

Supplementary Table 1. Amino Acid Sequences of Proteins Used for Immunizations.

>Rpk9-I3-01NS

(MGILPSPGMPALLSLVSLLSVLLMGCVAETGT)RFPNITNLCPFGEVFNATRFASVYAWNRKRISNCVADFSVLYNSASFS
TFKCYGVSPTKLNLCWNTNIYADSFVIRGDEVQRQIAPGQTGKIADYNYKLPDDFTGCVIAWNSNNLDSKVGGNYNLYRL
FRKSNLKPFERDISTEIQAGSTPCNGVEGFNCYFPLQSYGFQPTNGVGYQPYRVVLSFELLHAPATVCGPKKSTGGS
GGSGSGSGSGSGSEKAAKAEAAARKMEELFKKHKIVAVLRANSVEEAIEKAVAVFAGGVHLIEITFTVPDADTVIKELSFL
KEMGAIIGAGTVTSVEQAREAVESGAEFIVSPHLDEEISQFAKEEGVFYMPGVMTPTTELVKAMKLGHTILKLFPGEVVGP
QFVEAMKGPFPNVKFPVPTGGVNLNDVAEWFEGVQAVGVGEALNEGTPVEVAEKAKAFVEKIEGATE

>Rpk9-I53-50A

(MGILPSPGMPALLSLVSLLSVLLMGCVAETGT)RFPNITNLCPFGEVFNATRFASVYAWNRKRISNCVADFSVLYNSASFS
TFKCYGVSPTKLNLCWNTNIYADSFVIRGDEVQRQIAPGQTGKIADYNYKLPDDFTGCVIAWNSNNLDSKVGGNYNLYRL
FRKSNLKPFERDISTEIQAGSTPCNGVEGFNCYFPLQSYGFQPTNGVGYQPYRVVLSFELLHAPATVCGPKKSTGGS
GGSGSGSGSGSGSEKAAKAEAAARKMEELFKKHKIVAVLRANSVEEAIEKAVAVFAGGVHLIEITFTVPDADTVIKALSVL
KEKGAIIGAGTVTSVEQARKAVESGAEFIVSPHLDEEISQFAKEKGVFYMMPGVMTPTTELVKAMKLGHTILKLFPGEVVGPQ
FVKAMKGPFPNVKFPVPTGGVNLNDVAEWFKAGVLAAGVGSALVKGTPDEVREKAKAFVEKIRGATEGGSHHHHHHHH

