

A. brasiliensis 1 MPPKTG--GRGRKSI VAA--PROSTAGDRAAASSSSKA-----AATTS PAAKKV-RK--STGPARGGKRP
 A. niger 1 MPPKTG--GRGRKSI VAA--PROSTAGDRAAASSSSKA-----AATTS PAAKKV-RK--STGPARGGKRP
 A. acidus 1 MPPKTGGRRGRGRKSVTAA--PROSTAGDRAAASSSTA-----ATTAS PAAKKV-RK--STGATRGGKRP
 A. tubingensis 1 MPPKTGGRRGRGRKSVTAA--PROSTAGDRAAASSSTA-----ATTAS PAAKKV-RK--STGATRGGKRP
 A. kawachii 1 MPPKTGGRRGRGRKSVTAA--PROSTAGDRAAASSSTA-----AITAS PAAKKV-RK--STGATRGGKRP
 A. carbonarius 1 MPPKT--GRGRKA-AST-PRKSTTGDRAAASASKA-----AATTS PSASKV-HK--TAGSSRGGKRP
 A. terreus 1 MPPKT--GRGHKI-TAA-PRTEASSSRTTAAA-G-----PSTASPSAHRV-RK--STGPSRGGKRP
 A. clavatus 1 MPPKT--GRGRKA-VSA-GRPRKD-----ESGPSDA-----PATASPSSTRGQ-RK--SSGATRGGKRP
 A. flavus 1 MPPKT--GGGRKV-TAA-SRAKAD-----GAKKESA-----AAKGSSTRG-RK--SAGGARAGKRP
 A. oryzae 1 MPPKT--GGGRKV-TAA-SRAKAD-----GAKKESA-----AAKGSSTRG-RK--SAGGARAGKRP
 A. fumigatus 1 MPPKT--GRGRKA-TGA-PRTOPR-DDGGAGPSNA-----AATASPSTRGQPPK--FRGGTRGGKRP
 N. fischeri 1 MPPKT--GRGRKA-TGA-PRTOPR-DDGGAGPSNA-----AATASPSTRGQPPK--SRGGTRGAKRP
 A. wentii 1 MPPKT--GRGNKI-TAA-PRAKAAKEEAEGPSRA-----SPATASPATRGR-RK--SAGASRGGKRP
 A. aculeatus 1 MPPKT--GRGRKS-TAG-PRKSTAAAAAATTAATDDGAAAAAGPSTAPATTTTTPAARG--RK--PAGVTR-GKRP
 A. zonatus 1 MPPKT--GRGRKM-LAAQARPRPATGD-GGADGDG-----AAAAGPS-SRNDGATKPG-RG--GR--KSGGTRGGKRP
 A. glaucus 1 MPPKT--GKGRKV-VSE-PRSRPSTGDGEAGPSK-----PQOTASPSANKRK-PKASTSGEAR-DKRP
 A. rubrum 1 MPPKT--GKGRKV-VSE-PRSRPSTGDGEAGLSSD-----LQOTVSPANKN-PKASTSGEAR-GKRP
 A. nidulans 1 MPPK-----GRKP-SSA-ATAGTGSSKATSAKTST-----TTSGASP--KVTKSSRTLGSKALASA--SVSKSKGSKRP
 A. sydowii 1 MPPK-----GRKP-ASA-----TAGPSTTTT-----TTTGAGP-----AKSAGVKKG-AK--GVQGTGKRP
 A. versicolor 1 MPPK-----GRKP-ASA-----TAGPS-----KPSAGVKKG-PK-----GGKRP
 A. nidulans_H3 1 MARTK--QTARKS-----TPAAGP-----SKSAGVKKG-PK-----TGGKAP

