Supporting Information

Mimicking Neuroligin-2 Functions in β-cells by Functionalized Nanoparticles as a Novel Approach for Antidiabetic Therapy

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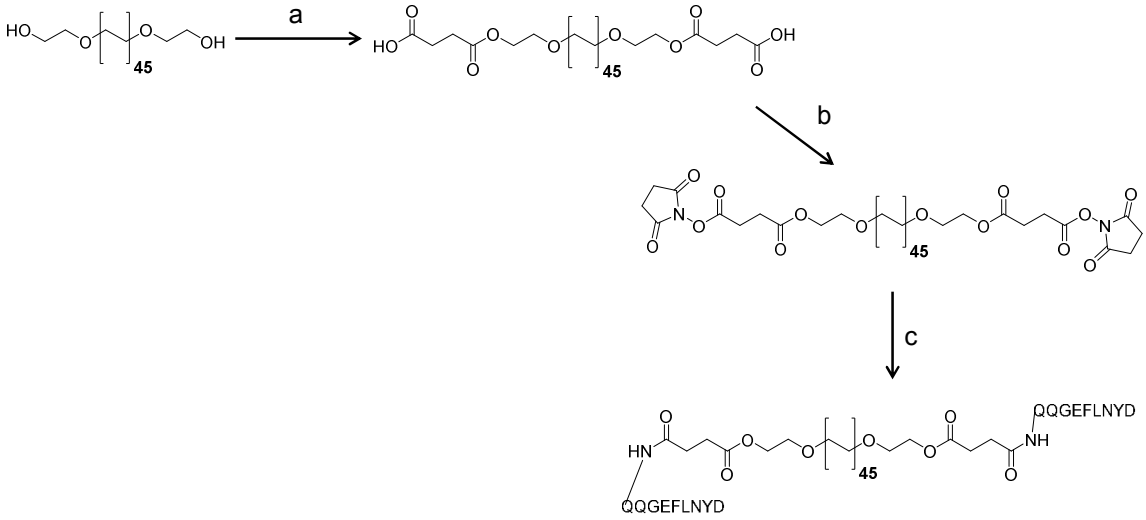
1. Scheme S1. Synthesis of HSA-112

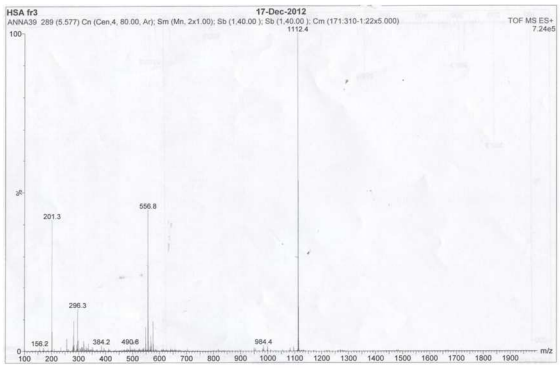


Reagents and conditions: (a) succinic anhydride $C_4H_4O_3$, dry tetrahydrofurane (THF), 3% dry pyridine C_5H_5N, nitrogen pressure, 60° C, 24h; (b) N-hydroxysuccinimide $C_4H_5NO_3$, N,N`-dicyclohexylcarbodiimide (DCC) $C_{13}H_{22}N_2$, dry THF, room temperature, 8h; (c) HSA-28 peptide, solution of 15% $NaHCO_3$/dioxane 1:1, room temperature, 48h.

2. Figure S1. Analytical data for synthesized peptides

Figure S1a. HSA-28 (MH^+ =1112.4)

Mass spectrum (ESI^+)



