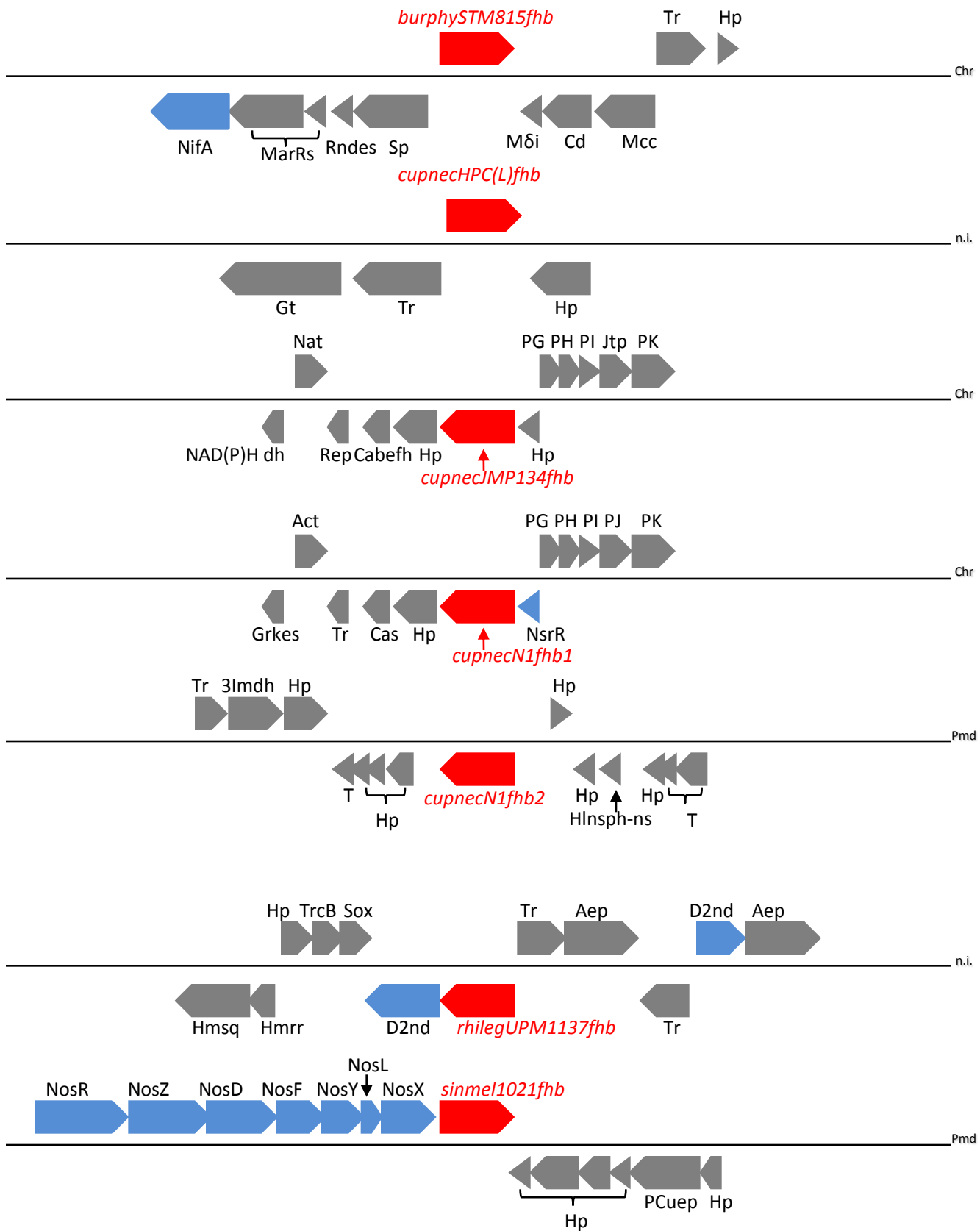
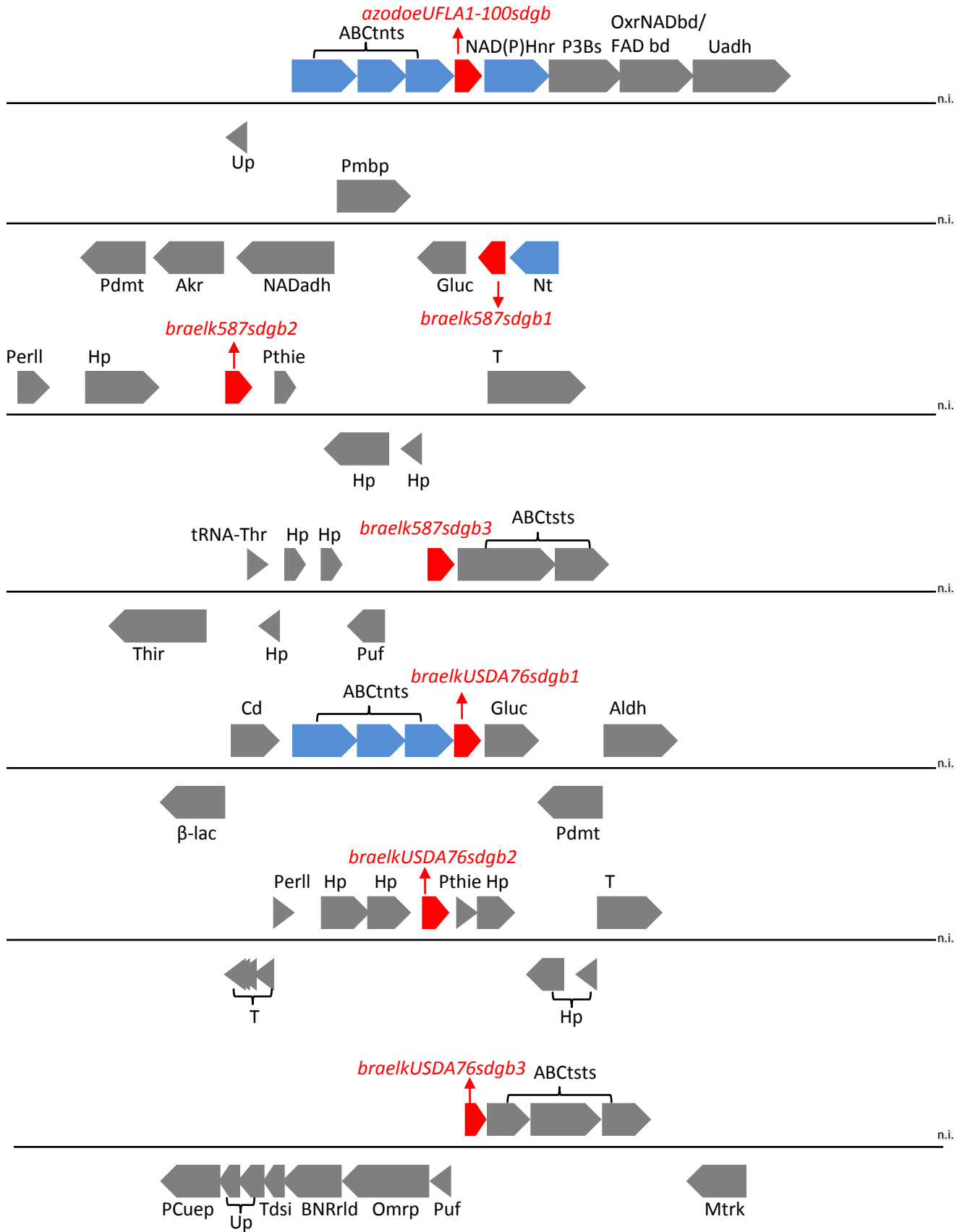
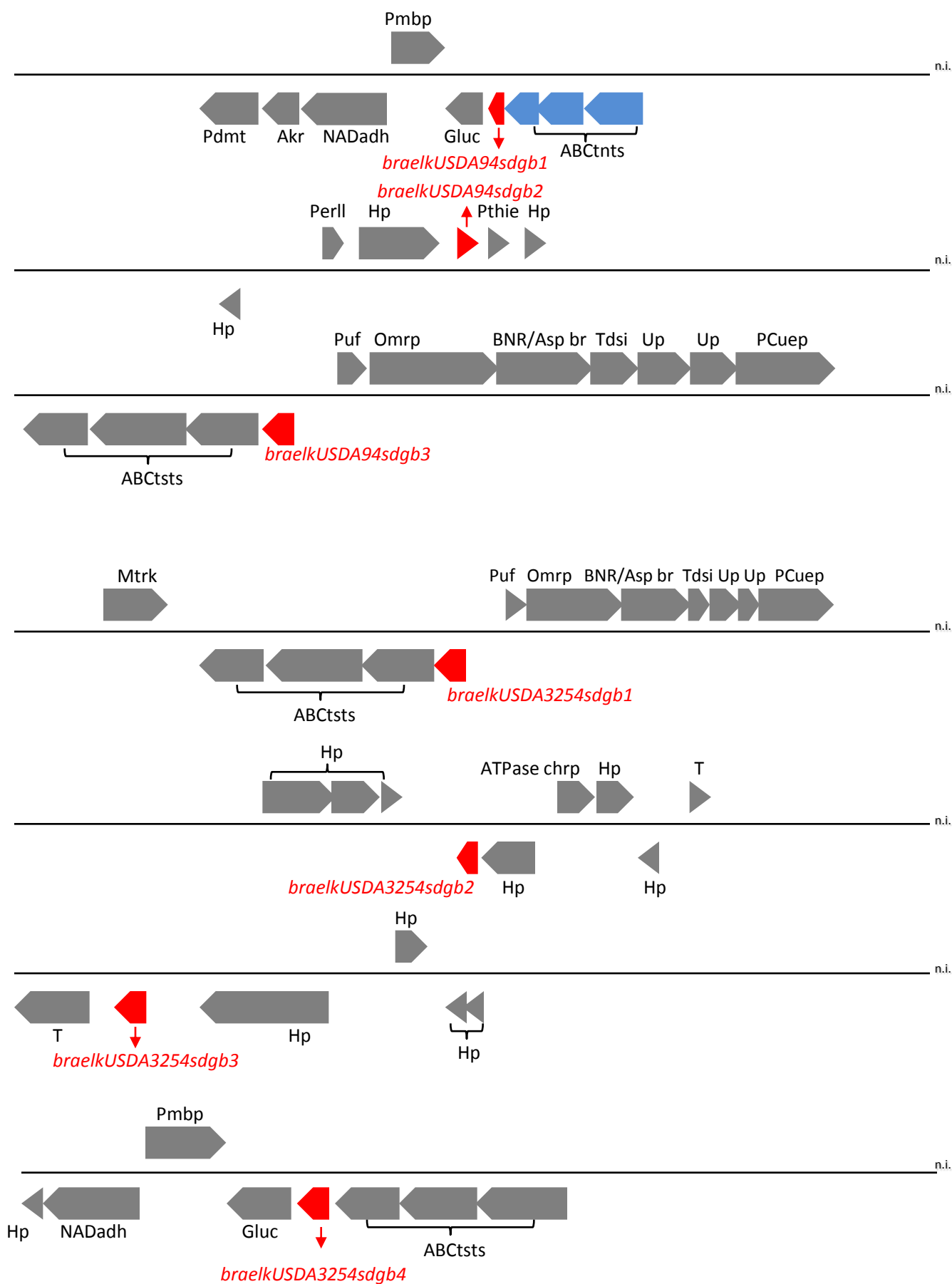


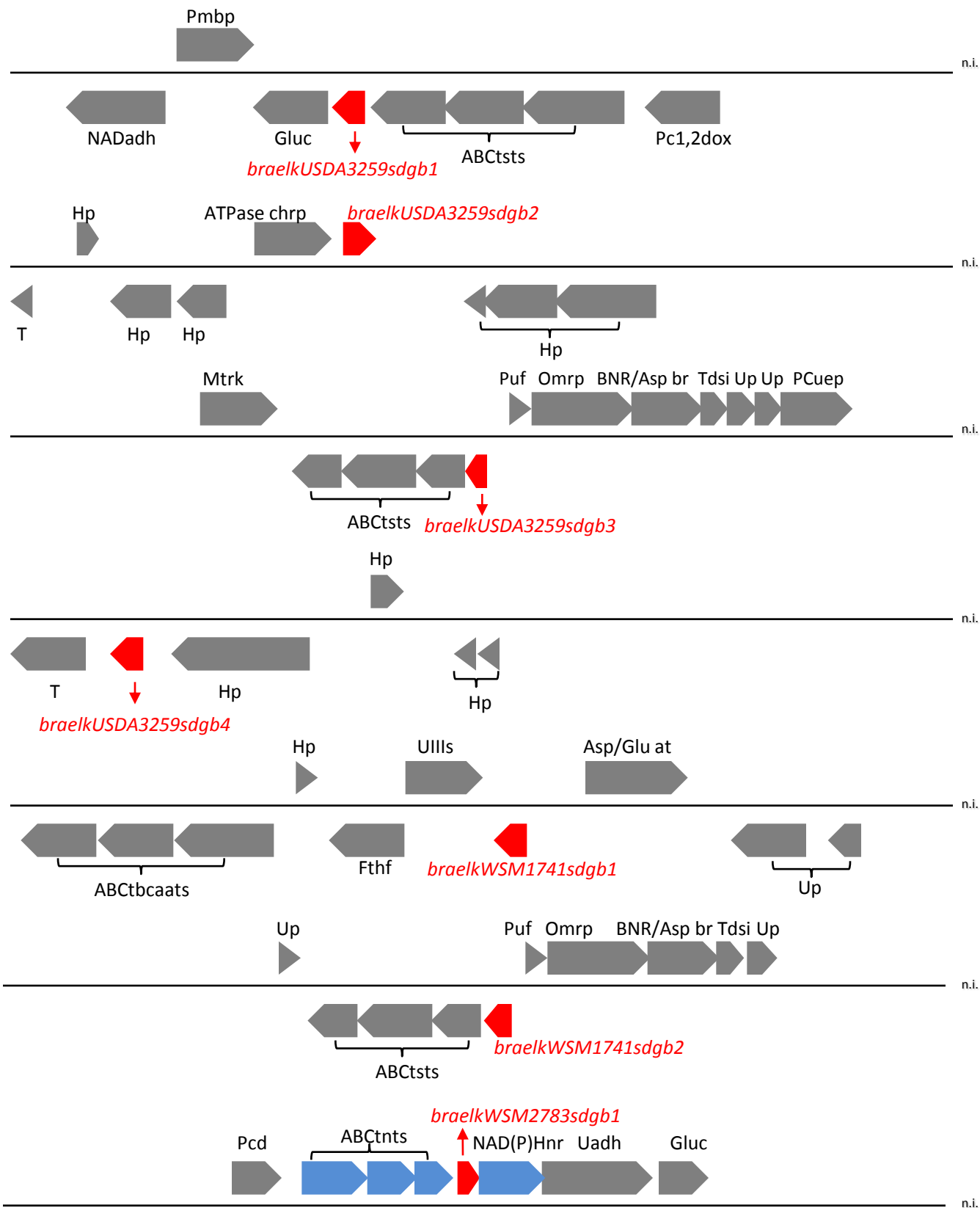
(A)

