

**Supplementary Table S1. The sequence information used in the phylogenetic tree.**

Group	Designation	Match in NCBI	Description
<b>New-type FNSI</b>	<b>SIDMR6-1</b>	XP_019069725.1	<i>Solanum lycopersicum</i>
	<b>SIDMR6-2</b>	XP_004241427.1	<i>Solanum lycopersicum</i>
	<b>StDMR6-1</b>	XP_006347521.1	<i>Solanum tuberosum</i>
	<b>StDMR6-2</b>	XP_006347314.1	<i>Solanum tuberosum</i>
	<b>NtFNSI</b>	NP_001239794.1	<i>Glycine max</i>
	<b>CaFNSI</b>	XP_027109944.1	<i>Coffea Arabica</i>
	<b>PpFNSI</b>	XP_007218269.1	<i>Prunus persica</i>
	<b>PtrFNSI</b>	XP_002321354.3	<i>Populus trichocarpa</i>
	<b>TcFNSI</b>	EOY23715.	<i>Theobroma cacao</i>
	<b>CsFNSI</b>	XP_028118921.1	<i>Camellia sinensis</i>
	<b>AtDMR6</b>	AT5G24530.1	<i>Arabidopsis thaliana</i>
	<b>OsFNSI-1</b>	LOC_Os03g03034.1	<i>Oryza sativ</i>
	<b>OsFNSI-2</b>	LOC_Os04g49194.1	<i>Oryza sativa</i>
	<b>TaS5H</b>	ABB20895.1	<i>Triticum aestivum</i>
	<b>SbDMR6-1</b>	Sobic.001G526900.1	<i>Sorghum bicolor</i>
	<b>SbDMR6-2</b>	Sobic.001G314300.1	<i>Sorghum bicolor</i>
	<b>SbDMR6-3</b>	Sobic.006G190000.1	<i>Sorghum bicolor</i>
	<b>ZmFNSI-1</b>	Zm00001d029744	<i>Zea may</i>
	<b>ZmFNS I -2</b>	Zm00001d027423	<i>Zea mays</i>
	<b>HvS5H</b>	BAJ94485.1	<i>Hordeum vulgare</i>
<b>S3H</b>	<b>Sis3H</b>	7G210600.1	<i>Setaria italic</i>
	<b>ZmS3H</b>	Zm00001d002564	<i>Zea mays</i>
	<b>OsDLO</b>	LOC_Os04g49210.1	<i>Oryza sativa</i>
	<b>HvS3H</b>	BAJ94485.1	<i>Hordeum vulgare</i>
	<b>PpS3H</b>	XP_007218269.1	<i>Prunus persica</i>
	<b>PtrS3H</b>	XP_002317046.3	<i>Populus trichocarpa</i>
	<b>AtS3H</b>	AT4G10500.1	<i>Arabidopsis thaliana</i>
	<b>AtDLO2</b>	AT4G10490.1	<i>Arabidopsis thaliana</i>
	<b>VvS3H</b>	XP_002267625.1	<i>Vitis vinifera</i>
	<b>TcDLO2</b>	XP_007039319.1	<i>Theobroma cacao</i>
<b>FNSI</b>	<b>SmFNSI/F3H</b>	XP_002985262	<i>Selaginella moellendorffii</i>
	<b>PaFNSI/F2H</b>	KJ439220	<i>Plagiochasma appendiculatum</i>
	<b>MeFNSI</b>	QEP99659.1	<i>Marchantia emarginata</i>
	<b>MpFNSI</b>	QEP99658.1	<i>Marchantia paleacea</i>
	<b>CjFNSI/F2H</b>	QEP99661	<i>Conocephalum japonicum</i>
	<b>CjFNSI</b>	QEP99662	<i>Conocephalum japonicum</i>

