

## Drug Metabolism and Disposition

Minor compensatory changes in SAGE Mdr1a (P-gp), Bcrp, and Mrp2 knockout rats do not detract from their utility in the study of transporter-mediated pharmacokinetics

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Supplemental Table 1. Mean change in expression of ADME-relevant genes (136 probesets representing 112 unique genes) in SAGE knockout rats relative to wild-type controls

Fold-change >2X induced FDR <0.2 p-value <0.05 Signal change >250		Fold-change >2X repressed FDR <0.2 p-value <0.05 Signal change >250																					
probeset	Gene Symbol	Bcrp-Brain	Bcrp-Duodenum	Bcrp-Ileum	Bcrp-Jejunum	Bcrp-Kidney_corte	Bcrp-Kidney_medu	Mdr1a-Brain	Mdr1a-Duodenum	Mdr1a-Ileum	Mdr1a-Jejunum	Mdr1a-Kidney_corte	Mdr1a-Kidney_medu	Mdr1a-Liver	Mrp2-Brain	Mrp2-Duodenum	Mrp2-Ileum	Mrp2-Jejunum	Mrp2-Kidney_corte	Mrp2-Kidney_medu	Mrp2-Liver		
		x	Ila	Bcrp-Liver								x							x				
1370464_at	Abcb1a	1.2	1.2	-1.2	-1.2	-1.1	-1.4	-1.5	-6.0	-4.1	-6.4	-4.1	-27.1	-13.6	-11.5	1.1	-1.3	-1.5	-1.2	1.3	-1.1	-1.0	
1370465_at	Abcb1a	-1.0	1.1	-2.3	-1.3	-1.2	-1.3	-2.1	-15.0	-14.7	-17.3	-12.4	-19.1	-8.8	-4.4	1.3	1.1	-2.7	-1.5	1.2	-1.3	1.8	
1370583_s_at	Abcb1b	1.0	1.4	-1.6	1.1	-1.0	-1.3	-1.1	-2.7	-3.9	-8.3	-5.4	-2.5	-2.0	-2.5	-1.2	-1.3	-2.9	-1.6	-1.2	-1.3	1.4	
1368497_at	Abcc2	1.0	-1.1	-1.6	-2.7	-1.1	-1.3	1.1	1.1	1.3	1.0	1.1	-1.1	-1.5	1.1	-1.0	-1.0	-2.5	-1.3	-2.1	-1.4	-5.1	
1379402_at	Abcc4	-1.1	-1.3	1.0	1.1	1.1	1.1	1.0	-1.0	1.1	-1.1	1.1	1.1	1.2	1.4	1.1	-1.1	1.1	1.2	1.5	1.2	1.4	
1368365_at	Aldh3a2	1.0	-1.3	-1.2	-1.3	1.1	1.3	-1.0	1.1	-1.3	-1.2	-1.3	1.1	1.7	-1.0	1.0	-1.5	-1.2	-1.4	1.1	1.4	-1.0	
1369244_at	Arnt	-3.0	-1.5	1.0	1.3	2.2	1.4	2.4	-1.1	1.5	2.0	1.8	2.9	1.5	1.1	-1.9	-1.1	1.2	1.4	2.2	1.6	2.0	
1387508_at	Baat	1.8	-1.4	-1.4	-1.1	1.5	-1.1	-1.0	2.1	-1.8	1.2	-1.5	3.5	-1.2	-1.1	4.2	-1.6	-1.6	-2.0	1.9	-2.0	-1.1	
1368905_at	Ces2c	1.6	2.6	2.7	2.0	-1.0	1.0	-1.1	1.0	3.8	3.8	3.3	-1.0	1.3	-1.2	1.3	1.0	-1.2	-1.2	1.1	-1.0	1.1	
1368826_at	Comt	2.4	5.2	2.8	2.8	6.1	4.2	3.1	-1.2	1.5	-1.1	-1.0	-1.1	-1.1	-1.2	-1.0	1.7	1.1	1.2	1.5	1.1	1.2	
