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Supporting Information

A Spectroscopic Study on the Amyloid-β Interaction with Clicked Peptide-Porphyrin Conjugates: a Vision Toward the Detection of Aβ Peptides in Aqueous Solution

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SUPPORTING INFORMATION

A spectroscopic study on the Amyloid-β interaction with clicked peptide-porphyrin conjugates: a vision toward the detection of Aβ peptides in aqueous solution.

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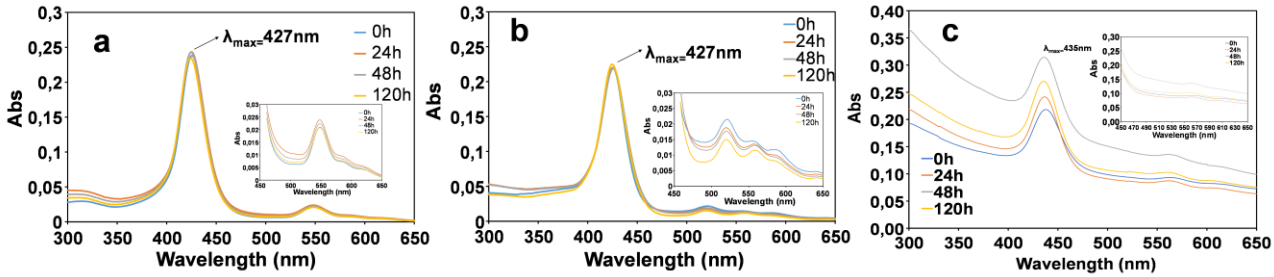


Figure 1S. UV-Vis spectra acquired at different time intervals, in the region between 300-650 nm of a) ***Cu-Ph-Pep***, b) ***Ph-Pep***, c) ***Zn-Ph-Pep***.

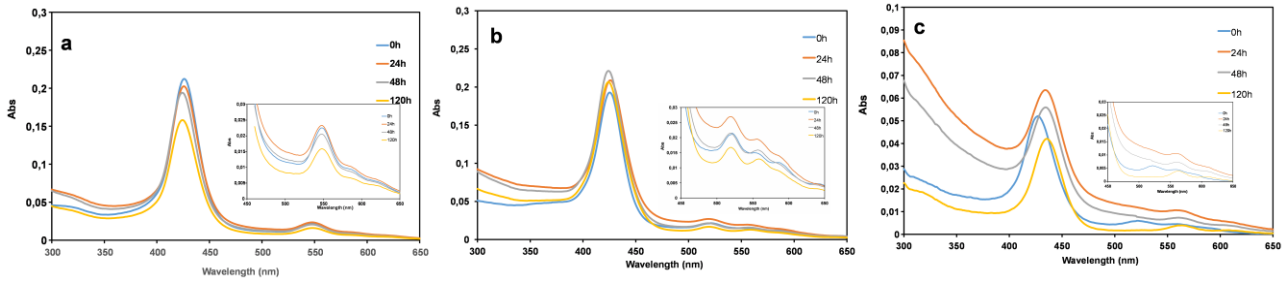


Figure 2S. UV-Vis spectra of porphyrin-peptide conjugates recorded in presence of Aβ_{42} monomers, a) Aβ_{42}/***Cu-Ph-Pep;*** b) Aβ_{42}/***Ph-Pep***; c) Aβ_{42}/***Zn-Ph-Pep***.

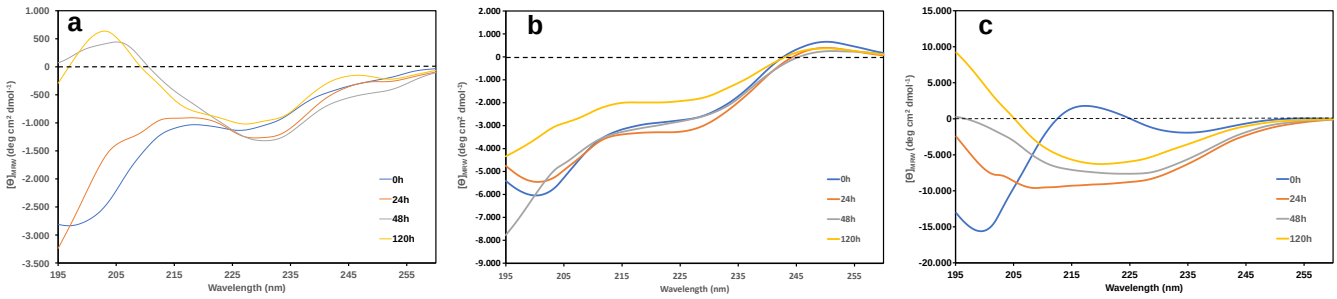


Figure 3S. CD spectra of conjugates at 5µM concentration recorded at different time intervals a) ***Cu-Ph-Pep***; b) ***Ph-Pep***; and c) ***Zn-Ph-Pep.***

