18	315 > 58	32	ESI+
Clonazepam	7.76	316 > 270	24	316 > 214	35	ESI+
Clozapine	6.83	327 > 270	22	327 > 192	40	ESI+
Cocaine	5.80	304 > 82	26	304 > 182	18	ESI+
Codeine	3.52	300 > 165	48	300 > 215	24	ESI+
Codeine-6-glucuronide	3.32	476 > 300	28	476 > 282	22	ESI+
Cyclizine	7.07	267 > 167	15	267 > 152	39	ESI+
Demoxepam	7.45	287 > 179	20	287 > 105	20	ESI+
Dextromethorphan	6.95	272 > 171	38	272 > 215	22	ESI+
Dextropropoxyphene	7.62	340 > 58	14	340 > 266	12	ESI+
Diazepam	8.61	285 > 154	26	285 > 193	30	ESI+
Dihydrocodeine	3.49	302 > 199	30	302 > 227	25	ESI+
Diphenhydramine	6.98	256 > 167	12	256 > 152	36	ESI+
Diphenhydramine glucuronide	6.82	432 > 256	20	432 > 167	24	ESI+
Doxylamine	4.67	271 > 182	20	271 > 167	38	ESI+
Doxylamine glucuronide	4.15	447 > 226	16	447 > 182	30	ESI+
Fenazepam	8.40	350 > 206	36	348 > 183	30	ESI+
Fentanyl	6.90	337 > 188	23	337 > 105	41	ESI+
Fexofenadine	7.63	502 > 466	27	502 > 171	37	ESI+
Flunitrazepam	7.95	314 > 239	34	314 > 268	25	ESI+
Fluoxetine	7.74	310 > 44	14	310 > 148	9	ESI+
Flupentixol	8.36	435 > 265	14	435 > 100	9	ESI+
Gabapentin	3.65	172 > 154	16	172 > 137	10	ESI+
GHB	1.35	103 > 57	20	103 > 85	8	ESI-
Haloperidol	7.21	376 > 165	24	376 > 123	36	ESI+
Hydrocodone	3.52	300 > 199	28	300 > 171	38	ESI+
Hydromorphone	2.75	286 > 185	28	286 > 157	39	ESI+
Hydroxizine	7.61	375 > 201	20	375 > 166	60	ESI+
Imipramine	7.56	281 > 86	10	281 > 208	25	ESI+
Ketamine	5.06	238 > 125	24	238 > 179	15	ESI+
Ketobemidone	4.49	248 > 190	28	248 > 70	32	ESI+
Lamotrigine	5.26	256 > 210	25	256 > 171	35	ESI+
Levetiracetam	3.51	171 > 126	12	171 > 69	26	ESI+
Levomepromazine	7.70	329 > 100	18	329 > 242	22	ESI+

Analyte	RT (min)	MRM 1 (m/z)	CE 1 (eV)	MRM 2 (m/z)	CE 2 (eV)	Ionization mode
Lorazepam	7.94	323 > 231	29	323 > 229	29	ESI+
Lorazepam glucuronide	7.31	496 > 320	12	496 > 274	36	ESI+
Lormetazepam	8.36	335 > 289	21	335 > 177	42	ESI+
MDA	4.01	180 > 163	8	180 > 105	20	ESI+
MDMA	4.22	194 > 105	20	194 > 163	12	ESI+
Meclozine	8.51	391 > 201	21	391 > 165	43	ESI+
Melatonin	6.26	233 > 174	15	233 > 159	27	ESI+
Meprobamate	6.48	219 > 158	8	219 > 97	24	ESI+
Metamphetamine	4.09	150 > 119	10	150 > 91	18	ESI+
Methadone	7.74	310 > 105	26	310 > 265	14	ESI+
Methylphenidate	5.62	234 > 84	19	234 > 56	36	ESI+
Metoclopramide	5.03	300 > 227	16	300 > 184	28	ESI+
Metoprolol	5.63	268 > 116	14	268 > 74	16	ESI+
Mianserin	6.98	265 > 58	20	265 > 208	20	ESI+
Midazolam	7.01	326 > 291	26	326 > 223	36	ESI+
Mirtazapine	5.47	266 > 195	26	266 > 72	18	ESI+
Morphine	2.31	286 > 201	24	286 > 165	38	ESI+
Morphine-3-glucuronide	1.82	462 > 285	26	462 > 152	74	ESI+
Morphine-6-glucuronide	1.82	462 > 286	30	462 > 201	40	ESI+
N-Demethylclozapine	6.60	313 > 192	41	313 > 270	25	ESI+
N-Demethyldiazepam	8.20	271 > 140	28	271 > 165	28	ESI+
Nitrazepam	7.67	282 > 236	22	282 > 180	35	ESI+
Norbuprenorphine	6.80	414 > 83	36	414 > 101	44	ESI+
Norclobazam	7.77	287 > 245	22	287 > 210	32	ESI+
Norfentanyl	5.11	233 > 84	16	233 > 150	16	ESI+
Norfluoxetine	4.73	296 > 134	4	296 > 296	2	ESI+
Norketamine	4.94	224 > 125	24	224 > 207	13	ESI+
Nortriptyline	7.67	264 > 233	12	264 > 91	14	ESI+
O-Desmethyltramadol	4.21	250 > 58	12	250 > 232	13	ESI+
O-Desmethylvenlafaxine	5.10	264 > 107	31	264 > 133	24	ESI+
Olanzapine	3.87	313 > 256	22	313 > 84	22	ESI+
Ondansetron	5.99	294 > 170	26	294 > 184	26	ESI+
Oxazepam	7.87	287 > 241	32	287 > 104	22	ESI+
Oxazepam glucuronide	6.98	463 > 287	20	463 > 269	25	ESI+
Oxcarbazepine	7.06	253 > 208	20	253 > 180	28	ESI+
Oxycodone	3.83	316 > 241	30	316 > 298	18	ESI+
Oxymorphone	3.49	302 > 227	28	302 > 198	42	ESI+
Oxymorphone-3-glucuronide	1.81	478 > 284	24	478 > 227	42	ESI+