1368468_at	Cyp11a1	-1.2	-1.3	-1.2	-1.1	-1.9	-1.3	-1.5	-1.1	-1.5	-1.2	-1.2	-2.3	-1.4	1.1	1.1	-1.2	-1.1	1.0	-2.4	-1.2	-1.1	
1387305_s_at	CYP11B1	1.4	2.1	-1.1	-1.5	-2.4	2.2	1.7	1.4	-1.7	-2.0	-1.7	-1.4	2.6	1.9	-1.7	1.1	1.3	-1.4	1.9	1.9		
1370269_at	Cyp1a1	-1.6	-1.8	1.1	-2.1	-2.9	-5.8	-1.9	-1.4	-1.5	-1.2	-1.8	-15.8	-13.2	-1.0	-1.3	-2.0	-6.9	-1.8	-13.1	-9.8	-1.0	
1369264_at	Cyp21a1	1.4	-1.1	-3.5	-2.1	-2.1	-1.4	-1.6	-1.5	-2.2	-5.2	-2.5	-2.0	-2.3	1.1	1.9	-1.6	-2.8	-1.1	-1.3	-2.4	-1.2	
1376667_at	Cyp26b1	1.2	-1.2	1.0	1.0	-1.0	-1.0	-2.4	1.0	-1.2	1.3	1.1	1.0	3.3	1.4	1.0	-1.6	-1.5	-2.3	-2.4	1.2	-2.1	
1387511_at	Cyp2a1	-1.4	1.0	-1.2	-1.0	-1.1	-1.1	-1.3	1.1	-1.0	-1.5	-1.3	-1.8	-1.7	1.2	1.2	1.1	1.1	-1.6	-1.1	2.1		
1371076_at	CYP2B6	-1.2	1.2	-3.1	1.1	-1.5	-1.7	-2.7	-1.1	-1.0	-1.1	-1.1	-1.4	-1.4	-2.1	1.1	-1.0	-4.6	1.3	-1.3	-1.1	-3.1	
1387328_at	Cyp2c11	-1.1	-1.1	-1.4	-1.4	-2.2	-2.7	-1.3	1.1	-1.1	-1.2	-1.3	-5.7	-9.0	-1.2	1.4	-1.1	-1.2	1.0	-13.6	-12.2	-1.4	
1368155_at	Cyp2c12	2.6	3.7	2.5	2.8	2.9	-1.6	4.2	2.4	2.8	2.2	1.2	-1.4	-1.1	3.0	1.3	4.9	1.2	1.1	1.3	1.2	-1.8	
1367988_at	Cyp2c23	1.2	-1.1	-1.2	-1.5	-1.2	-1.4	-1.2	1.5	-1.9	-2.0	-1.7	-1.1	-2.4	-1.1	2.4	-2.1	-2.9	-2.2	-1.3	-1.8	-1.1	
1367917_at	Cyp2d2	-1.2	-1.1	-1.7	-2.5	-1.1	-1.3	-1.2	-1.9	-1.8	-2.3	-1.3	-2.4	-2.4	-1.2	2.0	-1.6	-1.6	-1.8	-1.4	-2.4	-1.3	
1367871_at	Cyp2e1	-1.1	1.3	-1.0	-1.2	-1.2	-2.5	-1.7	1.0	1.6	1.1	1.0	1.0	-1.8	-1.3	1.4	1.5	1.2	1.2	-1.3	-2.1	-1.3	
1398307_at	Cyp3a18	-1.6	-1.2	-1.3	-1.4	1.6	-2.0	-1.2	-2.2	-1.3	1.0	-1.1	1.3	1.2	-1.1	-1.2	-1.2	-1.1	1.4	-1.3	-2.4		
1368934_at	CYP4A1	-1.2	-1.2	-1.1	-1.4	-1.1	-1.8	-1.2	1.1	-1.4	1.0	-1.4	-1.2	-3.5	1.0	1.4	-1.7	-1.1	-1.7	-5.1	-1.3		
1368607_at	Cyp4a8	-1.1	1.7	-1.1	1.3	-1.1	-1.3	1.4	-1.3	1.3	-1.3	-1.1	-2.4	-1.5	1.1	2.0	-1.0	1.5	-1.1	-1.4	1.1		
1393894_at	Cyp4a8	-1.1	-1.2	-1.1	-1.4	1.1	-1.5	2.2	-1.1	-1.2	-1.1	-1.1	-1.1	-3.1	-2.0	1.1	-1.2	1.1	1.1	-1.6	-1.0		
1370399_at	Cyp4b1	-1.6	1.0	-1.7	-1.2	1.1	1.0	-1.1	-1.1	1.2	-1.5	1.0	-1.1	1.4	1.0	1.2	1.3	-1.9	1.1	1.0	1.6	1.1	
1368467_at	Cyp4f1	-1.0	-1.1	-2.5	-1.4	1.1	-1.3	-1.1	-1.1	-1.2	-1.8	-1.2	1.1	-2.1	-1.1	1.1	-1.3	-1.6	-1.2	1.2	-2.1	-1.1	