HPLC analysis

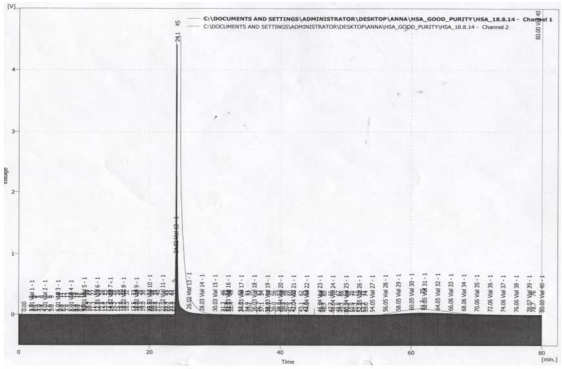
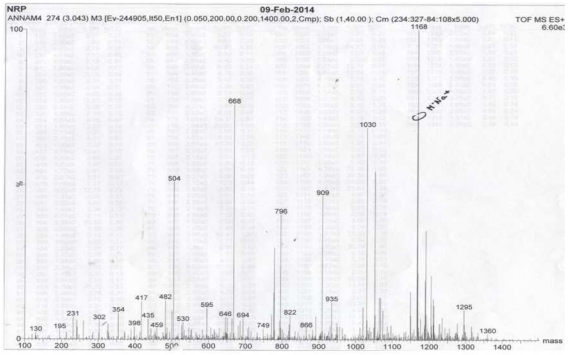


Figure S1b. EEIQYSDFN (scrambled peptide)

Mass spectrum (ESI^+)

EEIQYSDFN (scrambled peptide) (MNa^+=1168.0)



HPLC analysis

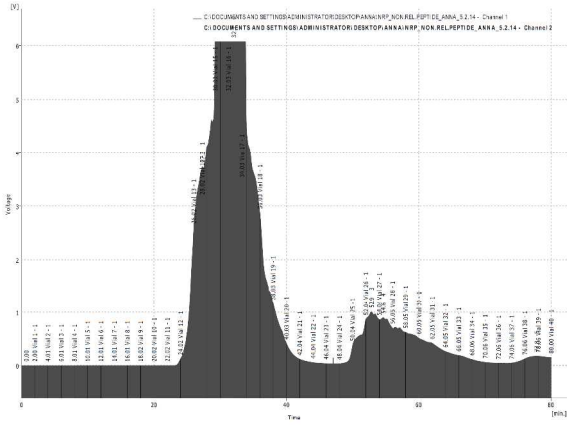
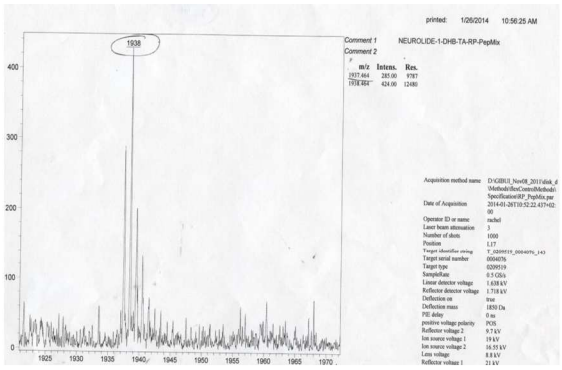


Figure S1c. SEGNRWSNSTKGLFQRA (CNSP1)

Mass spectrum (MALDI)

SEGNRWSNSTKGLFQRA (CNSP1) (MH^+ =1938.0)



HPLC analysis

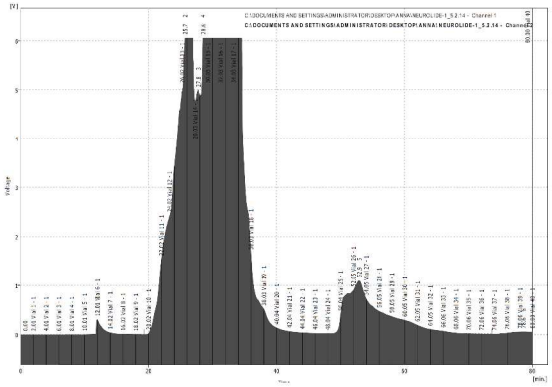
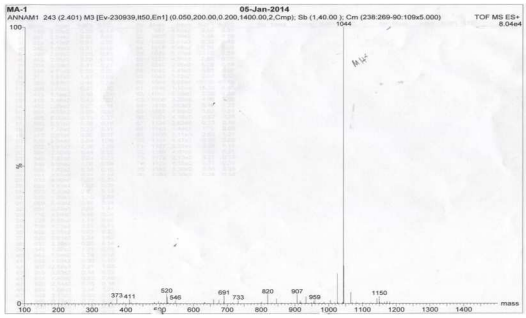


