

**INK2S00107R\_GRN\_Q125X\_E08\_AA**  
7861 bp

5'  
3'

AAACTGAGGTTAGGCGGGTTCATCGCGCTGGGGTCTGTAGTCTGAGCGCTACCCGGTTGCTGCTGCCAAGGACCGCGGAGTCGGAC  
TTTGACTCCATCCGCCAGTAGCGCGACCCAGACATCAGACTCGCGATGGGCCAACGACGACGGGTTCTTGGCGCCTCAGCCTG

85

GRN

GRN-201

GCAGGTAGGAGAGCGGCCGCGCAGACCTCTCGCCTGCTCCTGCCAGGGGCCCGCCAGGGCCATGTGAGCTTGAGGTTCCCTG6  
CGTCCATCCTCTCGCCGGCGCGTCTGGAGAGCGGACGAGGACGGGTCCCCGGGCGGTCCCGGTACACTCGAACTCCAAGGGGACC

170

GRN

GRN-201

AGTCTCAGCCGGAGACAACAGAAGAACCGCTTACTGAACTCCTTGGGGTTCTGATACACTAGGGGGAGTTTTATGGGAAAGAG  
TCAGAGTCGGCCTCTGTTGTCTTCTTGGCGAATGACTTTGAGGAACCCCAAGACTATGTGATCCCCCTCAAATACCTTTCTC

255

GRN

GRN-201

GAAGCAGTAATTGCAGTGACGCCCCGTTAGAAGGGGCTTTCTACCTCCCCAGCATTCCCCCAAAGCAGGGACCACACCATTTCTTG  
CTTCGTCATTAACGTCACCTGCGGGCAATCTTCCCCGAAAGATGGAGGGGTCGTAAGGGGGTTTCGTCCCTGGTGTGGTAAGAAC

340

GRN

GRN-201

ACCCAGCTCCACCCCTGTCGGTAGGTGCTGGCTTCTTCCCTCTCCTGGTGGTGGTGGGTGGTTCCCGCGGCGGCCTGGAGCCGG  
TGGGTGAGGTTGGGGACAGCCATCCACGACCCGAAGAAGGGGAGAGGACCACCACCACCCACCAAGGGCGCCGCCGGACCTCGGCC

425

GRN

GRN-201

AGGGGCGCGGACCCCTGGGCTGGGAGCTCCGAGGGCCTGGGAACGAGACCTGAGACCTTGGCTTCTCGAAGGTAGTAGGGACTTG  
TCCCCGCGCGCTGGGACCCGACCCTCGAGGCTCCCGGACCCTTGCTCTGGACTCTGGAACCGAAGAGCTTCCATCATCCCTGAAC

510

GRN

GRN-201

GGAGTGGTGACTGAACCTGGTCTGGCTCCTCCTTACTTCTTCTTGTGCGGGTGGGACGAGCTAGCTTCCGCCTCTCCCAGCCAC  
CCTCACCCTGACTTGGACCAGACCGAGGAGGAATGAAGGAGAACAACGCCACCCTGCTCGATCGAAGGCGGAGAGGGTTCGGTG

595

GRN

GRN-201

TTTTTCTGCTCATTTCGAGCTAGGTTGGCTCCCTTTTTGGGAATTTCTCTCCCTTGGCACTCGGAGTTGGGGGGTGCCACCT  
AAAAAGGACGAGTAAACGTCGATCCAACCGAGGGGAAAACCTTAAAGGAGAGGGGAACCGTGAGCCTCAACCCCCACGGTGA

680

GRN

GRN-201

AGTGGAAAGATAACGGAGCTAGGGTCTTGAAGAGGCTGCTGTCCCTCTGGCTGTTTTGGCGGTGTAGGGTGGCATGAGAGACTGC  
TCACCTTCTATTGCCTCGATCCCAGAACTTCTCCGACGACAGGGGAGACCGACAAAACCGCCACATCCCACCGTACTCTCTGACG

765

GRN

GRN-201

GACTCGCCTCCTCATCCCTGTTTCTGTATGCGAGTGCTTGTATTTCAGTAGAAGCATACTATACTCCCTCAATTTAGGGTAAAC  
CTGAGCGGAGGAGTAGGGACAAAAGACATACGCTCACGAACATAAGTCATCTTCGTATGTGATATGAGGGAGTTAAATCCCATTG

850

GRN

GRN-201

AGGAGGGGGCCACATGCACAGGTAATTCACCAGGGGAGCCGAACACTCCTGTGCAGACAGACTCCCCTTCCCAGCAAGCCATGGCAG  
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935

GRN

GRN-201

CGGACAGCCTGCTGAGAACACCCAGGAAGCAGGCGGTGCCAGCTGCAGGTGCTTTGCCTGGGAGCTGTGGGGCTGAGGAGAGGGT  
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1020

GRN

GRN-201

CCACTGTCCAGGACCAGTGAACCTTCATCCTTATCTGTCCAGGAGGTGGCCTCTTGGGGATGCTGAGTTAGGGGAGGGGCACTTGA  
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1105

GRN

GRN-201

GGAAAGCCAGGTGGAGCAGAGAGGATGTGAGTGACTGGGTGGGTGAGATTTCTGCCCTCCCCCGCAGTGGTATCCACACCTA  
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1190

GRN

GRN-201

GACTCGTGGGGTAACTGAGGCACAGACAGAGCAACTTCTCAGGCCCTCACAGTTGGCAATTCTAGGATTAGGACCCAAAGTGC  
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1275

