Sensitive Detection of Dipeptidyl Peptidase Based on DNA-Peptide Conjugate and double signal amplification of CHA and DNAzymes

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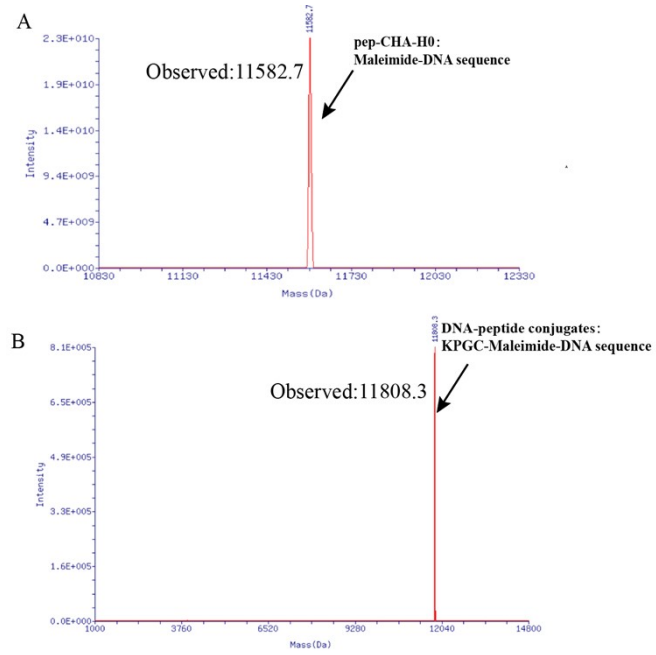
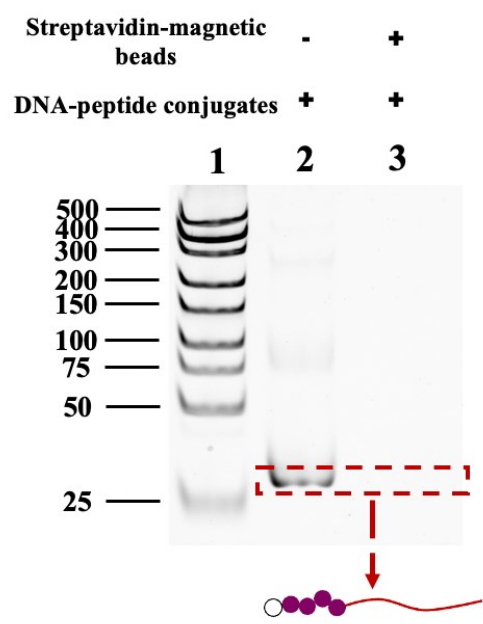[1]These authors contributed equally to this work.

Contents

**Table S1**.   The DNA sequences used in this work.

Name	Sequences（5'–3'）
pep-CHA-H0	Maleimide-TTT TTT TTT TTT TTT TGG AAA CAC CAC CCA TAT CGC T
CHA-H0	TTT TTT TTT TTT TTT TGG AAA CAC CAC CCA TAT CGC T
CHA-H1	GTC ATT CAG CGA TAT GGG TGG TGT TTC CAC CCA TGT ACG AAA CAC CAC CCA T
CHA-H2	GTG TTT CGT ACA TGG GTG GAA ACA CCA CCC ATC ACC CAT GTA CAG TCA
DNAzymes	GTC ATT CAG CGA TCA CCC ATG TAC AGT CA
HS-Substrate-FAM	HS-TTT TTT TTT TTT TTG ACT GTT /rA/GG AAT GAC-FAM

A

Observed:11582.7

pep-CHA-H0:
Maleimide-DNA sequence

B

Observed:11808.3
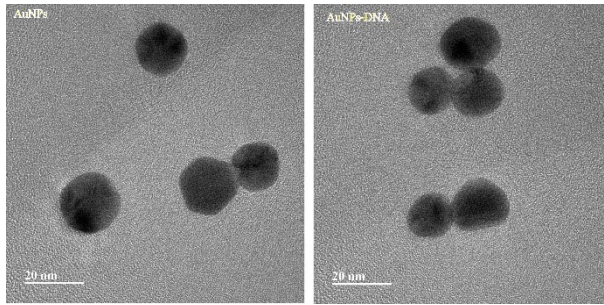
DNA-peptide conjugates:
KPGC-Maleimide-DNA sequence

