Optimization of gold nanoparticle-based real-time colorimetric assay of dipeptidyl peptidase IV activity

ALDEWACHI, Hasan <http://orcid.org/0000-0003-2126-4366>, WOODROOFE, Nicola <http://orcid.org/0000-0002-8818-331X>, TUREGA, Simon <http://orcid.org/0000-0003-1044-5882> and GARDINER, Philip <http://orcid.org/0000-0002-2687-0106>

Available from Sheffield Hallam University Research Archive (SHURA) at:
http://shura.shu.ac.uk/15430/

This document is the author deposited version. You are advised to consult the publisher's version if you wish to cite from it.

Published version


Copyright and re-use policy

See http://shura.shu.ac.uk/information.html
Supporting Information

Gold nanoparticle-based real-time colorimetric assay of dipeptidyl peptidase IV activity

Hasan Saad Aldewachi1,2, Nicola Woodroffe1 and Philip H E Gardiner1

1 Biomedical Research Centre, Sheffield Hallam University, City Campus, Sheffield, S1 1WB, UK.
2 Pharmacy College, Mosul University, Mosul, Iraq.

Fig. S1. The stability of the as-synthesized AuNP (UV-vis absorption spectra of the colorimetric assay toward 0 U/L DPP IV/CD 26 (blue curve) and 20 U/L DPP IV/CD 26 (red curve) after the Au NP was stored for 0 month, 1 month, 2 months, 3 months, respectively). Error bar represents the standard deviation (n = 3).

Fig. S2 a) Plot of absorbance of GPDC-AuNPs at 642/522 nm versus reaction time at various enzymatic activities of DPP-IV/CD-26 (0, 2.5, 5, 7.5, 10, 12.5, 15, 20 and 25 U/L) for 60 minutes, Inset: Plot of absorbance of GPDC-AuNPs at 642/522 nm versus reaction time for the firsts 10 minutes. b) Hydrodynamic size of GPDC-AuNPs measured by DLS at different incubation time (measured at 1 minute intervals) with 20 U/L of DPP-IV enzyme.

Fig. S3 various enzymatic activities of DPP-IV/CD-26 (0, 2.5, 5, 7.5, 10, 12.5, 15, 20 and 25 U/L) with unmodified citrate capped gold nanoparticles.

Fig. S4 UV-vis absorption spectra of the colorimetric assay toward spiked DPP IV standards (5, 10, 15, 20 and 25 U/L DPP IV /CD26) using human serum samples, (b) calibration plots (between the red shift of the LSPR peak and DPP IV activity/CD26). Error bar represents the standard deviation (n = 3).
Fig. S1
Fig. S2

(a)
DPP-IV/CD-26 activity

Abs642/Abs522

Hydrodynamic Radius (nm)

Time (Minutes)

Time (Seconds)

25 U/L
20 U/L
15 U/L
12.5 U/L
10 U/L
7.5 U/L
5 U/L
2.5 U/L
0 U/L