

**Suppl. Table 1. Nucleotide and amino acid sequences of proteins identified in the genomes of *Novymonas esmeraldas* and *Sergeia podlipaevi***

*Novymonas esmeraldas*

Membrane domain

**NDUFB1**

ATGGCGACAGCACAGGAGCTCGGTGCGGGCGGCATCGACGGGGCCGGCAAGCCC  
ATCTTCGTGGCGACGGAGCACACACGCTTCTCGGCGAGAGAAGACCGTGAGCTCT  
CCGACCAGGAGCAGCTGGCGTGGAAGTCCTTCCAGCTCTGGCGCACCTCCCTCTC  
CATCGAGCGCCGCGACTCCGTGTACCAGACGATCACGAACGGCGACTACACCAA  
CTTCAACCTCACACGACACATCATGGGCACCCCCTACCCTGTCATCGACAACACC  
CCCTCCATCCTCAACACGGCCCGCCGGCGTGCGCATGTACGAGCATGGCATCTCCT  
TCCTTGTCGCTACAGCTACAGCATGTGGGTGCGCTCCAAGGCGTCGCTGCGCCA  
CGTCCACCTCCACCGCGCCACGCGCATGAGCGTGTCGTTTGGCACCTTCATGTTCA  
CCGACTTGTGCTTCTGGTACCGCAGCATGTTCCGCCTCTCCGGCTTCTGCCAAC  
GACTACGAGTGCCGCAAGTTCGGCGTGATGGAGTCGCAGGAGCGGCTGGAGCAG  
AAGAAGGAGATGTGGGAGAAGTACTCCGCGTACAAGCGCGAGTGGTGCCGCCGC  
TTCGACTACCACGTCTACGGCATCCGCCCGGCGAGACGTTGAGCCTCTTCTCCG  
CCTGCTGGCTCCCGGCGTGGGGCACGTCGTACGGCACCGTCACCGACTACCCGCT  
GCGCAAGAACCCGTA CTTCCTCAGCGCCACACCGCTGCGGGACATGTACACGGA  
GTACTCCTTCACGATCGAGCCGCCGAGGTCCGCGAACTCGCCGCTGCCGCATGCG  
CGGCCGGAGGTGTTGTACACCTTCCGTGGGCGCGTGTCGCCTCCGATAGCAACA  
AGCCGTGGATGGTGTGA

MATAQELGAGGIDGAGKPIFVATEHTRFSAREDRELSDQEQLAWKSFQLWRTSLSIE  
RRDSVYQTITNGDYTNFNLTRHIMGTPYPVIDNTPSILNTAAGVRMYEHGISFLVAYS  
YSMWVRSKASLRHVHLHRATRMSVSFGTFMFTDLCFWYRSMFRLSGFLPNDYECRK  
FGVMESQERLEQKEMWEKYSA YKREWCRRFDYHVYGIRPGETLSLFSACWLPAW  
GTSYGTVTDYPLRKNPYFLSATPLRDMYTEYSFTIEPPRSANSPLPHARPEVLYTFRGP  
RVASDSNKPWMV

**NDUFB7**

ATGACCGAGTACCTCGCCGATCTGGCCTCGGCCAAGCCGGGGGAGGCGATGCCG  
CCCATCAACCTCGGGCCCTACGACAACCCCCTTCTCTGGAACAAGCTGGACCCCT  
TTGGCGCCGATCGCGGCCACCAGCGCCGTCCGATGACGGTGTCGCGAGACTTCAT  
GGAGCTGAACCAGGTGCCCATCGTCTATCGTGACCACTGCGTCCATCGCTGGATC  
CCATTCCATCGCTGCATTCGCAACCTGAAGCCGGTCACGTGGGGGCACGGTCAACT  
GCCACGAGTTCGAGGAGTCGTGGATGGTGTGCCGCGCGCACGAGACGTACCGCC  
TCCAGCTCCTCAAGAGCAAGTTTATGGCGCTCACGAAGGACTACACCGCGGAGG  
ACAAGAAGTCTTCCCTAGCATCCTCTACCTCGGCCTCCCCTACTACATGCCGTCC  
TACTACTGGAACCTGGCCACGTCGCAGCGACTTAGCGGCTGGGACGAGAAGGAC  
CCAGCGAACCCCGTCATGTGGCGCGAGCCCAACCGCTCCCTCATGCGCTCCGAGT

TCTCGCCCACCAACTGGGAGAAGGGCACGATGACCAGCGCCTACGGTCACAAGC  
TCATCCCCGACGAGGTTGTGCACGACATGGTGCCGGGCTTCCGCTGCCAGAGGA  
CAAGCGTCCGCAGGCCGTGTGA

MTEYLADLASAKPGEAMPINLGPYDNPLLWNKLDPFGADRGHQRRPMTVSRDFME  
LNQVPIVYRDHCVHRWIPFHRCIRNLKPVTWGTVNCHEFEESWMVCRAHETYRLQL  
LKSKFMALTKDYTAEDKKFFPSILYLGLPYMPSYYWNLATSQRLSGWDEKDPANP  
VMWREPNRSLMRSEFSPTNWEKGMTSA YGHKLIPDEVVHDMVPGFPLPEDKRPQA  
V

### **NDUFB9**

ATGGTGGAGTACCATGAGTGGCACCTGCACGAGCCGCTGCTGCAGAACTACGAG  
GGCTGGCGCATCCTCGACAACCCCAAGTACGAGCAGAAGTCAGACGCGTACGTC  
TACGATTTTCATGGGCAGCGTTCGCCACCTCGACCCGATCATCGACGACCCACGAC  
TCACCCACAAGCAGCGTGTCTGCCGGCTCTACCGGTGGTCGCTCAAGGAGCTGCA  
GATGTGGATGATCCAGCTAAGCGCGCACAAAGCTGAACCTTGCCCACAAGGTGGT  
GCGCCGCCGCTTCGAGAAGTACCGCTACGTCACCGACCCGGCCACGTGCGACATG  
ATGGTGCGGCAGACACAGAAGTACCTCCGCGACAACGCCAACTTCCACTACCTGC  
GCCGCAACAACGCTTCGCCGTGGAGCACGTACACCTTAGCAAATCCAATGTTCCA  
CCCCGACAACGCTTCGCCGTGGAGCACGTACACCTTAGCAAATCCAATGTTCCA  
GACGACGCCAAGCTGCATCGCTGGACGGCACACCACCCCATGTACGCCGGCCCTG  
GTGAGGCGTCGGAGCGCTTCGGCGACATGGACGTGTCGCCCCACCTGCGCGGCAT  
CACGTGGGCGATGGTGACGCTTCTTCTTTTGTGGTCCGCCTACCAAATCCTTGGCG  
GCCCCGGTCTGCGCGGCGACCGACACTTCGAGGAGTGGACGCAGCAGTTCGATC  
AGAAGCTCACCGGTGCCCTCTACGCCGAGGAGCGCAACTCCCGCTCCCGCAACAG  
CGTTCTAGGCGGTGACTGGGACAGGGTGCTTGGCTTGGTCGGGATGCCGAAGGG  
GTACTACCGCAACAACATCTCCGTCGTGGACAAGGCCAACTACCCGCCCGAGTAG

MVEYHEWHLHEPLLQNYEGWRILDNPKEYEQKSDAYVYDFMGSVRHLDPIIDPRLT  
HKQRVCRLYRWSLKEQLQMWMIQLSAHKLNLAHKVRRRFEKYRYVTDPATCDMM  
VRQTQKYLRDNANFHYLRRNNASPWSTYTLANPMFHPDNSLVYDHWTHSEVMWY  
DDAKLHRWTAHHPMYAGPGEASERFGDMDVSPHLRGITWAMVTLLLLWSAYQILG  
GPGLRGDRHFEEWTQQFDQKLTGALYAEERNSRSRNSVLGGDWDRVLGLVGMPKG  
YYRNNISVVDKANYPPE

### **NDUFB10**

ATGACAGTGACCGCCGCGGCACACGGTGGTGACAGCCACGGGCACCACCACGAC  
GACCACGACCACCACAGCGCCGGCGATGCCCCGCACGAGCGGATCGCCGCCCCG  
TCCATGGCGTCAAGGACTACCTCGACAACCTGCCCGCCTTCGACACGGCGAAGG  
CGATGCCGCAGCCGCGCAGTGCCGTGGAGCGCTTCTCACGTGTGCTTCAGATGCA  
GTTTGGGCAGGACCCCGACATGCCACCCTCGGCCACAATGTCGAGCGCAAGTAC  
CACAGCTTACTGGACTACCTCGCCAGTCCGATGGCTCCGCTGCGCCCCCGCACGT  
ACGTGGACGCCTACACGCGTCCCAACCCGTGTCCGGAGGAGTACTGGTGGGCGTC  
GTGGCGCTGGCCACGGACGAAGTACGTGAACGCGAAGGTGCCGCCCGCGGTGGA

TGGCAAGTACACGGACTACTACCACTACCTAGCGTTCAAGAACTGGCTGGAGCGG  
GAGCGTGACGTGTACGTGGCGCACGCGAATCTCGTGCATGAGATGGTGTACACGCT  
GTGTGGTGAAGGAGGGGCAGTACAACGCGGCCAAGAACTGCCGCCACCTCTACC  
ACAAGGAGTTCGCCATGTTCGCGTATGGAGGAGCTGAACCAGGCGTTGCTCTACAT  
GGCCATGACAGGCAACGCAGCGATCCGTGAGACACCGTACCCGGAGAACTTCGT  
GGAGGAGAAGCGAAAGATCTACGACGATTGGCTGTACCGCACACGCATGCGCAA  
GCCGGGCGACGTGGCCTAG

MTVTAAHGGDSHGHHDDHDHHSAGDAPHERIAAPSMASKDYLDNLPAFDATA  
MPQPRSAVERFSRVLQMCFGQDPDMPDMLGHNVERKYHSLLDYLASPMAPLRPRTYV  
DAYTRPNPCPEEYVWASWRWPRTKYVNAKVPPPVDGKYTDYYHYLAFKNWLERE  
RDVYVAHANLVHEMVSRCVVKEGQYNAAKNCRHLYHKEFAMSRMEELNQALLYM  
AMTGNAAIRETPYPENFVEEKRKIYDDWLRYRTRMRKPGDVA

### **NDUFB11**

ATGACGGGGTGAATCAGAAGATGGCCAAGATGGCCTTTCGGCGGTCCAAGTTC  
CGCCGCCTAGCCTGGGGTGACGGCGACCCGTACCCGTACACACCACGCGCCACGT  
TCCGCTACCAGTGGGACGACTGGCCGATGTGGGAGAAGATGTGGCACCTCTGCGT  
CGGAGTGCTCTGTGTCGAGTTCGCCCGTGTGGGCGCTACTACTCGAAGCTGAACAGC  
CGAATGGACTGGGCCCGCGAGGAGGCGCTGCGTCGCATGCGTCTACGCCGTGAG  
GCACAGGAGCTCATGATCCTGGAGGGCGAGACATTCGCGAGCGACATCCAGCCC  
GACCGCCACTAA

MTGWNQKMAKMAFRRSKFRRLAWGDGDPYPYTPRATFRYQWDDWPMWEKMWH  
LCVGVLCVEFAVWAYYSKLNRSRMDWAREEALRRMRLRREAQELMILEGETFASDIQ  
PDRH

### **NDUFAB1**

ATGCAGCGCTCCATCGCTCGCCGCCTCGGCGCACGTGCGACCCTTCCCTTGACTG  
CCGTCGGGATCAGGGGCTCGCAGCCTCAGGCCATCACACGTGCCAGCACTGCGAC  
TGTCTGCGTGAGGGCTATCCCGTCCTCTCACTGCTCTGTACGCCTGTACTCCGGCG  
GCCACCATGAGGAGCCTGCTGCTCGCAGTGGCCAGTACCTGCTAGACAAGAACG  
ACGTCCTCACGCGTGTCTTGGAGGTAGTGAAGAACTTCGAGAAGGTGGACGCCTC  
CAAGGTGAGCCCTGAGTCACACTTCGTGAACGACCTGGGCGCTCAACTCCCTCGAT  
GTAGTCGAAGTCGTCTTTGCCATTGAGCAGGAGTTCATCCTAGACATTCCCGATC  
ACGACGCCGAGAAGATCCAGTCCATCCCAGACGCGGTCGAGTACATTGCCCAGA  
ATCCGATGGCCAAGTAG

