

Additional file 11, Fig. S10

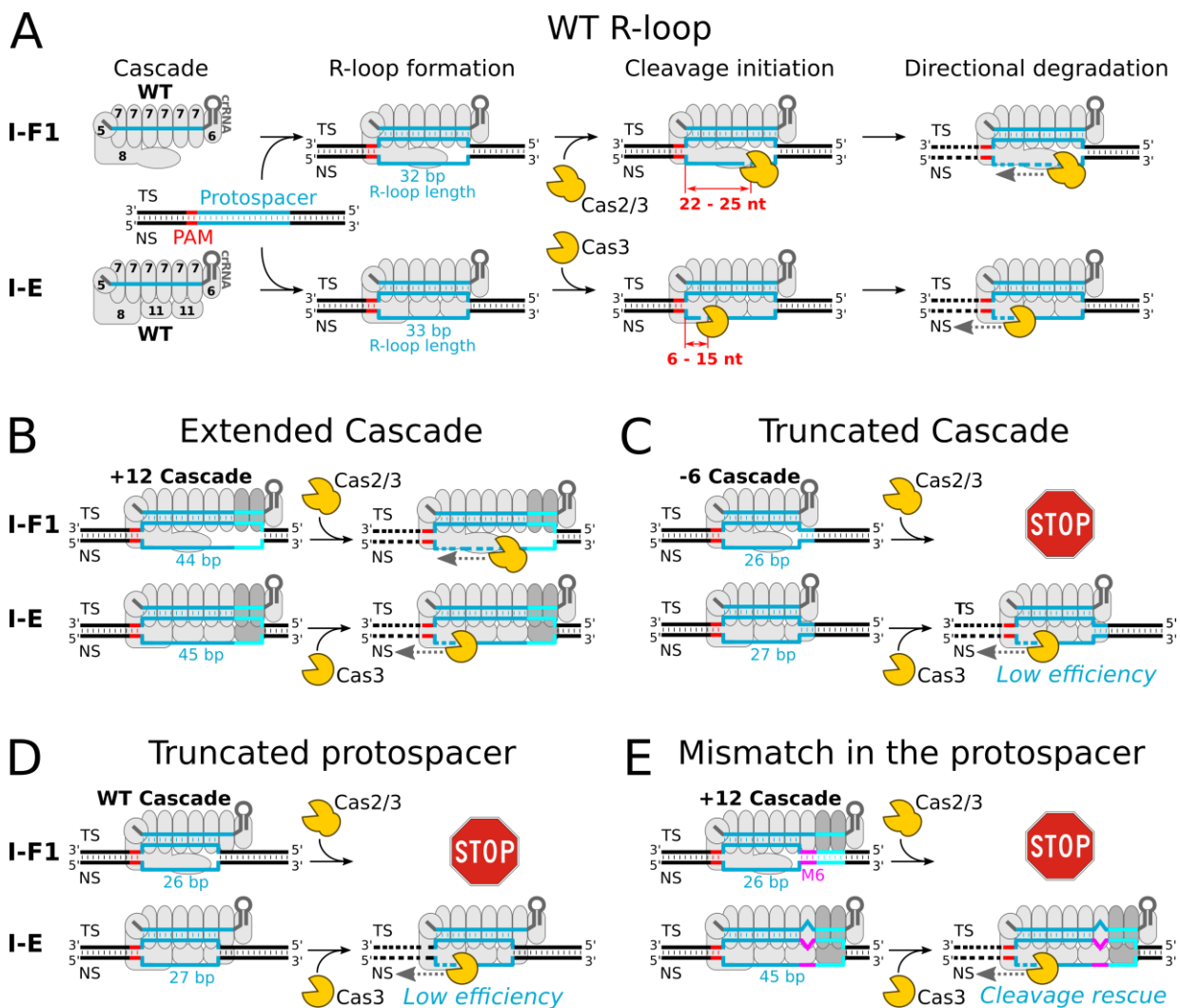


Fig. S10. Comparison of DNA interference stages in the type I-F1 and I-E CRISPR-Cas systems. **(A)** DNA interference mediated by the R-loop of WT length. Upon DNA target recognition, Cascade complexes (subunits numbered according Cas8 analogue, Cas5, Cas6 and Cas7 homologs or Cas11) form an R-loop (length is indicated below), where the spacer basepairs with the target strand (TS) of the protospacer displacing the non-target strand (NS). DNA cleavage in the type I-F1 and I-E systems is initiated at different sites: Cas2/3 cuts the NT at the PAM-distal end (22-25th nt), while Cas3 cleaves at the PAM-proximal end (6-15th nt), respectively. Then the Cas2/3 and Cas3 degrade DNA unidirectionally. **(B)** DNA interference mediated by the extended Cascade. The R-loops formed by the extended Cascades (e.g., +12) trigger DNA degradation similarly to the WT R-loops. **(C)** DNA interference mediated by the truncated Cascade. The R-loop formed by the truncated type I-F1 Cascade (e.g. -6) disables DNA cleavage initiation, while corresponding truncation of the type I-E Cascade maintains DNA cleavage although the efficiency is markedly reduced. **(D)** Interference of DNA containing the truncated protospacer. Binding of the WT or extended Cascade to the protospacers truncated at the PAM-distal end leads to the formation of shorter R-loop, which impairs DNA cleavage analogously to **(C)**. **(E)** Interference of DNA containing a mismatch within the protospacer. Mismatch of 6 bp within the protospacer (M6; 27-32nd positions) disrupts base pairing of the extended type I-F1

Cascade (e.g. +12) leading to truncated R-loop (26 bp), which fails of DNA cleavage initiation. The extended type I-E Cascade overcomes analogous mismatch (28-33rd positions) forming full-length R-loop (45 bp), which is cleavaged with similar efficiency to WT R-loop. The extra Cascade subunits are coloured in darker grey, while WT, extended and mismatch (proto)spacer regions are bluish and cyan and magenta, respectively.