**Realignment of variable loops of tRNAs, the 3-31 nt minihelix theorem and consequences for the origin of life**

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Supplementary File #1: Archaeal tRNALeu. A collection of tRNALeu sequences from Archaea. V loop sequences are highlighted in yellow. TDNA sequences were obtained from the tRNA database (<http://trnadb.bioinf.uni-leipzig.de/> ).

>tdbD00006674|Aeropyrum\_pernix\_K1|272557|Leu|CAA

GCGGGGGTGCCCGAGCCAGGGCGAAGGGGGCGGGCTCAAGACCCGTTGGCGTAGGCCGGC GTGGGTTCAAATCCCACCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006675|Aeropyrum\_pernix\_K1|272557|Leu|CAG

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGTCGGGCTCAGGACCCGATGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006676|Aeropyrum\_pernix\_K1|272557|Leu|GAG

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGTCGGGCTGAGGACCCGATGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006677|Aeropyrum\_pernix\_K1|272557|Leu|TAA

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGGCGGGCTTAAGACCCGTTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006678|Aeropyrum\_pernix\_K1|272557|Leu|TAG

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGTCGGGCTTAGGACCCGATGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00001487|Archaeoglobus\_fulgidus|2234|Leu|CAA

GCGGGGGTTGCCGAGT--GGCCAAAGGCGGTGGACTCAAGATCCACTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001486|Archaeoglobus\_fulgidus|2234|Leu|CAG

GCGGGGGTTGCCGAGC--GGACAAAGGCGCGGGATTCAGGGTCCCGTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001485|Archaeoglobus\_fulgidus|2234|Leu|GAG

GCGGGGGTTGCCGAGC--GGACAAAGGCGCAGGATTGAGGGTCCTGTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001488|Archaeoglobus\_fulgidus|2234|Leu|TAA

GCGGGGGTTGCCGAGCCAGGAA-AAGGCGCAGGGCTTAAGACCCTGTCCCGAAGGGGTCC GCGGGTTCGAATCCCGCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001484|Archaeoglobus\_fulgidus|2234|Leu|TAG

GCGGGGGTTGCCGAGC--GGCCAAAGGCGCTGGATTTAGGGTCCAGTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006679|Archaeoglobus\_fulgidus\_DSM\_4304|224325|Leu|CAA

GCGGGGGTTGCCGAGT--GGCCAAAGGCGGTGGACTCAAGATCCACTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006680|Archaeoglobus\_fulgidus\_DSM\_4304|224325|Leu|CAG

GCGGGGGTTGCCGAGC--GGACAAAGGCGCGGGATTCAGGGTCCCGTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006681|Archaeoglobus\_fulgidus\_DSM\_4304|224325|Leu|GAG

GCGGGGGTTGCCGAGC--GGACAAAGGCGCAGGATTGAGGGTCCTGTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006682|Archaeoglobus\_fulgidus\_DSM\_4304|224325|Leu|TAA

GCGGGGGTTGCCGAGCCAGGAA-AAGGCGCAGGGCTTAAGACCCTGTCCCGAAGGGGTCC GCGGGTTCGAATCCCGCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006683|Archaeoglobus\_fulgidus\_DSM\_4304|224325|Leu|TAG

GCGGGGGTTGCCGAGC--GGCCAAAGGCGCTGGATTTAGGGTCCAGTCCCGTAGGGGTTC GAGGGTTCGAATCCCTCCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001489|Haloarcula\_marismortui|2238|Leu|CAG

GCAGGGATAGCCAAGTTTGGCCAACGGCGCAGCGTTCAGGGCGCTGTCCCGTAGGGGTCC GCAGGTTCAAATCCTGCTCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006684|Halobacterium\_sp.\_NRC-1|64091|Leu|CAA

GCGAGGGTAGCCAAGCTCGGCCAACGGCGACGGACTCAAGATCCGTTCTCGTAGGAGTTC GAGGGTTCGAATCCCTTCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006685|Halobacterium\_sp.\_NRC-1|64091|Leu|CAG

GCAGGGATAGCCAAGTTTGGCCAAAGGCGCAGCGTTCAGGGCGCTGTCCCGTAGGGGTTC GCAGGTTCAAATCCTGCTCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006686|Halobacterium\_sp.\_NRC-1|64091|Leu|GAG

