Supplemental Data

Fig. S1

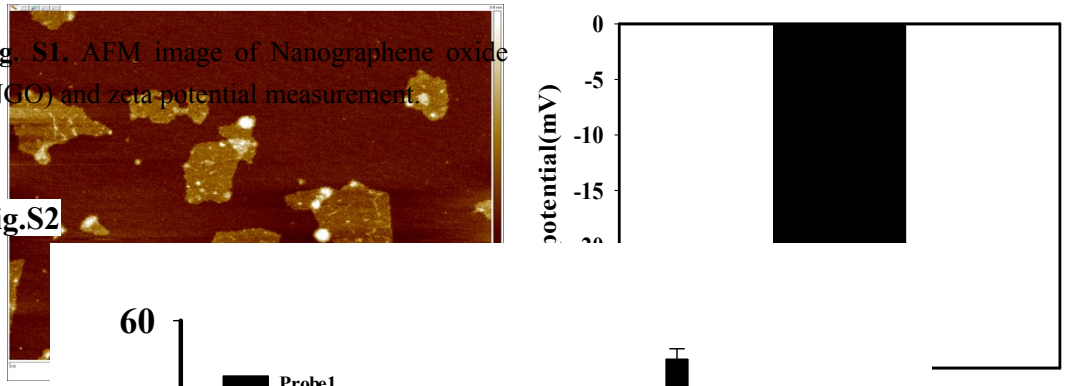


Fig. S1. AFM image of Nanographene oxide (NGO) and zeta potential measurement.

Fig.S2

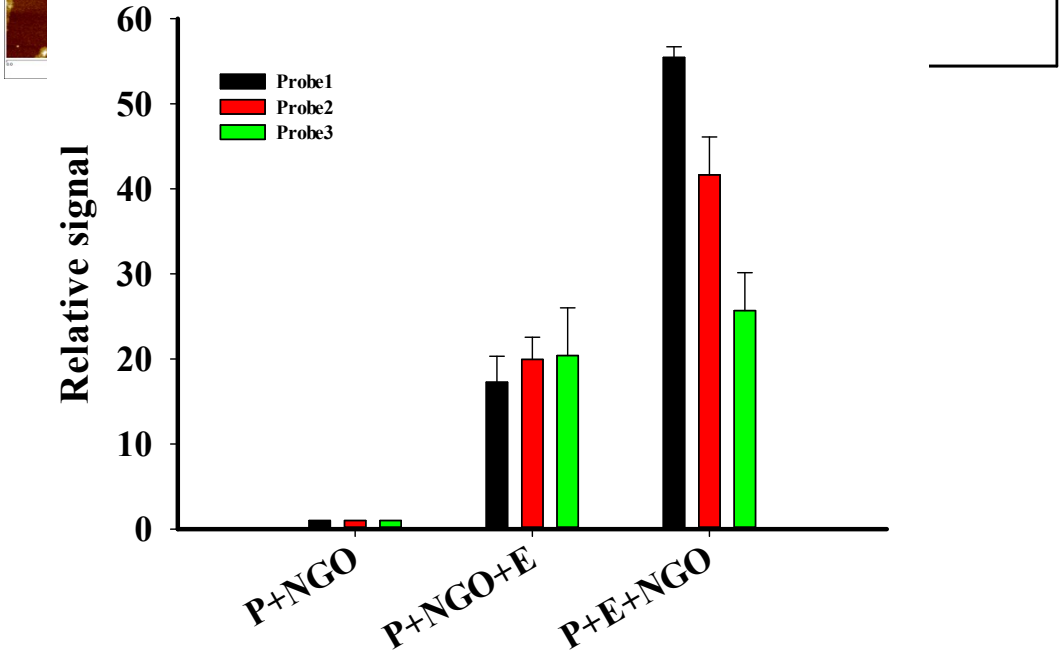


Fig.S2. The S/N detection of NGO-quenched Probe1, Probe2 and Probe3 at optimal conditions. [NGO]=12 μg/mL, [Probe]=100nM.

