A novel H-shape adaptor-mediated isothermal exponential amplification reaction (HS-EXPAR) to identify target nucleic acid

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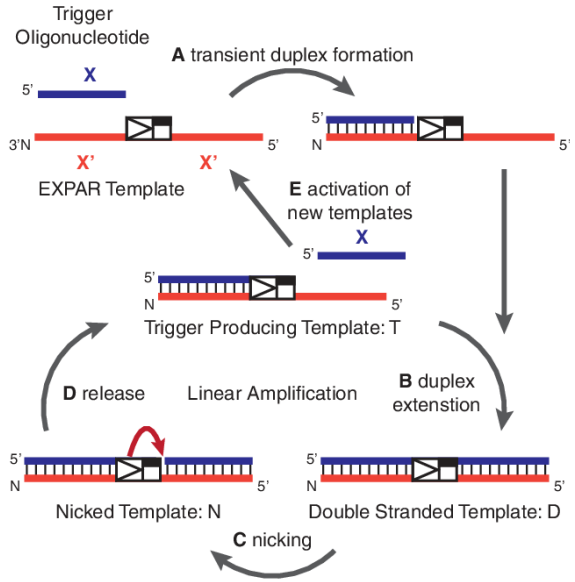
Introduction: Exponential amplification reaction (EXPAR)



Qian, Jifeng et al. Nucleic Acids Research 40 (2012): e87 - e87.

Purpose	Amplification of short nucleic acids
materials	EXPAR template, polymerase, nicking enzyme
Mechanism	Repeated extension and generation of trigger strands
Advantage	Isothermal amplification without thermal cycling
Limitation	Limited to short nucleic acids with extensible 3'-OH

Application of EXPAR technology to detect long target nucleic acids

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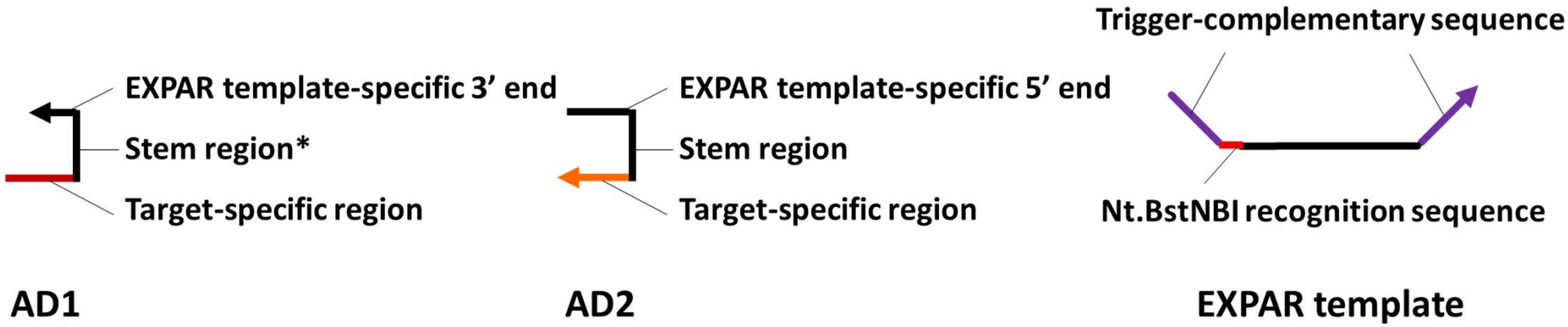
(a) Without target DNA