GCGTGGGTAGCCGAGCTAGGTCAAAGGCGCAGCGTTGAGGGCGCTGTCCTGTAGAGGTTC GCCGGTTCGAATCCGGTCCCACGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006687|Halobacterium\_sp.\_NRC-1|64091|Leu|TAA

GCGAGGGTGGCCGAGC--GGCCAAAGGCGGCGGGCTTAAGACCCGCTCCCGTAGGGGTTC GTGGGTTCGAATCCCACCTCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006688|Halobacterium\_sp.\_NRC-1|64091|Leu|TAG

GCGCGGGTAGCCAAGCCAGGAA-ACGGCGTAGCGCTTAGGACGCTATCCCGTAGGGGTCC GCCGGTTCAAATCCGGTCCCGCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001491|Methanocaldococcus\_jannaschii|2190|Leu|GAG

GCGGGGGTCGCCAAGCCAGGTCAAAGGCGCCAGATTGAGGGTCTGGTCCCGTAGGGGTTC GCGGGTTCAAATCCCGTCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001492|Methanocaldococcus\_jannaschii|2190|Leu|TAA

GCAGGGGTCGCCAAGCCTGGCCAAAGGCGCCGGACTTAAGATCCGGTCCCGTAGGGGTTC GGGGGTTCAAATCCCCTCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001490|Methanocaldococcus\_jannaschii|2190|Leu|TAG

GCAGGGGTCGCCAAGCCTGGCCAAAGGCGCTGGGCCTAGGACCCAGTCCCGTAGGGGTTC CAGGGTTCAAATCCCTGCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006692|Methanocaldococcus\_jannaschii\_DSM\_2661|243232|Leu|GAG

GCGGGGGTCGCCAAGCCAGGTCAAAGGCGCCAGATTGAGGGTCTGGTCCCGTAGGGGTTC GCGGGTTCAAATCCCGTCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006693|Methanocaldococcus\_jannaschii\_DSM\_2661|243232|Leu|TAA

GCAGGGGTCGCCAAGCCTGGCCAAAGGCGCCGGACTTAAGATCCGGTCCCGTAGGGGTTC GGGGGTTCAAATCCCCTCCCCTGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006694|Methanocaldococcus\_jannaschii\_DSM\_2661|243232|Leu|TAG

GCAGGGGTCGCCAAGCCTGGCCAAAGGCGCTGGGCCTAGGACCCAGTCCCGTAGGGGTTC CAGGGTTCAAATCCCTGCCCCTGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00011867|Methanococcus\_aeolicus\_Nankai-3|419665|Leu|GAG

GCGGGGGTTGCCAAGCCTGGCCAAAGGCGCTAGGTTGAGGGCCTAGTCTCATAGGAGTTC GAGGGTTCGAATCCCTTCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011850|Methanococcus\_aeolicus\_Nankai-3|419665|Leu|TAA

GCAGGGGTTGCCAAGCCTGGCCAACGGCGCTGGACTTAAGATCCAGTCTCATAGGAGTTC GGGGGTTCAAATCCCTTCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011857|Methanococcus\_aeolicus\_Nankai-3|419665|Leu|TAG

GCAGGGGTTGTCGAGCCTGGCCAAAGACGCAGGACTTAGAATCCTGTCCTATAGTGGTTC CAGGGTTCAAATCCCTGCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006695|Methanococcus\_maripaludis|39152|Leu|GAG

GCGAGGGTTGCCAAGCCTGGTTAAAGGCGCTAGGTTGAGGGCCTAGTCTCATAGGAGTTC GAGGGTTCGAATCCCTTCCCTCGC----

T(((\*\*\*\*)))\*\*C

>tdbD00006696|Methanococcus\_maripaludis|39152|Leu|TAA

GGAGGGATTGCCAAGCCTGGTCAAAGGCGTCGGACTTAAGATCCGATCCGGTAGCGGTTC GAGGGTTCAAATCCCTTTCCCTCC----

T(((\*\*\*\*)))\*\*C

>tdbD00006697|Methanococcus\_maripaludis|39152|Leu|TAG

GCAGGGGTTGTCGAGCCTGGCCAAAGATGCAGGACTTAGAATCCTGTCCAGTAGTGGTTC CAGGGTTCAAATCCCTGCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006698|Methanococcus\_maripaludis|39152|Leu|TAG

