



Figure S1. Characteristics of five putative conserved motifs in 139 GRFs.

Table S1. Gene information, predicted putative physiochemical properties, NLSs and subcellular localizations of 139 GRF proteins.

Gene name	Gene ID	Species	Protein length (aa)	MW(KDa)	PI	Predicted subcellular localization	Predicted monopartite NLS (position)	Predicted bipartite NLS (position)
AfGR F1	Azfi_s0001.g00094	<i>Azolla filiculoides</i>	625	67.1502	6.61	Nucleus	-	273
AfGR F2	Azfi_s0097.g043820	<i>Azolla filiculoides</i>	801	82.10981	6.66	Nucleus	-	239
AfGR F3	Azfi_s0256.g060519	<i>Azolla filiculoides</i>	818	87.30616	6.72	Nucleus	-	372
AtGR F1	AT2G22840	<i>Arabidopsis thaliana</i>	530	56.40134	9.27	Nucleus	-	201; 325; 348
AtGR F2	AT4G37740	<i>Arabidopsis thaliana</i>	535	58.58489	8.85	Nucleus	-	232; 256; 440
AtGR F3	AT2G36400	<i>Arabidopsis thaliana</i>	398	43.70729	8.56	Nucleus	-	4; 149
AtGR F4	AT3G52910	<i>Arabidopsis thaliana</i>	380	42.53372	6.87	Nucleus	-	156; 250
AtGR F5	AT3G13960	<i>Arabidopsis thaliana</i>	397	44.69557	8.18	Nucleus	-	86
AtGR F6	AT2G06200	<i>Arabidopsis thaliana</i>	244	28.21061	8.87	Nucleus	-	85; 196
AtGR F7	AT5G53660	<i>Arabidopsis thaliana</i>	365	40.41032	8.13	Nucleus	-	121; 140
AtGR F8	AT4G24150	<i>Arabidopsis thaliana</i>	493	54.6087	6.44	Nucleus	-	-
AtGR	AT2G45480	<i>Arabidopsis thaliana</i>	429	48.60	8.3	Nucleus	-	92;

F9			<i>psis thaliana</i>	757	5	s		310
AvGR F1	Av_00000935- RA	<i>Aldrova nda vesiculo sa</i>	369	41.65 316	8.7 7	Nucleu s	-	84; 263
AvGR F10	Av_00011365- RA	<i>Aldrova nda vesiculo sa</i>	367	41.17 092	8.7 2	Nucleu s	-	84; 263 265
AvGR F11	Av_00013002- RA	<i>Aldrova nda vesiculo sa</i>	374	41.99 66	9.1 1	Nucleu s	-	83
AvGR F12	Av_00013064- RA	<i>Aldrova nda vesiculo sa</i>	455	49.98 494	8.5 5	Nucleu s	-	106; 115
AvGR F13	Av_00014513- RA	<i>Aldrova nda vesiculo sa</i>	503	53.02 958	8.5 8	Nucleu s	-	-
AvGR F14	Av_00015655- RA	<i>Aldrova nda vesiculo sa</i>	355	38.99 746	7.7	Nucleu s	132	106; 130; 130
AvGR F15	Av_00018870- RA	<i>Aldrova nda vesiculo sa</i>	541	57.59 941	8.9 4	Cell membr ane. Nucleu s	-	316
AvGR F16	Av_00018901- RA	<i>Aldrova nda vesiculo sa</i>	409	44.18 537	9.1 1	Nucleu s	-	91
AvGR F17	Av_00020000- RA	<i>Aldrova nda vesiculo sa</i>	565	60.05 906	8.1 1	Cell membr ane	-	-
AvGR F18	Av_00020017- RA	<i>Aldrova nda vesiculo sa</i>	229	25.26 819	9.2 4	Nucleu s	-	79
AvGR	Av_00022695-	<i>Aldrova</i>	601	63.66	9.1	Cell	-	239;