Analyte	RT (min)	MRM 1 (m/z)	CE 1 (eV)	MRM 2 (m/z)	CE 2 (eV)	Ionization mode
Paroxetine	7.38	330 > 192	24	330 > 70	28	ESI+
Pentobarbital	7.54	225 > 182	14	225 > 42	20	ESI-
Perphenazine	8.02	404 > 171	22	404 > 143	28	ESI+
Pethidine	6.03	248 > 220	20	248 > 174	16	ESI+
Phenobarbital	6.53	231 > 188	10	231 > 42	14	ESI-
Phenytoin	7.41	253 > 182	16	253 > 104	30	ESI+
Pregabalin	3.59	160 > 55	18	160 > 97	12	ESI+
Primidone	5.45	219 > 91	28	219 > 162	12	ESI+
Promethazine	7.34	285 > 198	24	285 > 240	15	ESI+
Propranolol	6.80	260 > 116	17	260 > 56	29	ESI+
Quetiapine	7.02	384 > 221	38	384 > 253	22	ESI+
Reboxetine	7.25	314 > 176	11	314 > 91	31	ESI+
Risperidone	6.47	411 > 82	26	411 > 191	58	ESI+
Scopolamine	3.87	304 > 138	20	304 > 156	14	ESI+
Scopolamine glucuronide	3.71	478 > 175	18	478 > 113	22	ESI-
Sertraline	7.91	306 > 158	12	308 > 277	24	ESI+
Sulpirid	3.15	342 > 214	32	342 > 112	24	ESI+
Suvorexant	9.46	450 > 186	22	450 > 104	62	ESI+
Tapentadol	5.74	222 > 121	20	222 > 107	24	ESI+
Temazepam	8.23	301 > 177	36	301 > 255	22	ESI+
Temazepam glucuronide	7.51	477 > 301	15	477 > 283	25	ESI+
Thiopental	8.09	241 > 57	16	241 > 100	14	ESI-
Topiramate	6.99	340 > 264	6	340 > 184	12	ESI+
Tramadol	5.60	264 > 58	12	264 > 246	10	ESI+
Trazodone	6.51	372 > 148	35	372 > 176	25	ESI+
Triazolam	8.12	343 > 308	24	343 > 239	40	ESI+
Venlafaxine	6.59	278 > 121	28	278 > 91	40	ESI+
Zaleplon	7.50	306 > 236	26	306 > 264	20	ESI+
Ziprasidone	6.92	413 > 159	40	413 > 194	26	ESI+
Zolpidem	6.29	308 > 235	36	308 > 92	52	ESI+
Zonisamide	5.16	213 > 132	14	213 > 76	28	ESI+
Zopiclone	5.36	389 > 245	16	389 > 217	34	ESI+
Zuclopenthixol	8.14	401 > 231	41	401 > 128	25	ESI+

**Supplementary Table S3** Analyte recovery (%) for the 11 glucuronides and their parent drug after incubation with each enzyme at 20°C for the five incubation periods.