Fig. S3

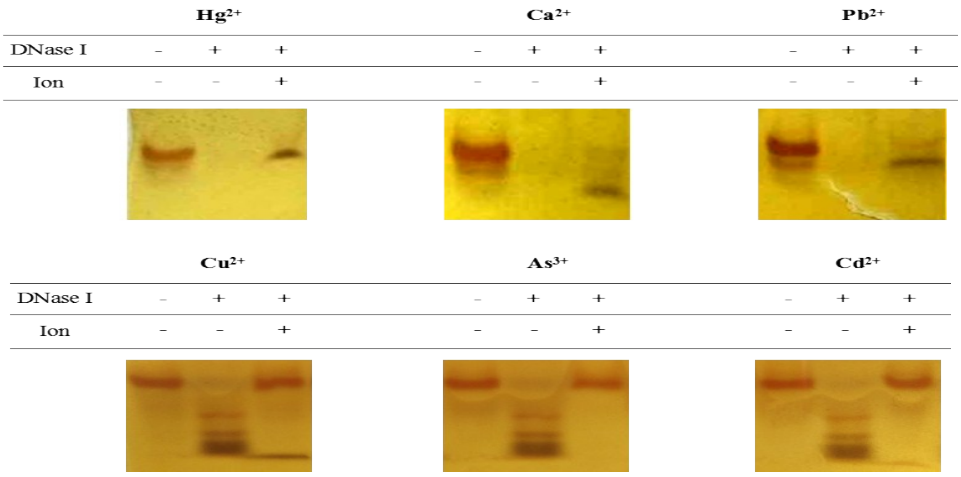


Fig. S3. Investigating the effects of metal ions on DNase I using PAGE method.

Fig. S4

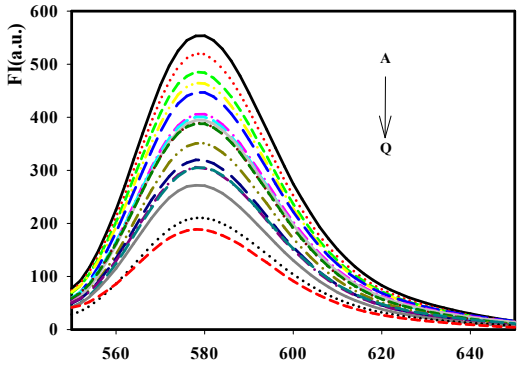
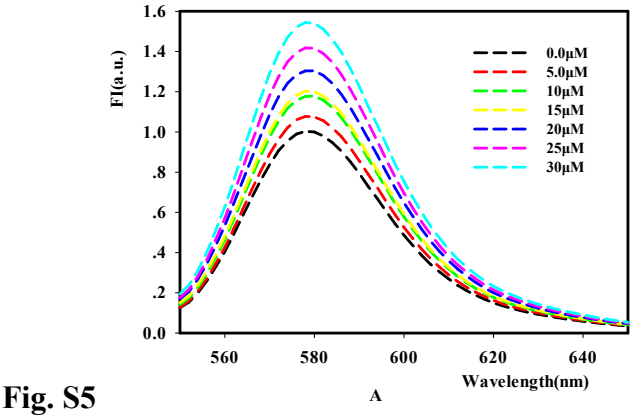
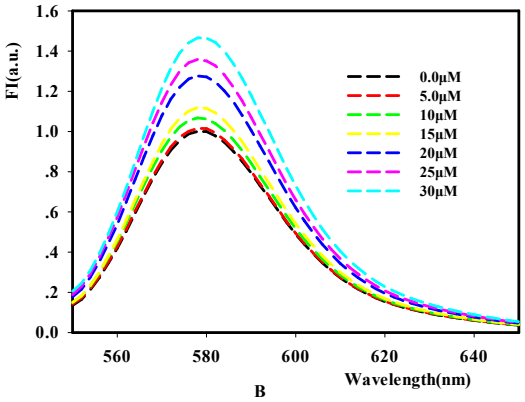
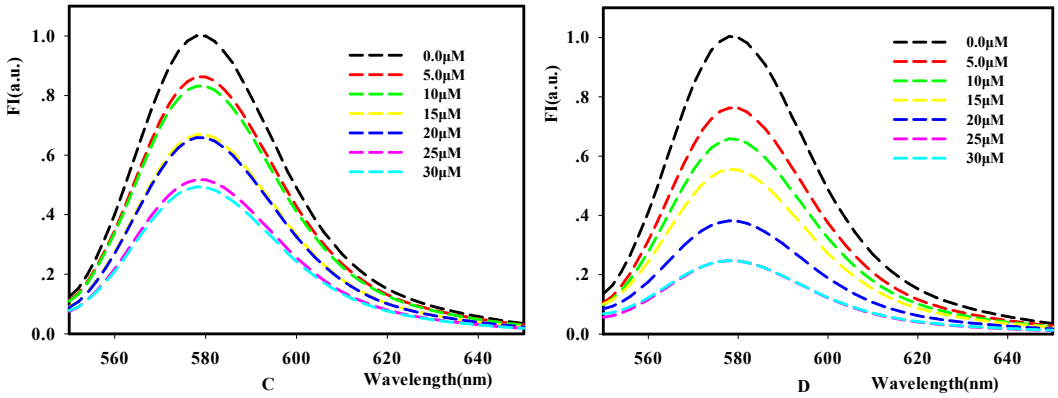


