

# Functions Predicted for *N. equitans* Proteins

**Key:** The predicted protein function for each CDS is listed, with the archaeon containing the most similar homolog shown in brackets.

## Referenced euryarchaea include:

*Archaeoglobus fulgidus* VC-16  
*Ferroplasma acidarmanus*  
*Halobacterium* sp. NRC-1  
*Methanocaldococcus jannaschii* JAL-1  
"Methanococcus jannaschii"  
*Methanopyrus kandleri* AV19  
*Methanosarcina acetivorans* C2A  
*Methanothermobacter thermoautotrophicus* ΔH  
"Methanobacterium thermoautotrophicum"  
*Pyrococcus abyssii* GE5  
*Pyrococcus furiosus* DSM 3638  
*Pyrococcus horikoshii* OT3  
*Thermoplasma acidophilum*  
*Thermoplasma volcanium* GSS1

## Referenced crenarchaea include:

*Aeropyrum pernix* K1  
*Pyrobaculum aerophilum* IM2  
*Sulfolobus solfataricus*  
*Sulfolobus tokodaii*

## Amino acid biosynthesis

### Aromatic amino acid family

NEQ192 Prephenate dehydrogenase/chorismate mutase/prephenate dehydratase [*A. fulgidus*]

### Glutamate family

NEQ126 Glutamyl-tRNA<sup>Gln</sup> amidotransferase, subunit D [*P. horikoshii*]  
NEQ245 Glutamyl-tRNA<sup>Gln</sup> amidotransferase, subunit E [*S. tokodaii*] SPLIT, see NEQ396  
NEQ396 Glutamyl-tRNA<sup>Gln</sup> amidotransferase, subunit E [*M. jannaschii*] SPLIT, see NEQ245  
NEQ185 Glutamyl-tRNA<sup>Gln</sup>/aspartyl-tRNA<sup>Asn</sup> amidotransferase, subunit B [*A. fulgidus*]  
NEQ360 Glutamyl-tRNA<sup>Gln</sup>/aspartyl-tRNA<sup>Asn</sup> amidotransferase, subunit A [*A. fulgidus*]  
NEQ513 Glutamyl-tRNA<sup>Gln</sup>/aspartyl-tRNA<sup>Asn</sup> amidotransferase, subunit C [*A. fulgidus*]

## Coenzyme biosynthesis

NEQ367 Nicotinamide mononucleotide adenyltransferase [*S. tokodaii*]

## Cell envelope

### Biosynthesis and degradation of surface polysaccharides and lipopolysaccharides

NEQ012 Glycosyltransferase [*M. acetivorans*]  
NEQ025 Mannose-1-phosphate guanylyltransferase [*A. fulgidus*]  
NEQ061 UDP-N-acetylglucosamine-dolichylphosphate N-acetylglucosamine-phosphotransferase [*S. solfataricus*]  
NEQ155 Oligosaccharyl transferase [*P. furiosus*]  
NEQ172 Glycosyltransferase [*P. horikoshii*]  
NEQ195 Glycosyltransferase [*S. tokodaii*]

### Surface structures

NEQ300 Hypothetical surface layer protein [*M. jannaschii*]

## Cellular processes

### Cell division

NEQ119 Septum site-determining protein [*P. furiosus*]  
NEQ133 Cell division protein FtsZ [*P. horikoshii*]  
NEQ473 Cell division protein FtsZ [*A. fulgidus*]  
NEQ475 Cell division control protein (CDC48; AAA family ATPase) [*P. furiosus*]

### Detoxification

NEQ011 Superoxide reductase [*P. horikoshii*]  
NEQ191 Thioredoxin peroxidase [*M. jannaschii*]

## DNA metabolism

### Chromosome-associated proteins

NEQ288 Histone protein [*M. jannaschii*]  
NEQ348 Histone protein [*M. jannaschii*]  
NEQ363 DNA-binding protein [*P. horikoshii*]  
NEQ538 Histone deacetylase/aminohydrolase [*P. aerophilum*]

### DNA replication, recombination and repair

NEQ282 DNA replication initiation protein (MCM family) [*M. thermoautotrophicum*]  
NEQ057 Cell division control protein 6 related [*S. tokodaii*]  
NEQ003 ATP-dependent RNA helicase [*P. abyssii*], SPLIT See NEQ409.  
NEQ409 ATP-dependent RNA helicase [*P. furiosus*] SPLIT see NEQ003  
NEQ007 O<sup>6</sup>-Methylguanine DNA—protein -cysteine S-methyltransferase [*P. aerophilum*]  
NEQ045 DNA topoisomerase I [*P. horikoshii*] SPLIT see NEQ324.  
NEQ324 DNA topoisomerase I [*P. horikoshii*] SPLIT see NEQ045  
NEQ063 Ribonuclease HIII [*P. aerophilum*]  
NEQ068 DNA-Directed DNA polymerase BI [*P. furiosus*] SPLIT see NEQ528.  
NEQ528 DNA-Directed DNA polymerase BI [*P. furiosus*] SPLIT see NEQ068  
NEQ077a Endonuclease IV [*P. abyssii*]  
NEQ088 Structure-specific flap endonuclease (FEN1) [*P. abyssii*]  
NEQ118 Single-stranded DNA-specific exonuclease, 5'-3' [*M. acetivorans*]  
NEQ126a Endonuclease III [*P. abyssii*] SPLIT see NEQ398  
NEQ398 Endonuclease III [*A. fulgidus*] SPLIT see NEQ126a  
NEQ144 DNA Topoisomerase VI, subunit B [*A. fulgidus*]  
NEQ542 DNA Topoisomerase VI, subunit A [*P. furiosus*]  
NEQ170 Replication factor C, small subunit [*A. fulgidus*]  
NEQ430 Replication factor C, large subunit [*M. jannaschii*]  
NEQ199 ssDNA Binding protein (RPA70/SSB family) [*M. jannaschii*]  
NEQ240 DNA-Directed DNA polymerase II, small subunit [*A. fulgidus*]  
NEQ420 DNA-Directed DNA polymerase II, large subunit [*P. furiosus*]  
NEQ256 DNA Double-strand break repair ATPase [*T. volcanium*]  
NEQ295 Sliding clamp protein for DNA replication (PCNA) [*P. abyssii*]  
NEQ536 Sliding clamp protein for DNA replication (PCNA) [*P. furiosus*]  
NEQ537 Sliding clamp protein for DNA replication (PCNA) [*P. abyssii*]  
NEQ318 Reverse gyrase [C-terminus] [*P. abyssii*] SPLIT see NEQ434

