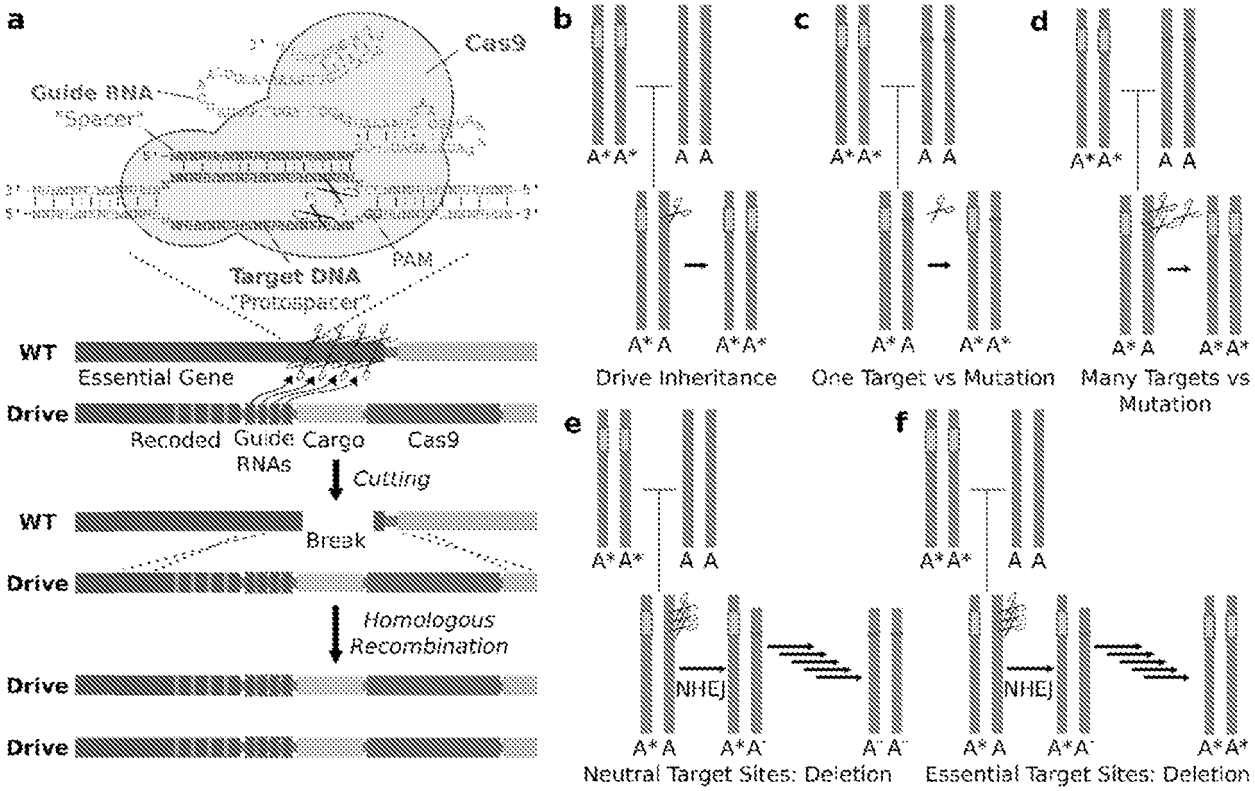


Figure 1

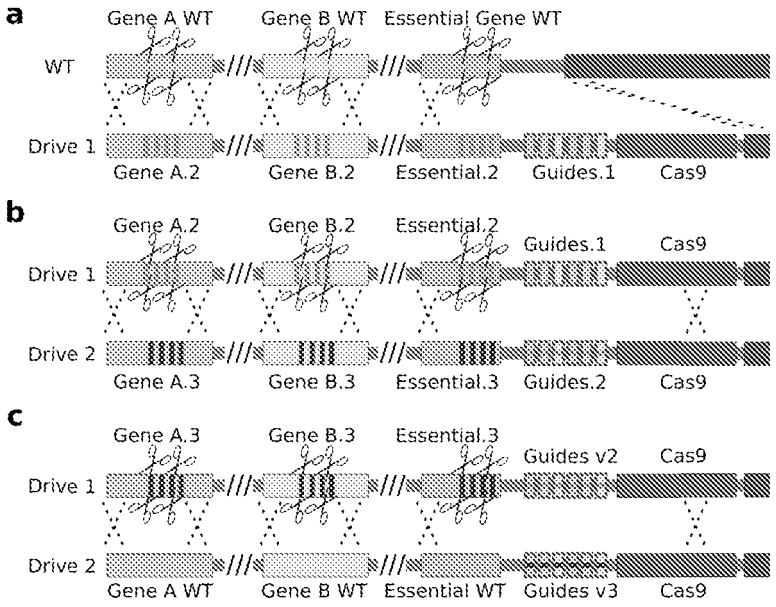


Figure 2

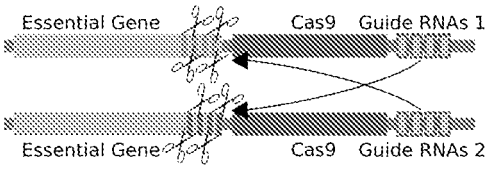

Essential Gene
Cas9
Guide RNAs 1
Essential Gene
Cas9
Guide RNAs 2

Figure 3

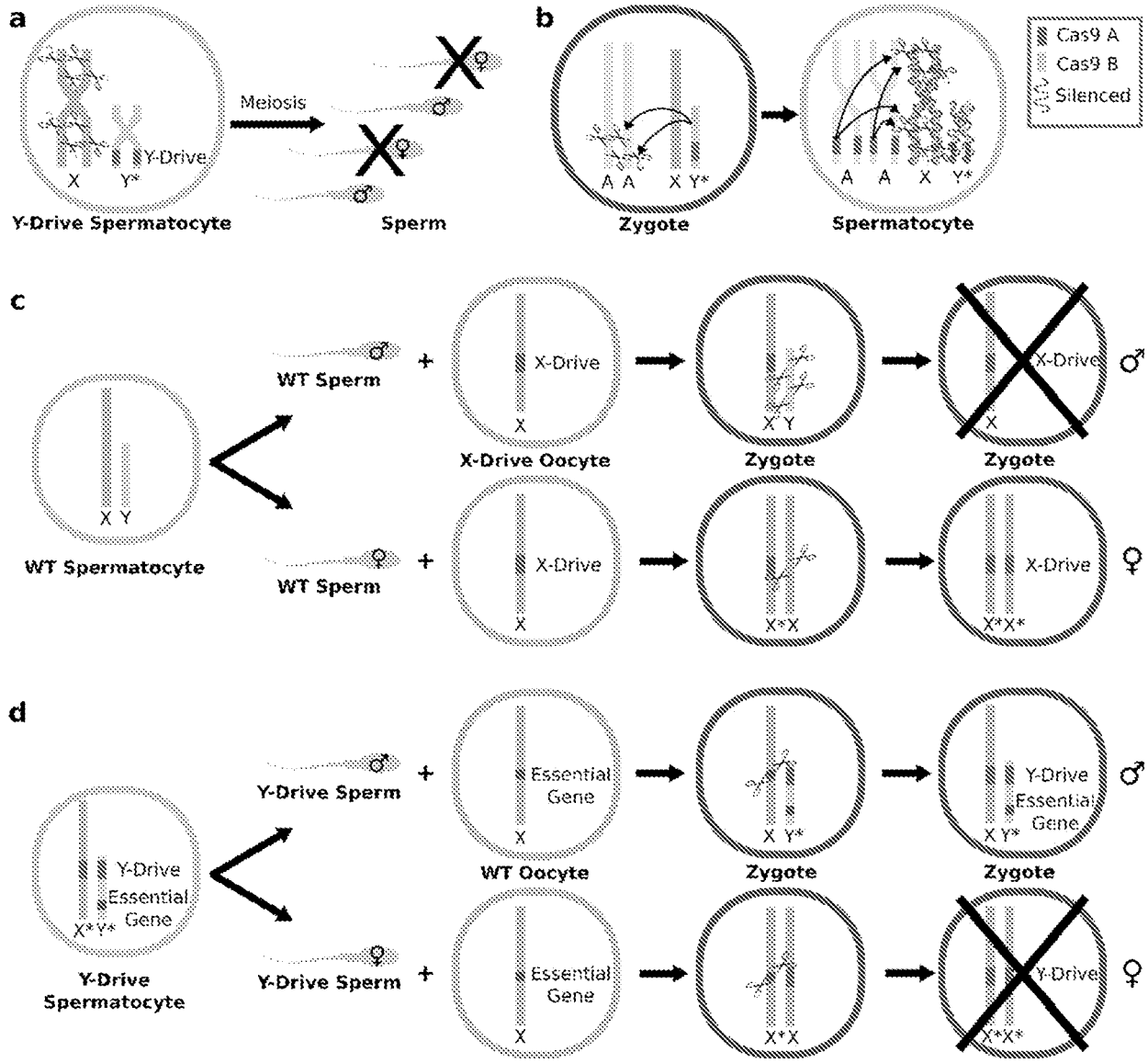


Figure 4

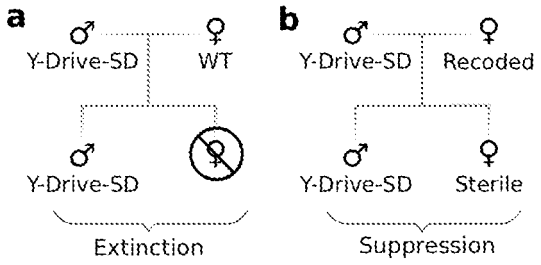


