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NuoMEcoli           ---MLLPWLILIPFIGGFLCWQTER----FGVKVPRWIALITMGLTLALSLQLWLQGGYS 53
Nqo13Thermus        ----MVVLAVLLPVVFGALLLLG----------LPRALGVLGAGLSFLLNLYLFLT---- 42
Nqo13Paracoccus     -MTNLLSIITFLPIVAAIIMALFLRGQDEAAARNAKWLALLTTTATFVISLFVLFR---F 56
NuoMRhodobacter     -MENLLSIITFIPLVAALIMALFLRGDDAAAQRNAKWLALLATSATFLVSLFLLAG---F 56
NuoMPseudomonas     ---MILPWLILIPFIGGFLCWIAEH----SSKTLPRWIALLSMTLVLILSLWIWATGDFQ 53
NuoMStretomyces     MSFPLLTVTAALPAVGAIATAAVPA----AKRTAAKWLALLVSLATLGLAIAVLVR---- 52
ND5Yarrowia         -MFLTSILLSSLYLFNRILAWQGNV--------KHFYLFASNLLLLFIVVLYINFNTFSN 51
ND4Bovine           ---MLKYIIPTIMLMP--LTWLSKN--------NMIWVNSTAHSLLISFTSLLLMNQFG- 46
ND4Human            ---MLKLIVPTIMLLP--LTWLSKK--------HMIWINTTTHSLIISIIPLLFFNQIN- 46

NuoMEcoli           LTQSAG-IPQWQSEFDMPWIPRFGISIHLAIDGLSLLMVVLTGLLGVLAVLCSWKEIEKY 112
Nqo13Thermus        --HPGG----VAHAFQAPLLPGAGVYWAFGLDGLSALFFLTIALTVFLGALVARVEG--- 93
Nqo13Paracoccus     DPANTG----FQFVEDHAWIM--GVCYKMGVDGISVLFVLLTTFMMPLTILSTWQVQDKV 110
NuoMRhodobacter     DAQDTG----FQFVESYDWIA--GLQYKMGVDGISILFVMLTTFLMPLTIASAWEVETRV 110
NuoMPseudomonas     LAPAPGGEPEWTLQFKVLWIERLGISVHLAMDGLSLLMVALTGLLGVLSVLCSWNEIQRR 113
NuoMStretomyces     FDPDGD---RYQLTESHSWIADFGVRYELGVDGIAVALIALTALLIPFIILAGWHDADPL 109
ND5Yarrowia         SFQFNF-ELFNSLNPFGLSNSDISNGLLFGIDGLSLTFILLTVLLIPLTLLGNWYNIN-- 108
ND4Bovine           ------------------DNSLNFSLLFFSDSLSTPLLILTMWLLPLMLMASQHHLSKE 87
ND4Human            ------------------NNLFSCSPTFSSDPLTTPLLMLTTWLLPLTIMASQRHLSSE 87

NuoMEcoli           QG---------FFHLNLMWILGGVIGVFLAIDMFLFFFFWEMMLVPMYFLIALWG----- 158
Nqo13Thermus        -----------RFLGLALLMEGLLLGLFAARDLLVFYVFFEAALIPALLMLYLYG----- 137
Nqo13Paracoccus     KE----------YMIAFLVLEGLMIGVFTALDLVLFYLFFEAGLIPMFLIIGIWG----- 155
NuoMRhodobacter     KE----------YMIAFLILETLMLGVFCALDLVLFYLFFEAGLIPMFLIIGIWG----- 155
NuoMPseudomonas     IG---------FFHLNLLWILGGVIGVFLAIDLFLFFFFWEMMLVPMYFLIALWG----- 159
NuoMStretomyces     ETGSSRWRPTQGFFALILAVEAMVIISFEATDVFLFYIFFEAMLIPLYFLIGGFGDRAHE 169
