

Figure S1



Figure S2

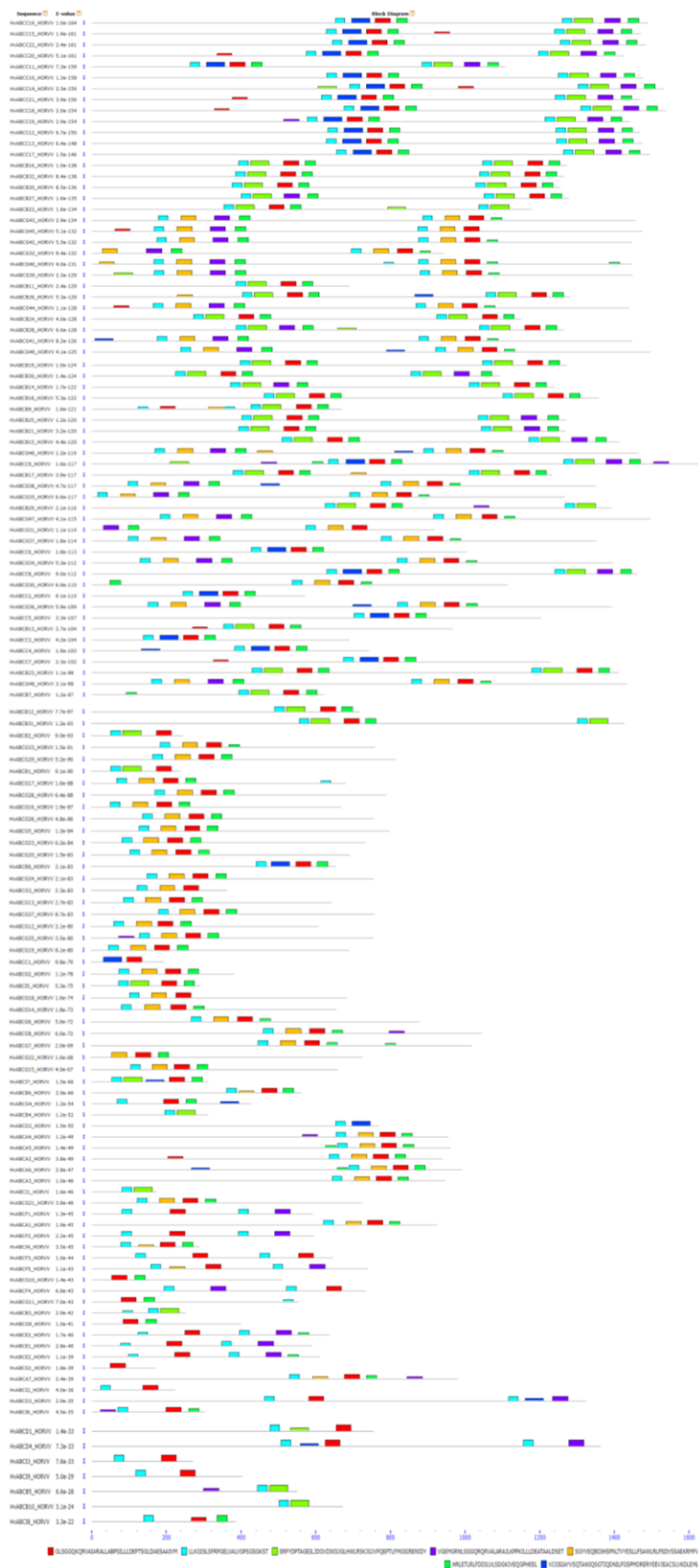


Table S1 Physicochemical properties, domain and subcellular localization of ABC proteins in barley