Figure 5

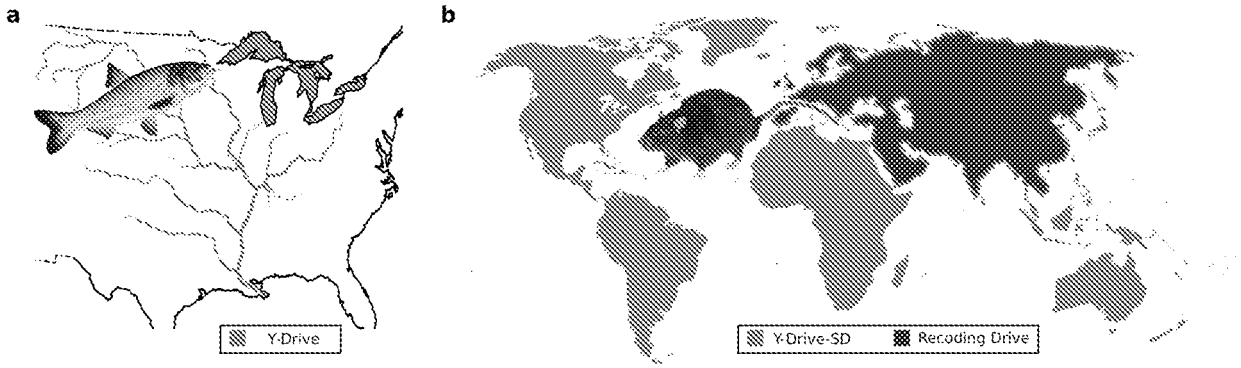


Figure 6

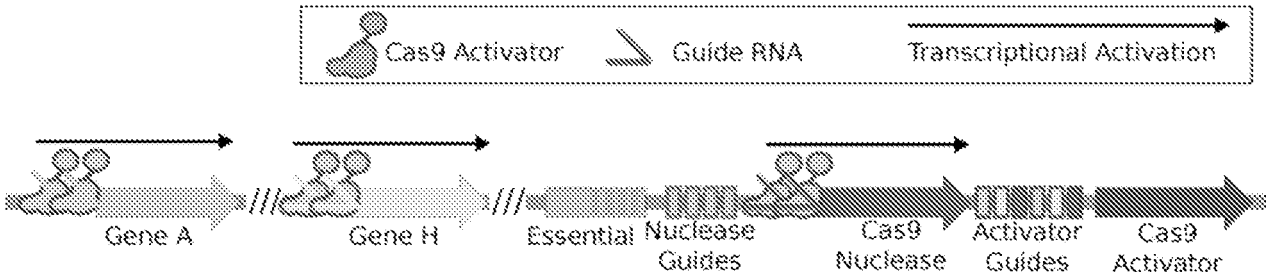

Cas9 Activator
Guide RNA
Transcriptional Activation
Gene A
Gene H
Essential
Nuclease Guides
Cas9 Nuclease
Activator Guides
Cas9 Activator

Figure 7

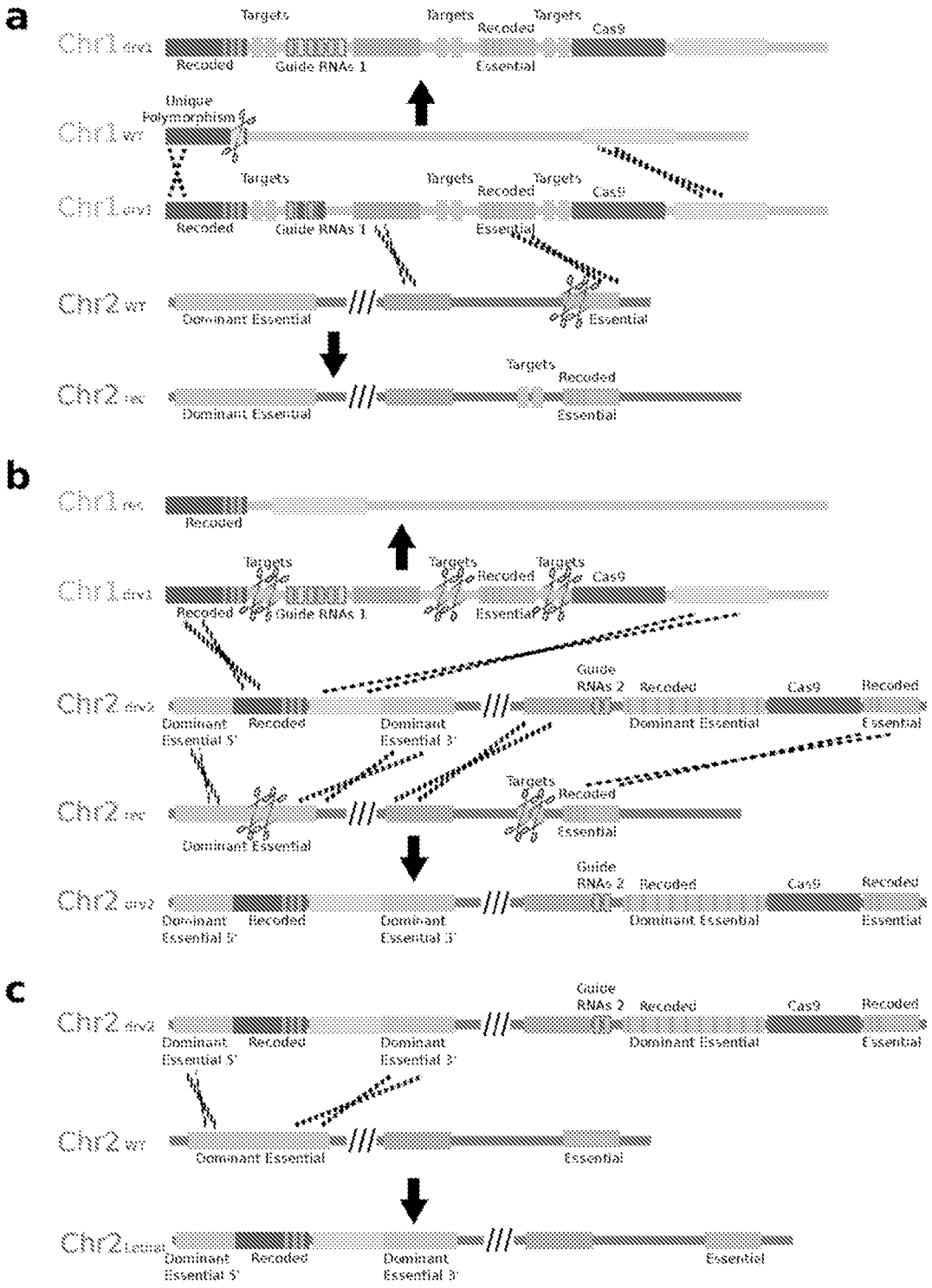

a
Chr1 drv1
Targets
Recoded
Guide RNAs 1
Targets
Essential
Targets
Recoded
Cas9
Chr1 wt
Unique
Polymorphism
Chr1 drv1
Chr2 wt
Dominant Essential
Essential
Chr2 rec
b
Chr1 rec
Chr1 drv1
Guide RNAs 3
Chr2 drv2
Guide
RNAs 2
Dominant
Essential 5'
Dominant
Essential 3'
c
Chr2 wt
Chr2 Lethal