Fig. S4. The wavelength scan results of enzymatic products at the presence of natural compounds. The compounds in samples A to Q are C-H-4, chikusetsusaponin V, C-G-9, C-G-6, C-G-10, chikusetsusaponin IV, C-H-2, chikusetsusaponin Iva, C-H-3, C-H-1, Control, C-G-13, C-G-11, SBB-L-1,C-G-8, Schisanlactone E and Cyclocariol F, respectively. E=2U, [P1]=100 nM, [compound]=20μM.

Fig. S5







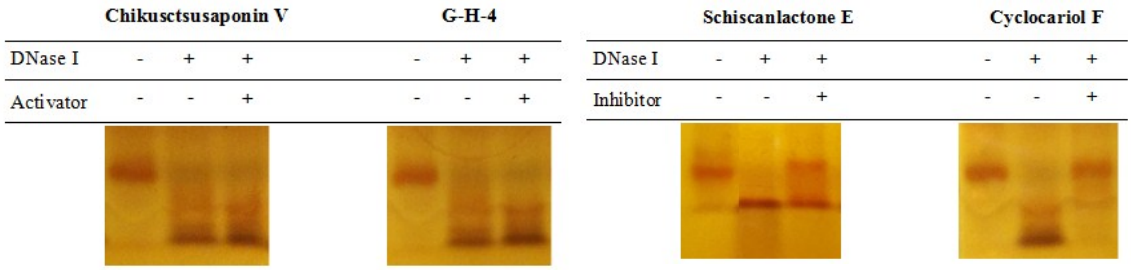
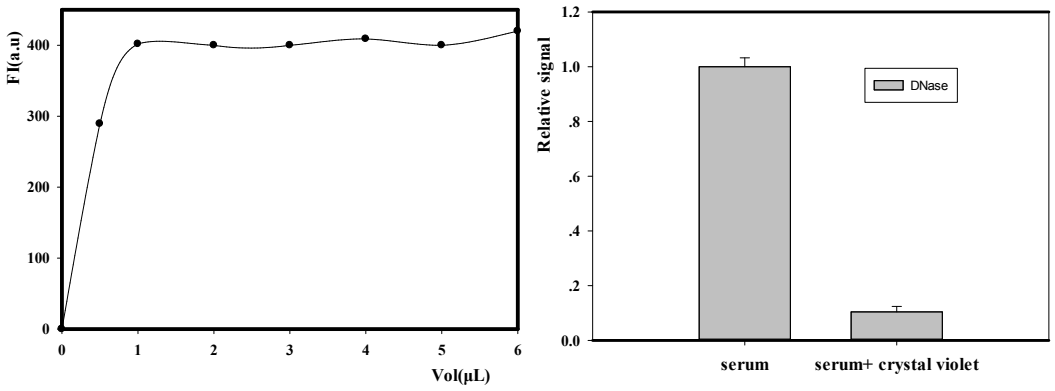


Fig. S5. The wavelength scan results of enzymatic products at the presence of selected natural compounds with different concentration. Compounds of Sample A to D are chikusetsusaponinV, C-H-4, Schisanlactone E and Cyclocariol F, respectively.

Fig. S6



A B

Fig. S6. Fluorescence-based measurement of DNase. (A) DNase I assay with different amount of serum; (B) The sample was heated at 95°C for 10min.