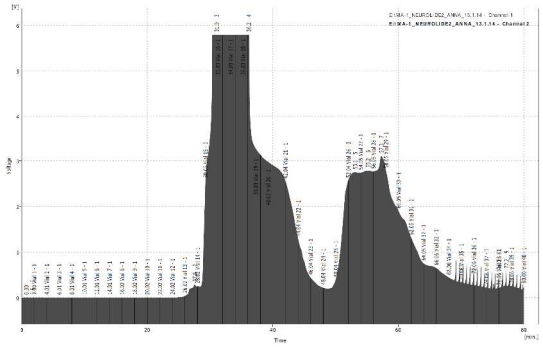
Figure S1d. HSEGLFQRA (CNSP2)

Mass spectrum (ESI^+)

HSEGLFQRA (CNSP2) (MH^+ =1044.0)



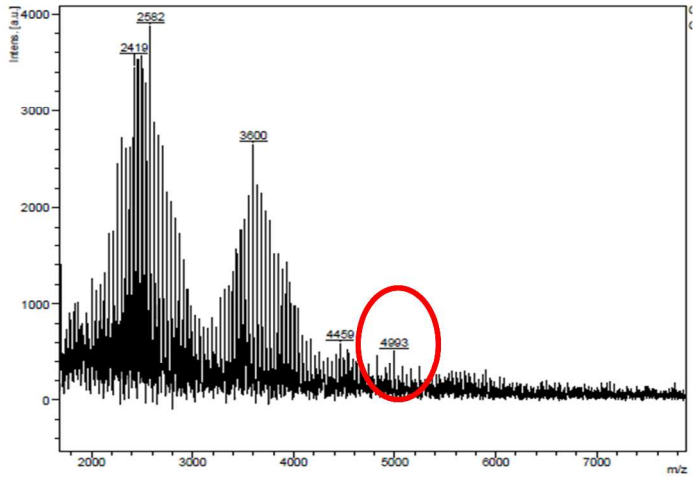
HPLC analysis



3. **Figure S2.** Analytical data of HSA-112

Mass spectrum (MALDI)

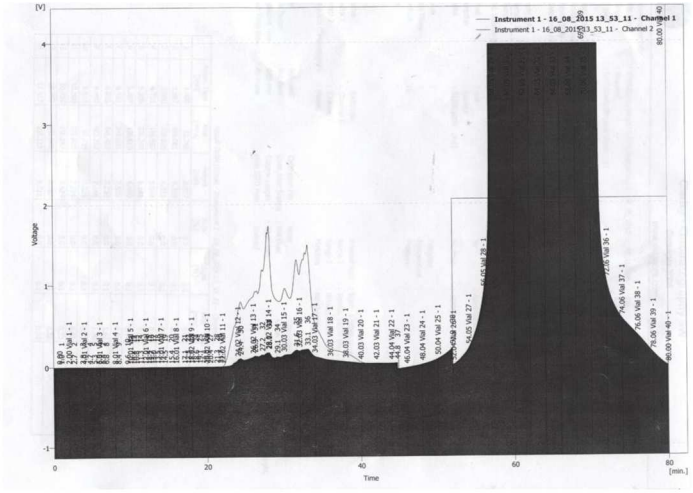
HSA-112 (double substituted by HSA-28 PEG_{2000})(MH^+≈4993.0)



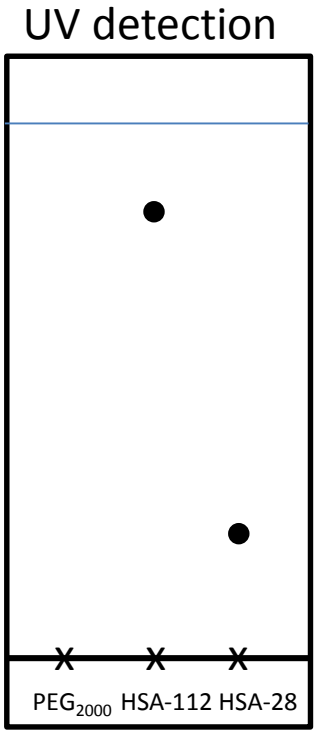
HPLC analysis

A peak in retention time around 23-38 min is monosubstituted by HSA-28 PEG_{2000}