Figure 8

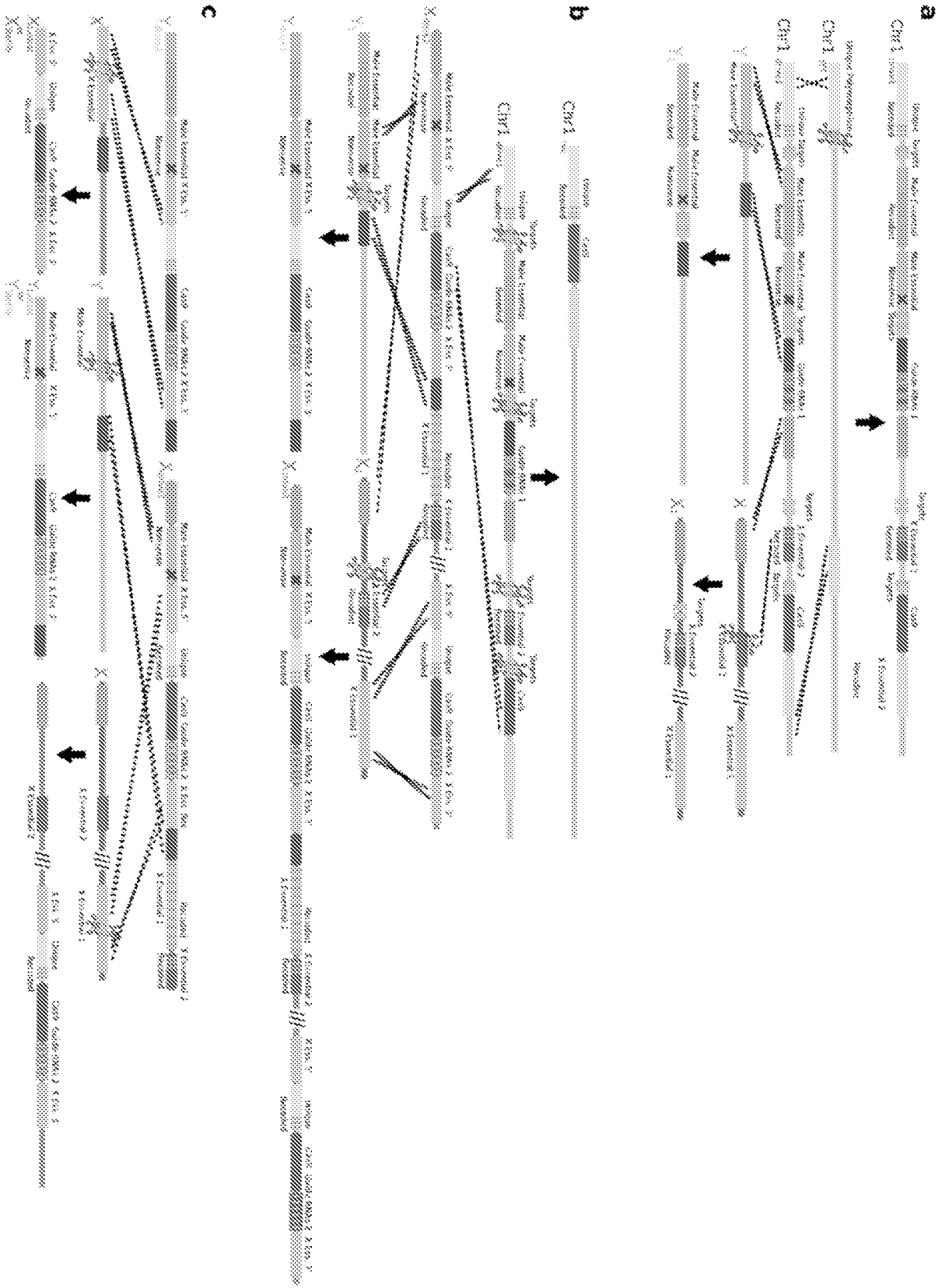


Figure 9

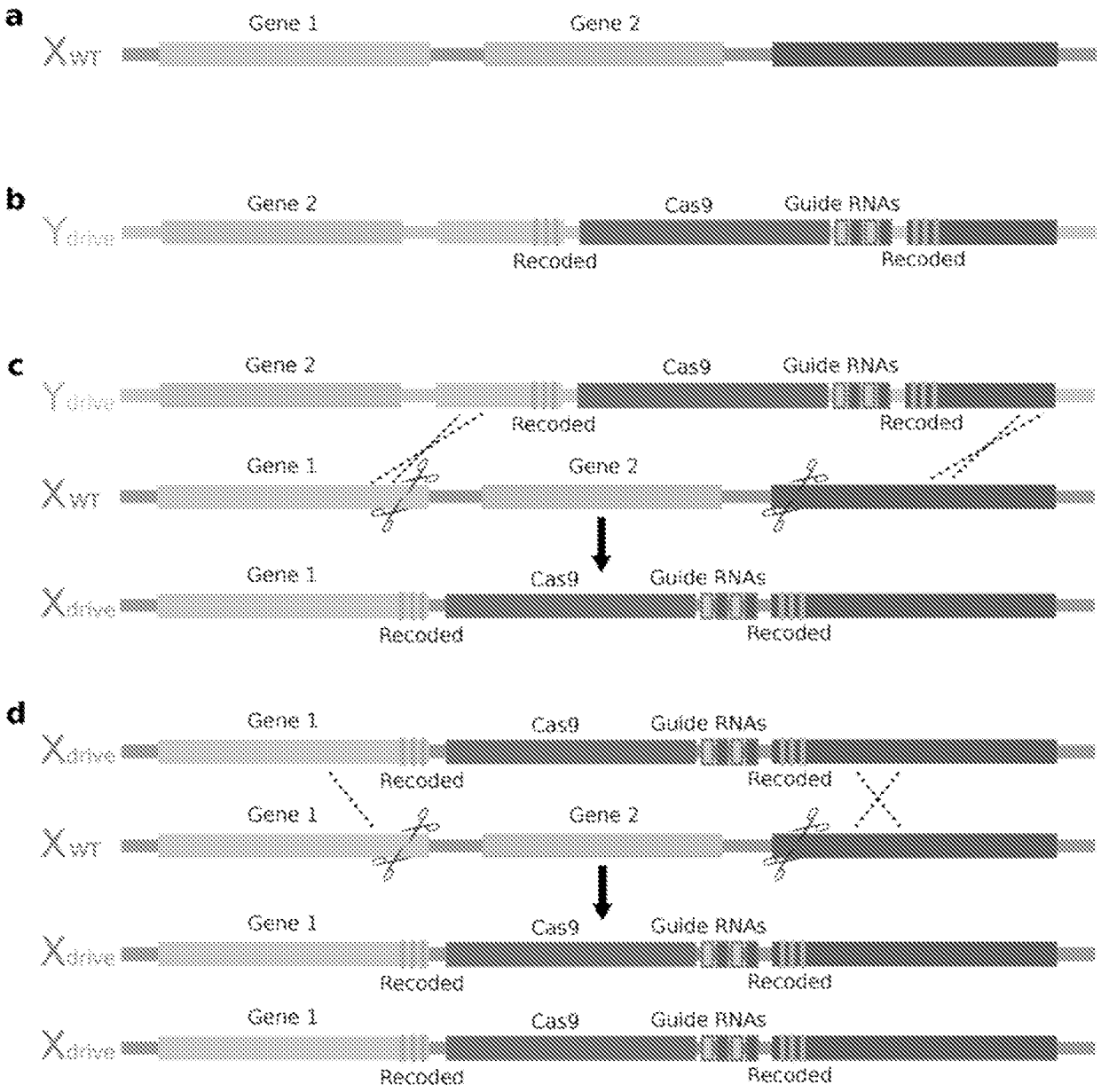

a
Gene 1
Gene 2
b
Gene 2
Cas9
Guide RNAs
Recoded
Recoded
c
Gene 2
Cas9
Guide RNAs
Recoded
Recoded
Gene 1
Gene 2
Gene 1
Cas9
Guide RNAs
Recoded
Recoded
d
Gene 1
Cas9
Guide RNAs
Recoded
Recoded
Gene 1
Gene 2
Gene 1
Cas9
Guide RNAs
Recoded