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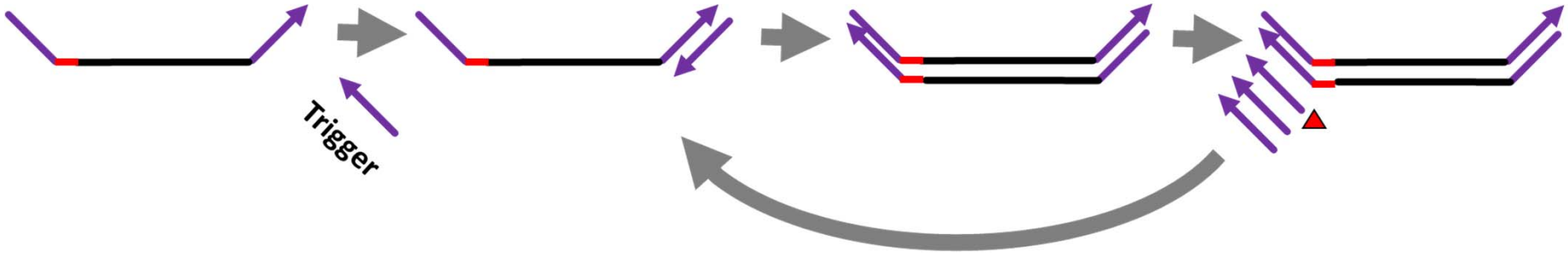
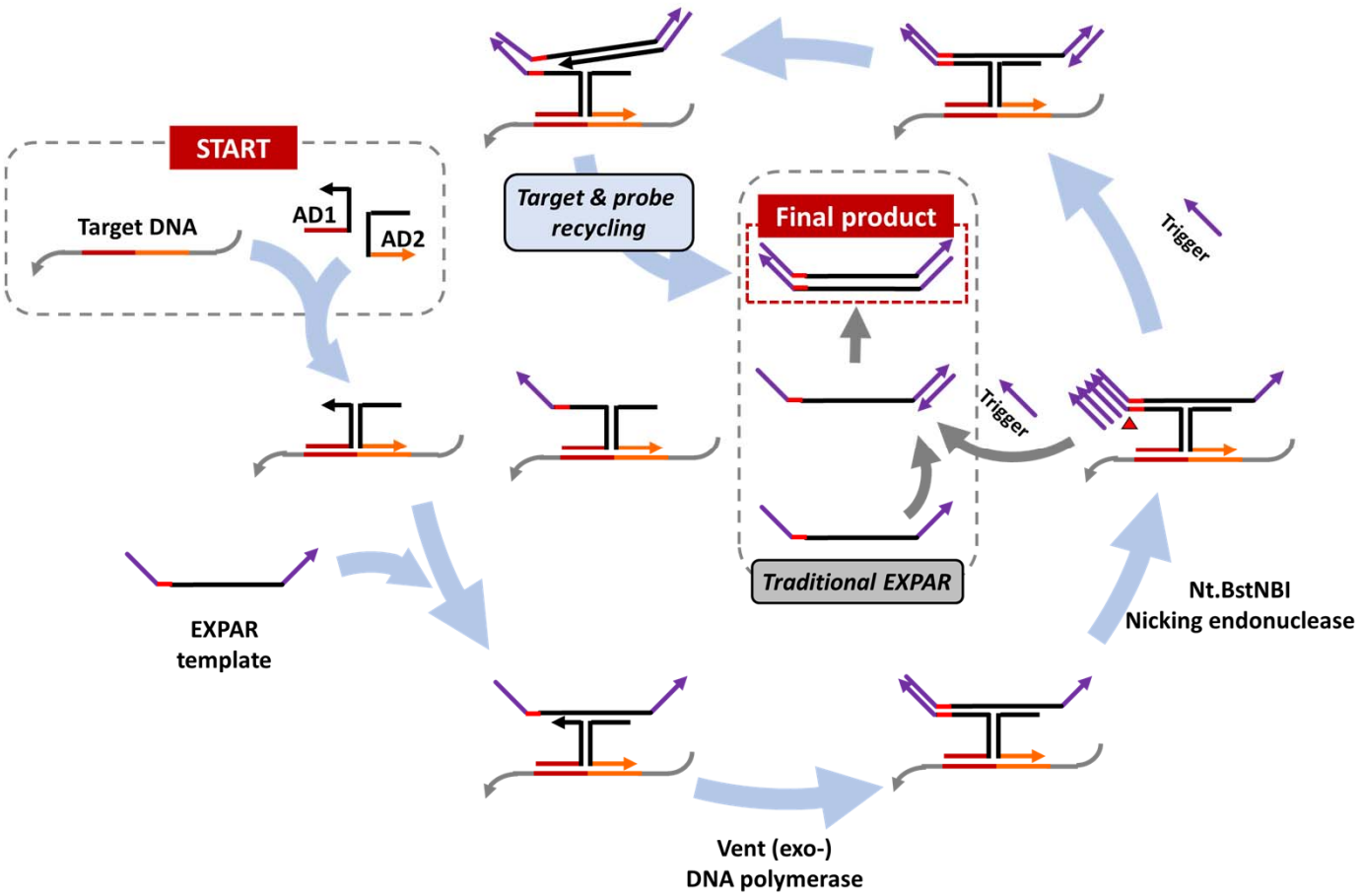
(b) Traditional EXPAR