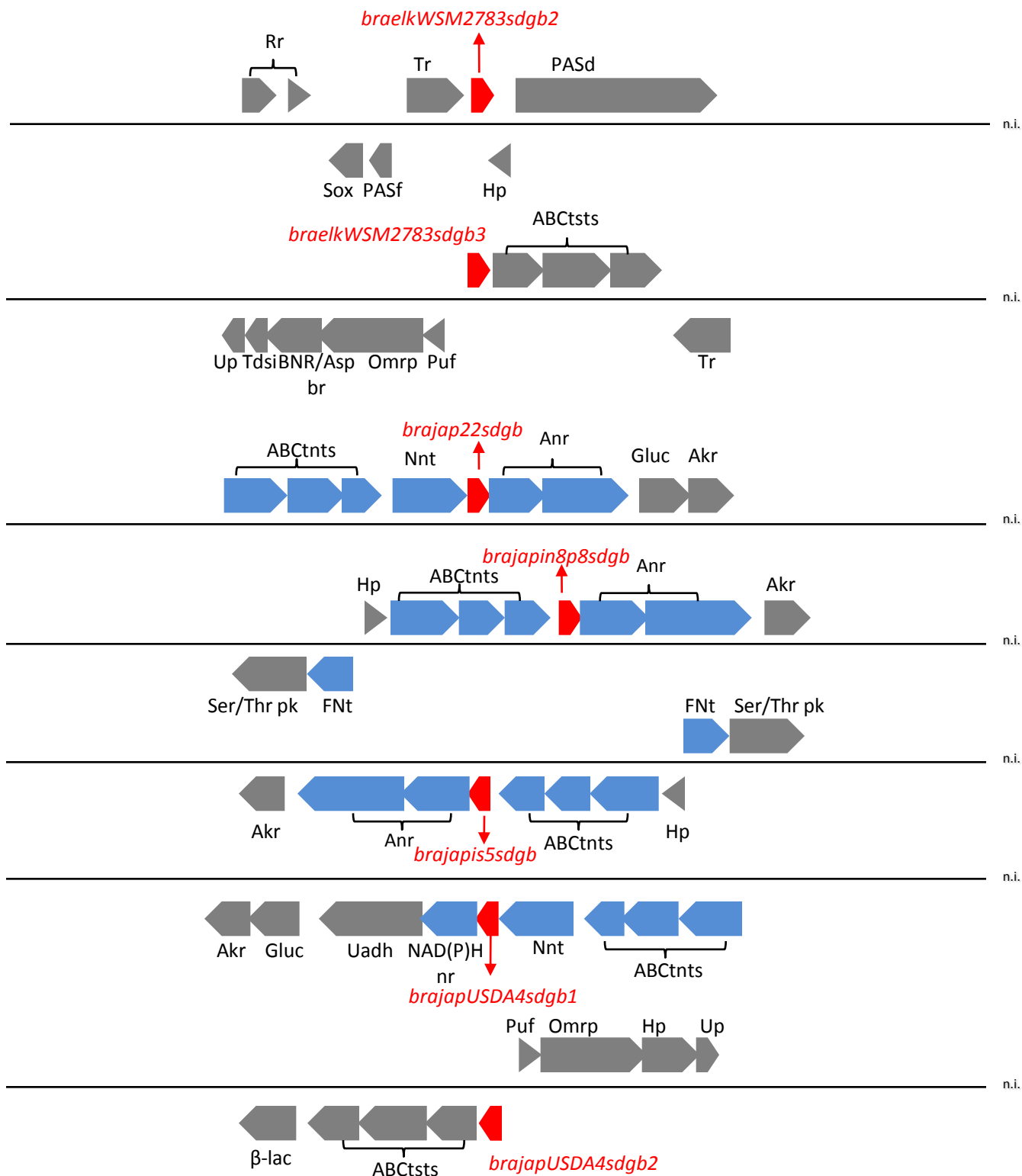


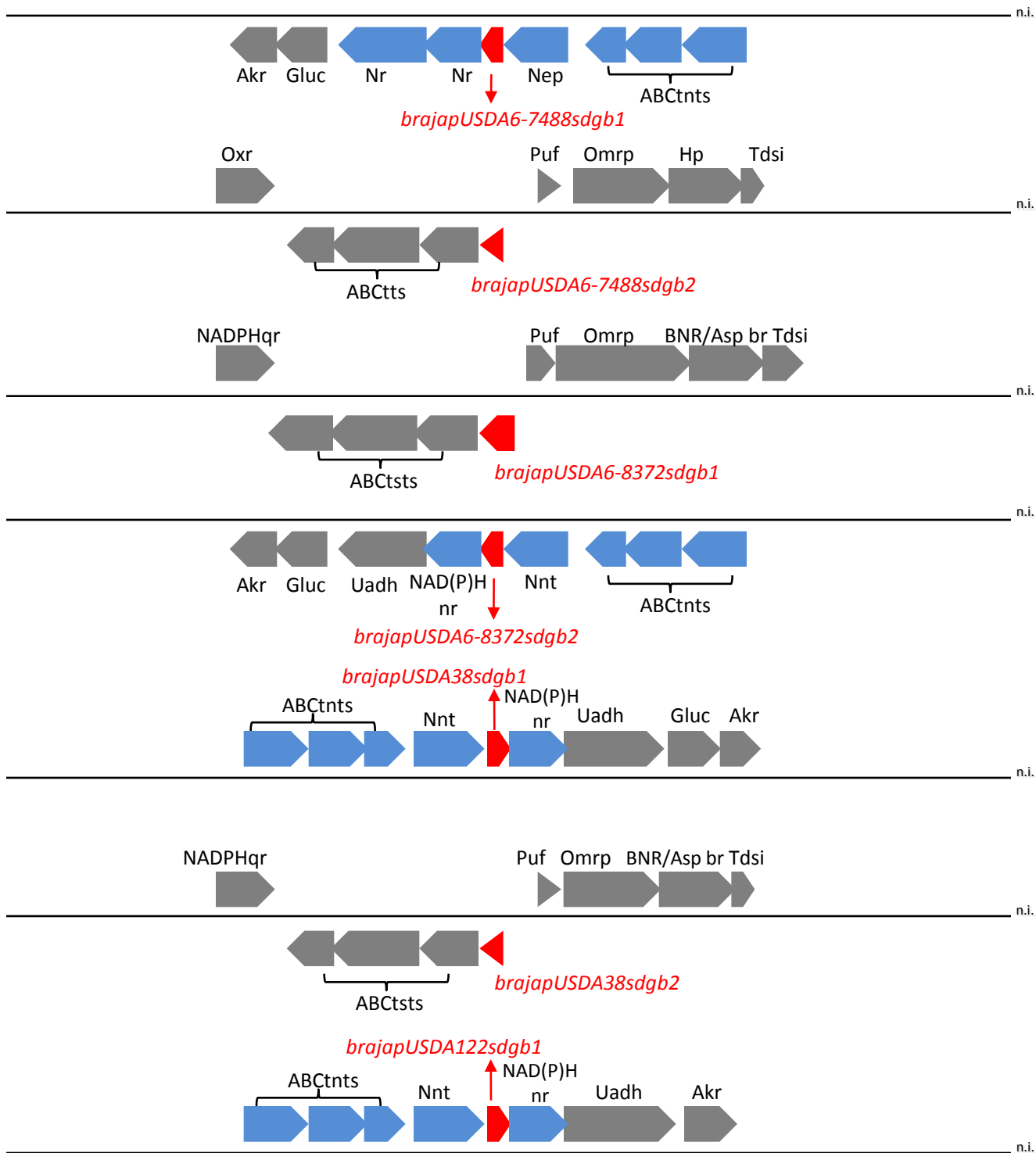
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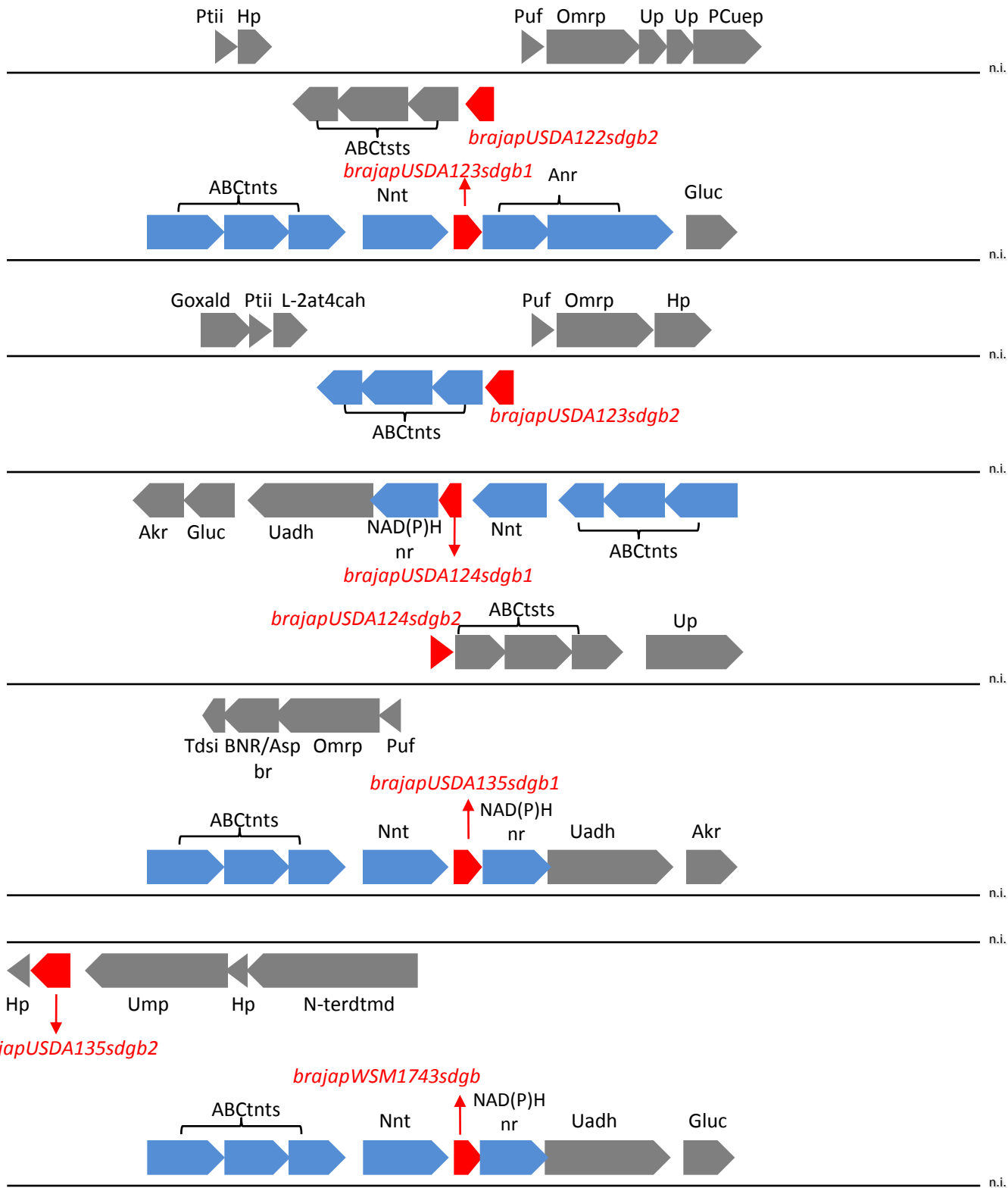