A. brasiliensis 58 AG-----KAPROSDVO-----PGDPTPOG--RVRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPSEVG
 A. niger 58 AG-----KAPRESOVOILAAAGDPTPOG--RVRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPSEVG
 A. acidus 60 AG-----KAPRESOVO-----PGDPTPOG--RVRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPSEVG
 A. tubingensis 60 AG-----KAPRESOVO-----PGDPTPOG--RVRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPSEVG
 A. kawachii 60 AG-----KAPRESOVO-----PGDPTPOG--RVRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPSEVG
 A. carbonarius 56 AG-----KKPRVSDVO-----PGDPTPOG--RSRRYKPGTVALKEIRKYORSYDILLISKLPFARLVREVALDLLPSEVG
 A. terreus 55 AG-----APRSDVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPAEVRG
 A. clavatus 52 AG-----APRKSVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPSEVG
 A. flavus 51 AG-----ASRKSVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPADVVG
 A. oryzae 51 AG-----ASRKSVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPADVVG
 A. fumigatus 56 AH-----APRPSVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPAEVRG
 N. fischeri 56 AR-----APRPSVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPAEVRG
 A. wentii 57 AGVSK-PK-AKPSKQDVO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPADVVG
 A. aculeatus 71 AK-----APRTSNVE-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPAEVRG
 A. zonatus 64 PG-----TSGSNIO-----PGDPTPKG--RRRRYKPGTVALKEIRKYORSYDILLIRKLPFARLVREVALDLLPANVVG
 A. glaucus 58 SVVTKTPKAAKTAITSDVO-----PGDPTPOG--RSRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPADVVG
 A. rubrum 59 SVVTKPPK---TAKTLDFO-----PGDPTPOG--RRRRYKPGTVALKEIRKYORSYDILLIQKLPFARLVREVALDLLPADVVG
 A. nidulans 65 PT-----APSDOSSIO-----PGDPTPKG--RRRRYKPGTVALKEIRKYORSYDILLIRKLPFARLVREVALDLLPADVVG
 A. sydowii 50 PR-----TSDAOSDVO-----PGDPTPKG--RRRRYKPGTVALKEIRKYORSYDILLIRKLPFARLVREVALDLLPAEVRG
 A. versicolor 40 RT-----SDVQPDVO-----PGDPTPKG--RRRRYKPGTVALKEIRKYORSYDILLIRKLPFARLVREVALDLLPAEVRG
 A. nidulans_H3 18 RK-----QLASKAAR---KAAPSTGCVKKPHRYKPGTVALREIRRYOKSTELLIRKLPFARLVREIA----QDFK

A. brasiliensis 125 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. niger 128 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. acidus 127 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. tubingensis 127 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. kawachii 127 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. carbonarius 123 SELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. terreus 121 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. clavatus 118 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. flavus 117 SELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. oryzae 117 SELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. fumigatus 122 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 N. fischeri 122 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. wentii 130 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. aculeatus 137 SELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. zonatus 130 SELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. glaucus 133 EQLRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. rubrum 131 EQLRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. nidulans 133 SELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. sydowii 117 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. versicolor 106 AELRWOSHAIQALQEAAEAFVHLFEDTNLCAIHAKRVTIMQKDIQLARRIRGVWGGGLG
 A. nidulans_H3 81 SDLRFQSSAIGALQESVEAVLVSLFEDTNLCAIHAKRVTIQSKDIQLARRIRGE---RS

