

Supporting Information

Substrate selectivity in starch polysaccharide monooxygenases

Van V. Vu^{1*}, John A. Hangasky², Tyler C. Detomasi³, Skylar Henry⁴, Son Tung Ngo^{5,6},
Elise A. Span⁷, and Michael A. Marletta^{2,3,4*}

¹NTT Hi-Tech Institute, Nguyen Tat Thanh University, Ho Chi Minh City, Vietnam

²California Institute for Quantitative Biosciences (QB3), University of California Berkeley,
Berkeley, California, USA 94720

³Department of Chemistry, University of California Berkeley, Berkeley, California, USA
94720

⁴Department of Molecular and Cell Biology, University of California Berkeley, Berkeley,
California, USA 94720

⁵Laboratory of Theoretical and Computational Biophysics, Ton Duc Thang University,
Vietnam

⁶Faculty of Applied Sciences, Ton Duc Thang University, Ho Chi Minh City, Vietnam

⁷Biophysics Graduate Group, University of California, Berkeley, California, USA 94720

*To whom correspondence should be addressed: Van V. Vu (Email: vanvu@ntt.edu.vn),
Michael A. Marletta (Tel: 510-642-8758 Email: marletta@berkeley.edu)

Table of Contents:

Amino acid sequences of AA13 PMOs used in this study	3
Figure S1. Relative activities of AA13 PMOs	4
Figure S2. HPAEC-PAD chromatograms for <i>NcAA13</i> ΔCBM	4
Figure S3. HPAEC-PAD chromatograms for <i>NcAA13</i> cat	5
Figure S4. HPAEC-PAD chromatogram for <i>MtAA13</i> +CBM	5
Figure S5. Rates of O ₂ reduction by AA13 PMOs	6
Figure S6. Docking of random coil amylose to <i>AoAA13</i>	7
Figure S7. Docking of single amylose helix to <i>AoAA13</i>	7
Table S1. Putative AA13 PMOs identified from the SSN	8

Amino acid sequences of AA13 PMOs used in this study

>NcAA13

HGYLTIPFSRTRLGAEAGLDTCPCECSILEPVTAWPNVTEAKVGRSGPCGYNARV SIDYNQPATN
WGNSPVVITYTAGDTVDVQWCVDHNGDHGGMFSYRICQDQELVNKFLTPGYLPTEAEKQAAE
DCFEKGTLPCTDVNGQSCDFSPDCQQGQACWRNDWFTCNAFQADSRRGCQGV DNAALGSC
FTTIAGGYTVTKKIKIPNYISGHTLLSFRWNSFQTAQVYLSCADIAIVGDSASTTKVSATATTLVTS
SKTASASCTPAATVAVTFNHLASTSYGESIKIVGSISQLGSWSASSGVALSASQYTTSNPLWTA
TVSLPAGTKFEYKFVKVSSEGSVAVTW ESDPNRSYTVPQSCAESVAVESSWK

>NcAA13ΔCBM

HGYLTIPFSRTRLGAEAGLDTCPCECSILEPVTAWPNVTEAKVGRSGPCGYNARV SIDYNQPATN
WGNSPVVITYTAGDTVDVQWCVDHNGDHGGMFSYRICQDQELVNKFLTPGYLPTEAEKQAAE
DCFEKGTLPCTDVNGQSCDFSPDCQQGQACWRNDWFTCNAFQADSRRGCQGV DNAALGSC
FTTIAGGYTVTKKIKIPNYISGHTLLSFRWNSFQTAQVYLSCADIAIVGD
SASTTKVSATATTLVTSSKTASAS

>NcAA13cat

HGYLTIPFSRTRLGAEAGLDTCPCECSILEPVTAWPNVTEAKVGRSGPCGYNARV SIDYNQPATN
WGNSPVVITYTAGDTVDVQWCVDHNGDHGGMFSYRICQDQELVNKFLTPGYLPTEAEKQAAE
DCFEKGTLPCTDVNGQSCDFSPDCQQGQACWRNDWFTCNAFQADSRRGCQGV DNAALGSC
FTTIAGGYTVTKKIKIPNYISGHTLLSFRWNSFQTAQVYLSCADIAIVGD

>MtAA13

HGYLTIPSSRTRLGAEAGLDSCPECSILEPVQSWPDLDAALVGRSGPCGYNARV SIDYNQPGE
HWGNP VATYSPGQVVEVQWCVDHNGDHGGMFSYRICQNQTLVDKFLTPGYLP TADEKQAA
EDCFQAGT L SCKDVTGQDCGYNPDCSEGQPCWRNDWFTCNAFQADSKRACQGV DNA PQG
SCYTSISGGFPVTKKIKIPDYQSSHTLLSFKWNSFQTGQIYLSCADIAITASN

>MtAA13+CBM

HGYLTIPSSRTRLGAEAGLDSCPECSILEPVQSWPDLDAALVGRSGPCGYNARV SIDYNQPGE
HWGNP VATYSPGQVVEVQWCVDHNGDHGGMFSYRICQNQTLVDKFLTPGYLP TADEKQAA
EDCFQAGT L SCKDVTGQDCGYNPDCSEGQPCWRNDWFTCNAFQADSKRACQGV DNA PQG
SCYTSISGGFPVTKKIKIPDYQSSHTLLSFKWNSFQTGQIYLSCADIAITASN

