

Table S3. Domain and motif survey of legume and three lower plants Hsfs.

| Gene name | Group | DBD | OD | NLS | NES | AHA1 | AHA2 |
|-----------------|-------|---------|---------|-------------------|--------------------|-------------------|-------------------|
| <i>LjHsf-03</i> | A1 | 2-95 | 132-182 | (206) KKRR | | (424) DEFWEQFF | |
| <i>MtHsf-08</i> | A1 | 10-103 | 140-190 | (214) KKRR | (484) LLASDSTL | (424) DEFWEQFFRP | |
| <i>MtHsf-09</i> | A1 | 10-103 | 140-190 | (214) KKRR | (484) LLASDSTL | (424) DEFWEQFFRP | |
| <i>MtHsf-12</i> | A1 | 30-123 | 161-211 | (236) KKRR | (424) LPIDLDCL | (443) SSIWDDLL | |
| <i>CaHsf-01</i> | A1 | 10-103 | 140-190 | (214) KKRR | (479) LTQQMELL | (425) DEFWELFFM | |
| <i>CaHsf-02</i> | A1 | 30-120 | 158-208 | (233) KKRR | (480) LDQLTEQM | (439) PSIWDDLQQT | |
| <i>CaHsf-12</i> | A1 | 3-96 | 134-184 | (209) KKRR | (465) LLSSDR | (415) PSIWDDLQQT | |
| <i>GmHsf-01</i> | A1 | 18-111 | 149-199 | (224) KKRR | (453) LLSSD | (403) NPIWDEIL | |
| <i>GmHsf-05</i> | A1 | 12-105 | 141-191 | (216) KKRR | (453) LTQQMGL | (399) DEFWELFLRP | |
| <i>GmHsf-20</i> | A1 | 18-121 | 159-209 | (234) KKRR | (492) LLSSN | (442) NPIWDEIL | |
| <i>GmHsf-26</i> | A1 | 12-105 | 141-191 | (216) KKRR | (453) LTQQMGL | (399) DEFWELFLRP | |
| <i>GmHsf-37</i> | A1 | 28-121 | 158-208 | (233) KKRR | (502) LLSSD | (452) PHFWDDLRT | |
| <i>CcHsf-13</i> | A1 | 31-124 | 162-212 | (236) KKRR | (506) LLSSDT | (456) PHFWDDIVRT | |
| <i>CcHsf-19</i> | A1 | 1-84 | 120-170 | (195) KKRR | (438) LTQQMGLL | (384) DEFWELFFRP | |
| <i>CcHsf-21</i> | A1 | 18-111 | 148-198 | (224) KKRR | (485) LLSSD | (435) PSIWDDLQQT | |
| <i>PvHsf-06</i> | A1 | 25-118 | 156-206 | (231) KKRR | (466) LLSSD | (416) PNFWDDIV | |
| <i>PvHsf-10</i> | A1 | 18-111 | 149-199 | (224) KKRR | (482) LLSSDT | (432) PSIWDEILQT | |
| <i>PvHsf-18</i> | A1 | 12-105 | 141-191 | (216) KKRR | (454) LTKQMGLL | (400) DEFWELFFRP | |
| <i>PpHsf-03</i> | A1 | 43-136 | 163-213 | (234) RKKRR | | (405) SGFWEQFLTE | |
| <i>PpHsf-04</i> | A1 | 56-149 | 190-240 | (263) RKKRR | (467) LDGDLDL | (449) DIFWEQFL | |
| <i>PpHsf-07</i> | A1 | 56-149 | 192-242 | (265) RKKRR | (472) LDHDLDL | (454) DIFWEQFLSE | |
| <i>LjHsf-01</i> | A2 | 46-139 | 169-219 | (244) RKKRR | (376) LVDHMGYL | (291) GSIFSAAYDN | (367) DDWTEDLQD |
| <i>MtHsf-07</i> | A2 | 44-137 | 168-218 | (239) KRKRR | (244) LTASLSLENL | (321) DAVWEDLL | (361) DNWTVDLQK |
| <i>CaHsf-11</i> | A2 | 45-138 | 170-220 | (241) KRKRR | (359) LVDQMDF | (309) DTVWEDLLNQ | (349) DDDWTVDLQK |
