

Table 10 TamR-tf (HEA3) nucleic acid (SEQ ID NO: 39)

HEA3 nucleotide (SEQ ID NO:39) and amino acid sequence (SEQ ID NO:40)

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M V S K L S Q L Q T E L L A A L E E S G L S K E A L I Q A
ATGGTG TCCAAGCTGT CCGAGCTGCA GACAGAACTG CTGGCAGCAG TGCTGGAAAG CGGCTGAGC AAAGAGGGCC TGATTCAGGC
TACCAC AGGTTGACA GGGTGGACGT CTGTCTTGAC GACGTGTGTG ACGAGCTTTC GCGGACTG TTTCTCGGG ACTAAGTCCG

· I G E E G P Y L L A G E G P L D K G E S C G C G R G E L A R L P N
ACGCGGGA CTTGACCTT ATCTGTGTC TGGGAAAGC CCTCTGGATA AGGGGAGAG CTGTGGCGGA GGAAGAGGAG AGCTGGCGGA GCTGCTAAC
TGAGCGGCTT GGAGCTGGAA TAGAGGAGG ACGGCTTCCG GGAGACCTAT TCCGCTGTC GACAGCGCT CTTCTGCTC TCGACGGGT GAGGGATTG

G I G E T R G S E D E T D D D G E D E T P P I L K E L E N L S P E E
GGCTGGGG AGACAAGAG CAGGAGGAG GAGACAGAG ACGAGCGGA GGAATCAGC CCGCCATCC TGAAGAGCT GGAAGACCTG AGCCCGAGG
GGGACCGCT TGTGTTGCG GTGCTCTG CTCTGTCTG TGCTGGCGT CTGAGAGTG GGGGGTAGG ACTTCTGGA GCTTTTGAG TCGGGCTCG

· A A E Q K A V V E T L L Q E D P W R V A K N V K S Y L D Q H N I P
AAGCGGGA CAGAGAGGC GTGTGAGA GACTGTGCA GGAAGATCC TGGCGGTCC GGAAGATGT CAGAGGTAC CTCAGCAGC ACAACATCC
TTGGCGGCTT GGTCTTCCG CAGACCTCT GTGAGAGCT CTTCTAGG AGCGCCAGC GGTCTACCA GTTCTGATG GAGCTGTG TGTGTAGG

· Q R E V V D T T G L N Q S H L S D H L N K G T P M K T Q K R A A L
CGAGGGAG GTGTGAGA CACCGGCT GAGCAGAG CAGCTGAGC AGGACTGAA GAGGGGAG CCGATGAAA CCGAGAGG AGCGCGCTG
GTGCGCTC CACCGCTT GGTGGCGGA CTGTGCTCG GTGAGCTCG TGTGAGCT GTTGGTGG GGTACTTT GGTCTTCTC TCGGGGAG

K T W Y V R K Q R E V A Q Q F T H A G Q G Q L I E E F T G D E E P T
TACATGGT AGTGGGAA CAGAGAGAG GTGGCCAGC AGTTATACA TGGCGGCG GCGGCTGA TCGAGGAGC TACCGGAG GAGCTGCCA
ATGTGAGCA TCGAGGCTT GGTCTCTC CACCGGCTG TGAATGTGT GCGCGGCT CCGCGGCT AGCTGCTG ATGCGGCTG CTGAGGCT

· K K G R R N R P K W G P A S Q Q I L F Q A Y E R Q K N P S K E E R
CGAGAGGG CAGAGGAG CCGTTAAGT GGGCGGTC ATCTGAGCAG ATCTGTTC AGGCTACGA GCGGAGAG AGCCCGAGC AAGAGGAGC
GTTCTTCC GTCTGCTG GCGAATTC CCGGGGAG TAGAGTCTG TAGGAGAG TCGGATGT GCGCTCTT TGGGTCTT TCTGCTTC

· E T L V E E Q N R A E E I Q R G V S P S Q A Q G L G S N L V T E V
GGAGACCT GTGGAGAG CAGAGGGG GAGTGCAT CAGAGAGG TGGGCTTC TCGGCTCAG GCGTGGCA GCAATCTGT CAGGAGGTG
GCTGTGAG CAGCTTCTA GTTGGGCG GTCTAGTG GTCTCTCG ACTGGGAG AGTCCGAG CCGGAGCG GTTAGACA GTGGCTTAC