1388055_at	Cyp4f5	-1.3	-1.2	-1.1	-1.2	1.0	1.1	-1.8	-1.2	-1.4	-1.2	1.1	1.1	1.8	1.3	-1.5	-1.8	-1.2	-1.4	1.5	-1.3		
1370889_at	Cyp4v3	-2.1	-1.4	-1.9	-1.2	-1.4	-1.6	-2.3	-1.3	-1.0	-1.2	1.0	-1.1	1.3	-1.1	-1.7	-1.2	-1.3	-1.1	1.1	-2.3	-2.5	
1387053_at	Fmo1	-1.5	-1.4	-1.0	-2.1	1.1	-1.2	-1.7	-1.2	-1.3	-1.2	-1.3	-1.0	-2.1	-1.9	-1.1	-1.0	-1.4	-1.2	-2.3	-1.7	1.2	
1377635_at	Fmo2	-1.1	1.2	-1.2	-1.2	1.3	1.1	-1.4	-1.0	1.1	-1.2	-1.1	-1.1	-1.0	-1.0	1.1	1.3	1.0	1.3	1.2	1.7	-1.1	
1387567_at	Slco1a1	-1.1	1.0	-1.6	-1.1	-1.1	-1.2	1.1	-1.5	-2.3	-1.9	-1.4	-1.5	-2.3	-1.0	1.5	-1.9	-1.8	-1.3				

probeset	Gene Symbol	Bcrp-				Bcrp-				Mdr1a-				Mdr1a-				Mrp2-				Mrp2-					
		Bcrp-Brain	Bcrp-Duodenum	Bcrp-Ileum	Bcrp-Jejunum	x	Ila	Bcrp-Liver	Mdr1a-Brain	Mdr1a-Duodenum	Mdr1a-Ileum	Mdr1a-Jejunum	x	Mdr1a-Kidney_corte	Mdr1a-Kidney_med	Mdr1a-Liver	Mrp2-Brain	Mrp2-Duodenum	Mrp2-Ileum	Mrp2-Jejunum	x	Mrp2-Kidney_corte	Mrp2-Kidney_med	Ila	Mrp2-Liver		
1378551_at	Cyp20a1	-1.1	1.1	1.1	1.2	1.0	-1.2	-1.1	-1.0	1.0	-1.2	-1.1	-1.0	-1.2	-1.1	-1.3	-1.1	1.0	-1.0	1.0	-1.0	1.0	-1.1	-1.3	-1.3		
1387583_at	Cyp26a1	-1.4	-1.2	-1.1	-1.2	-1.3	-1.3	-1.3	-1.2	-1.3	-1.2	-1.1	-1.2	-1.2	-1.3	-1.1	-1.0	1.1	-1.3	-1.2	-1.2	-1.3	-1.2	-1.3	1.2		
1384392_at	Cyp26b1	1.1	1.1	-1.4	-1.3	-1.6	-1.1	-2.1	-1.0	-1.3	-1.4	-1.2	-1.2	-1.3	-1.4	-1.2	-1.1	-1.3	-1.4	-1.3	-1.2	-1.1	-1.2	-1.1	-1.6		
1387914_at	Cyp27a1	-1.2	-1.1	-1.4	-1.5	1.2	1.0	-1.3	1.0	-1.1	-1.5	-1.3	-1.1	-1.3	-1.2	-1.2	1.2	1.2	-1.2	1.0	-1.5	-1.1	1.2	1.2	-1.1	1.1	
1368636_at	Cyp27b1	-1.1	1.2	1.0	-1.2	-1.0	-1.5	-1.2	-1.0	1.0	-1.3	-1.1	1.1	-1.4	1.1	-1.0	1.1	1.1	1.3	1.1	1.1	1.3	1.0	1.0	1.1	1.1	
1369275_s_at	CYP2a1	1.2	-1.3	1.1	-1.1	-1.1	-1.2	-1.2	-1.2	1.1	1.4	1.1	-1.0	1.1	-1.1	1.1	-1.1	1.6	-1.3	1.4	1.1	-1.3	1.0	1.0	1.0	1.0	
1369424_at	Cyp2a2	-1.6	1.2	1.1	1.8	-1.4	-1.5	-1.2	-1.3	-1.1	1.4	-1.9	-1.6	-1.5	-1.2	-1.0	1.4	1.5	-1.0	-2.0	-1.2	-1.1	-1.2	-1.1	-1.1	-1.1	
1369136_at	Cyp2a3	-1.5	1.1	-1.0	-1.2	-1.3	-1.4	-1.3	-1.6	-1.4	-1.4	-1.3	-1.3	-1.2	-1.2	-1.5	1.3	-1.1	-1.2	-1.0	1.0	1.1	1.1	1.0	1.0	1.0	