NEQ434 Reverse gyrase [N-terminus] [*P. horikoshii*] SPLIT see NEQ318  
NEQ341 DNA primase/topoisomerase [*P. furiosus*]  
NEQ395 DNA Primase [*T. acidophilum*]  
NEQ346a Endonuclease V [*F. acidarmanus*]  
NEQ368 DNA-(Apurinic or apyrimidinic site) lyase (endonuclease IV) [*M. jannaschii*]  
NEQ369 Helicase-related DNA repair protein (RAD25/XPB subfamily) [*S. solfataricus*]  
NEQ372 Uracil DNA glycosylase [*S. tokodaii*]  
NEQ383 DNA repair protein (Rad32/Mre11) [*P. horikoshii*]  
NEQ424 Holliday-junction resolvase [*M. thermoautotrophicum*]  
NEQ426 DNA Recombinase (RadA) [*P. furiosus*]  
NEQ509 DNA Ligase; ATP-dependent [*P. abyssii*]  
NEQ387 DNA Helicase/structure-specific endonuclease [*P. abyssii*]

## Energy metabolism

### ATP-proton motive force interconversion

NEQ103 A<sub>1</sub>A<sub>0</sub> ATP synthase, subunit A [*M. kandleri*]  
NEQ263 A<sub>1</sub>A<sub>0</sub> ATP synthase, subunit B [*M. jannaschii*]  
NEQ166 A<sub>1</sub>A<sub>0</sub> ATP synthase, subunit D [*P. horikoshii*]  
NEQ217 A<sub>1</sub>A<sub>0</sub> ATP synthase, proteolipid subunit K [*M. jannaschii*]  
NEQ410 A<sub>1</sub>A<sub>0</sub> ATP synthase, subunit I [*P. furiosus*]

### Amino acids and amines

NEQ077 Glutamate dehydrogenase [*T. volcanium*]  
NEQ190 Branched-chain amino acid aminotransferase [*P. aerophilum*]  
NEQ223 Agmatinase/arginase [*M. jannaschii*]

### Electron transport

NEQ024 Hypothetical flavoprotein [*P. aerophilum*]  
NEQ049 Hypothetical [Fe-S] protein [*A. fulgidus*]  
NEQ051 Ferredoxin—NADP reductase [*P. furiosus*]  
NEQ084 IMP Dehydrogenase-related protein [*A. fulgidus*]  
NEQ306 Hypothetical NAD(P)-dependent oxidoreductase [*S. tokodaii*]  
NEQ321 Thioredoxin [*P. furiosus*]  
NEQ373 Ferredoxin protein [*P. horikoshii*]  
NEQ382 Hypothetical oxidoreductase (contains Fe-S cluster) [*P. furiosus*]  
NEQ491 Thioredoxin reductase [*S. solfataricus*]

### Other

NEQ461 Inorganic pyrophosphatase [*S. tokodaii*]

## Hypothetical proteins

NEQ006 Hypothetical protein  
NEQ010 Hypothetical protein  
NEQ018 Hypothetical protein  
NEQ020 Hypothetical protein  
NEQ026 Hypothetical protein  
NEQ027 Hypothetical protein  
NEQ028 Hypothetical protein  
NEQ029 Hypothetical protein  
NEQ032 Hypothetical protein  
NEQ033 Hypothetical protein  
NEQ034 Hypothetical protein  
NEQ035 Hypothetical protein  
NEQ036 Hypothetical protein