Gene name	Protein name	Type of domain	No.of exons	ORF(aa)	MW(k D)	PI	Subcellular localization
<i>HvABCA</i> 1	A0A287G9Z 1	NBD	18	923	102687.69	9.05	Plasma membrane
<i>HvABCA</i> 2	A0A287TZ0 7	TMD2-NBD	17	939	104338.35	7.49	Plasma membrane
<i>HvABCA</i> 3	M0WZM9	TMD2-NBD	18	946	105752.77	8.22	Plasma membrane
<i>HvABCA</i> 4	A0A287G9Z 0	TMD2-NBD	18	954	105599.25	8.75	Plasma membrane
<i>HvABCA</i> 5	A0A287Q0T9	TMD2-NBD	18	960	106384.45	8.96	Plasma membrane
<i>HvABCA</i> 6	A0A287X621	TMD2-NBD	18	991	110383.64	8.98	Plasma membrane
<i>HvABCA</i> 7	A0A287G A22	TMD2-NBD	15	979	108695.01	7.84	Endoplasm. retic.
<i>HvABCB</i> 1	A0A287WG F7	NBD	12	239	26033.42	5.53	Vacuolar
<i>HvABCB</i> 2	A0A287HF4 7	NBD	14	245	27028.96	6.71	Vacuolar
<i>HvABCB</i> 3	A0A287LPQ 3	NBD	10	252	27438.15	9.67	Vacuolar
<i>HvABCB</i> 4	A0A287LD X6	TMD-NBD	6	312	33689.02	6.76	Plasma membrane
<i>HvABCB</i> 5	A0A287I NY9	TMD-NBD	2	551	—	—	Plasma membrane
<i>HvABCB</i> 6	A0A287GY7 8	TMD-NBD	19	561	61902.17	7.2	Mitochondrial

<i>HvABCB</i>	A0A287MA	TMD-NBD	18	622	68825.	8.3	Chloroplast
7	M0				58		
<i>HvABCB</i>	A0A287IF94	TMD-NBD	10	653	70255.	9.3	Chloroplast
8					49	3	
<i>HvABCB</i>	A0A287SDQ	TMD-NBD	17	670	72073.	9.0	Vacuolar
9	1				96	6	
<i>HvABCB</i>	A0A287P	TMD-NBD	15	673	—	—	Mitochondrial
10	176				—	—	
<i>HvABCB</i>	A0A287LE1	TMD-NBD	13	692	74809.	5.9	Plasma membrane
11	5				6	3	
<i>HvABCB</i>	A0A287XAI	TMD-NBD	16	718	77500.	8.9	Plasma membrane
12	1				28	2	
<i>HvABCB</i>	A0A287IP	TMD-NBD	7	965	—	—	Plasma membrane
13	42				—	—	
<i>HvABCB</i>	M0VMJ6	TMD-NBD-TMD-NBD	7	1238	133704	7.5	Plasma membrane
14					.44	7	
<i>HvABCB</i>	A0A287WP	TMD-NBD-TMD-NBD	6	1411	152919	8.7	Plasma membrane
15	W5				.97	1	
<i>HvABCB</i>	A0A287LE5	TMD-NBD-TMD-NBD	12	1273	137699	8.1	Plasma membrane
16	8				.22	5	
<i>HvABCB</i>	A0A287LH	TMD-NBD-TMD-NBD	9	1231	133919	8.3	Plasma membrane
17	W3				.38	3	
<i>HvABCB</i>	A0A287UIA	TMD-NBD-TMD-NBD	9	1355	148301	9.2	Plasma membrane
18	6				.27	4	
<i>HvABCB</i>	M0X0N8	TMD-NBD-TMD-NBD	9	1270	137759	8.2	Plasma membrane
19					.43	7	
<i>HvABCB</i>	A0A287GW	TMD-NBD-TMD-NBD	12	1255	135477	5.9	Plasma membrane
20	34				.62	6	
<i>HvABCB</i>	A0A287ILD	TMD-NBD-TMD-NBD	10	1267	137459	8.6	Plasma membrane