GRN

GRN-201

ATTTTCAGGCAGTCCCTGTACCCTGTTTTCTGTTGTACCTGTTGCACCATTCCCAGGCACTGCCCATCGTGCCACTAGTGATATGA  
TAAAAGTCCGTCAGGGACATGGGACAAAAGACAACATGGACAACGTGGTAAGGGTCCGTGACGGGTAGCACGGTGATCACTATACT

1360

GRN

GRN-201

ACCCAGGTCCAATACGCTCTGGGGCCATCAAAGCCTGACGTACCCATGACCTGATGTGTGACGTGTTATAGGTGTCCCTTGGTAT  
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1445

GRN

GRN-201

CTTCACGGAACTGGTTCCAGGACCCCAAAATCTGTGGGTGCTCAAGCCCCTGAGATAAAATGGTGTAAATATTTGCATATAACCTA  
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1530

GRN

GRN-201

TACATACTTTAAATCATTTCTAGATTACTTATACCTAATACAATGGAAATGACATGTCGGCTGGGCGTGGTGGCTCATGCCTGTA  
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1615

GRN

GRN-201

ATCCCACCACTTTGGGAGGCCGTGGCAGGTGGATCACCTGAGGTCTGGAGTTTGGAGACCAGCCTGACCAACATGGTGAACCCCC  
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1700

GRN

GRN-201

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1785

GRN

GRN-201

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1870

GRN

GRN-201

CAAAAAAAAAAGAGAAAAAGAAAAAGAAATGCCATGTAAATAGTTGTGATCCTGAATTGTTTAGGGAATAATAAGAAAGAACTAT  
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1955

GRN

GRN-201

CTGTAGATGTTTCAGTATAGATGCACCCATCGTAAGCCTAACTACATTGTATAACTCAGCAACGATGTAACATTTTCAGGGGTTTT  
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2040

GRN

GRN-201

TTTGTTTTGTTTTTGGAGACAGAATCTCAGTCTCACTCTGTCACCCAGGCTGGAGTATGTTGGCGTGATCTCTGCTCACTGCAAC  
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2125

GRN

GRN-201

CTCCACCTCCTGGGCTCAAGCGATTCTCCTGCCTCAGCCTCTTGAGTAGCTGGGATTGCAGGTGTGCGCTACCACGCATGGCTAA  
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2210

GRN

GRN-201

TTTTTGATTTTTAATAGAGATGGGGTTTTACCACGTTGGTCAGGCTGGTCTTGAACCTCCTGACCTTGGGATCCGCCACCTGGG  
AAAAACATAAAAAATTATCTCTACCCAAAATGGTGCAACCAAGTCCGACCAGAACTTGAGGACTGGAACCCCTAGGCGGGTGGACCC

2295

GRN

GRN-201

CCTCCAAAAGTGCTGGGATTACAGGCGTTAGCCACCGCGCCCAATATATTTTTGATCCCTGGTTGGATATGGAGGGCTGACTGTAC  
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2380

GRN

GRN-201

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2465

GRN

GRN-201

GGAGGCTGAGGTGGGTGGATCAGCTGAGGTGAGGATTCAGGAGTTCAAGACCAGCCTGACCAATATGGTGAACCCCTCTCTGCTAAAAAT  
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2550

GRN

GRN-201

ACAAAAATTAGCCAGGCGTGGTGGCGAGCGCCTGTAGTCCCAGCTACTTGCTTGAACCTTGGGAGGCAGAGGTTGCAGTGAGCTGA  
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2635

GRN

GRN-201

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2720

GRN

GRN-201

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2805

GRN

GRN-201

CATGGCAATACCTCATCTCTAAAAATAAAATAAAAGTAAAGGTATTAATTACTACTTTGGATGGTTGTTGCAAAGAAATATATAT  
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2890

GRN

GRN-201

AAAAAATGGAGAGTCTTGTAAGTGGCTCCCAAGAGGCTCAACAGACATTACTGTTTTTGCTTCTTCATTATGAGTTACCTCTCT  
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2975

GRN

GRN-201

GGCCACCCCACTGAACTAGCTGGGCTAGCTGAGCCTGGGAGAAGAGTTGTTTAGGAAGTGAGAGGCTGCTCTCCACAGAGACTCA  
CCGGTGGGGTGACTTGATCGACCCGATCGACTCGGACCCTCTTCTCAACAAATCCTTCACTCTCCGACGAGAGGTGTCTCTGAGT

3060

GRN

GRN-201

AGGCTCAGTTCCTCCTGGTGACTCAGATGGGCAGCCCAGTGGGCACACGTGGTCTCTCTCCACATGTGGCTGAGTTTCACTTCCA  
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3145

GRN

GRN-201

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3230

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GRN-201

GGTGTCTCAAGGGCTGACCCAGCTTCTGTGTCTTTTCTCTGGGTGAGGAGGGGACATTCATGGGCAGATGGTGACCTCTGGGGA  
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3315

GRN

GRN-201

AGGCAGCCCAGACTCCACTGGCCACCATATTTCTTTTTTCAACCTTTCTCACCCCTGTGGTTTTCCCATGTCATCATGTGGCCGC  
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3400

GRN

GRN-201

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AAGGGCGTTCCGGAATCGCCCCACGTCCATACTTGTATCACAGTCCGTTCTCCGTAGACCTCCCCTTGGGACCGAAAAGGACCC

3485

GRN

GRN-201

GGGACTCCCTCCCTGCACCCTAGCCCTGTCTCTCCCATGGCTACTGATGCCTTCCCCTCACCCCAGAGGTGGCCACATCTGCA  
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3570

GRN

GRN-201

CAGATCAGACCCACAAAAATCACGTCTTCTGACTCTCATAAGCCTGCCAGTGAGGGCCAGGCATTAGGCCATGTGCTGGGGAC  
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3655