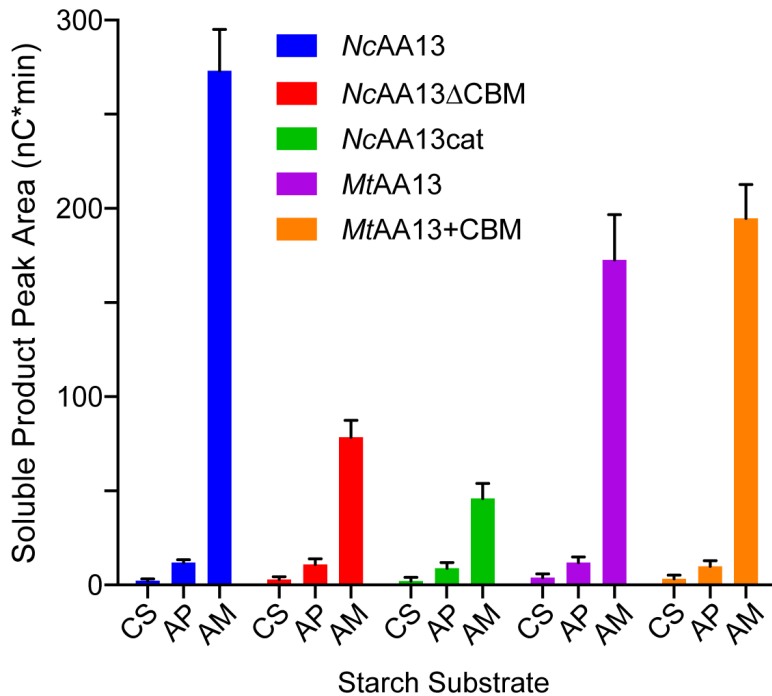


Figure S1. Relative activity of AA13 PMOs on cornstarch, amylopectin and potato amylose. PMO (5 μ M), ascorbic acid (2 mM) and 50 mg/mL starch polysaccharide in 50 mM sodium acetate buffer pH 5.0 were shaken at 1100 RPM for 2 hours at 40°C. CS = cornstarch; AP = amylopectin; AM = amylose

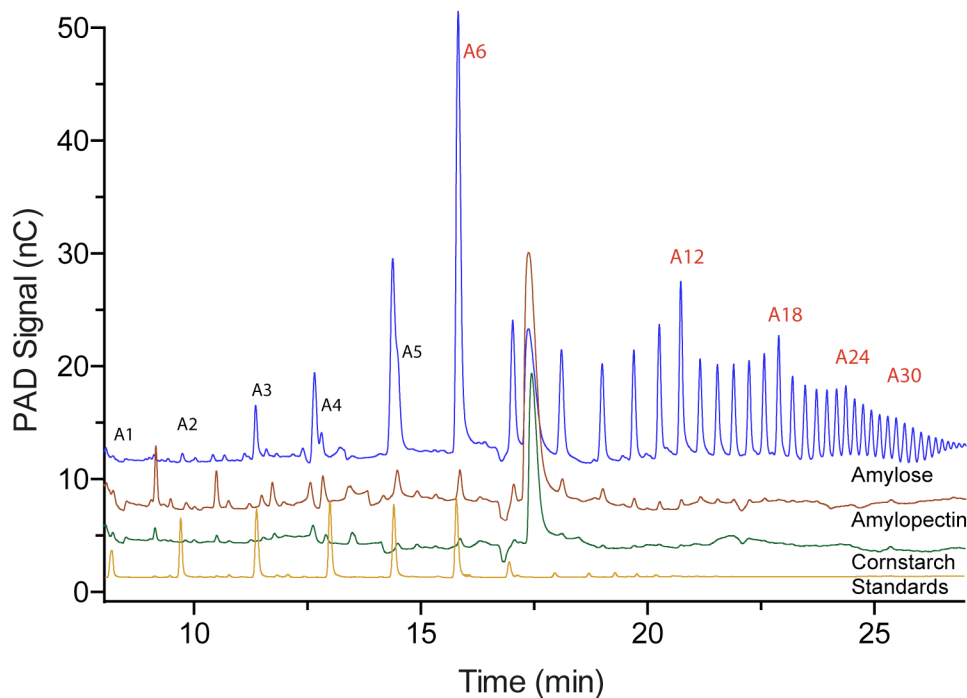


Figure S2. HPAEC-PAD chromatograms for *NcAA13*ΔCBM.