F19	RA	<i>Aladrova vesiculosa</i>	055	7	membrane. Nucleus	263
AvGR F2	Av_00004307-RA	<i>Aladrova vesiculosa</i>	362	40.49 102	8.9 4	Nucleus - 85; 259
AvGR F20	Av_00023828-RA	<i>Aladrova vesiculosa</i>	410	44.91 37	6.3 3	Nucleus - 179
AvGR F21	Av_00024262-RA	<i>Aladrova vesiculosa</i>	628	67.20 784	8.3 5	Cell membrane. Nucleus - 266; 290; 392
AvGR F3	Av_00004572-RA	<i>Aladrova vesiculosa</i>	406	45.10 23	8.9 2	Nucleus - 42; 108; 265
AvGR F4	Av_00007247-RA	<i>Aladrova vesiculosa</i>	372	41.47 896	8.3 7	Nucleus - 83
AvGR F5	Av_00009217-RA	<i>Aladrova vesiculosa</i>	560	58.98 234	8.1 8	Cell membrane - -
AvGR F6	Av_00009484-RA	<i>Aladrova vesiculosa</i>	543	57.48 387	7.5 2	Cell membrane - 197; 302
AvGR F7	Av_00009515-RA	<i>Aladrova vesiculosa</i>	401	43.76 747	8.6 9	Nucleus - 113
AvGR F8	Av_00010330-RA	<i>Aladrova vesiculosa</i>	518	55.06 272	7.5 8	Nucleus - -
AvGR F9	Av_00010799-RA	<i>Aladrova vesiculosa</i>	518	55.60 684	8.1 8	Cell membrane. - 25; 202

		<i>sa</i>				Nucleu s		
CcGR F1	GWHPACFD0 00460	<i>Cladopus chinensis</i>	329	35.87 144	5.3 2	Cell membrane. Nucleu s	-	119; 128
CcGR F10	GWHPACFD0 15113	<i>Cladopus chinensis</i>	271	30.69 875	8.2 7	Nucleu s	-	-
CcGR F11	GWHPACFD0 22459	<i>Cladopus chinensis</i>	263	29.67 149	8.6 5	Nucleu s	-	27; 113
CcGR F2	GWHPACFD0 02369	<i>Cladopus chinensis</i>	356	39.23 585	8.0 2	Nucleu s	-	170
CcGR F3	GWHPACFD0 04174	<i>Cladopus chinensis</i>	272	30.10 859	8.7 1	Nucleu s	-	137; 196
CcGR F4	GWHPACFD0 05783	<i>Cladopus chinensis</i>	246	27.52 706	9.5 3	Nucleu s	-	136
CcGR F5	GWHPACFD0 07337	<i>Cladopus chinensis</i>	305	34.40 959	8.9	Nucleu s	-	80; 89
CcGR F6	GWHPACFD0 07888	<i>Cladopus chinensis</i>	246	27.48 202	9.4 4	Nucleu s	-	136
CcGR F7	GWHPACFD0 12264	<i>Cladopus chinensis</i>	382	42.74 732	9.3 5	Nucleu s	-	103; 159
CcGR F8	GWHPACFD0 12674	<i>Cladopus chinensis</i>	313	35.47 848	7.5 8	Nucleu s	-	201
CcGR	GWHPACFD0	<i>Cladopus</i>	270	30.95	6.1	Nucleu	-	77

F9	14476	<i>s</i> <i>chinensi</i>	586	9	s			
CdG RF1	prefix00835.t1	<i>s</i> <i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	381	42.58 055	8.1 8	Nucleu s	-	150; 159
CdG RF10	prefix15436.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	342	38.41 46	8.3 9	Nucleu s	-	76
CdG RF11	prefix17660.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	403	44.98 444	5.6 9	Nucleu s	-	134
CdG RF12	prefix18448.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	284	33.45 044	8.5 5	Nucleu s	-	79; 88; 238
CdG RF13	prefix21354.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	323	36.36 829	7.6 4	Nucleu s	-	61
CdG RF14	prefix25051.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	139	15.85 011	9.5 8	Nucleu s	-	50
CdG RF2	prefix01244.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	433	47.84 98	6.5	Nucleu s	-	16; 144
CdG RF3	prefix04847.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	541	60.72 992	6.4 4	Nucleu s	-	251
CdG RF4	prefix05720.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	358	39.42 026	6.1 5	Nucleu s	-	-
CdG RF5	prefix06054.t1	<i>Ceratop</i> <i>hyllum</i> <i>demersu</i> <i>m</i>	333	37.59 273	7.6 4	Nucleu s	-	76
CdG	prefix06361.t1	<i>Ceratop</i>	585	64.47	8.4	Nucleu	-	224