A. acidus 1 MD--PRLVTD~~R~~KS~~R~~KRF-LP~~K~~KR-FR~~K~~IL~~R~~NNIDGITRPSIRRLARRGGVIRISADVYPEV
A. kawachii 1 MD--PRLVTD~~R~~KS~~R~~KRF-LP~~K~~KR-FR~~K~~IL~~R~~NNIDGITRPSIRRLARRGGVIRISADVYPEV
A. tubingensis 1 MD--PRLVTD~~R~~KS~~R~~KRF-LP~~K~~KR-FR~~K~~IL~~R~~NNIDGITRPSIRRLARRGGVIRISADVYPEV
A. niger 1 MD--PRLVTD~~R~~RRS~~R~~KRF-LP~~K~~KR-LR~~K~~LL~~R~~NNIDGITRPSIRRLARRGGVIRISADVYPEV
A. niger 1 MD--PRLVTD~~R~~RRS~~R~~KRF-LP~~K~~KR-LR~~K~~LL~~R~~NNIDGITRPSIRRLARRGGVIRISADVYPEV
A. carbonarius 1 MD--PKLVTD~~K~~RS~~R~~RF-LP~~K~~KR-YR~~K~~VLR~~R~~NNIDGITRPTIRRLARRGGVIRISAGIYAEV
A. aculeatus 1 MD--LNL~~L~~KESGKHRAFMPRR-FR~~K~~LARDNIOGVTRPAIRRLARRGGVYRIGNEYEEA
A. nidulans 1 MP~~S~~LISV~~P~~OSTGLHGLATLOS~~R~~-R~~H~~K~~L~~RESIRGVTRPAIRRLARRGGVYRIKNEYDEI
A. wentii 1 MA-----PRLQ-----NIFPK-R~~H~~R~~K~~L~~R~~DN~~I~~AGITRPAIRRLARRGGVMRIKKEYDEI
A. versicolor 1 MAR-----VA~~V~~HIL~~P~~LAGY~~R~~-R~~H~~K~~V~~L~~R~~DN~~I~~LGVTRPAIRRLARRGGVYRIKKEYDEI
A. sydowii 1 MAR-----VATCVLPMSRYK-R~~H~~R~~I~~L~~R~~DN~~I~~LGITRPAIRRLARRGGVYRIKKEYDEI
A. fumigatus_A11 1 MDV-AH~~L~~AANPNTQGL-L~~L~~K~~G~~HRRRRL~~L~~RD~~N~~VNGIT~~K~~PAIRRLARRGGVVRMKTDIYAQI
A. fumigatus_Af2 1 MDV-AH~~L~~AANPNTQGL-L~~L~~K~~G~~HRRRRL~~L~~RD~~N~~VNGIT~~K~~PAIRRLARRGGVVRMKTDIYAQI
N. fischeri 1 MDV-TH~~L~~AANPNT~~R~~GL-L~~L~~K~~G~~H-RR~~R~~FL~~R~~DN~~I~~MGIT~~K~~PAIRRLARRAGVVRIKTDIYAEI
A. clavatus 1 MD--PNSPQNRSTRGL-L~~L~~K~~S~~H-RR~~R~~H~~L~~RD~~N~~LLGITRPAIRRLARRGGVMRIKSDIYNEA
A. flavus 1 MDT-AN~~L~~PRN-----LIIGQSR-RR~~K~~K~~I~~RD~~N~~I~~M~~GITRPAIR~~K~~LARRGGTI~~R~~IKNDIYDEA
A. oryzae 1 MDT-AN~~L~~PRN-----LIIGQSR-RR~~K~~K~~I~~RD~~N~~I~~M~~GITRPAIR~~K~~LARRGGTI~~R~~IKSDIYDEA
A. terreus 1 MDP-TR~~L~~PRTW-----RP~~K~~AK-R~~H~~K~~K~~L~~R~~DN~~L~~MGITRPAIRRLARRGGVIRIKADIYDEI
A. zonatus 1 MIT-PPPTGNPLTGGFPALPR-GR~~K~~P~~I~~RD~~N~~I~~L~~GVSR~~O~~SIRRLARRGGTARINIDIYQGV
A. nidulans_H4 1 MS-----GRGKGGKGLGKGGAKRHR~~K~~I~~L~~RD~~N~~I~~O~~GIT~~K~~PAIRRLARRGGV~~K~~RISAMIYEE~~T~~

