

Supplementary Textfile 1. Representative raw sequences from cloned full-length cDNA products.

Exon numbering according to their position in the genome, see Supplementary Table 2. The SNP in TENM4 exon 4 was also present in all of 55 RNAseq reads that covered the sequence. The clones for expression—cloned in-frame from the ATG in TENM4 exon5—were also sequenced to confirm the exons here.

Key:

Vector sequence

SAPS3 exon 1

TENM4 exons

TENM4 exon in opposite orientation 'exon int15'

NRG1 exons

microhomology overlap

SNPs or errors in red

SAPS3-TENM4-NRG1 Clone D

Top transcript shown in Fig. 1. Long isoform with cytoplasmic tail, includes reversed exon TENM4 int15, lacks TENM4 exon 10

Sequencing with T7 primer:

vector

GGATCCACTAGTAACGGCCGCCAGTGTGCTGGA
ATTCTGCAGATATC

SAPS3 exon 1

TGCTTGATACGTCCGCCATTTTGGGCGCTTCGCTGATGGTGTCCGT
GAGCGCGTTTCCCGCCTGAGCGCAACTAGCGGCGGGTCTGGGCACCTCAG

TENM4 Exon3:

AAAAGATCCGCACCATCCTCCAGGATCCAATGGCCTTGAGAGAGGGCTGCAGGGCCACGGACATT
GCTGACTCTTCAGAACGTGCTGACATGGAGCCAG

TENM4 Exon4: [T is a C in reference genome]

GTAGACTGAAATTATCATGTGTCCAAATTAATGCATACTTCAAGGATTATTTGAAGGACTATTCTTAGACC
CTTTAAGAAGATTTAAAGAAAA

TENM4 Exon5:

ACCACTCGGCCCTGAGTGCGGCGAGGACCCTGTTTGTGGATGTGGAGGA
GCGCGGGCCGAGGCCATGGACGTGAAGGAGAGGAAGCCTTACCGCTCGCTGACCCGGCG
CCGCGACGCCGAGCGCCGCTACACCAGCTCGTCCGCGGACAGCGAGGAGGGCAAAGCCCC
GCAGAAATCGTACAGCTCCAGCGAGACCCTGAAGGCCTACGACCAGGACGCCCGCCTAGC
CTATGGCAGCCGCTCAAGGACATTGTGCCGAGGAGGCCGAGGAATTCTGCCGCACAG

TENM4 Exon6:

GTGCCAACTTCACCCTGCGGGAGCTGGGGCTGGAAGAAGTAACGCCCCCTCACGGGACCCT
GTACCGGACAGACATTGGCCTCCCCACTGCGGCTACTCCATGGGGGCTGGCTCTGATGC
CGACATGGAGGCTGACACGGTGCTGTCCCCTGAGCACCCCGTGCCTGTGGGGCCGGAG
CACACGGTCAGGGCGCAGCTCCTGCCTGTCCAGCCGGGCCAATTCCAATCTCACACTCAC
CGACACCGAGCATGAAAACACTGAGACTG

Sequencing with TENM4exon5F:

CCGCCTAGCCTATGGCAGCCGCGTCAAGGACATTGTGCCGCAGGA
GGCCGAGGAATTCTGCCGCACAG

TENM4 Exon6:

GTGCCAACTTCACCCTGCGGGAGCTGGGGCTGGAAGA
AGTAACGCCCCCTACGGGACCCTGTACCGGACAGACATTGGCCTCCCCACTGCGGCTA
CTCCATGGGGGCTGGCTCTGATGCCGACATGGAGGCTGACACGGTGCTGTCCCCTGAGCA
CCCCGTGCGTCTGTGGGGCCGGAGCACACGGTCAGGGCGCAGCTCCTGCCTGTCCAGCCG
GGCCAATTCCAATCTCACTCACCGACACCGAGCATGAAAACACTGAGACTG