RF6		<i>hyllum</i>	395			s		
		<i>demersu</i>						
		<i>m</i>						
CdG	prefix07205.t1	<i>Ceratop</i>	735	81.64	9.4	Nucleu	-	223;
RF7		<i>hyllum</i>		069	5	s		580;
		<i>demersu</i>						650
		<i>m</i>						
CdG	prefix09195.t1	<i>Ceratop</i>	391	43.26	6.6	Nucleu	-	81;
RF8		<i>hyllum</i>		227	1	s		105
		<i>demersu</i>						
		<i>m</i>						
CdG	prefix14436.t1	<i>Ceratop</i>	233	26.23	9.1	Nucleu	-	129
RF9		<i>hyllum</i>		688	8	s		
		<i>demersu</i>						
		<i>m</i>						
EfGR	g01483.t1	<i>Euryale</i>	338	38.00	8.1	Nucleu	-	78; 87
F1		<i>ferox</i>		605	5	s		
EfGR	g09724.t1	<i>Euryale</i>	462	49.75	9.5	Nucleu	-	31
F10		<i>ferox</i>		375		s		
EfGR	g11371.t1	<i>Euryale</i>	589	63.26	8.4	Nucleu	-	33;
F11		<i>ferox</i>		748	1	s		220;
								457
EfGR	g12032.t1	<i>Euryale</i>	230	24.68	9.3	Nucleu	-	88
F12		<i>ferox</i>		304	2	s		
EfGR	g12966.t1	<i>Euryale</i>	331	36.91	8.8	Nucleu	-	72
F13		<i>ferox</i>		69	8	s		
EfGR	g16304.t1	<i>Euryale</i>	345	38.36	9.1	Nucleu	-	83
F14		<i>ferox</i>		869	7	s		
EfGR	g17571.t1	<i>Euryale</i>	614	65.23	8.2	Nucleu	-	200
F15		<i>ferox</i>		352	5	s		
EfGR	g17620.t1	<i>Euryale</i>	265	29.07	9.5	Nucleu	-	137
F16		<i>ferox</i>		685	1	s		
EfGR	g24211.t1	<i>Euryale</i>	235	25.31	9.3	Chloro	-	109
F17		<i>ferox</i>		819	2	plast.		
						Nucleu		
						s		
EfGR	g26131.t1	<i>Euryale</i>	310	35.32	9.0	Nucleu	-	76; 85
F18		<i>ferox</i>		833	5	s		
EfGR	g30061.t1	<i>Euryale</i>	587	62.97	8.5	Nucleu	-	34;
F19		<i>ferox</i>		224		s		220;
								452
EfGR	g03460.t2	<i>Euryale</i>	307	34.76	8.9	Nucleu	-	77; 86
F2		<i>ferox</i>		871		s		
EfGR	g36593.t2	<i>Euryale</i>	331	36.81	8.5	Nucleu	-	69