R V Y N W F A N R R K E E A F R H K L S A G D M R A A N L W P E P L
CGCTGTAG ATGTGCTG CAGCGGCG AAGAGGAG CCTCGGCA CAGCTGTCT GTGGCGTA CAGAGGCG CAGCTGTG CCGAGCGCG
GCGCATGT TAACAGAG GTTGGGCG TTTCTCTT GGAAGCGGT GTTGCAGA GAGCGCTAT ACTCTGGG GTTGGAGAG GGTGGGGG

· M I K R S K K N S L A L S L T A D Q N V S A L L D A E P F I L Y S
TGATGATCA GGGAGGAG AAGAGGCG TGGCTGTG CTTGAGCG GATCAGATG TGTGGCTGT GTGGAGCG GAGCGGCTA TCTGTAGC
ACTAGAGT CGCTGCTC TGTGTGAG ACGGAGCT GAGTGGCG CTAGCTAC AAGGCGGA GAGCTGCG CTGGGGAT AGGAGATG

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· E Y D P T R F F S E A S M M G L L T N L A D R E L V H M I N W A K
 CGAGTACGAC CCGACACAGC CTTTCAGCGA GGCAGCAGT ATGGGCTGCG TGACCAACCT GCGCGACCGG GAGCTGGTGC ACATGATCAA CTGGGCCAAG
 GCTCATGCTG GGGTGGTCTG GGAAGTCGCT CCGTCTGTAC TACCGGAGCG ACTGCTTGGG COGGCTGGCC CTCGACACCG TGTACTAGTT GACCCGGTTC

 R V P G F V D L T L H D Q V H L L E C A W L E I L M I G L V W R S M
 CGGGTGGCGG GCTTCGTGGA CCGTACCGTG CAGCAGCAGG TCCAGCTGCT GGAATGTGCG TGGCTGGAAA TCCTGATGAT CCGGCTCTGT TGGAGAAGCA
 GCGCAGCGGG CGAGGACCTG GACTGGGAC GTGCTGCTCC AGGTGGACGA CCTTACACCG ACCGACCTTT AGGACTACTA GCGCGAGCAG ACCTCTTGCT

 · E H P G K L L F A P N L L L D R N Q G K C V E S M V E I F D M L L ·
 TGGAGACCCC CCGCAAGCTG CTGTTCCCGC CCAACCTGCT CTTGGACCGG AACCAAGGAA AGTGGCTGGA GGGCATGGTG GAGATCTTCG AGATGCTGCT
 ACCTTGTGGG GCGCTTCGAC GACAAGCGGG GGTGGACGA GGACCTGGCC TTGCTCCGTT TCACGCACCT CCGGTACCAG CTCTAGAGCG TGTAGGAOGA

 · A T S S R F R M M N L Q G E E F V C L K S I I L L N S G V Y T F L
 GGCACCTCC AGCGGTTCCT GAGATGAA CCGTACCGG GAGGAATTGG TGTGCTGAA GTCCATCATC CTGCTGAACA GCGGCTGTA CAGCTTCTCT
 CCGGTGGAGG TGCGCCAAAG CTTACTACTT GAGCTTCGCG CTCCTTAAGC ACACGAGACT CAGGTAGTAG GCGCGGAGCT GCGCGAAGCG

 S S T L K S L E E K D H I H R V L D K I T D T L I H L M A K A G L T
 TCATCCACCG TGAAGTCCCT GGAAGAGAGG GACCACATCC ACCGGGTGCT GGACAAGATC ACCGACACCG TGAATCCACT GATGGCCAGG GCTGGGCTGA
 AGTAGGTGGG ACTTCAGGGA CTTTCTCTTC CTGCTGAGG TGGCCCAAGA CCGTGTCTAG TGGCTGTGGG ACTAGGTGGA CTACCGGTTC GAGCGGACT

 · L D Q D H Q R L A Q L L L I L S H I R H M S N K R N E H L Y S M K ·
 CACTCGAGCA GAGCAGCAG AGACGGGCGG AGCTGCTGCT GATCCTGAGC CACATCCGGC ACATGAGCAA CAAGCGGATG GAACACCTGT ACAGCATGAA
 GTGAGGTCTG CTCTGCTGCT CCGTACCGGG TCGAGGACGA CTAGGACTCG GTGAGGCGCG TGTACTCTGT GTTCGCTAC CTGTGGGACA TGTCTACTT

