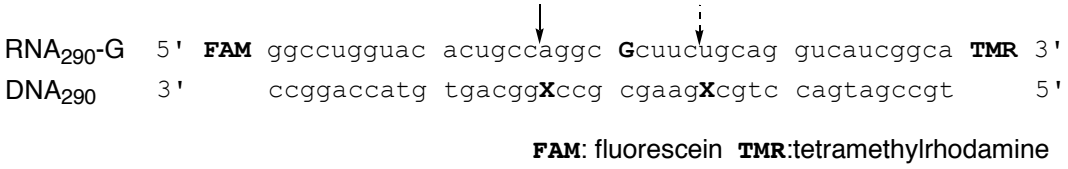
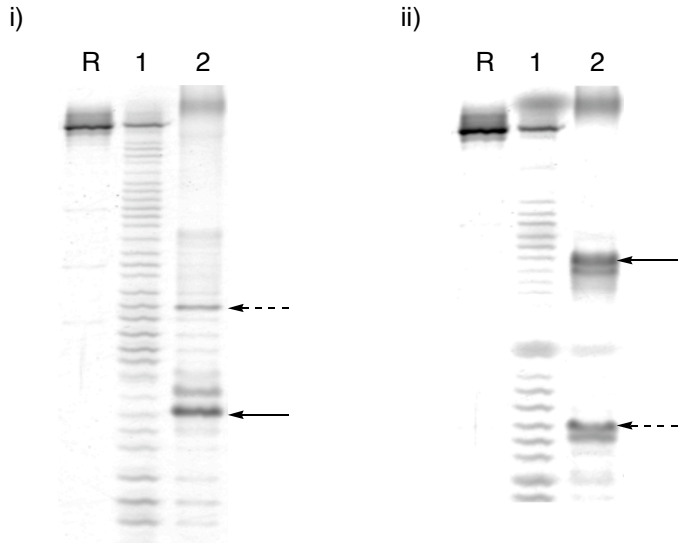
1: The Confirmation of Two-Sites RNA Scission

To confirm that two target sites are efficiently activated by the acridines and hydrolyzed by Lu^{III}, the substrate RNA labeled both with tetramethylrhodamine and with fluorescein was cleaved and analyzed by PAGE.

(A) The oligonucleotides used in this experiment.



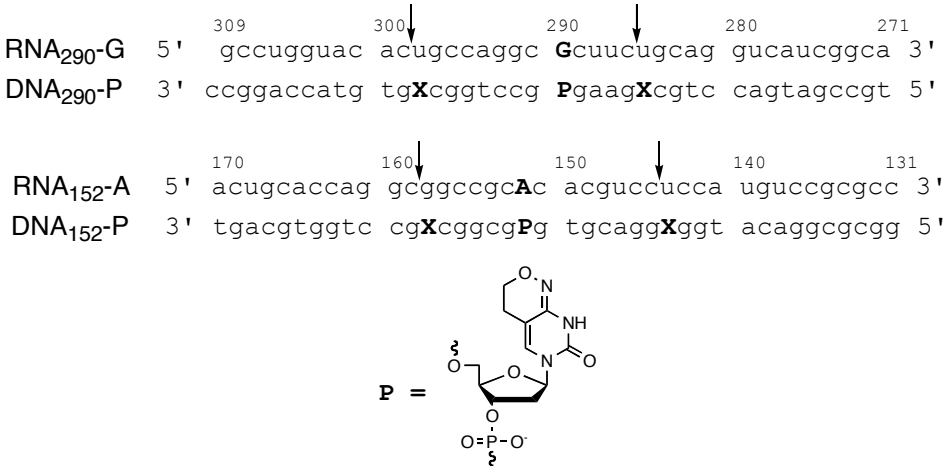
(B) PAGE patterns of two-sites RNA scission.



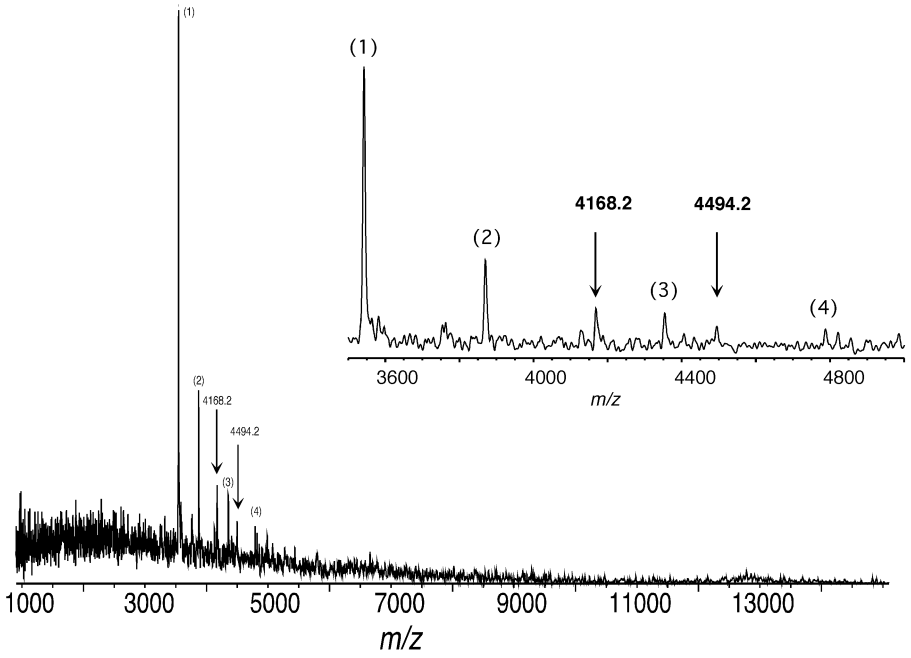
(i) Detected by fluorescence of fluorescein. (ii) Detected by fluorescence of tetramethylrhodamine. Lane 1, Lu^{III} only; Lane 2, RNA_{290}-G/DNA_{290}/Lu^{III}. At pH 7.5 and 37 °C for 4 hour; $[RNA_{290}\text{-G}]_0$ = 2 μM, $[DNA_{290}]$ = 10 μM, $[Lu^{III}]$ = 150 μM, [NaCl] = 200 mM. R, RNA only. The two target sites are indicated by the two arrows, respectively. Under above conditions, cleavage conversions at each target sites are ca. 20%, and the 5'-phosphodiester of the target nucleotide is cleaved 5 times as fast as the 3'-one. Other minor cleavages are under 0.3%.

2: Simultaneous Analysis of the Two SNP Sites in APOE.

(A) The oligonucleotides and nucleoside analogue dP.



(B) Mass spectrum of the cleavage products from 1:1 mixture of RNA_{290}-G and RNA_{152}-A in the presence of DNA_{290}-P and DNA_{152}-P.



The inset shows the magnification of the region between *m/z* 3500.0 and 5000.0. The signal at 4168.2 is for the 13-mer fragment (U298-C286) from RNA_{290}-G, whereas the

signal at 4494.2 is for the 14-mer one (G158-C145) from RNA_{152}-A. Reaction conditions; [Lu^{III}] = 150 μM at pH 7.5, 25 °C for 24 h. The signals (1) and (4) are for G309-C299 and U285-A271 from RNA_{290}-G, while the signals (2) and (3) are for A170-C159 and U144-C131 from RNA_{152}-A, respectively. Since this spectrum was acquired under conditions optimized for *m*/*z* 3000-5000, signals for DNA_{290}-P (theoretical *m*/*z* = 12624.4) or DNA_{152}-P (12802.3) were not clearly detected.