GCAGGGGTTGTCGAGCCTGGCCAAAGATGCAGGACTTAGAATCCTGTCCAGTAGTGGTTC CAGGGTTCAAATCCCTGCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001493|Methanococcus\_vannielii|2187|Leu|TAG

GCAGGGGTTGTCGAGCCTGGCCAAAGATGCAGGACTTAGAATCCTGTCCAGTAGTGGTTC CAGGGTTCAAATCCCTGCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001495|Methanopyrus\_kandleri|2320|Leu|GAG

GCGGGGGCGCCCGAGCCTGGTCAAAGGGGCGGGAATGAGGATCCCGTGGCCGTAGGGCGTC CCGGGTTCAAATCCCGGCCCCCGCACCA

T\*(((\*\*\*\*)))\*\*C

>tdbD00006901|Methanopyrus\_kandleri\_AV19|190192|Leu|GAG

GCGGGGGCGCCCGAGCCTGGTCAAAGGGGCGGGAATGAGGATCCCGTGGCCGTAGGGCCGTCCCGGGTTCAAATCCCGGCCCCCGCACCA

T((((\*\*\*\*))))\*\*C

>tdbD00006900|Methanopyrus\_kandleri\_AV19|190192|Leu|TAA

GCGGGGGCGCCCGAGCCTGGTCGAAGGGGGCGGACTTAAGATCCGCTGGCCGTAGGGCCGTCCCGGGTTCAAATCCCGGCCCCCGCACCA

T((((\*\*\*\*))))\*\*C

>tdbD00006902|Methanopyrus\_kandleri\_AV19|190192|Leu|TAG

GCGGGGGCGCCCGAGCCTGGTCAAAGGGGCGGGACTTAGGATCCCGTGGCCGTAGGGCCGTCCCGGGTTCAAATCCCGGCCCCCGCACCA

T((((\*\*\*\*))))\*\*C >tdbD00011888|Methanosarcina\_acetivorans\_C2A|188937|Leu|CAA

GCGGGAGTAACCAAGC--GGTCAACGGTGGCAGACTCAAGATCTGTTCGTGCAGACGTTC AGGGGTTCGAATCCCTTCTCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011893|Methanosarcina\_acetivorans\_C2A|188937|Leu|CAG

GCGAGAGTTGCCCAGCCAGGTCAAAGGCGCCAGGTTCAGAGCCTGGTCTTGTAGGAGTTC GTGCGTTCGAATCGCACCTCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011883|Methanosarcina\_acetivorans\_C2A|188937|Leu|GAG

GCGAGGGTTGCCCAGCCAGGTCAAAGGCGCTAGGTTGAGGGCCTAGTTTCGTAGGAATTC GTGGGTTCGAATCCCATCCCTCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00011884|Methanosarcina\_acetivorans\_C2A|188937|Leu|GAG

GCGAGGGTTGCCCAGCCAGGTCAAAGGCGCTAGGTTGAGGGCCTAGTTTCGTAGGAATTC GTGGGTTCGAATCCCATCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011916|Methanosarcina\_acetivorans\_C2A|188937|Leu|TAA

GCGAGGGTTGCCCAGCCAGGCCAAAGGCGCCAGACTTAAGATCTGGTATCGAAGGATTTC GTGGGTTCGAATCCCACCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011907|Methanosarcina\_acetivorans\_C2A|188937|Leu|TAG

GCGAGGGTTGCCCAGCTAGGTCAAAGGCGATGGGCTTAGGACCCATTTTCGTAGGAATTC GTGCGTTCGAATCGCACCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006832|Methanosarcina\_mazei\_Go1|192952|Leu|CAA

GCGGGAGTAACCAAGC--GGTCAACGGTGGCAGACTCAAGATCTGTTCGTGCAGACGTTC AGGGGTTCGAATCCCTTCTCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006833|Methanosarcina\_mazei\_Go1|192952|Leu|CAG