GRN

GRN-201

TCAGACCCACACATATACGCATGTCAGCATTTCATGCTTACAGGTCCGCACATGCTGGGGCAAGTGTACACACAGGGGCGCTGTAG  
AGTCTGGGTGTGTATATGCGTACAGTCGTAAGTACGAATGTCCAGGCGTGTACGACCCCGTTCACAGTGTGTGCCCGCGACATC

3740

GRN

GRN-201

GAAGCTGACTCTCAGCCCCTGCAGATTTCTGCCTGCCTGGACAGGGAGGTGTTGAGAAGGCTCAGGCAGTCTGGGCCAGGACCT  
CTTCGACTGAGAGTCCGGGACGTCTAAAGACGGACGGACCTGTCCCTCCACAACCTCTTCCGAGTCCGTACAGGACCCGGTCTTGGGA

3825

GRN

GRN-201

TGGCCTGGGGCTAGGGTACTGAGTGACCCTAGAATCAAGGGTGGCGTGGGCTTAAGCAGTTGCCAGACGTTCCCTTGGTACTTTGC  
ACCGGACCCCGATCCCATGACTCACTGGGATCTTAGTTCCACCGCACCCGAATTCGTCAACGGTCTGCAAGGAACCATGAAACG

3910

GRN

GRN-201

AGGCAGACCATGTGGACCCTGGTGAGCTGGGTGGCCTTAACAGCAGGGCTGGTGGCTGGAACGCGGTGCCCAGATGGTCAGTTCT  
TCCGTCTGGTACACCTGGGACCACTCGACCCACCGGAATTGTCGTCCCGACACCGACCTTGCGCCACGGGTCTACCAGTCAAGA

3995

GRN

GRN-201

1 5 10 15 20 25  
M W T L V S W V A L T A G L V A G T R C P D G Q F

ENSE00003606043

GRN-201

GCCCTGTGGCCTGCTGCCTGGACCCCGGAGGAGCCAGCTACAGCTGCTGCCGTCCCCTTCTGGTGAGTGCCCTCAGCCTAGGCA  
CGGGACACCGGACGACGGACCTGGGGCCTCCTCGGTTCGATGTCGACGACGGCAGGGGAAGACCACTCACGGGGAGTCCGGATCCGT

4080

GRN

GRN-201

30 35 40 45  
C P V A C C L D P G G A S Y S C C R P L L

ENSE00003606043

GRN-201

AGAGCTGGCAGCCTGGGTTTTCCCAAAGGGTCATCTTGGATTGGCCAGAGGAGGACGCCAGGCACAAGTCTGTGGTTTTATCATTT  
TCTCGACCGTCGGACCCAAAAGGGTTTTCCAGTAGAACCTAACCGGTCTCCTCCTGCGGTCCGTGTTTCAGACACCAAATAGTAAA

4165

GRN

GRN-201

GRN-201

TCCCTGTCTTTCTAGGACAAATGGCCCAACAACACTGAGCAGGCATCTGGGTGGCCCTGCCAGGTTGATGCCCACTGCTCTGCCG  
AGGGACAGAAAAGATCCTGTTTACCGGGTGTGTGACTCGTCCGTAGACCCACCGGGGACGGTCCAACCTACGGGTGACGAGACGGC

4250

GRN

GRN-201

D K W P T T L S R H L G G P C Q V D A H C S A  
ENSE00003646360

GRN-201

GCCACTCCTGCATCTTTACCGTCTCAGGGACTTCCAGTTGCTGCCCTTCCCAGAGGTGAGCGTGCCATCAGCCCAGTGGAGGGG  
CGGTGAGGACGTAGAAATGGCAGAGTCCCTGAAGGTCAACGACGGGGAAGGGTCTCCACTCGCACGGTAGTCGGGTACCTCCCC

4335

GRN

GRN-201

G H S C I F T V S G T S S C C P F P E  
ENSE00003646360

GRN-201

CTTAGGTCTGCATTTATGCTTTTTCTGCACTCTACCACCTGCAGATAAAAGGGCCCTGCCAATGCAGGTTTCTCTGTGTTCCACA  
GAATCCAGACGTAAATACGAAAAGGACGTGAGATGGTGGACGTCTATTTTCCGGGACGGTTACGTCCAAGAGACACAAGGTGT

4420

GRN

GRN-201

GRN-201

GGCCGTGGCATGCGGGGATGGCCATCACTGCTGCCACGGGGCTTCCACTGCAGTGCAGACGGGCGATCCTGCTTCCAAAGATCA  
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4505

GRN

GRN-201

A V A C G D G H H C C P R G F H C S A D G R S C F Q R S  
ENSE00002344685

GRN-201

GGTGCAGCTGGGGTGTGGGTGCAGGGCAGGCAGACGGGCAGCATGTGGAGTCTGGAACCCAGGAGCCAGCTGGCGGGGGCAGCC  
CCACGTGACCCACACCCACGTCCCGTCCGTCTGCCCGTCTGACACCTCAGACCTTGGGTCTCGGGTCGACCGCCCCGTCGG

4590

GRN

GRN-201

GRN-201

CTGATTCCTGCCCTTGTGCCCTCATTTCATGTGGCATCTGTACTAAGCAACAGCCCTGCTGTGGACAGAGGGGCAGCACTGGGGAT  
GACTAAGGACGGGAACACGGGAGTAAGTACACCGTAGACATGATTCGTTGTGCGGGACGACACCTGTCTCCCCGTCGTGACCCCTA