21	6					.03	5	
<i>HvABCB</i>	A0A287L	TMD-NBD-TMD-TMD-			128217	9.0		
			11	1178				Plasma membrane
22	EA0	NBD			.97	2		
<i>HvABCB</i>	A0A287P8S				155449	6.0		
		TMD-NBD-TMD-NBD	11	1409				Plasma membrane
23	5				.34	2		
<i>HvABCB</i>					124397	7.5		
	M0VMZ3	TMD-NBD-TMD-NBD	10	1151				Plasma membrane
24					.07	9		
<i>HvABCB</i>	A0A287WU				139242	6.4		
		TMD-NBD-TMD-NBD	10	1268				Plasma membrane
25	M2				.24	4		
<i>HvABCB</i>	A0A287ERQ				137505	7.0		
		TMD-NBD-TMD-NBD	10	1283				Plasma membrane
26	6				.48	5		
<i>HvABCB</i>	A0A287LDR				139374	7.3		
		TMD-NBD-TMD-NBD	12	1280				Plasma membrane
27	1				.41	6		
<i>HvABCB</i>	A0A287GDI				136185	6.0		
		TMD-NBD-TMD-NBD	12	1265				Plasma membrane
28	0				.54	9		
<i>HvABCB</i>	A0A287PQZ				148863	9.3		
		TMD-NBD-TMD-NBD	8	1391				Plasma membrane
29	8				.82	2		
<i>HvABCB</i>	A0A287E2C				118609	7.3		
		TMD-NBD-TMD-NBD	7	1091				Plasma membrane
30	9				.17	2		
<i>HvABCB</i>	A0A287MU				156509	8.0		
		TMD-NBD-TMD-NBD	11	1425				Plasma membrane
31	70				.67	8		
<i>HvABCB</i>	A0A287T				136357	7.5		
		TMD-NBD-TMD-NBD	12	1265				Plasma membrane
32	K16				.55	8		
<i>HvABCC</i>	A0A287XR0				21356.	5.7		
		NBD	3	195				Plasma membrane
1	2				47	3		
<i>HvABCC</i>	A0A287VR				64348.	7.9		
		TMD-NBD	5	570				Plasma membrane
2	A1				36	5		
<i>HvABCC</i>	A0A287E8H				76862.	5.3		
		NBD-TMD	10	689				Plasma membrane
3	3				93	7		

<i>HvABCC</i>	A0A287G2E	TMD-NBD	13	742	81878.64	76	5	Plasma membrane
4	6							
<i>HvABCC</i>	A0A287SQS	TMD-NBD	11	1201	—	—	—	Plasma membrane
5	9							
<i>HvABCC</i>	A0A287VR0	TMD-NBD-TMD	13	1002	112321.95	9.2	4	Plasma membrane
6	7							
<i>HvABCC</i>	A0A287J	TMD-NBD-TMD	6	1226	137384.83	8.8	6	Plasma membrane
7	B27							
<i>HvABCC</i>	A0A287VX1	TMD-NBD-TMD-NBD	34	1459	162273.12	7.7	5	Plasma membrane
8	8							
<i>HvABCC</i>	A0A287J912	TMD-NBD-TMD-NBD	29	1628	182783.15	7.4	7	Plasma membrane
9								
<i>HvABCC</i>	A0A287H	TMD-NBD-TMD-NBD	13	1477	—	—	—	Plasma membrane
10	0Y8							
<i>HvABCC</i>	A0A287H0Z	TMD-NBD-TMD-NBD	15	1108	121806.93	5.7	9	Plasma membrane
11	9							
<i>HvABCC</i>	A0A287KF0	TMD-NBD-TMD-NBD	30	1469	161017.89	7.2	1	Plasma membrane
12	5							
<i>HvABCC</i>	A0A287X7	TMD-NBD-TMD-NBD	12	1475	162032.55	8.1	4	Plasma membrane
13	W7							
<i>HvABCC</i>	A0A287HCE	TMD-NBD-TMD-NBD	11	1533	169070.73	6.3	3	Plasma membrane
14	6							
<i>HvABCC</i>	A0A287VR	TMD-NBD-TMD-NBD	13	1471	162585.72	6.9	3	Plasma membrane
15	C4							
<i>HvABCC</i>	A0A287VR	TMD-NBD-TMD-NBD	13	1490	—	—	—	Plasma membrane
16	G5							
<i>HvABCC</i>	A0A287M5	TMD-NBD-TMD-NBD	10	1496	167303.18	6.4	7	Plasma membrane
17	V2							
<i>HvABCC</i>	A0A287JB6	TMD-NBD-TMD-NBD	11	1538	171907	8.5		Plasma membrane