 · C K N V V P L Y D L L L E M L D A H R L H A P T S R G G A S V E E
 GTGCAAGAAG GTGGTGGCCC TGTAGGACT GCTGCTCGAG ATGCTGGATG CCCACAGACT GCACGCCCC ACAAGCAGAG GCGGAGCCAG CGTGGAGGAA
 CAGCTTCTTG CACGAGGGGG ACATGCTGGA CGACGAGCTC TACGACCTAC GGGTGTCTGA CGTGCGGGGA TGTCTGCTC GCGCTCGCTC GCACCTCCTT

 T D Q S H L A T A G S T S S H S L Q K Y Y I T G E A E G F E A T V E
 ACCGACCACT CTCACCTGGC CACCGCGCGC AGCACAAGCA GGCACAGCCT GCAGAAGTAC TACATCACCG GCGAGGCGGA GGGATTCCCT GCGACCGTGG
 TGGCTGGTCA GAGTGGACCG GTGGCGCGCG TCGTGTCTGT CCGTGTGGGA CCGTCTGATG ATGAGTGGG CCGTCCGGCT CCGTAAGGGA CCGTGGCACC

 · F Q Y L P D T D D R H R I E E K R K R T Y E T F K S I M K K S P F ·
 AGTTCAGTA CCGTCCCGAC ACCGACGACC GGCACCGGAT CGAGGAAAAG CGGAAGCGGA CCTACGAGAC ATTCAGAGAG ATCTAGAGA AGTCCCTCTT
 TCAAGTGAT GAGCGGGCTG TGGCTGCTGG CCGTGGCCTA GCTCCTTTTC GCTTGGCTCT GATGCTCTG TAAGTCTCG TAGTACTTCT TCAGGGGGA

 · S G P T D P R P P P R R I A V P S R S S A S V E K P A P Q E Y P F
 CAGCGGCCCC ACCGATCCCA GACCCCGCCC TAGAAGAATC GCGGTGCCCA GCAGATCTAG CCGCAGCGTG CCGAAGCCTG CCCCCAGCC CTACCTTTTC
 GTGCGCGGGG TGGCTAGGCT CTGGGGGGGG ATCTTCTTAG CCGCAGCGGT CCGTCTAGAT CCGGTGGCAC GGGTTCCGAG GGGGGGTCTG GATGGGAAG

 T S S L S T I N Y D E F F T M V F P S G Q T S Q A S A L A P A P P Q
 ACCAGCAGC TGAGCAGCAT CAACATCGAC GAGTTCCTTA CCGTCTGTGT ACCCAGCGGC CAGATCTGTC AGGCCCTGCG TCTGGCACCT GCTCCACCTC
 TGTCTGCTGG ACTCTGCTTA GTGATGCTG CTCAGAGGAT GGTACACAAA GGGGTGCGCG GTCTAGAGAG TCGGAGAGCG AGACCGTGA CAGCTGGAG

 · V L R Q A P A P A P A P A M V S A L A Q A P A P V P V L A P G P P ·

AGGTGCTGCC TCGGGCCCCC GCTCCAGCGC CAGCCCCGCG CAGGTGTCT GACATGGGCC AGGCTCCAGC TCGTGGCTCT GTGCTGGCCC CTGGACCTCG
 TCCACGAGCG AGTCCGCGGA CGAGTCTCGG GTGCGGAGCG GTACTACAGA CCGTACCGCG TCCGAGGTCT AGGATAGGA CAGGACCGGG GACCTGAGG

· Q A V A P P A P K P T Q A G E G T L S E A L L Q L Q F D D E D L G
 TCAGGCTGTG GCGCTCTCTG CCGCTAAAG TACCCAGGCG GGGGAGGGGA CACTGTCTGA GCGCTGCTG CAGCTCTAGT TCGACGAGCA GGATCTGGGA
 AGTCCGACAC CCGGAGGAGG GGGGATTGG ATGGGTCTCG CCGCTCCCTT GTGACAGACT CCGGAGCAGC GTCGAGTCA AGCTGCTGCT CCGTAGACCT

A L L G N S T D P A V F T D L A S V D N S E F Q Q L L N Q G I P V A
 GCATGCTGG GCATAGCAU CGACCCCGCG GTGTTACCG AGCTGGCTG CCGTGGACAC AGCGAGTTC AGCAGCTCT CAACAGGGG ATCCCTGTCT
 CCGACGACC CCGTATCTGT GCTGGGGCGG CACAAAGGC TGGACCGGAG GCACCTGTGT TCGTCAAGG TCGTGGAGGA GTTGTCTCG TAGGAGCAGC