GCGAGAGTTGCCCAGCCAGGTCAAAGGCGCCAGGTTCAGAGCCTGGTCTTGTAGGAGTTC GTGCGTTCGAATCGCACCTCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006834|Methanosarcina\_mazei\_Go1|192952|Leu|GAG

GCGAGGGTTGCCCAGCCAGGTCAAAGGCGCTAGGTTGAGGGCCTAGTTTCGTAGGAATTC GTGGGTTCGAATCCCATCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006835|Methanosarcina\_mazei\_Go1|192952|Leu|GAG

GCGAGGGTTGCCCAGCCAGGTCAAAGGCGCTAGGTTGAGGGCCTAGTCTTGTAGGAGTTC GTGGGTTCGAATCCCATCCCTCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006836|Methanosarcina\_mazei\_Go1|192952|Leu|TAA

GCGAGGGTTGCCCAGCCAGGCCAAAGGCGTCGGACTTAAGATCCGATATCGAAGGATTTC GTGGGTTCGAATCCCACCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006837|Methanosarcina\_mazei\_Go1|192952|Leu|TAG

GCGAGGGTTGCCCAGCCAGGTCAAAGGCGATGGGCTTAGGACCCATTTTCGTAGGAATTC GTGCGTTCGAATCGCACCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011964|Methanospirillum\_hungatei\_JF-1|323259|Leu|CAA

GCGGGGATAGCCAAGT--GGTCAAAGGCGAACGCCTCAAGAGCGTTTCTCGTAGGAGTTC AGGGGTTCGACTCCCTTTCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011972|Methanospirillum\_hungatei\_JF-1|323259|Leu|CAG

GCGAGGATCGCCGAGCCAGGTCAAAGGCGTTAGGTTCAGGGCCTAATCCCGTAGGGGTTC GCCGGTTCAAATCCGGCTCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011960|Methanospirillum\_hungatei\_JF-1|323259|Leu|GAG

GCGAGGGTATCCGAGCCAGGTCAAAGGAGCAAGGTTGAGGGCCTTGTCGCGAAGGCGTTC GAGCGTTCAAATCGCTTCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011930|Methanospirillum\_hungatei\_JF-1|323259|Leu|TAA

GCGAGGGTACCAAAGCCTGGCCAAATGGGCCGGACTTAAGATCCGGTTTCGAAGGAATCC AAGGGTTCAAATCCCTTCCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011947|Methanospirillum\_hungatei\_JF-1|323259|Leu|TAG

GCGAGGATTGCCGAGCCAGGTCAAAGGCGACGGATTTAGGGTCCGTTCCCGAAGGGGTCC GGGTGTTCAAATCGCCCTCCTCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006689|Methanothermobacter\_thermautotrophicus\_str.\_Delta\_H|187420|Leu|GAG

GCAGGGGTGGTCGAGC--GGTCAAAGGCGCTAGGTTGAGGGCCTAGTGGGGGAGTCCCTTC GCGGGTTCGAATCCCGTCCCCTGCA---

T\*(((\*\*\*\*)))\*\*C

>tdbD00006690|Methanothermobacter\_thermautotrophicus\_str.\_Delta\_H|187420|Leu|TAA

GCAGGGGTGCCCGAGC--GGCCAAAGGGGGAGGACTTAAGATCCTCTGGCGCAGGCCTTC GAGGGTTCGAATCCCTTCCCCTGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006691|Methanothermobacter\_thermautotrophicus\_str.\_Delta\_H|187420|Leu|TAG

GCGGGGGTGCCCGAGCT-GGCCAAAGGGGACAGGCTTAGGACCTGTTGGCGTAGGCCTAC CAGGGTTCGAATCCCTGCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00001494|Methanothermus\_fervidus|2180|Leu|TAG

GCGGGGGTGCCCGAGT--GGTCAAAGGGGACAGGCTTAGGACCTGTTGGCGTTAGGCTTC CAGGGTTCGAATCCCTGCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00011983|Nanoarchaeum\_equitans\_Kin4-M|228908|Leu|CAA