Supplemental table

Table S1

Table S1 oligonucleotide strands with modifications

Name	Sequences
Probe1	5'- TAMRA -CTCAACAGACACATGGGGTC(GATGCG)-3'
Probe2	5'- TAMRA -CGCATCAGACACATGGGGTC(GATGCG)-3'(hairpin structure)
Probe3	5'- TAMRA- CGCATCAGACACATGGGG(CTGATGCG)-3' (hairpin structure)

Table S2

Table **S**2 Description of the two strong inhibitors

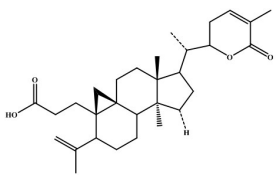
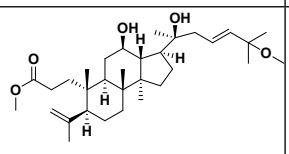
Code	Molecular formula	Molecular Weight	Chemical Name	Structure	Note
Schisanlactone E	$C_{30}H_{44}O_4$	468.68	3-((3aS,6aR,7aS,9aR)-3a,9a-dimethyl-1-((1S)-1-(5-methyl-6-oxo-3,6-dihydro-2H-pyran-2-yl)ethyl)-6-(prop-1-en-2-yl)decahydro-1H-cyclopenta[a]cyclopropa[e]naphthalen-6a(7H)-yl)propanoic acid		known compound
Cyclocariol F	$C_{32}H_{54}O_5$	518.3971	12R,20S-dihydroxy-25-methoxy-3,4-secodammara-4(28),23-dien-3-oic acid ethyl ester		New compound

Table S3

Table S3 Advantage comparison of different methods.

Strategy	Detection modes	Limit of Detection	Km	Technology Characteristics	References
Colormetric assay	colormetric	--	--	DNA-AuNP aggregates used to evaluate the enzymatic activity of DNase I	Xu et al., 2007
Electrochemical assay	current peaks	10^{-4} U μL^{-1}	--	Fc-oligo-SH-immobilized electrode; was used to detection of DNase I activity	Shinobu Sato et al., 2008
Fluorescent assay	fluorescence	5 pg	--	Double stranded DNA, Pico Green dye; was used to detection of DNase I activity and DNase I inhibitor activity	Suk-Jung Choi et al., 2000
Real-time fluorescent assay	fluorescent	1.75 U mL^{-1}	--	GO and a fluorescent dye fluorescein amidite (FAM) -labeled dsDNA substrate (F-dsDNA) ;used for real-time nuclease activity/inhibition assay	Zhixue Zhou et al., 2012
Fluorescent assay	fluorescence	1 UmL^{-1}	1 ± 0.10 μ M	DNA/GO (graphene oxide) probe; used for high-throughput assay of DNase I in biological samples as well as drug screening in vitro	Wei Xu et al. 2016
Label-free fluorescent assay	fluorescence	0.10 U mL^{-1}	--	DNA-templated silver nanocluster/graphene oxide (DNA- AgNC/GO) nanocomposite was used to detect deoxyribonuclease I activity	Chang Yeol Lee et al. 2016
End-point assay	fluorescence	0.005 U	2.19 ± 0.07 μ M	NGO based single strand probe; used for DNase I activity, nature compounds screening and	This work

biosamples assay

Reference:

Choi, S. J., Szoka, F. C., 2000. Analytical Biochemistry, 281(1):95-97.

Lee, C. Y., Park, K. S., Jung, Y. K., Park, H. G., 2016. Biosensors & Bioelectronics, In Press.

Sato, S., Fujita, K., Kanazawa, M., Mukumoto, K., Ohtsuka, K., Waki, M., Takenaka, S., 2008. Analytical Biochemistry, 381(2):233-239.

Xu, W., Xie, Z.H., Tong, C.Y., Peng, L., Xiao, C.H., Liu, X.M., Zhu, Y.H., Liu, B., 2016. Analytical and Bioanalytical Chemistry, 408(14):3801-3809.

Xu, X., Han, M. S., Mirkin, C. A., 2007. Angewandte Chemie, 119(19): 3538- 3540.

Zhou, Z., Zhu, C., Ren, J., Dong, S., 2012. Analytica Chimica Acta, 740:88-92.