· P H T T E P M L M E Y P E A I T R L V T G A Q R P P D P A P A P L ·
 CCGCAGCAC CACCGAGCCC ATGCTGATGG AATGCTCGA GCGCATCACT AGACTGGTCA CAGGCGCCCA GAGGCTCTCA GATCAGCAG CAGCTCCACT
 GGGGTGTGTG GTGGCTCGGG TACGACTACT TTATGGGGCT CCGGTAGTGG TCTGACAGT GTCCGCGGGT CTCGAGAGGT CTAGGTCTGT GTCGAGGTGA

· G A P G L P N G L L S G D E D F S S I A D N D F S A L L S Q I S S
 GGGAGCCCC GCGCTGCTA ATGGGCTGCT GTCTGGGAG GAGGACTTCT CAGGATGCG GCACATGGAC TTCAGGCGCG TGTGTGCCA GATCAGCAG
 CCGTGGGGA CCGGACCGAT TACCGAAGA CAGACCGCTG CTCTGAAGA GTCTGTAAG CCGTACTCTG AGTCCGCGG ACACAGCGCT CTAGTCTCTG

Table 11 TamR-tf (HEA4) nucleic acid (SEQ ID NO: 42) amino acid sequence (SEQ ID NO: 43)

HEA4 Nucleotide(SEQ ID NO: and Amino Acid Sequence

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M V S K L S Q L Q T E L L A A L L E S G L S K E A L I Q A
ATGCTG TCCAAGCTGT CCCAGCTGCA GACAGAATG CTGGCAGCAC TGCTGGAAAG OGGCCTGAGC AAAGAGGCCC TGATTGAGG
TACCAC AGGTTTGACA GGGTCGACGT CTGTCTTGAC GACGCTGCTG ACGACCTTTC GCGGACTGCT TTTCTCGGG ACTAAGTCG

· L G E P G P Y L L A G E G P L D K G E S C G G G R G E L A E L P N
ACTCGCGAA CCGGACCTT ATCTGCTCC TCGGAAAGC CCGCTGATA AGGCGGAGC CTCTGCGGA CGAGAGGAG AGCTGCGCA CCTGCTAAG
TGAGCGCTT GGACCTGGA TAGACGAGG ACGCTTTCG GGAGACCTAT TCGGCTCTC GACACCGCT CCTTCTCTC TCGACGGCT CGACGGATTG

G L G E T R G S E D E T D D D G E D F T P P I L K E L E N L S P E E
GGCCTGGGG AGACAAGAGG CAGCGAGGAC GAGACAGAG ACGACGGGA GGACTTCACC CCGCCATCC TGAAAGAGCT GGAAACCTG AGCCCGAGG
CGGACCGGC TCTGTTCTC GTGCTCTTG CTCTCTGTC TGCTGCGCT CCGAAGTGG GGGGGTAGG ACTTCTCGA CCTTTTGAC TCGGGCTCC

· A A H Q K A V V E T L L Q E D P W R V A K M V K S Y L Q Q H N I P
AAGCGCGCA CCAGAAAGC GTGTGAGAG CACTGCTGCA GGAAGATCC TGGCGGCTG CCAAGATGT CAGAGCTAC CTGCGAGGC ACGACATCC
TTGCGCGGT GGTCTTTCG CACGACCTC GTGAGGAGT CCGTCTAGG ACGCGGAGC GGTCTACCA GTCTGTAGG GAGTGTGCT TGTGTAGG

· Q R E V V D T T G L N Q S H L S Q H L N K G T P M K T Q K R A A L
CCAGCGGAG GTGGTGACA CCACCGGCT GAACGAGAG CACCTGAGC AGCACCTGAA CAAGGCGACC CCGATGAAA CCCAGAGAG AGCCGCGCTG
GGTGGCTC CACGACCTG GTGGCGGGA CTGTCTCTG GTGACTCGG TGTGGAATT GTTCCGCTG GGTACTTTT GGTCTTCTC TCGCGGAGC