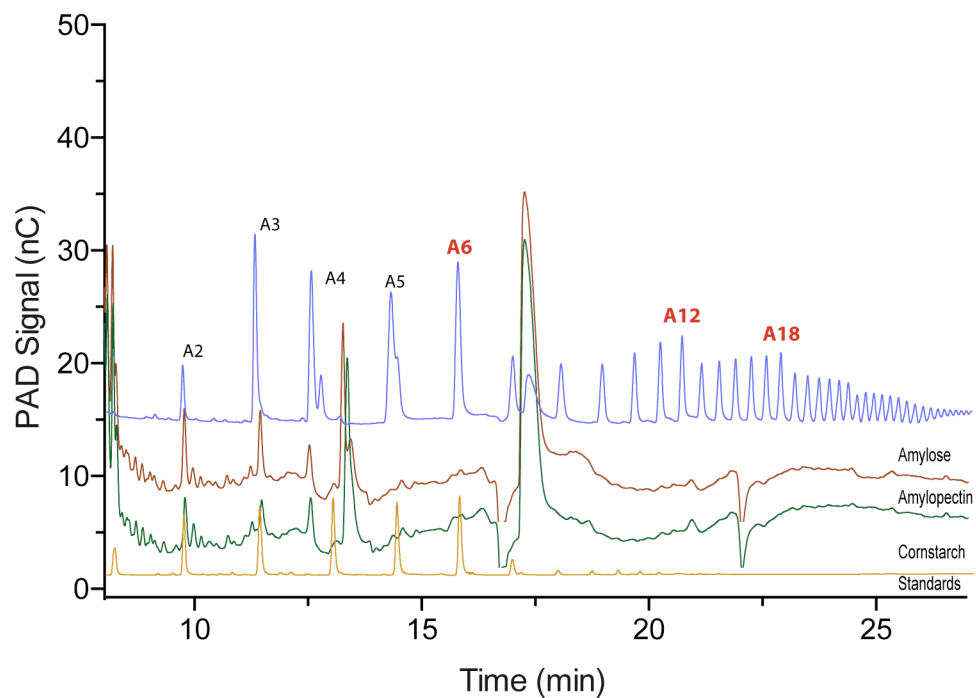


Figure S3. HPAEC-PAD chromatograms for *NcAA13cat*.

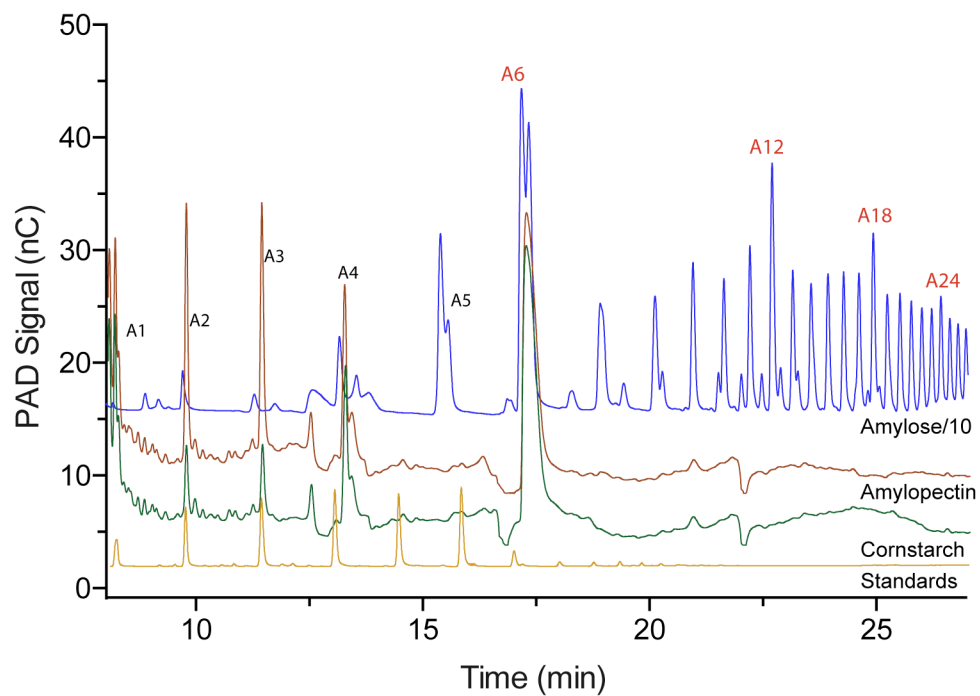


Figure S4. HPAEC-PAD chromatograms for *MtAA13+CBM*.

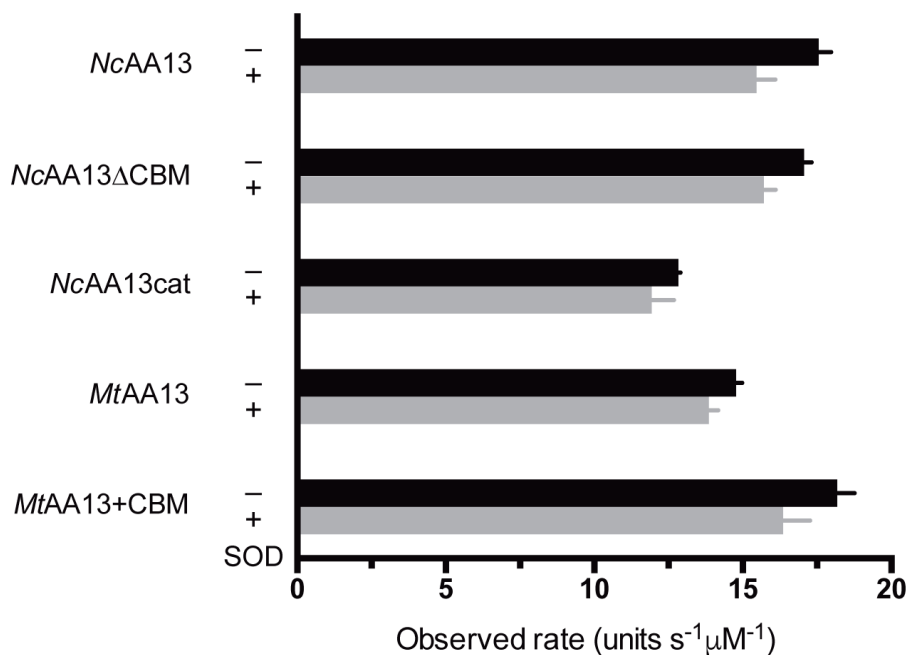


Figure S5. Rates of O₂ reduction by AA13 PMOs. Determined using a horseradish peroxidase (HRP) coupled assay in the presence (+) and absence (-) of superoxide dismutase (SOD, 250 units/mL). Reactions contained PMO (1 μM), HRP (1.3 μM), and Amplex Red (100 μM) in 50 mM MOPS pH 7.0 and were initiated by the addition of ascorbic acid (2 mM). Error bars represent one standard deviation of the mean (n=3).