ND5Yarrowia         -------FNSNLYYTLVLAIGLVILLNFWALDYISFYILFEATLPLLFILIHIYGS---- 157
ND4Bovine           NL-----TRKKLFITMLISLQLFLIMTFTAMELILFYILFEATLVPTLIIITRWGNQ--- 139
ND4Human            PL-----SRKKLYLSMLISLQISLIMTFTATELIMFYIFFETTLIPTLAIITRWGNQ--- 139
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NuoMEcoli           HKASDGK-TRITAATKFFIYTQASGLVMLIAILALVFVHYNATGVWTFNYEE------LL 211
Nqo13Thermus        ------GEGRTRALYTFVLFTLVGSLPMLAAVLGARLLSG----SPTFLLED------LL 181
Nqo13Paracoccus     ------GKDRIYASFKFFLYTFLGSVLMLVAMIAMYRMAGTTDIPTLLTFDFPSENFRLL 209
NuoMRhodobacter     ------GKDRIYAAFKFFLYTFLGSVLMLIAMIAMYYDAGTTDIPTLLSHEFSSGTMTLA 209
NuoMPseudomonas     HSSDDGKKTRIYAATKFFIFTQASGLVMLVAILGLVFVNFNATGVITFDYAT------LL 213
NuoMStretomyces     HGEKTAATQRSYAAVKFLLYNLAGGLIMLAAVIGLYVVAGNFSLTEIAEARA------NG 223
ND5Yarrowia         -------SDSERASFYVLMFTLSGSLFMLLSIVVISIVLNTTNFINHNLFVLSLD----- 205
ND4Bovine           -------TERLNAGLYFLFYTLAGSLPLLVALIYIQNTVGSLNFLMLQYWVQPVHN---- 188
ND4Human            -------PERLNAGTYFLFYTLVGSLPLLIALIYTHNTLGSLNILLLTLTAQELSN---- 188

NuoMEcoli           NTPMSSGVEYLLMLGFFIAFAVKMPVVPLHGWLPDAHSQAPTAGSVDLAGILLKTAAYGL 271
Nqo13Thermus        AHPLQEEAAFWVFLGFALAFAIKTPLFPLHAWLPPFHQENHPSGLADALGTLYKVGVFAF 241
Nqo13Paracoccus     GMTVVGGMQMLLFLAFFASFAVKMPMWPVHTWLPDAHVQAPTAGSVLLAAVLLKMGGYGF 269
NuoMRhodobacter     GFQIVGGLQTLLFLAFFASFAVKMPMWPVHTWLPDAHVQAPTAGSVVLAAILLKMGGYGF 269
NuoMPseudomonas     KTQLSPHVEWLLMLGFFVAFAVKMPVVPVHSWLPDAHAQAPTAGSVDLAGILLKTAAYGL 273
NuoMStretomyces     SLDMATSTERWLFLGFFFAFAVKAPLFPLHTWLPNAMGESTAPVAVLITAVVDKVGTFAM 283
ND5Yarrowia         -------LQTIIWLGLFIAIMVKTPLFPIHVWLPVVHSESPLAGSMILAGLILKLALYAI 258
ND4Bovine           -----SWSNVFMWLACMMAFMVKMPLYGLHLWLPKAHVEAPIAGSMVLAAVLLKLGGYGM 243
ND4Human            -----SWANNLMWLAYTMAFMVKMPLYGLHLWLPKAHVEAPIAGSMVLAAVLLKLGGYGM 243

NuoMEcoli           LRFSLPLFPNASAEFAPIAMWLGVIGIFYGAWMAFAQTDIKRLIAYTSVSHMGFVLIAIY 331
Nqo13Thermus        FRFAIPLAPEGFAQAQGLLLFLAALSALYGAWVAFAAKDFKTLLAYAGLSHMGVAALGVF 301
Nqo13Paracoccus     LRFSLPMFPVASGVAQPYVFWLSAIAIVYTSLVALAQSDMKKVIAYSSVAHMGYVTMGVF 329