Y T W Y V R K Q R E V A Q Q F T H A G Q G G L I E E P T G D E L P T
TACCTTGT AGTGCGGAA GCAGAGAGG GTGGCGGAG AGTTTACACA CGCGGCGAG GCGGCGCTG TCGAGGAAC TACCGGAGC GAGCTGCGA
ATGTGAACA TCGACGCTT CCGTCTCTC CACCGGCTG TCAATGTGT GCGCGGCTC CCGCGGACT AGCTCCTGG ATGCGGCTG CTGACGGGT

· K K G R R N R F K W G P A S Q Q I L F Q A Y E R Q K N P S K E E R
CCAGAGGGG CAGACGAGC CGGTTAAGT GGGCGCTGC ATCTGAGAG ATCTGTCTC AGGCTACGA GCGGCGAGG AACCCAGCA AAGAGGAAG
GGTCTTCC GCTGCTTGG GCCAATTC CCGGGGAG TAGAGTCTC TAGGACAGG TCGGATGCT GCGGCTCTC TTGGGGTCT TTCTCTTGC

· E T L V E E C N R A E C I Q R G V S P S Q A Q G L G S N L V T E V
GGAGACATG GTGGAAGAT GCAACCGGC CAGTGCATC CAGAGAGGCT TGAGCGCTC TCAGGCTAG GCGCTGGCA GCAATCTGT CACCGAAGT
CCTCTGTAC CACCTTCTA CCGTGGCGG GCTCACTAG GTCTCTCGC ACTCGGAGG AGTCTGAGT CCGGAGCGT CGTTAGACCA GTGCTTTCG

R V Y N W P A N R R K E B A F R H K L S A G D M R A A N L W P S P L
CGGGTGACA ATGGGTTGC CAACCGGCG AAGAGGAG CCGTGGCA CAAGCTGTCT GTGGCGATA TGAGAGCGC CAACCTGTG CCGAGCGCC
GCCACATGT TAACCAAGG GTGGCGGCG TTTCTCTTC GGAAGCGGT GTTGACAGA CACGCTAT ACTCTGCGG GTTGACACC GGTGCGGGG

· H I K R S K K N S L A L S L T A D Q M V S A L L D A E P P I L Y S
TGATGTCAG GCGGAGCAG AAGAACAGC TGCGCTGAG CCGACCGCC GATCAGATG TGTGCTCTC GCTGGAGCC GAGCGCGTA TCGTGTACG
ACTACTAGT CCGCTGCTC TTCTGTGCG ACGGAGCTC GGAGTGGCG CTAGTCTAC ACAGCGAGA GACCTGCGG CTCGGGGAT AGGACATGT

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• E Y D P T R P E S E A S M M G L L T N L A D R E L V H M I N W A K
CGAGTACGAC CCCACCAGAC CTTTCAGCGA GGCCAGCATG ATGGGCTGCG TGACCAACCT GGCCGACCGG GAGCTGGTGC ACATGATCAA CTGGGCCAAG
GCTCATGCTG GGGTGGTCTG GGAAGTCGCT CCGGTGCTAC TACCCGGACG ACTGGTTGGA CCGGCTGGCC CTGGACCAGG TGTACTAGTT GACCGGGTTC

R M P G F V D L T L H D Q V H L L E C A W L E I L M I G L V W R S M
GGGTGCCCG GCTTCGTGGA CTTGACCTG CAQACCCAGG TCCACCTGCT GGAATGTGCC TGCTGGGAA TCTGATGAT CCGCTCTGCT TGGAGAAGCA
GCCCACGGGC CGAAGCACCT GACTGGGAC GTGCTGGTCC AGGTGGACGA CCTTACACGG ACCGACCTTT AGGACTACTA GCGGAGACAC ACCTCTTCGT

• E H P V K L L F A P N L L L D R N Q G K C V E G M V E I F D M L L •
TGAACACCC CGTGAAGCTG CTGTTGCCCC CCAACCTGCT CTTGGACCGG AACCAAGGAA AGTGCGTGGA GGGCATGGTG GAGATCTTCG ACATGCTGCT
ACCTTGTGGG GCACCTTCGAC GACAAGCGGG GGTGGACGA GGACCTGGCG TTGTCCTCTT TCAGGCACCT CCGTACCAAC CTCTAGAAGC TGTACGACGA