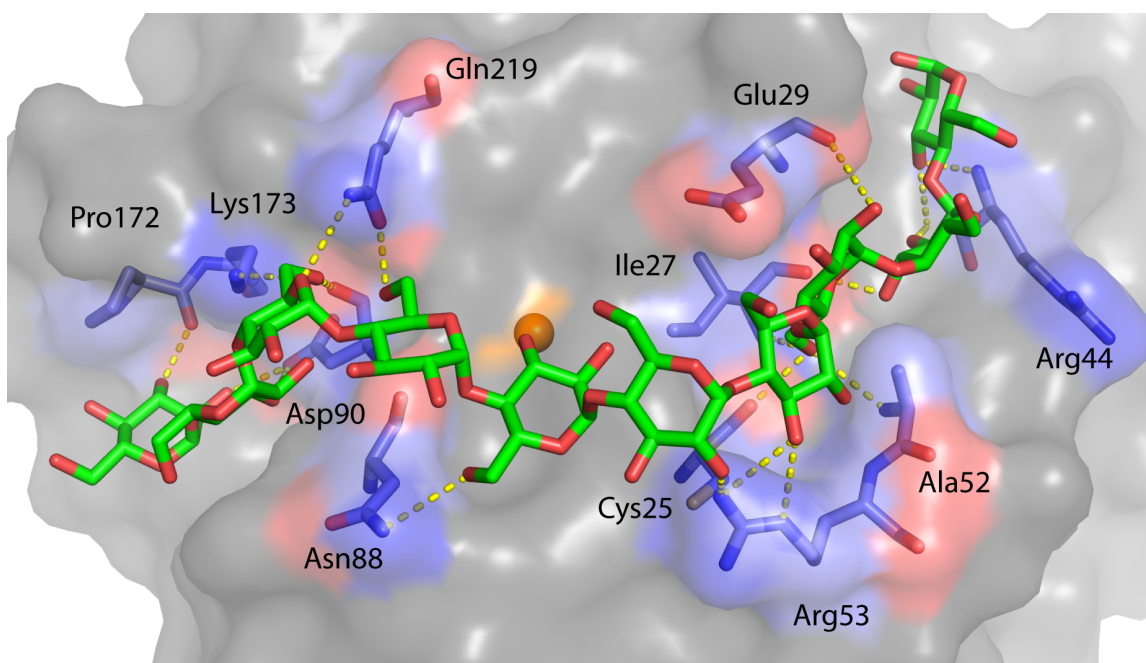


Figure S6. The three-dimensional docking model for the random amylose coil and AαAA13. The yellow dashed lines correspond to H-bonds between the substrate and enzyme.

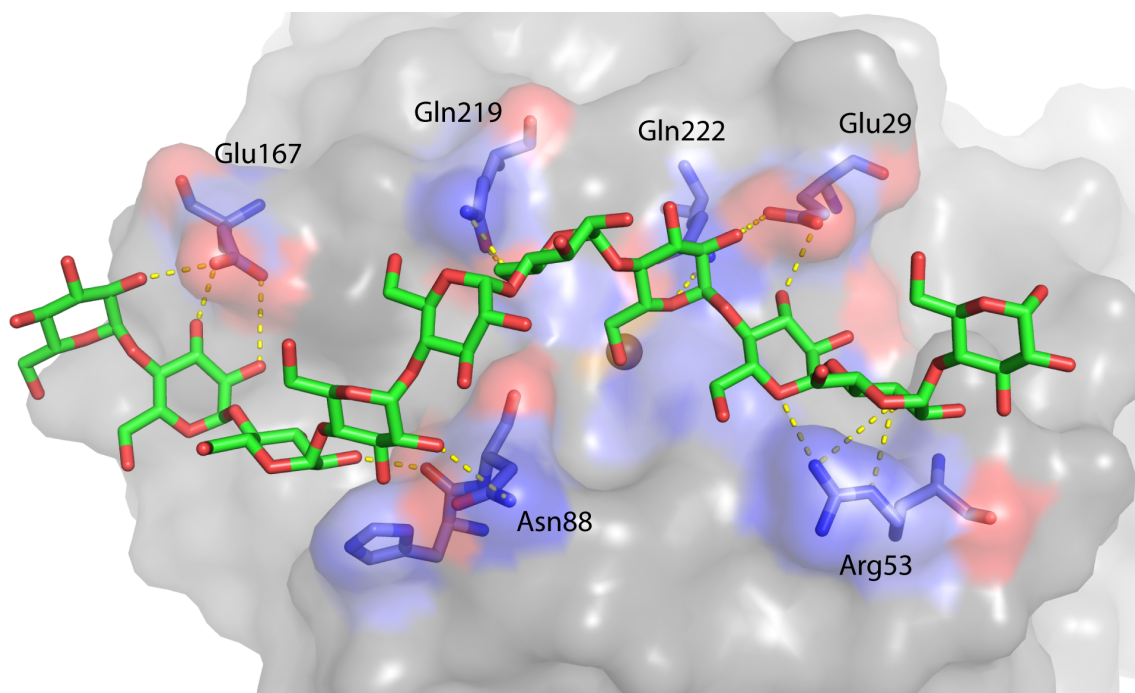


Figure S7. The three-dimensional docking model of an amylose single helix and AoAA13. The yellow dashed lines correspond to H-bonds between the substrate and enzyme.