18	0					.93	1	
<i>HvABCC</i>	A0A287PXI					159920	8.1	
		TMD-NBD-TMD-NBD	11	1442				Plasma membrane
19	0					.68	6	
<i>HvABCC</i>	A0A287KG2					156262	5.7	
		TMD-NBD-TMD-NBD	10	1424				Plasma membrane
20	5					.67	6	
<i>HvABCC</i>						160306	6.9	
	M0XGX5	TMD-NBD-TMD-NBD	10	1469				Plasma membrane
21						.12	8	
<i>HvABCC</i>	A0A287V					164457	8.0	
	R94	TMD-NBD-TMD-NBD	13	1485				Plasma membrane
22						.69	5	
<i>HvABCD</i>						83879.	8.5	
	F2D899	TMD-NBD	30	755				Extracellular
1						91	4	
<i>HvABCD</i>	A0A287MQ					82097.	8.5	
		TMD-NBD	11	769				Plasma membrane
2	F8					6	9	
<i>HvABCD</i>						147939	9.0	
	M0XWG4	TMD-NBD-TMD-NBD	27	1322				Extracellular
3						.15	6	
<i>HvABCD</i>	A0A287EH					151499	9.3	
		TMD-NBD-TMD-NBD	25	1364				Extracellular
4	D3					.63	8	
<i>HvABCE</i>	A0A287NT					66609.	6.3	
		NBD-NBD	12	590				Plasma membrane
1	U8					64	2	
<i>HvABCE</i>	A0A287JRE					68787.	7.6	
		NBD-NBD	11	611				Plasma membrane
2	8					52	8	
<i>HvABCE</i>	A0A287FPU					71204.	8.9	
		NBD-NBD	12	636				Plasma membrane
3	6					23	5	
<i>HvABCF</i>						66031.	6.0	
	M0V694	NBD-NBD	5	592				Cytoplasmic
1						68	9	
<i>HvABCF</i>						66587.	6.3	
	M0WET2	NBD-NBD	5	595				Cytoplasmic
2						25	7	
<i>HvABCF</i>	A0A287V1L					72014.	6.9	
		NBD-NBD	17	645				Cytoplasmic
3	8					27	7	

<i>HvABCF</i>	A0A287GM	NBD-NBD	2	733	—	—	Cytoplasmic
4	N2						
<i>HvABCF</i>	A0A287DX	NBD-NBD	9	739	82742.	8.8	Extracellular
5	M9				73	6	
<i>HvABCG</i>	A0A287X8G	NBD	1	171	19391.	5.1	Plasma membrane
1	4				19	7	
<i>HvABCG</i>	A0A287K0G	NBD	7	382	41160.	5.1	Plasma membrane
2	0				22	6	
<i>HvABCG</i>	A0A287P76	NBD	1	390	42322.	10.	Plasma membrane
3	6				02	72	
<i>HvABCG</i>	A0A287QL	NBD	2	429	—	—	Vacuolar
4	G3						
<i>HvABCG</i>	A0A287L	NBD	4	797	87161.	10.	Extracellular
5	F62				29	16	
<i>HvABCG</i>	A0A287Y	NBD	10	877	97605.	9.1	Plasma membrane
6	2H0				42	2	
<i>HvABCG</i>	A0A287F5H	NBD	15	1018	112603	8.8	Plasma membrane
7	3				.18	6	
<i>HvABCG</i>	A0A287V6N	NBD	14	1044	115199	8.6	Plasma membrane
8	4				.45	9	
<i>HvABCG</i>	A0A287IQ0	NBD-TMD2	5	400	—	—	Plasma membrane
9	1						
<i>HvABCG</i>	A0A287H	NBD-TMD2	7	511	—	—	Plasma membrane
10	8V2						
<i>HvABCG</i>	A0A287JT05	NBD-TMD2	2	554	60179.	9.7	Plasma membrane
11					21	2	
<i>HvABCG</i>	A0A287L3B	NBD-TMD2	1	608	65661.	9.5	Vacuolar
12	8				44	8	
<i>HvABCG</i>	A0A287NF	NBD-TMD2	4	642	68092.	8.9	Plasma membrane