Recoded
Gene 1
Cas9
Guide RNAs
Recoded
Recoded

Figure 10

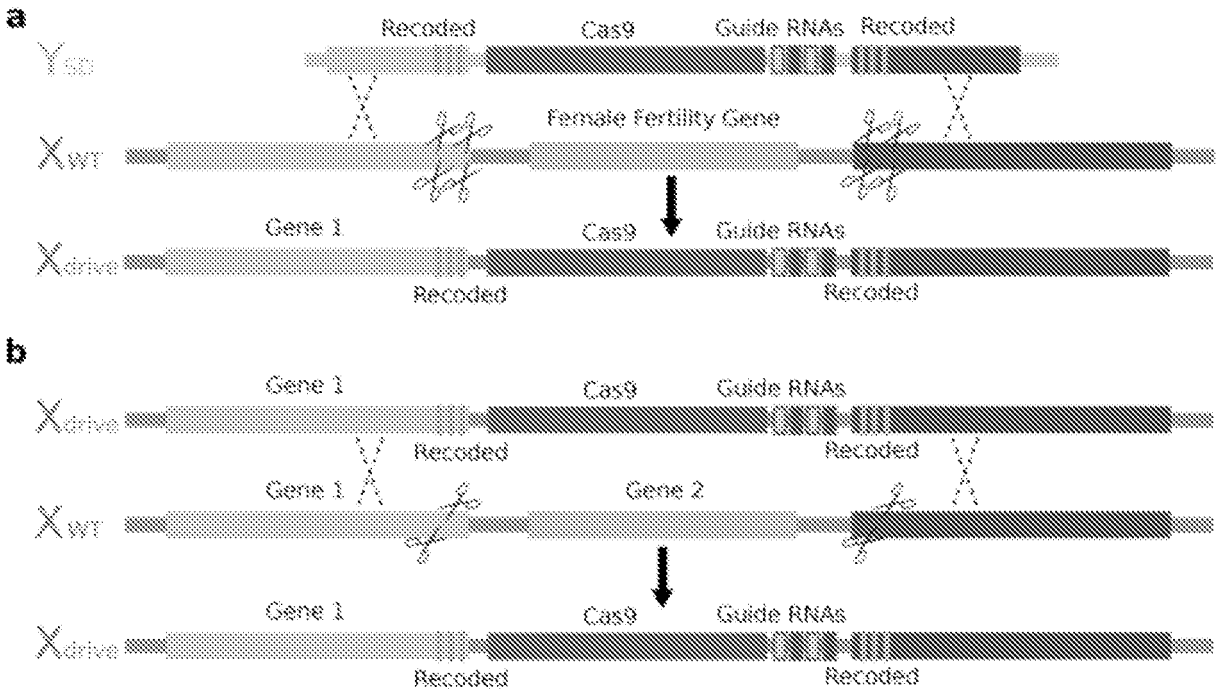

a
Recoded
Cas9
Guide RNAs
Recoded
Y_{SD}
Female Fertility Gene
X_{WT}
Gene 1
Cas9
Guide RNAs
X_{drive}
Recoded
Recoded
b
Gene 1
Cas9
Guide RNAs
X_{drive}
Recoded
Recoded
Gene 1
Gene 2
X_{WT}
Gene 1
Cas9
Guide RNAs
X_{drive}
Recoded
Recoded