4675

GRN

GRN-201

GRN-201

Sanger Sequencing Primer

GAGCTGGGCCGGTCTAATAC

PCR Forward

GAGCTGGGCCGGTCTAATAC

AGGAGGGTGC GGGAGAAAGTGCAAGACTCCAGGTCCAGGC GTTGTGGGGGTGGGGAGAGGTCGAGCTGGGCCGGTCTAATACCAA  
TCCTCCCACGCCCTCTTTCACGTTCTGAGGTCCAGGTCCGCAACACCCCCACCCCTCTCCAGCTCGACCCGGCCAGATTATGGTT

4760

GRN

GRN-201

GRN-201

CCCATGGTCAGTGGGTGCCCTTCCCCATGCCATCTTGCTGAGGGAGGGACTGGATTGTGAGGAGGGTGAGTTAGGCCTGCCTAG  
GGGTACCAGTCACCCACGGGGAAGGGGTACGGTAGAACGACTCCCTCCCTGACCTAACACTCCTCCCCTCAATCCGGACGGATC

4845

GRN

GRN-201

GRN-201

GAGATCACTGAGCCTTAGTGTCACCCTCAAACCCAGTAGCTGGGCTTGACGGCCCTGGTGCCACCAGCTCCTTGTGTGATGGGG  
CTCTAGTGACTCGGAATCACAGTGGGAGTTTGGGGTCATCGACCCGAACGTCCGGGACCACGGTGGTTCGAGGAACACACTACCCC

4930

GRN

GRN-201

GRN-201

Donor Template SNV -> REV

cctgagtgggctggtagtatcctgggtcatcttgtccacagGTAACAACCTCCGTGGGTGCCATCCAGTGCCCTG

GAGTCACCTTCCCTGAGTGGGCTGGTAGTATCCTGGGTTCATCTTGTCCACAGGTAACAACCTCCGTGGGTGCCATCCAGTGCCCTG  
CTCAGTGGAAGGGACTCACCCGACCATCATAGGACCCAGTAGAACAGGTGTCCATTGTTGAGGCACCCACGGTAGGTCACGGGGAC

5015

GRN

GRN-201

G N N S V G A I Q C P

ENSE00002337665

GRN-201

Donor Template SNV -> REV

PAM Protospacer Sequence

SNV

AGA TCACGGGAC

gRNA Protospacer



Donor Template SNV -> REV

ATAGTCAGTTTCGAATGCCCGGACTTC

ATAGTCAGTTTCGAATGCCCGGACTTCTCCACGTGCTGTGTTATGGTCGATGGCTCCTGGGGGTGCTGCCCATGCCCGAGGTACA  
TATCAGTCAAGCTTACGGGCCTGAAGAGGTTGCACGACACAATACCAGCTACCGAGGACCCCCACGACGGGGTACGGGGTCCATGT

5100

GRN

GRN-201

D S Q F E C P D F S T C C V M V D G S W G C C P M P Q

ENSE00002337665

GRN-201

Donor Template SNV -> REV

Protospacer Sequence

TATCAGTC

gRNA Protospacer

AATCTGGGGGAGATGGGGGTATGTGGAGGGAAGTGGGGGCAGAGTTGGGGGCCAGGGGCAGGGGGTGAAGACGGAGTCAGGACCA  
TTAGACCCCTCTACCCCATACACCTCCCTTACCCCGTCTCAACCCCGGTCCCGTCCCCCACTTCTGCCTCAGTCCTGGT

5185

GRN

GRN-201

GRN-201

ACTTCTGCCTCAGTCCTGGT

PCR Reverse

TTTTTCTCAGGCTTCTGCTGTGAAGACAGGGTGCACCTGCTGTCCGCACGGTGCCTTCTGCGACCTGGTTACACCCGCTGCAT  
AAAAAAGAGTCCGAAGGACGACACTTCTGTCCCACGTGACGACAGGCGTGCCACGGAAGACGCTGGACCAAGTGTGGGCGACGTA

5270

GRN

GRN-201

A S C C E D R V H C C P H G A F C D L V H T R C I

ENSE00003576251

GRN-201

CACACCCACGGGCACCCACCCCTGGCAAAGAAGCTCCCTGCCAGAGGACTAACAGGGCAGGTGAGGAGGTGGGAGAGCATCAG  
GTGTGGGTGCCCGTGGGTGGGGGACCGTTTCTTCGAGGGACGGGTCTCCTGATTGTCCCGTCCACTCCTCCACCCCTCTCGTAGTC

5355

GRN

GRN-201

T P T G T H P L A K K L P A Q R T N R A

ENSE00003576251

GRN-201

GCCAGGGGCTGGGGCGGGGCCTCATTGACTCCAAGTGTAGGAAAAAGTTTCTCCATCCTGGCTGCCCTCACGTTTGTCTCCTCT  
CGGTCCCCGACCCCGCCCGGAGTAACTGAGGTTACATCCTTTTTCAAAGGAGGTAGGACCGACGGGGAGTGCAAACGAGGAGA

5440

GRN

GRN-201

GRN-201

TCCAGTGGCCTTGTCCAGCTCGGTTCATGTGTCCGGACGCACGGTCCCCTGATGGTTCTACCTGCTGTGAGCTGCCCAGT  
AGGTCACCGGAACAGGTCGAGCCAGTACACAGGCCTGCGTGCAGGGCCACGGGACTACCAAGATGGACGACACTCGACGGGTCA