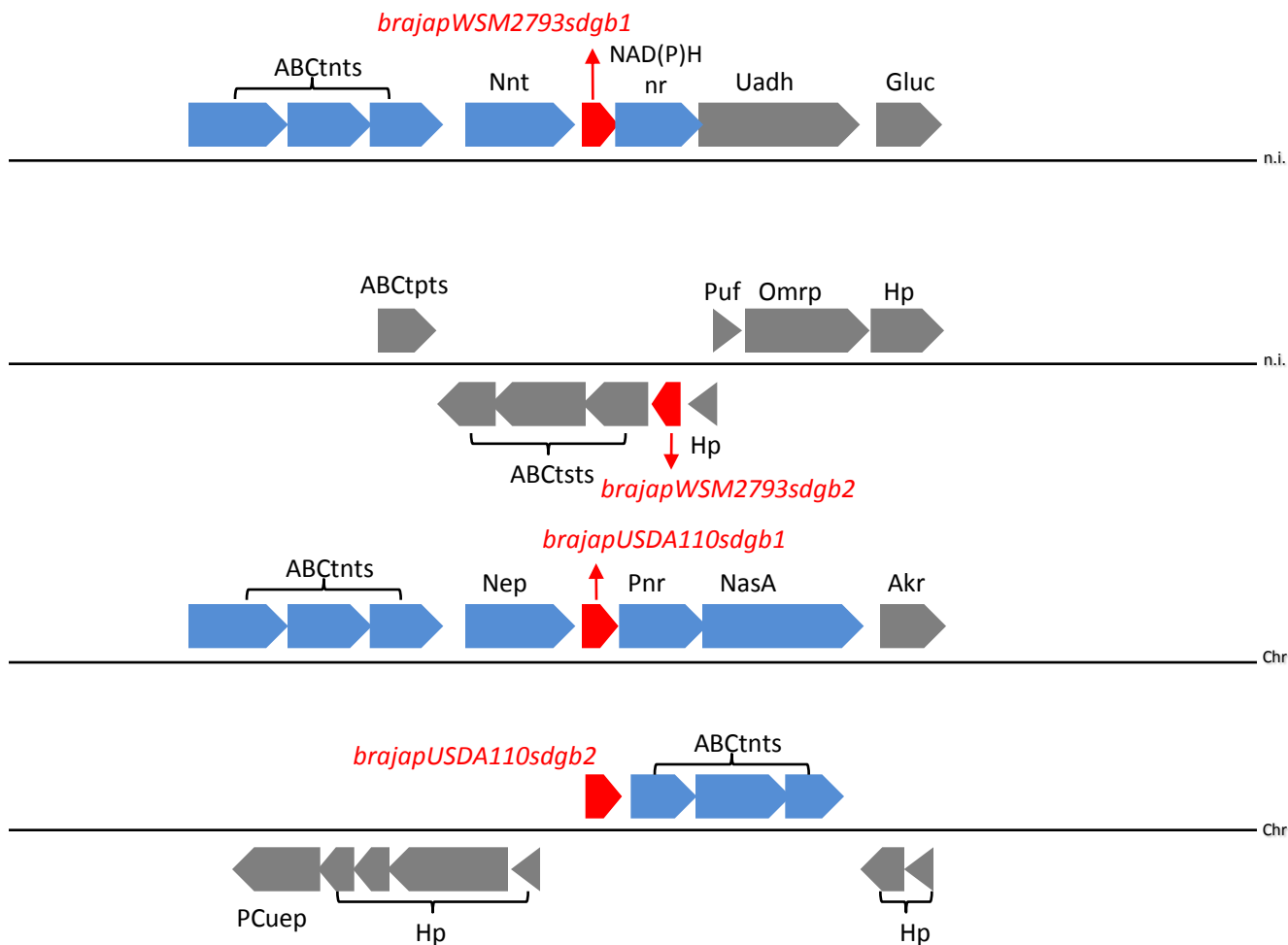




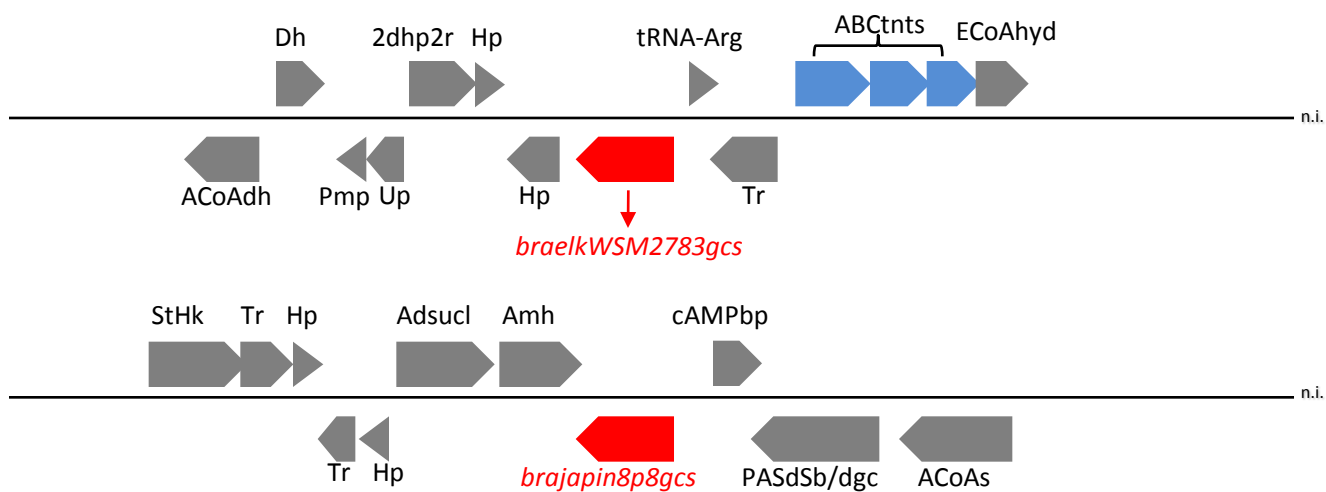


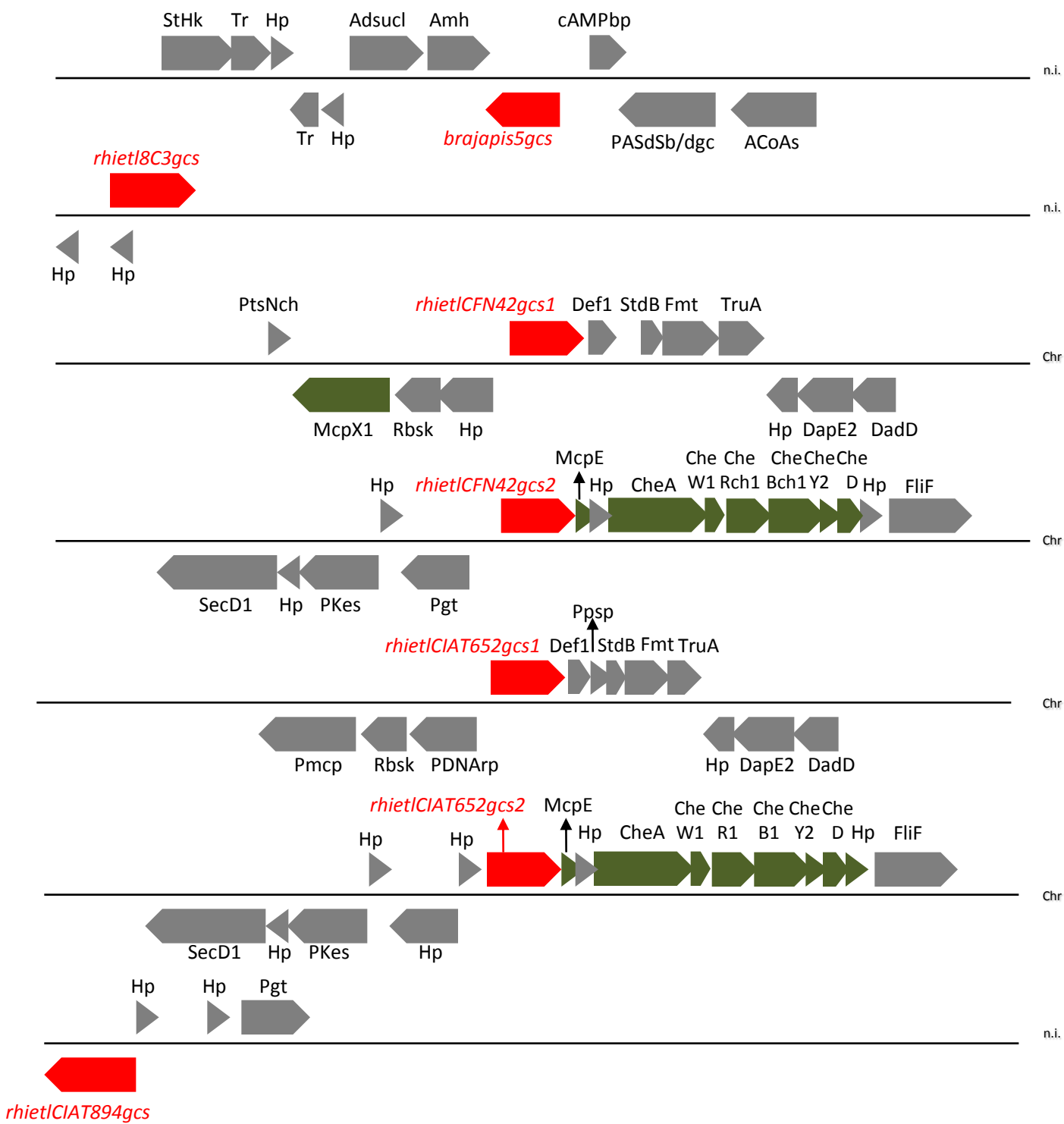


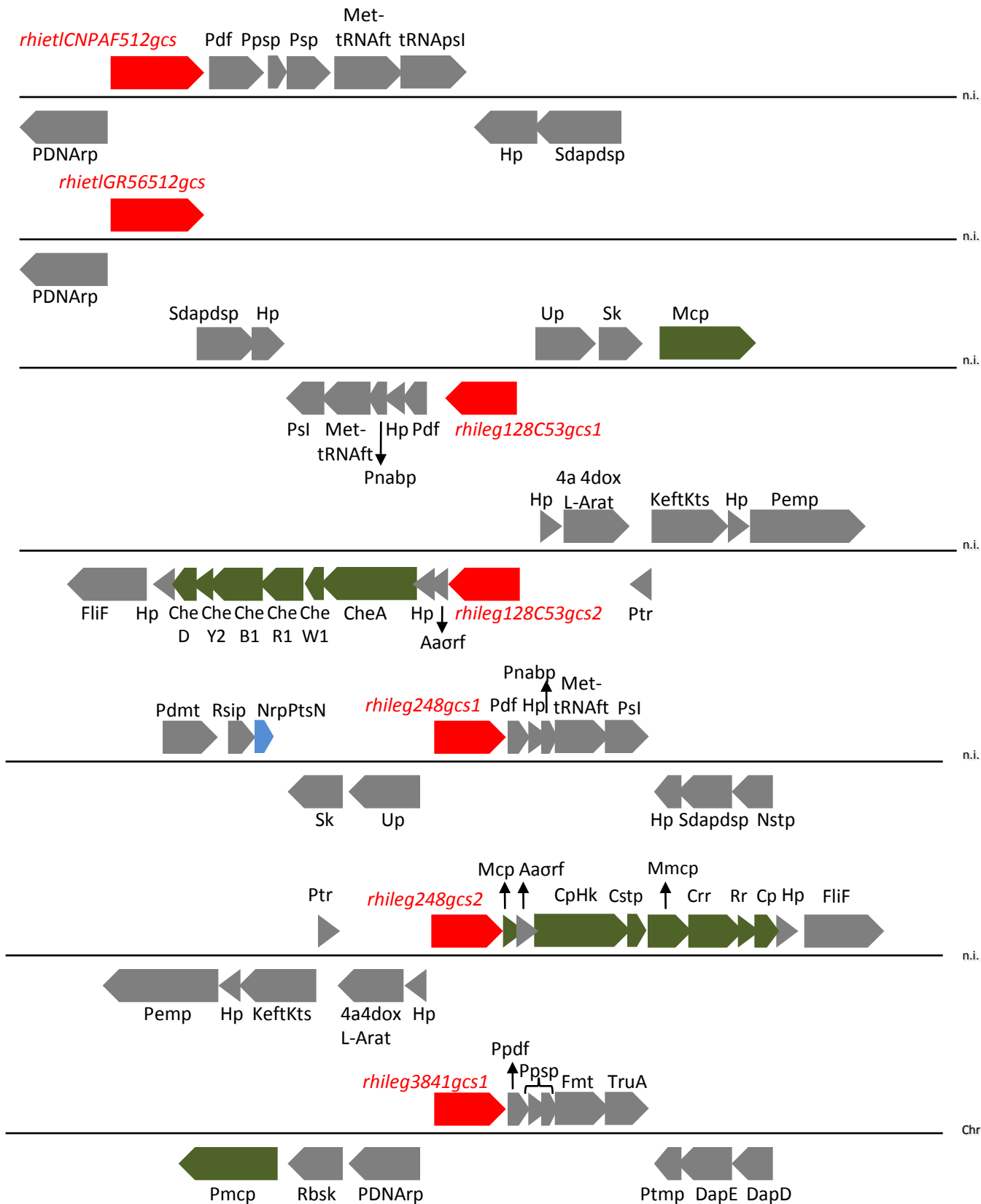


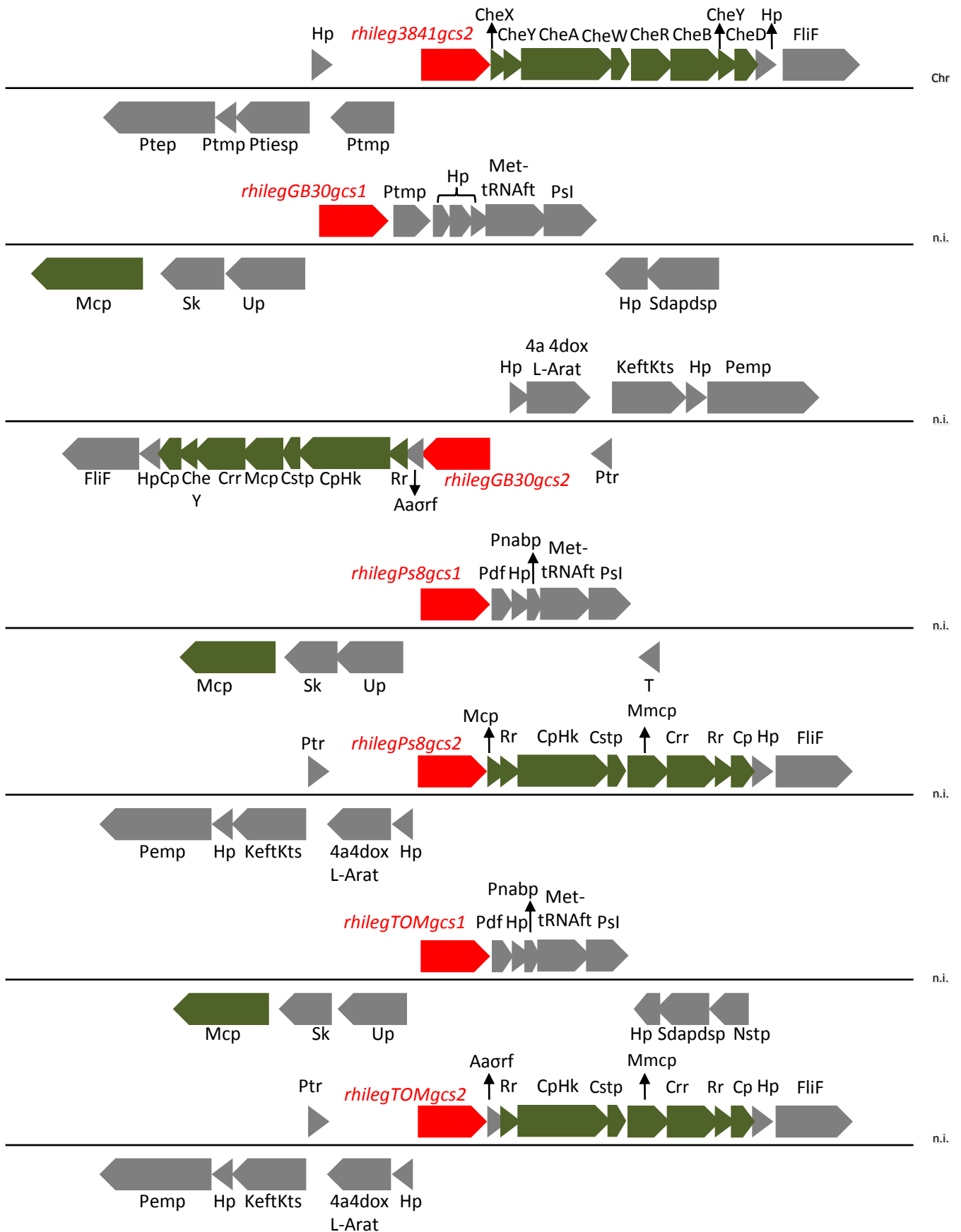


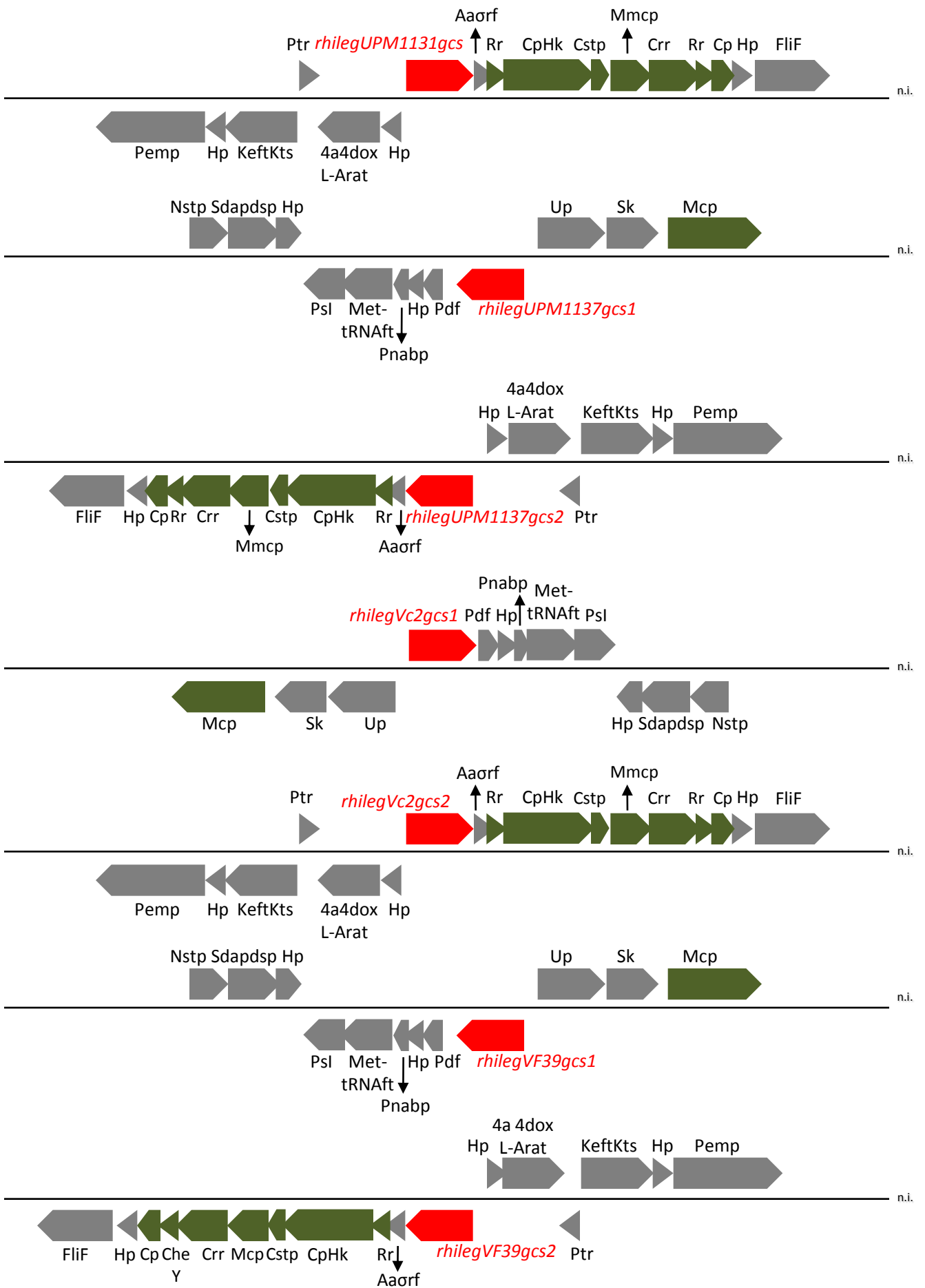
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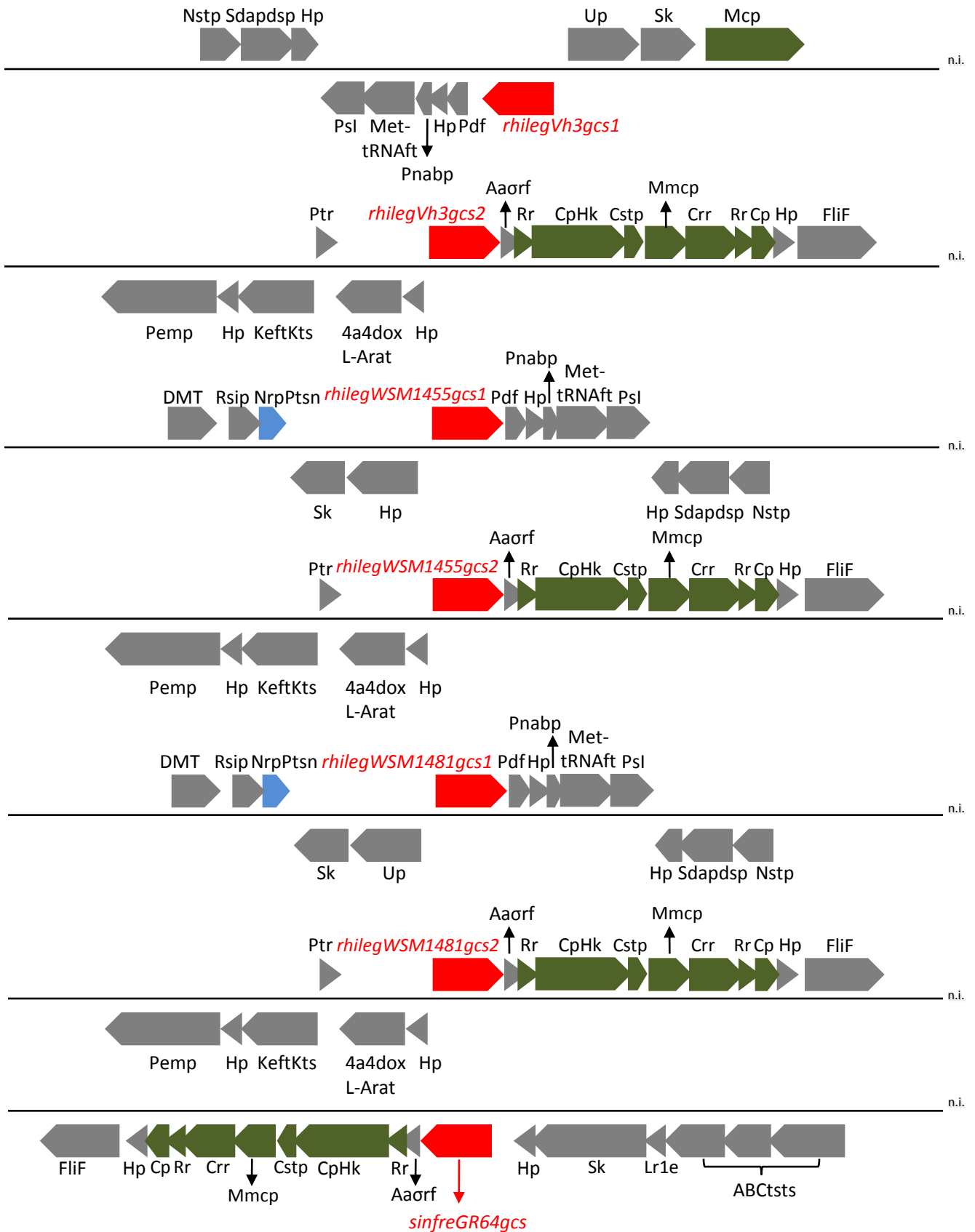