GCGGCCGTGCCCGAGC--GGTCGAAGGGGTCGGGCTCAAGACCCGATGGGTTAGTCCCGTC CGGGGTTCGAATCCCCGCGGCCGCA---

T(((\*\*\*\*\*)))\*\*C

>tdbD00011990|Nanoarchaeum\_equitans\_Kin4-M|228908|Leu|GAG

GCGGCCGTGCCCGAGC--GGACAAAGGGGCCAGGTTGAGGTCCTGGTGGGGTAGTCCCTGC CGGGGTTCGAATCCCCGCGGCCGCA---

T(((\*\*\*\*\*)))\*\*C

>tdbD00011997|Nanoarchaeum\_equitans\_Kin4-M|228908|Leu|TAA

GCGGCCGTGCCCGAGCT-GGCCAAAGGGGTCGGGCTTAAGACCCGATGGGGTAGTCCCTGC CGGGGTTCGAATCCCCGCGGCCGCA---

T(((\*\*\*\*\*)))\*\*C

>tdbD00011978|Nanoarchaeum\_equitans\_Kin4-M|228908|Leu|TAG

GCGGCCGTGCCCGAGC--GGTCGAAGGGGTCGGGCTTAGGACCCGATGGGTTAGTCCCGTC CGGGGTTCGAATCCCCGCGGCCGCA---

T(((\*\*\*\*\*)))\*\*C

>tdbD00006699|Pyrobaculum\_aerophilum\_str.\_IM2|178306|Leu|CAA

GCGGGGGTGCCCGAGCCAGGCCAAAGGGGCAGGGCTCAAGACCCTGTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006700|Pyrobaculum\_aerophilum\_str.\_IM2|178306|Leu|CAG

GCGGGGGTGCCCGAGCCAGGTCAAAGGGGCAGGGTTCAGGTCCCTGTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006701|Pyrobaculum\_aerophilum\_str.\_IM2|178306|Leu|GAG

GCGGGGGTGCCCGAGCCAGGTCAAAGGGGCAGGGTTGAGGTCCCTGTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006702|Pyrobaculum\_aerophilum\_str.\_IM2|178306|Leu|TAA

GCGGGGGTGCCCGAGCCAGGTCAAAGGGGCAGGGCTTAAGACCCTGTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006703|Pyrobaculum\_aerophilum\_str.\_IM2|178306|Leu|TAG

GCGGGGGTGCCCGAGCCAGGTCAAAGGGGCAGGGTTTAGGTCCCTGTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006704|Pyrococcus\_abyssi\_GE5|272844|Leu|CAA

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGGGGGACTCAAGATCCCCTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006705|Pyrococcus\_abyssi\_GE5|272844|Leu|CAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTCAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006706|Pyrococcus\_abyssi\_GE5|272844|Leu|GAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTGAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006707|Pyrococcus\_abyssi\_GE5|272844|Leu|TAA

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGCCGGACTTAAGATCCGGTGCCGTAGGCTGC GCGGGTTCGAATCCCGCCCCCCGCACC-

T(((\*\*\*)))\*\*C

>tdbD00006708|Pyrococcus\_abyssi\_GE5|272844|Leu|TAG

GCGGGGGTTGCCGAGCCTGGCCAAAGGCGCGGGATTTAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006709|Pyrococcus\_furiosus\_DSM\_3638|186497|Leu|CAA

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGGGGGACTCAAGATCCCCTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006710|Pyrococcus\_furiosus\_DSM\_3638|186497|Leu|CAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTCAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006711|Pyrococcus\_furiosus\_DSM\_3638|186497|Leu|GAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTGAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006712|Pyrococcus\_furiosus\_DSM\_3638|186497|Leu|TAA

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGCCGGACTTAAGATCCGGTGCCGTAGGGCTGC GCGGGTTCGAATCCCGCCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006713|Pyrococcus\_furiosus\_DSM\_3638|186497|Leu|TAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTTAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACC-

T(((\*\*\*\*)))\*\*C

>tdbD00006714|Pyrococcus\_horikoshii\_OT3|70601|Leu|CAA

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGGGGGACTCAAGATCCCCTCCCGTAGGGGTTC CGGGGTTCGAATCCCCGCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006715|Pyrococcus\_horikoshii\_OT3|70601|Leu|CAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTCAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006716|Pyrococcus\_horikoshii\_OT3|70601|Leu|GAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTGAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006717|Pyrococcus\_horikoshii\_OT3|70601|Leu|TAA