	<b>PaFNSI</b>	QEP99657.1	<i>Plagiochasma appendiculatum</i>
	<b>CcFNSI/F2H</b>	QEP99660.1	<i>Conocephalum conicum</i>
	<b>DcFNSI</b>	AF184270	<i>Daucus carota</i>
	<b>PcFNSI</b>	AY817680	<i>Petroselinum crispum</i>
	<b>AcFNSI</b>	DQ683350	<i>Aethusa cynapium</i>
	<b>PpFNSI/F3H</b>	XP_001780809	<i>Physcomitrella patens</i>
	<b>PrF3H/FNSI</b>	AGY80772	<i>Pinus radiata</i>
	<b>PsF3H/FNSI</b>	ABK25766	<i>Picea sitchensis</i>
	<b>GbF3H/FNSI</b>	AAU93347	<i>Ginkgo biloba</i>
	<b>AgFNSI</b>	AY817676	<i>Apium graveolens</i>
<b>F3H</b>	<b>HvF3H</b>	ACH42080.1	<i>Hordeum vulgare</i>
	<b>AmF3H</b>	AY817678	<i>Ammi majus</i>
	<b>PaF3H</b>	AY817674	<i>Pimpinella anisum</i>
	<b>PcF3H</b>	AY230248	<i>Petroselinum crispum</i>
	<b>AgF3H</b>	AY817679	<i>Anethum graveolens</i>
	<b>AcF3H</b>	DQ683351	<i>Aethusa cynapium</i>
	<b>MtF3H</b>	8g024120.1	<i>Medicago truncatula</i>
	<b>VvF3H</b>	NP001268034.1	<i>Vitis vinifera</i>
	<b>CsF3Ha</b>	KY615688	<i>Camellia sinensis</i>
	<b>CsF3Hb</b>	KY615689	<i>Camellia sinensis</i>
	<b>AtF3H</b>	NP_190692	<i>Arabidopsis thaliana</i>
	<b>SbF3H</b>	ADB66755.1	<i>Sorghum bicolor</i>
	<b>ZmF3H</b>	NM_001136803	<i>Zea mays</i>
	<b>OsF3H</b>	XM_015779149	<i>Oryza sativa</i>
	<b>TaF3H</b>	ABR13013.1	<i>Triticum aestivum</i>
	<b>DuF3H</b>	comp23389	<i>Desmodium uncinatum</i>
<b>ANS</b>	<b>NtANS</b>	XP_009604108.1	<i>Nicotiana tomentosiformis</i>
	<b>AtANS</b>	NP_001031700	<i>Arabidopsis thaliana</i>
	<b>CsANSa</b>	KY615704	<i>Camellia sinensis</i>
	<b>CsANSb</b>	KY615703	<i>Camellia sinensis</i>
	<b>VvANS</b>	RVW17740.1	<i>Vitis vinifera</i>
	<b>GmANS</b>	NP_001239794.1	<i>Glycine max</i>
	<b>MtANS</b>	XP_003611189.1	<i>Medicago truncatula</i>
	<b>DuANS</b>	comp23380	<i>Desmodium uncinatum</i>
	<b>GmLDOX</b>	NP_001241248.1	<i>Glycine max</i>
	<b>CsFLSa:</b>	KY615705	<i>Camellia sinensis</i>
	<b>CsFLSb</b>	KY615707	<i>Camellia sinensis</i>
	<b>CsFLSc</b>	KY615706	<i>Camellia sinensis</i>
	<b>GsFLS</b>	KHN35581	<i>Glycine soja</i>
	<b>FaFLS</b>	ABH07784	<i>Fragaria x ananassa</i>

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<b>FLS</b>	<b>PpFLS</b>	AJO70134	<i>Prunus persica</i>
	<b>DuFLS</b>	comp24814	<i>Desmodium uncinatum</i>
	<b>AtFLS1</b>	AED91333	<i>Arabidopsis thaliana</i>
	<b>VvFLS1</b>	AB086055	<i>Vitis vinifera</i>
	<b>DuLDOX</b>	comp23594	<i>Desmodium uncinatum</i>
	<b>VvLDOX</b>	RVW17740.1	<i>Vitis vinifera</i>
	<b>MtLDOX</b>	XP_003601080.1	<i>Medicago truncatula</i>

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