5525

GRN

GRN-201

200 V A L S S S V M C P D A R S R C P D G S T C C E L P S  
ENSE00003466751

GRN-201

GGGAAGTATGGCTGCTGCCCAATGCCCAACGTGAGTGAGGGGCTGGAGCCAGCTTGGCTGTGTGCCCCAGCCACCTGGCCCTGA  
CCCTTCATACCGACGACGGGTTACGGGTTGCACTCACTCCCCGACCTCGGTTCGAACCGACACACGGGGGTCGGTGGACCGGGACT

5610

GRN

GRN-201

230 G K Y G C C P M 235  
ENSE00003466751

GRN-201

CACGCACCTTACAGGGGCTCTGTGGCATGGGGCTGGCTGGCTGCTTGGCTGGGAGCCTGGCTGATGCAGGGTTTCATGCTACCCCT  
GTGCGTGGAAATGTCCCCGAGACACCGTACCCCGACCGACCGACGAACGACCCCTCGGACCGACTACGTCCCAAGTACGATGGGGGA

5695

GRN

GRN-201

GRN-201

AGTGGGGGATTGGGGCAGTGCCAGCCATCAGCCTGGCTGCTCCCTGTGTGCTACTGAGCCTGGAAGTGACAAAGACCCACCCCTG  
TCACCCCTAACCCTGTCACGGTCGGTAGTCGGACCGACGAGGGACACACGATGACTCGGACCTTCACTGTTTCTGGGTGGGGAC

5780

GRN

GRN-201

GRN-201

TCCCCACTCAGGCCACCTGCTGCTCCGATCACCTGCACTGCTGCCCCCAAGACACTGTGTGTGACCTGATCCAGAGTAAGTGCCT  
AGGGGTGAGTCCGGTGGACGACGAGGCTAGTGGACGTGACGACGGGGTTCTGTGACACACACTGGACTAGGTCTCATTACGGA

5865

GRN

GRN-201

240 A T C C S D H L H C C P Q D T V C D L I Q S K C L 260  
ENSE00003667214

GRN-201

CTCCAAGGAGAACGCTACCACGGACCTCCTCACTAAGCTGCCTGCGCACACAGGTACCAGAGGCAAGGGTGCAGATACAGGGGTGG  
GAGGTTCCCTCTTGCATGGTGCCTGGAGGAGTGATTGACGGACGCGTGTGTCCATGGTCTCCGTCCACGCTATGTCCCCACC

5950

GRN

GRN-201

265 S K E N A T T D 270 L L T K L 275 P A H T  
ENSE00003667214

GRN-201

GGCCCCCTTTCCCTCCCTTTTAGGCCTGGCCTTAGGATCACTGCAAGGTGGTGTAAAGCGGTACCCTCCATCTTCAACACCTGGTTT  
CCGGGGGAAAGGAGGGGAAAATCCGGACCGGAATCCTAGTGACGTTCCACCACATTCGCCATGGGAGGTAGAAGTTGTGGACCAAG

6035

GRN

GRN-201

GRN-201

CAGCTGTGGAGCCGGCAAAGGGTTGATACCCCTGAGGGTCCCCAGTGCCACTTCTGACCTGTCTCTCTGCTTCCCTCACAGTGG  
GTCGACACCTCGGCCGTTTCCCAACTATGGGGACTCCAGGGGTACGGTGAAGACTGGACAGGAGAGACGAAGGGAGTGTCAACC

6120

GRN

GRN-201

V

GRN-201

GGGATGTGAAATGTGACATGGAGGTGAGCTGCCAGATGGCTATACCTGCTGCCGTCTACAGTCGGGGGCTGGGGCTGCTGCC  
CCCTACACTTTACACTGTACCTCCACTCGACGGGTCTACCGATATGGACGACGGCAGATGTCAGCCCCGGACCCGACGACGGG

6205

GRN

GRN-201

280 G D V K C 285 D M E V S 290 P D G Y T 295 C C R L 300 S G A W 305 G C C P

ENSE00003647696

GRN-201

TTTTACCCAGGTACCCAGGGGTGGCGGGTGGGTGGGCTGAGCACAGTGTGGCAGGCAGCCGGGCCCCAGTGCCACCTGCCCTTC  
AAAATGGGTCCATGGGTCCCCACCGCCACCCACCCGACTCGTGTACACCGTCCGTTCGGCCCCGGGGTACGGGTGGACGGGAAG

6290

GRN

GRN-201

310

F T Q

ENSE0000364...

GRN-201

TTCATCTGCCCTAGGCTGTGTGCTGTGAGGACCACATACACTGCTGTCCCGGGGTTTACGTGTGACACGCAGAAGGGTACCTG  
AAGTAGACGGGATCCGACACACGACACTCCTGGTGTATGTGACGACAGGGCGCCCCAAATGCACACTGTGCGTCTTCCCATGGAC

6375

GRN

GRN-201

315

A V C C E D H I H C C P A G F T C D T Q K G T C

ENSE00003589157

GRN-201

TGAACAGGGGCCCCACCAGGTGCCCTGGATGGAGAAGGCCCCAGCTCACCTCAGCCTGCCAGACCCACAAGCCTTGAAGAGAGAT  
ACTTGTCCCCGGGGTGGTCCACGGGACCTACCTCTTCCGGGGTTCGAGTGGAGTTCGGACGGTCTGGGTGTTTCGGAACCTTCTCTCTA

6460

GRN

GRN-201

340

345

350

355

360

E Q G P H Q V P W M E K A P A H L S L P D P Q A L K R D

ENSE00003589157

GRN-201

GTCCCCTGTGATAATGTCAGCAGCTGTCCCTCCTCCGATACCTGCTGCCAACTCACGTCTGGGGAGTGGGGCTGCTGTCCAATCC  
CAGGGGACACTATTACAGTCGTGACAGGGAGGAGGCTATGGACGACGGTTGAGTGCAGACCCCTCACCCCGACGACAGGTTAGG

6545

GRN

GRN-201

365

370

375

380

385

390

V P C D N V S S C P S S D T C C Q L T S G E W G C C P I

ENSE00003589157

GRN-201

CAGAGGTATATGGGAGGGGACAGCATCTTGGCCTGGGCAGGTGGGTGGCCAAAGCTCCTATTGCTTTCTGCCCTCCGCATAGCCCA  
GTCTCCATATACCCTCCCCTGTCGTAGAACCGGACCCGTCACCCACCGGTTTCGAGGATAACGAAAGACGGGAGGCGTATCGGGT

6630

GRN

GRN-201

P E

ENSE...