Table S1. List of Putative AA13 PMOs identified from the SSN

Uniprot ID	Gene names	Organism
A0A086T7N6	ACRE_038340	<i>Acremonium chrysogenum</i> (strain ATCC 11550 / CBS 779.69 / DSM 880 / JCM 23072 / IMI 49137)
A0A177DCW3	CC77DRAFT_279631	<i>Alternaria alternata</i> (Alternaria rot fungus) (<i>Torula alternata</i>)
G1XQZ0	AOL_s00188g352	<i>Arthrobotrys oligospora</i> (strain ATCC 24927 / CBS 115.81 / DSM 1491) (Nematode-trapping fungus) (<i>Didymozoophaga oligospora</i>)
A0A1L9WHG2	ASPACDRAFT_187572 9	<i>Aspergillus aculeatus</i> ATCC 16872
A0A1F8AEL3	ABOM_001080	<i>Aspergillus bombycis</i>
A0A0U5GC36	ASPCAL12954	<i>Aspergillus calidoustus</i>
A0A0U5GSG2	ASPCAL03191	<i>Aspergillus calidoustus</i>
A0A211DBF8	P168DRAFT_315717	<i>Aspergillus campestris</i> IBT 28561
A0A212FE25	BDW47DRAFT_104467	<i>Aspergillus candidus</i>
A1CDY2	ACLA_008190	<i>Aspergillus clavatus</i> (strain ATCC 1007 / CBS 513.65 / DSM 816 / NCTC 3887 / NRRL 1)
A1CN59	ACLA_099410	<i>Aspergillus clavatus</i> (strain ATCC 1007 / CBS 513.65 / DSM 816 / NCTC 3887 / NRRL 1)
A0A0J5PLS4	Y699_08665	<i>Aspergillus fumigatus</i> Z5

A0A0S7DPS2	ALT_3234	<i>Aspergillus lentulus</i>
A0A0S7E6Q6	ALT_7690	<i>Aspergillus lentulus</i>
A0A0L1IRR4	ANOM_010742	<i>Aspergillus nomius</i> NRRL 13137
A0A2I1BYW6	P174DRAFT_514621	<i>Aspergillus novofumigatus</i> IBT 16806
A0A2I1C802	P174DRAFT_388563	<i>Aspergillus novofumigatus</i> IBT 16806
I8A699	Ao3042_02852	<i>Aspergillus oryzae</i> (strain 3.042) (Yellow koji mold)
Q2U8Y3	AO090701000246	<i>Aspergillus oryzae</i> (strain ATCC 42149 / RIB 40) (Yellow koji mold)
A0A1S9DA65	OAory_01016380	<i>Aspergillus oryzae</i> (Yellow koji mold)
A0A2I2FWK1	P170DRAFT_366747	<i>Aspergillus steynii</i> IBT 23096
A0A1L9U0T5	ASPSYDRAFT_54588	<i>Aspergillus sydowii</i> CBS 593.65
A0A2J5I000	BDW42DRAFT_165265	<i>Aspergillus taichungensis</i>
Q0CFN7	ATEG_07497	<i>Aspergillus terreus</i> (strain NIH 2624 / FGSC A1156)
Q0CGA6	ATEG_07286	<i>Aspergillus terreus</i> (strain NIH 2624 / FGSC A1156)
A0A231MI14	CDV56_03360	<i>Aspergillus thermomutatus</i>
A0A0K8LDU5	AUD_5347	<i>Aspergillus udagawae</i>
A0A1L9PD13	ASPVEDRAFT_26243	<i>Aspergillus versicolor</i> CBS 583.65
A0A0B7K062	BN869_000006652_1	<i>Bionectria ochroleuca</i> (<i>Gliocladium roseum</i>)
W6Z8F0	COCMIDRAFT_4809	<i>Bipolaris oryzae</i> ATCC 44560
W7E8Q4	COCVIDRAFT_16131	<i>Bipolaris victoriae</i> FI3
W6YYE8	COCCADRAFT_2463	<i>Bipolaris zeicola</i> 26-R-13
M7UUT4	BcDW1_3780	<i>Botryotinia fuckeliana</i> (strain BcDW1) (Noble rot fungus) (<i>Botrytis cinerea</i>)
G2YZ29	BofuT4P101000017001	<i>Botryotinia fuckeliana</i> (strain T4) (Noble rot fungus) (<i>Botrytis cinerea</i>)
Q2GZT1	CHGG_04965	<i>Chaetomium globosum</i> (strain ATCC 6205 / CBS 148.51 / DSM 1962 / NBRC 6347 / NRRL 1970) (Soil fungus)
M2S5V9	COCSADRAFT_191741	<i>Cochliobolus sativus</i> (strain ND90Pr / ATCC 201652) (Common root rot and spot blotch fungus) (<i>Bipolaris sorokiniana</i>)
A0A1Q8RYS4	CCHL11_01311	<i>Colletotrichum chlorophyti</i>
A0A010RMK9	CFIO01_05002	<i>Colletotrichum fioriniae</i> PJ7
T0MA78	CGLO_01909	<i>Colletotrichum gloeosporioides</i> (strain Cg-14) (Anthracnose fungus) (<i>Glomerella cingulata</i>)
L2G5Y0	CGGC5_6145	<i>Colletotrichum gloeosporioides</i> (strain Nara gc5) (Anthracnose fungus) (<i>Glomerella cingulata</i>)
E3QKY3	GLRG_06810	<i>Colletotrichum graminicola</i> (strain M1.001 / M2 / FGSC 10212) (Maize anthracnose fungus) (<i>Glomerella graminicola</i>)
H1V4C0	CH063_06930	<i>Colletotrichum higginsianum</i> (strain IMI 349063) (Crucifer anthracnose fungus)
A0A1B7Y366	CH63R_10554	<i>Colletotrichum higginsianum</i> (strain IMI 349063) (Crucifer anthracnose fungus)