MQRSIARRLGARATLPLTAVGIRGSQPQAITRASTATVVCVRAIPSSHCSVRLYSGGHH  
EIPAARSGQYLLDKNDVLTRVLEVKNFEKVDASKVSPESHFVNDLGLNSLDVVEV  
VFAIEQEFILDIPDHDAEKIQSIPDAVEYIAQNPMK

## NDUFS5

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TGCGCCGCTGCCCCGGTGACATCCACCGTCCGGAGCTGGCGGGCGCTGAAGGCGTG  
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GCCACGATGTGGATGACGAGAGCGACCCCGACGAGGAGCGCTGGACGCTGCAC  
GATGCGGAGCCGGCGCCGATCGCAGAGAAGGCGGGCGAGCCCAGCGACGCCGAC  
GCGGAGGCGGCCATGGCGGCCAAGGCGGAGGCGGGCGGAGCTGCACAGTGATGGC  
AAAGGCGCTGAGGCGCTGGCCAAGATGAGCGAGGCGCTGGCGCACAACCCTGGC  
AGCGCCGCTACTGGGGTCTGCGCGCCGTGTACCACCTCGAGGCCAACCTGCCAC  
GTGCCGCGCTGCACGACGCCAACAAAGCGCTCGAGCGCAACCCGCAGAACGTCC  
GCGCGCTGCGTGTGCGAGGGACGGTGAACCGCCACCTCGGTGCTGGGAGGATG  
CGCTGAAGGACCTCAGCGCCGCGCAGGCCATCGACTACGACGACGACACGAACC  
CGATCCTTCGCTACGTCCAGGCCCGCGCCACGCAGCGCCACAAGCGTGCTCTGGC  
GCGTCGACAGGCAGAGGAGGCGGAGGAGGAGGCGGGCGGGCGGGCGGGCGGCAGG  
CGGAGCTTCGCCGCCAGCGCCAACAGGAGGCTGCTGAAGAGGAGGCGGAGGCGG  
AGGCAGCGCGTGCAGCCGCAAGTGGGATGCCTGGCGGGATGCCTGGTGGGATGC  
CTGGTGGGATGCCTGGTGGGATGCCGGGTGGGATGCCGGGTGGGATGCCGGGTG  
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GGCGATGGGGATGATGAACGACCCCAAGGTGGGGCCCGTCGTACAGAAGATCAT  
GTCGAAGATGATGGGCGGCGGGCGGCTTCCTGGTGCGGGCGGTGGCGGCATGCC  
TCCTCGCGGTGGCGCCGCTGGCGGGCGGTCGCGCGCGGGCGCCACAGACGATCTG  
GACTAG

MSSYS DADV GALNRV VDAVRRCPGDIHRPELAALKAWAADAGATFAPAPAPAEAP  
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GAEALAKMSEALAHNPGSAA YWGLRAVYHLEANLPRAALHDANKALERNPQNVR  
ALRVRGTVNRHLGRWEDALKDLSAAQAIDYDDDTNPILRYVQARATQRHKRALAR  
RQAE EAE EEA AARRQAE LRRQRQQA EAE EEA EAE AARAAASGMPGGMPGGMPGG  
MPGGMPGGMPGGMPGGMPGGMPGGMPPGMEAILQDPEIVAAMQDPEVAPKLAQMMQNPMAA  
MGM MNDPKVGPVVQKIMSKMMGGGGFPGAGGGGMPPRGAAGGASRAAPTDDL  
D

## NDUFA6

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GAGGAACGGTTCCTGACCGAAGCGGGGATGTGAAGTCGTTGAGGCCTCAGACG  
TACGACGTGCCGCCAGGTGCGATCGGACAACATCAAGTCGCCGGAGTTCAACACGT  
CTCTAGGAAAGTTTGAGCAGGCACCCTATTTACCGGTGGACCGCCAGCGATGCG  
CTATCATGGCTACAAGCGTGAGTCTGCTAACAAAGAAGGAGTCGATTACCGCGAC  
GTGCTGCCCAAGGTTCCCATGGAGGACCACCATCCGAACATGGATTTTCTCTCCG  
TCACCGGGCGGCGTGAGGGAAGCACGTTTTTGCTTGCTAATGCCGGCGTGAAC TG  
GGAGTTGAAGGCGTCTGCGATGTCGCTCTATCGCACGATCCTCAAGGCGCTGCCA  
ATGATCAAGCATTACTACTGGCTGCTGATCCCTCTTCCGCAGATGAAGGACAAGA

TCCGCTTCCGATTTCTGCAGAACCAGCACACCAAAGACCCGGACGCGATTGCGCA  
TCTCCTTCACAACGGGTGGATGGAGTTCAGGAGTCAATCATGTTTCGCCGCCCT  
CGCGCGACCATCGAGAAGTACTTCGAATATGAGAGCATGGACACACTCATCGAG  
CAGTACACAAGGGGAGGAGGGTCTGATGAACCACGAGCGGGAGTTCTGGAACGGC  
GAGGAGCAGCGGCGGAGGGGCCGACAATGGCCACTGGTCGTGGCTCGGGGAG  
CAGTGCGAGCAGGAGTTTAGCAAGATCGCGGGCCGCATCCCCATGTCGTGGACC  
ACCTCGAAGGGGTACTTCGAGAAGGGGCAGGCGGATGGCACGAACTACTGGGAG  
AAGAACCTCGACTACGAGGGGTGGTACATCAAGAACGTTGACCCGGACCGTCAG  
AACGCGCGGCGTGAGATGCAGGGCTGGGTGGAGAGCGGCTACAATCAGCCAAAG  
CACTACGCTAGCAAGAACCGCCGCGGCTACCGCCGCATGGTGAAGGACATCGAG  
ACGCTCATGGAAACCTCGATGGAGGACCTGTACACGCACAACCGCGAGCAGCTC  
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GCACGTTGGCGTACCAGGACGACGACTTCTACTCCACCCGCTTCGATGAGTACGA  
GAAGTACGTGAAGCAGGCGATGCGTGAGATGCCGAACCCGCGCCTCTGGAAGAC  
GGACGCGTTCTACTTCCGCCTTCGCTACCTCATCGCTCCGCTGGAGTACAACCTGGG  
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ACCCCGACGTGCCGGACACGCGCCTCCTTCCATGGTACCACAAGGACTTCGACTA  
CGACCGCCGCCACAAGTGGGACGAGCGGTGCATGCGCATGAAACGGTGGGTGCA  
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GAGCAGTACGTGAACCGCCCGGAGCGGTTTCGCGCGCCGGACAACGCTGAGCGC  
CGCTACGCGGCGCCGCGTATGGTGCAGCTCTACCGTGCCTGAACCGCGTGATGG  
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GCAAGCTCTCTGCGGAGGAGGTGCAGAAGCGCATCGCGGGCGGCTGACTTCACGA  
AGTTCGGTTCGACGTCCCGTGTGCATCTATCCTGACGGCCTAGTTCAGCCGCAG  
CTTGACTCGACGGCGGAGCTCCAGCGGCACCGCTGCCACTGCTACTGCGACGG  
CAGATGCGTAG

MLRRFCPLAVAATGLRFNASNGGTFDGGDEPIPNSTGKDNAPGLYSKKTDPDAYFEE  
RFPDRSGDVKSLRPQTYDVPPGRSDNIKSPEFNTSLGKFEQAPYFTGGPPAMRYHGYK  
RESANKEGVDRDVLKVPMPEDHHPNMDFLSVTGRREGSTFLLANAGVNWELKAS  
AMSLYRILKALPMIKHYWLLIPLPQMKDKIRFRFLQNQHTKDPDAIRHLLHNGWM  
EFQESIMFRRPRATIEKYFEYESMDTLIEQYTREEGLMNHEREFWNGEEQRREGPHNG  
HWSWLGEQCEQEFSKIAGRIPMSWTTSKGYFEKGQADGTNYWEKNLDYEGWYIKN  
VDPDRQNARREMQGWVESGYNQPKHYASKNRRGYRRMVKDIELMETSMEDLYT  
HNREQLFQYLIRETSPESNRINAERTLAYQDDDFYSTRFDEYEKYVKQAMREMPNPR  
LWKTDAFYFRLRYLIAPLEYNWAKVPVGTAQERLFNEWISDNCNYAVYTSDAFAQI  
KADKMRNPMARTWADFYTDFDPDVPDTRLLPWYHKDFDYDRRHKWDERCMRMK  
RWVQGGTIDGKHAFDSSIAEWEQYVNRPERFRAPDNAERRYAAPRMVQLYRALNR  
VMDVALANQMRQALEKGGDFSKLSAEVQKRIAAADFTKFRFDVPPVVIYPDGLVQP  
QLGLDGGSSSGTAATATATADA

## NDUFA8

ATGGACCAGTTCACGCAGCCGCTGGAAGGCATCTTCCGTGATGGCATTCTGCGC  
CGGTGCTGCGCGCCTTCGCCCCGCTCTTCCAAGCTCTGCCGAGCCTGCAAGAGCG  
CGTCGAGGCGTCGCGCGACTGCTACTACTGGCGCGCCAACCCCATGAAGTGCTTG  
GACGAGGACGTGAGCACCGTGAGCGGCTTCATGCAGGCCTCCGAGGCGAGCTTC  
CGCCTGTGTCCCCAGCAGTCCGCGACGCTGCTCAAGTGCCACATGACAGAGCCGG  
CACGCGCCGTGTACTTCTGCCGTGATGAGGAGTGGGAGTGGCGGAGCTGCTTGAT  
GGATCAGACCCGGCATCCGCTTCTGGCCCTACGCGAACGCGCCCATCGGCGCGCCG  
TGGTCGAATGGCGGACAGACGGAGGACTTCCATCTCGAGGATCGCTTCTTCTACG  
AGAACTTCTCCTTCTGGCGCCGTCGTGGGGCCATGCTGGCGGTGCGTGAGCGGGA  
GCTCGAGGTCGCGGCGCAGCGCAAGCACTGGCTGGATGAGCAGACAGACGACAC  
CTCCCTAGCGGCACCGAAGCCGACTCTAGCACCCATCGGCATCCACGCGAAGATC  
AACTAG

MDQFTQPLEGIFRDGIPAPVLRAPLFLQALPSLQERVEASRDCYYWRANPMKCLDE  
DVSTVSGFMQASEASFRLCPQQSATLLKCHMTEPARAVYFCRDEEWWRSLMDQT  
GIRFWPYANAPIGAPWSNGGQTEDFHLEDRFFYENFSFWRRRGAMLAVRERELEVA  
AQRKHWLDEQTD DDTSLAAPKPTLAPIGIHAKIN

## NDUFA9

ATGCGGCGCTTCTCGGTGACGTCCACCGCGGCTGTCGCCGCTGCCGTTGGTGGTG  
CGCGTGCTTCTGGGACCCGTACGGACATCAGCCCAGTCCATGTTCTGGACCG  
CAAGGACTTCAACCAGATGTACCCGACCACGAAGCCGAAGACCACTGGTGGCGG  
CTTCGGCTACGAGCGCGGGCCGTAAGTGGGCGCCATGCTGCTGCCCAACCCCGCC  
GTTCGCCTTCCACACGAACGCCGCCGCTCAACCCGAAGCCGGCGAAGCGCGTCA  
CGGTCTTTGGCGCCAGCGGCTACCTCGGCGCTGAGGTGGTGGCGGAGCTGTGCGA  
GCACCCCGACATCGAGACGGTGCAGCGCCACCACGCGCTACCCACACTCATCCCG  
GAAGGATCGGACCTCGACGTGTTGCTGCGCCAGTACCCCGAGAAGCTAGAGCTG  
CACGAGTGCAGCTGACGGACCGCATCCAGGTGAACGTAGCCGCCAACGGGAGC  
GACACCCTCATCTTCGCGGTGACTACCACGCCGAGTACGCCAACAACAGCCACC  
ACGACGTCTTCTGATCGGCGCCACCAACGTTAGCTGGACGGCCCGCAGCGTCCG  
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TGGGTGCTGGACGCGGCGCGCGGTTGGTGCCTGCTCCATGTCGCACCGCGCGG  
TGCGCTACAAGTTTGACCTCGGTGGCCCGCAGACGACGAGCCACGTCGAGGCGTT  
CCGCGAGATCGCGCGGCACTTCGAGCAGCGCCTCGTCGTGCCGTGCTACCGCGGC  
TTCGGCCGCTTCTTCGGCAAGCTCGCCCCCTGGACGGTGCCCAACCCCTGGTTCCG  
ACGACAACACTACATCCTCACCTTCGAGCTGGACCAGGTGAACCGACGCAGCACCCCT  
CTTCGACCGCCTCGCGAGCTGGGACCGCATCGCTACACGCCGCACTCCATCCGC  
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GACATCGCCTTCAAGAAGCTTGAGGCGCGGACAAGGCCGCTTCGAGCAGGAG  
GAGGAGGCGGCGAAGAAGTACGGCATCCACCGCGCCAAGGCCGAGCCGGGCTTC  
GGCCGCACCGACGGCCTCGAGGCGCTCGCGCAGGAGATCTACCCCGGCCAGCAG

