34	sgRNA sequence used for miR390 targeting in CRISPR/CAS9 system- GEiGS#3
35	mature GEiGS-siRNA targeting GFP- used in SWAP5 (based on miR390) and in SWAP1 (based on miR173)
36	Complementary strand of mature GEiGS-siRNA targeting GFP- used in SWAP5 (based on miR390) and in SWAP1 (based on miR173)
37	mature GEiGS-siRNA targeting GFP- used in SWAP6 (based on miR390) and in SWAP2 (based on miR173)
38	Complementary strand of mature GEiGS-siRNA targeting GFP- used in SWAP6 (based on miR390) and in SWAP2 (based on miR173)
39	mature GEiGS-siRNA targeting AtPDS3- used in SWAP7 (based on miR390) and in SWAP3 (based on miR173)
40	Complementary strand of mature GEiGS-siRNA targeting AtPDS3- used in SWAP7 (based on miR390) and in SWAP3 (based on miR173)
41	mature GEiGS-siRNA targeting AtPDS3- used in SWAP8 (based on miR390) and in SWAP4 (based on miR173)
42	Complementary strand of mature GEiGS-siRNA targeting AtPDS3- used in SWAP8 (based on miR390) and in SWAP4 (based on miR173)
43	mature GEiGS-siRNA targeting AtADH1- used in SWAP11 (based on miR390) and in SWAP9 (based on miR173)
44	Complementary strand of mature GEiGS-siRNA targeting AtADH1- used in SWAP11 (based on miR390) and in SWAP9 (based on miR173)
45	mature GEiGS-siRNA targeting AtADH1- used in SWAP12 (based on miR390) and in SWAP10 (based on miR173)
46	Complementary strand of mature GEiGS-siRNA targeting AtADH1- used in SWAP12 (based on miR390) and in SWAP10 (based on miR173)
47	Primary transcript of miR173 (pri-miR173)
48	Primary transcript of SWAP1 (used in Donor vector for targeting GFP)
49	Primary transcript of SWAP2 (used in Donor vector for targeting GFP)
50	Primary transcript of SWAP3 (used in Donor vector for targeting PDS3)

WHAT IS CLAIMED IS:

1. A method of modifying a gene encoding or processed into a RNA silencing molecule to a target RNA in a eukaryotic cell, with the proviso that said eukaryotic cell is not a plant cell, the method comprising introducing into the eukaryotic cell a DNA editing agent which redirects a silencing specificity of said RNA silencing molecule towards a second target RNA, said target RNA and said second target RNA being distinct, thereby modifying the gene encoding the RNA silencing molecule.

2. The method of claim 1, wherein the gene encoding the RNA silencing molecule is endogenous to the eukaryotic cell.

3. The method of any one of claims 1 or 2, wherein said modifying said gene encoding said RNA silencing molecule comprises imparting said RNA silencing molecule with at least 45 % complementarity towards said second target RNA.

4. The method of any one of claims 1-3, wherein said silencing specificity of said RNA silencing molecule is determined by measuring a RNA or protein level of said second target RNA, and/or is determined phenotypically and/or is determined genotypically.

5. A method of modifying a gene encoding or processed into a non-coding RNA molecule having no RNA silencing activity in a eukaryotic cell, with the proviso that said eukaryotic cell is not a plant cell, the method comprising introducing into the eukaryotic cell a DNA editing agent conferring a silencing specificity of said non-coding RNA molecule towards a target RNA of interest, thereby modifying the gene encoding or processed into the non-coding RNA molecule.

6. The method of any one of claims 1-5, wherein said RNA silencing molecule or said non-coding RNA molecule is processed from a precursor,

optionally wherein said non-coding RNA molecule or said RNA silencing molecule is a RNA interference (RNAi) molecule,

optionally wherein said RNAi molecule is selected from the group consisting of a small interfering RNA (siRNA), a short hairpin RNA (shRNA), a microRNA (miRNA), a Piwi-interacting RNA (piRNA) and trans-acting siRNA (tasiRNA);

optionally wherein said RNAi molecule is modified to preserve secondary RNA structure and to be recognized by cellular RNAi factors.

7. The method of any one of claims 1-6, wherein said modifying said gene is affected by a modification selected from the group consisting of a deletion, an insertion, a point mutation and a combination thereof,

optionally wherein said modification is in a stem region of said non-coding RNA molecule or said RNA silencing molecule, is in a loop region of said RNA silencing molecule, is in a non-structured region of said RNA silencing molecule, is in a stem region and a loop region of said RNA silencing molecule, or is in a stem region and a loop region and in non-structured region of said RNA silencing molecule,

optionally wherein said modification comprises a modification of at most 200 nucleotides.

8. The method of claim 7, wherein said method further comprises introducing into said eukaryotic cell a donor oligonucleotide sequence.

9. The method of any one of claims 1-8, wherein said DNA editing agent comprises at least one gRNA,

optionally wherein said DNA editing agent comprises an endonuclease,

optionally wherein said DNA editing agent comprises a DNA editing system selected from the group consisting of a meganuclease, a zinc finger nucleases (ZFN), a transcription-activator like effector nuclease (TALEN) and CRISPR,

optionally wherein said endonuclease comprises Cas9.

10. The method of any one of claims 1-9, wherein said target RNA of interest or said second target RNA is endogenous or exogenous to said eukaryotic cell.

11. The method of claim 10, wherein said target RNA of interest or said second target RNA is associated with a cancer or with an infectious disease.

12. The method of any one of claims 1-11, wherein said eukaryotic cell is obtained from a eukaryotic organism selected from the group consisting of a mammal, an insect, a nematode, a bird, a reptile, a fish, a crustacean, a fungi and an algae.

13. The method of any one of claims 1-12, wherein said eukaryotic cell is a mammalian cell, optionally a non-human mammalian cell.

14. A method of generating a eukaryotic non-human organism, with the proviso that said organism is not a plant, wherein at least some of the cells of said organism comprise a modified gene encoding or processed into a non-coding RNA molecule or encoding or processed into a RNA silencing comprising a silencing specificity towards a target RNA of interest or a second target RNA, the method comprising modifying a gene according to the method of any one of claims 1-13, thereby generating the eukaryotic non-human organism.