>S-2P-foldon

(MGILPSPGMPALLSLVSLLSVLLMGCVAETGT)QCVNLTTRTQLPPAYTNSFTRGVYYPDKVFRSSVLHSTQDLFLPFFS
NVTWFHAIHVSGTNGTKRFDNPVLPFNDGVYFASTEKSNIIRGWIFGTTLDSTKQSLIVNATNVVIVKCEFCNDPFL
GVYYHKNKSWMESEFRVYSSANNCTFEYVSQPFLMDLEGKQGNFKNLREFVFKNIDGYFKIYSKHTPINLVRDLPPQGF
SALEPLVDLPIGINITRFQTLALHRSYLTGPDSSSGWTAGAAAYVGYLQPRFTLLKYNENGTITDAVDCALDPLSETKCT
LKSFTVEKGIYQTSNFRVQPTESIVRFPNITNLCPFGEVFNATRFASVYAWNRKRISNCVADYSVLYNSASFSTFKCYGVS
PTKLNLCFTNVYADSFVIRGDEVQRQIAPGQTGKIADYNYKLPDDFTGCVIAWNSNNLDSKVGGNYNLYRLFRKSNLKP
FERDISTEIQAGSTPCNGVEGFNCYFPLQSYGFQPTNGVGYQPYRVVLSFELLHAPATVCGPKKSTNLVKNKCVNFN
FNGLTGTGVLTESNKKFLPFQFGRDIADTTDAVRDPQTLLEILDITPCSFGGVSVITPGTNTSNQVAVLYQDVNCTEVPVAI
HADQLTPTWRVYSTGSNVFQTRAGCLIGAEHVNSYECDIPIGAGICASYQTQTNPSGAGSVASQSIIAYTMSLGAENS
VAYSNNSIAIPTNFTISVTTEILPVSMTKTSVDCTMYICGDSTECSNLLLQYGSFCTQLNRALTGIAVEQDKNTQEVFAQVK
QIYKTPPIKDFGGFNFSQILPDPSPKRSFIEDLLFNKVTLADAGFIKQYGDCLGDIARDLCAQKFNGLTVLPLLLTDEM
IAQYTSALLAGTITSGWTFGAGAALQIPFAMQMAYRFNGIGVTQNVLYENQKLIANQFNSAIGKIQDLSSTASALGKLQD
VVNQAQALNTLVKQLSSNFGAISSVLNDILSRDPPEAEVQIDRLITGRLQSLQTYVTQQLIRAAEIRASANLAATKMSEC
VLGQSKRVDFCGKGYHLSFPQSAPHGVVFLHVTYVPAQEKNFTTAPAICHGDKAHFPREGVFSNGTHWFVTVQRNFY
EPQIITDNTFVSGNCDVVIGIVNNTVYDPLQPELDSFKEELDKYFKNHTSPDVLGDISGINASVNIQKEIDRLNEVAKN
LNEIDLQELGKYEYIKGSGRENLYFQGGGGSGYIPEAPRDGQAYVRKDGGEWLLSTFLGHHHHHHHHH

>Rpk9-I53-50 (A component : B component)

(MGILPSPGMPALLSLVSLLSVLLMGCVAETGT)RFPNITNLCPFGEVFNATRFASVYAWNRKRISNCVADFSVLYNSASFS
TFKCYGVSPTKLNLCWNTNIYADSFVIRGDEVQRQIAPGQTGKIADYNYKLPDDFTGCVIAWNSNNLDSKVGGNYNLYRL
FRKSNLKPFERDISTEIQAGSTPCNGVEGFNCYFPLQSYGFQPTNGVGYQPYRVVLSFELLHAPATVCGPKKSTGGS
GGSGSGSGSGSGSEKAAKAEAAARKMEELFKKHKIVAVLRANSVEEAIEKAVAVFAGGVHLIEITFTVPDADTVIKALSVL
KEKGAIIGAGTVTSVEQARKAVESGAEFIVSPHLDEEISQFAKEKGVFYMMPGVMTPTTELVKAMKLGHTILKLFPGEVVGPQ
FVKAMKGPFPNVKFPVPTGGVNLNDVAEWFKAGVLAAGVGSALVKGTPDEVREKAKAFVEKIRGATEGGSHHHHHHHH :
MNQHSKDHETVRIAVRARWHAIEVDACVSAFEAAMRDIGGDRFAVDVFDVPGAYEIPLHARTLAETGRYGAVLGTAF
VVNGGIYRHEFVASAVINGMMNVQLNTGVPVLSAVLTPHNYDKSKAHTLLFLALFAVKGMEARACVEILAAREKIAA

Signal peptides are indicated in parentheses.

Supplementary Table 2. ORF Nucleic Acid Sequences of mRNA Constructs Used for Immunizations.