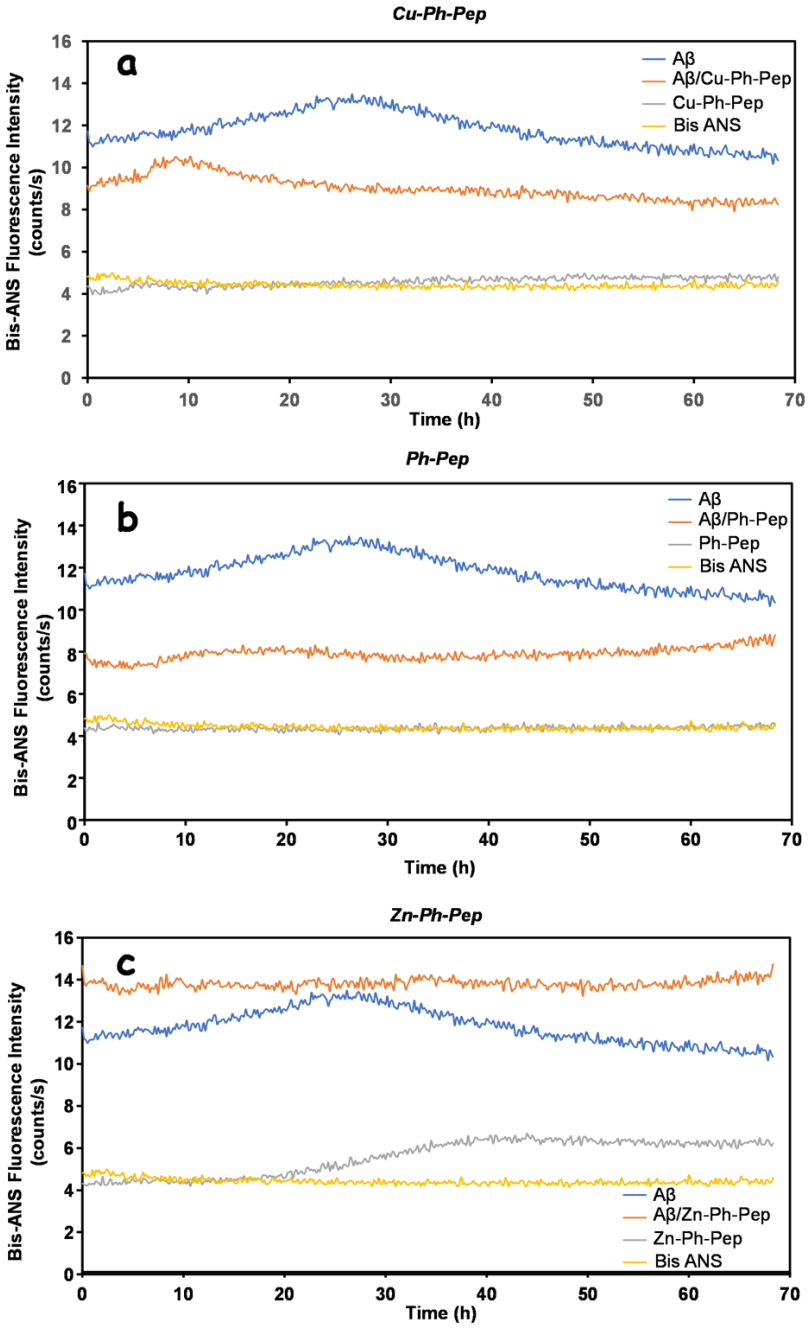
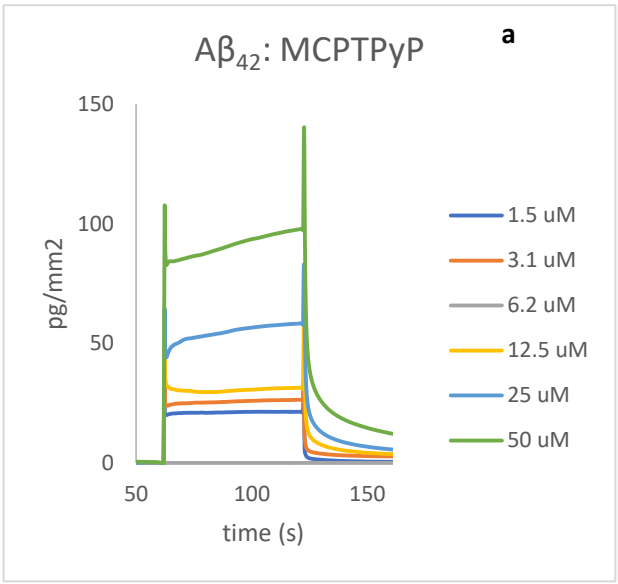
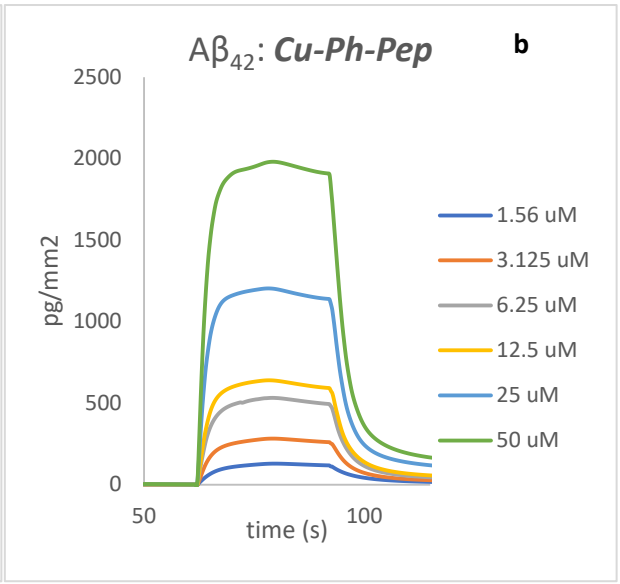