Fig.S1 Mass spectrum of the pep-CHA-H0 and DNA-peptide conjugates

Fig.S2 Supernatants before and after magnetic conjugation.
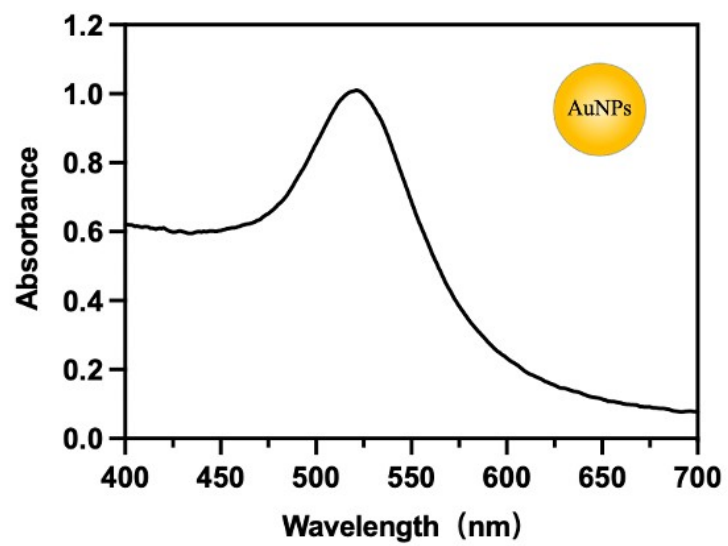
Fig.S3 UV−vis absorbance responses of bare AuNPs.
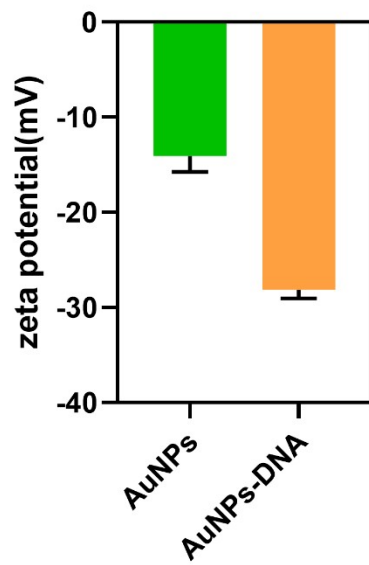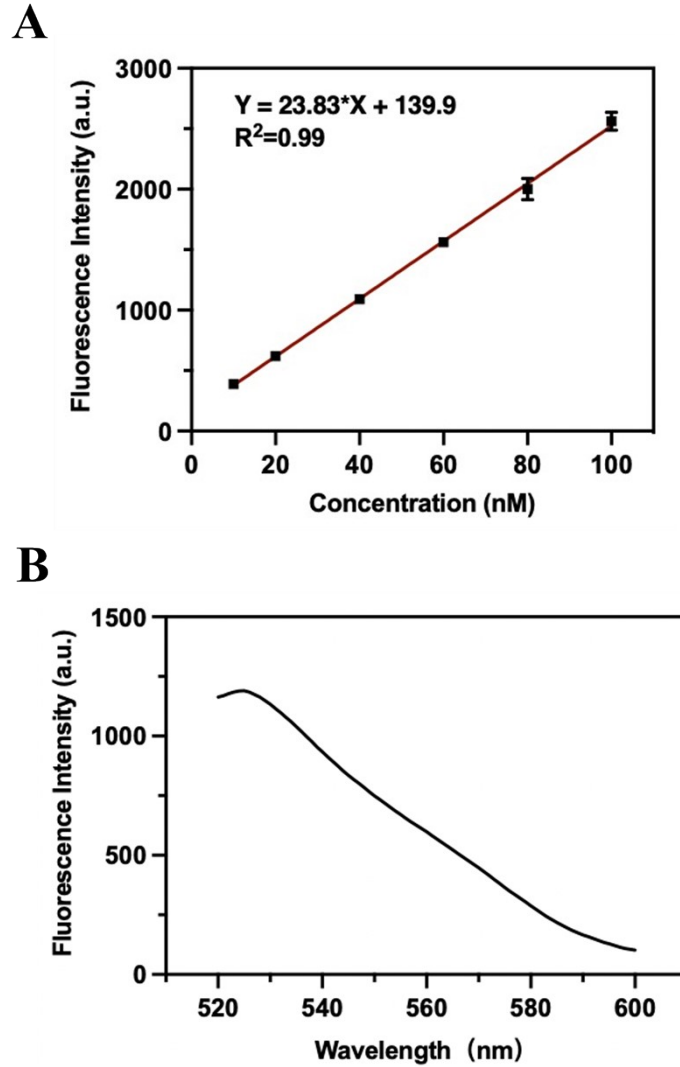
Fig. S4 TEM of AuNPs and AuNPs-DNA

Fig. S5 zeta potential of AuNPs and DNA-AuNPs

A

$Y = 23.83*X + 139.9$
$R^2 = 0.99$

Fluorescence Intensity (a.u.) vs Concentration (nM)

B

Fluorescence Intensity (a.u.) vs Wavelength (nm)

Fig. S6 Quantitation of fluorescently labeled substrate on one AuNP. (A) The corresponding curve between the FAM-labeled substrates concentrations and the signal intensity at 520 nm. (B) Fluorescence spectra of HS-substrate-FAM released from the surface of the signal output signal probe. The data error bars indicate mean ± SD (n= 3).

