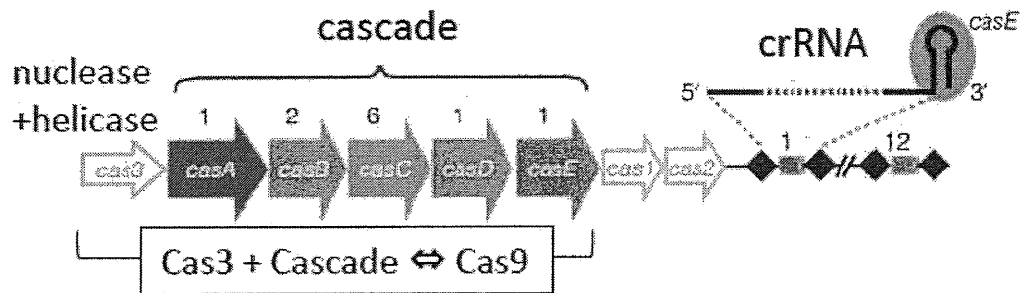


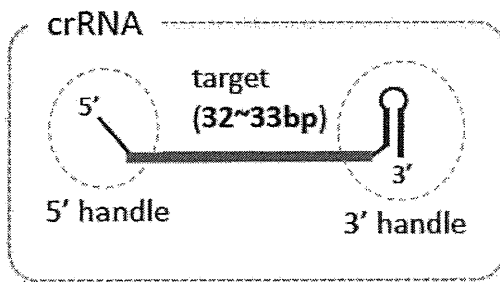
Fig. 1

A.

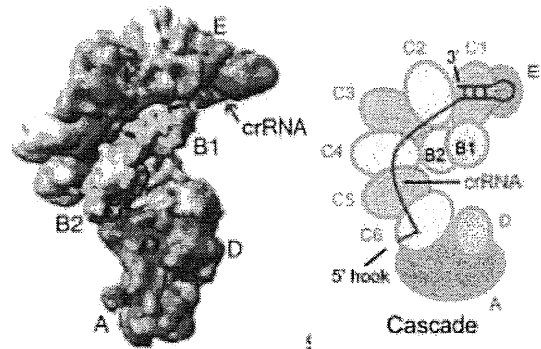


(Wiedenheft B et al Nature. 2011 477(7365):486-9. doi: 10.1038/nature10402.)

B.



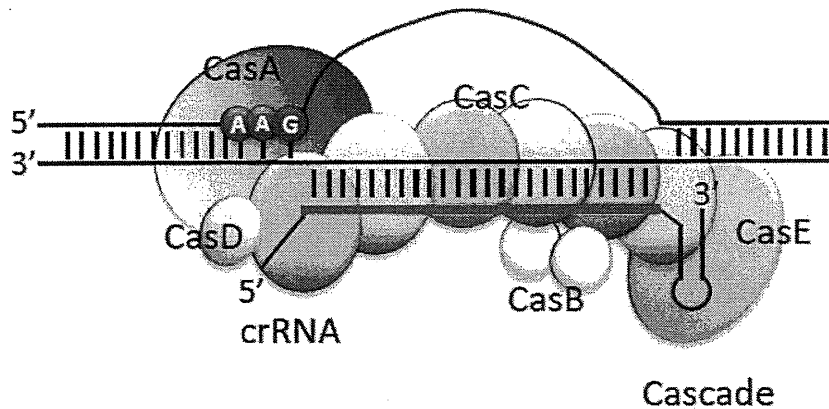
C.



structure (left) and schematic diagram (right) of Cascade

(Wiedenheft B et al Nature. 2011 477(7365): 486-9. doi: 10.1038/nature10402.)

D.