(c) With target DNA



➡ **Dual three way junction structure enhances target specificity**

➡ **HS-EXPAR could reliably detect long target DNA**

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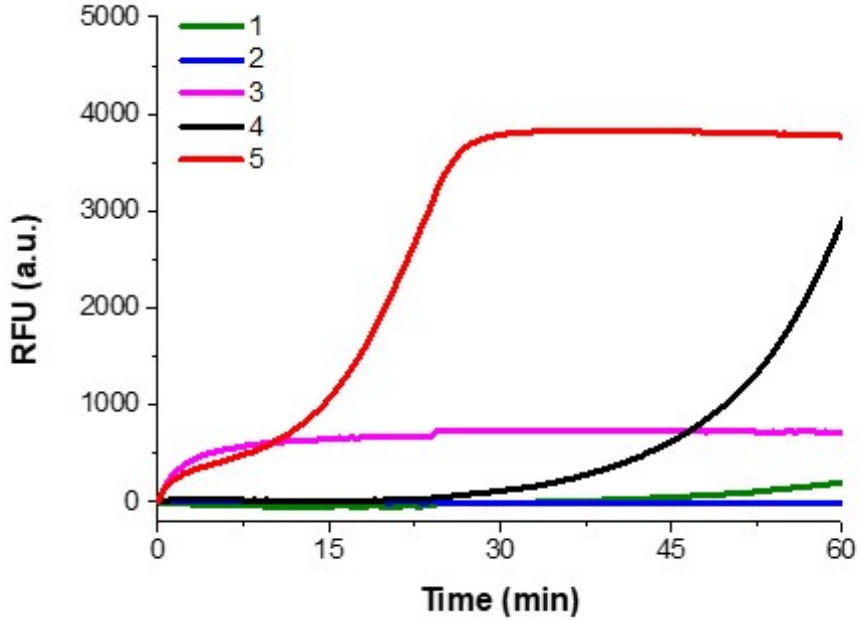
(A) Component feasibility test



1: EXPAR template (EXT)

