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| **Supplementary File 2. A list of used sequences in the study.** |
| Oligos | Sequences | 5′ Modifications | 3′ Modifications | Used |
| FQ reporter | TTATT | FAM (labeled at phosphonate) | BHQ1 (labeled at phosphonate) | Fig. 1, 4, 5, 6 |
| T1-labeled reporter | T1TATT | FAM (at T1 base) | BHQ1 (at phosphonate) | Fig. 1  |
| Base-labeled FQ reporter | TTATT | FAM (at T1 base) | BHQ1 (at T base) | Fig. 1 |
| Probe 1 | CAAACCCAGAGCCAATCTTATCT | FITC (at phosphonate) | None (-OH) | Fig. 2, 3, 4 |
| Probe 2 | GGGTGGGCGGAAAACTATTTC | FAM (at phosphonate) | None (-OH) | Fig. 2, 3, 4 |
| Probe 3 | AGTCCGTTTGTTCTTGTGGC | FAM (at phosphonate) | None (-OH) | Fig. 2, 3, 4, 5, 6 |
| Activator-S for Cas12a trans-cleavage activity | TTTCAACAGCACATGCAGAATCAT | None (-OH) | None (-OH) | Fig. 1, 2 |
| Activator-AS for Cas12a trans-cleavage activity | ATGATTCTGCATGTGCTGTTGAAA | None (-OH) | None (-OH) | Fig. 1, 2  |
| crRNA | GGUAAUUUCUACUAAGUGUAGAUAACAGCACAUGCAGAAUCAU | None (-OH) | None (-OH) | Fig. 1, 2 |
| A20 | AAAAAAAAAAAAAAAAAAAA | FAM (at phosphonate) | None (-OH) | Fig. 4 |
| C20 | CCCCCCCCCCCCCCCCCCCC | FAM (at phosphonate) | None (-OH) | Fig. 4 |
| T20 | TTTTTTTTTTTTTTTTTTTT | FAM (at phosphonate) | None (-OH) | Fig. 4 |
| Substrate-S for endonuclease activity | AAGATTGGCTCTGGGTTTGAAAA | FAM (at phosphonate) | None (-OH) | Fig. 6 |
| Substrate-AS for endonuclease activity | CAAACCCAG[THF]GCCAATCTTAAAA | None (-OH) | None (-OH) | Fig. 6 |
| Substrate-S for exonuclease activity | CAAACCCAGAGCCAATCTTATCT | FAM (at phosphonate) | None (-OH) | Fig. 6 |
| Substrate-AS for exonuclease activity | AGATAAGATTGGCTCTGGGTTTG | None (-OH) | None (-OH) | Fig. 6 |
| 10 base protruding structure-S | CAAACCCAGAGCCAATCTTATCT | FAM (at phosphonate) | None (-OH) | Fig. 8 |
| 10 base protruding structure-AS | GGCTCTGGGTTTGATCGATCGATCG | None (-OH) | None (-OH) | Fig. 8 |
| 4 base protruding structure | CAAACCCAGAGCCAATCTTATCT | FAM (at phosphonate) | None (-OH) | Fig. 8 |
| 4 base protruding structure-AS | AAGATTGGCTCTGGGTTTGATCG | None (-OH) | None (-OH) | Fig. 8 |
| A4 protruding structure-1-S | CAAACCCAGAGCCAATCTTAAAA | None (-OH) | None (-OH) | Fig. 8 |
| A4 protruding structure-1-AS | AAGATTGGCTCTGGGTTTGAAAA | None (-OH) | None (-OH) | Fig. 8 |
| A4 protruding structure-2-S | AGTCCGTTTGTTCTTGAAAA | None (-OH) | None (-OH) | Fig. 8 |
| A4 protruding structure-2-AS | CAAGAACAAACGGACTAAAA | None (-OH) | None (-OH) | Fig. 8 |
| Bubble-S | TGTGAGTTTTGAGCGTGGCGTGCTGGAGCAAAAA | None (-OH) | None (-OH) | Fig. 8 |
| Bubble-AS | TGCTCCAGCAATCGATCGATAAAACTCACAAAAA | None (-OH) | None (-OH) | Fig. 8 |
| Fork-S | TGTGAGTTTTGAGCGTGGCGTGCTGGAGCAAAAA | None (-OH) | None (-OH) | Fig. 8 |
| Fork-AS | TGCTCCAGCACGCCACGCTCATCGATCGAC | None (-OH) | None (-OH) | Fig. 8 |
| 3′flap on dsDNA-S-1 | AGTCCGTTTGTTCTTGTGGC | FAM (at phosphonate) | None (-OH) | Fig. 8 |
| 3′flap on dsDNA-S-2 | TAAGATTGGCAAAAA | None (-OH) | None (-OH) | Fig. 8 |
| 3′flap on dsDNA-AS | GCCAATCTTACAAACGGACTAAAAA | None (-OH) | None (-OH) | Fig. 8 |
| Note that S stands for sense strand, and AS stands for antisense strand. |