Figure 4S. bis-Ans fluorescence kinetics of Aβ_{42} (20 µM), Aβ_{42}/porphyrin-peptide conjugates at a 1:1 molar ratio and peptide conjugates alone. a) ***Cu-Ph-Pep***; b) ***Ph-Pep***; c) ***Zn-Ph-Pep.***


a
Aβ42: MCPTPyP
150
100
50
0
pg/mm2
50
100
150
time (s)
1.5 uM
3.1 uM
6.2 uM
12.5 uM
25 uM
50 uM


b
Aβ42: Cu-Ph-Pep
2500
2000
1500
1000
500
0
pg/mm2
50
100
time (s)
1.56 uM
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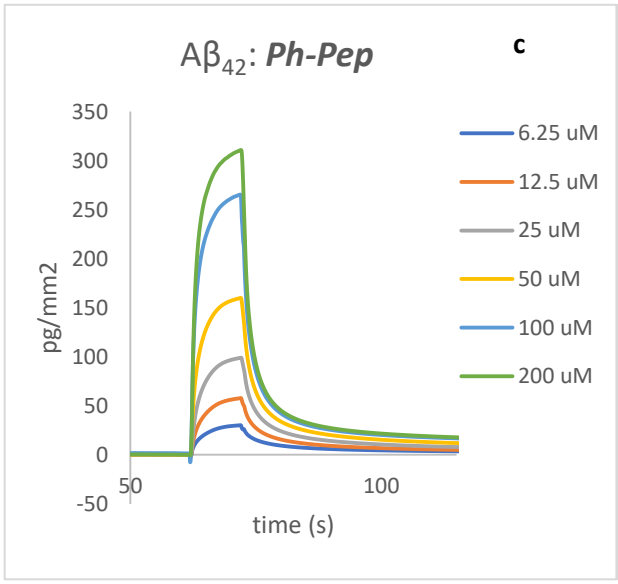
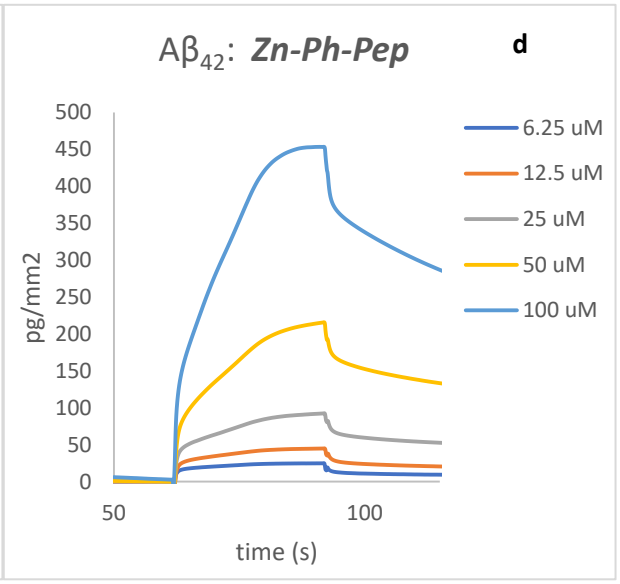
6.25 uM
12.5 uM
25 uM
50 uM


c
Aβ42: Ph-Pep
350
300
250
200
150
100
50
0
-50
pg/mm2
50
100
time (s)
6.25 uM
12.5 uM
25 uM
50 uM
100 uM
200 uM


d
Aβ42: Zn-Ph-Pep
500
450
400
350
300
250
200
150
100
50
0
pg/mm2
50
100
time (s)
6.25 uM
12.5 uM
25 uM
50 uM
100 uM