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NEQ040 Hypothetical protein  
 NEQ041 Hypothetical protein  
 NEQ046 Hypothetical protein  
 NEQ048 Hypothetical protein  
 NEQ050 Hypothetical protein  
 NEQ056 Hypothetical protein  
 NEQ060 Hypothetical protein  
 NEQ062 Hypothetical membrane protein  
 NEQ066 Hypothetical protein  
 NEQ070 Hypothetical protein  
 NEQ072 Hypothetical protein  
 NEQ079 Hypothetical protein  
 NEQ080 Hypothetical protein  
 NEQ081 Hypothetical protein  
 NEQ085 Hypothetical protein  
 NEQ086 Hypothetical protein  
 NEQ089 Hypothetical protein  
 NEQ094 Hypothetical protein  
 NEQ095 Hypothetical protein  
 NEQ099 Hypothetical protein  
 NEQ100 Hypothetical protein  
 NEQ104 Hypothetical protein  
 NEQ107 Hypothetical protein  
 NEQ116 Hypothetical protein  
 NEQ120 Hypothetical protein  
 NEQ121 Hypothetical protein  
 NEQ123 Hypothetical protein  
 NEQ132 Hypothetical protein  
 NEQ134 Hypothetical protein  
 NEQ135 Hypothetical protein  
 NEQ136 Hypothetical protein  
 NEQ137 Hypothetical protein  
 NEQ138 Hypothetical protein  
 NEQ139 Hypothetical protein  
 NEQ140 Hypothetical protein  
 NEQ145 Hypothetical protein  
 NEQ151 Hypothetical protein  
 NEQ153 Hypothetical protein  
 NEQ154 Hypothetical protein  
 NEQ160 Hypothetical protein  
 NEQ161 Hypothetical protein  
 NEQ163 Hypothetical protein  
 NEQ164 Hypothetical membrane protein  
 NEQ171 Hypothetical protein  
 NEQ188 Hypothetical protein  
 NEQ193 Hypothetical protein  
 NEQ194 Hypothetical protein  
 NEQ196 Hypothetical protein  
 NEQ197 Hypothetical protein  
 NEQ200 Hypothetical protein  
 NEQ209 Hypothetical protein  
 NEQ214 Hypothetical protein  
 NEQ215 Hypothetical protein  
 NEQ216 Hypothetical protein  
 NEQ218 Hypothetical protein  
 NEQ221 Hypothetical protein  
 NEQ222 Hypothetical protein  
 NEQ224 Hypothetical protein  
 NEQ225 Hypothetical protein  
 NEQ232 Hypothetical membrane protein  
 NEQ233 Hypothetical protein  
 NEQ236 Hypothetical protein  
 NEQ237 Hypothetical membrane protein  
 NEQ243 Hypothetical protein  
 NEQ246 Hypothetical protein  
 NEQ249 Hypothetical protein  
 NEQ250 Hypothetical protein  
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 NEQ284 Hypothetical protein  
 NEQ289 Hypothetical protein  
 NEQ290 Hypothetical protein  
 NEQ291 Hypothetical protein  
 NEQ292 Hypothetical protein  
 NEQ296 Hypothetical protein  
 NEQ301 Hypothetical protein  
 NEQ304 Hypothetical protein  
 NEQ309 Hypothetical protein  
 NEQ312 Hypothetical protein  
 NEQ322 Hypothetical protein  
 NEQ327 Hypothetical protein  
 NEQ330 Hypothetical protein

NEQ331 Hypothetical protein  
 NEQ332 Hypothetical protein  
 NEQ335 Hypothetical protein  
 NEQ336 Hypothetical protein  
 NEQ354 Hypothetical protein  
 NEQ356 Hypothetical membrane protein  
 NEQ357 Hypothetical protein  
 NEQ362 Hypothetical protein  
 NEQ365 Hypothetical protein  
 NEQ376 Hypothetical protein  
 NEQ380 Hypothetical protein  
 NEQ391 Hypothetical protein  
 NEQ392 Hypothetical protein  
 NEQ403 Hypothetical protein  
 NEQ404 Hypothetical protein  
 NEQ407 Hypothetical protein  
 NEQ408 Hypothetical protein  
 NEQ413 Hypothetical protein  
 NEQ416 Hypothetical protein  
 NEQ418 Hypothetical protein  
 NEQ442 Hypothetical protein  
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 NEQ499 Hypothetical protein  
 NEQ500 Hypothetical protein  
 NEQ504 Hypothetical protein  
 NEQ510 Hypothetical protein  
 NEQ514 Hypothetical protein  
 NEQ518 Hypothetical protein  
 NEQ520 Hypothetical protein  
 NEQ529 Hypothetical protein  
 NEQ532 Hypothetical protein  
 NEQ533 Hypothetical protein  
 NEQ539 Hypothetical protein  
 NEQ545 Hypothetical protein  
 NEQ549 Hypothetical protein  
 NEQ550 Hypothetical protein

