

**Table S2. Novel Domain Architectures shared across the Pseudofungi.**

Gene Name	Domain Architecture	Oomycete exemplar (Accession number)	<i>Hyphochytrium</i> homologue (Accession number)
1-phosphatidylinositol 3-phosphate 5-kinase FAB1	FYVE_like_SF-GAF	<i>Phytophthora nicotianae</i> (KUF83522)	Hypho2016_00014879
Long-chain-fatty-acid--AMP ligase FadD29	FAAL-PKS_PP-BioF	<i>Phytophthora nicotianae</i> (KUF80336)	Hypho2016_00002377
rhodanese domain-containing dual specificity protein phosphatase	DSPc-FYVE_like_SF- RHOD	<i>Phytophthora nicotianae</i> (KUF77573)	Hypho2016_00006029
putative aminotransferase	AAT_like-dihydrodipicolinate reductase	<i>Phytophthora sojae</i> (XP_009530580)	Hypho2016_00002138
putative callose synthase	Glucan_synthase-Sugar_tr	<i>Phytophthora infestans</i> (XP_002998554)	Hypho2016_00001204
conserved hypothetical	RING-finger-tub	<i>Phytophthora infestans</i> (XP_002898661)	Hypho2016_00011754
AGC/RSK/RSKP90 protein kinase	PH-PH-PH-STKc_AGC	<i>Phytophthora infestans</i> (XP_008915041)	Hypho2016_00001388
phosphatidylinositol 3 and 4-kinase-like protein	PH-FYVE_scVPS27p-PI3Kc_II	<i>Phytophthora sojae</i> (XP_009538551)	Hypho2016_00003770
PAX-interacting protein 1	TPR_11-Prefoldin_2	<i>Phytophthora nicotianae</i> (KUF96058)	Hypho2016_00008250
histidine kinase A two component receptor	PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-PAS-Histidine kinase-like ATPases	<i>Phytophthora sojae</i> (XP_009526816.1)	Hypho2016_00014859
TKL protein kinase	S_TKc-DEP	<i>Phytophthora parasitica</i> (ETM36095)	Hypho2016_00016538
L-aminoadipate-semialdehyde dehydrogenase large subunit	Abhydrolase_6-A_NRPS-SDR_e1	<i>Phytophthora infestans</i> (XP_002905400)	Hypho2016_00000654