NuoMRhodobacter     LRFSLPMFPIGSELLSPLVFWMSAIAIVYTSLVALAQSDMKKLIAYSSVAHMGYVTMGIF 329
NuoMPseudomonas     IRFALPLFPNASAEFAPIAMWLGIIGIFYGALLSFAQTDIKRLVAYSSVSHMGFVMIGIY 333
NuoMStretomyces     LRFCLQLFPEASKWATPVILVLAVISIIYGALLAVGQRDIKRLIAYASISHFGFIIMGIF 343
ND5Yarrowia         LRLLLPLLCEAQILYTPMIYIISLLTIILTSLATLRQIDLKVIIAYSSISHMGIAILGVC 318
ND4Bovine           LRITLILNPMTDFMAYPFIMLS-LWGMIMTSSICLRQTDLKSLIAYSSVSHMALVIVAIL 302
ND4Human            MRLTLILNPLTKHMAYPFLVLS-LWGMIMTSSICLRQTDLKSLIAYSSISHMALVVTAIL 302
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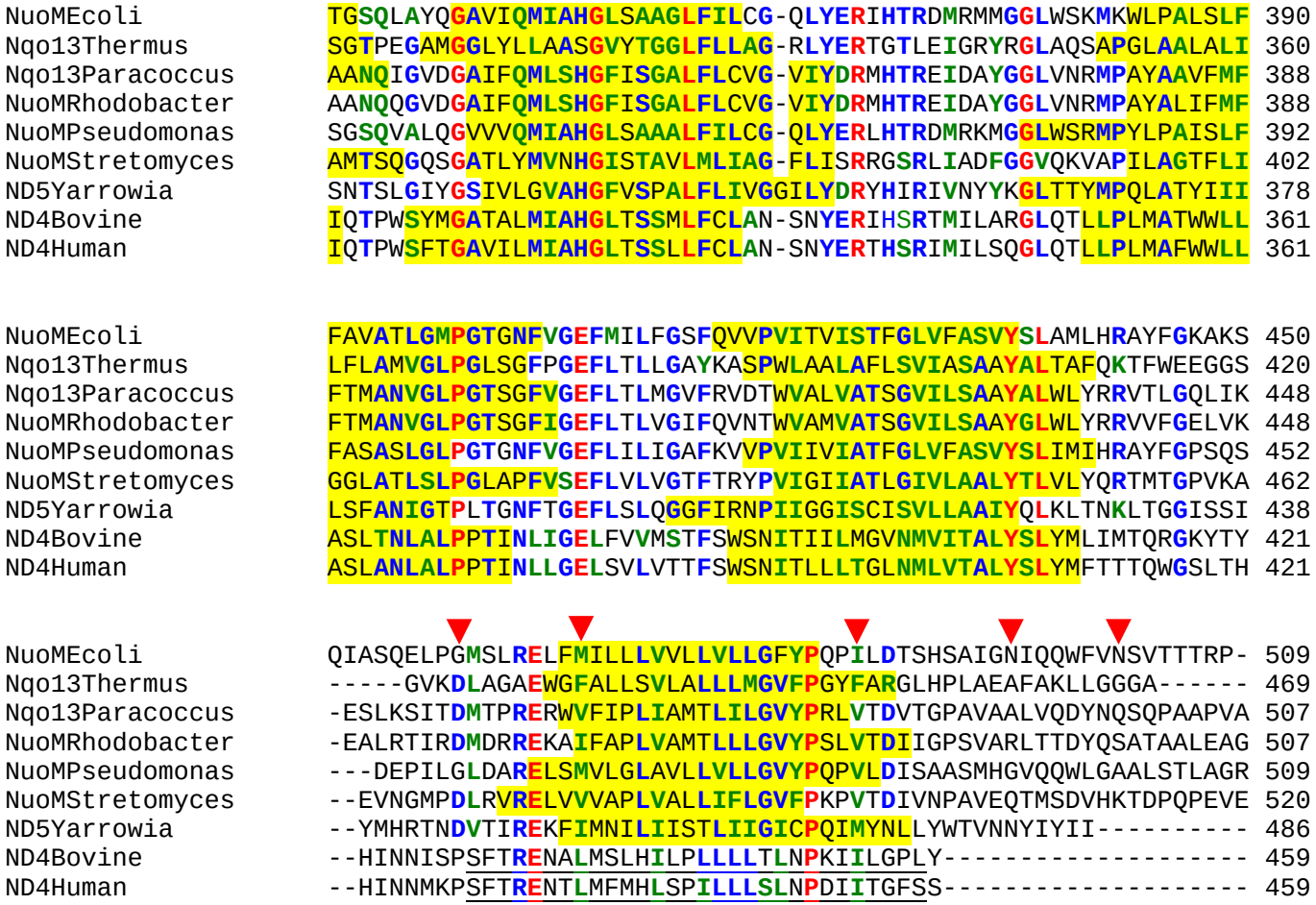
NuoMEcoli TGSQLAYQGAVIQMIAHGLSAAGLFILCG-QLYERIHTRDMRMMGGLWSKMKWLPALSLF 390
Nqo13Thermus SGTPEGAMGGLYLLAASGVYTGGLFLLAG-RLYERTGTLEIGRYRGLAQSAPGLAALALI 360
Nqo13Paracoccus AANQIGVDGAIFQMLSHGFISGALFLCVG-VIYDRMHTREIDAYGGLVNRMPAYAAVFMF 388
NuoMRhodobacter AANQQGVDGAIFQMLSHGFISGALFLCVG-VIYDRMHTREIDAYGGLVNRMPAYALIFMF 388
NuoMPseudomonas SGSQVALQGVVVQMIAHGLSAAALFILCG-QLYERLHTRDMRKMGGLWSRMPYLPAISLF 392
NuoMStretomyces AMTSQGQSGATLYMVNHGISTAVLMLIAG-FLISRRGSRLIADFGGVQKVAPILAGTFLI 402
ND5Yarrowia SNTSLGIYGSIVLGVAHGFVSPALFLIVGGILYDRYHIRIVNYYKGLTTYMPQLATYIII 378
ND4Bovine IQTPWSYMGATALMIAHGLTSSMLFCLAN-SNYERIHSRTMILARGLQTLLPLMATWWLL 361
ND4Human IQTPWSFTGAVILMIAHGLTSSLLFCLAN-SNYERTHSRIMILSQGLQTLLPLMAFWWLL 361
NuoMEcoli FAVATLGMPGTGNFVGEFMILFGSFQVVPVITVISTFGLVFASVYSLAMLHRAYFGKAKS 450
Nqo13Thermus LFLAMVGLPGLSGFPGEFLTLLGAYKASPWLAALAFLSVIASAAYALTAFQKTFWEEGGS 420
Nqo13Paracoccus FTMANVGLPGTSGFVGEFLTLMGVFRVDTWVALVATSGVILSAAYALWLYRRVTLGQLIK 448
NuoMRhodobacter FTMANVGLPGTSGFIGEFLTLVGIFQVNTWVAMVATSGVILSAAYGLWLYRRVVFGELVK 448
NuoMPseudomonas FASASLGLPGTGNFVGEFLILIGAFKVVPVIIVIATFGLVFASVYSLIMIHRAYFGPSQS 452
NuoMStretomyces GGLATLSLPGLAPFVSEFLVLVGTFTRYPVIGIIATLGIVLAALYTLVLYQRTMTGPVKA 462
ND5Yarrowia LSFANIGTPLTGNFTGEFLSLQGGFIRNPIIGGISCISVLLAAIYQLKLTNKLTGGISSI 438
ND4Bovine ASLTNLALPPTINLIGELFVVMSTFSWSNITIILMGVNMVITALYSLYMLIMTQRGKYTY 421
ND4Human ASLANLALPPTINLLGELSVLVTTFSWSNITLLLTGLNMLVTALYSLYMFTTTQWGSLTH 421
NuoMEcoli QIASQELPGMSLRELFMILLLVVLLVLLGFYPQPILDTSHSAIGNIQQWFVNSVTTTRP- 509