TTCCGCATCAAGCCGCTCGAGGGCGCCAAGTACCCCTCCAACGTCGCTCAGCCCG  
GCCCCACGGCGATCCAGTAG

MRRFSVTSTAAVAAA VGGARAFWDPYGHQPESMFLDRKDFNQMYPTTKPKTTGGG  
FGYERGPYWAAMLLPNPAVRLPHERRRLNPKPAKRVTVFGASGYLGAEVVRELCEH  
PDIETVRATTRYPTLIPEGSDLVLLRQYPEKLELHECDVTDRIQVNVAANGSDTLIFA  
VDYHAEYANNSHHDVFLIGATNVSWTARSVRAERVIFCNGLDATFASESNYVDFRA  
RGEDAVGANHPDATIIRFGPLYGRRYRYRGLGRYIYPACFPNTQVQPTWVVDAARA  
VVRCSMSHRAVRYKFDLGGPQTTSHVEAFREIARHFEQRLVVP CYRGFGRFFGKLAP  
WTVPNPWFDNYILTFELDQVNRSTLFDRLASWDRIA YTPHSIREAAEVERGTRTL  
APHELIDIAFKLEAADKAAFEQEEEEAAKKYGIHRAKAEPGFGR TDGLEALAQEIYP  
GQQFRIKPLEGAKYPSNVAQPGPTAIQ

### Peripheral domain

#### **NDUFA13**

ATGCTGCGCAGCACCGCACGTCGGCTGGTGC GGGACCCCGTTCCGACCGACACCA  
AGGCGTTCTACACATGGTTCAGCGGCCAGGCCTACCGTCAGGAGCGCGTGATTCC  
AGGCGGCTACCCCGCCGTTTCGCGTGTACCCGGTGTACGGCAAGCGCTGGTTCACG  
GGCCGCACCGTGGTGGCCCTCATCGCCGGCATCTCCATCTTCGGCGCGTGATGC  
GCCCCGAGCGCGAGCGCTACAACATGGAGATGATGATCGAATTCGCCGAGCGTC  
AGTCTCTACTTGCCCTACCAGACCGCGGAGGTTACCTGCGCTGCTTCGTCTCG  
GGCTACAAGCGCCACCGCTTCGAGCAGGAGAACCTCATCGACAAGGGCTACGTC  
GGCCTGACGTCCGAGTTCGCAAGTCTTCTACCACAGCGATGTGTGGCGTCCGC  
CGCTGCACGACGTGCTCCTGCACCCCTACATCAAGTACGGTGGCCCCGTGGGTAG  
CTACA ACTGGTCTGTCTGGCTACTTCTAA

MLRSTARRLVRDPVPTDTKAFYTWFSGQAYRQERVIPGGYP AVRVPVYVGKRWFTG  
RTVVALIAGISIFGAWMRPERERYNMEMMIEFAERQSSYLPYQTAEVHLRCFVSGYK  
RHRFEQENLIDKGYVGLTSEFRKFFYHSDVWRPPLHDVLLHPYIKYGGPVGSYNWSV  
GYF

#### **NDUFA12**

ATGACGAGCGTCTTCACATTCGGCAGCCTCGGGCGCCA ACTCGATGGCGAAGAAGT  
ACGGCGAGATGGCTGTCAGGTCTGTTCAAGTGC GGGTCCAAGAACTTCGTCTACAC  
CAAGTCGCACGACGACGCGCATAGCTTCCCGCGGCACCACCACCGCCAGGGCGA  
CAACCCGGTGCCTCTCTCCTTCACCTTGCCCCGGTGGCGGTGGACGATGCACGAC  
TTCCGCATGTTTCGGCCTCTTCGGTGC ACTGCGTAGACACTACTACATTGGCGAGG  
CGTGGCGCCGCAAGGATGAGAAGATCTTCGTTCGGCAAGGATGAGAACGGCAACA  
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GGTGAGTGGGGCCACA ACTCGCGTCTTGGTATTCCCATGCCCTTCAACATCAAGT  
ACAACGAGTGGTCGCTCTCAACTCCTGCAACATTTACTCACGCGATCCCATGTG  
GGTGGCCGCACCGGGCCTTCTCGTCAACCCCGAGCGGCGTGCTTTGCAGGAGGCG

GGCTTCTCGCGGTGGCTCTGGCAGAAGGGTCTCCCGGTGTACATGCCCTTCTGTG  
GTGTCCACGACTACTCGGACGAGCTGGTGGAGGAGTTCTACCGCGGCCAGTGGGC  
CTTCGGACGTGAGAGCAAGGGTAACGACCATGACGAGTGGCGTAACTAG

MTSVFTFGSLGANSMAKKYGEMAVRSSKCGSKNFVYTKSHDDAHSFPRHHHRQGD  
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GEWGHNSRLGIPMPFNIKYNWSPLNSCNIYSRDPMWVAAPGLLVNPERRALQEAGF  
SRWLWQGLPVYMPFCGVHDYSDELVEEFYRGQWAFGRESKGNHDHEWRN

## **NDUFA5**

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GCCGGTGTGGCGGTGGAGCCGCTGTGGAAGCCGAAGCTGCTCGCCGCCGCTCG  
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ACGTCACGATGACGCTGGTGAAGCGCATCAACTTTGGCGTGAAGGAGTGCCAGG  
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CTTCTGGGAGCTGGACCCGGAGCAGGTGAAGCGCGTGGCCCCGCGAGGACCAGGG  
TATCGGCAAGGAGGGCATGGGCTACAACACCCCATGGGAGCAGGTCATCCGCGA  
GGACTTCGACAAGCGCAAGAAGGCCCTGACGCAGGAGGAGATGGCGGAGCTGAA  
GCGCATGGACACCGAGCGGATGGCGCGGAGACGGCCGCGTACAAGGAGCGCAA  
GGACCGCATCCGCGACGATCTAGAGAAGGCGCGTGGCGACATGCTGAAGAAGTT  
CTTGAACAAGCGCTACGCCGTAGACAAGGACCTCATGCGAATGCAGCCCGGTAA  
GAGCTACTCCGGCAAGAGTGCCGAGGACCTGATCGACGAGTTGCGCGCGTCTGTG  
AAGCAGGGTCCTCCGGCGCCGTCCAAGTGA

MLASRPLLSALRRTGRLLTISDEYIPRAFPVKSTTGLAGVAVEPLWKPKLLAAASELQ  
AFLHTSDIPPESTYFNVMTLVKRINFGVKECQDDWCTLEKKYFWGWPVEYILQVT  
WRELETAQKWNEWRFWELDPEQVKRVAREDQIGIGKEGMGYNTPWEQVIREDFDKR  
KKALTQEEMAELKRMDTERMARETAAYKERKDRIRDLEKARGDMLKKFLNKRYA  
VDKDLMRMQPGKSYSGKSAEDLIDELRASVKQGPPAPSK

## **NDUFA2**

ATGTCGTGGCGCGCGCGGTTACCCCATGCGTGGGCTCTCTCACGGTGTGGCTCA  
ACCCCAAGGACCCGAAGTCTTTGGCGTCAGAACTGGTGGCGCAACAATCTGCC  
GGAGCTGCAGCTGCTCAACCCGTTCTGCACCTTACGATTCAGGAGCTCTCCTTCG  
GCGAGCCGCACATGTATGTGAACTACACGCCGACCGACCAGCGCATGATCCGCCT  
CGCCGGTGCACCGAGGAGGAGTGCAGGAGATCATGGAGGCATGCATCACGTA  
CGGCATGCATCACGCCATTCTCGAGCGCCCACGCACTGACGACGGCGGGCGACTTG  
GTGAACCAGCCTGCCATCACGTCCTTCGGCTACACGGAGAGCTTACCGCAAAGC  
TGGAGGTGGCGCCACCGGCGGACATCGGCCAGAAGACACCAGAGGGTGTTCGACG  
ACCCCGGCCAGAAGCCGCGCATGTTCCCCCGCAACGTAGGCTGCAAGTTGATGCC  
GTAG

MSWRARFTPCVGS�TVWLNPKNPCFGVRNWWRNLPQLLNPFCTFTIQELSFGE  
PHMYVNYTPTDQRMIRLAGATEEECEEIMEACITYGMHHAILERPRTDGDDLNVNQ  
AITSFGYTESFTAKLEVAPPADIGQKTPEGVDDPGQKPRMFPRNVGCKLMP

### NDUFS7

ATGCTTCGTTTCACTCGTGCCTCCTTACC GGCCGCGCGATGATCTCGCGCGGCAG  
CCCCGAGTGGTCCCACCGCCTCGACCTCAAGAAGGGCAAGAAGACGACGCTGGC  
GCACAAGCTTGGCACGAGCAAGCCAAACAACGCACTGCAGTACGCGCAAATGAC  
GCTGCACGACTTGACGGAGTGGGTTGTTGCGTACTCGCCATGGCCGCTCACCTT  
GGTCTCGCGTGCTGCGCGGTGGAGATGATGCACTCCTACTCGTCACGCTATGACC  
TTGACCGTTTTCGGCATCGTTCCGCGTCCGTCGCCGCGCCAGGCGGAGATCATCAT  
TGTGTCTGGCACTGTGACCAACAAGATGGCACCGCTGTTGCGCCACATTTACGTT  
CAAATGGTAAACCCGAAGTGGGTCTCTCGATGGGAAGCTGTGCCAACGGCGGT  
GGCTACTACCACTTCTCTTACGCGGTGCTGCGCGGGTGCAGCGGTTCGATCCCGG  
TGGACTTCTGGATTCCCGGCTGCCCGCCATCTGCCGAGAGTCTCGTGTTTTGTCTC  
CACAACCTGCAGAAGAAGATCCGCTGGCACGAGATCCAGAAGTACTCGGTGCGG  
TGA

MLRFTRASFTGRAMISRGSPEWSHRLDLKKGKKTTLAHLGTSKPNNALQYAQMTL  
HDLTEWVVAYSPWPLTFGLACCAVEMMHSYSSRYDLDRFGIVPRPSRQAEIIIVSGT  
VTNKMAPLLRHIYVQMVNPKWVISMGSCANGGGYYHFSYAVLRGCERSIPVDFWIP  
GCPPSAESLVFCLHNLQKKIRWHEIQKYSVR

### NDUFS6

ATGAAGAAGACGTTCCCGTTACTGTGGACCTTCTCGGACAACCGAGGCTACTATG  
GGCCCCCGGTCTACATGCCGTTAGAGTACGCCAGCCGCGTCACGAATCAGAAGCA  
GCTGGTGTTCACCCATCCCAAGGATCCCAAGTACACGTGGAACACCGGCATCAAC  
GAGCTCTCTAGTCTTACCCCGGCATCCTCGGGCCGGGACGCAAGACGCCGCAGC  
TGAACTACACTAGCCGCGGTGGCATCATCTGCGAAATCCCACCCGTGCCCGTCTA  
CCGCGAGCACATCTGGTGATGGGCCATGGCCACTTACCCTGCAGCACCCACGT  
ATCTTTATCAAATGCCACGCAACAAGGTCGTCTGCTGCAAGTGGTGCCGTCTGA  
AGTTCATCAACATGTCCACGGACGCCGACAACGACGACGACTGGTTCGAGGAGG  
AGCAGAAGATTGCCACCACGCCGGAGACAGAGGAGGACCTGCGGCAGCCCATCC  
GCGACATGACCGGCGTGCTGCGCGACAGCCCTTCCAGGACGGCAAGGAGCCCG  
ACCCGGATGTGTACCGCACCGTCTTCAACCCTGAGCGGTACCGCTGGAAGCACGC  
CAACACAGACCACTACGAGGTGCACCCGGCCTACGCCAAGAAGGACGGCGATAC  
TGAAGAGTGCGGCCATCACCCTAG

MKKTFFLLWTFSDNRGYYGPPVYMPLEYASRVTNQKQLVFTHPKDPKYTWNTGINE  
LSSLHPGILGPGRKTPQLNYTSRGGIICEIPPVPVYREHIWCMGHGHFTLQHPRIFIKCP  
RNKVVCKKWCRLKFINMSTDADNDDDFEQQKIATTPETEEDLRQPIRDMTGVLRL  
DSPFQDGKEPDPDVYRTVFNPERYRWKHANTDHYEVHPAYAKKDGDTTEECGHHH