TENM4 Exon7

ATCATCCGGGCGGCCTGCAGAACCACGCGGGCTCCGGACGCCGCCGCCGCTCTCGCACGCCA
CACCCCAACCAGCACCACGCGGCCTCCATTAACCTCCCTGAACCGGGGCAACTTCACGCC
GAGGAGCAACCCAGCCCGGCCCCACGACCCTCGCTCTCCGGAGAGCCCCCTGCCGG
CGGCGCCAGGAGCCTGCCACGCCAGGAGAAGTGGCTGCTCAACAGCAACATCCCCCT
GGAGACCAG

TENM4 Exon8

AAACCTAGGCAAGCAGCCATTCTAGGGACATTGCAGGACAACCTCATTGA
GATGGACATTCTCGGCGCCTCCGCCATGATGGGGCTTACAGTGACGG

TENM4 Exon9

GCACTTCTCTTCAAGCCTGGAGGCACCTCCCCGCTCTTCTGCACCACATCACCAGGGTACCCACTGACGTC
CAGCACAGTGTACTCTCTCCGCCCGACCCCTGCCCGCAGCACCTTCGCCCGGCCGGC
CTTTAACCTCAAGAAGCCCTCCAAGTACTGTAAGTGAAGTGCAGCCCTGAGCGCCAT
CGTCATCTCAGCCACTCTGGTCATCTGCTGGCATACTTTGTGG

TENM4 Exon11

GAAAGCCAGTAGTTTCTTCCAGAGGACAN TTCATAGATTCTGGAGAAATTGATGTGGG

Sequencing with NRG1exon9R:

NRG1 Exon 9 (reverse strand)

GCACATTTACAAGATGGCTTGTCCCAGTGGTGGATGTAGATGTAG

NRG1 Exon 6 (reverse strand)

ATGAAGAAGTATTTGCTCCTTCTGTGGATACTGATATTCTAATGGGAGACT

NRG1 Exon 5 (reverse strand)

CTGAAGACACATATGCTCCTCAGTTGAGGCTGGCATAACCAGTGATGATCT

NRG1 Exon 4 (reverse strand)

CGTTTGATTCCACGATGGTGATATTGGCAGAGGCACTGTCATTTCTAATTTGCTGATCACTTTGCACATATACT
CTCCAGAATCAGCCAGTGATGCTTTGTTAATGCGAAGTTCTGACTTC

NRG1 Exon 3 (reverse strand)

CCTGGCTTTTTTGTATCTTGATATTTGTGGTTTGTTTTTTCGATTCAATTCATTCCCATTCTTGAACCACTTGAA
TCTGAGAGAGGAGTATTCAGAACTGGTTTACACCCGAAGGACTAGTTTGGAACTGCAGCCGATTCTGGCTT
TTCATCTTTCAATCGGGGAGGCAAGG

TENM4int15 (reverse strand)

CTGATTCCAAGCCTCTTCTCT
GAAAAATCACAGAATCTTGAACAGTTACGTGAGCACTCTGTCCTGTACCACTGGAATC

TENM4 Exon 12 (reverse strand)

CAATGGCAGTGGTGAGAAAGGAAACCACTTCTGACTCCTTCCGTCATTGTAAAAAGCCAAGT

GCCAGATTCTGAATCCAAATACTGGATGAAGCCTGTCTCATGGCTGGAGGGGGGCACAG
TTCCCCGAGACTGGCGCGGGGTCCCCTCTAGGCTCCGCGCCTCCTGGGTTAGGAGCCTCC
TGCCATCCAGCAGCTCCACAAAGTCAA

Partial TENM4 Exon 11 (reverse strand)

CTGTGTATGTGAAGGAGGGAGGCCTTTTCTGC
CATAAATGCCAACCCAGGGCTGCCTTTCCAGAGACACATTGAATTCAGATGCACAGGAT
GGTCTATGAACACTTGAGATCTCCAGAAAGTGCCAGGAGGAATCTTCTGGGAAGCTCGCC
TTCCACATCAATTTCTCCAGAATCTATGAAACTGTCCTCTGGAAAGAA