• A T S S R F R M M N L Q G E E F V C L K S I I L D N S G V Y T F L
GGCCACCTCC AGCCGGTTCG GGATGATGAA CTTGCAGGGC GAGGAATTGG TGTGCTGAA GTCCATCATC CTGCTGAACA GGGCGTGTGA CACCTTCCTG
CCGGTGGAGG TCGGCCAAGG CTTACTACTT GGACGTCCCG CTCCTTAAGC ACACGGACTT CAGGTAGTAG GACGACTTGT CCGCGACAT GTGGAGGAG

S S T L K S L E E K D H I H R V L D K I T D T L I H L M A K A G L T
TCATCCACCC TGAAGTCCCT GGAAGAGAAG GACCACATCC ACCGGGTGCT GGACAAGATC ACCGACACCC TGATCCACCT GATGGCCAAG GCTGGCCTGA
AGTAGGTGGG ACTTCAGGGA CCTTCTCTTC CTGGTGTAGG TGGCCACGA CTTGTTCTAG TGGCTGTGGG ACTAGGTGGA CTACCGCTTC CGACCGGACT

• L Q Q Q R Q R L A Q L L L I L S H I R H M S N K G M E H L Y S M K •
CACTCCAGCA GCAGCACCAG AGACTGGCCC AGTGTCTGCT GATCCTGAGC CACATCCGGC ACATGAGCAA CAAGGGAATG GAACACCTGT ACAGCATGAA
GTGAGGTCTG CTGCTGTGTC TCTGACCGGG TCGACGAGA CTAGGACTCG GTGTAGGCGG TGTACTCSTT GTTCCTTAC CTGTGGACA TGTCTACTTT

• C K N V V P L Y D L L L E A A D A H R L H A P T S R G G A S V E E
GTGCAAGAAC GTGGTGCCCC TGTACGACCT GCTGCTGGAG GCTGCCGATG CCCACAGACT GCAGGCCCTT ACAAGCAGAG GCGGAGCCAG CGTGAGGAA
CACGTTCTTG CACGACGGGG ACATGCTGGA CGACGAGCTC CGACGGCTAC GGGTGTCTGA CGTGCGGGGA TGTTCGTCTC CGCCTCGGTC GCACCTCCTT

T D Q S H L A T A G S T S S H S L Q K Y Y I T G E A E G E P A T V E
ACCGACCACT CTACCTGGG CACCGCGGGC AGCACAAGCA GCGACAGCCT GCAGAAGTAG TACATCACCG GCGAGGCGGA GGGATTCCTT GCCACCGTGG
TGCTGCTCA GAGTGGACCG GTGGCGGCGG TGTGTCTGT CCGTGTGCGA CTTCTTCATG ATGTAGTGGC CGCTCCGCTT CCTAAGGGA CCGTGGCACC

• F Q Y L P D T D D R H R I E B K R K R T Y E T F K S I M K K S P F •
AGTTCAGTA CTTGCCCGAG ACCGACGACC GGCACCGGAT CGAGGAAAAG CGGAAGCGGA CCTACGAGAC ATTCAAGAGC ATCATGAAGA AGTCCCTCTT
TCAAGGTGAT GGACGGGCTG TGGCTGCTGG CCGTGGCCTA GCTCCTTTTC GCCTTCGCTT GGATGCTCTG TAAGTTCTCG TAGTACTTCT TCAGGGGGAA

• S G P T D P R P P P R R I A V P S R S S A S V P K P A P Q P Y P F
CAGCGGCCCC ACCGATCCCA GACCCCGCCC TAGAAGAATC GCGGTGCCCA GCAGATCTAG CGCCAGCGTG CCGAAGCCTG CCCCCAGCC CTACCTTTTC
GTGCGCGGGG TGGCTAGGCT CTGGGGGGG ATCTTCTTAG DGGACCGGT GGTCTAGATC GCGGTGGCAC GGGTTCGGAC GGGGGTGGG GATGGGAAAG

T S S L S T I N Y D E F P T M V F P S G Q I S Q A S A T A P A P P Q
ACCAGCAGCC TGAGCACCAT CAACTAGGAC GAGTTCCCTA CCATGTTGTT CCCCAGCGGC CAGATCTCTC AGGCCTCTGC TCTGGCACCT GCTCCACCTC
TGGTGGTGG ACTGTTGGTA GTTGATGCTG CTCAGGGGAT GGTACACAAA GGGGTGCGCG GTCTAGAGAG TCGGAGAGG AGACCGTGA CGAGGTGGAG