### Hypothetical proteins - Conserved

NEQ001 Hypothetical protein [*M. jannaschii*]  
 NEQ004 Hypothetical protein [*M. jannaschii*]  
 NEQ005 Hypothetical protein [*S. tokodaii*]  
 NEQ009 Hypothetical protein [*P. aerophilum*]  
 NEQ016 Hypothetical protein [*P. horikoshii*]  
 NEQ017 Hypothetical protein [*P. horikoshii*]  
 NEQ019 Hypothetical protein [*P. horikoshii*]  
 NEQ021 Hypothetical protein [*M. jannaschii*]  
 NEQ030 Hypothetical protein [*M. acetivorans*]  
 NEQ043 Hypothetical protein [*A. pernix*]  
 NEQ054 Hypothetical protein [*P. abyssi*]  
 NEQ071 Hypothetical protein [*A. fulgidus*]  
 NEQ078 Hypothetical protein [*A. pernix*]  
 NEQ098 Hypothetical protein [*P. furiosus*]  
 NEQ109 Hypothetical protein [*A. fulgidus*]  
 NEQ113 Hypothetical protein [*S. solfataricus*]  
 NEQ114 Hypothetical protein [*A. fulgidus*]  
 NEQ128 Hypothetical protein [*S. solfataricus*]  
 NEQ131 Hypothetical protein [*P. aerophilum*]  
 NEQ147 Hypothetical protein [*A. fulgidus*]  
 NEQ150 Hypothetical protein [*M. thermoautotrophicum*]  
 NEQ158 Hypothetical protein [*P. furiosus*]  
 NEQ162 Hypothetical membrane protein [*M. jannaschii*]  
 NEQ189 Hypothetical membrane protein [*Halobacterium* sp.]  
 NEQ212 Hypothetical protein [*P. furiosus*]  
 NEQ244 Hypothetical protein [*T. acidophilum*]  
 NEQ258 Hypothetical protein [*A. fulgidus*]  
 NEQ267 Hypothetical protein [*M. jannaschii*]  
 SPLIT see NEQ268  
 NEQ268 Hypothetical protein [*M. jannaschii*]  
 SPLIT see NEQ267

NEQ277 Hypothetical protein [*Halobacterium* sp.]  
 NEQ283 Hypothetical protein [*A. fulgidus*]  
 NEQ285 Hypothetical protein [*M. acetivorans*]  
 NEQ288a Hypothetical protein [*P. horikoshii*]  
 NEQ298 Hypothetical protein [*P. horikoshii*]  
 NEQ310 Hypothetical protein [*M. abyssi*]  
 NEQ313 Hypothetical protein [*M. acetivorans*]  
 NEQ314 Hypothetical protein [*A. fulgidus*]  
 NEQ325 Hypothetical protein [*P. furiosus*]  
 NEQ334 Hypothetical protein [*P. furiosus*]  
 NEQ339 Hypothetical membrane protein [*T. volcanium*]  
 NEQ347 Hypothetical protein [*M. acetivorans*]  
 NEQ350 Hypothetical protein [*T. volcanium*]  
 NEQ351 Hypothetical protein [*P. furiosus*]  
 NEQ352 Hypothetical membrane protein [*P. furiosus*]  
 NEQ353 Hypothetical protein [*A. fulgidus*]  
 NEQ371 Hypothetical protein [*S. tokodaii*]  
 NEQ386 Hypothetical protein [*P. abyssi*]  
 NEQ389a Hypothetical basic protein [*M. jannaschii*]  
 NEQ415 Hypothetical protein [*S. tokodaii*]  
 NEQ419 Hypothetical protein [*P. horikoshii*]  
 NEQ428 Hypothetical protein [*M. jannaschii*]  
 NEQ429 Hypothetical protein [*S. tokodaii*]  
 NEQ431 Hypothetical protein [*P. furiosus*]  
 NEQ435 Hypothetical protein [*A. fulgidus*]  
 NEQ441 Hypothetical protein [*M. kandleri*]  
 NEQ449 Hypothetical protein [*S. tokodaii*]  
 NEQ455 Hypothetical membrane protein [*P. abyssi*]  
 NEQ490 Hypothetical protein [*M. acetivorans*]  
 NEQ515 Hypothetical protein [*P. horikoshii*]  
 NEQ524 Hypothetical protein [*P. abyssi*]  
 NEQ526 Hypothetical protein [*T. volcanium*]

### Protein fate

#### Degradation of proteins, peptides, and glycopeptides

NEQ023 Hypothetical Zn-dependent peptidase [*P. aerophilum*]  
 NEQ042 Carboxypeptidase (M32 family) [*P. aerophilum*]  
 NEQ044 *O*-Sialoglycoprotein endopeptidase [N-terminus] tyrosine protein kinase [C-terminus] [*P. furiosus*]  
 NEQ110 Serine protease [*A. fulgidus*]  
 NEQ186 Proteasome-activating nucleotidase [*S. solfataricus*]  
 NEQ203 Proteasome,  $\beta$ -subunit [*M. jannaschii*]  
 NEQ521 Proteasome,  $\alpha$ -subunit [*M. kandleri*]  
 NEQ281 ATP-Dependent protease LA related protein [*P. furiosus*]  
 NEQ315 Serine protease IV (ClpP class) [*M. jannaschii*]  
 NEQ343 Intracellular protease [*P. abyssi*]  
 NEQ349 ATP-Dependent protease La [*A. fulgidus*]  
 NEQ412 Leucine aminopeptidase [*A. pernix*]  
 NEQ414 ATP-Dependent protease La [*M. jannaschii*]  
 NEQ451 Zn-Dependent protease [*P. horikoshii*]  
 NEQ493 Glycoprotein endopeptidase [*P. horikoshii*]  
 NEQ511 Amidase [*P. horikoshii*]  
 NEQ544 Hypothetical membrane-associated Zn-dependent protease [*M. kandleri*]

#### Protein and peptide secretion and trafficking

NEQ168 Protein translocase, SecY/SEC61 $\alpha$  subunit [*M. kandleri*]  
 NEQ375a Protein translocase, SecE/SEC61 $\gamma$  subunit [*A. pernix*]  
 NEQ436 Protein translocase, SecD subunit [*M. jannaschii*]  
 NEQ437 Protein translocase, SecF subunit [*M. jannaschii*]  
 NEQ169 Type II secretion system protein [*A. fulgidus*]  
 NEQ425 Type IV secretion system protein [*M. acetivorans*]  
 NEQ432 Type I signal peptidase [*M. kandleri*]