Sequencing with NRG1exon4F:

Partial NRG1 Exon4:

GAAATGACAGTGCCTCTGCCAATATCACCATCGTGAATCAAACG

NRG1 Exon5:

AGATCATCACTGGTATGCCAGCCTCAACTGAAGGAGCATATGTGTCTTCAG

NRG1 Exon6:

AGTCTCCATTAGAATATCAGTATCCACAGAAGGAGCAAATACTTCTTCAT

NRG1 Exon9:

CTACATCTACATCCACCACTGGGACAAGCCATCTTGTAATAATGTGCGGAGAAGGAGAAAACCTTCTGTGTG
AATGGAGGGGAGTGCTTCATGGTGAAGACCTTCAAACCCCTCGAGATACTTGTGCAA

NRG1 Exon11:

GTGCCAAATGAGTTTACTGGTGATCGCTGCCAAAACCTACGTAATGGCCAGCTTCTACA

NRG1 Exon13:

AGGCGGAGGAGCTGTACCAGAAGAGAGTGCTGACCATAACCGGCATCTGCATCGCCCTCCTT
GTGGTCGGCATCATGTGTGTGGTGGCCTACTGCAAAACCAA

NRG1 Exon14:

GAAACAGCGGAAAAAGCTGCATGACCGTCTTCGGCAGAGCCTTCGGTCTGAACGAAACAATATGATGAACAT
TGCCAATGGGCCTCACCATCTAACCCACCCCGAGAATGTCCAGCTGGTGAAT

NRG1 Exon15:

CAATACGTATCTAAAAACGTCACTCTCCAGTGAGCATATTGTTGAGAGAGAAGCAGAGACATCCTTTCCACC
AGTCACTATACTTCCACAGCCCATCACTCCACTACTGTCACCCAGACTCCTAGCCACAG

NRG1 Exon16:

CTGGAGCAACGGACACACTGAAAGCATCCTTTCCGAAAGCCACTCTGTAATCGTGATGTCA
TCCGTAGAAAACAGTAGGCACAGCAGCCAACTGGGGGCCAAGAGGACGTCTTAATGGC
ACAGGAGGCCCTCGTGAATGTAACAGCTTCTCAGGCATGCCAGAGAAACCCCTGATTC
CTACCGAGACTCTCCTCATAGTGAAAG

Partial NRG1 Exon18:

GTATGTGTCAGCCATGACCACCCCGGCTCGTATGTCACCTGTAGATTTCCACACGCCA

Sequencing with SP6 primer:

NRG1 Exon18 (reverse strand):

TTTTCTGTTTTCTATTTGCAGAACTGCTAAAATAAAATAAA
TTGTTTAATTTAAGGTGGAATACTTTATTATATAAAATAAAGTTTTACAGGTGAATCTAT
GTGTTTATTTAGGTTTTATACAGCAATAGGGTCTTGGTTAGCAATTACACTAGACAGCCT
GGCCTGGATTTCTTCTGTGTCGAGAAGCGGCCTGCTGGGTTAGTCCTGCTGTCAGCCAG
GCGGAAGGCAGGTGTTGCCTCAAGACTGGCTGCCAGGGGTTCTGTATGCCAGGAAAGG
CGTATCTTCACTACTCTTTCATCTTCTGTTTCACTCTCTGAGTTACTGCTCTGGGAGCT
TGTGTTGCTGTCCACTTCCAATCTGTTAGCAATGTGGCCATTGGGCTTGGTTCTTTTGGC
CCGCCGGCTATTGGCGAGTTTCTTAACAGGCTCTTGGGCTGGCTCGTACTCTTGGGTCGT