A0A167CH28	CI238_02795 CSPAĒ12_11820	<i>Colletotrichum incanum</i>
A0A135UQD8	CNYM01_02813	<i>Colletotrichum nympheae</i> SA-01
N4VB78	Cob_11323	<i>Colletotrichum orbiculare</i> (strain 104-T / ATCC 96160 / CBS 514.97 / LARS 414 / MAFF 240422) (Cucumber anthracnose fungus) (<i>Colletotrichum lagenarium</i>)
A0A135V3Z7	CSAL01_04573	<i>Colletotrichum salicis</i>
A0A135SKR2	CSIM01_04997	<i>Colletotrichum simmondsii</i>
A0A066XEI0	CSUB01_07202	<i>Colletotrichum sublineola</i> (Sorghum anthracnose fungus)
A0A161W435	CT0861_04005	<i>Colletotrichum tofieldiae</i>
A0A1J7JBA6	CONLIGDRAFT_71720 7	<i>Coniochaeta ligniaria</i> NRRL 30616
A0A1Y2WPL0	K445DRAFT_69239	<i>Daldinia</i> sp. EC12
A0A0G2HSM7	UCDDA912_g08868	<i>Diaporthe ampelina</i>
A0A163MI62	ST47_g119	<i>Didymella rabiei</i> (Chickpea ascochyta blight fungus) (<i>Mycosphaerella rabiei</i>)
A0A1Y2M8E7	B5807_02758	<i>Epicoccum nigrum</i> (Soil fungus) (<i>Epicoccum purpurascens</i>)
M7T9X2	UCREL1_6413	<i>Eutypa lata</i> (strain UCR-EL1) (Grapevine dieback disease fungus) (<i>Eutypa armeniaca</i>)
A0A1V1T6T1	ANO14919_060010	fungal sp. No.14919
A0A1L7TN90	FMAN_11051	<i>Fusarium mangiferae</i> (Mango malformation disease fungus)
N4UA15	FOC1_g10007481	<i>Fusarium oxysporum</i> f. sp. cubense (strain race 1) (Panama disease fungus)
X0AID2	FOMG_02397	<i>Fusarium oxysporum</i> f. sp. melonis 26406
W9NUS4	FOVG_15024	<i>Fusarium oxysporum</i> f. sp. pisi HDV247
A0A1L7W091	FPRO_11517	<i>Fusarium proliferatum</i> (strain ET1) (Orchid endophyte fungus)
A0A2L2T1U9		<i>Fusarium venenatum</i>
A0A2H3SCJ6	FFC1_11269	<i>Gibberella fujikuroi</i> (Bakanae and foot rot disease fungus) (<i>Fusarium fujikuroi</i>)
W7MJ21	FVEG_07686	<i>Gibberella moniliformis</i> (strain M3125 / FGSC 7600) (Maize ear and stalk rot fungus) (<i>Fusarium verticillioides</i>)
A0A2K0WGV6	FNYG_05189	<i>Gibberella nygamai</i> (Bean root rot disease fungus) (<i>Fusarium nygamai</i>)
A0A2B7XTD3	AJ79_02706	<i>Helicocarpus griseus</i> UAMH5409
A0A2B7XJ99	AJ79_05800	<i>Helicocarpus griseus</i> UAMH5409
A0A1Y2W567	M426DRAFT_47971	<i>Hypoxyton</i> sp. CI-4A
A0A1Y2V3J9	M434DRAFT_76425	<i>Hypoxyton</i> sp. CO27-5
E5A5Y5	LEMA_P082690.1	<i>Leptosphaeria maculans</i> (strain JN3 / isolate v23.1.3 / race Av1-4-5-6-7-8) (Blackleg fungus) (<i>Phoma lingam</i>)
A0A175WE05	MMYC01_201513	<i>Madurella mycetomatis</i>