## NDUFS1

ATGCCGACGCGTGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGTGCAGTTG  
TCGTCGTCGTCGTCATCGCCGCTCTGGACGGCGCGTCCGACTTCCGACCAGATG  
GCACGCCGTACAACCTCCGAGATGACTGAGATCGGACACGGCAGCACGTACCTGC  
GCGGTGGGGCTGCCAACGCGGGCGGAGCAGGTGGCGGGGGCAGTACGCGG  
AGAGCAAGCCCCGTGCCATCATGTTCTGTCACAAGCGGCCTGTGAGATCATCCC  
ACAGGAGGAGAACGTGTTGGAGGTGCTGGAGCGGGAGGGCATCACGGTGCCAAA  
GTTCTGCTATCATCCGATCCTCTCCGTCGCGGGTAACTGCCGCATGTGCATGGTGC  
AGGTGGACGGCACGCAGAACATCGTCGTGGCGTGTCTGACCGTGGCGCTGCCAG  
GCATGTCCATCATCACGGACAGCCGCCTCGTGCAGCGATGCACGCGAGGGCAACGT  
GGAGCTCATCCTCATCAACCACCCGAACGACTGCCCCATCTGCGAGCAGGGCAGC  
AACTGCGACCTGCAGAACATCAGCATGAACTACGGCTCCGACATCCCACGCTACC  
GCGAGGACAAGCAGGCCGTGCGAGGACTTCTACTTCGACCCGCAGACGCGCGTCG  
TGCTGAACCGGTGCATCCACTGCACTCGCTGCGTGCCTTCTTGAACGAACACGC  
GCAGGACTTCAACCTCGGACACATCGGCCGCGGTGGGCTCAGCGAGATCTCGACC  
TTCCTCGATGAGCTGGAGGTGAAGACGGACAACAACATGCCGGTGTGCGAGCTGT  
GCCCCGTTGGAAAGCTGTACCTCGGCGATGCGGATGAGAACGAAGACATCTTGC  
GCGAACTCGAGGCGGTGGAGGCCGCCGCTGCCGCCACCGCCACCGCGTAG

MPTRAAAAAAAAAAAVTLSSSSSPLWTARRHFRPDGTPYNSEMTEIGHGSTYLRRG  
AANAQAEQVAAGQYAESKPRAIMFVNKRPEIIPQENNVLEVLEREGITVPKFCYHPI  
LSVAGNCRMCMVQVDGTQNIIVVACSTVALPGMSIITDSRLVRDAREGNVELILINHP  
NDCPICEQATNCDLQNIISMNYGSDIPRYREDKQAVEDFYFDPQTRVVLNRCIHCTRC  
VRFLNEHAQDFNLGHIGRGLSEISTFLDELEVKTDNNMPVSQLCPVGKLYLGDAD  
NEDILRELEAVEAAAATATA

## NDUFV2

ATGCGCCATCAGAACACGGACTACGACAACACTCGCATCCCGTGGGACTTCACGA  
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AGCGCATCTCCGCCACCATCCCGCTGCTGCACCTCGCCCAGCAGCAGGGCGG  
GTACATCCCTGTGACGGCCATGTACAAGATCGCGAAGATATGCGAGGTGCCGCCG  
ATGCACGTCTTCGAGACGGTGACCTTCTACTCCATGTTCAACCGCCACCCCGTGG  
GCAAGTACCACATACAGTTCTGCCGTACCACCCCTTGCATGCTCTGCGGCGTGA  
CGAGCTCATGCACCGCACCATGCGGTACCTCAACGTGCGCATGCACGGCACCTCC  
AGCGACGGTCTCATCACGGTGGGGGAGATGGAGTGCCCTCGGCGCGTGCCTGAAT  
GCACCGATGCTCGTCGTGAGTGACTACAGCGACCCACCCAACCTTCTCCTACGACT  
ATGTGGAGGACTTGACGTGGGACAGCGTCAAGACGCTCATCGAGAAGCTGCGCA  
GTGGGCAGGCCTTCAAGATCGGGCCGCAGCGACCAGACCGCAAGTGCGCTGAGC  
CGGCCGGCGGCCGCACGTGCTGTTGTTCAAGGAGCCCCAGGCCATACTGCCG  
TGACTTCGACGCCAAGCCGGAGGAGAAGAAGGCCGGAGCTGCACCAGCGAAGTA  
G

MRHQNTDYDNTRIPWDFTTASYEKIHNEILPKFPRGKRISATIPLLHLAQQQGGYIPV  
TAMYKIAKICEVPPMHVFETVTFYSMFRNHPVGKYHIQFCRTTPCMLCGVDELMHRT  
MRYLNVRMHGTSSDGLITVGEMECLGACVNAPMLVVSDDYSDPPNFSYDYVEDLTW

DSVKTLEKLRSGQAFKIGPQRPRKCAEPAGGRTSLLFKEPPGPYCRDFDAKPEEKK  
AGAAPAK

## **NDUFV1**

ATGATGATGCGCCAGGGCCTTCTTCGCTCGTCCGCCGCGCTGCTGGATCGCGTGC  
ACGGCCACCTCAAGGACCAGGATCGCATCTTCACGAACCTGTATGAGGACTTCGG  
CACCGGCATCGCTGCGGCGGAGCGTCGCGGTGACTGGTACCGGACGAAGGACAT  
CCTCCTCAAGGGCCATGACTGGGTGATCAACGAGATGAAGGCAAGCGGGCTGCG  
CGGCCGCGGCGGCGCCGGCTTCCCGTCGGGGCTGAAGTGGTCCTTCATGCCCAAG  
AAGAAGCCAGACGAGCGGCCGAGCTACCTCGTCGTCAACTGCGATGAGTCGGAG  
CCCGGCACGTGTAAGGATCGAGAGATCATGCGCCACGAGCCGCACAAGCTGGTC  
GAGGGGTCGCTCGTCGCCGGCTTCGCGATGCGCGCCCCTACGGCTACATCTACA  
TTCGCGGTGAGTTCTACAACGAGTGGCGCTCGGTGGAGCAGGCGATCCACGAGG  
CCTACGAGAAGGGCTACCTTGGCAAGAACGCATGCGGCAGCGGCTGGGACTTCG  
ACCTCTACACCTACCGCGGCGCCGGGGCGTACATTTGCGGGGAGGAGACGGCCA  
TGATTTCCAGCATCGAGGGCGGGCAAGGGAAGCCGCGGCTGAAGCCGCCGTTCC  
CCGGAACGTCGGCCTCTACGGCTGCCCAACCACCGTGACGAACCTGCGAGACGGT  
GGCGGTGGCGCCGACGATCCTCCGCCGCGGGCCGCAGTGGTTCGCGCAGTTCGGG  
CGGAAAGGCAACGCGGGCACGAAGCTGTACTCCATCTCCGGCCACGTGAACCGC  
CCATGCACGGTGGAGGAGGAGATGAGCATGCCGCTGCGTGAGCTGATCGAGGTC  
CACGCCGGCGGCGTTCGTGGCGGCTGGGACAACCTGCTCTGCGTCATCCCGGGCG  
GCTCGTCGTGCCGCTGATCCCAAAGCACGTCTGCGACAACATCTTGATGGACTA  
CGACGCGCTCAAGGATGCGCAGACCGGGCTCGGCACGGCGGCGGTGATCGTCAT  
GGACAAGTCGACCGACGTGATCGACGCGATCGAGCGGCTTTCGCAGTTCTACATG  
CGTGAATCGTGCGGACAGTGCACGCCGTGCCGCGAGGGTGCGCCGTGGCTGGAC  
AAGATGATGAAGCGCTTCGTCAACGGCAACGCCAAGAAGGAGGAGATCTACACC  
ATGTGGGATGTGTCGAAGCAGATGGAGGGCCGCTCCATCTGCGCGCTCGGCACG  
GCGGCGGCGTGGCCGGTGCAGGGACTCATCCGCCACTTCCAGCCGCTCATGGAGG  
AGCGCATCGACCGCTTCTGGGAGGCGAACCACACTGGGGAAAGGCCGGCTCGC  
CGTGGCGCCGCTGGAAGACCCACCGTACTACACCATGCAGAAGGGCGACCGTC  
TCAACTGGGATGGCAAGATTGTGCGCAACTGGAAGTAG

MMMRQGLLRSSAALLDRVHGHLKDQDRIFTNLYEDFGTGIAAAERRGDWYRTKDIL  
LKGHDWVINEMKASGLRGRGGAGFPSGLKWSFMPKKKPDERSYLVNCDSEPGT  
CKDREIMRHEPHKLVEGSLVAGFAMRARYGYIYIRGEFYNEWRSVEQAIHEAYEKG  
YLGKNACGSGWDFDLYTYRGAGAYICGEETAMISSIEGGQKPKPKPPANVGLYG  
CPTTVTNCETVAVAPTILRRGPQWFAQFGRKGNAGTKLYSISGHVNRPCTVEEEMSM  
PLRELIEVHAGGVRGGWDNLLCVIPGGSSCLIPKHVCDNILMDYDALKDAQTGLGT  
AAVIVMDKSTDVIDAIERLSQFYMRESCGQCTPCREGAPWLDKMMKRFVNGNAKKE  
EIYTMWDVSKQMEGRSICALGTAAPVQGLIRHFQPLMEERIDRFWEANPHWGKA  
GSPWRRWKTHRYTMMQKGDRLNWDGKIVRNWN

Alternative NADH dehydrogenase

**NDH2**

ATGCTGCGTCACACGGTGCTGCGGCTGACAAAGCCGAATGTGGTGGTGCTAGGCA  
CGGGGTGGGCGGGCTGCTACGCCGCGCACCACCTCGACCCCAACCTGTGCAACAT  
CCAGGTCATATCCACCCGCAATCACATGGTCTTCACCCCCCTGCTTCCCCAGACG  
ACAACAGGCACGCTGGAGTTCCGCTCCGTGTGCGAGCCCATCACGAACATTCAGC  
CCGCGCTCGCCAAGCTGCCACACCGCTTCTTCCGCAGCGTCATCTACGACGTGCA  
CTTCGAGAAGAAGTTGGTGCAGTGTGTTGGCGTCGGTGTGTTGGGCGGCTCAGAG  
AACGTCCCCGTCAGCACCTTCAGTGTCCAGTACGACTACCTCATCATGGCTCACG  
GCGCGCGGCCAACACGTTCAACATTCCTGGTGTGGAGGAAAAGGCGTTCTTCCT  
GCGCGAGGTGAACGAGGCGCGCGGCATTTCGCAAGCGCCTCGTGCAGAACATCAT  
GGCTGCCGACCTGCCACCACCCCTGTGCGAGGAGGCGAAGCGGCTGCTGCACACC  
GTCGTTGTCGGCGGTGGGCCGACCGGGATCGAGTTTGCCGCGAACCTCGCGGACT  
TCTTCCGGGAGGATATCAAGAAGATCAACACCTCGCTGCTGCCCTACTGCAAGGT  
GACTGTGCTCGAGGCGGGCGAGGTGCTGGGCTCCTTTGACACGGCGCTGCGACAC  
TACGGCCAGCGGCGGCTGAGGCAGCTCGGTGTTGAGATCCGCAAGACTGCTGTG  
GTCGGCGTCACAGACCAGGAGGTGTTACCAAGTCTGGCGAGGTGTTGCCGACCG  
GGCTGGTGGTGTGGAGCACCGGCGTCGGCCCCGGGCCGATCACGAAGGCGCTCA  
AGTGCGACAAGACGAAGCGCGGGCGTGTCTCCATCGACAACCACCAGCGCGTCC  
TCCGCGACGGCAAGCCGATCCCGAACGTGTTTCGCGGTGGGGGACTGCGCAGCCG  
AAAACGAGAAACCGCTGCCGACGCTGGCCGCCGTCGCCTCACGGCAGGGGCGCT  
ACATCGGCAAGGAGGTGAACAACCTGCTCAAGGGCAAGACGATGAGCAAGCCCT  
TCGTGTACCGCAGCCTCGGCAGCATGGCCTCCATCGGCAACCCTCCGCCATCGT  
CTCCCTCGGGGAAAAGTACAAGATCGACGTGAACGGGTACGCTGCGTGTGTTGGT  
GTGGAAGAGTGCCTACTTGACGATCCTGGGCACCATCCGGAGCCGGCTCTACGTC  
ATTGTCAACTGGGTGGGTAGTCAGGTTTTTCGGCCGCGACATCACGTACATCGGCG  
ACCTCAGCGAGGATCGCGTCTACGCTGCCTTGGCGGTGGAGGAGGTGTCGAAGG  
AGGTGGGTGCAAGAAGACGCACCAGATGCTGCACGCCCAGGACCCTAATAGCA  
TCTTCACATCCGCCATGGCAGAAGAAGCGGCCAGGAAGGGCTTCTGCCTCGCAA  
GCTGGGCGAGCCAGCACCCGCGGCGCACCCAGGCCCCCGCCGAGGACCCCTCCGC  
GGCACCGGCCTCCAACGCTGCTGCGCCGACCACGCCAGAGAAGAAGGAGTAG