>Rpk9-I3-01NS

AΨGGGCAΨCCΨGCCAAGCCCΨGGAAΨGCCΨGCCΨGCGΨGAGCCΨGGΨGΨCCCΨGCGΨGΨCΨGΨGCGΨGCGΨG
AΨGGGAΨGCGΨGGCA)GAGACCGGCACAAGGΨΨCCCΨAACAΨCACCAAΨCΨGΨGCCAΨΨCGGCGAGGΨGΨ
ΨΨAACGCCACACGCGΨΨΨGCCΨCCGΨGΨAΨGCCΨGGAACCGGAAGAGAAΨCΨCΨAAΨΨGCGΨGGCCGACΨΨ
CAGCGΨGCGΨGΨACAAΨAGCGCCΨCCΨΨCΨΨACCΨΨAAGΨGCGΨAΨGGCGΨGAGCCCCACCAAGCΨGAAC
GAΨCΨGΨGCGΨGGACAAACAΨΨΨACGCCGACΨCCΨΨGΨGAΨCCGGGGCGAΨGAAGΨGAGACAGAΨCGCAC
CAGGACAGACCGGAAAGAΨCGCAGACΨACAACΨAΨAAGCΨGCCΨGACGAΨΨCACAGGCΨGCGΨGAΨCGCC
ΨGGAAΨAGCAACAAΨCΨGGAΨΨCCAAAGΨGGGCGGCAACΨACAAΨΨAΨCΨGΨACAGGCΨGΨΨCCGCAAGΨ
CCAACCΨGAAGCCAΨΨΨGAGCGGGACAΨCΨCCACCGAGAΨCΨACCAGGCCGGCΨCΨACACCCΨGCAACGGC
GΨGGAGGGCΨΨCAAΨΨGΨΨAΨΨΨΨCCCCΨGCAGΨCΨΨACGGCΨΨCCAGCCΨACAAΨΨGGCGΨGGGCΨAΨ
CAGCCAΨACCGGGΨGGΨGGΨGCGΨGΨCΨΨΨΨGAGCΨGCGΨGCACGCACCAGCAACCGΨGΨGCGGCCCCAAGA
AGAGCACAGGAGGCΨCΨGGAGGCAGCGGCΨCCGGAGGCΨCΨGGAGGCAGCGGCΨCCGAGAAGGCCGCCAAG
GCCGAGGAGGCCGCCAGGAAGAΨGGAGGAGCΨCΨΨAAGGAGCACAAAΨCΨGΨGGCGGΨGCGΨCAGGGCAAA
ΨAGCGΨAGAAGAGGCCAAAAGAAGGCACΨCGCCGΨCΨΨCΨCGGAGGCGΨGGACCΨGAΨAGAGAΨCACAΨ
ΨCACGGΨGCCAGAΨGCGΨGAΨACGGΨCAΨΨAAGGAGCΨGAGΨΨΨCΨCAAAGAGAΨGGGCGCCAΨCAΨAGG
CGCCGGCACCGΨGACAΨCCGΨGGAGCAGGCCAGAGAAGCCGΨCGAGΨCCGGAGCCGAAΨΨCAΨAGΨGΨCCC
CΨCAΨCΨCGAΨGAGGAGAΨCAGΨCAGΨΨΨGCCAAGGAGGAGGGAGΨGΨΨΨAΨAΨGCCCGGAGΨGAΨGAC
GCCGACGGAGCΨAGΨGAAGGCCAΨGAAACΨGGGCCACACCAΨCCΨCAAGCΨGΨΨΨCCΨGGAGAAGΨGGΨΨ
GGΨCCCCAAΨΨΨGΨCGAAGCCAΨGAAGGGACCAΨΨΨCCAAACGΨGAAAΨΨCGΨGCCGACCGGAGGAGΨΨAA
CΨΨAGACAACGΨΨGCCGAGΨGGΨΨΨGAGGCAGGCGΨΨCAGGCGGΨCGGGGΨCGGAGAGGCCΨCAACGAA
GGAACACCAGΨGGAAGΨCGCCGAGAAGGCCAAAGCAΨΨGΨGGAGAAAΨCGAGGGAGCCACΨGAAΨGAΨG
A