A0A151V4J3	MGG_10208	<i>Magnaporthe oryzae</i> (strain 70-15 / ATCC MYA-4617 / FGSC 8958) (Rice blast fungus) (<i>Pyricularia oryzae</i>)
A0A136J859	Micbo1qcDRAFT_232912	<i>Microdochium bolleyi</i>
G2QP40	MYCTH_2313229	<i>Myceliophthora thermophila</i> (strain ATCC 42464 / BCRC 31852 / DSM 1799) (<i>Sporotrichum thermophile</i>)
C7Z3N0	NECHADRAFT_83307	<i>Nectria haematococca</i> (strain 77-13-4 / ATCC MYA-4622 / FGSC 9596 / MPVI) (<i>Fusarium solani</i> subsp. <i>pisi</i>)
A0A0P7AKS7	AK830_g8222	<i>Neonectria ditissima</i>
A1DCZ0	NFIA_027740	<i>Neosartorya fischeri</i> (strain ATCC 1020 / DSM 3700 / CBS 544.65 / FGSC A1164 / JCM 1740 / NRRL 181 / WB 181) (<i>Aspergillus fischerianus</i>)
A1D1F9	NFIA_009310	<i>Neosartorya fischeri</i> (strain ATCC 1020 / DSM 3700 / CBS 544.65 / FGSC A1164 / JCM 1740 / NRRL 181 / WB 181) (<i>Aspergillus fischerianus</i>)
A0A229Y606	CDV57_02697	<i>Neosartorya fumigata</i> (<i>Aspergillus fumigatus</i>)
Q6MWQ3	B24N4.140	<i>Neurospora crassa</i>
A0A177C2Q2	CC84DRAFT_1262742	<i>Paraphaeosphaeria sporulosa</i>
A0A1V6PZ81	PENANT_c024G06821	<i>Penicillium antarcticum</i>
A0A1F5L9I4	PENARI_c020G01612	<i>Penicillium arizonense</i>
A0A1S9S1F3	PEBR_08403	<i>Penicillium brasilianum</i>
A0A0F7TJL1	PMG11_02977	<i>Penicillium brasilianum</i>
A0A0G4P5S8	PCAMFM013_S006g000215	<i>Penicillium camemberti</i> FM 013
A0A0G4P905	PCAMFM013_S008g000211	<i>Penicillium camemberti</i> FM 013
A0A167PZ82	EN45_111530	<i>Penicillium chrysogenum</i> (<i>Penicillium notatum</i>)
A0A1V6U8J6	PENCOP_c015G04110	<i>Penicillium coprophilum</i>
A0A1V6UQV5	PENCOP_c005G03047	<i>Penicillium coprophilum</i>
A0A0A2JQW9	PEX2_022470	<i>Penicillium expansum</i> (Blue mold rot fungus)
A0A0A2KSS1	PEX2_061300	<i>Penicillium expansum</i> (Blue mold rot fungus)
A0A1V6SRF9	PENFLA_c028G08892	<i>Penicillium flavigenum</i>
A0A1V6SVS5	PENFLA_c022G02189	<i>Penicillium flavigenum</i>
A0A101MC66	ACN42_g9323	<i>Penicillium freii</i>
A0A101MF58	ACN42_g7847	<i>Penicillium freii</i>
A0A1V6Z0K8	PENNAL_c0006G01669	<i>Penicillium nalgiovense</i>
A0A0M8PAR7	ACN38_g361	<i>Penicillium nordicum</i>
A0A0M8P8X0	ACN38_g5977	<i>Penicillium nordicum</i>
S8AKS0	PDE_01354	<i>Penicillium oxalicum</i> (strain 114-2 / CGMCC 5302) (<i>Penicillium decumbens</i>)
A0A135LNE1	PGRI_069720	<i>Penicillium patulum</i> (<i>Penicillium griseofulvum</i>)
A0A135LJJ3	PGRI_029680	<i>Penicillium patulum</i> (<i>Penicillium griseofulvum</i>)
A0A1V6NB36	PENPOL_c014G03596	<i>Penicillium polonicum</i>