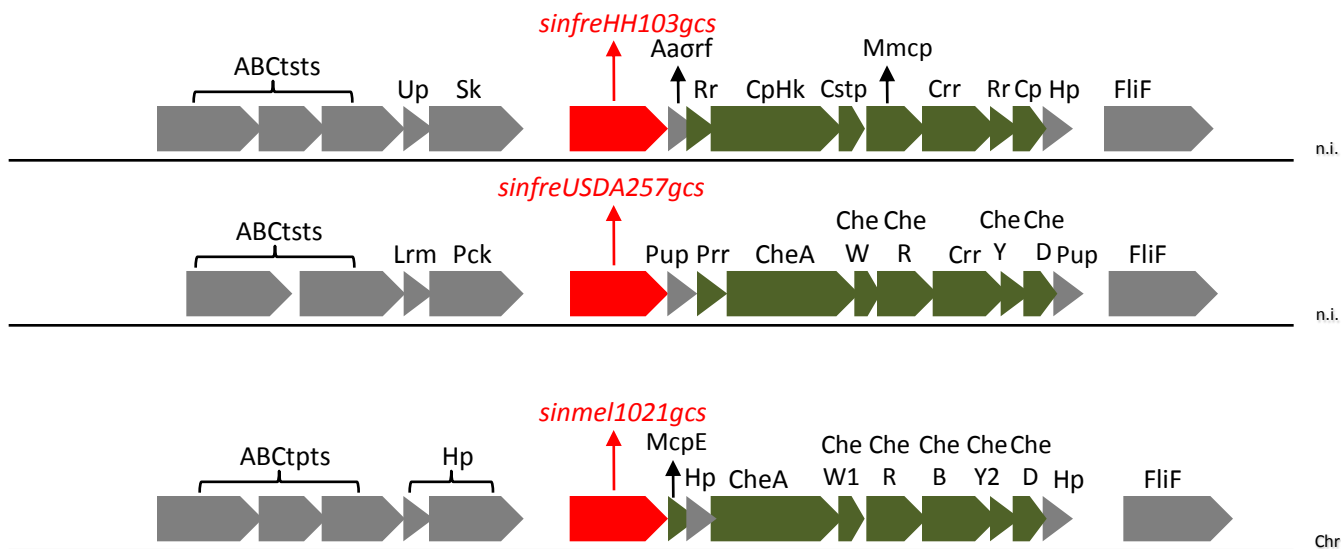




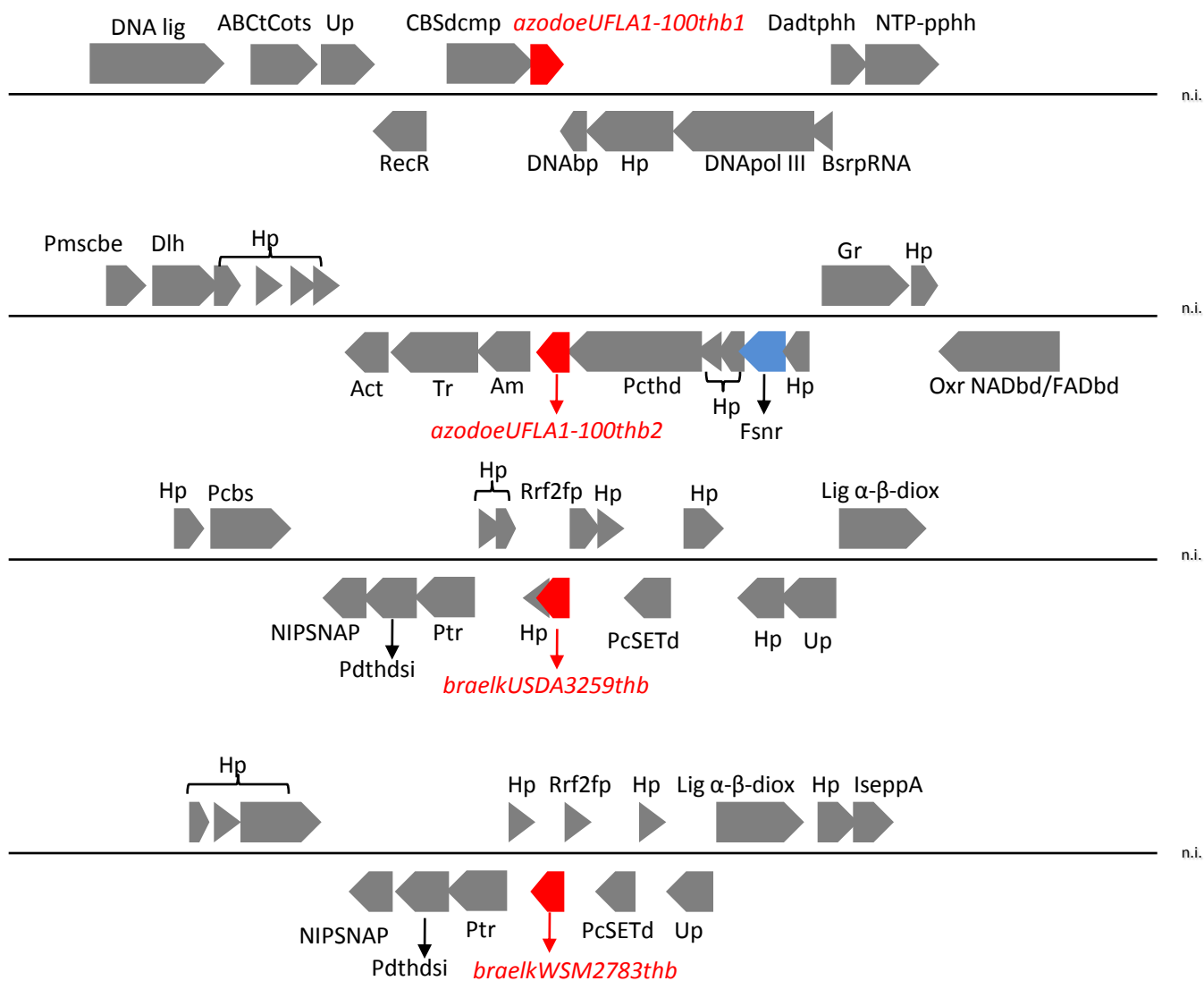


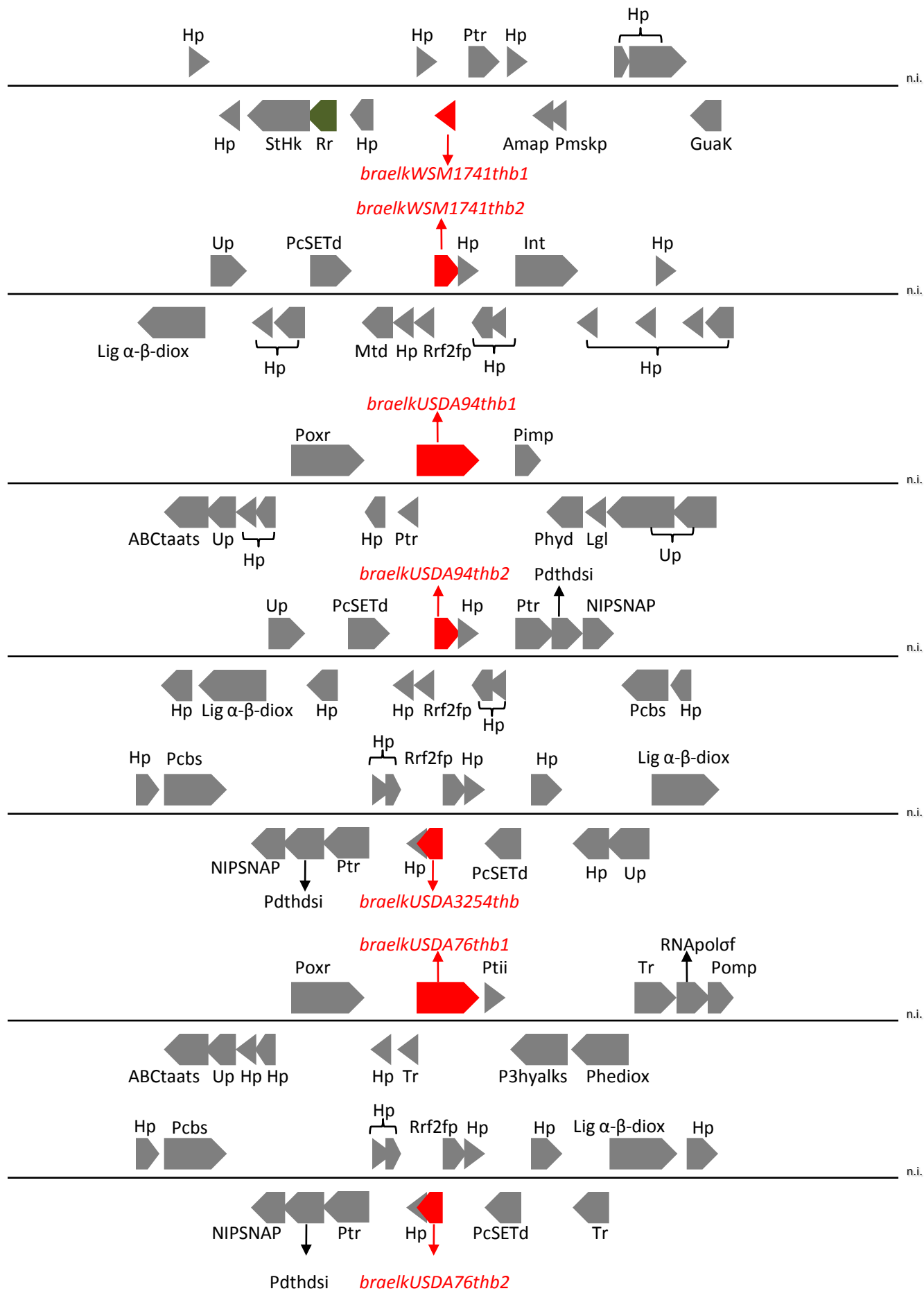


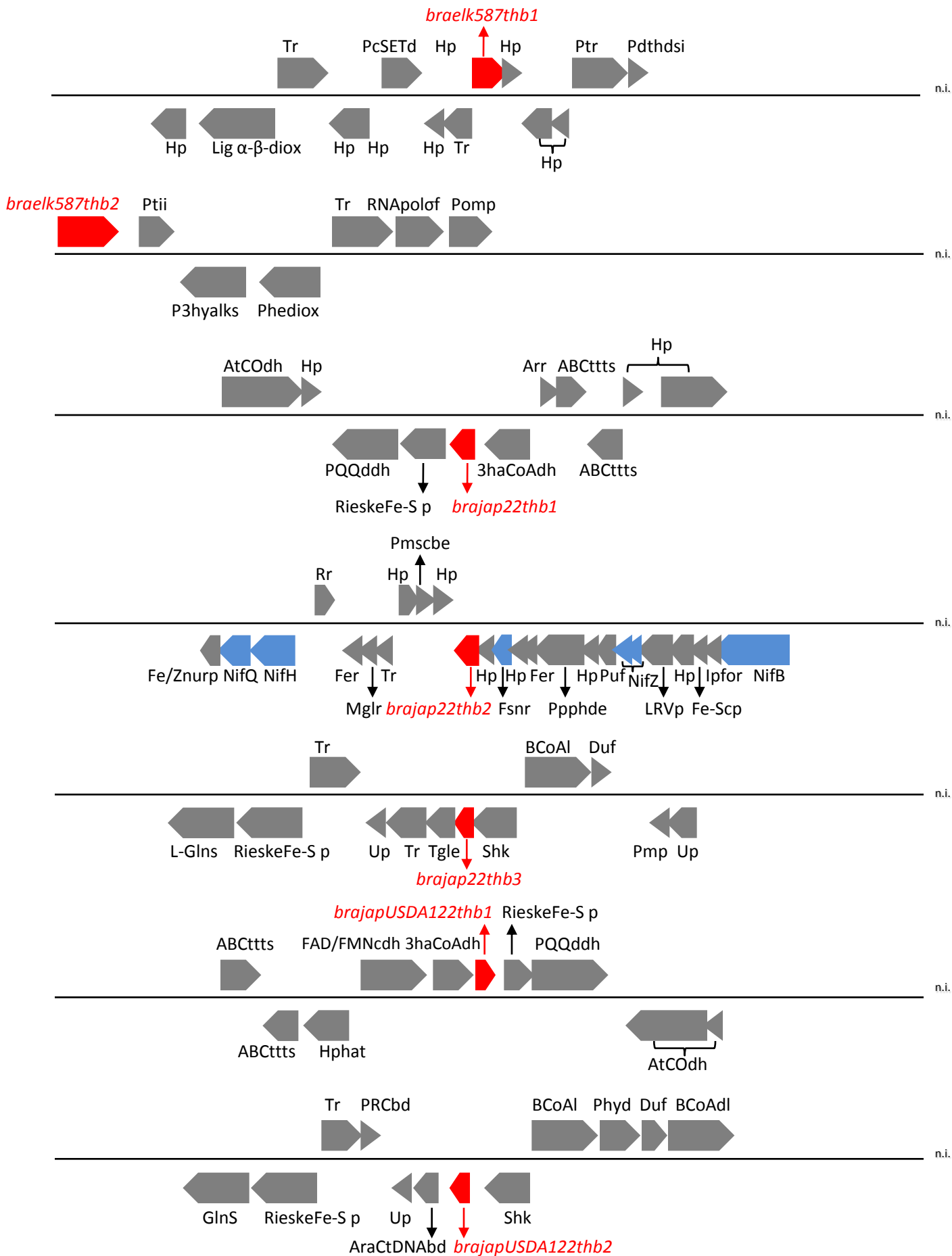




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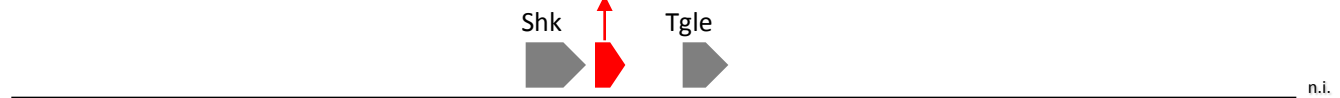