Figure 11

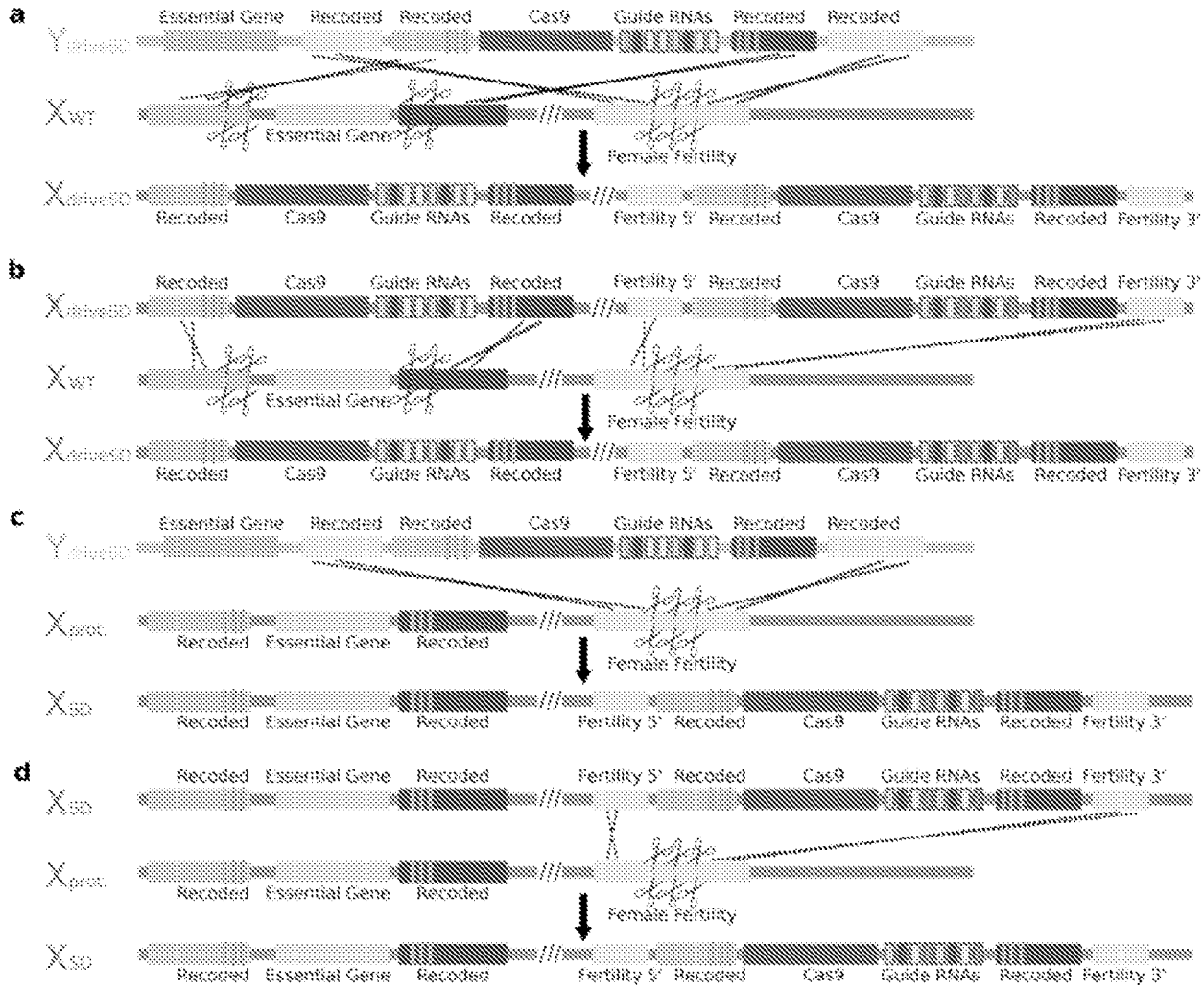

a
Essential Gene
Recoded
Recoded
Cas9
Guide RNAs
Recoded
Recoded
Essential Gene
Female Fertility
Recoded
Cas9
Guide RNAs
Recoded
Fertility 5'
Recoded
Cas9
Guide RNAs
Recoded
Fertility 3'
b
Recoded
Cas9
Guide RNAs
Recoded
Fertility 5'
Recoded
Cas9
Guide RNAs
Recoded
Fertility 3'
Essential Gene
Female Fertility
c
Essential Gene
Recoded
Recoded
Cas9
Guide RNAs
Recoded
Recoded
Recoded
Essential Gene
Recoded
Female Fertility
Recoded
Essential Gene
Recoded
Fertility 5'
Recoded
Cas9
Guide RNAs
Recoded
Fertility 3'
d
Recoded
Essential Gene
Recoded
Fertility 5'
Recoded
Cas9
Guide RNAs
Recoded
Fertility 3'
Recoded
Essential Gene
Recoded
Female Fertility