F20		<i>ferox</i>	882	5	s			
EfGR	g03523.t2	<i>Euryale</i>	575	61.39	6.7	Nucleu	-	135;
F3		<i>ferox</i>	942	6	s			191
EfGR	g03563.t1	<i>Euryale</i>	273	29.89	9.2	Nucleu	-	12;
F4		<i>ferox</i>	865	8	s			139
EfGR	g04250.t1	<i>Euryale</i>	200	21.79	9.9	Nucleu	-	59; 85
F5		<i>ferox</i>	967	5	s			
EfGR	g07175.t1	<i>Euryale</i>	621	65.57	7.6	Nucleu	-	199
F6		<i>ferox</i>	756		s			
EfGR	g07218.t1	<i>Euryale</i>	274	30.02	9.3	Nucleu	-	12;
F7		<i>ferox</i>	184	6	s			13;
								139
EfGR	g08094.t1	<i>Euryale</i>	332	36.93	9.0	Nucleu	-	72
F8		<i>ferox</i>	589	9	s			
EfGR	g08916.t1	<i>Euryale</i>	318	34.68	9.3	Nucleu	-	84
F9		<i>ferox</i>	476	9	s			
LmG	lm5633.a03.13.	<i>lemna</i>	218	23.59	9.2	Nucleu	-	83
RF1	g01020_p1	<i>minuta</i>	446	7	s			
LmG	lm5633.a03.4.g	<i>lemna</i>	340	38.77	8.7	Nucleu	-	94;
RF2	01820_p1	<i>minuta</i>	158	1	s			221;
								244
LmG	lm5633.a03.8.g	<i>lemna</i>	261	28.56	8.8	Chloro	145	103
RF3	10900_p1	<i>minuta</i>	218	9		plast.		
						Nucleu		
						s		
NcG	XP_031478480	<i>Nympha</i>	589	63.26	8.6	Nucleu	-	34;
RF1	.1	<i>ea</i>	154		s			220;
		<i>colorata</i>						457
NcG	XP_031482096	<i>Nympha</i>	332	36.91	8.8	Nucleu	-	72
RF2	.1	<i>ea</i>	385	8	s			
		<i>colorata</i>						
NcG	XP_031482372	<i>Nympha</i>	576	61.40	8.6	Nucleu	-	219
RF3	.1	<i>ea</i>	75	9	s			
		<i>colorata</i>						
NcG	XP_031491651	<i>Nympha</i>	338	38.10	7.7	Nucleu	-	78; 87
RF4	.1	<i>ea</i>	917		s			
		<i>colorata</i>						
NcG	XP_031495439	<i>Nympha</i>	297	31.90	9.1	Nucleu	-	140
RF5	.1	<i>ea</i>	194	4	s			
		<i>colorata</i>						
NcG	XP_031498107	<i>Nympha</i>	278	30.23	9.1	Nucleu	-	140
RF6	.1	<i>ea</i>	004	5	s			
		<i>colorata</i>						
NcG	XP_031498261	<i>Nympha</i>	412	46.98	9.1	Nucleu	-	37;

RF7	.1	<i>ea colorata</i>	986	7	s		40; 180; 189 215
NcG RF8	XP_031499041 .1	<i>Nympha ea colorata</i>	645	68.47 868	8.4 7	Nucleu s	-
NcG RF9	XP_031503184 .1	<i>Nympha ea colorata</i>	333	36.91 496	8.9 2	Nucleu s	- 69; 245
NnG RF1	NNU_000550- RA	<i>Nelumb o nucifera</i>	581	61.70 756	6.3 6	Cell membr ane. Cell wall. Nucleu s	- 176
NnG RF2	NNU_001408- RA	<i>Nelumb o nucifera</i>	243	25.64 872	9.0 5	Cell membr ane. Nucleu s	- 101
NnG RF3	NNU_002283- RA	<i>Nelumb o nucifera</i>	604	65.56 5	8.1 4	Nucleu s	- 228; 252
NnG RF4	NNU_002395- RA	<i>Nelumb o nucifera</i>	380	41.38 598	9.0 5	Nucleu s	- 142
NnG RF5	NNU_006992- RA	<i>Nelumb o nucifera</i>	355	39.77 916	8.8 2	Nucleu s	- 81
NnG RF6	NNU_010640- RA	<i>Nelumb o nucifera</i>	372	42.18 76	8.6 1	Nucleu s	- 78; 87; 259; 302 205
NnG RF7	NNU_014113- RA	<i>Nelumb o nucifera</i>	550	58.25 181	7.5 3	Cell membr ane. Nucleu s	- 79; 255; 282 192
NnG RF8	NNU_018235- RA	<i>Nelumb o nucifera</i>	372	42.10 757	8.9 5	Nucleu s	-
NnG RF9	NNU_023103- RA	<i>Nelumb o</i>	436	47.47 062	7.2 3	Nucleu s	-