1387722_at	Cyp2b12	1.9	1.7	1.2	2.2	1.4	-1.2	-1.3	1.2	2.0	-3.1	-2.3	-1.4	-1.1	1.3	1.4	1.6	-1.9	-1.2	-1.0	-1.5	-1.2	-1.0	-1.5	1.9	1.9	
1387993_at	Cyp2b21	1.0	3.6	1.4	-1.3	-1.4	1.3	-1.0	1.1	1.8	1.2	-1.3	-1.9	1.0	-1.2	1.3	3.6	1.0	-1.2	1.0	1.2	1.3	1.0	1.2	1.3	1.3	
1370475_at	Cyp2b3	-1.3	-1.3	-1.1	1.0	-1.1	-1.2	-1.2	1.0	-1.6	-1.3	-1.3	-1.0	-1.1	-1.0	-1.1	1.3	-1.1	1.1	1.0	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	
1370495_s_at	Cyp2c13	1.1	1.3	1.4	1.2	1.3	1.2	-1.3	1.4	-1.1	1.1	-1.0	-1.1	-1.0	-1.1	-1.0	2.4	1.1	1.0	1.0	-1.0	1.2	1.2	1.2	1.1	1.1	
1370580_a_at	CYP2C18	-1.3	-1.3	-1.2	-1.7	-2.2	-1.4	-1.4	1.4	1.1	-1.9	-1.3	-1.6	-2.1	-1.3	7.0	1.4	-1.4	1.3	-1.3	-3.4	-1.1	-1.1	-1.1	-1.1	-1.1	
1387949_at	Cyp2c22	1.5	2.0	-1.3	1.4	1.0	-1.3	-1.1	1.3	1.7	-1.8	-1.1	-1.5	-1.0	-1.0	2.7	2.1	-1.1	1.3	1.2	1.1	-1.2	1.1	1.1	-1.2	-1.2	
1396155_at	Cyp2c29	-1.3	-1.0	1.2	-1.1	-1.3	-1.1	1.6	-1.6	-1.8	1.2	-1.2	-1.1	-1.3	-1.2	-1.2	1.4	-1.9	-1.2	1.4	-1.2	1.4	2.9	2.9	2.9	2.9	
1370241_at	Cyp2c7	1.1	1.1	-1.1	-1.1	-1.4	-1.3	-1.2	1.6	1.2	-1.1	-1.0	-1.8	-1.5	-1.1	5.7	1.2	-1.0	1.2	-1.5	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	
1370496_at	Cyp2d3	-1.1	-1.4	-1.0	-1.9	1.6	-1.1	1.3	-1.9	1.0	-1.3	1.4	-2.1	-1.0	4.1	-1.5	-1.1	-1.6	2.1	-1.1	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
1387913_at	Cyp2d4	-1.3	-1.4	-1.7	-2.0	-1.5	-1.4	1.2	-1.2	-1.4	-1.3	-1.5	-1.7	-1.9	2.2	-1.2	-1.6	-1.7	-1.5	-1.7	-1.5	-1.7	-1.6	-1.6	-1.6	-1.6	
1370329_at	Cyp2d4	-1.1	-1.1	-1.4	-1.1	-1.0	1.3	1.0	-1.2	-1.1	-1.4	1.0	-1.4	-1.1	-1.2	-1.1	-1.1	-1.4	1.0	-1.2	-1.1	-1.1	-1.5	-1.5	-1.5	-1.5	
1368608_at	Cyp2f4	-2.0	-1.8	-2.0	-1.8	-1.2	-1.2	1.2	-2.8	-1.2	-3.1	-2.1	-1.0	-1.7	-1.2	1.1	-1.3	-2.0	1.5	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	-1.1	
1371142_at	Cyp2g1	-2.2	-1.4	-2.3	-1.4	-1.2	-1.7	-1.2	-1.7	-1.5	-1.6	-1.3	-1.3	-1.2	-1.1	-1.6	-1.4	-1.2	-1.0	-1.2	-1.0	-1.1	-1.1	-1.1	-1.1	-1.1	
1396327_at	Cyp2j10	1.1	-1.3	-1.3	-1.6	-1.2	-1.2	-1.1	1.3	-1.3	-1.3	-1.2	-1.3	-1.2	-1.1	1.2	-1.0	1.0	1.0	1.0	1.2	1.1	1.1	1.1	1.1	1.1	
1370706_a_at	Cyp2j3	-1.2	-1.1	-1.4	-1.0	-1.1	-1.2	1.0	-1.2	-1.5	-1.5	-1.5	-1.4	-1.4	-1.4	-1.0	-1.1	-1.3	-1.5	-1.7	-1.1	1.1	-1.2	-1.2	-1.2	-1.2	