· V L P Q A P A P A P A P A M V S A L A Q A P A P V P V L A P G P P ·
 AGGTGTGCT TCAGGCCCC GTCCAGCCC CAGCCCTGG CATGGTGTCT GCACTGGCCC AGGCTCCAGC TCCTGTGCCT GTGCTGGCCC CTGGACCTCC
 TCCAGCAGG AGTCCGGGGA CGAGGTGGG GTCCGGGACG GTACCAAGA CTGACCGCG TCCGAGGTCG AGGACACGGA CACGACCGGG GACCTGGAGG

 · Q A V A P P A P K P T Q A G E G T L S E A L L Q L Q F D D E D L G
 TCAGGCTGTG GCCCTCCTG CCGCTAAAC TACCCAGGCC GGGGAGGAA CACTGTCTGA GGCCCTGGTG CAGCTCCAGT TCGACGAGA GGATCTGGGA
 AGTCCGACAC CGGGGAGGAC GGGGATTGG ATGGGTCCGG CCCCTCCCTT GTGACAGACT CCGGACGAC GTCGAGGTCA AGCTGCTGCT CTTAGACCTT

 A L L G N S T D P A V F T D L A S V D N S E F Q Q L L N Q G I P V A
 GCAGTGTGCG GCAATAGCAC CGACCCCGCC GTGTTTACCG ACCTGGCCTC GTGGACAAC AGGAGTTCC AGCAGCTCCT CAACCAGGGC ATCCCTGTCTG
 CGTGACGACC CGTTATCGTG GCTGGGGCGG CACAAATGGC TGGACCGGAG GCACCTGTTG TCGTCAAGG TCGTCGAGGA GTTGTGCTCG TAGGGACAGC

 · P H T T E F M L M E Y P E A I T R L V T G A Q R P P D P A P A P L ·
 CCCCACACAC CACCGAGCCC ATGCTGATGG AATACCCCGA GGCCATCACC AGACTGGTCA CAGGCGCCCA GAGGCTCCA GATCCAGCAC CAGCTCCACT
 GGGGTGTGTG GTGGTCCGG TACGACTACC TTATGGGGCT CCGGTAGTGG TCTGACCACT GTCCGCGGGT CTCGGAGGT CTAGGTCTGT GTGAGGTGA

 · G A P G L P N G L L S G D E D F S S I A D M D F S A L L S Q I S S
 GGGAGCCCTT GGCCTGCCA ATGGGTGCT GTCTGGGAC GAGGACTTCT CCAGATTGC CGACATGGAC TTCAGCGCCC TGCTGTCCA GATCAGCAGC
 CCTCGGGA CCGAGGGAT TACCCGAGA CAGACCGCTG CTCCTGAAGA GGTCTAACG GCTGTACCTG AAGTCGCGG ACGACAGGT CTAGTGTCTG

Table 12 7xHBD/mEF1 α nucleic acid sequence (SEQ ID NO: 41)

Tagttaataatctacaatagttaataatctacaatagttaataatctacaatagttaataatctacaatagttaataatctacaat
 agttaataatctacaa

Table 13 Her2t nucleic acid (SEQ ID NO: 44) and amino acid sequence (SEQ ID NO: 45)

HER2t(CHP) Nucleotide and Amino Acid Sequence

M L L L V T S L L L C E L P H
 ATGCT TCTCCTGGT ACAAGCCTT TCCTCTGTGA GTTACCACAC
 TAGCA AGAGGACCAC TGTTCGGAAG ACGAGACACT CAATGGTGTG

 P A F L L I R C H P E C Q P Q N G S V T C F G P E A D Q C V A C A H
 CCAGCATTCC TCCTGATCCC ATGCCACCTT GAGTGTGAGC CCCAGAATGG CTCAGTGACC TGTTTTGGAC GGGAGGCTGA CCAGTGTGTG GCCTGTGCCC
 GGTCTGAAGG AGGACTAGGG TACGGTGGGA CTCACAGTCG GGGTCTTACC GAGTCACTGG ACAAACCTG GCCTCCGACT GGTACACAC CCGACACGGG

 · Y K D P P E C V A R C P S G V K P D L S Y M P I W K F P D E E G A ·
 ACTATAAGGA CCTCCCTTC TCGTGGGCC GCTGCCCCAG CCGTGTGAAA CCGACCTCT CTTACATGCC CATCTGGAAG TTTCAGATG AGGAGGGCGC
 TGATATTCTT GGGAGGGAAG ACGACCGGG CAGCGGGTC GCCACACTTT GGACTGGAGA GGATGTACGG GTAGACCTTC AAAGGTCTAC TCCTCCCGCG