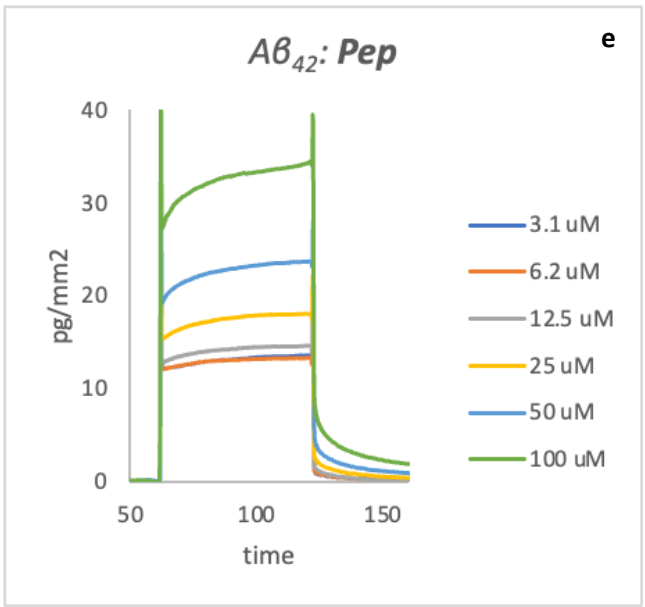

e
Aβ42: Pep
40
30
20
10
0
pg/mm2
50
100
150
time
3.1 uM
6.2 uM
12.5 uM
25 uM
50 uM
100 uM

Figure 5S. Quantitative binding kinetics of $A\beta_{42}$ vs a) MCPTPyP; b) ***Cu-Ph-Pep***; c) ***Ph-Pep***; d) ***Zn-Ph-Pep***; and e) ***Pep*** measured by GCI. All curves were blank subtracted. Experiments were performed in triplicate. All the quality assessments (i.e., $\chi 2$ shown in Table 1 of the main text, parameter errors, and residual plots were acceptable; the sensorgrams had sufficient curvatures and the kinetic constant k_{off} were within the measurable range) were fulfilled. Descriptive Statistical Analysis was employed to calculate the mean of the obtained values of k_{on}, k_{off} and K_D as a measure of central tendency and standard deviations of the former values were computed as a measure of dispersion.

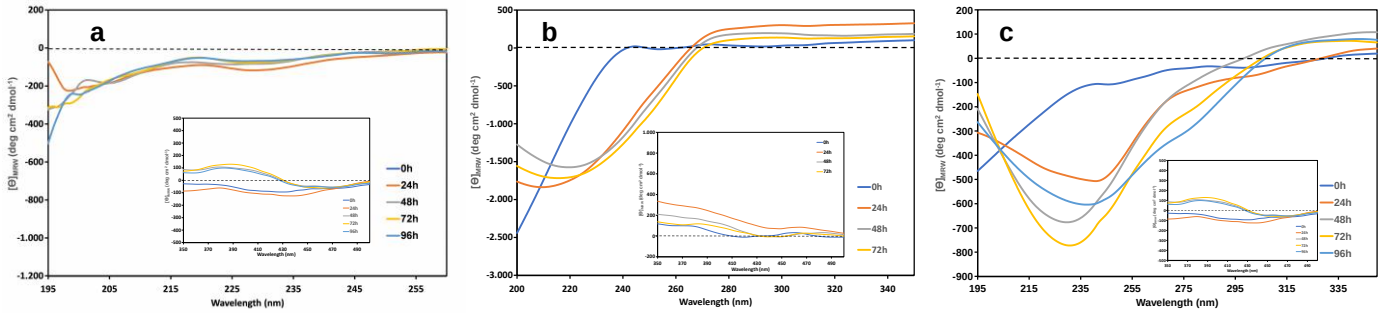


Figure 6S. CD Spectra the porphyrin-peptide conjugates at 20 µM in the Far-UV region (195-350 nm). **a**) **Cu-Ph-Pep**; **b**) **Ph-Pep**; **c**) **Zn-Ph-Pep**. inset: CD spectra in the near UV region (350-500 nm).