>Rpk9-I53-50A

AΨGGGCAΨCCΨGCCAAGCCCΨGGAAΨGCCΨGCCΨGCGΨGAGCCΨGGΨGΨCCCΨGCGΨGΨCΨGΨGCGΨGCGΨG
AΨGGGAΨGCGΨGGCA)GAGACCGGCACAAGGΨΨCCCΨAACAΨCACCAAΨCΨGΨGCCAΨΨCGGCGAGGΨGΨ
ΨΨAACGCCACACGCGΨΨΨGCCΨCCGΨGΨAΨGCCΨGGAACCGGAAGAGAAΨCΨCΨAAΨΨGCGΨGGCCGACΨΨ
CAGCGΨGCGΨGΨACAAΨAGCGCCΨCCΨΨCΨΨACCΨΨAAGΨGCGΨAΨGGCGΨGAGCCCCACCAAGCΨGAAC
GAΨCΨGΨGCGΨGGACAAACAΨΨΨACGCCGACΨCCΨΨGΨGAΨCCGGGGCGAΨGAAGΨGAGACAGAΨCGCAC
CAGGACAGACCGGAAAGAΨCGCAGACΨACAACΨAΨAAGCΨGCCΨGACGAΨΨCACAGGCΨGCGΨGAΨCGCC
ΨGGAAΨAGCAACAAΨCΨGGAΨΨCCAAAGΨGGGCGGCAACΨACAAΨΨAΨCΨGΨACAGGCΨGΨΨCCGCAAGΨ
CCAACCΨGAAGCCAΨΨΨGAGCGGGACAΨCΨCCACCGAGAΨCΨACCAGGCCGGCΨCΨACACCCΨGCAACGGC
GΨGGAGGGCΨΨCAAΨΨGΨΨAΨΨΨΨCCCCΨGCAGΨCΨΨACGGCΨΨCCAGCCΨACAAΨΨGGCGΨGGGCΨAΨ
CAGCCAΨACCGGGΨGGΨGGΨGCGΨGΨCΨΨΨΨGAGCΨGCGΨGCACGCACCAGCAACCGΨGΨGCGGCCCCAAGA
AGAGCACAGGAGGCΨCΨGGAGGCAGCGGCΨCCGGAGGCΨCΨGGAGGCAGCGGCΨCCGAGAAGGCCGCCAAG
GCCGAGGAGGCCGCCAGGAAGAΨGGAGGAGCΨGΨΨCAAGAAGCACAAGAΨCΨGΨGGCCGΨGCGΨGAGGGCCAA
CAGCGΨGGAGGAGGCCAΨCGAGAAGGCAGΨGGCCGΨGΨΨCΨCGCAGGAGGAGΨGCACCΨGAΨCGAGAΨCACC
ΨΨΨACAGΨGCCAGACGCCGAΨACCGΨGAΨCAAGGCCΨGΨCCGΨGCGΨGAAGGAGAAGGGAGCAAΨCAΨCG
GAGCAGGCACCGΨGACAΨCΨGΨGGAGCAGGCAAGGAAGGCAGΨGGAGΨCΨGGAGCCGAGΨΨAΨCΨGΨGAG
CCCCACCΨGGACGAGGAGAΨCΨCCAGΨΨCGCCAAGGAGAAGGGCGΨGΨΨΨACAΨGCCAGGCGΨGAΨG
ACCCCCACAGAGCΨGGΨGAAGGCCAΨGAAGCΨGGGCCACACCAΨCCΨGAAGCΨGΨΨΨCCΨGGCGAGGΨGG
ΨGGGACCCAGΨΨGΨGAAGGCCAΨGAAAGGCCCCΨΨCCCΨAAΨGΨGAAGΨΨΨGΨGCCACAGGCGGGCGΨ
GAACCΨGGACAAΨGΨGGCAGAGΨGGΨΨCAAGGCAGGCGΨGCGΨGGCCGΨGGGAGΨGGGAGCGCCΨGGΨ
GAAGGGCACCCΨGAΨGAGGΨGCGGGAGAAGGCCAAGGCCΨΨΨGΨGGAGAAGAΨCAGAGGCGCCACAGAGΨ
GAΨGA