ANALYTE	20°C														
	MIX					B-One					BGT				
	5 min	10 min	60 min	18 h	24 h	5 min	10 min	60 min	18 h	24 h	5 min	10 min	60 min	18 h	24 h
AMITRIPTYLINE	1	1	1	6	8	98	99	100	100	98	28	72	83	80	84
AMITRIPTYLINE GLUCURONIDE	55	52	51	47	44	1	1	1	0	0	59	8	0	0	0
BUPRENORPHINE	5	8	27	43	43	60	61	57	65	56	42	72	72	79	75
BUPRENORPHINE GLUCUCONIDE	38	38	16	0	0	0	0	0	0	0	29	2	0	0	0
CODEINE	1	1	1	10	11	93	103	119	126	117	4	23	64	99	88
CODEINE-6-GLUCURONIDE	103	85	83	81	74	14	9	0	0	0	87	77	30	0	0
DIPHENHYDRAMINE	1	2	2	11	13	103	96	97	94	101	44	100	100	97	100
DIPHENHYDRAMINE GLUCURONIDE	49	47	46	38	36	1	1	1	0	0	61	9	0	0	0
DOXYLAMINE	2	2	2	6	7	36	35	39	38	39	7	29	38	40	40
DOXYLAMINE GLUCURONIDE	83	75	80	70	73	1	1	0	0	0	72	21	0	0	0
LORAZEPAM	7	10	31	46	49	59	63	61	55	60	41	79	78	79	78
LORAZEPAM GLUCURONIDE	50	44	19	1	2	2	2	2	2	2	47	5	2	2	2
MORPHINE	3	3	11	57	63	70	73	89	92	92	6	32	59	83	82
MORPHINE-3-GLUCURONIDE	102	87	73	4	2	0	0	0	0	0	78	40	1	0	0
MORPHINE-6-GLUCURONIDE	71	61	65	38	34	34	29	4	0	0	83	86	62	1	0
OXYMORPHONE	1	1	2	13	14	14	15	16	16	16	1	7	20	23	23
OXYMORPHONE-3-GLUCURONIDE	81	70	68	10	6	4	2	0	0	0	89	70	7	0	0
SCOPOLAMINE	4	5	19	54	56	69	70	70	71	71	14	68	91	94	91
SCOPOLAMINE GLUCURONIDE	96	87	69	0	0	1	1	1	1	0	79	27	0	0	0
TEMAZEPAM	14	17	54	99	99	110	112	110	111	114	26	89	107	106	107
TEMAZEPAM GLUCURONIDE	131	116	81	0	0	0	0	0	0	0	69	35	0	0	0

**Supplementary Table S4** Analyte recovery (%) for the 11 glucuronides and their parent drug after incubation with each enzyme at 40°C for the five incubation periods.

ANALYTE	40°C														
	MIX					B-One					BGT				
	5 min	10 min	60 min	18 h	24 h	5 min	10 min	60 min	18 h	24 h	5 min	10 min	60 min	18 h	24 h
AMITRIPTYLINE	1	1	1	2	32	38	99	104	98	96	68	72	75	76	77
AMITRIPTYLINE GLUCURONIDE	48	48	45	23	21	1	1	1	0	0	12	3	0	0	0
BUPRENORPHINE	11	24	43	39	40	56	69	62	62	54	67	66	65	70	66
BUPRENORPHINE GLUCUCONIDE	34	24	1	0	0	0	0	0	0	0	2	0	0	0	0
CODEINE	1	1	3	47	51	91	104	109	109	117	18	27	79	87	86
CODEINE-6-GLUCURONIDE	89	74	66	33	24	12	5	0	0	0	72	66	3	0	0
DIPHENHYDRAMINE	1	2	4	37	41	94	105	102	85	90	92	87	99	87	89
DIPHENHYDRAMINE GLUCURONIDE	45	46	41	14	10	1	1	1	0	0	14	4	0	0	0
DOXYLAMINE	2	2	2	24	27	36	36	39	39	41	23	29	35	38	38
DOXYLAMINE GLUCURONIDE	79	79	75	46	39	1	1	0	0	0	31	13	1	0	0
LORAZEPAM	11	22	41	40	41	58	59	50	49	46	79	72	79	65	64
LORAZEPAM GLUCURONIDE	37	24	1	1	1	2	2	1	2	2	5	1	2	1	2
MORPHINE	4	9	31	81	84	70	77	98	91	91	26	34	71	80	78
MORPHINE-3-GLUCURONIDE	77	62	31	0	0	0	0	0	0	0	46	24	0	0	0
MORPHINE-6-GLUCURONIDE	57	55	49	2	1	34	23	0	0	0	84	75	21	0	0
OXYMORPHONE	1	2	7	15	15	15	16	14	17	17	5	8	21	22	21
OXYMORPHONE-3-GLUCURONIDE	66	61	33	0	0	4	1	0	0	0	73	55	0	0	0
SCOPOLAMINE	6	13	37	55	55	66	68	56	73	73	52	68	86	89	85
SCOPOLAMINE GLUCURONIDE	83	63	27	0	0	1	1	1	0	0	40	18	0	0	0
TEMAZEPAM	21	39	96	100	94	111	113	121	112	113	76	91	99	104	101
TEMAZEPAM GLUCURONIDE	115	86	0	0	0	0	0	0	0	0	43	30	0	0	0