Nqo13Thermus -----GVKDLAGAEWGFALLSVLALLLMGVFPGYFARGLHPLAEAFAKLLGGGA------ 469
Nqo13Paracoccus -ESLKSITDMTPRERWVFIPLIAMTLILGVYPRLVTDVTGPAVAALVQDYNQSQPAAPVA 507
NuoMRhodobacter -EALRTIRDMDRREKAIFAPLVAMTLLLGVYPSLVTDIIGPSVARLTTDYQSATAALEAG 507
NuoMPseudomonas ---DEPILGLDARELSMVLGLAVLLVLLGVYPQPVLDISAASMHGVQQWLGAALSTLAGR 509
NuoMStretomyces --EVNGMPDLRVRELVVVAPLVALLIFLGVFPKPVTDIVNPAVEQTMSDVHKTDPQPEVE 520
ND5Yarrowia --YMHRTNDVTIREKFIMNILIISTLIIGICPQIMYNLLYWTVNNYIYII---------- 486
ND4Bovine --HINNISPSFTRENALMSLHILPLLLLTLNPKIILGPLY-------------------- 459
ND4Human --HINNMKPSFTRENTLMFMHLSPILLLSLNPDIITGFSS-------------------- 459

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NuoMEcoli            ------
Nqo13Thermus         ------
Nqo13Paracoccus      TAQASH 513
NuoMRhodobacter      TRLAME 513
NuoMPseudomonas      ------
NuoMStretomyces      AAK--- 523
ND5Yarrowia          ------
ND4Bovine            ------
ND4Human             ------
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Supplemental Figure 2. Comparison of the amino acid sequence of *E. coli* NuoM subunit with its homologs. The totally conserved residues are shown in red letters, while blue letters indicate residues conserved in almost 60% of the cases. Amino acids that are conserved in almost 50% of the cases or the residues having similar characteristic in about 80% of the cases are shown in green letters. Yellow shadows indicate the predicted transmembrane helices. Potential transmembrane helices are underlined. Red arrows indicate residues mutated to introduce a STOP codon. Sequence sources and their accession numbers are: NuoMEcoli: *Escherichia coli* K-12 [P0AFE9], Nqo13Thermus: *Thermus thermophilus* [Q56228], Nqo13Paracoccus: *Paracoccus denitrificans* [P29925], NuoMRhodobacter: *Rhodobacter capsulatus* [P50974] NuoMPseudomonas: *Pseudomonas aeruginosa* [26990824], NuoMStreptomyces: *Streptomyces coelicolor* A3 [Q9XAR6], ND4Yarrowia: *Yarrowia lipolytica* [Q9B6D6], ND4Bovine: *Bovis taurus* [P03910], ND4Human: *Homo sapiens* [Q4F0G8].