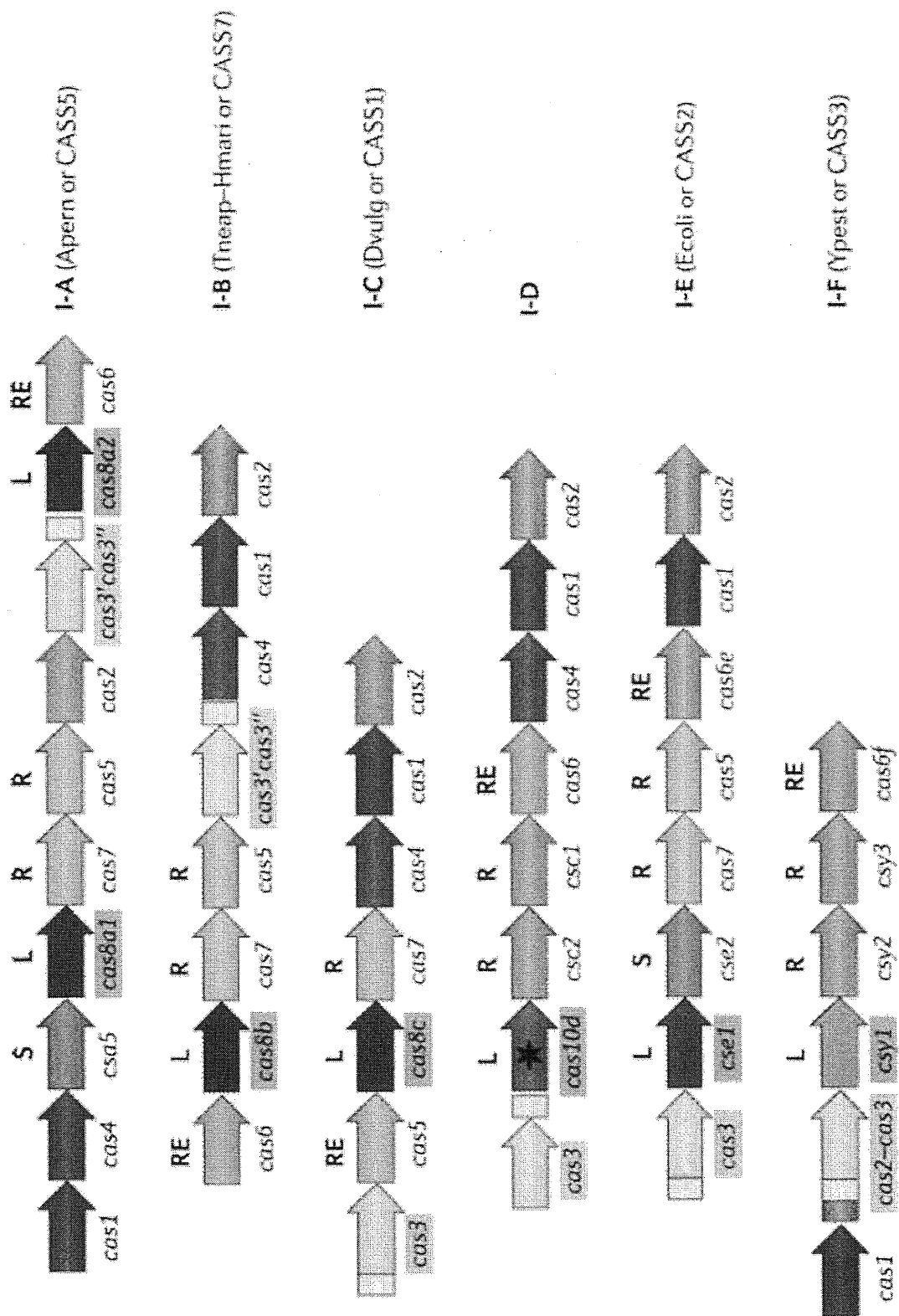


E.

* selection condition (PAM sequence) of target is different from that of Cas9

Cas9: (20bp) 5' - ...AGATTC **TTCCGCTTCACTGGAAGTCGCGTCGG**.....
 Cascade: (32bp) 5' - ...CGCAAG **TATTGCAGCAGCTTTATCATCTGCCGCTCCACGTT**C.....

Fig. 2



(Makarova et al. Nat Rev Microbiol. 2011; 9(6): 467-477)