Table S2. Selected methods for DPPIV detection

Technique	Linear range	LOD	Reference
Bioluminescence sensing	2.0 − 40.0 mU•mL^{-1}	0.78 mU•mL^{-1}	[32]
Liquid Chromatography−fluorescence Detection	1.0 - 100.0 ng/mL	25 pg/L	[33]
Fluorescence Spectrophotometry	10.0 -180.0 ng/mL	18.62 ng/mL	[34]
Colorimetry	10.0 - 30.0 mU•mL^{-1}	>10 mU•mL^{-1}	[35]
Colorimetry	0 - 12.0 mU•mL^{-1} 0 - 30.0 mU•mL^{-1}	1.2 mU•mL^{-1} 1.5 mU•mL^{-1}	[36]
Fluorescence Spectrophotometry	1.0 −5.0 mU•mL^{-1}	0.18 mU•mL^{-1}	This work
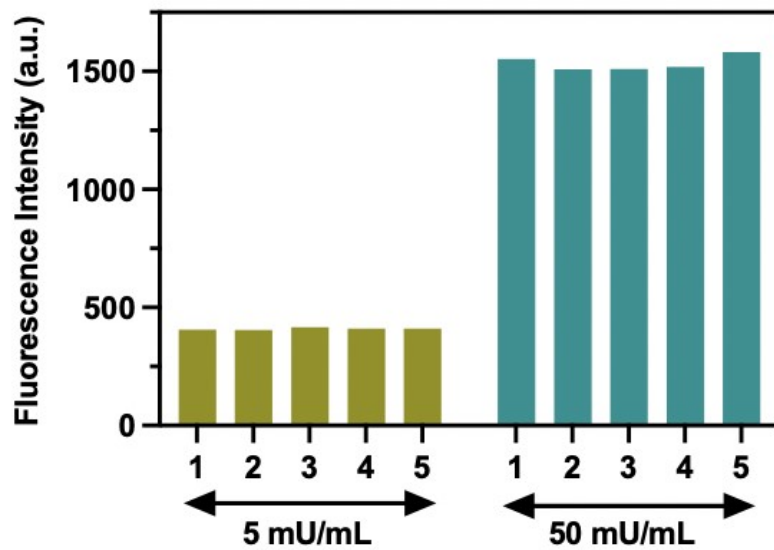
Fig. S7. Analysis of the reproducibility of the fabricated biosensor by detecting 5 mU•mL^{-1} and 50 mU•mL^{-1} DPPIV with 5 independent samples.
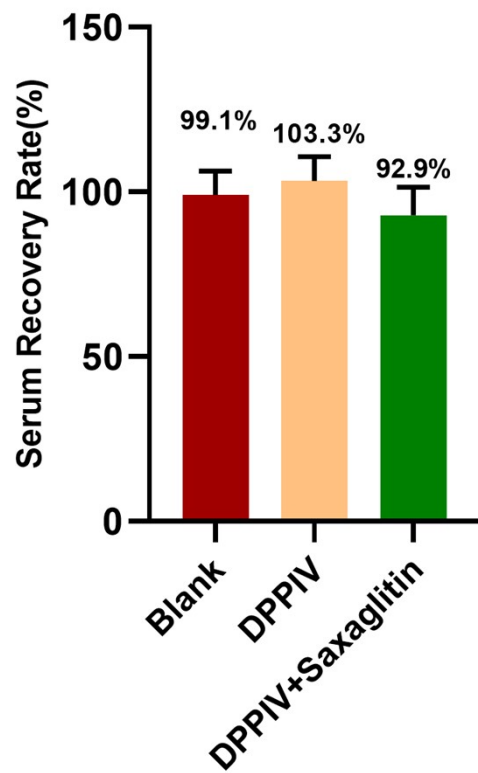
Fig. S8 The recovery rates of Blank, DDPPIV and DPPIV+Saxaglitin groups in 10%serum samples were analyzed

References.

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CRediT authorship contribution statement