GCGGGGGTGCCCGAGCCTGGCCAAAGGGGCCGGACTTAAGATCCGGTGCCGTAGGGCTGC GCGGGTTCGAATCCCGCCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00006718|Pyrococcus\_horikoshii\_OT3|70601|Leu|TAG

GCGGGGGTTGCCGAGCCTGGTCAAAGGCGCGGGATTTAGGGTCCCGTCCCGTAGGGGTTC CGGGGTTCAAATCCCCGCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00012052|Staphylothermus\_marinus\_F1|399550|Leu|CAA

GCGGGGGTGCCCGAGCCAGGTTAAAGGGGGCGGACTCAAGATCCGCTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00012014|Staphylothermus\_marinus\_F1|399550|Leu|CAG

GCGGGGGTGCCCGAGCATGGTCAAAGGGGTCGGGCTCAGGACCCGATGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00012021|Staphylothermus\_marinus\_F1|399550|Leu|GAG

GCGGGGGTGCCCGAGCCTGGTCAAAGGGGCCGGGTTGAGGACCCGGTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00012026|Staphylothermus\_marinus\_F1|399550|Leu|TAA

GCGGGGGTGCCCGAGCCTGGTCAAAGGGGGCGGACTTAAGATCCGCTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00012053|Staphylothermus\_marinus\_F1|399550|Leu|TAG

GCGGGGGTGCCCGAGCCTGGTCAAAGGGGTCGGGCTTAGGACCCGATGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCACCA

T(((\*\*\*\*)))\*\*C

>tdbD00012068|Sulfolobus\_acidocaldarius\_DSM\_639|330779|Leu|CAA

GCGGGGGTGCCCGAGCT-GGTCAAAGGGGGCGGACTCAAGATCCGCTGGCGAAGGCCTAC GCGGGTTCAAATCCCGTCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00012061|Sulfolobus\_acidocaldarius\_DSM\_639|330779|Leu|CAG

GCGGGGGTGCCCGAGCAAGGTCAAAGGGGTCGGGCTCAGGCCCCGATGGTGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00012066|Sulfolobus\_acidocaldarius\_DSM\_639|330779|Leu|GAG

GCGGGGGTGCCCGAGCAAGGTCAAAGGGGGCGGACTGAGGCTCCGCTGGTGTAGGCCTGC GTGGGTTCAAGTCCCACCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00012059|Sulfolobus\_acidocaldarius\_DSM\_639|330779|Leu|TAA

GCGGGGGTGCCCGAGCA-GGTCAAAGGGGGCGGACTTAAGATCCGCTGGCGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00012082|Sulfolobus\_acidocaldarius\_DSM\_639|330779|Leu|TAG

GCGGGGGTGCCCGAGCAAGGTCAAAGGGGTCGGGCTTAGGCCCCGATGGTGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCA---

T(((\*\*\*\*)))\*\*G

>tdbD00001496|Sulfolobus\_solfataricus|2287|Leu|CAG

GCGGGGGTGCCCGAGCAAGGTCAAAGGGGTCGGGCTCAGGCCCCGATGGTGTAGGCCTGC GTGGGTTCAAATCCCACCCCCCGCA---

T(((\*\*\*\*)))\*\*C

>tdbD00006719|Sulfolobus\_solfataricus\_P2|273057|Leu|CAA

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T(((\*\*\*\*)))\*\*C

>tdbD00006720|Sulfolobus\_solfataricus\_P2|273057|Leu|CAG

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T(((\*\*\*\*)))\*\*C

>tdbD00006721|Sulfolobus\_solfataricus\_P2|273057|Leu|GAG

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T(((\*\*\*\*)))\*\*C

>tdbD00006722|Sulfolobus\_solfataricus\_P2|273057|Leu|TAA

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T(((\*\*\*\*)))\*\*C

>tdbD00006723|Sulfolobus\_solfataricus\_P2|273057|Leu|TAG

GCGGGGGTGCCCGAGCTAGGTCAAAGGGGGCAGGCTTAGGCCCTGCTGGCGAAGGCCTGC ACGGGTTCAAATCCCGTCCCCCGC----

T(((\*\*\*\*)))\*\*C