| <i>GmHsf-10</i> | A2 | 41-134 | 166-216 | (239) RKKRR | (361) LVDHMGYL | (312) DSVWEDLLNQ | (351) ADEWSEDLQK |
| <i>GmHsf-35</i> | A2 | 41-134 | 164-214 | (239) NRKRR | (354) LVDHMDYL | (280) DTFWSPAYDN | (345) DDWSEQLQD |
| <i>GmHsf-41</i> | A2 | 40-133 | 163-213 | (239) NRKRR | | (268) DTFWSPAYDN | |
| <i>CcHsf-05</i> | A2 | 40-133 | 163-213 | (236) RKKRR | (326) LVDHMGYL | (269) ESFFSAACDD | (316) DDEWNEDELQK |
| <i>PvHsf-04</i> | A2 | 43-135 | 164-214 | (240) NRKRR | (345) LEDLVAN | (280) DTFWSPAFDS | (353) DDWMEQFQD |
| <i>PvHsf-17</i> | A2 | 43-136 | 166-216 | (239) RKKRR | (362) LVDHLGHL | (313) DAIWEDLLNQ | (353) DEWSEDLQK |
| <i>LjHsf-08</i> | A3 | 92-185 | 214-264 | (276) KKK8RVRRK | | (311) PDWGNMIM | |
| <i>GmHsf-08</i> | A3 | 37-130 | 159-209 | (230) PKVRRRF | | (259) QPDWRNV | (412) DMWDINYL |
| <i>GmHsf-23</i> | A3 | 45-138 | 169-219 | (229) RHKK8RVVRK | | (351) EDIWDSDGLNV | (393) SDIWDIGLG |
| <i>GmHsf-30</i> | A3 | 1-87 | 118-168 | (189) RVVRK | (393) LGSGLGD | (218) HDWRNIGM | (344) EDIWDSDGLNV |
| <i>CcHsf-02</i> | A3 | 17-110 | 141-191 | (201) RHKK | (312) LDFSALGI | (242) PDWRIIGMS | (326) EDIWDSDGLNV |
| <i>PvHsf-14</i> | A3 | 20-113 | 144-194 | (204) RHKK | | (245) PDWRNIDMSS | (368) EDIWDSDGLNV |
| <i>LjHsf-06</i> | A4 | 11-104 | 135-185 | (203) RKRR | (240) LTLNMRERLDQ | (254) MLFWETIAHE | (337) DVFWEQFLTE |
| <i>LjHsf-11</i> | A4 | 11-104 | 136-186 | (204) RKRR | (248) LDSLES | (255) MTFWENIVHD | (340) DVFWEQFLTE |
| <i>MtHsf-03</i> | A4 | 12-105 | 139-189 | (194) KKEQKRRK | (234) LSLNLEQLDLL | (248) MTFWEEITND | (353) NEFWGQYL |
| <i>MtHsf-16</i> | A4 | 10-103 | 134-184 | (202) RKRR | (240) LTLNTERL | (254) VAFWETLA | (337) DVFWEQFLTE |
| <i>CaHsf-09</i> | A4 | 11-104 | 135-185 | (204) RKRR | (243) LNAERLDQL | (255) MVFWETIAHE | (337) DVFWEQFLTE |
| <i>GmHsf-12</i> | A4 | 1-84 | 115-165 | (183) RKRR | (220) LTLNVERLDQL | (234) MAFWEAIVHD | (318) DVFWEQFLTE |
| <i>GmHsf-17</i> | A4 | 11-104 | 135-185 | (203) RKRR | (240) LTLNVERLDQL | (254) MAFWEAIVHD | (338) DVFWEQFLTE |
| <i>GmHsf-32</i> | A4 | 12-105 | 138-188 | (206) RKRR | (195) LNLLLL | (257) MTFWENITHD | (341) DIFWERFLTE |
| <i>GmHsf-36</i> | A4 | 12-105 | 138-188 | (206) RKRR | (195) LNLLLL | (257) MTFWEDITHD | (341) DIFWERFLTE |
| <i>CcHsf-14</i> | A4 | 11-104 | 135-185 | (203) RKRR | (240) LTLNMRERLDQL | (254) MAFWEAIAHD | (289) DVFWEQFLTE |
| <i>CcHsf-17</i> | A4 | 11-104 | 137-187 | (206) RKRR | (252) LLESSI | (257) IEFWEEMSHD | (299) DIFWEKFLTE |