GRN-201

TAGGTGATACCCAGCTCTGACAGATTCTGTCCCCAGCTGGAGGTGCTGTAAGCAGGAGAGGCGGGCTGGAGTAGGTAGGGGCTCGG  
ATCCACTATGGGTCGAGACTGTCTAAGCAGGGGTCGACCTCCACGACATTCTGCTCTCCGCCCGACCTCATCCATCCCCGAGCC

6715

GRN

GRN-201

GRN-201

CACTGCGCCCCACATAGTGGCTACCTACAACGCCCTTTCTGCCACCCCCCAGGCTGTCTGCTGCTCGGACCACCAGCACTGCT  
GTGACGCGGGGTGTATCACCGATGGATGTTGCGGGAAAGGACGGGTGGGGGGTCCGACAGACGACGAGCCTGGTGGTCTGTGACGA

6800

GRN

GRN-201

395 400  
A V C C S D H Q H C  
ENSE00000732199

GRN-201

GCCCCAGGGCTACACGTGTGTAGCTGAGGGGCAGTGTTCAGCGAGGAAGCGAGATCGTGGCTGGACTGGAGAAGATGCCTGCCCG  
CGGGGGTCCCGATGTGCACACATCGACTCCCCGTACAGTCTGCTCCTTCGCTCTAGCACCGACCTGACCTCTTCTACGGACGGGC

6885

GRN

GRN-201

405 410 415 420 425 430  
C P Q G Y T C V A E G Q C Q R G S E I V A G L E K M P A R  
ENSE00000732199

GRN-201

CCGGGCTTCCTTATCCCACCCAGAGACATCGGCTGTGACCAGCACACCAGCTGCCCGGTGGGGCAGACCTGCTGCCCGAGCCTG  
GGCCCCAAGGAATAGGGTGGGGTCTCTGTAGCCGACACTGGTCTGTGGTCTGACGGGCCACCCCGTCTGGACGACGGGCTCGGAC

6970

GRN

GRN-201

435 440 445 450 455 460  
R A S L S H P R D I G C D Q H T S C P V G Q T C C P S L  
ENSE00000732199

GRN-201

GGTGGGAGCTGGGCCTGCTGCCAGTTGCCCCATGTGAGTGCCTCCCTGCCTGCCCTGGATAGGGGAGCTAAGCCCAGTGAGGGG  
CCACCCTCGACCCGGACGACGGTCAACGGGGTACACTCACGGAGGGACGGACGGGGACCTATCCCCTCGATTTCGGGTCACCTCCC

7055

GRN

GRN-201

465 470  
G G S W A C C Q L P H  
ENSE00000732199

GRN-201

ACAGGAACATAATGCCATTCTGTGCTCCCTTCCCGCCAGGCTGTGTGCTGCGAGGATCGCCAGCACTGCTGCCCGGCTGGCTAC  
TGTCTTGTATTACGGTAAGACACGAGGGAAGGGGCGGTCCGACACACGACGCTCCTAGCGGTCGTGACGACGGGCCGACCGATG

7140

GRN

GRN-201

A V C C E D R Q H C C P A G Y  
ENSE00000732197  
GRN-201

ACCTGCAACGTGAAGGCTCGATCCTGCGAGAAGGAAGTGGTCTCTGCCAGCCTGCCACCTTCTGGCCCGTAGCCCTCACGTGG  
TGGACGTTGCACTTCCGAGCTAGGACGCTCTTCTTACCAGAGACGGGTCGGACGGTGGAAGGACCGGGCATCGGGAGTGCACC

7225

GRN

GRN-201

T C N V K A R S C E K E V V S A Q P A T F L A R S P H V  
ENSE00000732197  
GRN-201

GTGTGAAGGACGTGGAGTGTGGGGAAGGACACTTCTGCCATGATAACCAGACCTGCTGCCGAGACAACCGACAGGGCTGGGCCTG  
CACACTTCTGCACCTCACACCCCTTCTGTGAAGACGGTACTATTGGTCTGGACGACGGCTCTGTTGGCTGTCCCGACCCGGAC

7310

GRN

GRN-201

G V K D V E C G E G H F C H D N Q T C C R D N R Q G W A C  
ENSE00000732197  
GRN-201

CTGTCCCTACCGCCAGGTCAGTGCCAACCCCATCCTGGGGCTGGGTATGGCCAGGGACAGGTCCCACCTCGTCCAACCCCTCTC  
GACAGGGATGGCGGTCCAGTCACGGTTGGGGGTAGGACCCCGACCCATACCGGTCCCTGGTCCAGGGTGGAGCAGGTTGGGAGAG

7395

GRN

GRN-201

C P Y R Q  
ENSE00000732197  
GRN-201

GCCCCCTCTGACCATCCAGGGCGTCTGTTGTGCTGATCGGCGCCACTGCTGTCTGCTGGCTTCCGCTGCGCAGCCAGGGGTAC  
CGGGGGGAGACTGGTAGGTCCCGCAGACAACACGACTAGCCGCGGTGACGACAGGACGACCGAAGGCGACGCGTCCGTTCCCATG