MLRHTVLRRLTKPNVVVLGTGWAGCYAAHHLDPNLCNIQVISTRNHMVFTPLLPQTT  
TGTFEFRSVCEPITNIQPALAKLPHRFFRSVIYDVDFEKKLVQCVGVGVVGGSENPV  
STFSVQYDYLIHAGARPNTFNIPGVEEKAFFLREVNEARGIRKRLVQNIMAADLPTT  
PVEEAKRLLHTVVVGGGPTGIEFAANLADFFREDIKKINTSLLPYCKVTVLEAGEVLG  
SFDTALRHYGQRRLRQLGVEIRKTA VVGVTDQEVFTKSGEVLPTGLV VVWSTGVGPG  
PITKALKCDKTKRGRV SIDNHQ RVL RDGKPIPNVFAVGDCAAENEKPLPTLAAVASR  
QGRYIGKEVNLLK GK TMSKPFVYRSLGSMASIGNHSAIVSLGEKYKIDVNGYAAL  
WVWKSAYLTILGTIRSRLYVIVNWVGSQVFRDITYIGDLSEDRVYAALAVEEVSKE  
VGRKKTHQMLHAQDPNSIFTSAMAEAAARKGFLPRKLGEPAPAAHQAPAEDPSAAP  
ASNAAAPTTPPEKKE

*Wallacemonas raviniae*

Membrane domain

**NDUFB1**

ATGGCGGATGTCAAGGCTAATCAACTAGGCCAGGTGGCGTGGATGCGGCGGGC  
AAGCCCATCTTCATCTCCACTGAGCACACGCGCTACGCGCCTGCAAAGGACCGCG  
AACTGACGGACCAAGAGCAGATCGCATGGAAGTCGTTCCAGCTCTGGCGCACGA  
CACTGTCGATGGAGCGCCGCGACAACGTTTACAAGGGTATCGCGGATTCTGACTA  
CACGAATTTCCACATGGCTTACCACATGATGGGCACACCGTACCCCGTCATTGAG  
CCGGCGCCGAGCGTGTTTCGAGACCTTCAAGTGCATCCGCTGGTACGAGCACGGCG  
CGGCGGCTCTCGGTGGCTACGGCTATCTCACCTGGATCAACGCCAAGGCATCCAC  
CCGCTACGCACGCATGTTCCAGACGTCACGCAACGCACTCAGCTTTGGCACTTTT  
GCGCTTCTAGAGATCTGCTTTGCGTACCGTAGTATGTTTCGTCTTTCGGGCTACCT  
GCCGAACGATCACGAGTGCCGCAAGTACGGCGTCATGGAGGACACCGCGCGCTT  
GGAAAAGAAGAAGGAGATGTGGGAGAAGTATGCCGCCTACAAGAAGGAGTGGA  
TGCGTTCGGTTCGACTACCACGTCTACGGCATTTCGCCCCGGAGACAACCTGGAGCCT  
GTTCTCTGCGTGCTGGTTCCCCGCCTGGTTCGCCGTCCTACTGCAAGTCCACCGACT  
ACCCACTCCGCAAGAACCCGCACTTCCTCACCCTACCCCGCTCCGTGACATGTT  
CGTCGACTCCAACCTCCACAACGAGATGGAGAAGAGCGACAACGTGCCGCTGGT  
CCGTGCCAAGCCTGAGGTCAAGTACATCTACCATGGCCCTATCGACGCTCAAAAG  
TCCACCAAGTAA

MADVKANQLGPGGVDAAGKPIFISTEHTRYAPAKDRELTDQEQIAWKSFQLWRTTLS  
MERRDNVYKGIADSDYTNFHMA YHMMGTPYPVIEPAPS VFETFK CIRWYEHGAAAL  
GGYGYLTWINAKASTRYARMFQTSRNALSFGTFALLEICFAYRSMFRLSGYLPNDHE  
CRKYGVMEDTARLEKKKEMWEKYAA YKKEWMRRFDYHVYGIRPGDNWSLFSAC  
WFPAWSPSYCKSTDYPLRKNPHFLTATPLRDMFVDSNFHNEMEKSDNVPLVRAKPE  
VKYIYHGPIDAQKSTK

**NDUFB7**

ATGACGGAGTATCTGAAGGATCTTGCCTCCGCCGCGCCTGGCGAGCACCTCCCA  
TCAATCTTGGCCCGTACGATAATCCGCTTCTGTGGAACAAGCTTGATCCCTATGGT  
GCTGATCGTGGTCACCAGCGTCGCCCCATGTCTGTGTCGCGCGACACGATGGAGC  
TGCAGCAGGTGCCGATCGTGTTCCGTGATCAGTGCGTCCACCGCTGGATCCCGTT  
TCACCGTTGCCTGAAGAATCTGAAGCCGGTCACGTGGGGTACCGTGAAGTCCAC  
GAGTTCGAGGAGGCCTGGATGGTGTGCCGCTCGTACGAGACGTACCGCATGCAG  
CTGCTCAAGAGCAAGTTCATGGAGATGACCAAGGACTACACCGCTGAGGACAAG  
AAGTTCTTCCCTAGTGTCATGTACCTGGGAGTGCCGTA CTACATGCCACGTTTAA  
CTGGTCCATGGCGGCGTCGCAGCGACTTAGTGGGTGGGACGAGAAGGACCCCCA  
GAACCCGATGATGTGGAAGCAGCCCAACCGCTCGCTCATGCGCGCGGAGTTCTCG  
CCGACAAACTGGGAGAAGGGCACCATGACCAGCGCCTACGGCCACAAGCTTATT  
CCCGACGAGATTGTGCACGATATGGTGCCCGGCTTCCCACTGCCGGAGGACAAGC  
GCCCTCAGGCCACTGCGTAG

MTEYLKDLASAAPGEHPPINLGPYDNPLLWNKLDPYGADRGHQRRPMSVSRDTMEL  
QQVPIVFRDQCVRWIPFHRCLKNLKPVTWGTVNCHEFEEAWMVCRSYETYRMQLL  
KSKFMEMTKDYTAEDKKFFPSVMYLGVPYYPMPFYWSMAASQRLSGWDEKDPQNP  
MMWKQPNRSLMRAEFSPTNWEKGTMTSAYGHKLIPDEIVHDMVPGFPLPEDKRPQA  
TA

### **NDUFB9**

ATGATGCGTCGTAGCTCTCTTCTGTAAAGCGGTGGCATGGTGGAGTACCACGAGT  
GGCACCTGCACGAGCCGCTCCTGCAAACTACGAGGGCTGGCGTATTCTCGACAA  
CCCCAAGTACGAGCACAAGAGCGACGCCTACATCTACGATATCACCGGTAGCGTC  
CGTCACCTAGACCCCATCATCGATGACCCTCGCCTGACCCACAAGCAGCGCGTGT  
GCCGCCTGTACCGCTGGTCGCTGAAGGAGATTGAGATGTGGATGGTGCAGCTCAA  
CGCGACAAGTTCAACCTCGCATACAAGGTGATTGCGCCGCGCTTTGAAAAGTAC  
CGCTACGTGTCCGACCCCGCCACGTGCGACATGATGGTGCGCCAGACCCAGAAGT  
ACCTGCGCGAGAACGCCAACTTCCACTTTCTGCGCCGCAACAACGGCTCCCCGTG  
GAGCACGTACACCCTCGCGAACCCCATGTTCCACCCCGCAACTCGCTCGTCTAC  
GACCACTGGACGCACCCGGAGGTGATGTGGTACGACGACGCCAAGCTGCACCGC  
TGGACCGCGCACCCCATGTACGCCGGTGCCGGCGAGATGTCCGACCGCTACG  
GTGACATGGACGTCTCGCCCCATCTCCGTGCGATCACCTGGTGCATCTGCCTGCTC  
GTGTTCCGGCTTCGCCTTCTTCCAGCTCCTCGGTGGGCCACGCCTGATCATGCAGGG  
TGGTGAGGACCCGCACTTTGAGAAGTGGTGCGCGAGCTTCGACCTCAACCTGGCC  
GGCACGCTCTACGCGGAGGAGCGCAACACGCGTAGCCGACGAGCATGCTTGGC  
TTCGACTGGGACCGCATCATGGGGCGCACTGGCGTCGAGAACGACGGCTTCCACT  
TCTTCGATGTCAAGGCGGTGGACCCCAAGAACTACGCCTAA

MMRRSSLLLSGGMVEYHEWHLHEPLLQNYEGWRILDNPKEYEHKSDAYIYDITGSVR  
HLDPIIDPRLTHKQVRVCLYRWSLKEIQMWMVQLNAHKFNLAYKVIRRRFEKYRY  
VSDPATCDMMVRQTQKYLRENANFHFLRRNNGSPWSTYTLANPMFHPDNSLVYDH  
WTHPEVMWYDDAKLHRWTAHHPMYAGAGEMSDRYGDMDVSPHLRAITWCICLLV  
FGFAFFQLLGGPRLIMQGGEDPHFEKWASFDLNLGTLYAEERNTRSRSSMLGFDW  
DRIMGRTGVENDGFHFFDVKA VDPKNYA

### **NDUFB10**

ATGGGCGGGCACCACGGCGATCACGGTGATCACGGTCACGACGACCACCACCAC  
GCCGCGGCAAGTACGTTGACTACAAGGGCTCCACCCCGTATGAGAAGATCCCG  
ATGCCAGCGATGGGCTCGCAGGACTACCTCGACAATCCTCCGGCCTTTGACACGA  
GCAAGGCACCGGCTCCGGCCCCGCTCGGCGGCGCGTCGCTTACGGAGGCGCTGA  
CGCTGCAGTGGGGTCAGGACCCCGACATGCCACCCCTCGGCAGCTCGCTCGAACG  
CAAGTACAATGGCTTCTGATTACTTTCTTAGCCCCATCGCCCCGCTGCGGCCGC  
GCACGTACGTGGACTCGCACACCCGCCCCAACCCGTGCCCTGAGGAGTACTGGTG  
GGCGTCTGGCGCTGGCCCCGCACCAAGTACGTCAACGCCAAGGTCCCACCGCCC  
GTTGATGGCAAGTACTCAGACTACTACCACTACCTCTCCTTCAAGAACTGGCTGG  
AGCGTGAGCGTGACGTGTACGTTGCGCAGGCCAACCTCGTCCATGAGATGCTCCA  
GCGCTGTGTCGTGAAAGAGGGTCAGTACAACGCCGCAAGAACTGCCGCCACTT

GTACAACAAGGAGTTCGCCATGTCGCGTATGGAGGAGTTCAATCAGGCGCTGCTG  
TACATGGCCATGACGGGCAACGCCGCGATTTCGCGAGACCCCGTACCCCGATGGCT  
TCGTCGACGAGAAGCGCAAGATCTATGACGACTGGCTGTACCGCACGCGCATGC  
AGAAGCCTGGCGATGTCGCGTAA

MGGDHGDHGDHGHDDHHHAAAKYVDYKGSTPYEKIPMPAMGSQDYLDNPPAFDT  
SKAPAPARSAARRFTEALTLQWGQDPDMPTLGSSLERKYNGFLDYFLSPIAPLRPRTY  
VDSHTRPNPCPEEYWWASWRWPRTKYVNAKVPPPVDGKYSDYYHYLSFKNWLERE  
RDVYVAQANLVHEMLQRCVVKEGQYNAAKNCRHLYNKEFAMSRMEEFNQALLYM  
AMTGNAAIRETPYPDGFVDEKRKIYDDWLYRTRMQKPGDVA

