

Additional file 3: Nucleotide sequence of the sgRNA expression cassettes. Blue letters indicate the U6 promoter. Orange letters indicate the RNA polymerase III U6 snRNA gene. Red letters indicate the sgRNA scaffold. Green letters indicate the target sequence of *amdS*, *cre-1*, *res-1*, *ghl-1*, or *alp-1*, respectively.

>RNA polymerase III U6 snRNA gene

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AGGATCGGTGGAGTGAAGTTCGGAATCGAGGTTTCGGCGATGGGTCGTAAGCATGGCGACTTCGAACTTACTTGC
ACTGGCAAAGCGTTGCCAGAACGGCGAGAAAAAGAAGGGTAAGCGATATTCGCGTCATGATGGACTGTTCTTTT
TGGAACAGTAGTTGTTGTGGGAAGACTATGTCACACTTGCCACCTGCAAGGCCAGGGTCGTGGTTCGAACGAG
ACCAGCCTCGGCGCTGCTGGGAGCTCAAGATGGGCACGTTTGATTTCGTTAGACGTCAACAAGGCTGGAGTTCC
TAGTGACAGCCAAAGGCACAGCCACATTAAGTGGCGCTTTATCTGTCCACTAAGGTTCAATTGTGGCTTTGAGC
CGCGCAGTGTGCAGTCGTGCATTGGCCACCTAGCTAGCAGTATTAAGATCCTCTTCTCTCCCGAGATCTTCCTC
CTCTCTTTTCTTTCTTTCTCCTCGCCCTTCGGGGCATTGGTCAATTTGAAACGATACAGAGAAGATTAGCA
TGGCCCTGCACTAAGGATGACACGCTACTCAAAGAGACGCTACCAATTTTTTT
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>sgRNA-*amdS* expression cassette with U6 promoter

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AGGATCGGTGGAGTGAAGTTCGGAATCGAGGTTTCGGCGATGGGTCGTAAGCATGGCGACTTCGAACTTACTTGC
ACTGGCAAAGCGTTGCCAGAACGGCGAGAAAAAGAAGGGTAAGCGATATTCGCGTCATGATGGACTGTTCTTTT
TGGAACAGTAGTTGTTGTGGGAAGACTATGTCACACTTGCCACCTGCAAGGCCAGGGTCGTGGTTCGAACGAG
ACCAGCCTCGGCGCTGCTGGGAGCTCAAGATGGGCACGTTTGATTTCGTTAGACGTCAACAAGGCTGGAGTTCC
TAGTGACAGCCAAAGGCACAGCCACATTAAGTGGCGCTTTATCTGTCCACTAAGGTTCAATTGTGGCTTTGAGC
CGCGCAGTGTGCAGTCGTGCATTGGCCACCTAGCTAGCAGTATTAAGATCCTCTTCTCTCCCGAGATCTTCCTC
CTCTCTTTTCTTTCTTTCTCCTCGGGAACAGCATGGAGGGTGTGTTTAGAGCTAGAAATAGCAAGTTAAATAA
GGCTAGTCCGTTATCAACTTGAAAAGTGGCACCGAGTCGGTGCTTTTTTT
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>sgRNA-*cre-1* expression cassette with U6 promoter

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AGGATCGGTGGAGTGAAGTTCGGAATCGAGGTTTCGGCGATGGGTCGTAAGCATGGCGACTTCGAACTTACTTGC
ACTGGCAAAGCGTTGCCAGAACGGCGAGAAAAAGAAGGGTAAGCGATATTCGCGTCATGATGGACTGTTCTTTT
TGGAACAGTAGTTGTTGTGGGAAGACTATGTCACACTTGCCACCTGCAAGGCCAGGGTCGTGGTTCGAACGAG
ACCAGCCTCGGCGCTGCTGGGAGCTCAAGATGGGCACGTTTGATTTCGTTAGACGTCAACAAGGCTGGAGTTCC
TAGTGACAGCCAAAGGCACAGCCACATTAAGTGGCGCTTTATCTGTCCACTAAGGTTCAATTGTGGCTTTGAGC
CGCGCAGTGTGCAGTCGTGCATTGGCCACCTAGCTAGCAGTATTAAGATCCTCTTCTCTCCCGAGATCTTCCTC
CTCTCTTTTCTTTCTTTCTCCTCGAACGCGCAAAGTCTGCAGGTTTAGAGCTAGAAATAGCAAGTTAAATAA
GGCTAGTCCGTTATCAACTTGAAAAGTGGCACCGAGTCGGTGCTTTTTTT
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>sgRNA-*res-1* expression cassette with U6 promoter