		<i>nucifera</i>							
SiGR F1	CAA7387704.1	<i>Spirodel a intermedia</i>	530	56.36 808	8.2 7	Nucleu s	-	194; 273	
SiGR F2	CAA7391974.1	<i>Spirodel a intermedia</i>	357	38.15 435	8.6 4	Nucleu s	-	78; 253	
SiGR F3	CAA7393787.1	<i>Spirodel a intermedia</i>	158	17.22 233	10. 02	Nucleu s	-	68	
SiGR F4	CAA7394958.1	<i>Spirodel a intermedia</i>	300	33.68 392	9.2 1	Nucleu s	-	86; 229	
SiGR F5	CAA7399847.1	<i>Spirodel a intermedia</i>	203	21.81 505	10. 28	Nucleu s	-	88; 176	
SiGR F6	CAA7401268.1	<i>Spirodel a intermedia</i>	333	37.09 969	8.6 3	Nucleu s	-	85	
SiGR F7	CAA7406501.1	<i>Spirodel a intermedia</i>	372	39.37 449	8.4 8	Nucleu s	-	87	
SpGR F1	Spo001498	<i>Spirodel a polyrhiza</i>	525	54.61 278	8.6 4	Nucleu s	-	190; 267	
SpGR F2	Spo004459	<i>Spirodel a polyrhiza</i>	301	33.74 287	9.2 2	Nucleu s	-	86	
SpGR F3	Spo005290	<i>Spirodel a polyrhiza</i>	559	59.84 567	8.7 4	Nucleu s	-	47; 220	
SpGR F4	Spo012722	<i>Spirodel a polyrhiza</i>	402	41.74 232	8.7 9	Nucleu s	-	90; 99	

SpGR F5	Spo013751	<i>a Spirodel a polyrhiz a</i>	218	22.80 673	9.3	Chloro plast. Nucleu s	9	111
SpGR F6	Spo015563	<i>Spirodel a polyrhiz a</i>	326	36.35 185	8.6 3	Nucleu s	-	86
UgG RF1	unitig_0.g2446 .t1	<i>Utrricula gibba</i>	266	29.12 906	8.8 6	Nucleu s	117	-
UgG RF10	unitig_8.g3578 .t1	<i>Utrricula gibba</i>	345	39.02 02	9.6 4	Nucleu s	-	-
UgG RF11	unitig_8.g4145 .t1	<i>Utrricula gibba</i>	300	32.92 823	8.6 7	Nucleu s	-	90
UgG RF12	unitig_8.g4856 .t1	<i>Utrricula gibba</i>	454	48.42 992	9.0 6	Nucleu s	-	178
UgG RF2	unitig_0.g2836 .t1	<i>Utrricula gibba</i>	672	73.13 494	8.8	Nucleu s	301	45; 406
UgG RF3	unitig_21.g206 15.t1	<i>Utrricula gibba</i>	389	42.59 214	9.0 7	Nucleu s	-	65
UgG RF4	unitig_21.g209 82.t1	<i>Utrricula gibba</i>	347	39.55 484	6.9 9	Nucleu s	-	104; 282; 287
UgG RF5	unitig_699.g19 428.t1	<i>Utrricula gibba</i>	207	23.90 758	10. 88	Nucleu s	-	81; 134
UgG RF6	unitig_744.g24 115.t1	<i>Utrricula gibba</i>	496	53.46 53	7.7 4	Nucleu s	-	169
UgG RF7	unitig_747.g21 926.t1	<i>Utrricula gibba</i>	751	81.85 488	8.7	Nucleu s	-	91; 457
UgG RF8	unitig_749.g14 242.t1	<i>Utrricula gibba</i>	227	25.96 334	9.4 8	Nucleu s	-	97
UgG RF9	unitig_749.g14 291.t1	<i>Utrricula ria</i>	290	31.89 499	7.7 6	Nucleu s	-	95