>Membrane-anchored S-2P

AΨGΨΨCGΨGΨΨCCΨGGΨGCΨGCΨGCCΨCΨGGΨGΨCCAGCCAGΨGΨGΨGAACCΨGACCACCAGAACACAG
CΨGCCΨCCAGCCΨACACCAACAGCΨΨΨACCAGAGGCGΨGΨACΨACCCCGACAAGGΨGΨΨCAGΑΨCCAGCGΨ
GCΨGCACΨCΨACCCAGGACCΨGΨΨCCΨGCCΨΨΨCΨCAGCAACGΨGACCΨGGΨΨCCACGCCAΨCCACGΨG
ΨCCGGCACCAΑΨGGCACCAAGAGΑΨΨCGACAACCCCGΨGCΨGCCΨΨCΑACGACGGGGΨGΨACΨΨΨGCCAG
CACCGAGAAGΨCCAACAΨCΑΨCAGAGGCΨGGAΨCΨΨCGGCACCACACΨGGACAGCAAGACCCAGAGCCΨGCΨ
GAΨCGΨGAACAACGCCACCAACGΨGGΨCΑΨCΑAAGΨGΨGCGAGΨΨCCAGΨΨCΨGCAACGACCCΨΨCΨG
GGCGΨCΨACΨACCACAAGAACAACAAGAGCΨGGAΨGGAΑAGCGAGΨΨCCGGGΨGΨACAGCAGCGCCAACAAC
ΨGCACCΨΨCGAGΨACGΨGΨCCCAGCCΨΨΨCΨGAΨGGACCΨGGAAGGCAAGCAGGGCAACΨΨCΑAGAACC
ΨGCGCGAGΨΨCGΨGΨΨAAGAACAΨCGACGGCΨACΨΨCΑAGAΨCΨACAGCAAGCACACCCΨAΨCΑACCΨC
GΨGCGGGAΨCΨGCCΨCAGGGCΨΨCΨCΨGCΨCΨGGAACCCΨGGΨGGAΨCΨGCCAΨCGGCAΨCΑACAΨCΑ
CCCGGΨΨCAGACACΨGCΨGGCCΨGCACAGAAGCΨACCΨGACACCΨGGCGAΨAGCAGCAGCGGAΨGGACA
GCΨGGΨGCCCGCCΨΨACΨAΨGΨGGGCΨACCΨGCAGCCΨAGAACCΨΨCΨGCΨGAAGΨACAACGAGAACG
GCACCAΨCACCGACGCCGΨGGAΨΨGΨGCΨCΨGGAΨCCΨCΨGAGCGAGACAAAGΨGCACCCΨGAAGΨCCΨΨ
CACCGΨGGAAAGGGCAΨCΨACCAGACCAGCAACΨΨCCGGGΨGCAGCCCACCGAAΨCCAΨCGΨGCGGΨΨCC
CCAΑΨAΨCACCΑAΨCΨGΨGCCCCΨΨCGGCGAGGΨGΨΨCΑAΨGCCACCAGΑΨΨCGCCΨCΨGΨΨACGCCΨG
GAACCGGAAGCGGAΨCAGCAΑΨΨGCGΨGGCCGACΨACΨCCGΨGCΨGΨACAACΨCCGCCAGCΨΨCAGCACCΨ
ΨCΑAGΨGCΨACGGCGΨGΨCCCCΨACCAAGCΨGAACGACCΨGΨGCΨΨCACAΑACGΨGΨACGCCGACAGCΨΨ
CGΨGAΨCCGGGGAGΑΨGAAGΨGCGGCAGΑΨΨGCCCCΨGGACAGACAGGCAAGΑΨCGCCGACΨACAACΨACA
AGCΨGCCCGACGACΨΨCACCGGCΨGΨGΨGAΨΨGCCΨGGAACAGCAACAACCΨGGACΨCCAAGΨCGGCGGC
AACΨACAΑΨΨACCΨGΨACCGGCΨGΨΨCCGGAAGΨCCAΨCΨGAAGCCCΨΨCGAGCGGGACAΨCΨCCACCGA
GAΨCΨAΨCAGGCCGGCAGCACCCΨΨGΨAACGGCGΨGGAAGGCΨΨCΑACΨGCΨACΨΨCCACΨGCAGΨCC
ΨACGGCΨΨΨCAGCCACAAΑΨGGCGΨGGGCΨAΨCAGCCΨACAGAGΨGGΨGGΨGCΨGAGCΨΨCGAACΨGC
ΨGCAΨGCCCCΨGCCACAGΨGΨGCGGCCΨAAGAAAGCACCAΑΨCΨCGΨGAAGAACAΑΨGCGΨGAACΨΨC
AACΨΨCΑACGGCCΨGACCGGCACCGGCΨGCGΨGACAGAGAGCAACAAGAAGΨΨCCΨGCCAΨΨCCAGCAGΨΨ