13	M2				18	9	
<i>HvABCG</i>					70966.	8.7	
	F2DL63	NBD-TMD2	1	655			Vacuolar
14					09	1	
<i>HvABCG</i>					70844.	8.9	
	F2CQ28	NBD-TMD2	1	660			Plasma membrane
15					8	4	
<i>HvABCG</i>					71944.	9.3	
	F2DP21	NBD-TMD2	1	668			Vacuolar
16					43	5	
<i>HvABCG</i>					73900.	8.6	
	M0XY31	NBD-TMD2	1	681			Vacuolar
17					85	8	
<i>HvABCG</i>					73122.	9.5	
	M0YG47	NBD-TMD2	3	685			Plasma membrane
18					92	9	
<i>HvABCG</i>					76372.	9.2	
	F2DJI5	NBD-TMD2	8	689			Plasma membrane
19					82	4	
<i>HvABCG</i>	A0A287TN	NBD-TMD2			76032.	9.3	
	Y7		9	693			Plasma membrane
20					84	4	
<i>HvABCG</i>					79359.	9.1	
	M0YHK9	NBD-TMD2	11	723			Plasma membrane
21					06	7	
<i>HvABCG</i>	A0A287RFJ	NBD-TMD2			81554.	8.5	
	1		4	725			Vacuolar
22					78	6	
<i>HvABCG</i>	A0A287XA0	NBD-TMD2			80841.	9.0	
	3		3	732			Plasma membrane
23					39	6	
<i>HvABCG</i>	A0A287RPK	NBD-TMD2			82071.	8.3	
	3		8	755			Plasma membrane
24					41	1	
<i>HvABCG</i>	A0A287IWX	NBD-TMD2			—	—	
	2		10	756	—	—	Plasma membrane
25							
<i>HvABCG</i>					81278.	9.1	
	F2DQI5	NBD-TMD2	1	757			Vacuolar
26					75	4	
<i>HvABCG</i>					82968.		
	M0XE93	NBD-TMD2	9	757			9.1 Plasma membrane
27					77		