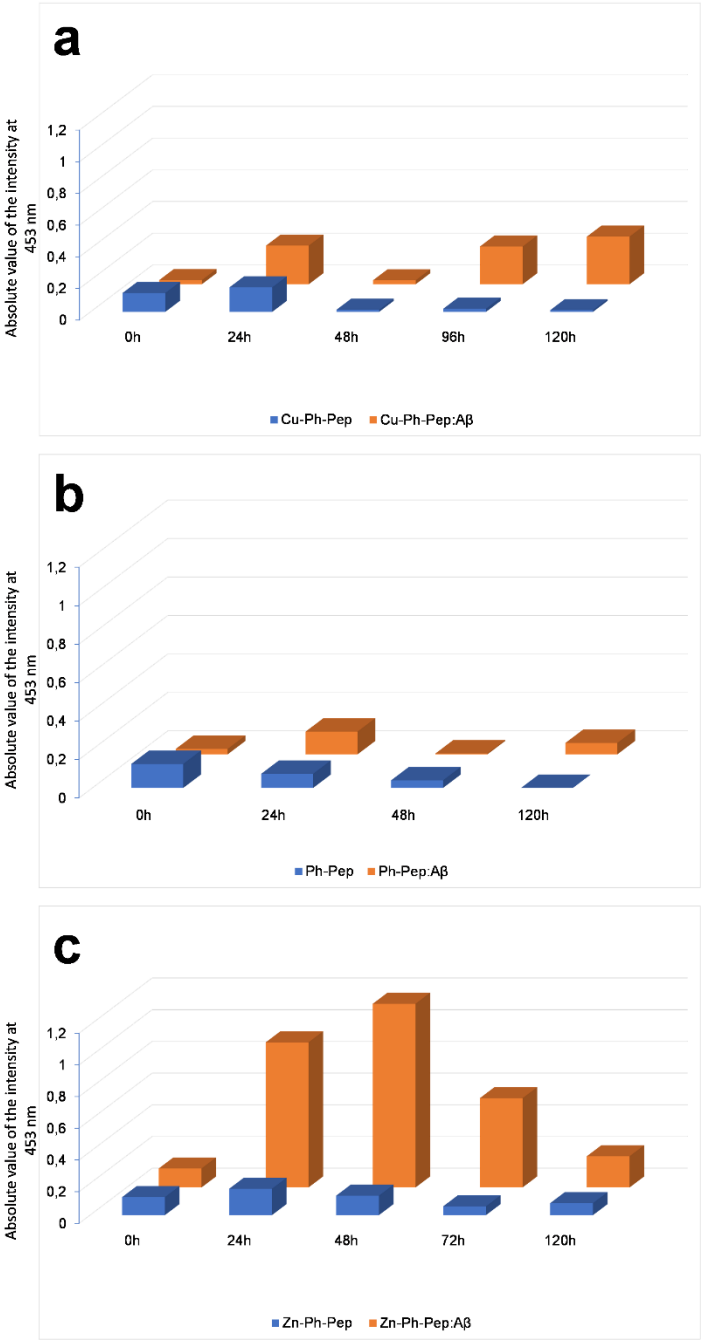


Figure 7S. Comparative graphic showing the absolute value of CD intensities at maximum absorption wavelength for each peptide derivative either in the presence or absence of Aβ_{42} at the same interval of time.

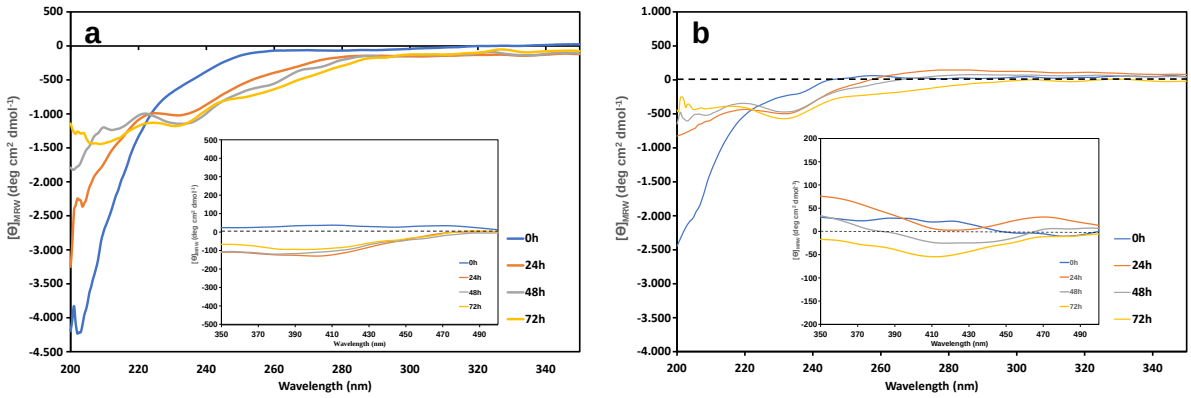


Figure 8S. Panel **a**: CD Spectra of Aβ $_{8\text{-}20}$ (20 µM) in the Far-UV (195-350 nm) and visible (350-500 nm, inset) regions**.** Panel **b**: CD Spectra of Aβ $_{8\text{-}20}$ /***Zn-Ph-Pep*** equimolar mixture (20 µM) in the Far-UV (195-350) and near-UV (350-500 nm) regions.