Figure 12

Figure 13

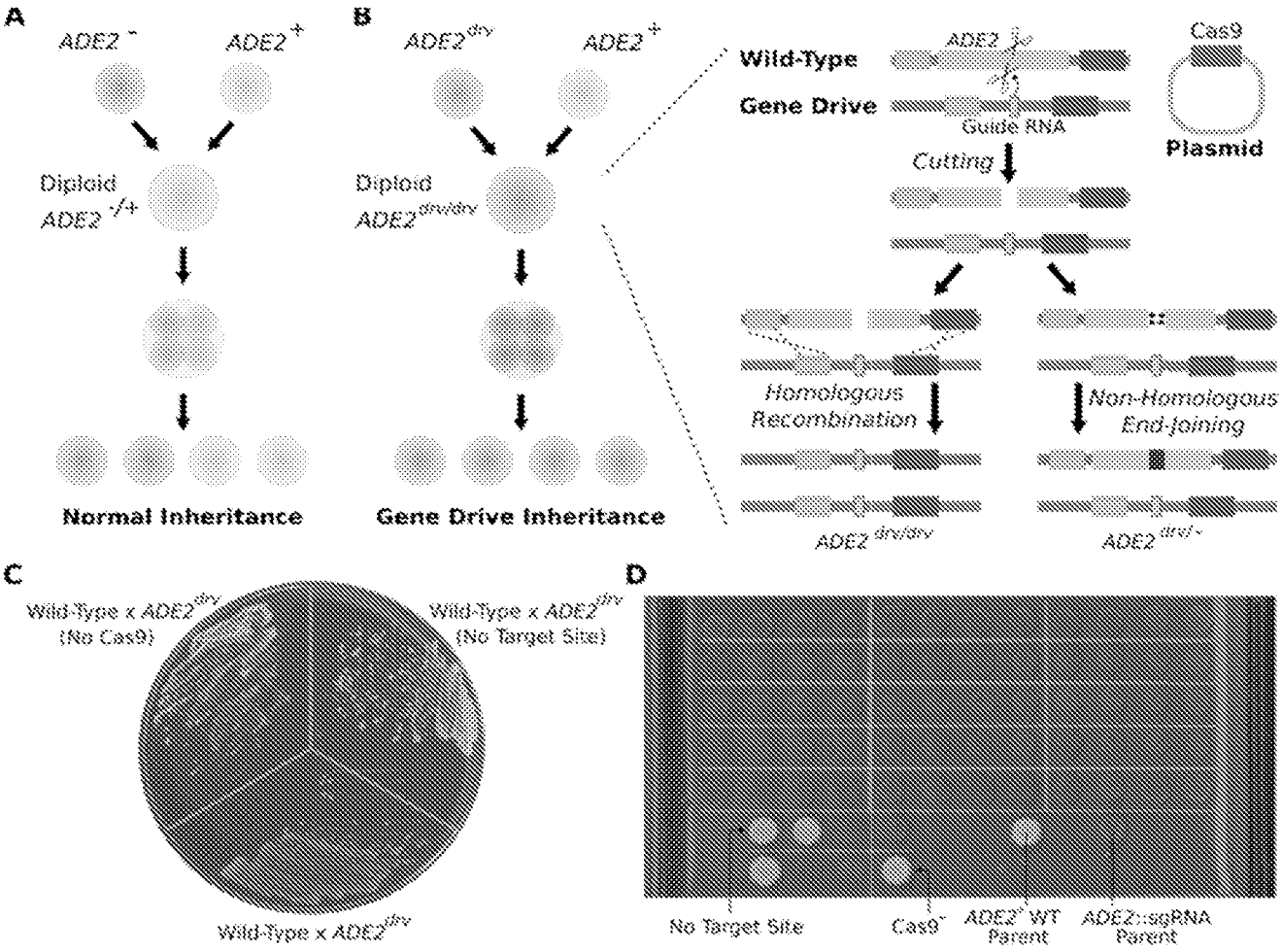

A
ADE2 -
ADE2 +
Diploid ADE2 -/+
Normal Inheritance
B
ADE2 drv
ADE2 +
Diploid ADE2 drv/drv
Gene Drive Inheritance
Wild-Type
Gene Drive
ADE2
Guide RNA
Cas9
Plasmid
Cutting
Homologous Recombination
Non-Homologous End-joining
ADE2 drv/drv
ADE2 drv/-
C
Wild-Type x ADE2 drv (No Cas9)
Wild-Type x ADE2 drv (No Target Site)
Wild-Type x ADE2 drv
D
No Target Site
Cas9-
ADE2+ WT Parent
ADE2::sgRNA Parent