7480

GRN

GRN-201

G V C C A D R R H C C P A G F R C A A R G T  
ENSE00001376066  
GRN-201

CAAGTGTGTTGCGCAGGGAGGCCCGCGCTGGGACGCCCTTTGAGGGACCCAGCCTTGAGACAGCTGCTGTGAGGGACAGTACTG  
GTTCAAAAACGCGTCCCTCCGGGGCGCGACCCCTGCGGGGAAACTCCCTGGGTCCGAACTCTGTCGACGACACTCCCTGTTCATGAC

7565

GRN

GRN-201

K C L R R E A P R W D A P L R D P A L R Q L L  
ENSE00001376066  
GRN-201

AAGACTCTGCAGCCCTCGGGACCCCACTCGGAGGGTGCCTCTGCTCAGGCCTCCCTAGCACCTCCCCCTAACCAAATTCTCCCT  
TTCTGAGACGTCGGGAGCCCTGGGGTGAGCCTCCACGGGAGACGAGTCCGGAGGGATCGTGGAGGGGGATTGGTTTAAGAGGGA

7650

GRN

GRN-201

GGACCCCATTTCTGAGCTCCCATCACCATGGGAGGTGGGGCCTCAATCTAAGGCCTTCCCTGTCAGAAGGGGGTTGTGGCAAAAAG  
CCTGGGGTAAGACTCGAGGGGTAGTGGTACCCTCCACCCGGGAGTTAGATTCCGGAAGGGGACAGTCTTCCCCAACACCGTTTTTC

7735

GRN

GRN-201

CCACATTACAAGCTGCCATCCCCTCCCGTTTTAGTGGACCCTGTGGCCAGGTGCTTTTCCCTATCCACAGGGGTGTTTGTGTGT  
GGTGTAAATGTTTCGACGGTAGGGGAGGGGCAAAGTCACCTGGGACACCGGTCCACGAAAAGGGATAGGTGTCCCCACAAACACACA

7820

GRN

GRN-201

GTGCGCGTGTGCGTTTTCAATAAAGTTTGTACACTTTCTTAA  
CACGCGCACACGCAAAGTTATTTCAAACATGTGAAAGAATT

3'

7861

5'

GRN









GRN-201

Feature	Location	Size	Type
✓ <b>GRN</b>	1 .. 7861	7861 bp	gene
/note	= gene <a href="#">ENSG00000030582</a> Protein coding		
<b>GRN-212</b>	1 .. 4649	4649 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000588170</a> Retained intron		
<b>GRN-215</b>	17 .. 4491	4475 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000589536</a>		
<b>GRN-209</b>	20 .. 5042	5023 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000587518</a>		
<b>GRN-207</b>	20 .. 4229	4210 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000587109</a>		
<b>GRN-211</b>	37 .. 5224	5188 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000588143</a>		
<b>GRN-221</b>	53 .. 5080	5028 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000593167</a>		
✓ <b>GRN-201</b>	57 .. 7861	7805 bp	prim_transcript
/note	= primary transcript <a href="#">ENST0000053867</a>		
<b>GRN-213</b>	57 .. 5799	5743 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000588237</a>		
<b>GRN-208</b>	57 .. 5266	5210 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000587387</a>		
<b>GRN-220</b>	57 .. 5059	5003 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000592783</a>		
<b>GRN-218</b>	57 .. 5038	4982 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000591740</a>		
<b>GRN-219</b>	57 .. 4544	4488 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000592323</a> Retained intron		
<b>GRN-203</b>	57 .. 4030	3974 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000585512</a>		
<b>GRN-214</b>	60 .. 7837	7778 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000589265</a>		
<b>GRN-210</b>	61 .. 4566	4506 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000587958</a> Retained intron		
<b>GRN-206</b>	69 .. 5918	5850 bp	prim_transcript
/note	= primary transcript <a href="#">ENST00000586782</a> Nonsense mediated decay		
✓ <b>GRN-201</b>	3920 .. 7553	3634 bp	CDS
▶ 12 segments = 1782 bp			
/note	= coding sequence <a href="#">ENSP00000053867</a>		
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,, AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVMVDGWSGCCPMPQ,,ASCCEDRVHCCPHGAFCDLV HTRCITPTGTHTPLAKKLPARTNRA,,VALSSVMCPDARSRCPDGSTCCCELPSTGKYGCCPMPN,,ATCCSDHLHCCPQDTVCDLIQSKLSK ENATDDLTKLPAHT,,VGDVKCDMEVSCPDPGYTCCRLQSGAWGCCPFTQ,,AVCCEDIHCCPAGFTCDTQKGTCEQGPHQVPWMEKAPA HLSLPDPQALKRDVPCDNVSSCPSSDTCCQLTSGEWGCCPIPE,,AVCCSDHQHCCPQGYTCVAEGQCQRGSEIVAGLEKMPARRASLSH PRDIGCDQHTSCPVGQTCPPSLGGSWACCQLPH,,AVCCEDRQHCCPAGYTCNVKARSCEKEV VSAQPATFLARSPHVGVKDVCEGEGHF SDHQTGGRNRQGVKQBYRQ,,GVCCADRRHCCPAGFRCAARGTKCLLRREAPRWDAPLRDPALRQLL*		