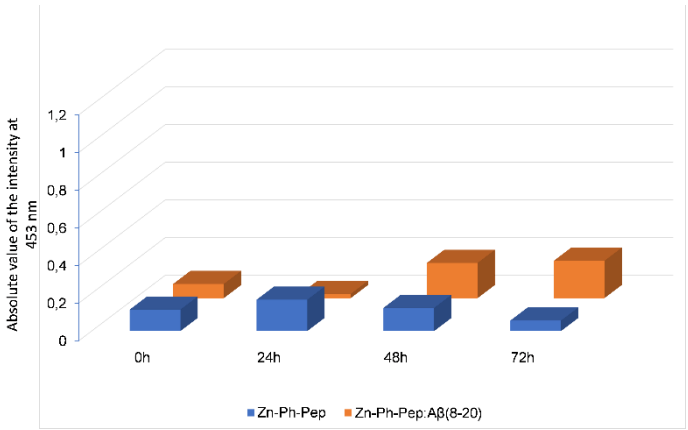


Figure 9S. Comparative graphic showing the absolute value of CD intensities at maximum absorption wavelength for conjugate ***Zn-Ph-Pep*** either in the presence or absence of Aβ $_{8\text{-}20}$ at the same time interval.

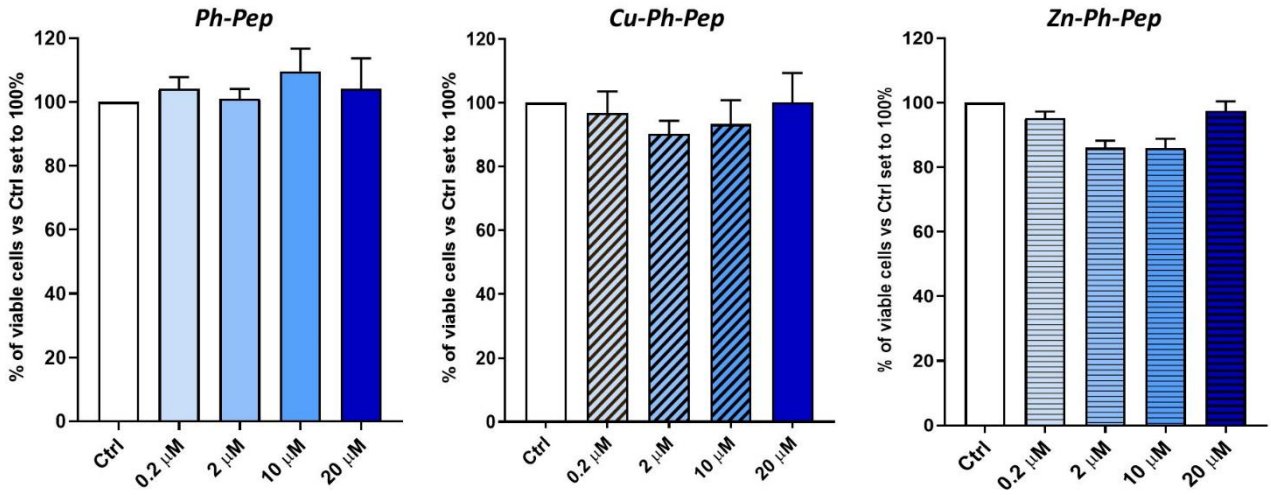


Figure 10 S. MTT Assay of fully differentiated SH-SY5Y treated for 48 hours with increasing concentrations of ***Ph-Pep*** and its derivatives (0.2, 2, 10, 20 µM). Bars represent means ±SEM of three independent experiments with n=3 each.

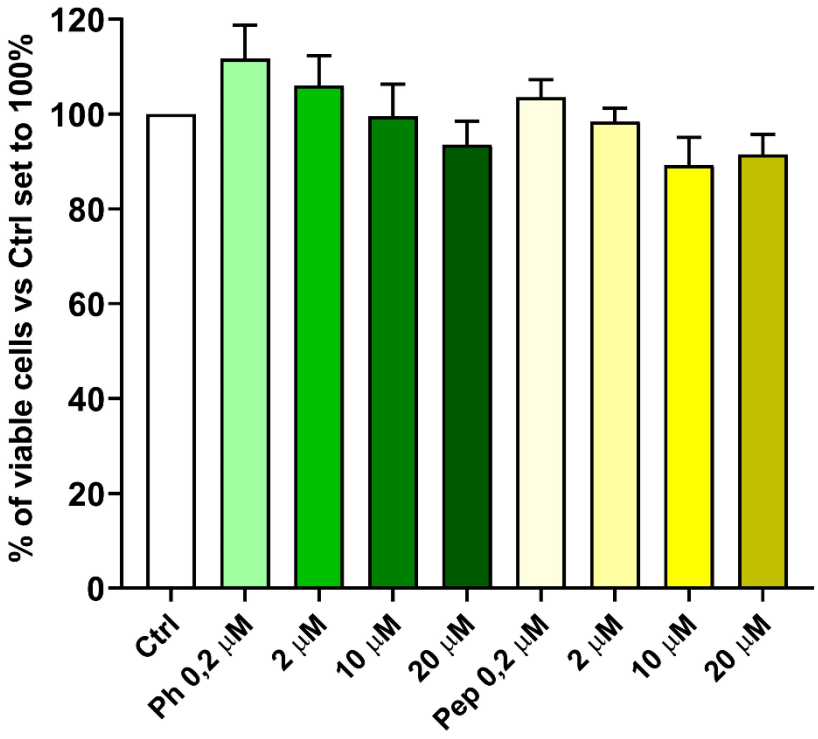


Figure 11S. MTT Assay of fully differentiated SH-SY5Y treated for 48 hours with increasing concentrations of pristine MCPTPyP (**Ph**)and Ac-GK(N_3)PGKLVFF-NH_2 Peptide (Pep) (0.2, 2, 10, 20 µM), separately added to evaluate the potential toxicity of the single components of the compounds. Bars represent means ±SEM of three independent experiments with n=3 each.