TTCATACTCCTCATCTCCACTATCCTCAAGGGGCTAGCAGGGAGGCTGTTACTGTCATG
CGCGGGGTTGTGGTGAAGGAGCTGAACTGCTGAGGGTGATGGTCAAACCTCTTCTCCCG
CAGCCTTGGTGGTGTACGAGAAGTAGAGGTCTCTTCTTCCATGAAGGGGCTGACCGC
CATGGAAGGCATGGACACCGTCATGCTGGACACGGGTGGAGACATTTCCGAAGGGGCGA
TTTGGGGGAGCTTGGCGTGTGGAAATCTACAGGTGACATACGAGCCGGGGTGGTCATGGC
TGACACATAC

NRG1 Exon16 (reverse strand):

CTTTCACTATGAGGAGAGTCTCGGTAGGAATCAGGGGTTTCTCTGGCATGCCTGAGGAAGCTGTTACATTAC
GAGGGCCTCCTGTGCCATTAAGACGTCCTC
Continued Exon 16 declining quality sequence:
TTGGGC CCCAGTTGGGCTGCTGTGCCTACTGTTTTCTACGGATGACATCACNAATTACAGAGTGG
CTTTCGAAAGNATGCTTTTCAGTGTGTCCGTTGCTCCAG

SAPS3-TENM4-NRG1 Clone 5

Marked with asterisk in Fig.1. Short isoform matching original cDNA reported by Schaefer et al. (1997). Terminates in extended exon 11 of NRG1.

Sequencing with T7 primer:

vector

GGATCCACTTAGTAACGGCCGCCAGTGTGCTGGA
ATTCTGCAGATATC

SAPS3 exon 1

TGCTTGATACGTCCGCCATTTTGGGCGCTTCGCTGATGGTGTCCGT
GAGCGCGTTTCCCGCCTGAGCGCAACTAGCGCGGGTCTGTTGGCACCTCAG

TENM4 Exon3:

AAAAGATCCCGCACCATCCTCCAGGATCCAATGGCCTTGAGAGAGGGCTGCAGGGCCACGGACATT
GCTGACTCTTCAGAACGTGCTGACATGGAGCCAG

TENM4 Exon4: [T is a C in reference genome]

GTAGACTGAAATTAATCATGTGTCCAAATTAATTTGCATACTTCAAGGATTATTTGAAGGACTATTCTTAGACC
CTTTAAGAAGATTTAAAGAAAA

TENM4 Exon5:

ACCACTCGGCCCTGAGTGCGGCAGGACCCTGTTTGTGGATGTGGAGGAGCGCGGGCCGGAGGCCATGGAC
GTGAAGGAGAGGAAGCCTTACCCTGCTGACCCGCGCCGACGCGGAGCGCCGCTACACCAGCTCGTCC
GCGGACAGCGAGGAGGGCAAAGCCCCGAGAAATCGTACAGCTCCAGCGAGACCCTGAAGGCCTACGACCA
GGACGCCCGCTAGCCTATGGCAGCCGCGTCAAGGACATTGTGCCGAGGAGGCCGAGGAATTCTGCCGCAC
AG

TENM4 Exon6:

GTGCCAACTTCACCCTGCGGGAGCTGGGGCTGGAAGAAGTAACGCCCCCTCACGGGACCCT
GTACCGGACAGACATTGGCCTCCCCACTGCGGCTACTCCATGGGGGCTGGCTCTGATGC
CGACATGGAGGCTGACACGGTGTGTCCCTGAGCACCCCGTGCCTGTGGGGCCGGAG
CACACGGTCAGGGCGAGCTCCTGCCTGTCCAGCCGGGCCAATTCCAATCTCACACTCA
CCGACACCGAGCATGAAAACACTGAGACTG

Partial TENM4 Exon7:

ATCATCCGGGCGGCCTGC

Sequencing with TENM4exon5F:

TENM4 Exon5:

CCGCTAGCCTATGGCAGCCGCGTCAAGGACATTGTGCCGAGGAGGCCGAGGAATTCTGCCGCACAG

TENM4 Exon6:

GTGCCAACTTCACCCTGCGGGAGCTGGGGCTGGAAGAAGTAACGCCCCCTCACGGGACCCTGTACCGGACAG
ACATTGGCCTCCCCACTGCGGCTACTCCATGGGGGCTGGCTCTGATGCCGACATGGAGGCTGACACGGTGTCT

GTCCCCTGAGCACCCCGTGCCTGTGTTGGGGCCGGAGCACACGGTCAGGGCGCAGCTCCTGCCTGTCCAGCCG
GGCCAATTCCAATCTCACTCACCGACACCGAGCATGAAAACACTGAGACTG

TENM4 Exon7:

ATCATCCGGGCGGCCTGCAGAACCACGCGCGGCTCCGGACGCCGCCGCCGCTCTCGCACGCCACACC
CCCAACCAGCACCACGCGGCCTCCATTAACCTCCCTGAACCGGGCAACTTACGCCGAGGAGCAACCCAGCC
CGGCCCCACGGACCACTCGCTCTCCGGAGAGCCCCCTGCCGGCGGGCGCCAGGAGCCTGCCACGCCAGG
AGAAGTGGCTGCTCAACAGCAACATCCCCCTGGAGACCAG

TENM4 Exon8:

AAACCTAGGCAAGCAGCCATTCTAGGGACATTGCAGGACAACCTCATTGAGATGGACATTCTCGGCGCCTCC
CGCCATGATGGGGCTTACAGTGACGG

TENM4 Exon9:

GCACTTCTCTTCAAGCCTGGAGGCACCTCCCCGCTCTTCTGCACCACATCACCAGGGTACCCACTGACGTCCA
GCACAGTGTACTCTCTCCGCCCGACCCCTGCCCGCAGCACCTTCGCCCGGCCGGCCTTTAACCTCAAGAAG
CCCTCAAGTACTGTAAGTGAAGTGCAGCCCTGAGCGCATCGTCATCTCAGCCACTCTGGTCATCTGCTGCT
GCATACTTTGTGG

Partial TENM4 Exon 10:

CCATGCACCTGTTTGGCCTAAACTGGCACCTGCAGCCGATGGAGGGGCAGATGTATGAGAT

Sequencing with NRG1exon9R:

Partial NRG1 Exon 9 (reverse strand):

AGATGGCTTGTCCCAGTGGTGGATGTAGATGTAG

NRG1 Exon6 (reverse strand):

ATGAAGAAGTATTTGCTCCTTCTGTGGATACTGATATTCTAATGGGAGACT

NRG1 Exon 5 (reverse strand):

CTGAAGACACATATGCTCCTCAGTTGAGGCTGGCATAACAGTGATGATCT

NRG1 Exon4 (reverse strand):

CGTTTGATTCCACGATGGTGATATTGGCAGAGGCACTGTCAATTCCTAATTTGCTGATCACTTTGCACATATACT
CTCCAGAATCAGCCAGTGATGCTTTGTTAATGCGAAGTTCTGACTTC

NRG1 Exon3 (reverse strand):

CCTGGCTTTTTTGTATCTTGATATTTGTGGTTTGTTTTTCGATTCAATTCATTCCCATTCTTGAACCACTTGAA
TCTGAGAGAGGAGTATTCAGAAGTGGTTTACACCCGAAGGACTAGTTTGGAACTGCAGCCGATTCC
TGGCTTTTCATCTCTTCAATCGGGGAGGCAAGG

TENM4 Exon12 (reverse strand):

CAATGGCAGTGGTGAGAAAGGAAACCACTTCTGACTCCTTCCGTCATTGTAAAAAGCCAAGTGCCAGATTCC
TGAATCCAAATACTGGATGAAGCCTGTCTCATGGCTGGAGGGGGGCACAGTTCCCCGAGACTGGCGCGGGGT
CCCCTAGGCTCCGCGCCTCCTGGGTTAGGAGCCTCCTGCCATCCAGCAGCTCCACAAAGTCAA