A peak in retention time around 55-70 min is disubstituted by HSA-28 PEG_{2000}

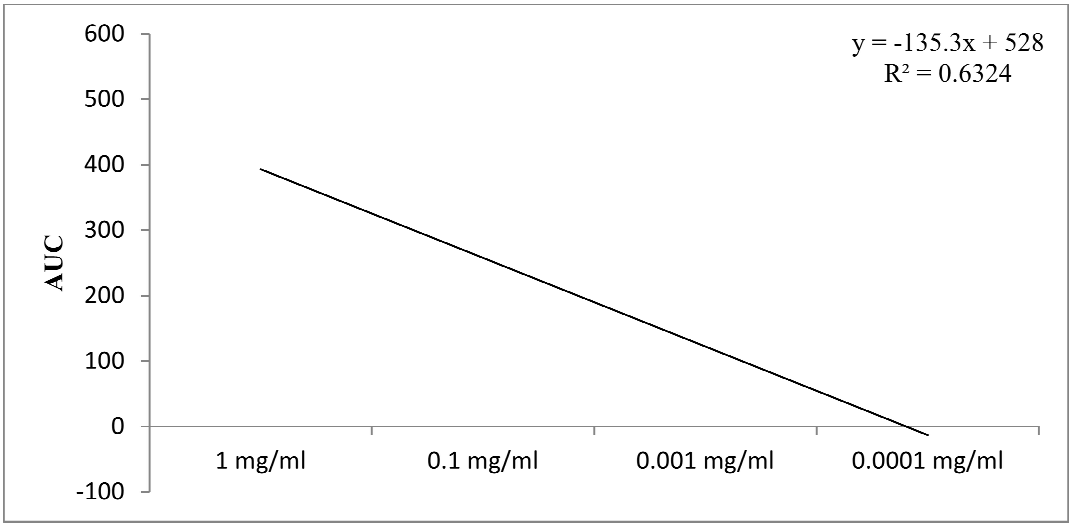


TLC



Eluent: Diethylether/Ethanol (80/20)

4. **Figure S3.** Calibration curve of HSA-28



5. **Figure S4**

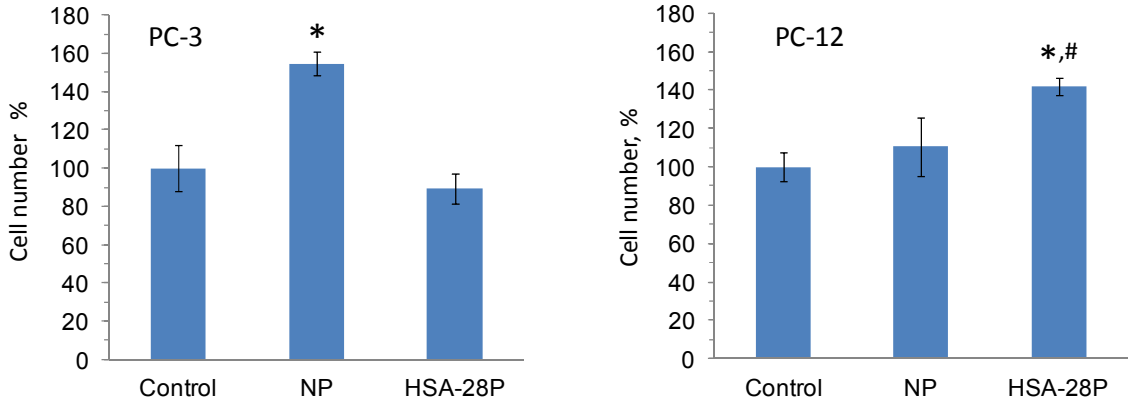


Fig. S4. *Evaluation of possible HSA-28P stimulatory effect on proliferation rate of PC-3 and PC-12 cell lines*. PC-3 cells or PC-12 cells were incubated for 24h with the medium

supplemented with HSA-28P (2.76μM), or NP (0.76 μg/ml). After the incubation time cells were detached by trypsin, colored by trypan blue and counted as described in Methods, n=6. MEAN±SE.