### **NDUFB11**

GTAGGCAATCCACTCGCAAATGACCGGTTGGAATCAAAGATGGCCAAGATGGC  
CTTCCGGCGGTCCAAATTCCGCCGCCTAGCCTGGGGTGACGGTGACCCATATCCT  
TACACGCCGCGCGCCACGTTCCGCTATCAGTGGGATGACTGGCCAATGTGGGAGA  
AGGTGTGGCATCTGGCCGTCGGCATTCTCGGCATTGAATTCGGCATTGTTGGGCGTA  
CTACTCCAAGCAAACAGCCGCATGGACTGGGCCCGCGAGGAGGCTCTCCGTCGT  
ATGCGTCTGCGCCGTGAAGCTCAGGAAGTATGATTCTCGAGGGTCAGACATTCA  
ACTCCGATATTCAGCCCGATCGCCGTTAACAATCGCCAACAG

MTGWNQKMAKMAFRRSKFRRLAWGDGDPYPYTPRATFRYQWDDWPMWEKVWH  
LAVGILGIEFIWAYYSKQNSRMDWAREEALRRMRLRREAQELMILEGQTFNSDIQP  
DRR

### **NDUFAB1**

ATGCAACGCACTCCCATCTCTCGTATCTTTGTGCGCAGCCTCGCTGTCGGTGTGG  
TGCCTACAAGTGCGCACCTGCCCCGCCCTGCGGTGCGTAATGCGTCGTGCGCTGTG  
TCAGTGCCGTGCGCGTCCGTTCCCATGCGCTTCTACTCCGGCGGTGGCCACGAGG  
AGCAGCACTCGCGTAGCGGCCAGTACCTTCTTGACCACAACGACGTGCTTACTCG  
TGTCCTGGAGGTTGTGAAGAAGTTCGAGAAGGTCGACGCGTTCGAAGGTCACCCCC  
GAGTCACACTTCGTGAACGACCTCGGCCTCAACTCCCTCGACGTCGTGGAGGTGG  
TGTTTGCCATCGAGCAGGAGTTCATCTTAGACATCCCTGACCACGACGCCGAGAA  
GATCCAGTCGATTCTGACGCTGTGGAGTACATCGCGCAGAACCCGATGGCGAAG  
TAA

MQRTPISRIFVRS LAVGVGAYKCAPARPAVRNASCAVSVPASVPMRFYSGGGHEEQ  
HSRSGQYLLDHNDVLTRVLEVVKNFVKVDASKVTPESHFVNDLGLNSLDVVEVVF  
EQEFILDIPDHDAEKIQSIPDAVEYIAQNPMK

### **NDUFS5**

ATGCCGACGATCAGTGCGACCGACTCGGCTGCCGTGCGAGCGCGTTGTCGACGCGC  
TCAAGTCGTCCCCGAGGAGATCCACGACCCGGCTCTGGCTTCACTCAAGGCGTG  
GGCGGAGTCGTGCGGTGCGCACTTCGCCGCGGCCCCACACGCGGCGCCACACGCT

GCCCCACACGCGGCCAGAGGAGGAGGTGCGCTCCGAGGGCAGCGAACCCGAT  
GAGGAGCGCTGGGATGTGGGCCAGCCACGCGAGGCGGCCGATGCGATCCCCGAC  
AAAGACGGCGAGCCCAGCGACGAGGACACTGAGAAGGCCATGGCGCTCAAGGG  
CGAGGCCGCTGATCTCAAGTCCGAGGGCAAGACCGAGGAGGCCATCGCGAAGCT  
CGGTGAGGCTCTGCGCCTTGTGCCGCGCAACGCGATGTACTGGGGCCTGCGCAGC  
GTGTACCAGCTCGAGGCCAAGCACCCCGCAGATGCCCTGCAGGACGCCAACCGC  
GCTCTCACGTACAACCCGCAGAACGTGCGCGCTCTTCGCGTGC GCGGCACCGTCT  
ACCGCCACCAGGCTCGCTGGGAGGACGCCCGCACCGACCTCAGCGCCGCGCAGG  
CCATCGACTACGACGAGGCCACCGACGCCACACTCAAGTTCGTCCAGAGCCGCGT  
TCACGCTCGCCAGCAGCGCACCAACAAGAAGAAGCTCGCTGCTGAGGAGGCAGC  
GCACCAGCGTCAGGAGCAGCTCCGCAAGCAGCGCGAGGAGGAGATCCGCCAGGC  
CGCGGCCGAGGCGCAGGGACGCTACGAGGCGGACGACGAAGAAGGGAACGGCA  
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ATGCAGAAGCTGATGGGCGCGATGATGGGAGGCGGTGGTATGCCCGGTGGTATG  
CCCGGTGGTATGCCCGGTGGTATGCCCGGCGGTGCTGGTGGCGCGCCACCCAGGG  
GCTTCCCCTCAGCGGGTGCGGGTGCGAAGGGTAACGATGACCTGGACTAG

MPTISATDSA AVQRVVDALKSSPQEIHPALASLKAWAESCGAHFAAAPHAAPHAAP  
HAPEEEVASEGSEPDEERWDVGPREAADAIPDKDGEPSEDEDTEKAMALKGEAAD  
LKSEGKTEEAI AKLGEALRLVPRNAMEYWGLRSVYQLEAKHPADALQDANRALTYNP  
QNVRALRVRGTVYRHQARWEDARTDLSAAQAIDYDEATD ATLK FVQSRVHARQQR  
TNKKKLAAEEAAHQ RQEQLRKQREEEIRQAAAEAQGRYEADDEE GNGMYGGMPGG  
MPGGMPGGMPGGMPGGIPGLAAAMQDPEIIAAMQDPEVGP KLQQMMSNPMMAM  
QYMNDPKVGPIMQKLMGAMMGGGGMPGGMPGGMPGGMPGGAGGAPPRGFPSAG  
AGAKGNDDLD

**NDUFA6**

ATGCTGCGTCGCGTGATCGGAAAGAGCTCGTGCTCACTCCAGGTCCGCATGGTGG  
CGTCAACCAGCGGCATTGGCACGTTCAACCCGAAGAAGGACTCCAAGGGAAACG  
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CCACTGGAATGGACAACCGTCTGGCCTCTACGCCAAGAAACCGGAGGACACGT  
ACTTTGAAAAGGCCTACCCTGACAAGATCGGTGAGCTGCCAGCCACACTGTGAC  
ATCGCCCAACGAGCCCAAATCGCGCGGTGACAACCTGAAAGTGCCCGAGTTCGA  
CACCTCTCTTGGTAAGTTCGAGCAGGCGCCGTACATTTCTGGCGGCCCCAGCGCG  
ATGCGGTACCAGAACTACCAGCGGAACCACCAGTGGAAGGTGTGAACCTCAAC  
GACACCGTCTTCGACCTCCCGTGGGATGATCACCACCCTAACTTCGAGTATGGCA  
CCATCACC GGCAAGCGTGAGGGCAGCTCTCAAATGCTCGCCAACACCATCGCCGT  
CTGGGAGTGCAACGCGGCAATCATGTCCCTCTACC GCGCCTGCCTCAAGTCACTC  
CCCATGATCAAGCACTTTTACTGGCTTGTGACACCGCTGCCGCAGATGAAGGACA  
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GCCAGTATGTCAAGGAGGAGGGCCAGCGCAATGACGAGAGGGCCTTCTGGAACG  
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AGCACTACGCCAGCAAGAACCGCCGTGGCTACCGCCGAATGGTGAAGGACGTCG  
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TCTTCCAGTACCTCATCCGTGAAACGCACCCCGAGTCCAATAGAATCAACGCGGA  
GCGCACGCTTGCTCGCCAAGACGACGATTTCTACTCCACCAAGTTCGACGAGTAC  
GAAAAGTACCTGAAGCAAACGATGCGCGAGATGCCGAACCCGCGCCTCTGGAAG  
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AGACAATGTCAACTACGCTGTATACACCAGCCCCGCATTCGCCGACATCAAGGCT  
GACAAGGCACGCAACCCGATGGCAAAGACATGGGCAGACTTCTACACGGAGTTT  
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ACGACCGTCGCCACAAGTGGGACGAGCGCTGCATGCGCATGAAGCGCTGGGTGC  
AGAGCGGGACCATCGACGGTAAGCTGCCATTTTTTGACAGCTTTGTGCGCCGAGTG  
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GACGTGCGCTGGCGAACCAGATTGCCGAGACACTTTTGAAGGGTGCGAAGCGC  
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ACAACCACAGCTCGGACTCGATGGTCGTTCAACTGCAGCGAAGACAAAGGCCAG  
TGCATAA

MLRRVIGKSSCSLQVRMVA STSGIGTFNPKKDSKGNNDNMIGHPEKSYDGPIRNATG  
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EQAPYISGGPSAMRYQNYQREPPVEGVNLNDTVFDLPWDDHHPNFEYGTITGKREGS  
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HVKDPDAIRHLIHNGWMEYQETVMFRRPRATVEKYFEAESMDELLRQYVKEEGQRN  
DERAFWNGEEQRREGPYGGHWSWLGEQSEKEFEKIAGRVPVSWTASKGYFEKGQA  
DGTNFWEKNDLYEGWYIKNVDPRQNRARREMQGWVESGYNQPKHYASKNRRGYR  
RMVKDVETLMETSMEDLYTHNREQLFQYLIRETHPESNRINAERTLARQDDDFYSTK  
FDEYEKYLKQTMREMPNRLWKTDIFYFRLRYLLAPLEYNWAKVPIGVAQEKL FNE  
WVSDNVNYAVYTSPAFADIKADKARNPMAKTWADFYTEFDPDVAETRRLPWYHPE  
FDYDRRHKWDERCMRMKRWWVQSGTIDGKLPFFDSFVAEWEQYVNRPERFRAPDSA  
ERRYAAPRMVQLYRALNRVMDVALANQIAETLLKGAKREDLAKLSVEQIQEKLAAA  
DLSSFKFAVPTIYPDEAAQPQLGLDGRSTAAKTKASA

## **NDUFA8**

ATGGACCAGTTTGAGAAGCCGCTTGAAGGCATCTTCCGCGATGGCATCCCCGCGC  
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GATCACCACGTCGCGCGACTGCTACTACTGGCGCTCCAACCCGATGAAGTGCCTC  
GACGAGGACGTCGACACCGTCACTGGCTTCATGCAAGCGTCCGAGGCCAGCTTCC

GCCTCTGCCCCGAGCAGTCTGCGACGCTGCTGAAGTGCCACATGACCGAGCCCCG  
GCGCGCCGTCTTCTTCTGCCGCGACGAGGAGTGGGAGTGGCGTAGCTGCCTCATG  
GACCAGACGGGTATCCGCTTCTGGCCGTACGCGAACGCCCGATCGGCGCGCAGT  
GGTCGAACGGCGGTCAAACCGAGGACTTCCACCTGGAGGATAGGTTCTTCTACGA  
GAACTTCTCGTGGTGGCGCAAGAAGGCGTCGCTCATGGCAGTGCCTCGCGCGAG  
CTGGAGGTGCAGTCCGAGCGCAAGAAGTGGCTTGATGAGAACGGTGATGGCTCG  
ACGAATATGCAGGCACCGAAGCCCACGATTGCACCGGTTGCCATTGCCACCGCGC  
GTGCCGTGAATTAG

MDQFEKPLEGIFRDGIPAVLRALAPLYQALPSLQDKITTSRDCYYWRSNPMKCVDE  
DVDTVTGFMQASEASFRLLCPQQSATLLKCHMTEPARAVFFCRDEEWERSCLMDQT  
GIRFWPYANAPIGAQWSNGGQTEDFHLEDRFFYENFSWWRKKASLMAVRSRELEVQ  
SERKNWLDENGDGSTMQAPKPTIAPVAIATARAVN