## Functions Predicted for *N. equitans* Proteins

### Protein folding and stabilization

- NEQ141 Thermosome (type II chaperonin) [*P. horikoshii*]  
 NEQ344 Small heat shock protein (class I) [*P. acetivorans*]  
 NEQ385 GimC Chaperonin, subunit  $\alpha$  [*P. furiosus*]  
 NEQ516 GimC Chaperonin, subunit  $\beta$  [*M. jannaschii*]

### Protein modification and repair

- NEQ002 Peptidyl-prolyl *cis-trans* isomerase [*M. jannaschii*]  
 NEQ047 Protein adenylyltransferase [*A. pernix*]  
 NEQ226 Hypothetical diphthamide synthesis protein [*F. acidarmanus*]  
 NEQ399 Methionine aminopeptidase [*P. abyssi*]  
 NEQ402 Deoxyhypusine synthase [*T. acidophilum*]  
 NEQ422 Diphthine synthase [*P. furiosus*]  
 NEQ459 Protein disulfide oxidoreductase [*P. furiosus*]

### Protein synthesis

#### Ribosomal proteins: synthesis and modification

- NEQ508 SSU Ribosomal protein S2 [*P. horikoshii*]  
 NEQ481 SSU Ribosomal protein S3P [*M. jannaschii*]  
 NEQ375 SSU Ribosomal protein S3AE [*M. kandleri*]  
 NEQ478 SSU Ribosomal protein S4E [*M. thermoautotrophicum*]  
 NEQ247 SSU Ribosomal protein S4P [*P. horikoshii*]  
 NEQ388 SSU Ribosomal protein S5 [*P. aerophilum*]  
 NEQ105 SSU Ribosomal protein S6E [*M. kandleri*]  
 NEQ319 Hypothetical SSU ribosomal protein HS6 [*S. tokodaii*]  
 NEQ242 SSU Ribosomal protein S7 [*M. kandleri*]  
 NEQ469 SSU Ribosomal protein S8E [*A. fulgidus*]  
 NEQ274 SSU Ribosomal protein S8P [*P. furiosus*]  
 NEQ446 SSU Ribosomal protein S9 [*P. furiosus*]  
 NEQ083 SSU Ribosomal protein S10AB [*S. solfataricus*]  
 NEQ069 SSU Ribosomal protein S11 [*M. kandleri*]  
 NEQ058 SSU ribosomal protein S12P [*P. furiosus*]  
 NEQ467 SSU Ribosomal protein S13P [*M. kandleri*]  
 NEQ227 SSU Ribosomal protein S14 [*S. solfataricus*]  
 NEQ487 SSU Ribosomal protein S15P/S13E [*M. kandleri*]  
 NEQ326 SSU Ribosomal protein S17P [*P. horikoshii*]  
 NEQ320 SSU Ribosomal protein S17E [*P. horikoshii*]  
 NEQ480 SSU Ribosomal protein S19P [*P. abyssi*]  
 NEQ187 SSU Ribosomal protein S19E [*P. furiosus*]  
 NEQ548 SSU Ribosomal protein S24E [*M. jannaschii*]  
 NEQ219 SSU Ribosomal protein S27E [*M. kandleri*]  
 NEQ176 SSU Ribosomal protein S27AE [*P. furiosus*]  
 NEQ359 SSU Ribosomal protein S28E [*P. horikoshii*]  
 NEQ546 LSU Ribosomal protein L1P [*P. abyssi*]  
 NEQ361 LSU Ribosomal protein L2P [*P. abyssi*]  
 NEQ433 LSU Ribosomal protein L3P [*M. thermoautotrophicum*]

- NEQ146 LSU Ribosomal protein L4 [*M. kandleri*]  
 NEQ093 LSU Ribosomal protein L5P [*P. abyssi*]  
 NEQ241 LSU Ribosomal protein L6P [*P. abyssi*]  
 NEQ091 LSU Ribosomal protein L10E [*M. jannaschii*]  
 NEQ101 LSU Ribosomal protein L11 [*M. kandleri*]  
 NEQ201 LSU Ribosomal protein L12A [*P. abyssi*]  
 NEQ207 LSU Ribosomal protein L13 [*M. kandleri*]  
 NEQ178 LSU Ribosomal protein L14E [*M. jannaschii*]  
 NEQ092 LSU Ribosomal protein L14P [*M. jannaschii*]  
 NEQ317 LSU Ribosomal protein L15 [*P. aerophilum*]  
 NEQ181 LSU Ribosomal protein L15E [*P. furiosus*]  
 NEQ450 LSU Ribosomal protein L16P/L10E [*A. fulgidus*]  
 NEQ075 LSU Ribosomal protein L18P [*M. jannaschii*]  
 NEQ489 LSU Ribosomal protein L18E [*S. solfataricus*]  
 NEQ379 LSU ribosomal protein L19E [*M. jannaschii*]  
 NEQ346 LSU Ribosomal protein LXA [*P. horikoshii*]  
 NEQ397 LSU Ribosomal protein L21E [*P. furiosus*]  
 NEQ204 LSU Ribosomal protein L22 [*M. kandleri*]  
 NEQ065 LSU Ribosomal protein L23 [*S. tokodaii*]  
 NEQ257 LSU Ribosomal protein L24P [*P. abyssi*]  
 NEQ337a LSU Ribosomal protein L24E [*A. fulgidus*]  
 NEQ262 LSU Ribosomal protein L29 [*M. jannaschii*]  
 NEQ179 LSU Ribosomal protein L30E [*M. jannaschii*]  
 NEQ311 LSU Ribosomal protein L30P [*M. jannaschii*]  
 NEQ364 LSU Ribosomal protein L31E [*M. jannaschii*]  
 NEQ530 LSU Ribosomal protein L32E [*P. abyssi*]  
 NEQ297 LSU Ribosomal protein L34E [*M. jannaschii*]  
 NEQ303 LSU Ribosomal protein L35AE [*P. abyssi*]  
 NEQ038 LSU Ribosomal protein L37AE/L43A [*M. kandleri*]  
 NEQ006a LSU Ribosomal protein L37E [*P. horikoshii*]  
 NEQ427a LSU Ribosomal protein L39E [*P. abyssi*]  
 NEQ505a LSU Ribosomal protein L40E [*P. furiosus*]  
 NEQ183 LSU Ribosomal protein L44E; [*T. acidophilum*]