| <i>PvHsf-08</i> | A4 | 12-105 | 138-188 | (206) RKRR | | (257) IMFWENIAHD | (336) DIFWERFLTE |
| <i>PvHsf-21</i> | A4 | 12-105 | 136-186 | (204) RKRR | (241) LALNVERLDQL | (255) VAFWEAIAHD | (339) DVFWEQFLTE |
| <i>MtHsf-02</i> | A5 | 20-113 | 140-189 | (200) RK10KKRRL | (257) LSLADLDM | (307) DVFWEQFLTE | |
| <i>MtHsf-04</i> | A5 | 139-232 | 259-309 | (317) HVRR | (356) LRLELS | | |
| <i>MtHsf-05</i> | A5 | 54-147 | 174-224 | (234) KRK10KKRR | (349) ISRQLNLTL | (435) DLFWEQFLTE | |
| <i>MtHsf-15</i> | A5 | 20-113 | 140-189 | (200) RK10KKRRL | (253) LRLELS | (435) DVFWENFLTE | |
| <i>CaHsf-05</i> | A5 | 15-108 | 135-185 | (208) KKRR | (477) MDNLTL | (431) DVFWEQFLTE | |
| <i>GmHsf-11</i> | A5 | 13-106 | 133-183 | (194) RK9KKRRLP | (474) MDQLTL | (427) DVFWEQFLTE | |
| <i>GmHsf-16</i> | A5 | 11-104 | 131-181 | (192) RK9KKRRLP | (472) MDQLTL | (425) DVFWEQFLTE | |
| <i>CcHsf-10</i> | A5 | 13-106 | 133-183 | (194) RK10KKRRL | (399) MDQLTL | (352) DVFWEQFLTE | |
| <i>CcHsf-11</i> | A5 | 14-107 | 131-181 | (192) RR10KKRRL | (438) MDQLTL | (391) DVFWEQFLTE | |
| <i>PvHsf-07</i> | A5 | 12-105 | 131-181 | (204) KKRR | | (389) DVFWEQFLTE | |
| <i>PvHsf-27</i> | A5 | 18-111 | 138-188 | (211) KKRR | (482) MDQLRL | (435) DVFWEQFLTE | |
| <i>LjHsf-10</i> | A6 | 38-131 | 160-210 | (223) KEWRK7KKRRR | (338) LAEQLGYL | (313) EVFWQDLLDE | |
| <i>GmHsf-21</i> | A6 | 22-115 | 145-195 | (211) RK10KRIRS | (312) LAEELGYL | (283) EVLWEELNE | |
| <i>GmHsf-25</i> | A6 | 124-217 | 251-301 | (326) NKRRR | (380) LDLALNL | (415) EVFWQDLLNE | |
| <i>GmHsf-45</i> | A6 | 17-110 | 142-192 | (218) KKRRR | (270) LPLVLNL | (304) EVFWQDLLNE | |
| <i>CcHsf-04</i> | A6 | 38-131 | 162-212 | (237) KKRRR | (315) LAEQLGYL | (293) EVFWQDLLNE | |
| <i>PvHsf-01</i> | A6 | 34-127 | 153-203 | (229) KKRR | (323) LSQELGYL | (303) EGFWEEDLLAL | |
| <i>PvHsf-12</i> | A6 | 42-135 | 165-215 | (240) KKRR | (287) LDLGLNL | (319) EVFWQDLLKE | |
| <i>LjHsf-09</i> | A7 | 32-125 | 150-200 | (213) KEKRR7RKRR | | (304) EEFWEALLFS | |
| <i>MtHsf-01</i> | A7 | 27-120 | 140-190 | (205) KKK9KKRRL | (253) LEMLALEM | (292) EGFWEEDLMFS | |
| <i>CaHsf-06</i> | A7 | 38-131 | 162-212 | (225) KEKRR7KKRRR | | (309) EGFGEELFSE | |
| <i>CaHsf-13</i> | A7 | 38-131 | 162-212 | (225) KEKRR7KKRRR | (273) LEVLAMEM | | |
| <i>GmHsf-22</i> | A7 | 39-132 | 158-208 | (232) KKRR | (330) LANQLDLL | (298) EEFWEELLFS | |
| <i>GmHsf-44</i> | A7 | 46-139 | 173-223 | (236) KEKRR7KKRRR | (292) LEVLAM | (328) EGFWEELFSE | |