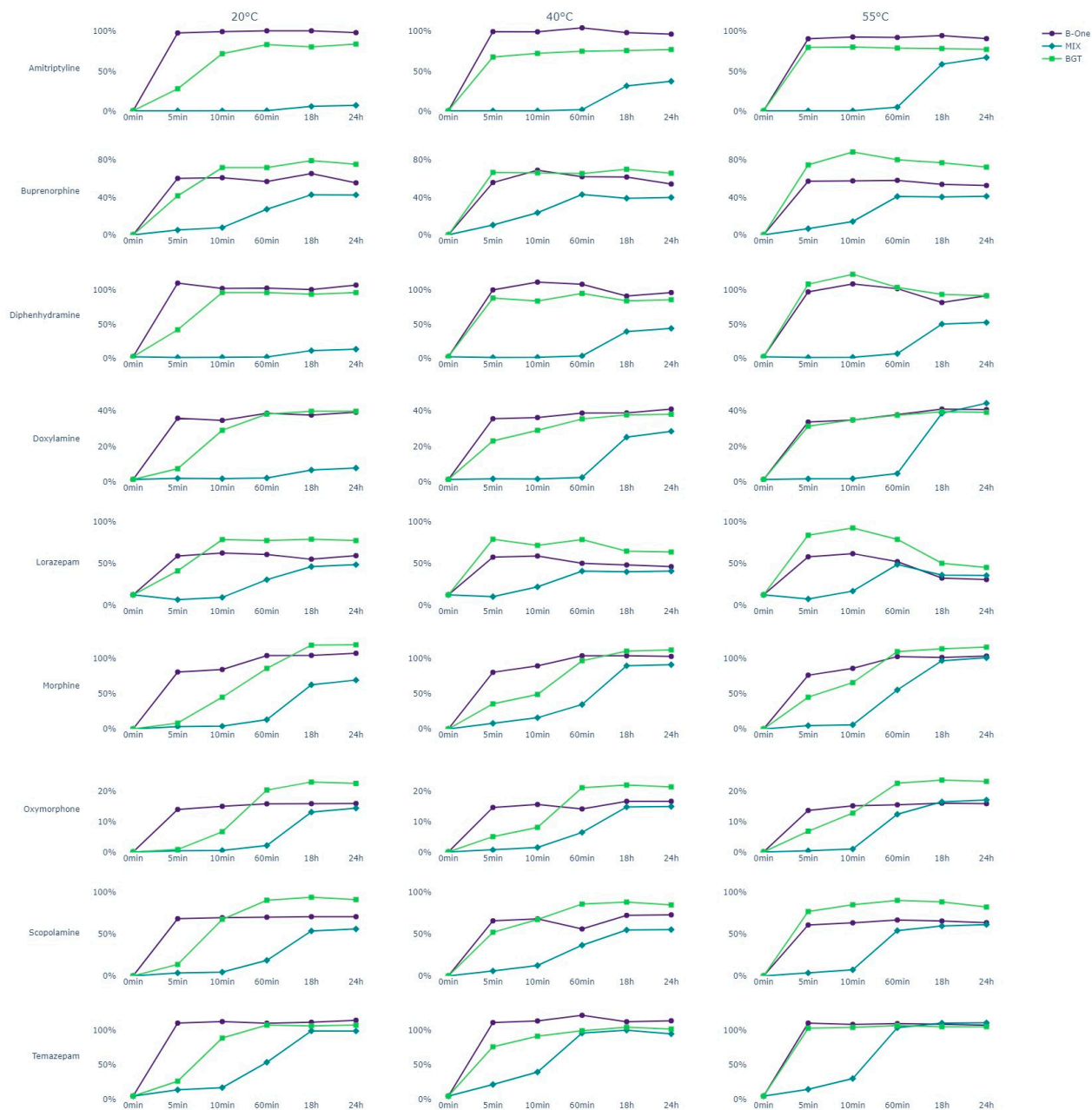
**Supplementary Table S5** Analyte recovery (%) for the 11 glucuronides and their parent drug after incubation with each enzyme at 55°C for the five incubation periods.

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**Supplementary Figure S1** Cleavage (%) of 10 glucuronides when enzymatically hydrolyzed with either MIX, B-One or BGT at 20°C, 40°C and 55°C for 24 hours. The x-axis is in categorical order based on the five incubation periods.



**Supplementary Figure S2** Analyte recovery (%) of 9 parent drugs when their corresponding glucuronide is enzymatically hydrolyzed with either MIX, B-One or BGT at 20°C, 40°C and 55°C for 24 hours. The x-axis is in categorical order based on the five incubation periods.