#### Translation factors

- NEQ235 Hypothetical ribosome assembly protein [*M. thermoautotrophicum*]  
 NEQ264 Translation initiation factor (SUI1 family) [*P. furiosus*]  
 NEQ130 Translation initiation factor aIF-1A [*P. furiosus*]  
 NEQ405 Translation initiation factor aIF2- $\alpha$  [*M. kandleri*]  
 NEQ323 Translation initiation factor aIF-2 $\beta$  [*P. horikoshii*]  
 NEQ270 Translation initiation factor aIF-2 $\gamma$  [*P. abyssi*]  
 NEQ498 Translation initiation factor 2 related protein [*M. kandleri*]  
 NEQ393 Translation initiation factor aIF-5A [*P. furiosus*]  
 NEQ517 Translation initiation factor aIF-6 [*S. tokodaii*]  
 NEQ082 Translation elongation factor EF-1 $\alpha$  [*P. furiosus*]  
 NEQ220 Translation elongation factor EF-1 $\beta$  [*M. kandleri*]  
 NEQ543 Elongation factor 2 (aEF-2) [*P. furiosus*]

- NEQ052 Peptide chain release factor aRF, subunit 1 [*P. abyssi*]

#### tRNA aminoacylation

- NEQ547 Alanyl-tRNA synthetase [*M. acetivorans*] SPLIT see NEQ211  
 NEQ211 Alanyl-tRNA synthetase [C-terminus] [*P. abyssi*] SPLIT see NEQ547  
 NEQ208 Arginyl-tRNA synthetase (class 1) [*M. jannaschii*]  
 NEQ535 Aspartyl-tRNA synthetase (class 2) [*A. pernix*]  
 NEQ055 Cysteinyl-tRNA synthetase [*P. furiosus*]  
 NEQ302 Glutamyl-tRNA synthetase (class 1) [*P. abyssi*]  
 NEQ417 Glycyl-tRNA synthetase (class 2) [*P. abyssi*]  
 NEQ102 Histidyl-tRNA synthetase (class 2) [*A. pernix*]  
 NEQ230 Isoleucyl-tRNA synthetase (class 1a) [*P. furiosus*]  
 NEQ239 Leucyl-tRNA synthetase (class 1a) [*M. jannaschii*]  
 NEQ087 Lysyl-tRNA synthetase (class-1) [*Halobacterium* sp.]  
 NEQ457 Methionyl-tRNA synthetase (class 1a) [*P. horikoshii*]  
 NEQ505 Phenylalanyl-tRNA synthetase,  $\alpha$ -subunit [*S. solfataricus*]  
 NEQ479 Phenylalanyl-tRNA synthetase,  $\beta$ -chain [*P. furiosus*]  
 NEQ210 Prolyl-tRNA synthetase (class 2) [*M. kandleri*]  
 NEQ308 Seryl-tRNA synthetase (class 2) [*S. tokodaii*]  
 NEQ177 Threonyl-tRNA synthetase (class 2) [*P. aerophilum*]  
 NEQ115 Tryptophanyl-tRNA synthetase (class 1b) [*S. solfataricus*]  
 NEQ389 Tyrosyl-tRNA synthetase (class 1b) [*P. furiosus*]  
 NEQ252 Valyl-tRNA synthetase (class 1a) [*A. pernix*]