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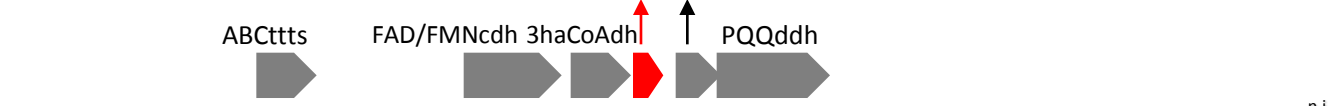


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2,3dhy2,3dhy Up Phyd BCoAl Pcbp Hb KeftKt Tr
bCoArce Pcbp

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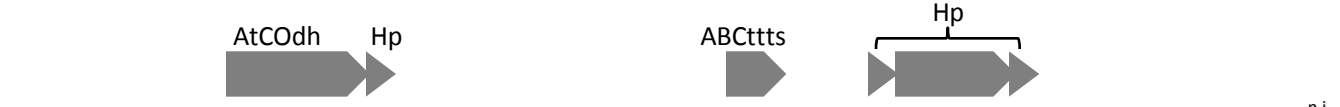


ABCttts Hphat Hp AtCODh

Lip Tr PRCbd BCoAl Phyd Duf BCoAdl

Glns Glns RieskeFe-S p Shk

brajapUSDA124thb2



PQQddh 3haCoAdh ABCttts

RieskeFe-S p *brajapUSDA135thb1*

ShK *brajapUSDA135thb2*



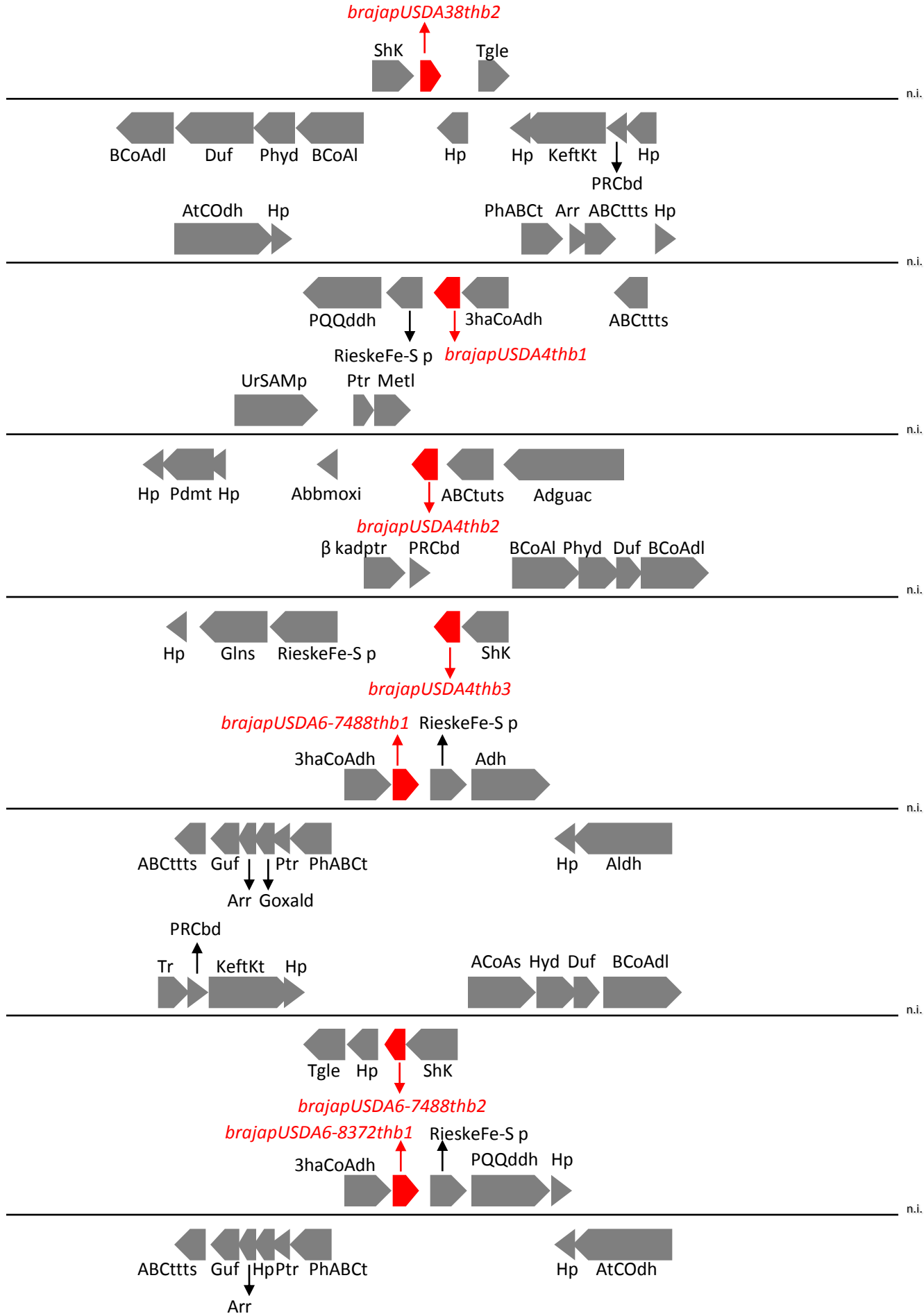
BCoAox BCoAdl Phyd BCoAl Hp

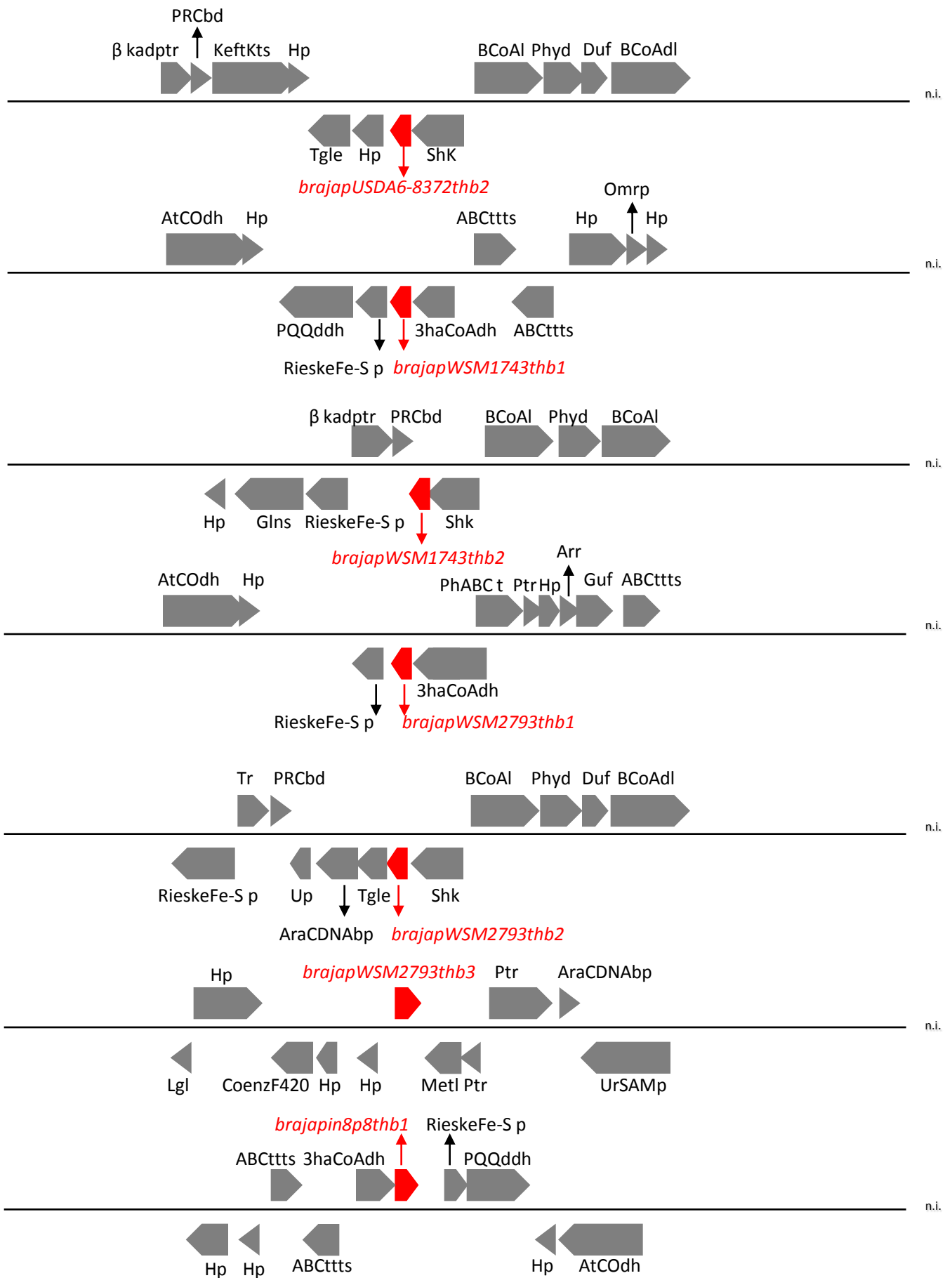
AtCODh Hp 3haCoAdh Ptr Hp Arr Guf ABCttts