| <i>CcHsf-16</i> | A7 | 48-141 | 171-221 | (234) KEKRR7KKRRR | (265) LELLAMEM | (301) EGFWEELFSE | |
| <i>CcHsf-18</i> | A7 | 35-128 | 154-204 | (228) KKRR | (331) LANQLGCF | (299) EEFWEELCS | |
| <i>PvHsf-13</i> | A7 | 41-134 | 160-210 | (234) KKRR | (346) LANELGCL | (314) EEFWEELLIS | |
| <i>PvHsf-26</i> | A7 | 46-139 | 168-218 | (231) KEKRR7KKRRR | (286) LEVLAMEM | (322) EGFWEELFSE | |
| <i>LjHsf-07</i> | A8 | 14-108 | 144-194 | (246) KRKH | (272) LKDLCSISSEFL | (307) DGSWEQLFLG | |
| <i>MtHsf-17</i> | A8 | 20-114 | 151-201 | (253) KKKPVVPR | (287) LKLLDEKLCPL | (312) DGSWEQLFLG | |
| <i>GmHsf-13</i> | A8 | 8-101 | 137-187 | | (281) LSPLN | (298) DGSWEQLFLG | |
| <i>GmHsf-15</i> | A8 | 14-107 | 143-193 | | (287) LSPLN | (304) DGSWEQLFLG | |
| <i>CcHsf-09</i> | A8 | 12-105 | 141-191 | | (285) LSPLN | (302) DGLWEQLFLG | |
| <i>PvHsf-03</i> | A8 | 12-105 | 141-191 | | (265) LKDLCL | (300) DGSWEQLFLG | |
| <i>LjHsf-05</i> | A9 | 60-153 | 179-229 | (243) KRKR8KRPRL | (361) LELEDL | | |
| <i>GmHsf-29</i> | A9 | 32-125 | 149-199 | (213) RKRKR8KRPRL | (287) LEDELCSLQGL | (353) TDWVSGSASG | |
| <i>GmHsf-39</i> | A9 | 27-120 | 144-194 | (208) RKRKR8KRPRL | (279) LEDELGNSLQGL | (345) TDWVSGSASG | |
| <i>CcHsf-12</i> | A9 | 59-152 | 176-226 | (240) RKRKR8KRPRL | (334) IYLELEDL | (346) TDWVSGSAGGL | |
| <i>PvHsf-19</i> | A9 | 70-163 | 187-237 | (251) RKRKR8KRPRL | (379) LELEDL | (389) TDWVSGSTFG | |
| <i>PvHsf-20</i> | A9 | 70-163 | 187-237 | (251) RKRKR8KRPRL | (379) LELEDL | (389) TDWVSGSAGGL | |
| <i>CrHsf-02</i> | A | 8-101 | 161-211 | (248) RKRKR | (742) LSGLDL | | |
| <i>MtHsf-11</i> | B1 | 114-207 | 271-300 | (355) KKR | (406) LHPLEREITL | | |
| <i>MtHsf-19</i> | B1 | 7-100 | 145-174 | (238) KRGR | (152) LTVELTL | | |
| <i>GmHsf-03</i> | B1 | 7-100 | 165-194 | (243) NHRKGR | | | |
| <i>GmHsf-28</i> | B1 | 8-101 | 167-196 | (246) NHRKGR | | | |
| <i>GmHsf-40</i> | B1 | 9-102 | 153-182 | (262) RKRGR | | | |
| <i>CcHsf-07</i> | B1 | 7-123 | 183-212 | (262) KRGR | | | |
| <i>CcHsf-20</i> | B1 | 7-123 | 176-205 | (278) RKR | | | |
| <i>PvHsf-09</i> | B1 | 7-100 | 152-181 | (259) RKR | | | |
| <i>PvHsf-24</i> | B1 | 7-100 | 166-195 | (247) KRVR | (270) FEPLNL | | |
| <i>LjHsf-02</i> | B2 | 20-113 | 187-216 | (280) KRHR | (240) LELIPAKDL | | |
| <i>MtHsf-10</i> | B2 | 22-115 | 190-219 | (300) KRKR | (246) LDLLPLRNVSL | | |
| <i>CaHsf-03</i> | B2 | 27-120 | 191-220 | (276) KRTR | | | |
| <i>CaHsf-04</i> | B2 | 21-114 | 164-193 | (241) KRAR | | | |
| <i>CaHsf-08</i> | B2 | 22-115 | 187-216 | (280) KRFR | | | |
