

**Table S1. Proteins included in the Phylogenetic tree of Hak family in Fungi**

ID sequence	Fungi Strains
XP_016607719.1	<i>Spizellomyces punctatus</i> DAOM BR117
ABI37006.2	<i>Debaryomyces hansenii</i> CBS 767
XP_718838.2	<i>Candida albicans</i> SC5314
XP_001383251.2	<i>Scheffersomyces stipitis</i> CBS 6054
XP_001528091.1	<i>Lodderomyces elongisporus</i>
VBB78842.1	<i>Yarrowia lipolytica</i> <sup>a</sup>
XP_501676.1	<i>Yarrowia lipolytica</i> <sup>b</sup>
XP_002417280.1	<i>Candida dubliniensis</i> CD36
XP_036666213.1	<i>Candida parapsilosis</i>
EDK41390.2	<i>Meyerozyma guilliermondii</i>
OVF10943.1	<i>Clavispora lusitaniae</i>
XP_002549931.1	<i>Candida tropicalis</i> MYA-3404
XP_003866449.1	<i>Candida orthopsilosis</i> Co 90-125
AAB17122.2	<i>Schwanniomyces occidentalis</i>
CCE34941.1	<i>Ogataea angusta</i>
XP_007007047.1	<i>Tremella mesenterica</i> DSM 1558
XP_001876329.1	<i>Laccaria bicolor</i> S238N-H82
XP_003032151.1	<i>Schizophyllum commune</i> H4-8
XP_007407239.1	<i>Melampsora larici-populina</i> 98AG31
KAF9808492.1	<i>Postia placenta</i> MAD-698-R-SB12
XP_003325997.2	<i>Puccinia graminis f. sp. tritici</i> CRL 75-36-700-3
KAG5294344.1	<i>Histoplasma capsulatum</i> G217B
EEQ88319.2	<i>Blastomyces dermatitidis</i> ER-3
XP_001247463.2	<i>Coccidioides immitis</i> RS
XP_003169811.1	<i>Nannizzia gypsea</i> CBS 118893

EGE03791.1	<i>Trichophyton equinum</i> CBS 127.97
SMY29655.1	<i>Zymoseptoria tritici</i> ST99CH_1A5
XP_001273808.1	<i>Aspergillus clavatus</i> NRRL 1
XP_001399699.2	<i>Aspergillus niger</i> CBS 513.88
XP_014080355.1	<i>Bipolaris maydis</i> ATCC 48331
XP_001804449.1	<i>Parastagonospora nodorum</i> SN15
XP_964946.1	<i>Neurospora crassa</i> OR74A
XP_040773768.1	<i>Cryphonectria parasitica</i> EP155 <sup>a</sup>
KAF3770430.1	<i>Cryphonectria parasitica</i> EP155 <sup>b</sup>
ELQ63511.1	<i>Pyricularia oryzae</i> 70-15
XP_009655039.1	<i>Verticillium dahliae</i> VdLs.17
XP_018242043.1	<i>Fusarium oxysporum</i>
XP_001554184.2	<i>Botrytis cinerea</i> B05.10
XP_001591952.1	<i>Sclerotinia sclerotiorum</i> 1980 UF-70
KAF9784960.1	<i>Thelephora terrestris</i>

<sup>a, b</sup> refer to different Haks in the same species