#### tRNA and rRNA modification and processing

- NEQ008 2-Methylthioadenosine synthase [*S. tokodaii*]  
 NEQ037 Small nuclear ribonucleoprotein (snRNP) [*M. kandleri*]  
 NEQ053 rRNA Methyltransferase [*P. abyssi*]  
 NEQ108 tRNA(Guanine-26, N<sup>2</sup>-N<sup>2</sup>) methyltransferase [*S. tokodaii*]  
 NEQ111 Ribonuclease PH [*A. fulgidus*]  
 NEQ124 tRNA-Guanine transglycosylase [*P. furiosus*] SPLIT see NEQ305  
 NEQ305 tRNA-Guanine transglycosylase [*M. acetivorans*] SPLIT See NEQ124  
 NEQ125 Box C/D snoRNP RNA modification enzyme, fibrillar subunit [*P. furiosus*]  
 NEQ342 Box C/D snoRNP RNA modification enzyme, Nop5p subunit [*S. tokodaii*]  
 NEQ152 tRNA Nucleotidyltransferase (CCA-adding enzyme) [*S. tokodaii*]  
 NEQ165 LSU Ribosomal protein L11P methyltransferase [*P. furiosus*]  
 NEQ205 tRNA Intron endonuclease [*M. jannaschii*]  
 NEQ261 tRNA Intron endonuclease [*M. acetivorans*]  
 NEQ502 2'-5' RNA Ligase [*M. jannaschii*]  
 NEQ228 tRNA Methyltransferase [*P. furiosus*]  
 NEQ238 N<sup>6</sup>-Adenine rRNA methyltransferase [*M. jannaschii*]  
 NEQ248 Ribonuclease PH-related protein [*P. furiosus*]  
 NEQ293 tRNA Pseudouridine synthase [*P. abyssi*]  
 NEQ333 tRNA Pseudouridine synthase [*M. jannaschii*]  
 NEQ337 tRNA 1-Methyladenosine methyltransferase [*M. jannaschii*]  
 NEQ384 rRNA Methyltransferase [*S. solfataricus*]  
 NEQ423 Thiamin biosynthesis/4-thiouridine synthesis protein [*A. fulgidus*]  
 NEQ440 tRNA Methyltransferase [*M. thermoautotrophicum*]

# Functions Predicted for *N. equitans* Proteins

NEQ454 tRNA Pseudouridine synthase [*P. furiosus*]  
NEQ522 tRNA Methyltransferase [*M. jannaschii*]

## Purines, pyrimidines, nucleosides, and nucleotides

### 2'-Deoxyribonucleotide metabolism

NEQ316 dCTP deaminase/dUTP diphosphatase [*M. thermoautotrophicum*]  
NEQ329 dUTP diphosphatase [*M. acetivorans*]

### Nucleotide and nucleoside interconversions

NEQ015 Thymidylate synthase; flavin-dependent [*S. tokodaii*]  
NEQ149 Adenylate kinase [*S. tokodaii*]  
NEQ307 Nucleoside diphosphate kinase [*P. aerophilum*]  
NEQ345 Anaerobic ribonucleoside-triphosphate reductase [*P. abyssi*]

## Signal transduction

NEQ460 Serine/threonine protein kinase [*M. kandleri*]  
NEQ464 Serine/threonine protein kinase with N-terminal DNA-binding HTH domain [*M. kandleri*]

## Transcription

### DNA-dependent RNA polymerase

NEQ503 DNA-Directed RNA polymerase, subunit A' [*P. furiosus*]  
NEQ427 DNA-Directed RNA polymerase, subunit A" [*P. abyssi*]  
NEQ156 DNA-Directed RNA polymerase, subunit B' [*P. abyssi*]  
NEQ173 DNA-Directed RNA polymerase, subunit B" [*P. horikoshii*]  
NEQ452 DNA-Directed RNA polymerase, subunit D [*P. abyssi*]  
NEQ370 DNA-Directed RNA polymerase, subunit E' [*M. jannaschii*]  
NEQ231 DNA-Directed RNA polymerase, subunit E" [*P. aerophilum*]  
NEQ411 DNA-Directed RNA polymerase, subunit F [*M. jannaschii*]  
NEQ507 DNA-Directed RNA polymerase, subunit H [*M. jannaschii*]  
NEQ205a DNA-Directed RNA polymerase, subunit K [*P. horikoshii*]  
NEQ182 DNA-Directed RNA polymerase, subunit L [*S. tokodaii*]  
NEQ377 DNA-Directed RNA polymerase, subunit M [*S. tokodaii*]  
NEQ338 DNA-Directed RNA polymerase, subunit N [*A. pernix*]  
NEQ399a DNA-Directed RNA polymerase, subunit P [*P. furiosus*]

### Degradation of DNA or RNA

NEQ064 Binuclear zinc phosphodiesterase [*M. jannaschii*]  
NEQ097 Thernonuclease [*M. thermoautotrophicum*]

### Transcription factors

NEQ039 Transcription initiation TATA-binding protein (TBP) [*M. jannaschii*]  
NEQ276 Transcription initiation factor IIB [*P. abyssi*]  
NEQ482 Transcription initiation protein E (TFE) [*M. thermoautotrophicum*]

NEQ073a Hypothetical zinc-finger protein [*P. aerophilum*]  
NEQ078a Hypothetical helix-turn-helix transcriptional regulator [*A. fulgidus*]  
NEQ541 Transcriptional regulator [*S. tokodaii*]  
NEQ229 Transcriptional regulator (AsnC family) [*M. jannaschii*]  
NEQ328 Transcriptional regulator (AsnC family) [*P. furiosus*]  
NEQ453 Transcriptional regulator (V4R and HTH domains) [*M. kandleri*]  
NEQ534 Transcriptional regulator [*P. horikoshii*]  
NEQ022 ATP-dependent RNA helicase [*P. horikoshii*]  
NEQ540 Transcription elongation factor (SPT5/NusG family) [*P. furiosus*]  
NEQ180 Transcription termination-antitermination factor [*M. acetivorans*]  
NEQ076 Hypothetical mRNA 3'-end processing factor [*P. furiosus*]  
NEQ143 Multiprotein bridging factor [*S. tokodaii*]