A0A1V6N9I3	PENPOL_c017G01197	<i>Penicillium polonicum</i>
B6H504	Pc13g11940 PCH_Pc13g11940	<i>Penicillium rubens</i> (strain ATCC 28089 / DSM 1075 / NRRL 1951 / Wisconsin 54-1255) (<i>Penicillium chrysogenum</i>)
A0A1V6QVM1	PENSOL_c034G01509	<i>Penicillium solitum</i>
A0A1V6R149	PENSOL_c021G03186	<i>Penicillium solitum</i>
A0A1V6TYC2	PENSTE_c001G01023	<i>Penicillium steckii</i>
A0A1V6RT27	PENVUL_c030G06465	<i>Penicillium vulpinum</i>
A0A1V6RFV6	PENVUL_c053G07299	<i>Penicillium vulpinum</i>
W3WVP5	PFICI_10005	<i>Pestalotiopsis fici</i> (strain W106-1 / CGMCC3.15140)
W3XHU1	PFICI_03594	<i>Pestalotiopsis fici</i> (strain W106-1 / CGMCC3.15140)
A0A1L7XTD6	PAC_18201	<i>Phialocephala subalpina</i>
B2AD24	PODANS_3_10650	<i>Podospora anserina</i> (strain S / ATCC MYA-4624 / DSM 980 / FGSC 10383) (<i>Pleurance anserina</i>)
A0A2B7Y8F4	AJ80_03622	<i>Polytolypa hystricis</i> UAMH7299
A0A176ZZF0	VC83_08192	<i>Pseudogymnoascus destructans</i>
L8FZK9	GMDG_01921	<i>Pseudogymnoascus destructans</i> (strain ATCC MYA-4855 / 20631-21) (Bat white-nose syndrome fungus) (<i>Geomyces destructans</i>)
A0A1B8FEW2	VE02_09112	<i>Pseudogymnoascus</i> sp. 03VT05
A0A1B8F0P0	VF21_05124	<i>Pseudogymnoascus</i> sp. 05NY08
A0A1B8ESK0	VF21_06861	<i>Pseudogymnoascus</i> sp. 05NY08
A0A1B8DR19	VE03_09245	<i>Pseudogymnoascus</i> sp. 23342-1-11
A0A1B8DX52	VE03_06159	<i>Pseudogymnoascus</i> sp. 23342-1-11
A0A1B8CWZ5	VE04_07979	<i>Pseudogymnoascus</i> sp. 24MN13
A0A093XP69	V490_04348	<i>Pseudogymnoascus</i> sp. VKM F-3557
A0A093YWU5	V491_08114	<i>Pseudogymnoascus</i> sp. VKM F-3775
A0A093YAT7	O988_02379	<i>Pseudogymnoascus</i> sp. VKM F-3808
A0A094B414	O988_00252	<i>Pseudogymnoascus</i> sp. VKM F-3808
A0A093Z9K5	V492_06850	<i>Pseudogymnoascus</i> sp. VKM F-4246
A0A094BWU4	V492_02397	<i>Pseudogymnoascus</i> sp. VKM F-4246
A0A093ZUQ3	V493_08371	<i>Pseudogymnoascus</i> sp. VKM F-4281 (FW-2241)
A0A094CR23	V493_04902	<i>Pseudogymnoascus</i> sp. VKM F-4281 (FW-2241)
A0A094BHW5	V494_06392	<i>Pseudogymnoascus</i> sp. VKM F-4513 (FW-928)
A0A094BIT3	V494_06121	<i>Pseudogymnoascus</i> sp. VKM F-4513 (FW-928)
A0A094CHM2	V496_07594	<i>Pseudogymnoascus</i> sp. VKM F-4515 (FW-2607)
A0A094FMF4	V497_03375	<i>Pseudogymnoascus</i> sp. VKM F-4516 (FW-969)
A0A094G2L0	V498_06073	<i>Pseudogymnoascus</i> sp. VKM F-4517 (FW-2822)
A0A094F3V1	V500_08416	<i>Pseudogymnoascus</i> sp. VKM F-4518 (FW-2643)
A0A094GHL8	V500_01018	<i>Pseudogymnoascus</i> sp. VKM F-4518 (FW-2643)
A0A094EYE2	V500_11384	<i>Pseudogymnoascus</i> sp. VKM F-4518 (FW-2643)
A0A094H6F6	V501_04976	<i>Pseudogymnoascus</i> sp. VKM F-4519 (FW-2642)

A0A094IVN6	V501_10519	<i>Pseudogymnoascus</i> sp. VKM F-4519 (FW-2642)
A0A094H1V3	V502_08997	<i>Pseudogymnoascus</i> sp. VKM F-4520 (FW-2644)
A0A094ID80	V502_01797	<i>Pseudogymnoascus</i> sp. VKM F-4520 (FW-2644)
A0A1B8CBQ9	VE00_05479	<i>Pseudogymnoascus</i> sp. WSF 3629
A0A1B8CH42	VE00_02898	<i>Pseudogymnoascus</i> sp. WSF 3629
A0A1Y2DQ45	BCR38DRAFT_487164	<i>Pseudomassariella vexata</i>
A0A178DWP8	IQ07DRAFT_515365	<i>Pyrenochaeta</i> sp. DS3sAY3a
E3RYB2	PTT_14495	<i>Pyrenophora teres</i> f. <i>teres</i> (strain 0-1) (Barley net blotch fungus) (<i>Drechslera teres</i> f. <i>teres</i>)
A0A1S8AB41	SAMD00023353_1030050	<i>Rosellinia necatrix</i> (White root-rot fungus)
A0A084G3W6	SAPIO_CDS6431	<i>Scedosporium apiospermum</i>
R0K3Z1	SETTUDRAFT_177090	<i>Setosphaeria turcica</i> (strain 28A) (Northern leaf blight fungus) (<i>Exserohilum turcicum</i>)
F7VQ11	SMAC_06790	<i>Sordaria macrospora</i> (strain ATCC MYA-333 / DSM 997 / K(L3346) / K-hell)
A0A2K1QKD6	CAC42_651	<i>Sphaceloma murrayae</i>
A0A084RM36	S40288_01253	<i>Stachybotrys chartarum</i> IBT 40288
A0A178AZ00	IQ06DRAFT_292194	<i>Stagonospora</i> sp. SRC1IsM3a
A0A0U1MA04	PISL3812_09507	<i>Talaromyces islandicus</i> (<i>Penicillium islandicum</i>)
C9SL07	VDBG_05484	<i>Verticillium alfalfae</i> (strain VaMs.102 / ATCC MYA-4576 / FGSC 10136) (<i>Verticillium</i> wilt of alfalfa) (<i>Verticillium albo-atrum</i>)
G2X9U0	VDAG_07135	<i>Verticillium dahliae</i> (strain VdLs.17 / ATCC MYA-4575 / FGSC 10137) (<i>Verticillium</i> wilt)
A0A2J8FJP8	VD0003_g2496	<i>Verticillium dahliae</i> (<i>Verticillium</i> wilt)
A0A0G4M855	BN1708_018452	<i>Verticillium longisporum</i>
A0A0G4NDU3	BN1723_006181	<i>Verticillium longisporum</i>
A0A0G4NDW8	BN1723_006177	<i>Verticillium longisporum</i>
A0A0G4LRZ1	BN1708_003943	<i>Verticillium longisporum</i>