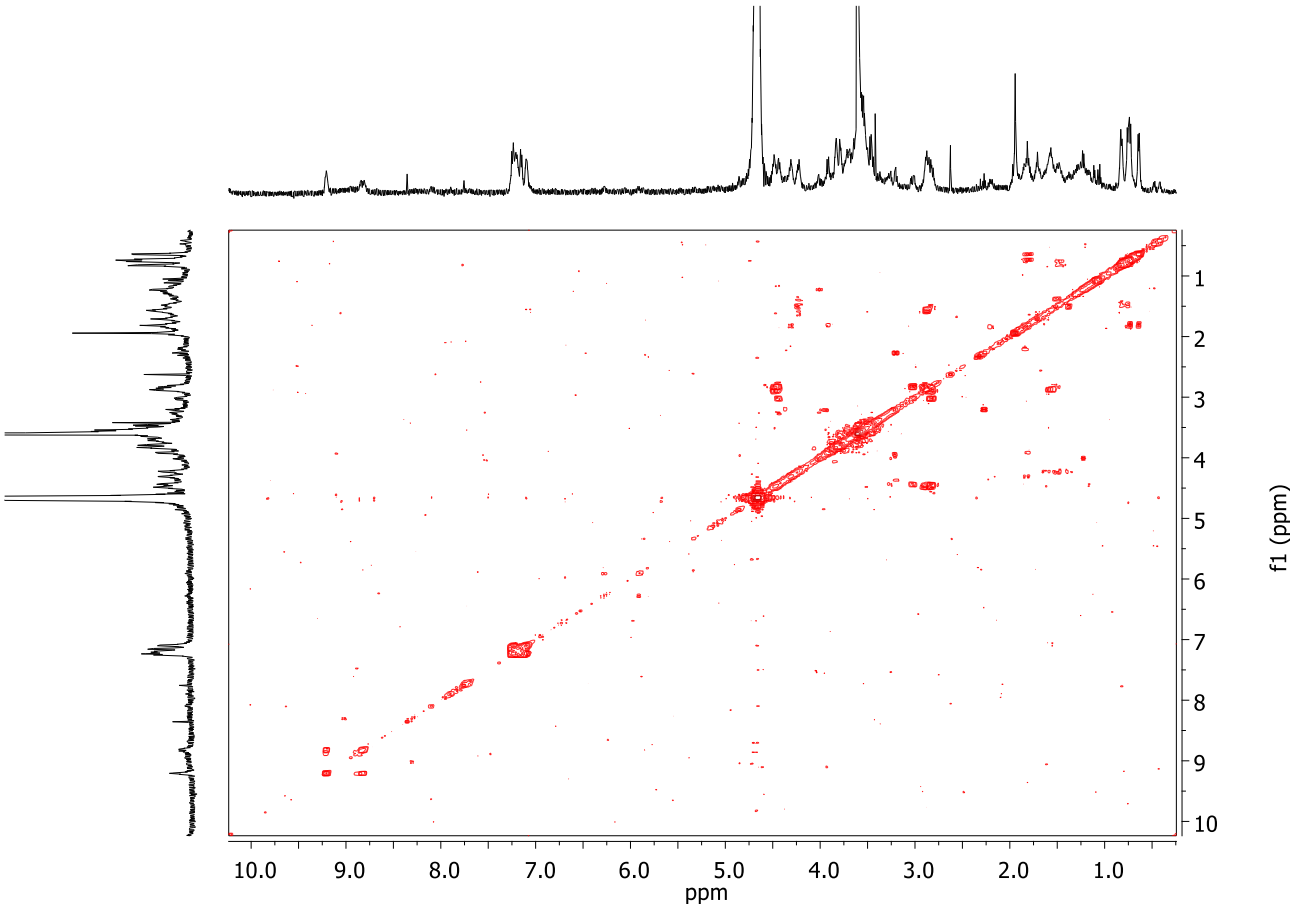


Figure 12S 2D COSY ***Ph-Pep***

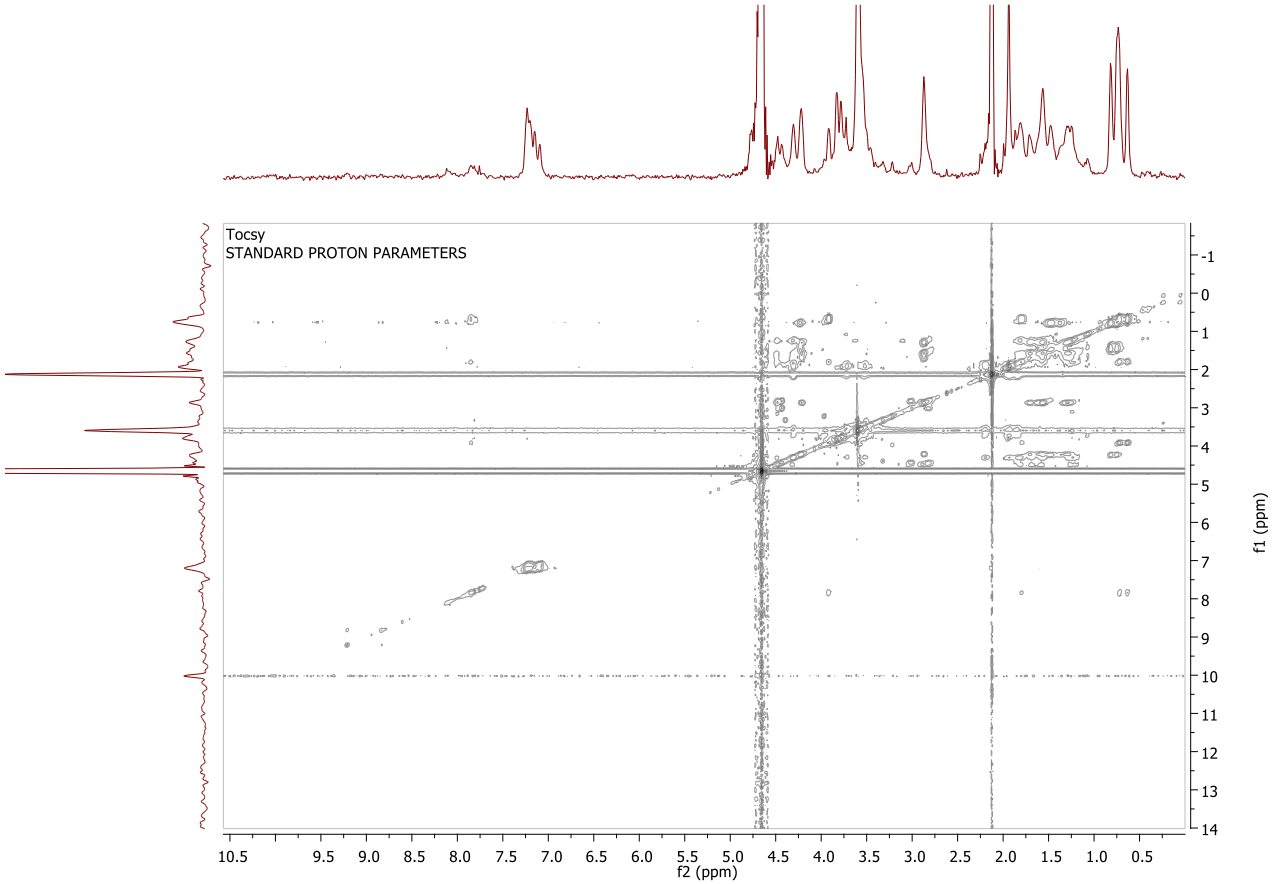


Figure 13S 2D TOCSY ***Ph-Pep***

Table 1S. Proton Chemical shifts (ppm) for the peptide-conjugate ***Ph-Pep***.

Position	Hα	Hβ	Hγ	Others
(1,2,3-triazol-4-yl)AlaOMe	3.89;	3.79; 3.75		O-CH_3 3.72
Lys(N_3)	4.23	1.61; 1.58	1.31	δCH_2 1.68; εCH_2 2.90
Gly(Ac)*	3.83;3.78			CH_3 1.95
Pro	4.31	2.21; 1.83	1.94	δCH_2 3.54;3.71
Gly*	3.34; 3.71			
Lys	4.48	1.69;1.58	1.35	δ$CH_2$1.68; ε$CH_2$3.05
Leu	4.23	1.50	1.49	$CH_3$0.81; $CH_3$0.75
Val	3.93	1.80	CH_3 0.72; $CH_3$0 .64	
Phe	4.43	3.03; 2.84		ar7.09; ar7,22
Phe	4.48	2.82; 2.91		ar7.09; ar7.22
MCPTPyP mojety				
Piridyl$_{2,6}$ 9.18	Piridyl $_{3,5}$ 8.18	Pirrolyl $_{3,4}$ 8.93; 8.72	Benzyl $_{2,6}$; 7.17 Benzyl $_{3,5}$ 6.51	N-CH_3 3,61