1387296_at	Cyp2j4	-1.6	-1.1	-1.5	-1.7	-1.5	-1.4	-1.6	-1.3	-1.4	-1.2	-1.5	-1.4	-1.4	-1.4	-1.5	-1.1	-1.2	-1.3	-1.2	-1.2	-1.3	-1.2	-1.2	-1.2	-1.2	
1390282_at	Cyp2s1	-1.1	1.1	2.0	-1.3	-1.0	-1.0	1.0	-1.2	-1.2	1.3	-1.8	-1.1	-1.4	-1.5	1.5	-1.0	-1.5	1.7	-1.4	-1.1	1.0	1.2	1.2	1.2	1.2	
1368265_at	Cyp2t1	-1.0	1.0	-1.4	1.1	1.1	-1.2	-1.0	1.1	1.2	1.3	1.4	1.2	-1.1	1.1	1.3	1.2	1.1	1.1	1.2	1.1	1.1	-1.1	1.0	1.0	1.0	
1398710_at	Cyp2u1	1.4	1.0	-1.1	-1.3	1.1	1.1	-1.2	1.2	-1.3	-1.1	-1.1	-1.0	1.2	1.2	-1.5	1.3	-1.2	1.0	1.1	1.1	1.1	-2.0	1.1	1.1	-2.0	
1385165_at	Cyp39a1	1.0	-1.0	-1.2	1.1	-1.0	-1.1	1.0	-1.1	-1.2	-1.1	-1.2	-1.1	-1.2	-1.1	1.0	1.1	1.2	-1.0	1.3	1.0	1.1	1.2	1.2	1.2	1.2	
1387118_at	Cyp3a23/3a1	-1.3	2.2	-1.0	-1.9	1.0	1.2	-1.1	1.2	1.0	-1.4	-1.0	1.1	-1.5	1.1	1.0	1.6	-1.2	1.3	1.4	1.1	-1.0	-1.0	-1.0	-1.0	-1.0	
1394128_at	Cyp3a1	1.2	-1.7	1.6	-1.7	-2.9	3.6	-1.3	-1.1	-2.7	-2.6	-1.2															

probeset	Gene Symbol	Bcrp-				Bcrp-				Mdr1a-				Mdr1a-				Mrp2-				Mrp2-			
		Bcrp-Brain	Bcrp-Duodenum	Bcrp-Ileum	Bcrp-Jejunum	x	Ila	Bcrp-Liver	Brain	Mdr1a-Duodenum	Mdr1a-Ileum	Mdr1a-Jejunum	x	Kidney_corte	Kidney_med	Mdr1a-Liver	Mrp2-Brain	Mrp2-Duodenum	Mrp2-Ileum	Mrp2-Jejunum	x	Kidney_corte	Kidney_med	Mrp2-Liver	
1385473_x_at	Tomm40b	1.0	-1.6	-1.8	-1.1	1.3	-1.2	-1.0	-1.1	-1.7	-1.6	-1.2	-1.4	-1.1	1.7	-1.0	-1.3	-1.1	-1.7	1.4	-1.1	1.3	-1.2	2.8	
1393861_at	Tomm40b	-1.2	-1.2	1.4	-1.5	1.0	-1.1	1.8	-1.0	-1.1	2.7	-2.6	-2.0	-1.2	2.5	-1.2	1.6	1.2	-1.7	1.1	-1.1	1.1	-1.1		
1370613_s_at	Ugt1a7c	2.0	-1.2	-1.4	-1.2	1.4	1.1	-1.3	1.0	-1.1	-1.3	-1.2	1.1	-1.2	-1.3	1.1	-1.2	-1.4	-1.1	-1.0	-1.4	-1.3			
1387825_at	Ugt2b	1.2	-1.3	2.4	-7.7	3.8	1.6	-1.3	1.9	-4.6	1.7	-6.7	1.8	-3.6	-1.1	9.7	-1.7	-1.1	-1.9	2.0	-3.9	-1.1			
1385247_at	Ugt2b	-4.4	1.7	2.1	3.6	-1.5	-1.2	-1.2	-3.7	-1.9	1.6	-1.1	-2.0	-1.1	1.2	-2.9	1.4	2.9	-1.4	-3.6	1.1	-1.1			

Supplemental Figure 1. Mdr1a (A), Bcrp (B), and Mrp2 (C) mRNA signal in tissues from relevant SAGE knockout rats (empty bars) and wild-type controls (full bars). Mean  $\pm$  S.D., n = 3-4.

