

Electronic Supplementary Information

to

**RNA-peptide conjugate synthesis by inverse-electron demand
Diels-Alder reaction**

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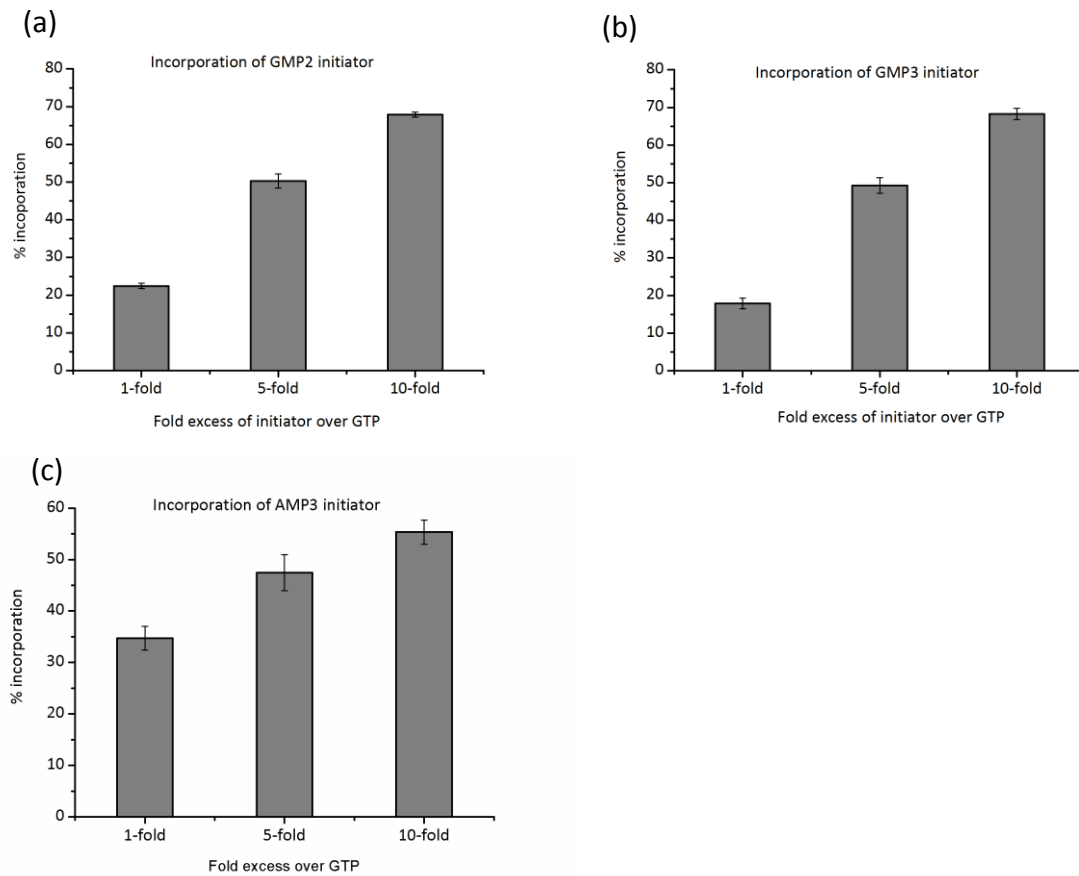


Figure S1. Incorporation efficiency of different initiator nucleotides. Graph showing the % incorporation of different initiator nucleotides, (A); GMP2 , (B); GMP3 & (C); AMP3 at the 5'-end of the 19mer RNA. Initiated and non-initiated 19mer RNA was analyzed by gel electrophoresis. Each incorporation was analyzed by performing transcriptions in triplicates and the average % incorporation together with standard deviation is plotted.

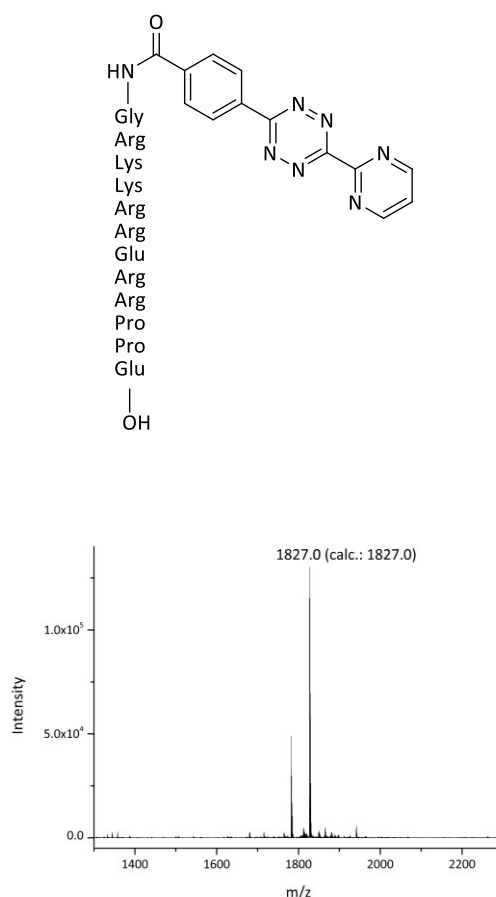


Figure S2. Structure and Mass spectrum (ESI⁺) of tetrazine peptide.

(a) RNA19 sequence (232 nucleotides)

5'-GGAGCUCAGCCUUCACUGCUGGCCCCUC**AU**UCUCCGACAAUGUACGACCUUG
CAUAUACCGCUAGCACGAACGGUGUAGAUACCUGGAUCAUUACAACACCACGA
UCUUCAAAUCGAAGAUGUUCGCAUGAUGUGCGCUAGCAAUAUAGUUUAGCGAG
UAUAGCCGAACGCCGUGUUGAGUACCUAACGAUACCGGUGUGAGGUGCCUGUC
UGGCACCACGGUCGGAUCCAC-3'

(b) 10-23 DNzyme sequence

5'-**CATTGTCGGAGAA**GGCTAGCTACAACGA**GAGGGGCCAGC**-3'

Figure S3. RNA19 sequence and the designed 10-23 DNzyme. (a) Complete sequence of 232 nucleotides long RNA19 ribozyme¹ with highlighted bases (bold and underlined) as the site of cleavage for the 10-23 DNzyme². The DNzyme cleaves after A, generating a 29mer RNA fragment. (b) 10-23 DNzyme sequence designed for the site-specific cleavage of RNA19. The highlighted parts (grey) are the two RNA binding arms (13 and 11 nucleotides long) and in between are the 15 nucleotides long catalytic core.

References

1. S. Ameta and A. Jäschke, *Chem. Sci.*, 2013, **4**, 957-964.

2. (a) A. Roth and R. R. Breaker, *Annu. Rev. Biochem.*, 2009, **78**, 305-334; (b) M. J. Cairns, A. King and L. Q. Sun, *Nucleic Acids Res.*, 2003, **31**, 2883-2889.