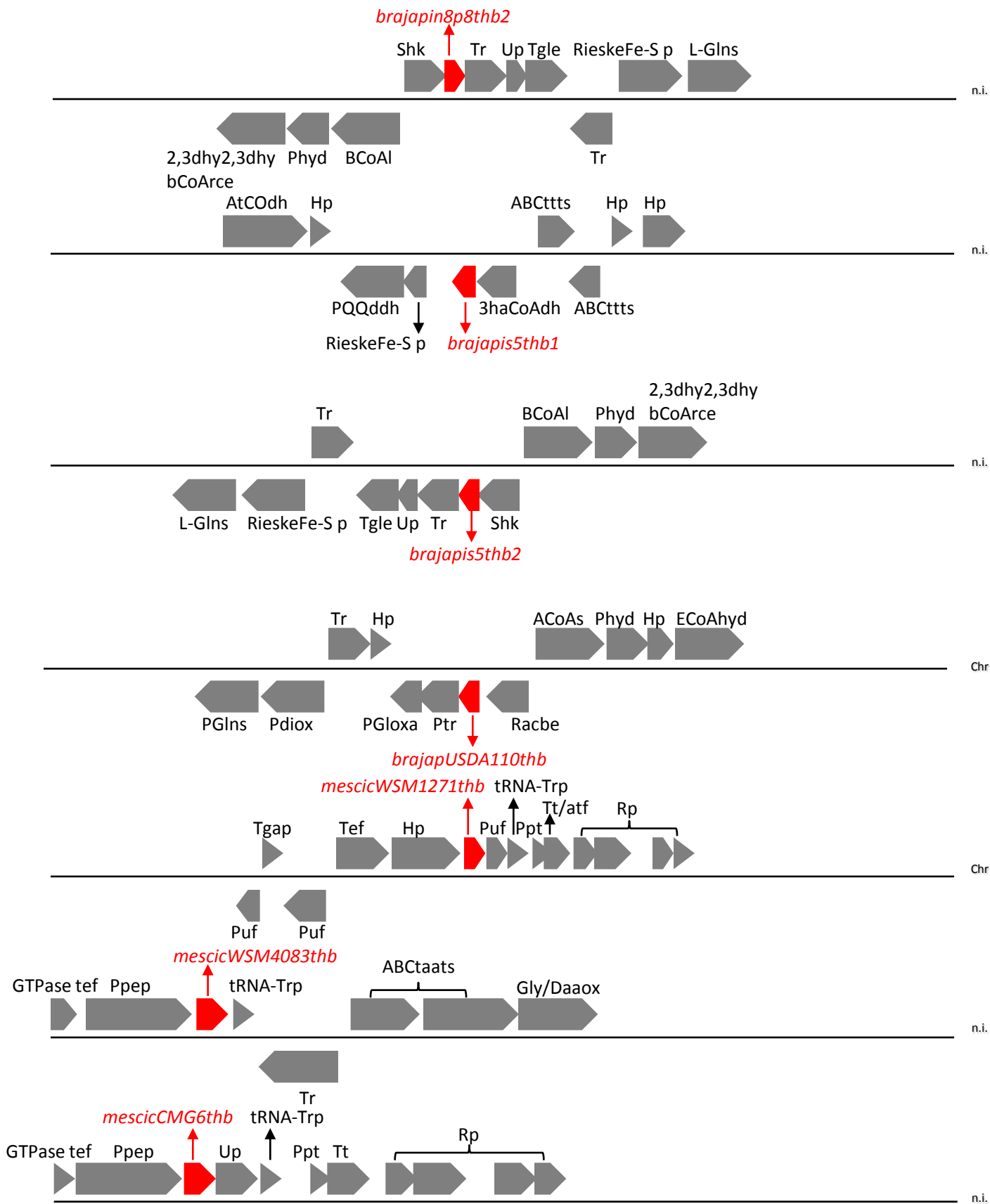
PQQddh 3haCoAdh

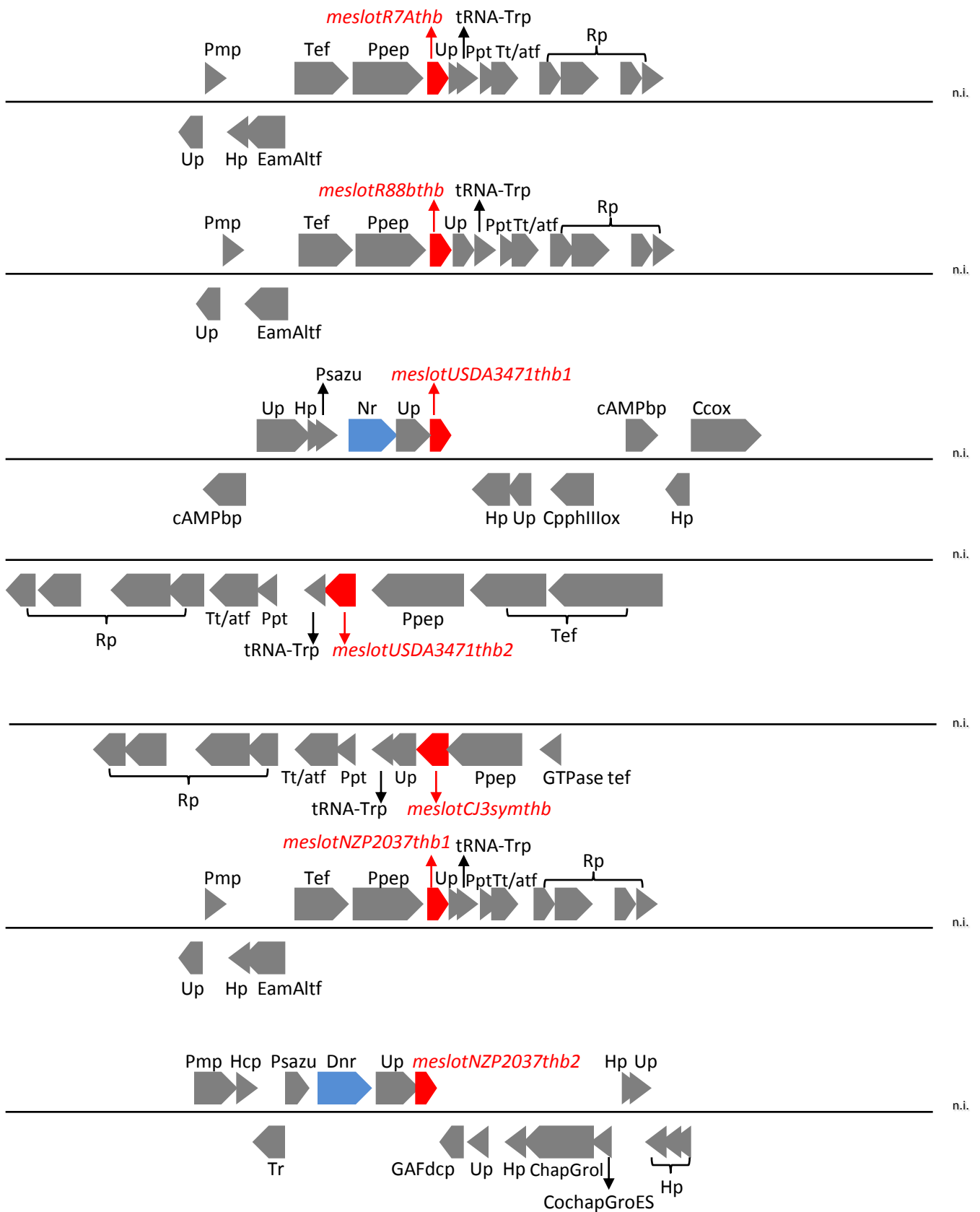
RieskeFe-S p *brajapUSDA38thb1*

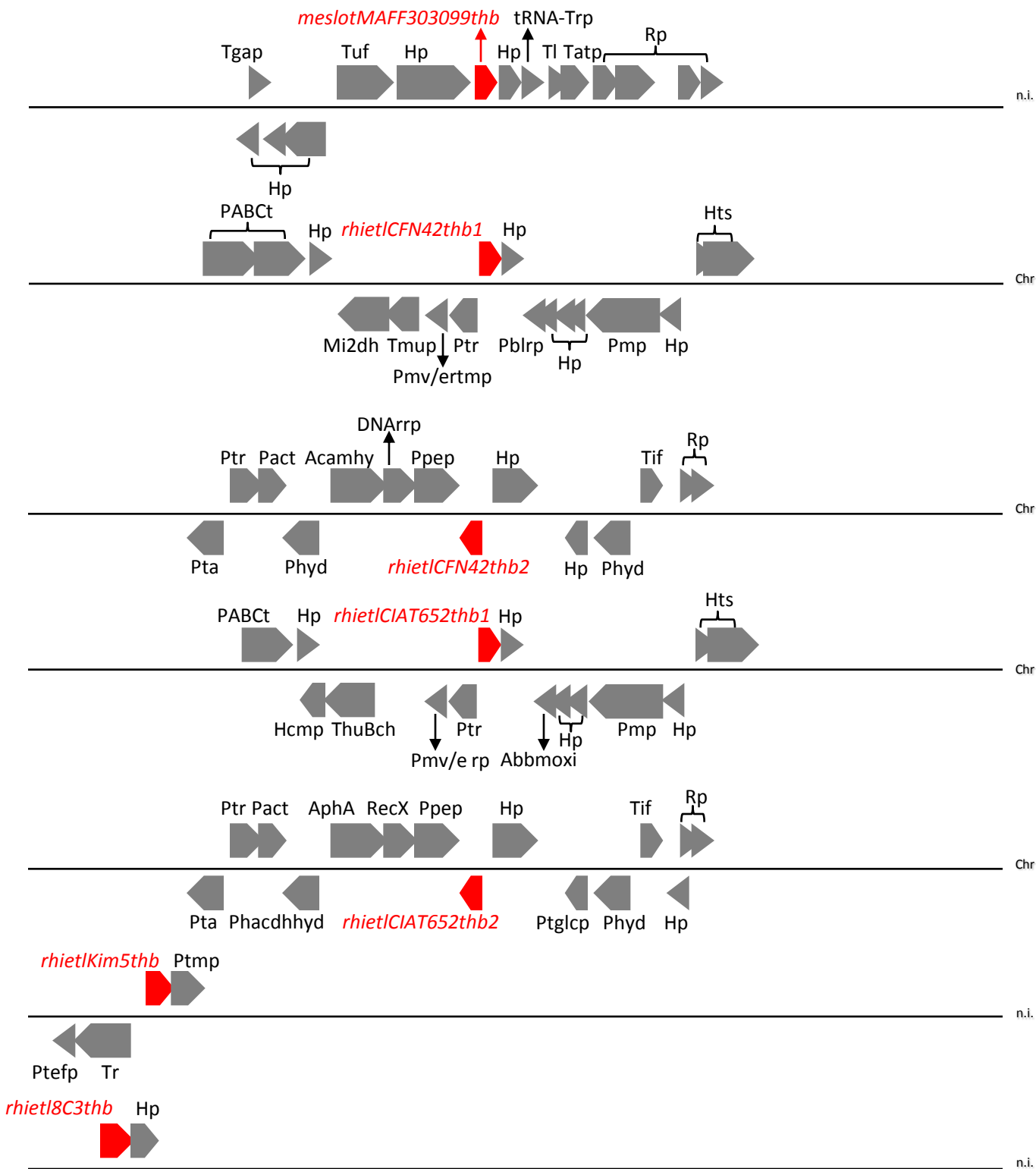


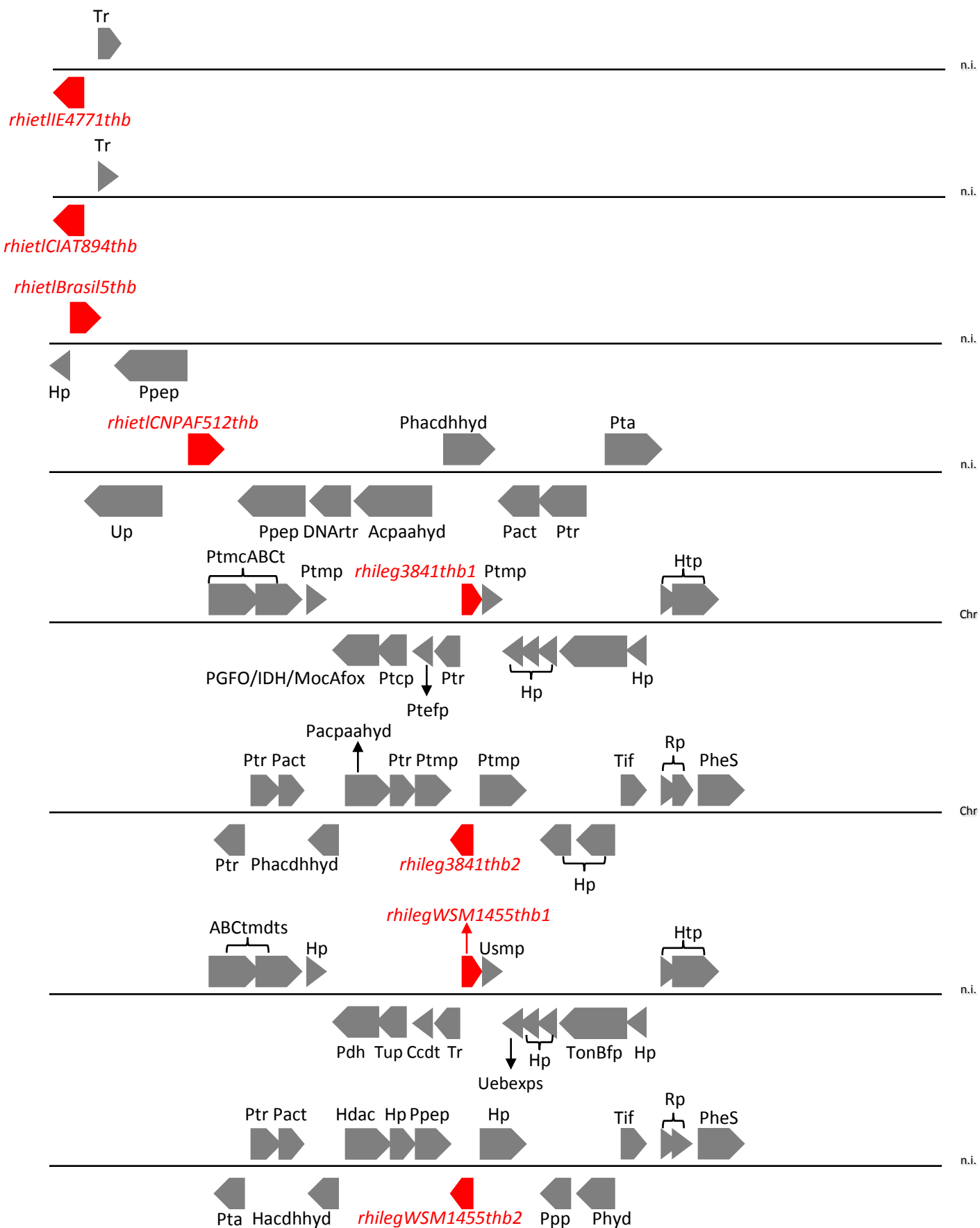


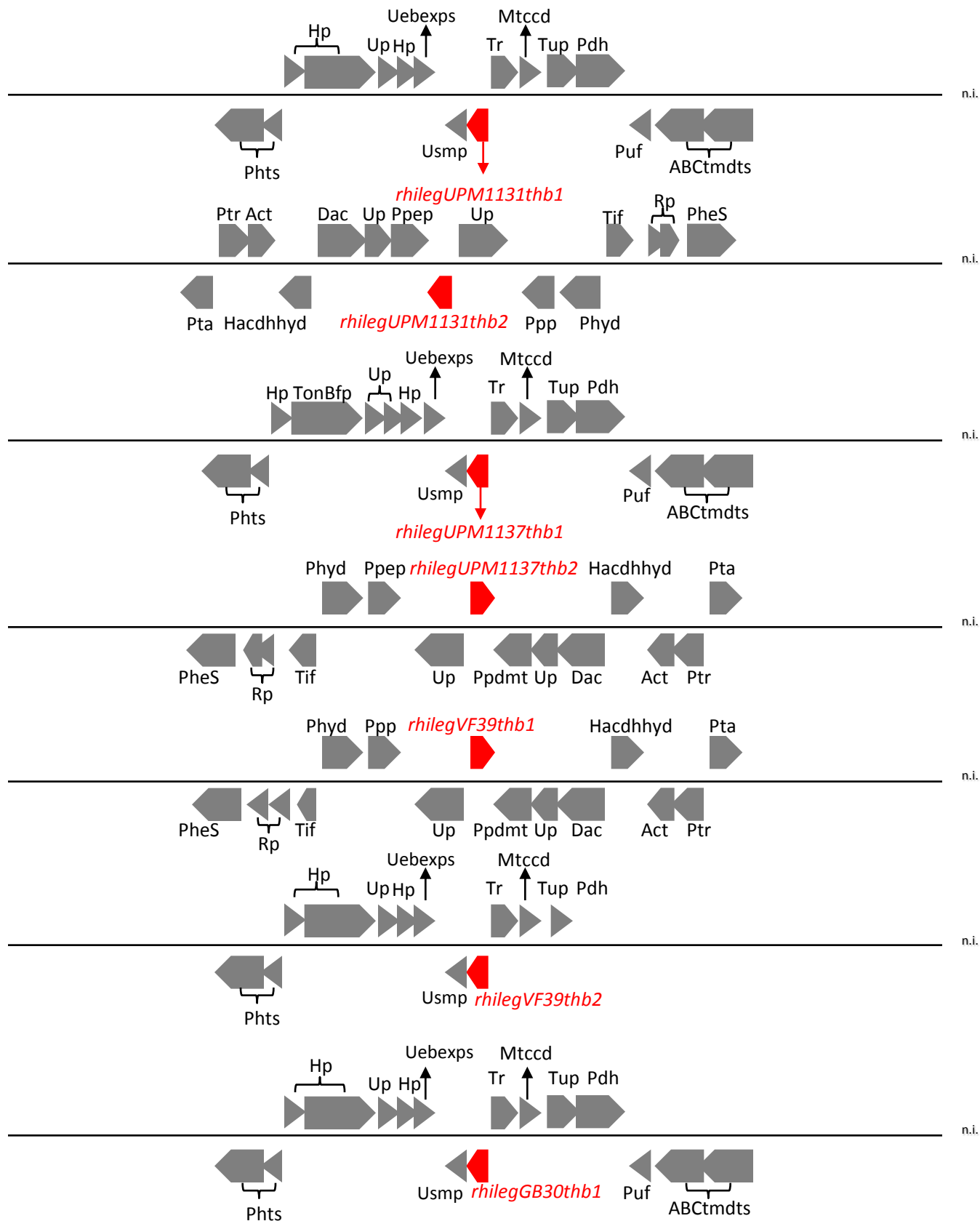