Figure 14

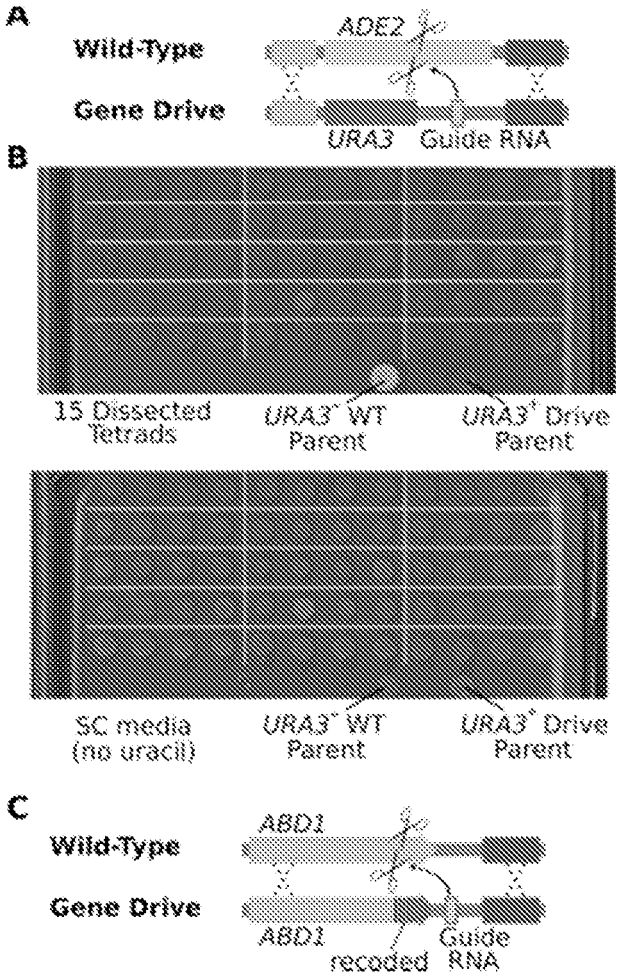
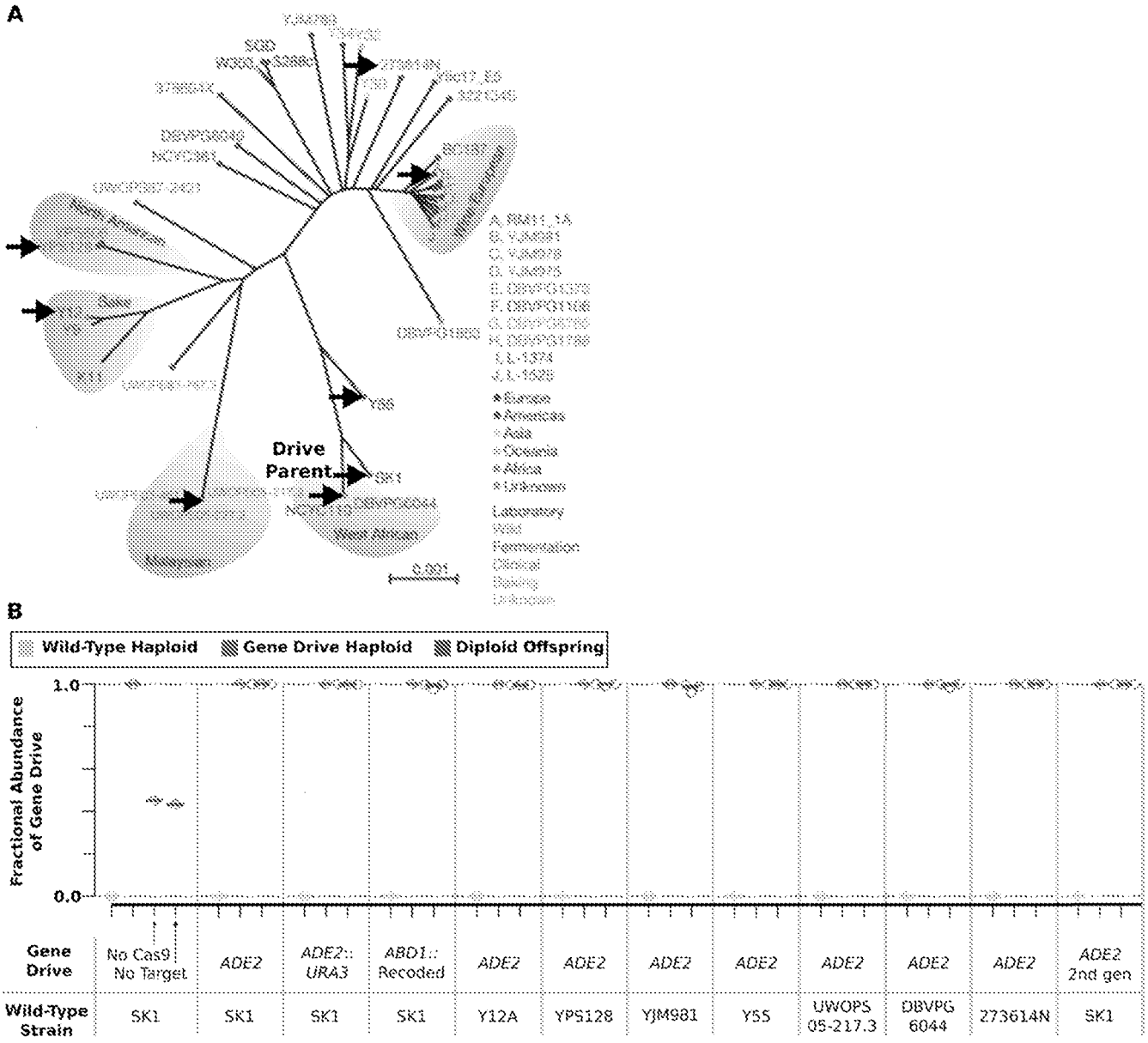

A
Wild-Type
ADE2
Gene Drive
URA3
Guide RNA
B
15 Dissected Tetrads
URA3- WT Parent
URA3+ Drive Parent
SC media (no uracil)
URA3- WT Parent
URA3+ Drive Parent
C
Wild-Type
ABD1
Gene Drive
ABD1 recoded
Guide RNA

Figure 15


A
Drive Parent
Y55
SK1
0.001
Laboratory
Wild
Fermentation
Clinical
Baking
Unknown
Europe
Americas
Asia
Oceania
Africa
Unknown
B
Wild-Type Haploid
Gene Drive Haploid
Diploid Offspring
Fractional Abundance of Gene Drive
1.0
0.0
Gene Drive
No Cas9 No Target
ADE2
ADE2:: URA3
ABD1:: Recoded
ADE2
ADE2
ADE2
ADE2
ADE2
ADE2
ADE2
ADE2 2nd gen
Wild-Type Strain
SK1
SK1
SK1
SK1
Y12A
YPS128
YJM981
Y55
UWOPS 05-217.3
DBVPG 6044
273614N
SK1