ΨGGCCGGGAΨAΨCGCCGAΨACCACAGACGCCGΨΨAGAGAΨCCCCAGACACΨGGAAΨCCΨGGACAΨCACCC
CΨΨGCAGCΨΨCGGCGGAGΨGΨCΨGΨGAΨCACCCΨGGCACCAACACCAGCAΑΨCAGGΨGGCAGΨGCΨGΨA
CCAGGACGΨGAACΨGΨACCGAAGΨGCCCGΨGGCCAΨΨCACGCCGAΨCAGCΨGACACCΨACAΨGGCGGGΨG
ΨACΨCCACCGGCAGCAΑΨGΨGΨΨCAGACCAGAGCCGGCΨGΨCΨGAΨCGGAGCCGAGCACGΨGAACAΨAG
CΨACGAGΨGCGACAΨCCCCAΨCGGCGCΨGGAAΨCΨGCGCCAGCΨACCAGACACAGACAΑACAGCCCΨCGGAG
AGCCAGAAGCGΨGGCCAGCCAGAGCAΨCΑΨΨGCCΨACACAΑΨGΨCΨCΨGGGCGCCGAGAACAGCGΨGGCCΨ
ACΨCCAACAACΨCΨAΨCGCΨAΨCCCCACCAACΨΨCACCΑΨCAGCGΨGACCACAGAGAΨCCΨGCCΨGΨGΨCC
AΨGACCAAGACCAGCGΨGGACΨGCACCAΨGΨACAΨCΨGCGGCCGAΨΨCCACCGAGΨGCΨCCAACCΨGCΨGCΨ
GCAGΨACGGCAGCΨΨCΨGCACCCAGCΨGAΑΨAGAGCCCΨGACAGGGAΨCGCCGΨGGAACAGGACAAGAACA
CCCCAAGAGGΨGΨΨCGCCΑAGΨGAAGCAGΑΨCΨACAAGACCCΨCCΨAΨCΑAGGACΨΨCGGCGGCΨΨCΑAΨ
ΨΨCAGCCAGΑΨΨCΨGCCGAΨCCΨAGCAAGCCAGCAAGCGGAGCΨΨCΑΨCGAGGACCΨGCΨGΨΨCΑACAΑ
AGΨGACACΨGGCCGACGCCGGCΨΨCΑΨCΑAGCAGΨAΨGGCGAΨΨGΨCΨGGGCGACAΨΨGCCGCCAGGGAΨ
CΨGAΨΨΨGCGCCAGAAGΨΨAACGGACΨGACAGΨGCΨGCCΨCCΨCΨGCΨGACCGAΨGAGAΨGAΨCGCCC
AGΨACACAΨCΨGCCΨGCΨGGCCGGCACAAΨCACAAGCGGCΨGGACAΨΨΨGGAGCAGGCGCCGCΨCΨGCA
GAΨCCCCΨΨΨGCΨAΨGCAGΑΨGGCCΨACCGGΨΨCΑACGGCAΨCGGAGΨGACCCAGAAΨGΨGCΨGΨACGAG
AACCAGAAGCΨGAΨCGCCAACCAGΨΨCΑACAGCGCCAΨCGGCAAGΑΨCCAGGACAGCCΨGAGCAGCACAGCA
AGCGCCCΨGGGAAAGCΨGCAGGACGΨGGΨCΑACCAGAAΨGCCAGGCACΨGAACACCCΨGGΨCΑAGCAGCΨ
GΨCCΨCCAACΨΨCGGCGCCAΨCAGCΨCΨGΨGCΨGAACGAΨAΨCCΨGAGCAGACΨGGACCCΨCCΨGAGGCC
GAGGΨGCAGΑΨCGACAGACΨGAΨCACAGGCAGACΨGCAGAGCCΨCCAGACAΨACGΨGACCCAGCAGCΨGAΨ
CAGAGCCGCCGAGΑΨΨAGAGCCΨCΨGCCAΑΨCΨGGCCGCCACCAAGΑΨGΨCΨGAGΨGΨGΨGCΨGGGCCAG
AGCAAGAGAGΨGGACΨΨΨGCGGCAAGGGCΨACCACCΨGAΨGAGCΨΨCCΨCAGΨCΨGCCCCΨCACGGCG
ΨGGΨGΨΨCΨGCACGΨGACAΨAΨGΨGCCCGCΨCΑAGAGAAGAAΨΨΨCACCACCGCΨCCAGCCAΨCΨGCCA
CGACGGCAΑAGCCCACΨΨCΨAGAGAAGGCGΨGΨCΨGΨCΨCΑACGGCACCCΑΨΨGGΨΨCGΨGACACAG
CGGAACΨΨCΨACGAGCCCCAGΑΨCΑΨCACCACCGACAACACCΨΨCGΨGΨCΨGGCAACΨGCGACGΨCGΨGAΨ