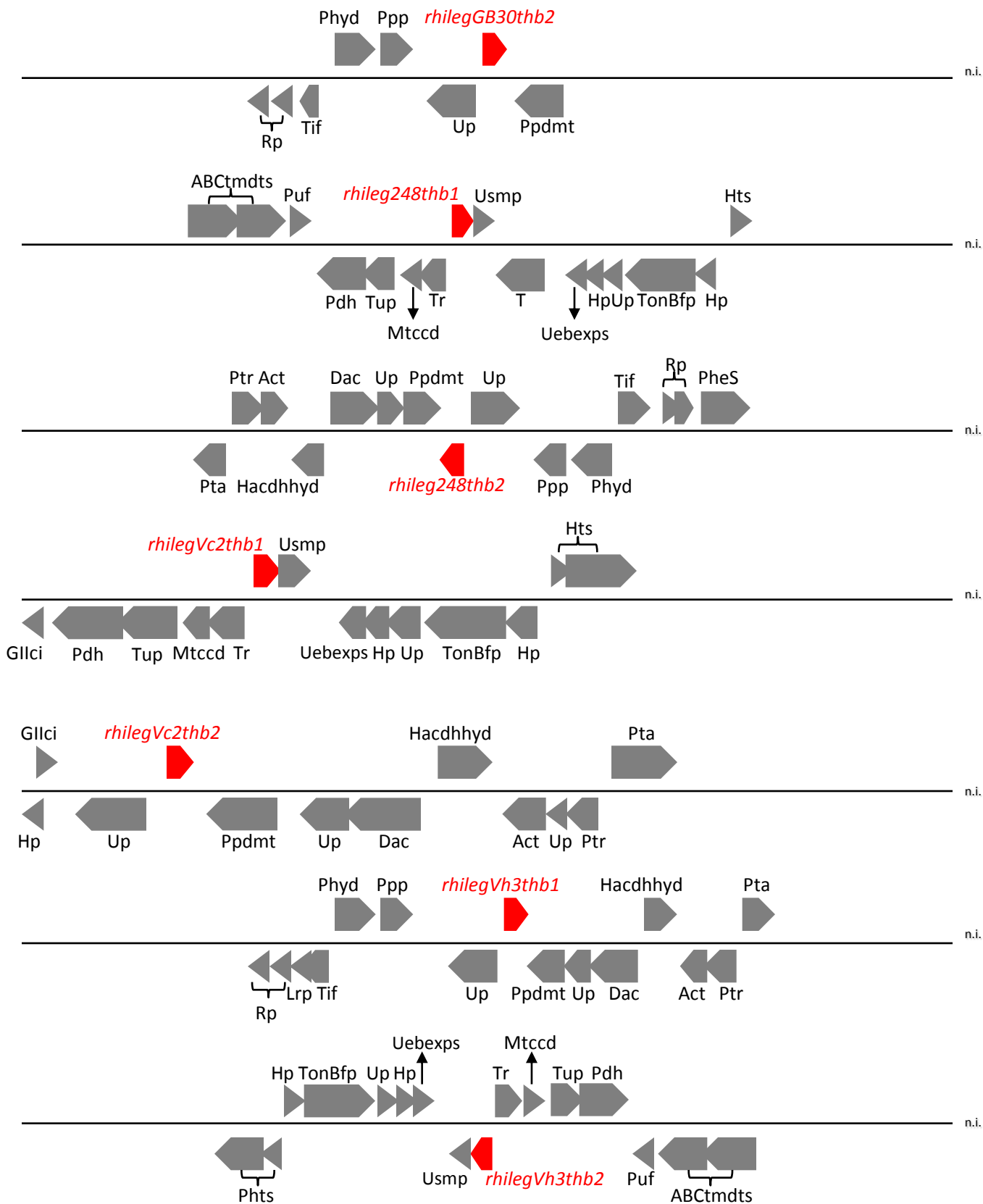


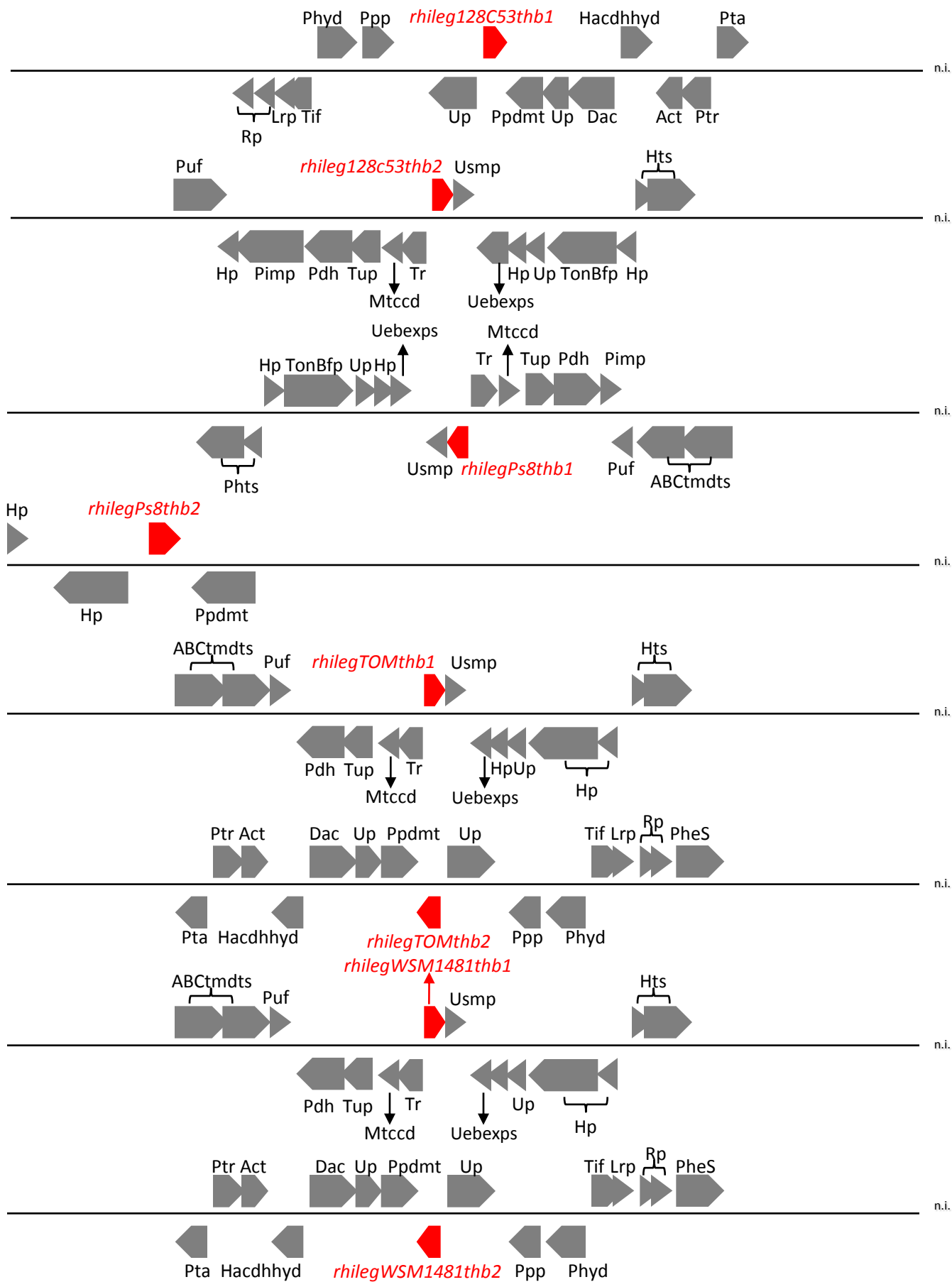


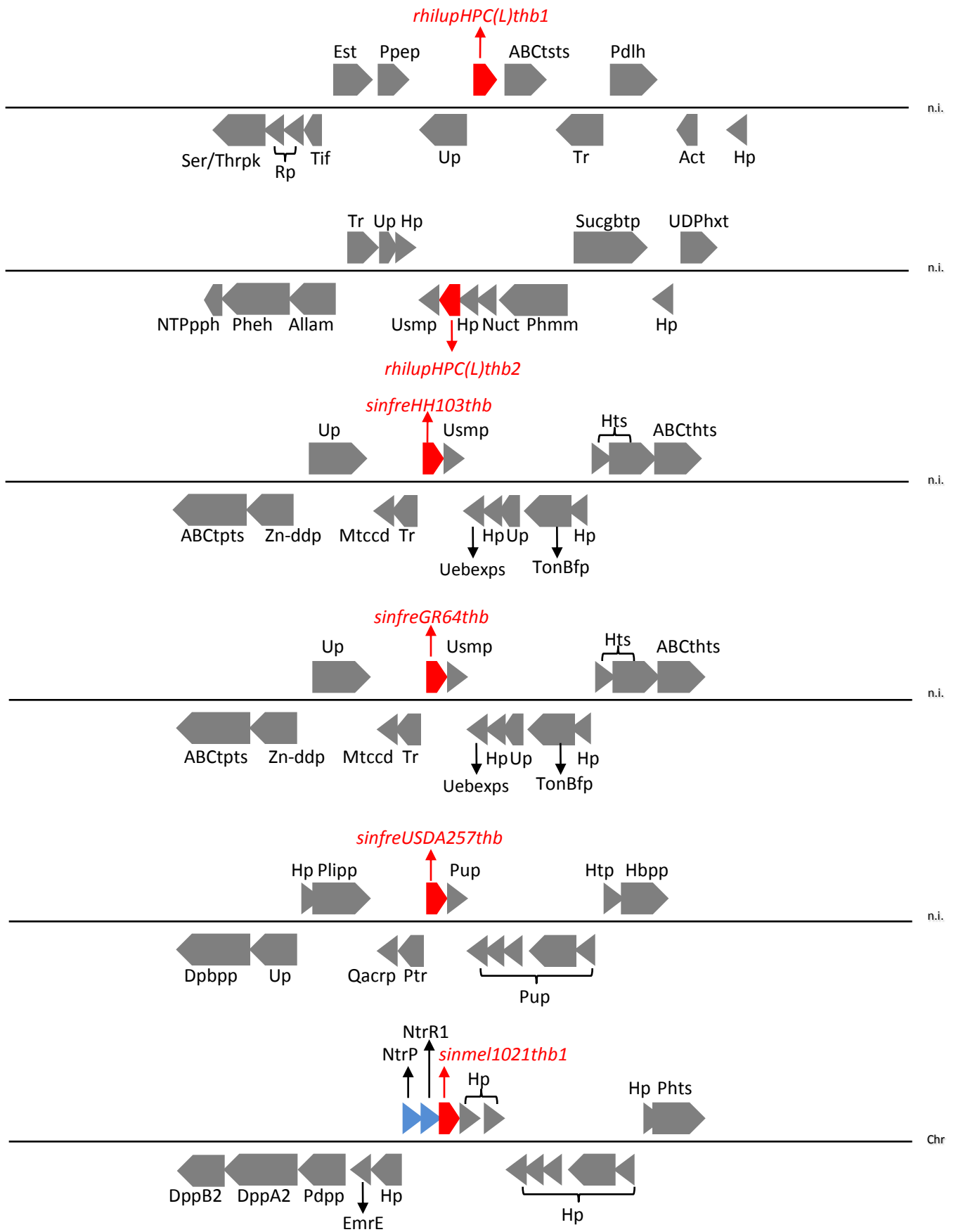


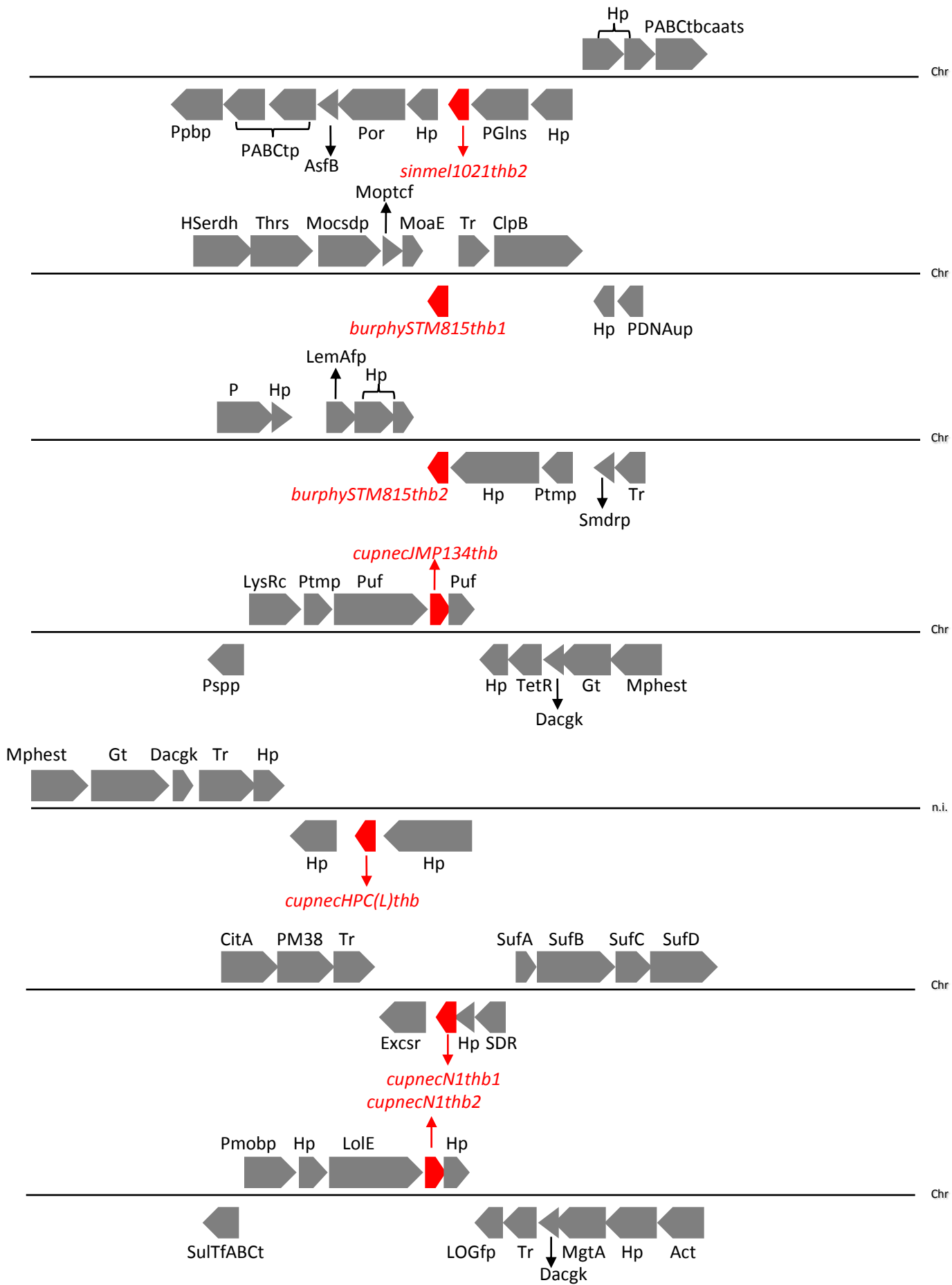












Abbreviations for predicted polypeptides:

2,3dh2,3dhybeCoArce, 2,3 dihydro 2,3 dihydrobenzoyl CoA ring cleavage enzyme; **2dhp2r**, 2 dehydropantoate 2 reductase; **3haCoAdh**, 3 hydroxyacyl CoA dehydrogenase; **3imdh**, 3-isopropylmalate dehydrogenase; **4-a4-dox-L-arat**, 4-amino 4-deoxy-L-arabinose transferase; **Aaorf**, Anti anti σ regulatory factor; **Abbmoxi**, Antibiotic biosynthesis monooxygenase; **ABCtaats**, ABC type amino acid transport system; **ABCbcaats**, ABC type branch chain amino acid transport system; **ABCtCots**, ABC type Co transport system; **ABCthts**, ABC type hemin transport system; **ABCtmdts**, ABC type multidrug transport system; **ABCtns**, ABC type nitrate transport system; **ABCtpts**, ABC type peptide transport system; **ABCtsts**, ABC, type sugar transport system; **ABCtts**, ABC type transport system; **ABCttts**, ABC type tungstate transport system; **ABCtuts**, ABC type uncharacterized transport system; **Acamhyd**, acetyl aminohydrolase; **ACoAdh**, acylCoA dehydrogenase; **ACoAs**, AcetylCoA synthetase; **Acpaahyd**, acetylpolysamine aminohydrolase; **Act**, acetyl transferase; **Adguac**, adenylate and guanylate cyclase; **Adh**, alcohol dehydrogenase; **AdsucI**, adenylosuccinate lyase; **Aep**, arabinose efflux permease; **Akr**, aldo/keto reductase; **Aldh**, aldehyde dehydrogenase; **Allam**, allantoate amidohydrolase; **Am**, amidase; **Amap**, Addition module antidote protein; **Amh**, amidohydrolase; **Anr**, Assimilatory nitrate reductase; **AphA**, acetylpolysamine aminohydrolase protein; **AraCtDNAbp**, AraC type DNA binding protein; **Arr**, Arsenate reductase; **AsfB**, putative ferredoxin protein; **Asp/Gluat**, Asp/Glu amidotransferase; **AtCOdh**, aerobic type carbon monoxide dehydrogenase; **ATPase chrp**, ATPases involved in chromosome partitioning; **BCoAdl**, benzoyl CoA dihydrodiol lyase ; **BCoAl**, benzoate CoA ligase; **BCoAox**, benzoyl CoA oxygenase, **β kadptr**, β keto adipate pathway transcriptional regulator; **β lac**, β lactamase; **BNR/Aspbr**, BNR Asp box repeat; **BNRrld**, BNR repeat like domain; **BsrpRNA**, bacterial signal recognition particle RNA; **Cabefh**, Ca binding ef-hand; **cAMPbp**, cAMP-binding protein; **Cas**, Ca sensor; **CBS-dcmp**, CBS-domain containing membrane protein; **Ccdt**, cation/cationic drug transporter; **Ccox**, cytochrome oxidase; **Cd**, catechol 1,2-dioxygenase; **ChapGrol**, chaperonin Grol; **CheA**, chemotaxis two component sensor histidine kinase protein; **CheBch1**, protein glutamate methyltransferase; **CheD**, chemotaxis protein; **CheRch1**, chemotaxis methyltransferase protein; **CheW1**, chemotaxis signal transduction protein; **CheY2**, chemotaxis two component response regulator protein; **CitA**, citrate proton symporter; **ClpB**, ATP dependent chaperone; **CochapGroES**, co-chaperonin GroEs; **CoenzF420**, coenzyme F420; **Cp**, chemotaxis protein; **CpHk**, chemotaxis protein histidine kinase; **CpphIllox**, coproporphyrinogen III oxidase; **Crr**, Chemotaxis response regulator; **Cstp**, chemotaxis signal transduction protein; **D2nd**, dioxygenase related to 2-nitropropane dioxygenase; **Dac**, deacetylase; **Dacgk**, diacylglycerol kinase; **Dadtphh**, diadenosine tetraphosphate hydrolase; **DapD**, N-succinyltransferase protein; **DapE**, putative succinyl diaminopimelate desuccinylase protein; **DapE2**, succinyl diaminopimelate desuccinylase protein; **Def1**, Peptide deformylase protein; **Dh**, dehydrogenase; **Dlh**, dienelactone hydrolase; **DMT**, DMT (drug/metabolite transporter) superfamily permease; **DNAbp**, DNA binding protein, **DNAlig**, DNA ligase; **DNApolIII**, DNA polymerase III; **DNArrp**, DNA repair regulator protein; **DNArtr**, DNA repair transcriptional regulator; **Dnr**, dissimilatory nitrite reductase; **Dpbpp**, dipeptide binding periplasmic protein; **DppA2**, putative dipeptide binding periplasmic protein; **DppbB2**, putative dipeptide transport system; **Duf**, domain of unknown function; **EamAltf**, EamA like transporter family; **ECoAhyd**, enoyl CoA hydratase; **EmrE**,

transmembrane protein; **Est**, esterase; **Excsr**, extracytoplasmic solute receptor; **FAD/FMNcdh**, FAD/FMN containing dehydrogenase; **Fe/Zn urp**, Fe/Zn uptake regulation protein; **Fer**, ferredoxin; **Fe-Scp**, Fe-S cluster protein; **Flif**, flagellar M-ring protein; **Fmt**, formyltransferase protein; **Fnt**, formate/nitrite transporter; **Fsnr**, ferredoxin subunit of nitrite reductase; **Fthf**, formyltetrahydrofolate; **GAFdcp**, GAF domain containing protein; **Gilci**, group II catalytic intron; **Glns**, Gln synthetase; **Gluc**, gluconolactonase; **Gly/Daaox**, Gly/D amino acid oxidase; **Goxald**, glyoxalase like domain; **Gr**, glutathione reductase; **Grkes**, glutathione-regulated K-efflux system; **Gt**, glycosyl transferase; **GTPase tef**, GTPase translation elongation factor; **Guak**, guanylate kinase; **Guf**, glycerol uptake facilitator; **Hacdhhyd**, haloacid dehydrogenase hydrolase; **Hbpp**, hemin binding periplasmic protein; **Hcmp**, hypothetical conserved membrane protein; **Hcp**, hybrid cluster protein; **Hdac**, histone deacetylase; **Hlnsph-ns**, histone like nucleoid-structuring protein H-NS; **Hmrr**, heavy metal response regulator; **Hmsq**, heavy metal sensor quinase; **Hp**, hypothetical protein; **Hphat**, histidinol phosphate aminotransferase; **HSerdh**, homoserine dehydrogenase; **Htp**, hemin transport protein; **Hts**, Hemin transport system; **Hyd**, hydrolase, **Int**, integrase; **Ipfor**, indol pyruvate ferredoxin oxidoreductase; **IseppA**, intracellular septation protein A; **Jtp**, J transmembrane protein, **KeftKts**, kef type K transport system; **L-2at4cah**, L-2-amino-thiazoline-4-carboxylic acid hydrolase; **LemAfp**, LemA family protein; **Lgl**, lactoylglutathione lyase; **L-Glns**, L-Gln synthetase; **Liga- β -diox**, lignostilbene α - β -dioxygenase; **Lip**, lipase; **LoGfp**, LoG family protein; **LoIE**, ABC transporter; **Lr1e**, L-rhamnose 1-epimerase; **Lrp**, long range pseudoknot; **LRVp**, LRV protein; **LysR**, regulatory protein; **MarRs**, transcriptional regulator; **Mcc**, muconate and chloromucanate cycloisomerase; **Mcp**, methyl accepting chemotaxis protein; **McpE**, methyl accepting chemotaxis protein; **McpX1**, methyl accepting chemotaxis protein; **MetI**, methylase; **Met-tRNAft**, Methionyl tRNA formyltransferase; **Mglr**, monothiol glutaredoxin; **MgtA**, mannosyltransferase; **Mi2dh**, myoinositol 2-dehydrogenase; **Mmcp**, methylase of methyl accepting chemotaxis protein; **MoaE**, molybdopterin biosynthesis protein; **Mocsdp**, Mo cofactor synthesis domain containing protein; **Moptcf**, molybdopterin converting factor; **Mphest**, metallophosphoesterase; **Mtccd**, membrane transporter of cation and cationic drugs; **Mtd**, methyltransferase domain; **MtrK**, methylthioribose kinase; **M δ i**, muconolactone δ -isomerase; **NADadh**, NAD dependent aldehyde dehydrogenases; **NAD(P)Hnr**, NAD(P)H nitrite reductase; **NAD(P)Hdh**, NAD(P)H dehydrogenase; **NADPHqr**, NADPH quinone reductase; **NasA**, nitrate reductase; **Nat**, N-acetyltransferase; **Nep**, nitrite extrusion protein; **NifA**, transcriptional regulator; **NifB**, responsible for formation of a functional Mo-Fe nitrogenase; **NifH**, Mo nitrogenase iron protein subunit; **NifQ**, responsible for formation of a functional Mo-Fe nitrogenase; **NifZ**, nitrogenase Mo-Fe maturation protein; **NIPSNAP**; **Nnt**, nitrate/nitrite transporter; **NosD**, periplasmic Cu-binding precursor; **NosF**, Cu-ABC transporter; **NosL**, N₂O reduction; **NosR**, regulatory protein for N₂O reductase; **NosX**, N₂O reduction; **NosY**, N₂O metabolic protein; **NosZ**, nitrous oxide reductase precursor; **Nr**, nitrite reductase; **NrpPtsN**, nitrogene regulatory protein PtsN; **NsrR**, transcriptional regulator; **Nstp**, N-succinyltransferase protein; **Nt**, nitrate transport; **Nterdtmd**, N-terminal double transmembrane domain; **NTPpph**, NTP

pyrophosphatase; **NTP-pphh**, NTP pyrophosphohydrolases; **NtrP**, nitrogen regulatory protein; **NtrR1**, nitrogen regulatory protein; **Nuct**, nucleotidyltransferase; **Omrp**, outer membrane receptor protein; **Oxr**, oxidoreductase; **OxrNADbd/FADbd**, oxidoreductase NAD binding domain/FAD binding domain; **P3Bs**, precorrin 3B synthase; **P3hyalks**, Poly (3-hydroxyalkanoate) synthetase; **PABCt**, probable ABC transporter; **PABCtbcaats**, Putative ABC type branch chain amino acid transport system; **PABCtp**, putative ABC transport protein; **Pacpaahyd**, Putative acetylpolymine aminohydrolase; **Pact**, probable acetyltransferase; **PASd**, PAS domain; **PASdsb/dgc**, PAS domain S-box/diguanylate cyclase; **PASf**, PAS fold; **Pblrp**, putative bleomycin resistance protein; **Pc1,2dox**, protocatechuate 1,2 dioxygenase; **Pcbp**, predicted cobalamin binding protein; **Pcbs**, protein involved in cellulose biosynthesis; **Pcd**, protocatechuate 3,4 dioxygenase; **PcK**, putative carbohydrate kinase; **PcSETd**, protein containing SET domain; **Pcthd**, protein containing a thioredoxin domain; **PCuep**, putative copper export protein; **Pdf**, peptide deformylase; **Pdh**, putative dehydrogenase; **Pdiox**, probable dioxygenase; **Pdlh**, predicted dienelactone hydrolase; **Pdmt**, permease of the drug/metabolite transporter; **PDNArp**, putative DNA recombination protein; **PDNAup**, putative DNA uptake protein; **Pdpp**, putative dipeptidase protein; **Pdthdsi**, predicted dithiol-disulfide isomerase; **Pemp**, protein export membrane protein; **Perll**, predicted enzyme related to lactoylglutathione lyase; **PG**, general secretion pathway proteins; **PGFO/IDH/MocAfox**, PGFO/IDH/MocA family oxidoreductase; **PGloxa**, probable glyoxalase; **PGlns**, probable Gln synthetase; **Pgt**, putative glycosyltransferase protein; **PH**, general secretion pathway proteins; **PhABCt**, phosphate ABC transporter; **Phacdhhhyd**, putative haloacid dehydrogenase hydrolase; **Phediox**, phenylpropionate dioxygenase; **Pheh**, phenylhydantoinase; **PheS**, phenylalanyl-tRNA synthetase; **Phmm**, Phosphomannomutase; **Phts**, putative hemin transport system; **Phyd**, predicted hydrolase; **PI**, general secretion pathway proteins; **Pimp**, predicted integral membrane protein; **PJ**, general secretion pathway proteins; **PK**, general secretion pathway proteins; **PKes**, putative K efflux system; **Plipp**, putative lipoprotein; **PM38**, peptidase M38; **Pmbp**, periplasmic molybdate-binding protein; **Pmcp**, probable methyl accepting chemotaxis protein; **Pmobp**, periplasmic molybdate binding protein; **Pmp**, predicted membrane protein; **Pmscbe**, predicted metal sulfur cluster biosynthetic enzyme; **Pmskp**, plasmid maintenance system killer protein; **Pmv/erp**, probable methyl viologen/ethidium resistance protein; **Pmv/ertmp**, probable methyl viologen/ethidium resistance transmembrane protein; **Pnabp**, predicted nucleic acid binding protein; **Pnr**, putative nitrite reductase; **Pomp**, predicted outer membrane protein; **Por**, putative oxidoreductase; **Poxr**, predicted oxydereductase; **Ppbbp**, putative periplasmic binding protein; **Ppdf**, putative peptide deformylase; **Ppdmt**, predicted permease of the drug/metabolite transporter; **Ppep**, putative permease protein; **Ppp**, predicted periplasmic protein; **Ppphde**, predicted pyridoxal phosphate dependent enzyme; **Ppsp**, probable plasmid stabilization protein; **Ppt**, preprotein translocase; **PQQddh**, PQQ dependent dehydrogenase; **PRCbd**, PRC barrel domain; **Psazu**, Pseudoazurin; **Psl**,

Pseudouridylate synthase I; **Psp**, plasmid stability protein; **Pssp**, probable signal peptide protein; **Pta**, probable transcriptional activator; **Ptcp**, putative transporter component protein; **Ptefp**, putative transmembrane efflux protein; **Ptep**, putative transmembrane exporting protein ; **Ptglcp**, putative transglutaminase-like cysteine peptidase; **Pthie**, predicted thioesterase; **Ptiesp**, putative transmembrane ion efflux system protein; **Ptif**, putative transcriptional initiation factor; **Ptii**, putative translation initiation inhibitor; **PtmcABCt**, putative transmembrane component ABC transporter; **Ptmp**, putative transmembrane protein; **Ptr**, probable transcriptional regulator; **PtsNch**, protein N(pi)-phosphohistidine-sugar phosphotransferase; **Puf**, protein of unknown function; **Pup**, putative uncharacterized protein; **Qacrp**, quaternary ammonium compound resistance protein; **Racbe**, regulator of the catabolism of benzoate; **RbsK**, ribose kinase protein; **RecR**, recombination protein; **RecX**, DNA repair transcriptional regulator; **Rieske FE-Sp**, Rieske Fe-S protein; **RNApol σ** , RNA polymerase σ factor; **RNDes**, RND efflux system outer membrane lipoprotein; **Rep**, regulatory protein; **Rp**, ribosomal protein; **Rr**, response regulator; **Rrf2fp**, Rrf2 family protein; **Rsip**, ribosomal subunit interphase protein; **Sdapdsp**, succinyl diaminopimelate desuccinylase protein; **SDR**, short chain dehydrogenase; **SecD1**, translocase; **Ser/Thrpk**, ser/thr protein kinase; **Shk**, shikimate kinase; **Sk**, sugar kinase; **Smdrp**, small multidrug resistance protein; **Sox**, Sulfite oxidase; **Sp**, secretion protein; **StdB**, plasmid stability protein; **StHk**, signal transduction histidine kinase; **Sucgbtp**, succinoglycan biosynthesis transport protein; **SufA**, iron sulfur cluster assembly transcriptional regulator; **SufB**, iron sulfur cluster assembly protein; **SufC**, iron sulfur cluster assembly protein; **SufD**, iron sulfur cluster assembly protein; **SulTfABCt**, SulT family ABC transporter; **T**, transposase; **Tatp**, transcription antitermination protein; **Tdsi**, thiol-disulfide isomerase; **Tef**, translation elongation factor; **TetR**, regulatory protein; **Tgap**, Transglycosylase associated protein; **Tgle**, Transglutaminase like enzyme; **Thir**, thioredoxin reductase; **Thrs**, threonine synthase; **ThuBch**, myoinositol dehydrogenase; **Tif**, translation initiation factor; **TI**, translocase; **Tmup**, trehalose maltose utilization protein; **TonBfp**, TonB family protein; **Tr**, transcriptional regulator; **TrcB**, thiosulfate reductase cytochrome B; **tRNA-Arg**; **tRNApsI**, RNAt pseudouridine synthase I; **tRNA-Thr**; **tRNA-Trp**; **TruA**, tRNA pseudouridine synthase; **Tt**, transcriptional termination; **Tt/atf**, transcriptional termination/antitermination factor; **Tuf**, elongation factor, **Tup**, trehalose utilization protein; **Uadh**, Uncharacterized anaerobic dehydrogenase; **UDPhxt**, UDP hexose transferase; **Uebexps**, uncharacterized enzyme involved in biosynthesis of extracellular polysaccharides; **Ulls**, uroporphyrinogen III synthase; **Ump**, uncharacterized membrane protein; **Up**, uncharacterized protein; **UrSAMP**, uncharacterized radical SAM protein; **Usmg**, uncharacterized small membrane protein; **Zn-ddp**, Zn-dependent dipeptidase.