<i>HvABCG</i> A0A287ELL		NBD-TMD2	1	789	85060.9	9.1		
28	2				58	6	Vacuolar	
<i>HvABCG</i> A0A287P		NBD-TMD2	2	815	89076.	9.1		Vacuolar
29	7I6				67			
<i>HvABCG</i> A0A287W		TMD2-PDR-NBD-TMD	14	1111	125898	6.2		Plasma membrane
30	2R8	2			.01	5		
<i>HvABCG</i> A0A287THL		TMD2-PDR-NBD	16	915	102841	7.6		Plasma membrane
31	9				.07	1		
<i>HvABCG</i> A0A287XC2		TMD2-PDR-NBD	15	943	104852	6.3		Plasma membrane
32	2				.22	3		
<i>HvABCG</i> A0A287T27		PDR-NBD-TMD2	24	759	85289.	5.6		Plasma membrane
33	2				08	7		
<i>HvABCG</i> A0A287R5Q		NBD-TMD2-PDR-NBD-TMD2	23	1394	155669	9.1		Plasma membrane
34	3				.69	6		
<i>HvABCG</i> A0A287MT		NBD-TMD2-PDR-NBD-TMD2	20	1265	144152	8.1		Plasma membrane
35	Z6				.96	2		
<i>HvABCG</i> A0A287V		N-NBD-TMD2-PDR-NB	24	1392	156052	7.5		Plasma membrane
36	KI3	D-TMD2			.12	8		
<i>HvABCG</i> A0A287WL		N-NBD-TMD2-PDR-NB	23	1349	152825	8.8		Plasma membrane
37	54	D-TMD2			.44			
<i>HvABCG</i> M0YEW0		N-NBD-TMD2-PDR-NB	22	1348	153853	8.0		Plasma membrane
38		D-TMD2			.13	9		
<i>HvABCG</i> M0W6C2		N-NBD-TMD2-PDR-NB	24	1450	163114	6.8		Plasma membrane
39		D-TMD2			.82	6		
<i>HvABCG</i> A0A287MJ9		N-NBD-TMD2-PDR-NB	23	1446	162239	7		Plasma membrane
40	1	D-TMD2			.64			
<i>HvABCG</i> M0XGX1		N-NBD-TMD2-PDR-NB	23	1448	162481	6.1		Plasma membrane
41		D-TMD2			.79	9		
<i>HvABCG</i> A0A2R9J98		N-NBD-TMD2-PDR-NB	21	1447	161735	8.5		Plasma membrane

42	3	D-TMD2			.74	9	
<i>HvABCG A0A287L2T</i>	N-NBD-TMD2-PDR-NB	21	1457	163941	7.3		Plasma membrane
43	7	D-TMD2			.76	6	
<i>HvABCG A0A287LK</i>	N-NBD-TMD2-PDR-NB	23	1440	163209	7.3		Plasma membrane
44	Y2	D-TMD2			.36	2	
<i>HvABCG M0WIH1</i>	N-NBD-TMD2-PDR-NB	19	1475	166619	6.8		Plasma membrane
45		D-TMD2			.47	5	
<i>HvABCG A0A287LH</i>	N-NBD-TMD2-PDR-NB	22	1462	164749	7.4		Plasma membrane
46	Y7	D-TMD2			.92	8	
<i>HvABCG A0A287X8A</i>	N-NBD-TMD2-PDR-NB	21	1494	169476	8.3		Plasma membrane
47	3	D-TMD2			.99	3	
<i>HvABCG A0A287KEZ</i>	N-NBD-TMD2-PDR-NB	24	1431	161725	8.2		Plasma membrane
48	0	D-TMD2			.83	1	
<i>HvABCG A0A287SM</i>	N-NBD-TMD2-PDR-NB	19	1496	168191	7.1		Plasma membrane
49	H0	D-TMD2			.35	4	
<i>HvABCI1 A0A287V R45</i>	NBD	2	175	19509.	4.9		Plasma membrane
					47	2	
<i>HvABCI2 F2DC59</i>	NBD	1	224	25130.	9.8		Plasma membrane
					55	7	
<i>HvABCI3 M0X8C2</i>	NBD	10	272	30599.	9.1		Chloroplast
					4	8	
<i>HvABCI4 A0A287LPQ 4</i>	NBD	5	289	31044.	8.9		Chloroplast
					71	4	
<i>HvABCI5 A0A287X IJ5</i>	NBD	3	292	30868.	6.3		Plasma membrane
					57	5	
<i>HvABCI6 M0XST9</i>	NBD	7	303	32484.		6	Chloroplast
					17		
<i>HvABCI7 A0A287P TL5</i>	NBD	1	312	32846.	6.1		Plasma membrane
					68	8	

<i>HvABCI8</i>	M0YCT8	NBD	11	387	41590. 51	8.7	Chloroplast
<i>HvABCI9</i>	A0A287P1X 9	NBD	7	402	44603. 32	9.5 3	Cytoplasmic