Feature	Location	Size		Type
<b>GRN-214</b>	3920 .. 7553	3634 bp	■ →	CDS
▶ 8 segments = 1311 bp				
/note	= coding sequence <a href="#">ENSP00000467616</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVMVDGSWGCCPMPQ,,AVCCEDHIHCCPAGFTCDTQKGTCEQGPHQVPMMEKAPAHLSLPDPQALKRDVPCDNVSSCPSSDTCCQLTSGEWGCCPIE,,AVCCSDHQHCCPQGYTCVAEGQCQRGSEIVAGLEKMPARRASLSHPRDIGCDQHTSCLVGVQTCPSLGGSWACCQLPH,,AVCCEDRQHCCPAGYTCNVKARSCEKEVSAQPATFLARSPHVGVKDVCEGEGHFCHDNQTCCRDNRQGWACCPYRQ,,GVCCADRRHCCPAGFRCAARGTKCLRREAPRWDAPLRDPALRQLL* 436 amino acids = 46.8 kDa			
<b>GRN-222</b>	3920 .. 7550	3631 bp	■ →	CDS
▶ 11 segments = 1314 bp				
/note	= coding sequence <a href="#">ENSP00000492014</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVMVDGSWGCCPMPQ,,ASCCEDRVHCCPHGAFCDLVHTRCITPTGTHPLAKKLPAQRTNRA,,VALSSVMCPDARSRCPDGSTCCLEPSGKYGCCPMPN,,ATCCSDHLHCCPQDTVCDLIQSKCLSKENATDLDLLKLAHT,,VGDVVKDMEVSCPDPGYTCRLQSGAWGCCPFTQ,,AVCCEDHIHCCPAGFTCDTQKGTCEQGPHQVPMMEKAPAHLSLPDPQALKRDVPCDNVSSCPSSDTCC,,RDNRQGWACCPYRQ,,GVCCADRRHCCPAGFRCAARGTKCLRREAPRWDAPLRDPALRQLL 438 amino acids = 47.0 kDa			
<b>GRN-222</b>	3920 .. 7550	3631 bp	■ →	prim_transcript
/note	= primary transcript <a href="#">ENST00000639447</a>			
<b>GRN-213</b>	3920 .. 5799	1880 bp	■ →	CDS
▶ 5 segments = 518 bp				
/note	= coding sequence <a href="#">ENSP00000466611</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,ASCCEDRVHCCPHGAFCDLVHTRCITPTGTHPLAKKLPAQRTNRA,,VALSSVMCPDARSRCPDGSTCCLEPSGKYGCCPMPN,,AT 172 amino acids = 18.1 kDa			
<b>GRN-208</b>	3920 .. 5266	1347 bp	■ →	CDS
▶ 5 segments = 574 bp				
/note	= coding sequence <a href="#">ENSP00000467431</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,IKGPCQCRFLCVPQAVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVMVDGSWGCCPMPQ,,ASCCEDRVHTRCITPTGTHPLAKKLPAQRTNRA,,VALSSVMCPDARSRCPDGSTCCLEPSGKYGCCPMPN,,AT 172 amino acids = 18.1 kDa			
<b>GRN-211</b>	3920 .. 5224	1305 bp	■ →	CDS
▶ 5 segments = 490 bp				
/note	= coding sequence <a href="#">ENSP00000465375</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVMVDGSWGCCPMPQ,,ASCCEDRVH 163 amino acids = 17.1 kDa			
<b>GRN-221</b>	3920 .. 5080	1161 bp	■ →	CDS
▶ 4 segments = 447 bp				
/note	= coding sequence <a href="#">ENSP00000466405</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVMVDGSWG 149 amino acids = 15.6 kDa			
<b>GRN-220</b>	3920 .. 5059	1140 bp	■ →	CDS
▶ 4 segments = 426 bp				
/note	= coding sequence <a href="#">ENSP00000467870</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDFSTCCVM 142 amino acids = 14.9 kDa			
<b>GRN-209</b>	3920 .. 5042	1123 bp	■ →	CDS
▶ 4 segments = 409 bp				
/note	= coding sequence <a href="#">ENSP00000465518</a>			
/translation	= MWTLVSWVALTAGLVAGTRCPDGQFCPVACCLDPGGASYSCCRPLL,,DKWPTTLSRHLGGPCQVDAHCSAGHSCIFTVSGTSSCCPFPE,,AVACGDGHHCCPRGFHCSADGRSCFQRS,,GNNSVGAIQCPDSQFECPDF 136 amino acids = 14.3 kDa			





Primer	Length		Binding Sites		Tm	Date Added
✓ <b>PCR Forward</b>	20-mer		4738 .. 4757		59°C	Jun 17, 2022
/sequence	= GAGCTGGGCCGGTCTAATAC 60% GC / 6158.1 Da					
✓ <b>Sanger Sequencing Primer</b>	20-mer		4738 .. 4757		59°C	Jun 17, 2022
/sequence	= GAGCTGGGCCGGTCTAATAC 60% GC / 6158.1 Da					
✓ <b>Donor Template SNV -&gt; REV</b>	100-mer		4942 .. 5041		79°C	Jun 17, 2022
/sequence	= cctgagtgggctggtagtagtacctgggtcatcttgtccacagGTAACAACCTCCGTGGGTGCCATCCAGTGCCCTGATAGTCAGTTCGAATGCCCGGACTT 66% GC / 30,799.9 Da					
✓ <b>gRNA Protospacer</b>	20-mer		5007 .. 5023		52°C	Jun 17, 2022
/sequence	= CTGACTATCAGGGCACTAGA 50% GC / 6126.1 Da					
✓ <b>PCR Reverse</b>	20-mer		5166 .. 5185		57°C	Jun 17, 2022
/sequence	= TGGTCCTGACTCCGTCTTCA 55% GC / 6035.0 Da					