A. acidus 57 RKT~~V~~K~~N~~R~~L~~TEI~~I~~R~~Q~~ILLV~~M~~ESSTTPGHERK~~V~~V~~R~~TE~~D~~V~~V~~FALNRMGHTLYGFG-----
A. kawachii 57 RKT~~V~~K~~N~~R~~L~~TEI~~I~~R~~Q~~ILLV~~M~~ESSTTPGHERK~~V~~V~~R~~TE~~D~~V~~V~~FALNRMGHTLYGFG-----
A. tubingensis 57 RKT~~V~~K~~N~~R~~L~~TEI~~I~~R~~Q~~ILLV~~M~~ESSTTPGHERK~~V~~V~~R~~TE~~D~~V~~V~~FALNRMGHTLYGFG-----
A. niger 57 RKT~~V~~K~~N~~R~~L~~TEI~~I~~R~~Q~~ILLV~~M~~ESSTTPGHERK~~V~~V~~R~~TE~~D~~V~~V~~FALNRMGHTLYGFG-----
A. niger 57 RKT~~V~~K~~N~~R~~L~~TEI~~I~~R~~Q~~ILLV~~M~~ESSTTPGHERK~~V~~V~~R~~TE~~D~~V~~V~~FALNRMGHTLYGFG-----
A. carbonarius 57 RVAL~~K~~D~~R~~LTEIL~~R~~Q~~V~~VH~~I~~MD~~S~~SSTTPRRERK~~V~~V~~T~~TRD~~V~~VFALNRMGHTLYGFNT-----T
A. aculeatus 58 RRAL~~K~~N~~R~~LTEI~~I~~RRIV~~H~~V~~M~~D~~S~~GTTPGHERK~~V~~V~~T~~TRD~~V~~TFV~~L~~N~~O~~MGNPIYGFQ-----
A. nidulans 60 RIVL~~K~~ER~~L~~AET~~L~~K~~Q~~V~~C~~L~~V~~MESG~~T~~IP~~S~~SERK~~L~~V~~T~~TRD~~V~~VYAL~~K~~R~~M~~G~~O~~T~~I~~YGFDRVSSERRI
A. wentii 49 RGVL~~K~~D~~R~~LREIL~~R~~H~~V~~Y~~I~~LESART~~P~~SHERK~~V~~V~~T~~TRD~~V~~VYAL~~O~~K~~I~~G~~H~~T~~V~~YGF~~A~~E-----I
A. versicolor 53 RLAL~~R~~D~~R~~LSEIL~~R~~H~~I~~M~~L~~I~~L~~ESST~~V~~PSH~~O~~R~~K~~L~~V~~TRD~~V~~VFALS~~R~~M~~G~~H~~T~~LYGFD-----
A. sydowii 53 RIVL~~K~~ER~~L~~SDI~~I~~R~~N~~I~~V~~L~~V~~LESST~~S~~PSH~~O~~R~~K~~L~~V~~TRD~~V~~VYALNRMGHTLYGFQ-----
A. fumigatus_A11 59 RSVIR~~G~~R~~L~~REIL~~F~~Q~~V~~V~~Q~~V~~L~~ESSK~~T~~H~~R~~H~~D~~RK~~V~~V~~T~~TRD~~V~~VYAL~~Q~~R~~M~~G~~O~~T~~M~~YGF-----
A. fumigatus_Af2 59 RSVIR~~G~~R~~L~~REIL~~F~~Q~~V~~V~~Q~~V~~L~~ESSK~~T~~H~~R~~H~~D~~RK~~V~~V~~T~~TRD~~V~~VYAL~~Q~~R~~M~~G~~O~~T~~M~~YGF-----
N. fischeri 58 RSVIR~~G~~R~~L~~REIL~~F~~Q~~V~~V~~Q~~V~~L~~ESSK~~T~~H~~R~~H~~D~~RK~~V~~V~~T~~TRD~~V~~VYAL~~Q~~R~~M~~G~~O~~T~~M~~YGF-----
A. clavatus 57 RVAIR~~Q~~R~~L~~REVL~~F~~Q~~V~~V~~Q~~V~~L~~DSAS~~T~~H~~R~~H~~O~~R~~K~~V~~V~~T~~T~~RD~~V~~VYAL~~Q~~R~~I~~G~~O~~T~~L~~YGF-----
A. flavus 54 RRAIR~~D~~R~~L~~TEIL~~R~~Q~~L~~AL~~I~~LESS~~D~~I~~H~~S~~R~~Q~~R~~K~~V~~V~~T~~TRD~~V~~I~~Y~~ALN~~R~~L~~G~~N~~T~~LYGF-----
A. oryzae 54 RRAIR~~D~~R~~L~~TEIL~~R~~Q~~V~~AL~~I~~LESS~~N~~V~~H~~S~~R~~Q~~R~~K~~V~~V~~T~~TRD~~V~~I~~Y~~ALN~~R~~L~~G~~N~~T~~LYGF-----
A. terreus 53 RR~~V~~V~~K~~N~~R~~I~~E~~D~~V~~L~~R~~Q~~V~~D~~I~~M~~S~~AS~~T~~N~~R~~T~~D~~R~~K~~V~~V~~T~~T~~RD~~V~~I~~Y~~ALN~~R~~M~~G~~N~~T~~LYGFD-----
A. zonatus 59 RQVI~~K~~D~~R~~LLELLISOLVELLES~~G~~N~~T~~PD~~H~~ERT~~I~~V~~D~~S~~R~~D~~V~~VY~~V~~L~~S~~R~~L~~G~~T~~PMYGF-----
A. nidulans_H4 56 RGVL~~K~~TFLE~~G~~VIR~~D~~AV~~T~~Y~~T~~E~~H~~A-----KR~~K~~T~~V~~TS~~L~~D~~V~~VYAL~~K~~R~~O~~G~~R~~T~~L~~YGFG-----

Additional File 34.**Histones of the Aspergilli**

This file shows alignments of the histone H1, the centromeric histone H3 and the putative histone showing similarity with histone H4 for different species of *Aspergillus*. Alignments carried out with MAFFT (G-ins-i) (<http://mafft.cbrc.jp/alignment/server/>) and visualised with BoxShade . (http://www.ch.embnet.org/software/BOX_form.html). The last page of this file compares the phylogenetic trees of the two most variables histones, H1 and CenH3. Trees are maximum likelihood trees derived from a MAFFT (G-ins-i) alignment curated with BMGE (<http://mobyli.pasteur.fr/cgi-bin/portal.py#forms::BMGE>) with default settings. Maximum likelihood trees with PhyML (<http://phylogeny.lirmm.fr/phylo.cgi/alacarte.cgi>). Digits at the nodes are aLTRs (approximate likelihood ratio test values).