TENM4 Exon11 (reverse strand):

CTGTGTATGTGAAGGAGGGAGGCCTTTTCTGCCATAAATGCCAACCAGGGCTGCC
TTTCCAGAGACACATTGAATTTAGATGCACAGGATGGTCTATGAACACTTGAGATCTC
CAGAAAGTGCCAGGAGGAATCTTCTGGGAAGCTCGCCTTCCACATCAATTTCTCCAGAA
TCTATGAAACTGTCTCTGGAAAGAACTACTGGGCTTTC

TENM4 Exon10 (reverse strand):

CTTCTGTGGTTCCTTGCCTT

contnuing low quality

NCCTGTCAGGGGTCTTAAGCCAGTGCCCCcTGAGGGGTATANGGGAGACGTCGGTTGGCACAGGCCACCT
GcCTGGCTGTGCTCCGTGATCTCATACATCTGNCCCCTCCATCG
GCTGCAGGTGCCAGTTTNAAGGCCAAACAGGTGCATGG

Sequencing with SP6 primer:

GCTGCTCGAGCGGCCGC

Extended Exon 11(reverse strand):

AGCTCTAGGTGGAATCTGAGGGGAGATGCAGCAACAAGAAAGCA
GCACCAACTGAGCATGCTC

NRG1 Exon11 (reverse strand):

CTATTCAGGCAGAGACAGAAAGGGAGTGGACGTACTGTAGAAGCTGGCCATTACGTAGTTTTGGCAGCGATC
ACCAGTAAACTCATTGGGCAC

NRG1 Exon9 (reverse strand):

TTGCACAAGTATCTCGAGGGGTTTGAAAGGTCTTTCACCATGAAGCACTCCCCTCCATTCACACAGAAAGTTTT
CTCCTTCTCCGCACATTTACAAGATGGCTTGCCAGTGGTGGATGTAGATGTAG

NRG1 Exon6 (reverse strand):

ATGAAGAAGTATTTGCTCCTTCTGTGGATACTGATATTCTAATGGGAGACT

NRG1 Exon5 (reverse strand):

CTGAAGACACATATGCTCCTCAGTTGAGGCTGGCATAACCAGTGATGATCT

NRG1 Exon4 (reverse strand):

CGTTTGATTCCACGATGGTGATATTGGCAGAGGCACTGTCATTTCTAATTTGCTGATCACTTTGCACATATACT
CTCCAGAATCAGCCAGTGATGCTTTGTTAATGCGAAGTTCTGACTTC

NRG1 Exon3 (reverse strand):

CCTGGCTTTTTTTGTATCTTGATATTTTGTGGTTTGTTTTTTCGATTCAATTCATTCCCATTCTTGAACCACT
TGAATCTGAGAGAGGAGTATTCAGAAGTGGTTTACACCCGAAGGACTAGTTTGGAACTG
CAGCCGATTCTGGCTTTTCATCTCTTCAATCGGGGAGGCAAGG

TENM4 Exon12 (reverse strand):

CAATGGCAGTGGTGAGAAAGGAAACCACTTCTGACTCCTTCCGTCATTGTAAAAAGCCAAGTGCCAGATTCC
TGAATCCAAATACTGGATGAAGCCTGTCTCATGGCTGGAGGGGGGGCACAGTTCCCCGAGACTGGCGCGGG
GTCCCCTCTAGGCTCCGCGCCTCTGGGTTAGGAGCCTCCTGCCATCCAGCAGCTCCACAAAGTCAA

Partial TENM4 Exon11 (reverse strand):

CTGTGTATGTGAAGGAGGGAGGCCTTTTTCTGCCATAAATGCCAACCAGGGCTGCCTTTCCAGAAACACATT
GAANTTTCAGATGCCCAGGATGGTCTATGAACACTTGANATCTCCAGAAAGTGCCAGGAGGAATCTTCTGGG