2: AD1+AD2

3: AD1+AD2+Target

4: AD1+AD2+EXT

5: AD1+AD2+EXT+Target

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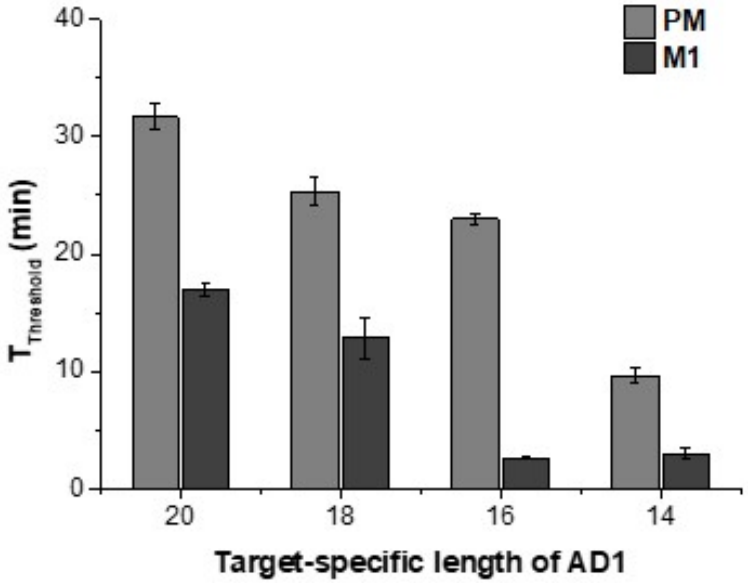
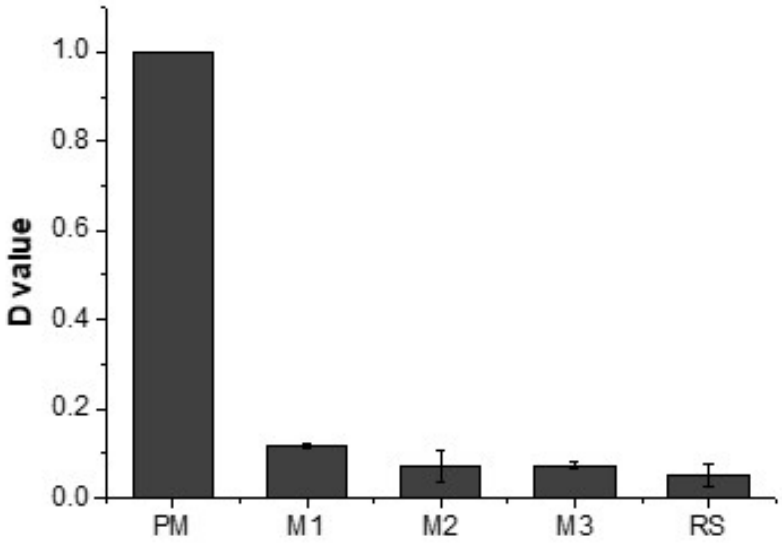
(B) Target-specific length dependence of the reaction



(C) Discriminating capability for mismatched target sequences



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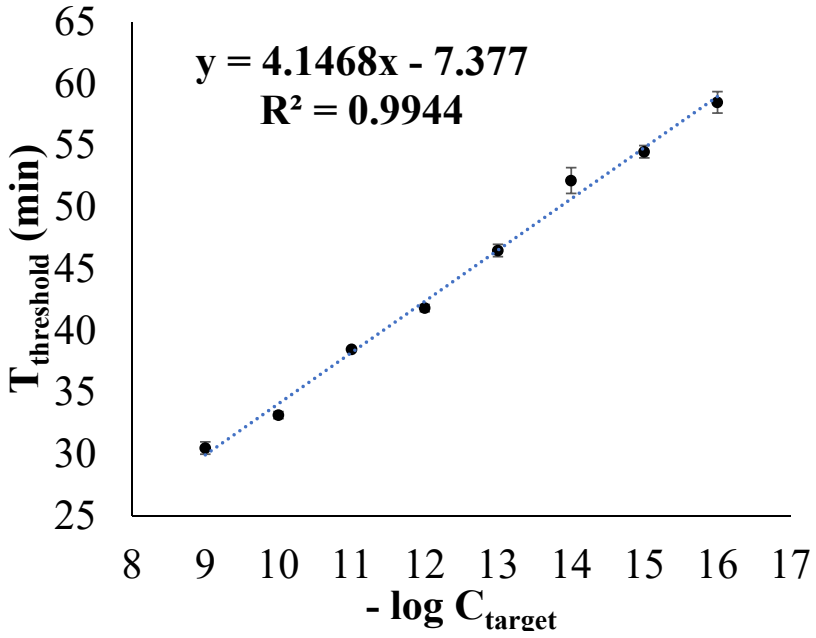
(D) Sensitivity test



The limit of detection (LOD) (3σ/slope) was estimated to be 63 aM, which is quite comparable or even better than those from previously reported isothermal signal amplification methods.