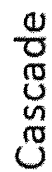
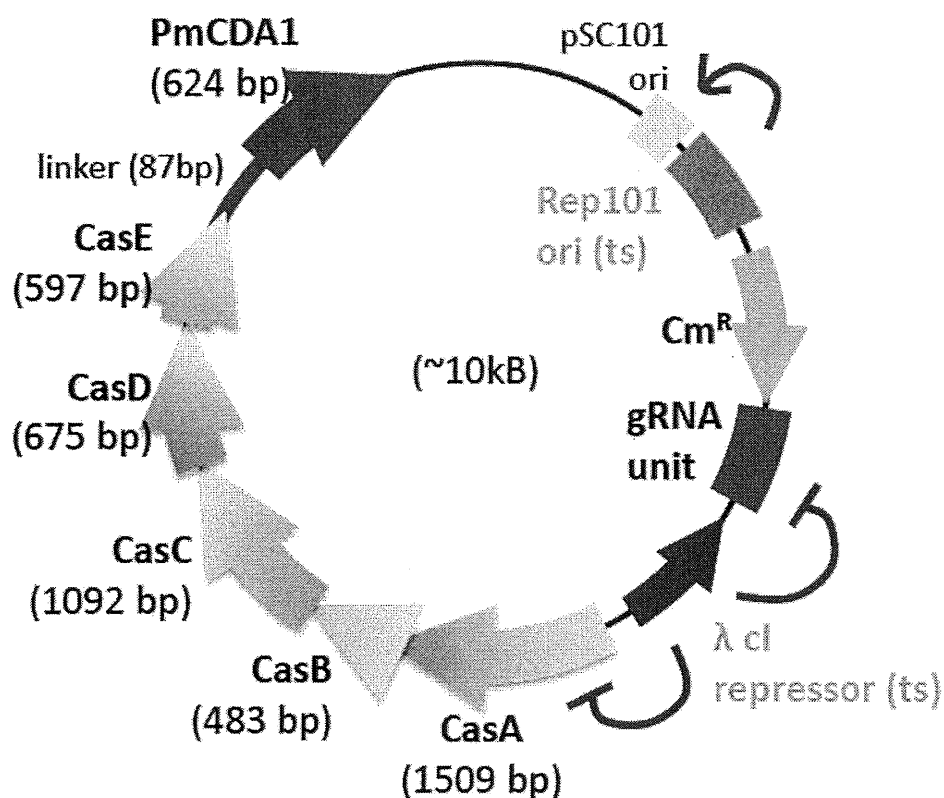


Fig. 4



repH	257..697	OL1	8378..8394
Erythromycin	1321..2055	-10	8391..8394
M13 fwd	2259..2275	tata	8395..8396
MCS	2276..2299	alt TS	8403..8403
rrnBt	2300..2363	alt TS	8405..8405
PmCDA1	2370..2993	3'handle	8416..8436
3xFLAG	3000..3065	5'handle	8437..8444
CasE, Cas6e	3081..3677	new target insertion site	8445..8460
CasD, Cas5	3664..4338	3'handle	8461..8481
CasC, Cse4, Cas7	4341..5432	5'handle	8482..8489
CasB, Cse2	5458..5940	rpoB_32 bp-target	8490..8521
CasA, Cse1	5933..7441	3'handle	8522..8542
AutoRep	7458..7463	5'handle	8543..8550
ts	7464..7464	T7 terminator	8557..8602
-10	7471..7477	CmUnit	8608..8641
OR1	7473..7489	source	8608..8641
OR2	7497..7513	CmUnit	8642..9442
OR3	7520..7536	cat	8673..9332
sd	7549..7554	cat	8673..9332
λ repressor (ts)	7560..8273	lac UV5 promoter	9386..9416
G to E for RecA resistant	7896..7898	Rep101	9580..10530
c to t	7897..7897	mut SQ in 1702	9761..9761
Synthesized eCascade array	8327..8641	mut in SQ 1702	10364..10364
Left operator	8331..8394	Mutation	10402..10404
OL3	8334..8350	mut in SQ 1702	10403..10403
OL2	8354..8370	pSC101 ori	10578..10800
-35	8368..8373		

rpoB (1521-1641 bp)

rifampicin resistance

5' -TCGACGCAGCTGTCTCAGTTTATGACACAGAAACCGCTGTCTGAGATACGCACAAACGTCTGATCTCCGCACTCGGGCCAGCGGGTCTGACCCGTGAACGTGCAGAGCTTCGAAAGTT-
3' -AGGTCTGGTCAGAGTCAAAATACCTGGTCTTGTGGGCGACAGAGCTCTAATGGGTGTTTGGAGCATAGAGGGGTGAGCCGGGTGCACCGAGCTGGGGCACTTGGCAGCGTCCGGAAGCTTCAAA-

GGCGACAGACTCTAATGGGTGTTTGCAGCATAGAG

target 4r

GACTCTAA TGGGTGTTTCAGCATAGAGGGCTGAG

target 5r

CCGGTCCGCCAGACTGGGCACTTGCAGGTCCGAA

★ colony formed on rifampicin medium was sequenced

[illegible]colony emergence
rate (at most) $3\sigma: \sim 0.05\%$

5r: ~0.004%