### **NDUFA9**

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CCCGTACCTTCTGGGACCCGTACGGCCACCAGCCCAGTCCATGTTTCATGGACCG  
CAAGGATCTCAACCAAATGTACCCACCCAGAAGCCCAAGACCACTGGTGGTGG  
CTTTGGTTATGAGCGTGGTCCGTAAGGACGCGATGCTGCTGCCTAACCCGGCC  
GTGCGTCTTCCGCACGAGCGCCGCGTCTCAACCCCAAGGCGGCCAAGCGTGTGA  
CGGTGTTCCGGCGCGAGCGGTTACCTAGGCGCGGAGATTGTGCGCGAGCTGTGTGA  
GCACCCTGACATCGAGAAGGTCCGTGCCACCACCCGCTACCCACCCCTGATCCCA  
AAGGGCTCCGACCTGGACCTCCTGCTGCAGCAGTACCCCGAGAAGATTGAACTGC  
ACGAGTGCAGCGTACGGACCGCATTTCAGGTCAACGTGGCGTCCAACGGCAGCG  
ACACGCTCATCTTCGCTATCGATTTCCACAACGAGTACGCGAATAATAGTCACCA  
CGACGTCTTCTGACCGGCGCGACAAACGTGAGCTGGACCGCCCGCAGCGTGCCT  
GCGGAGCGCGTCATCTTCTGCAACGGCCTCGACGCGACGTTCCGCTCCGAGTCCA  
ACTACGTTGATTTCCGCGCGCGCGGGCGAGGATGCCGTTGGCGCGAACCACCCTGA  
CGCCACCATTCTCCGCTTCGGCCCGCTGTACGGCAAGAACTACCGCTACCGCGGT  
CTCGGCCGCTTCGTCTACCCGGCCTGCTTCCCCAACACGCAGGTGCAGCCGACCT  
GGGTCGTGGACCGCCGACGCGCGGTTGTGCGTTGCTCCATGTCACAGCGCGCCGT  
CCGCTACAAGTTCGACCTCGGCGGCCCGGAGACGTTCTCCACGTCGAGTGCTTC  
CGCGAGGTGCGCGCAACTACGAGAACCAGCCTGGTTCGTTCCCTGCTACCGTGGCT  
TCGGTTCGCTTCTTCGGCAAGCTCGCCGGCTGGACGATCCCCAACCCGTGGTTTGA  
CGACAACACTACATCCTCACCTTTGAGCTCGATCAGGTCAACCGTCGCAGCACGCTG  
TTTGACCGCCTCGCCAGCTGGGAGCGCATCGGCTACAAGCCGCACTCCATTCGTG  
ACGCCGCGCGCGTGGAGCACGGCGAGGCCACACTCGCCCCTTTCACGAGCTCGA  
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GGAGAACGCCAAGAAGTACGGCATTACCGCGCCAAGGCGGAGCCTGGCTTTGG  
CCGTTCCGATGGCCTGGAGGCGCTCGCGCAGGAGATCTACCCCGGCCAGCAGTTC  
CGCATCAAGCCTCTCGAAGGCGCCAAGTACCCGTCCACTGTCAAGCACCCCGGTC  
CGACCGCCATCCAATAA

MMLRFGSRSQAQALAVAEGARTFWDOPYGHQPESMFMDRKDLNQMYPYTKPKTTGG  
GFGYERGPYWDAMLLPNPAVRLPHERRLNPKAAKRVTVFGASGYLGAEIVRELCE  
HPDIEKVRATTRYPTLIPKGSDDLQYPEKIELHECDVTDRIQVNVASNGSDTLIF

AIDFHNEYANNSHHDVFLTGATNVSWTARSVRAERVIFCNGLDATFASESNYVDFRA  
RGEDAVGANHPDATILRFGPLYGKNYRYRGLGRFVYPACFPNTQVQPTWVVDAARA  
VVRCSMSQRAVRYKFDLGGPETFSHVECFREVARNYENRLVVPCYRGFGRFFGKLA  
GWTIPNPWFDDNYILTFELDQVNRRLSTLFDRLASWERIGYKPHSIRDAARVEHGEATL  
APLHELDTEFKAMEAADKAAFEQEEENAKKYGIHRAKAEPGFGRSDGLEALAQEIYP  
GQQFRIKPLEGAKYPSTVKHPGPTAIQ

Peripheral domain

**NDUFA13**

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GGGCGGCTATCCGGCTGTTCTGTGTACCCGGTCTACGGCAAGCGCTGGATGACG  
GGCCGCACGCTCATCGCTGTTATCGCAGGCGTCTCTCTCTTCGGCGCGTGGGTCCG  
CCCCGAGAAGGAGCGCTACAACATGGAGATGCTTGTGGAGTTCTCAGAGCGCCA  
GGCCGCGCACCTGCCGTATCAGCAGGCGGAGATGAACCTGCGTCTTCTGCTGTCT  
GCGTACAAGCGTCACCGCTACGAGCAGGAGTGCCTTCTAGATAAGGGCTTTGTGCG  
GACTCACCAGTGAGTTCGCAAGTTCTTCTACCACGACGATGTCTGGCGCCCACC  
GCTGCACGACGTGCTCATGCACCCGTACCTCAAGTACGGTGGCCCCGTTACGAGC  
TACAACTGGACCATTGCTTACTTCTAA

MFRNTRARLV RDPVPDDTKAFYSWFSGQA YRQERVIPGGYPAVRVYPVYGKRWMT  
GRTLIAVIAGVSLFGAWVRPEKERYNMEMLVEFSE RQA AHLPYQQAEMNLRLLLSA  
YKRHRYEQECLLDKGFVGLTSEFRKFFYHDDVWRPPLHDVLMHPYLKYGGPVTSYN  
WTIAYF

**NDUFA12**

ATGACTAGCATCTTCACGTACGGGTCGCACTGCGCGAACC CGCTCGCTGAAAAGT  
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GAATCACTACGATGCGCGCATGACGTTTCCGCGTCACCACCACCGCGCTAGTGAT  
AACCCGATCAGGGACTGCTTACGTGGTCGCGCTGGCGCTGGACCATGCACGACT  
TCCGCATGTTCCGGCCTCTGGGGCTTCGTGAAGAAGCACGTCTACGTTGGTGAGAT  
CTGGCGTCGCCGTGATGAGAAGATCTTCGTGCGCAAGGACGAGAACGGCAACAA  
GTACTGGATGTCTCGCCGCACGCAGGGTACCAACAACGGCCGCTTCATTGAGCCC  
AAGGACCCGCACTGGTTCCGCGGGCAGGCCCTCACACGGCCAGCCCCATGTGGC  
TCAAGTGGCTGCAGGGCAACTCGGCGCACACGCCTGCGCAGGTCAAGGCACGTG  
GCGAGTGGGGTCTCAACTCGCGCATGGGTATGCCGCTGCCGTTCAACATCCACTA  
CGACA ACTGGGCACCGATCGCGTGGGGCGAGACGTGGTTCGCGCGATCCGATGTG  
GGTCTCCGCGCCGGGTATCCTCGTCAATCCGGAGCGCCGCGCACTCCAGGAGTCT  
GGCTACTCGCGCTGGCTGCAGAACAAGGGCCAGCCGCTCTACATGCCCTTCTGTG  
GCGTGCACGACTACCCGGATGAGCTCGTCGAGGAGTACTACCGCGGACAGTGGG  
CCTTTGGCCGCACGAGCAAGGGTAATGACCACGACGAGTGGAGGAACTAA

MTSIFTYGSHCANPLAEKYGRLAVKSSACGSKNFVYQNHYDARMTFPRHHHRASDN  
PIRDCFTWSRWRWTMHD FRMFLWGFVKKHVYVGEIWRRRDEKIFV GKDENGNKY

WMSRRTQGTNNGRFIEPKDPHWFRGQAPHTASPMWLKWLQNSAHTPAQVKARGE  
WGLNSRMGMPLPFNIHYDNWAPIAWGETWSRDPMWVSAPGILVNPERRALQESGYS  
RWLQNKGGQPLYMPFCGVHDYPDELVEEYYRGQWAFGRTSKGNDHDEWRN

## **NDUFA5**

ATGCTTGGTACGCGAAAGCTGCTGTCTGTGTTCCAGAGCACACTTGTCTGCGAA  
CGATTAGTGATGACTACATCCCCCGTGCGTTCCTCGGTGAAGTCCACGACGGGTCT  
GTCCGGTGTGCTGTTGAGCCACTCTGGAAGCCCAAGCTACTCGCCGCGGGCTCG  
GAGCTCCAGGCGTTCCTGGTGTGCTCGTCCGACATCCCCACGGAGTCGACCTATTTCA  
ACATCGCAATGACCTTAGTGAAGCGCATCAATTACGGCGTTCAGCAGTGCCAAGA  
TGA CTGGGCCACGCTAGAGAAGAAGTACTTCTGGGGCTGGCCTGTTGAGTACATC  
CTCCAGGTACCTGGCGAGAGTTGGAAACGGGCGCAGAAGTGAATGAGTGGCGC  
TTCTGGGAGCTCGATCCGGAGCAGGTCAAGAAGGTCTCGCGCGAGGATCAGAAC  
ATTGGCAAGGAGGGCCTTGGCTACAACACACCGTGGGAGCAAGTGGTGCGCGAG  
GACTTTGACAAGCGCAAGAAGGCCCTCACACAGGAGGAGATGGCGGAGCTGAAG  
CGGATGGACACGGAGCGGATGGCTCGCGAGACCGCCGCGTACAAGGAGCGCAAG  
GACCGCATTCGTGATGATCTAGAAAAGGCCCGCGGCGACATGCTGAAAAAGTTC  
CTGAACAAGCGCTTCGCTGTGGACAAGGATCTTATGCGCATGCAGCCGGGCAAG  
GCGCAAAGCGGCAAGCATGCCGAAGACCTCATTGCCGAGCTTCGTGCGTCCGTGA  
ATCAGAACCCCAAGTGCCAAGGATGCACCTCCGAAGAAGTAA

MLGTRKLLSVFQSTLVLRTISDDYIPRAFPVKSTTGLSGVA VEPLWKPKLLAAASELQ  
AFLVSSDIPTSTYFNIAMTLVKRINYGVQQCQDDWATLEKKYFWGWPVEYILQVT  
WRELETAQKWNEWRFWELDPEQVKKVSREDQNIGKEGLGYNTPWEQVVREDFDKR  
KKALTQEEMAELKRMDTERMARETAAYKERKDRIRDDLEKARGDMLKKFLNKRFA  
VDKDLMRMQPGKAQSGKHAEDLIAELRASVNQNPSAKDAPPK

## **NDUFA2**

ATGTCCTGGCGGGCTCGCTTACGCCGTGCGTGGGTCTCTCACCGTCTGGCTCAA  
CCCCAAGGACCCCAACTGCTTTGGTGTGCGCAACTGGTGGCGTAGCAACCTCCCT  
GAGCTGCAGCTTCTCAACCCTTTCTGCACCTTACAATCCAGGAGCTCTCCTTTGG  
CGAGCCCCACATGTACGTGAACTATTCCTCCACTGACCAGCGCATGGTTCGCTG  
GCGGGCGCAACGGAGGAGGAGTGCGAGGACATCATGGAGGCGATCATCACCTAC  
GGCATGAACCACGCCATCATCGAGCGTCCACGCACGGACGACGGTGGTGACCTC  
ATCAACCAGCCCGCGATCACCTCGTTCGGCTACATGGAGAGCTTACGGCCAAGC  
TGGAGGTCGCCCCGCCTGCGGATATCGGCCAGAGGACGCCAGAGGGTGTGATG  
ATCCGGGGCAGCGCCACGCGTCTGGCCGCGCAACGTTGGCTGCAAGCTCATGCC  
GTAA

MSWRARFTPCVGS�TVWLNPKNPCFGVRNWWRSNLPELQLLNPFCTFTIQELSFGE  
PHMYVNYSPDQRMVRLAGATEEECEDIMEAITYGMNHAIERPRTDDGGDLINQPA  
ITSFGYMESFTAKLEVAPPADIGQRTPEGVDDPGQRPRVWPRNVGCKLMP

## NDUFS7

ATGCTTCGCTTCACACGTCCGTCGCTCACGGGTCGTGCGATGATTTCTCGTGGTAG  
CCCCGAGTGGTCGCACCGGCTGGACCTCAAGAAGGGTAAGAAGACCACGCTCTC  
GCACAAGCTCGGTACGAGCAAGCCGAACAACGCGCTGCAGTACGCGCAGATGAC  
CATTACGATCTCACCGAGTGGGTGCTGACGTA CTACCCCTGGCCACTCACCTTC  
GGTCTCGCCTGCTGTGCCGTCGAAATGATGCACTGTTACGCCGCGCGTTACGACT  
TGGATCGTTTCGGCATTGTGCCGCGTCCCACGCCGCGTCAGGCTGAAATCATCAT  
TGTGTCTGGCACGGTCACGAACAAGATGGCCCCGCTGCTGCGCAACATTTACGTG  
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GGCTACTACCACTTTTCGTA CTCCGTCCTTCGTGGTTGCGAGCGTTCCATTCCGGT  
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ACAACCTGCAGAAGAAGATCCGCTGGCACGAGATTCAAAGTACTCCGTCCGAT  
AA

MLRFTRPSLTGRAMISRGSPEWSHRLDLKKGKKTTLSHKLGTSKPNNALQYAQMTH  
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TNKMAPLLRNIIYVQMVNPKWVISMGSCANGGGYYHFSYSVLRGCERSIPVDFWIPG  
CPPSAESLVFCLHNLQKKIRWHEIQKYSVR