| <i>GmHsf-04</i> | B2 | 5-98 | 174-203 | | | | |
| <i>GmHsf-18</i> | B2 | 31-124 | 179-208 | (262) KRAR | | | |
| <i>GmHsf-24</i> | B2 | 21-114 | 173-202 | (238) KRAR | | | |
| <i>GmHsf-27</i> | B2 | 22-115 | 192-221 | | | | |
| <i>GmHsf-38</i> | B2 | 30-123 | 180-209 | (279) KRAR | | | |
| <i>GmHsf-46</i> | B2 | 21-114 | 178-207 | (242) KKRAR | | | |
| <i>CcHsf-03</i> | B2 | 19-112 | 143-172 | (212) KRGR | | | |
| <i>CcHsf-08</i> | B2 | 22-115 | 190-219 | (286) KRKR | | | |
| <i>PvHsf-11</i> | B2 | 21-114 | 177-206 | (249) KRKR | | | |
| <i>PvHsf-15</i> | B2 | 22-115 | 190-219 | (292) KRKR | | | |
| <i>PvHsf-28</i> | B2 | 28-121 | 182-211 | (275) KRAR | | | |
| <i>MtHsf-14</i> | B3 | 20-113 | 153-182 | (154) KK12KRK | (174) LLDLVI | | |
| <i>CaHsf-07</i> | B3 | 20-113 | 157-186 | (172) KRKCK | (178) LLDLVA | | |
| <i>GmHsf-07</i> | B3 | 18-111 | 155-184 | (170) KRKCK | (198) LFGVRL | | |
| <i>GmHsf-43</i> | B3 | 18-113 | 157-186 | (172) KRKCK | (200) LFGVRL | | |
| <i>CcHsf-06</i> | B3 | 22-115 | 155-184 | (170) KRKCK | (196) PKLFGVRL | | |
| <i>PvHsf-02</i> | B3 | 57-150 | 187-216 | (202) KRKCR | (228) LSFRLRL | | |
| <i>PvHsf-22</i> | B3 | 19-112 | 156-185 | (171) KRKCK | (199) LFGVRLDV | | |
| <i>MtHsf-06</i> | B4 | 22-115 | 201-230 | (320) KTK8KKR | (363) LGLNLM | | |
| <i>MtHsf-13</i> | B4 | 23-116 | 166-195 | (245) KKRVRH | (212) LKLEVEL | | |
| <i>GmHsf-06</i> | B4 | 23-116 | 169-198 | (261) KKRLH | (268) LEELHMMIISL | | |
| <i>GmHsf-09</i> | B4 | 22-115 | 199-228 | (317) KTK8KKR | (348) LEKDDLGLNL | | |
| <i>GmHsf-14</i> | B4 | 22-115 | 200-229 | (317) KTK8KKR | (348) LEKDDLGLNL | | |
| <i>GmHsf-33</i> | B4 | 3-96 | 149-178 | (238) KKRLH | (193) LKLELDS | | |
| <i>GmHsf-34</i> | B4 | 22-115 | 201-230 | (318) KTK8KKR | (354) LENEDELLGLNL | | |
| <i>GmHsf-42</i> | B4 | 12-105 | 194-223 | (310) KTK8KKR | (348) LENEDELLGLNL | | |
| <i>CcHsf-15</i> | B4 | 22-115 | 149-178 | (249) RCKTK8KKR | (292) LGLNLM | | |
| <i>PvHsf-05</i> | B4 | 22-115 | 191-220 | (286) KTK8KKR | (327) FGLNLM | | |
| <i>PvHsf-23</i> | B4 | 22-115 | 181-210 | (302) KTK8KKR | (338) LGLNLM | | |
| <i>PvHsf-25</i> | B4 | 23-116 | 168-197 | (259) KKR | | | |
| <i>SmHsf-01</i> | B4 | 22-101 | 192-221 | (270) RKR | (292) IELELM | | |
| <i>PpHsf-01</i> | B4 | 23-116 | 176-205 | | | | |
| <i>PpHsf-02</i> | B4 | 23-116 | 178-207 | | | | |
| <i>PpHsf-05</i> | B4 | 23-116 | 178-207 | (350) KRR | (401) LLICA | | |
| <i>PpHsf-06</i> | B4 | 26-119 | 181-210 | | | | |