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AGGATCGGTGGAGTGAAGTTCGGAATCGAGGTTTCGGCGATGGGTCGTAAGCATGGCGACTTCGAACTTACTTGC
ACTGGCAAAGCGTTGCCAGAACGGCGAGAAAAAGAAGGGTAAGCGATATTCGCGTCATGATGGACTGTTCTTTT
TGGAACAGTAGTTGTTGTGGGAAGACTATGTCACACTTGCCACCTGCAAGGCCAGGGTCGTGGTTCGAACGAG
ACCAGCCTCGGCGCTGCTGGGAGCTCAAGATGGGCACGTTTGATTTCGTTAGACGTCAACAAGGCTGGAGTTCC
TAGTGACAGCCAAAGGCACAGCCACATTAAGTGGCGCTTTATCTGTCCACTAAGGTTCAATTGTGGCTTTGAGC
CGCGCAGTGTGCAGTCGTGCATTGGCCACCTAGCTAGCAGTATTAAGATCCTCTTCTCTCCCGAGATCTTCCTC
CTCTCTTTTCTTTCTTTCTCCTCGCCCTATGAGCCCTCGTACCGTTTTAGAGCTAGAAATAGCAAGTTAAATAA
GCTAGTCCGTTATCAACTTGAAAAGTGGCACCGAGTCGGTGCTTTTTTT
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>sgRNA-*ghl-1* expression cassette with U6 promoter

AGGATCGGTGGAGTGAAGTTCGGAATCGAGGTTGCGCGATGGGTCGTAAGCATGGCGACTTCGAACTTACTTGC
ACTGGCAAGCGTTGCCAGAACGGCGAGAAAAAGAAGGGTAAGCGATATTCGCGTCATGATGGACTGTTCTTT
TGGAACAGTAGTTGTTGTGGGAAGACTATGTCACACTTGCCACCTGCAAGGCCAGGGTCGTGGTTCGAACGAG
ACCAGCCTCGGCGCTGCTGGGAGCTCAAGATGGGCACGTTTGATTTCGTTAGACGTCAACAAGGCTGGAGTTCC
TAGTGACAGCCAAAGGCACAGCCACATTAAGTGGCGCTTTATCTGTCCACTAAGGTTCAATTGTGGCTTTGAGC
CGCGCAGTGTGCAGTCGTGCATTGGCCACCTAGCTAGCAGTATTAAGATCCTCTTCTCTCCCGAGATCTTCCTC
CTCTTCTTTTCTTTCTTTCTCCTCGACACATTCTGCGCCATCCGTTTTAGAGCTAGAAAATAGCAAGTTAAAATAAG
GCTAGTCCGTTATCAACTTGAAAAAGTGGCACCGAGTCGGTGCTTTTTTT

>sgRNA-*alp-1* expression cassette with U6 promoter

AGGATCGGTGGAGTGAAGTTCGGAATCGAGGTTGCGCGATGGGTCGTAAGCATGGCGACTTCGAACTTACTTGC
ACTGGCAAGCGTTGCCAGAACGGCGAGAAAAAGAAGGGTAAGCGATATTCGCGTCATGATGGACTGTTCTTT
TGGAACAGTAGTTGTTGTGGGAAGACTATGTCACACTTGCCACCTGCAAGGCCAGGGTCGTGGTTCGAACGAG
ACCAGCCTCGGCGCTGCTGGGAGCTCAAGATGGGCACGTTTGATTTCGTTAGACGTCAACAAGGCTGGAGTTCC
TAGTGACAGCCAAAGGCACAGCCACATTAAGTGGCGCTTTATCTGTCCACTAAGGTTCAATTGTGGCTTTGAGC
CGCGCAGTGTGCAGTCGTGCATTGGCCACCTAGCTAGCAGTATTAAGATCCTCTTCTCTCCCGAGATCTTCCTC
CTCTTCTTTTCTTTCTTTCTCCTCGTCTACCGCGGCAAGTTCAGTTTTAGAGCTAGAAAATAGCAAGTTAAAATAA
GGCTAGTCCGTTATCAACTTGAAAAAGTGGCACCGAGTCGGTGCTTTTTTT