 · C Q P G P I N C T H S G V D L D D K G C P A E Q R A S P L T S I I
 ATGCCAGCCT TGCCCATCA ACTGCACCA CTCTGTGTG GACCTGGATG ACAAGGGCTG CCGCGCGAG CAGAGAGCCA GCGCTCTGAC GTCCATCATC
 TACGTCGGA ACGGGTAGT TGAGTGGGT GAGGACACAC CTGGACTTAC TGTTCGGAC GGGCGGGCTC GTCTCTGGT CCGGAGACTG CAGGTAGTAG

 S A V V G I L L V V V L G V V F G I L I *
 TCTGGGTGG TTGGCTTCT GCTGTGCTG GTCTTGGGGG TGGTCTTGG GATCCTCATC TGA
 AGACGCCACC AACCGTAAGA CGACCAGCAC CAGAACCCCC ACCAGAAACC CTAGGAGTAG ACT

Table 14 DHFRdm nucleic acid (SEQ ID NO: 46) and amino acid (SEQ ID NO: 47)

DHFRdm Nucleotide and Amino Acid Sequence

M V G S L N

ATGGTTG GTTCGCTAAA

TACCAAC CAAGCGATT

C I V A V S Q N M G I G K N G D F P W P P L R N E S R Y F Q R M T
CTGCATCGTC GCTGTGTCC AGAACATGG CATCGGCAAG AACCGGGACT TCCCTTGGC ACGCTCAGG AATGAATCCA GATATTCCA GAGAAATGACC
GACGTAGCAG CGACACAGG TCTGTACCC GTAGCCGTTT TTGCCCTGA AGGGGACCG TGGCGAGTCC TTAATTAGGT CTATAAAGT GTCTTACTG

T T S S V E G K Q N L V I M G K K T W F S I P E K N R P L K G R I N
ACAACCTCTT CAGTAGAAGG TAAACAGAAT CTGGTGATTA TGGGTAAGAA GACCTGGTTC TCATTCTCTG AGAAGATCG ACCTTTAAAG GGTAGAATTA
TCTTGGAGAA GTCATCTTCC ATTTGTCTTA GACCACTAAT ACCATTCTT CTGGACCAAG AGGTAAGGAC TCTTCTTAGC TGGAAATTC CCATCTTAAT

L V L S R E L K E P P Q G A H F L S R S L D D A L K L T E Q P E L
ATTTAGTTCT CAGCAGAGAA CTCAAGGAAC CTCACAAGG AGCTCATTTT CTTCCAGAA GTCTAGATGA TGCCTTAAA CTTACTGAAC AACGAGAATT
TAAATCAAGA GTCGTCTCTT GAGTTCCTTG GAGGTGTTCC TGAGTAAAA GAAAGGTCTT CAGATCTACT ACGGAATTTT GAATGACTTG TTGGTCTTAA

A N K V D M V W I V G G S S V Y K E A M N H P G H L K L F V T R I
AGCAAATAAA GTACACATGG TCTGGATAGT TGGTGGCAGT TCTGTTTATA AGGAAGCCAT GAATCAGCCA GGCCTCTTA AACTATTTGT GACAAGGATC
TCGTTTATTT CATCTGTACC AGACCTATCA ACCACCGTCA AGACAAATAT TCCTTCGGTA CTTAGTGGGT CCGGTAGAAT TTGATAAACA CTGTTCCTAG

M Q D F E S D T F E P E I D L E K Y K L L P E Y P G V L S D V Q E E
ATGCAAGACT TTGAAAGTGA GACGTTTTT CCAGAAATTG ATTTGGAGAA ATATAAACTT CTGCCAGAT ACCCAGGTGT TCTCTCTGAT GTCCAGGAGG
TACGTTCTGA AACTTTCACT GTGCAAAAAA GGTCTTTAAG TAAACCTCTT TATATTGAA GACGGTCTTA TGGGTCCACA AGAGAGACTA CAGGTCTCTC

K G I K Y K F E V Y E K N D

AGAAAGGCAT TAAGTACAAA TTTGAAGTAT ATGAGAAGAA TGAT

TCTTTCCTTA ATTCATGTTT AAACCTCATA TACTCTCTT ACTA