CGGCAΨΨGΨGAACAAΨACCGΨGΨACGACCCΨCΨGCAGCCCGAGCΨGGACAGCΨΨCAAAGAGGAACΨGGACA
AGΨACΨΨΨAAGAACCACACAAGCCCCGACGΨGGACCΨGGGCGAΨAΨCAGCGGAAΨCAAΨGCCAGCGΨCGΨG
AACAΨCCAGAAAGAGAΨCGACCGGCΨGAACGAGGΨGGCCAAGAAΨCΨGAACGAGAGCCΨGAΨCGACCΨGCAA
GAACΨGGGGAAGΨACGAGCAGΨACAΨCAAGΨGGCCCΨGGΨACAΨCΨGGCΨGGGCΨΨAΨCGCCGGACΨGA
ΨΨGCCAΨCGΨGAΨGGΨCACAΨCAΨGCΨGΨGΨGCAΨGACCAGCΨGCΨGΨAGCΨGCCΨGAAGGGCΨGΨΨ
GΨAGCΨGΨGGCAGCΨGCΨGCAAGΨΨCGACGAGGACGAΨΨCΨGAGCCCGΨGCΨGAAGGGCGΨGAAACΨGCA
CΨACACAΨGAΨGA

>Luciferase

AΨGGAAGAΨGCCAAAAACAΨΨAAGAAGGGCCCCAGCGCCAΨΨCΨACCCACΨCGAAGACGGGACCGCCGGCGAG
CAGCΨGCACAAAGCCAΨGAAGCGCΨACGCCΨGGΨGCCCGGCACCAΨCGCCΨΨΨACCGACGCACAΨAΨCGA
GGΨGGACAΨΨACCΨACGCCGAGΨACΨΨCGAGAΨGAGCGΨΨCGGCΨGGCAGAAGCΨAΨGAAGCGCΨAΨGGG
CΨGAAΨACAAACCAΨCGGAΨCGΨGGΨGΨGCAGCGAGAAΨAGCΨΨGCAGΨΨCΨCAΨGCCCCΨGΨΨGGGΨ
GCCΨΨGΨΨCAΨCGGΨGΨGGCΨGΨGGCCCCAGCΨAACGACAΨCΨACAACGAGCGCGAGCΨGCΨGAACAGCA
ΨGGGCAΨCAGCCAGCCCACCGΨCGΨAΨΨCGΨGAGCAAGAAAGGGCΨGCAAAAGAΨCCΨCAACGΨGCAAAAG
AAGCΨACCGAΨCAΨACAAAAGAΨCAΨCAΨCAΨGGAΨAGCAAGACCGACΨACCAGGGCΨΨCCAAAGCAΨGΨAC
ACCΨΨCGΨGACΨΨCCCAΨΨΨGCCACCCGGCΨΨCAACGAGΨACGACΨΨCGΨGCCCGAGAGCΨΨCGACCCGGG
ACAAAACCAΨCGCCCΨGAΨCAΨGAACAGΨAGΨGGCAGΨACCAGGΨΨGCCCAAGGGCGΨAGCCCΨACCAGCAC