		<i>gibba</i>							
WaG	Waus00004g13	<i>Wolffia</i>	666	73.02	8.6	Chloro	519;	248;	
RF1	948.1	<i>australi</i>		658	7	plast	520;	257;	
		<i>ana</i>					523	504	
WaG	Waus00016g05	<i>Wolffia</i>	228	26.01	9.1	Nucleu	-	86	
RF2	717.1	<i>australi</i>		245	5	s			
		<i>ana</i>							
WaG	Waus00022g09	<i>Wolffia</i>	478	51.02	8.8	Cell	-	189	
RF3	139.1	<i>australi</i>		264	6	membr			
		<i>ana</i>				ane.			
						Nucleu			
						s			
WaG	Waus00029g11	<i>Wolffia</i>	206	23.05	9.5	Nucleu	-	79	
RF4	302.1	<i>australi</i>		058	3	s			
		<i>ana</i>							
WaG	Waus00054g16	<i>Wolffia</i>	219	23.95	7	Nucleu	-	94	
RF5	188.1	<i>australi</i>		804		s			
		<i>ana</i>							
ZmG	Zosma1g02640	<i>Zostera</i>	552	60.26	8.3	Nucleu	-	198	
RF1	.1	<i>marina</i>		697	3	s			
ZmG	Zosma970g000	<i>Zostera</i>	495	53.93	7.6	Nucleu	383	43;	
RF10	20.1	<i>marina</i>		196	1	s		240	
ZmG	Zosma2g02340	<i>Zostera</i>	329	37.03	8.6	Nucleu	-	93;	
RF2	.1	<i>marina</i>		762	6	s		216;	
								289	
ZmG	Zosma4g01130	<i>Zostera</i>	310	34.19	8.1	Nucleu	207	133	
RF3	.1	<i>marina</i>		019	8	s			
ZmG	Zosma8g00940	<i>Zostera</i>	482	53.09	8.0	Nucleu	315	10;	
RF4	.1	<i>marina</i>		155	4	s		212;	
								317	
ZmG	Zosma59g0017	<i>Zostera</i>	242	26.98	8.8	Nucleu	-	104	
RF5	0.1	<i>marina</i>		431	1	s			
ZmG	Zosma67g0054	<i>Zostera</i>	360	40.60	8.8	Nucleu	-	75; 84	
RF6	0.1	<i>marina</i>		547	4	s			
ZmG	Zosma81g0037	<i>Zostera</i>	280	31.90	8.6	Nucleu	-	101;	
RF7	0.1	<i>marina</i>		561		s		176	
ZmG	Zosma120g001	<i>Zostera</i>	347	37.60	8.9	Nucleu	-	81; 90	
RF8	10.1	<i>marina</i>		136	9	s			
ZmG	Zosma328g000	<i>Zostera</i>	320	35.68	9.1	Nucleu	-	82	
RF9	40.1	<i>marina</i>		101	3	s			

Table S2. Primers used for qRT-PCR

Name	Sequences
SpGRF1- F	CTACAAGTACCTCGACGCCAACG
SpGRF1- R	GGCTTCCACAGGCTTTCTTG
SpGRF2- F	GGTGCTTCCAAATGGGCTTCG
SpGRF2- R	CAGCGTAGGGATTCAGGAGA
SpGRF3- F	CCTTCCTCCCTGAACCTGA
SpGRF3- R	ACCCTGTTGGCGTCTGC
SpGRF4- F	GTTACGGCGTCCCAATG
SpGRF4- R	GGCGTTTCCACAGGCTTTCT
SpGRF5- F	CCCATCACTCGCTTCCCTC
SpGRF5- R	CGGCGGGTTTGATGCTG
SpGRF6- F	CCTTTCACGGCGTCTCAAT
SpGRF6- R	GGGACGGAGATTTCCACAGG
SpACT- F	CCAGATCATGTTCGAGACCTTCAAC
SpACT- R	GGAGGGCGTATCCTTCGTAGATG