## Transport and binding proteins

NEQ014 TDT (tellurite/dicarboxylate) family transporter [*P. abyssi*]  
NEQ073 ABC transporter, substrate-binding subunit  
NEQ074 ABC transporter, ATP-binding subunit [*P. furiosus*]  
NEQ090 Polysaccharide transporter [*A. fulgidus*]  
NEQ129 ABC transporter, permease subunit [*A. fulgidus*]  
NEQ175 glutamine ABC transporter, permease subunit [*M. jannaschii*]  
NEQ198 Mechanosensitive ion channel membrane protein [*M. jannaschii*]  
NEQ299 ABC transporter, ATP-binding subunit; contains [4Fe-4S] cluster [*P. horikoshii*]  
NEQ421 ABC transporter, ATP-binding subunit [*M. acetivorans*]  
NEQ486 Na<sup>+</sup>/Ca<sup>2+</sup> antiporter (CaCA family) [*P. abyssi*]  
NEQ501 Metal ion transporter (MIT-family) [*P. horikoshii*]  
NEQ531 Mechanosensitive ion channel membrane protein [*M. jannaschii*]

## Unknown function

NEQ013 Hypothetical "radical SAM" protein [*S. tokodaii*]  
NEQ031 RNA-binding protein [*S. tokodaii*]  
NEQ059 Hypothetical NTP-binding protein [*P. abyssi*]  
NEQ067 Hypothetical member of metallo-β-lactamase superfamily [*P. abyssi*]  
NEQ096 Hypothetical NTP-binding protein [*M. kandleri*] SPLIT see NEQ495  
NEQ495 Hypothetical NTP-binding protein [*P. horikoshii*] SPLIT see NEQ096  
NEQ112 Hypothetical GTPase (OBG/HIX superfamily) [*P. furiosus*]  
NEQ117 Hypothetical NTP-binding protein [*M. jannaschii*]  
NEQ122 Hypothetical member of metallo-β-lactamase superfamily [*P. furiosus*]  
NEQ127 Hypothetical O-carbamoyltransferase [*M. jannaschii*]  
NEQ148 Hypothetical "radical SAM" protein [*P. horikoshii*]  
NEQ157 Hypothetical GTPase (OBG/HIX superfamily) [*P. horikoshii*]  
NEQ159 Phosphatidylethanolamine-binding protein [*S. solfataricus*]  
NEQ174 Hypothetical GTP-binding protein [*P. horikoshii*]  
NEQ184 Hypothetical RNA-binding protein (contain S1 domain and KH domain) [*A. fulgidus*]  
NEQ198a Phosphoadenosine phosphosulfate reductase related protein [C-terminal domain] [*P. furiosus*]

NEQ206 Hypothetical protein with RNA-binding PUA domain [*P. aerophilum*]  
NEQ213 Histidine triad family protein [*M. acetivorans*]  
NEQ234 Magnesium chelatase, ChII subunit [*P. furiosus*]  
NEQ284a Hypothetical Zn-ribbon protein [*M. jannaschii*]  
NEQ294 Hypothetical ATP-binding protein [*P. horikoshii*]  
NEQ340 Hypothetical protein (HAD superfamily) [*T. volcanium*]  
NEQ355 Hypothetical Zn-ribbon protein [*A. fulgidus*]  
NEQ358 Hypothetical phosphoesterase protein [*P. abyssi*]  
NEQ366 Hypothetical GTP-binding protein [*P. horikoshii*]  
NEQ378 Hypothetical member of metallo-β-lactamase superfamily [*P. abyssi*]  
NEQ381 Hypothetical "radical SAM" protein [*P. abyssi*]  
NEQ401 ATP-binding protein (AAA+ class) [*M. kandleri*]  
NEQ406 Hypothetical nucleotide-binding  
NEQ432a Hypothetical Zn-ribbon protein [*P. horikoshii*]  
NEQ438 Hypothetical RNA-binding protein [*P. abyssi*] SPLIT see NEQ506  
NEQ506 Hypothetical RNA-binding protein [*S. solfataricus*] SPLIT see NEQ438  
NEQ456 Divalent metal cation-dependent hydrolase (TatD family) [*S. solfataricus*]  
NEQ463 Hypothetical GTPase [*S. solfataricus*]  
NEQ466 Hypothetical member of metallo-β-lactamase superfamily [*M. jannaschii*]  
NEQ472 Hypothetical phosphoesterase [*M. thermoautotrophicum*]  
NEQ489a Hypothetical Zn-ribbon protein [*M. acetivorans*]  
NEQ494 Hypothetical "radical SAM protein" [*S. tokodaii*]  
NEQ512 Hypothetical ATP-binding protein [*M. acetivorans*]  
NEQ519 Hypothetical zinc-binding nucleotidyl β-phosphatase (HIT family) [*M. jannaschii*]  
NEQ523 Hypothetical ATP diphosphatase (PP-loop family) [*P. horikoshii*]  
NEQ525 Phosphoadenosine phosphosulfate reductase related protein [*P. furiosus*]  
NEQ527 Hypothetical NTP-binding protein [*S. tokodaii*]