## NDUFS6

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GAGCTGGCCAGCCTGCACCCCGGTCTGCTTGGCCCCGGCCGCAAGACGCCGAGC  
TGA ACTTCTACAACCGTGGTGGCATCATCAACGAAATTC CCCCCGTC CCCCCGTGTA  
CCGTGAGCACATTTGGTGCATGGGTACGGCCACTTCACGCTGCAACACCCTCGC  
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AATTTATCAATATGGCCACTGCCGAGGACAACGACGAGGACTGGTTTGAAGAGG  
AGCACAAGATCGCCACGACGCCGGAGTCAAAGGAGGACTTGATGCAGCCGATTA  
GGGACCTCGGAGGTGTCCTGCGTGATAGCCATTCCAGATGGAAAGGAGCCTGA  
CCCACACGTATAACCGTGCTGTCTTCTCCCCTGATCGTCACCGCTGGAAGCACCCCC  
ACACGAACCACTACGAAGTGCACCCGGCCTACGCTGGCAAGAAGTGCGAGCACC  
ACCACTAAACCAAGCGCACGAACGATAACCACCAATGGTGGCTGTCTTGGGGTC  
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CGCAAACCAAGTGA ACTCGTTAGTAGTATGTAGGAAATTGCTAGTACACAACTGG  
AGTCTCCCTGA

MKKTSLLRWTFSDNRGYYSPIIYMPLEYASRVTNQKPLRFTHPRDPKYGWNTHAYE  
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PKGKVVGCKWCRLKFINMATAEDNDEDWFEEEHKIATTPESKEDLMQPIRDLGGVL  
RDSPFQMERSLTHYTVLSSPLIVTAGSTPRTTTKCTRPTLARSASTTTKPKRTNDTT  
NGGCLGVVQRKKRKEKKRKKTSERSHITHGLLTAWHTVHTRGTRMKERPPFTPLAK  
RTRHKRKPVNSLVVCRKLLVHKLESP

## NDUFS1

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GAGCAGGCCACGAACTGCGACCTCCAGAACGTGAGCATGAACTACGGCTCAGAC  
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AGACCCGCGTCGTGCTCAACCGCTGCATTCACTGCACTCGCTGCGTGCGCTTCCTC  
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TCTCTCAGCTGTGCCCCGTCGGCAACCTCTGCCTCGCCGACGCGGACGAGAACAA  
CGAGATCCTGCGTGAGATTGAGGCCGCGGAGGCTGTGGCGGCCACTGCTGCGAC  
CGCCTCCCATTGA

MCMVQVDGTQNLVVACSTVALPGMSIITESRLVRDAREGNVELILINHPNDPCICEQA  
TNCDLQNVSMNYGSDIPRYREDKKA VEDFYFDPQTRVVLNRCIHCTRCVRFLEHA  
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AAEVAATAATASH

## NDUFV2

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GCAGCAGCAGGGTGGCTACATCCCCGTCACGGCCATGTACAAGATCGCCAAGAT  
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ACCAAGAAGTAA

MWRFQLPVSARLSAVVAAGSSSVLTASPSLALTQPCRAIHGEMRHTNTDSDNTRIPW  
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HVFEVVTFYSMFRHPVGKYHMQFCRTTPCMLCGGDELMAQTLAYLNVDMMHGTT  
DGLITVGE MECLGACVNAPMLVISDYSNPPNFSYDYVEDATLES LKVV IENLRAGKPF  
KIGSQRTRDRKWAEPAGGR TSLFFKEPPSPYCRDLDAKPEKKPEPPKK

## NDUFV1

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GGCTGAGCGTCGCGGTGATTGGTACCGCACCAAGGACATCCTCCTCAAGGGCCAG  
GACTGGATCATTAACGAGATCAAGGCCAGCGGTCTGCGTGGTCGCGGTGGTGCTG  
GCTTCCCCTCCGGCCTCAAGTGGTCTTTTATGCCCAAGGTCAAGCCAGACGGCCG  
CCCCAGCTACCTCGTCGTGAACTGCGATGAGTCCGAGCCCGGCACATGCAAGGAT  
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GGCTTTGCCATGCGCGCGCGGTACGGCTACATCTACATCCGCGGGCGAGTTCCACA  
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GCGCTGGTGCCTACATTTGCGGTGAGGAGACGGCGATGATTTCCAGCTTAGAGGG  
CGGCCAGGGCAAGCCTCGCCTGAAGCCGCCGTTCCAGCGAACGTGGGCTTGAC  
GGGTGCCCCGACGACCGTCACCAACTGCGAGACGGTCTCTGTGCGACCCGACGATTC  
TGCGCCGCGGCCCTGCGTGGTTCGCGCAGTTTGGCCGCAAGGGCAACGCTGGCAC  
AAAGCTCTACTCCTTCAGTGGCCACGTCAACCGCCCCGTGCACGGTGGAGGACGAG  
ATGAGCATGCCCCGCGCGAGCTGATTGAGCGCCACGCGGGTGGCGTGCCTGGC  
GGCTGGGACAACCTGCTGTGTGTGATTCCCAGTGGGTCCTCGTGCCCGCTGATCC  
CCAAGCACATCTGCGACAATGTGCTCATGGACTACGACGCACTCAAGGCCGTCGA  
AACGGGGCTGGGCACGGCGGCCGTGATCGTCATGGACAAGTCCACCGACGTCAT  
CGCTGCCATTGAGCGTCTGTCCGTCTTCTACATGCGCGAGTCGTGCGGTTCAGTGC  
ACGCCGTGCCGCGAGGGCAGCCCGTGGCTGGACAAGATGATGAAGCGCTTTGTC  
AACGGGAACGCCAAGAAGGAGGAGATCTACACCATGTGGGACGTCTCGAAGCAG  
ATCGAGGGCCGCTCGATCTGTGCGCTTGGCACCGCCGCGCCTGGCCCGTGCAGG  
GCCTCATTGCGCACTTCACGCCCCGTCCTCGAGGACCGTATCGAGCGGTACTGGGA  
TGCGAACCCGCACTGGGGACAGTCGGGCTCCCCGTGGCGCCGATGGAAGACCCA  
CCGTTACTACAGATGCAGAAGGGTGACCGCCTCAATTGGGATGGCAAGATCGTC  
CGCAACTGGAATAA

MMRKAGLLATSGMLLALKDQDRIFTNLYDDFGTDVASAERRGDWYRTKDILLKGQ  
DWIINEIKASGLRGRGGAGFPSGLKWSFMPKVKPDGRPSYLVVNCDESEPGTCKDREI  
MRHEPHKLVEGALVAGFAMRARYGYIYIRGEFHNERKAVDKAIHEAYQKGYLKGN  
ACSGYDFDLTYTGGAGAYICGEETAMISSLEGGQGKPKLPFPANVGLYGCPPTV  
TNCETVSVAPTILRRGPAWFAQFGRKGNAGTKLYSFSGHVNRPCTVEDEMSMPLREL  
IERHAGGVRGGWDNLLCVIPGGSSCLIPKHICDNVLMYDALKAVETGLGTAAVIV  
MDKSTDVIAAIERLSVFYMRSCGQCTPCREGSPWLDKMMKRFVNGNAKKEEYTM  
WDVSKQIEGRSICALGTAAAWPVQGLIRHFTPVLEDRIERYWDANPHWGQSGSPWR  
RWKTHRYTMMQKGDRLNWDGKIVRNWN

### Alternative NADH dehydrogenase

## NDH2

ATGCTTCGTGTCACTGCGCGTTTTTTGAGCAGGCCGAACGTGGTGGTGTGGGCA  
CGGGTTGGGCGGGCTGCTACGCAGCGCACAACTGGATCCCTCGCTGTGCAACAT  
TCAGGTGCTCTCGACCCGCAATCACATGGTTTTTACACCACTGCTCCCCAGACC

ACCACCGGAACACTTGAGTTCCGCTCCGTCTGCGAGCCTGTCACAAACATTTCAGC  
CAGCGCTGGCACGTCTGCCGCATCGCTTCTACCGCAGCATGGTGTACGGTGTGGA  
TTTCGACAACAAGGTGGTCAACTGTGTTGGCGTCGGTGTCTCGGGGCGTCAGAG  
AAGGTCCCCGTGCACACGTTCACTGTGTCGTACGACTATCTGGTGTCTCGCGCACG  
GCGCACGCCGAACACGTTCAACATTCCAGGTGTCCAGGACAAGGCCTTCTTCCT  
GCGGGAGGTGAACGAGGCGCGCGGCATTTCGCAAGCGCCTGGTGCAAAACATTAT  
GGCGGCCGATCTCCCCACCACGACCGTTGAGGAGACCAAGCGCCTTCTCCACTGC  
GTCGTGGTTCGGTGGTGGCCCGACGGGTATCGAGTTCGCCGCCAGTCTTGCTGAGT  
TCTTCCTGGAGGACGTCAAGAAGGTGAACCGCAACCTGCTGCAGCACTGCAAGGT  
GACCGTGTCTGGAGGCTGGCGAGGTGCTCGGCTCGTTCGACGCCGCACTGCGCAAC  
CACGGGCTGCGCCGCCTCAACGCGCTCGGTGTGGAGGTGAAGAAGAGCGCTGTC  
GTGGGCGTGACGGAGAGCACGGTGTGACCAAGGACGGGGAGACCCTGCCGTGT  
GGTTTGGTGGTGTGGAGCACCGGTGTCTCGGCCCGTCCACCCTCACCAAGTCCCTCG  
CCTGCGACAAGACCAAGCGCGGCCGTATCGCCATTGATGACCACCTGCGTGTCTCT  
GCGCGACGGGCAGCCCATCCCAGGCGTCTACGCAGGAGGTGACTGCGCCGCCAA  
CGATGCGAATCCACTCCCAGACTCGCAGCTGTGGCGTCGCGCCACGGTATCTAC  
CTCGGTTCGCGAGCTGACCAAGATTCTTCGTGGTTCGTGGGGAGAAGTGCAAGCCGT  
TTGAGTACAAGAGCCTGGGCAGCATGGTCTCCATCGGAAACCGCAGTGCTCTCGT  
GTCCCTCGGCAACACAACGCACATCGACCTGCACGGCCTTCTCGCCCTGTACTTTT  
GGAAGTCAGCCTACCTCACCATTCTCGGCTCTGTCCGCAGCAAGCTCTACGTGTT  
GGTAAACTGGTGCGGCAGCAAGATCTTCGGTTCGCGACATCACGTACATTGGTGAC  
CTCAGCGAGGACCGTATGTACAGCCTTCTCGCCGAAAACGAGGTGTCACGTGAGA  
AGAACC GCCAGAAGGCGTACGAGACGCTTCGCACCATGTCCCCAGATGTTACAT  
CACTGCTGACAAGCTCGAGGAAAGTGCGCAACGCGGCTTCATTGAGCGCAAGGT  
CACCCGTGACGACGCCAAGGCTGCAGCCCCTGCTGACGCCAAGAAGGTGGATGA  
TGCAAAGAAGGTGGAGGACGCCAAGAAGGCGGACGCTGCCACCGCGCCCAAGCC  
TGCTGCAACCGATAAGACACCAAAGGCTACGCCAGAAGAGGCAAAGACGGCGGA  
CGCAAAGAAGTGA

MLRV TARFLSRPNVVVLGTGWAGCYAAHNLDPSLCNIQVLSTRNHMVFTPLLPQTT  
TGTFLEFRSVCEPVTNIQPALARLPHRFYRSMVYGVDFDNKVVNCVGVGVGASEKV  
PVHTFTVSYDYL VLAHGARPNTFNIPGVQDKAFFLREVNEARGIRKRLVQNIMAADL  
PTTTVEETKRL LHCVVGGGPTGIEFAASLAEFFLEDVKKVNRNLLQHCKVTVLEAG  
EVLGSFDAALRNHGLRRLNALGVEVKKSAVVGVTSTVLT KDGETLPCGLVWVSTG  
VGPSTLTKSLACDKTKRGRIADDHLRVL RDGQPIPGVYAGGDCAANDANPLPTLAA  
VASRHGIYLGRELTKILRGRGEKCKPFEYKSLGSMV SIGNRSALVSLGNTTHIDLHGL  
LALYFWKSAYLTILGSVRSKLYVL VNWCGSKIFGRDITYIGDLSEDRMYSLLAENEVS  
REKNRQKAYETLRTMSPDVHITADKLEESAQRGFIERKVTRDDAKAAAPADAKKVD  
DAKKVEDAKKADAATAPKPAATDKTPKATPEEAKTADAKK