CGCACCCGΨΨGΨΨCCGAΨΨCAGΨCAΨGCCCCGCGACCCCAΨCΨΨCGGCAACCAGAΨCAΨCCCCGACACCCG
ΨAΨCCΨCAGCGΨGGΨGCCAΨΨΨCACCACGGCΨΨCGGCAΨGΨΨCACCACGCΨGGGCΨACΨΨGAΨCΨGCGG
CΨΨΨCGGGΨCGΨGCΨCAΨGΨACCGCΨΨCGAGGAGGAGCΨAΨΨCΨΨGCGCAGCΨΨGCAAGACΨAΨAAGAΨ
ΨCAAΨCΨGCCCΨGCΨGGΨGCCACACΨAΨΨΨAGCΨΨCΨΨCGCΨAAGAGCACΨCΨCAΨCGACAAGΨACGAC
CΨAAGCAACΨΨGCACGAGAΨCGCCAGCGGGCGGGCGCCGCΨCAGCAAGGAGGΨAGGΨGAGGCCGΨGGCCAA
ACGCΨΨCCACCΨACCAGGCAΨCCGACAGGGCΨACGGCCΨGACAGAAACAACCAGCGCCAΨΨCΨGAΨCACCCC
CGAAGGGGACGACAAGCCΨGGCGCAGΨAGGCAAGGΨGGΨGCCΨΨCΨΨCGAGGCΨAAGGΨGGΨGGACΨΨG
GACACCCGΨAAGACACΨGGGΨGΨGAACCAGCGGGCGAGCΨGΨGCGΨCCGΨGGCCCCAΨGAΨCAΨGAGCG
GCΨACGΨΨAACAACCCCGAGGCΨACAAACGCΨCΨCAΨCGACAAGGACGGCΨGGCΨGCACAGCGGGCACAΨC
GCCΨACΨGGGACGAGGACGAGCACΨΨCΨΨCAΨCGΨGGACCGGCΨGAAGΨCCCΨGAΨCAAΨACAAGGGCΨ
ACCAGGΨAGCCCCAGCCGAACΨGGAGAGCAΨCCΨGCΨGCAACACCCCAACAΨCΨΨCGACGCCGGGGΨCGCC
GGCCΨGCCCGACGACGAΨGCCGGCGAGCΨGCCCGCCGACGΨCGΨCGΨGCΨGGAACACGGΨAAAACCAΨGAC
CGAGAAGGAGAΨCGΨGGACΨAΨGΨGGCCAGCCAGGΨΨACAACCGCCAAGAAGCΨGCGCGGΨGGΨGΨΨGΨG
ΨΨCGΨGGACGAGGΨGCCΨAAAGGACΨGACCGGCAAGΨΨGGACGCCCGCAAGAΨCCGCGAGAΨΨCΨCAΨΨA
AGGCCAAGAAGGGCGGCAAGAΨCGCCGΨG

Ψ, N1-methylpseudouridine-5'-triphosphate