Intracellular Surface-Enhanced Raman Scattering (SERS) with Thermally Stable Gold Nanoflowers Grown from Pt and Pd Seeds

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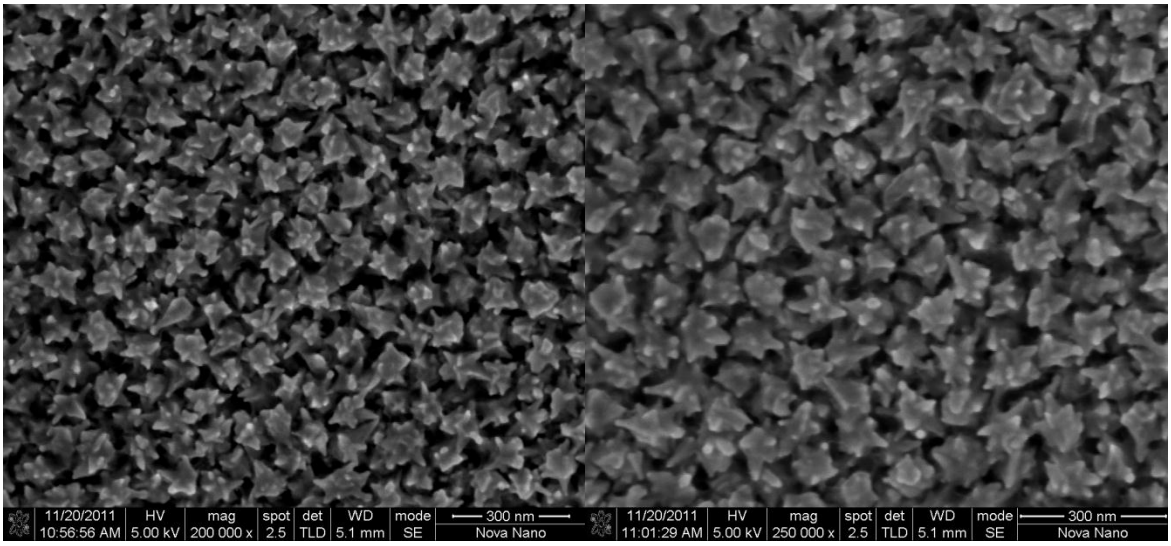


Fig. S1 SEM images of GNFs grown at room temperature with Pt1 seeds.

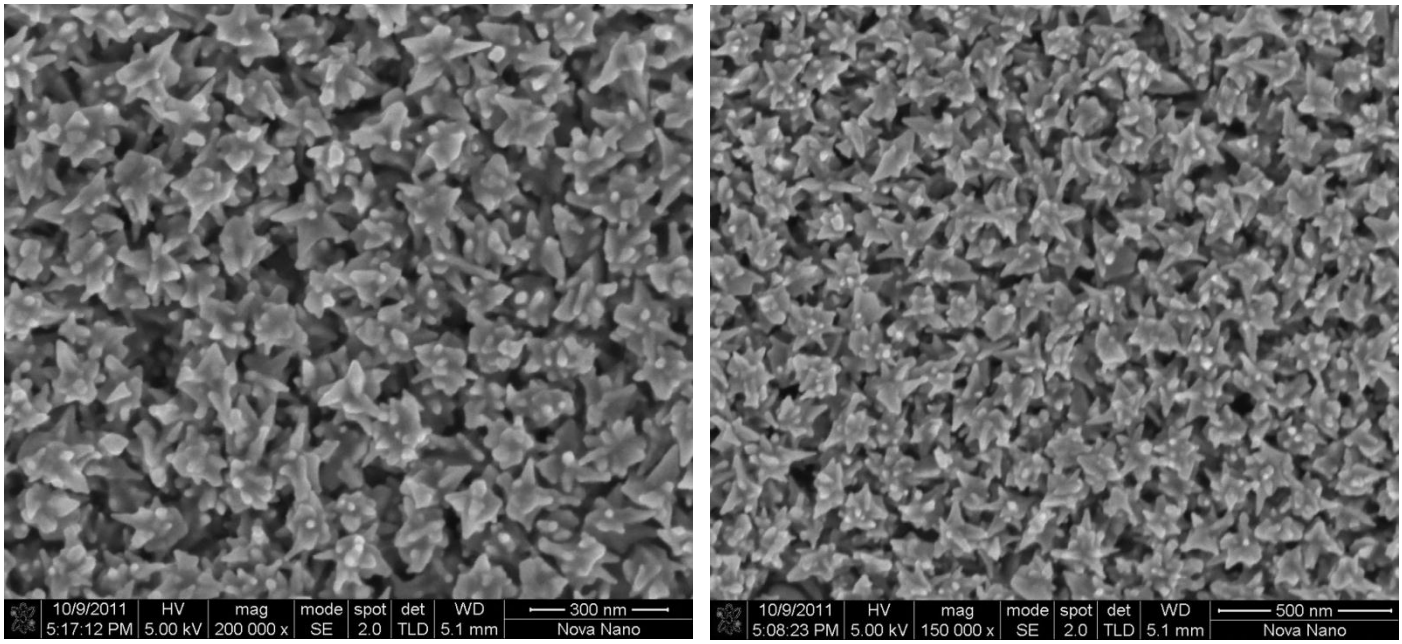


Fig. S2 GNFs grown from small size Pt NPs

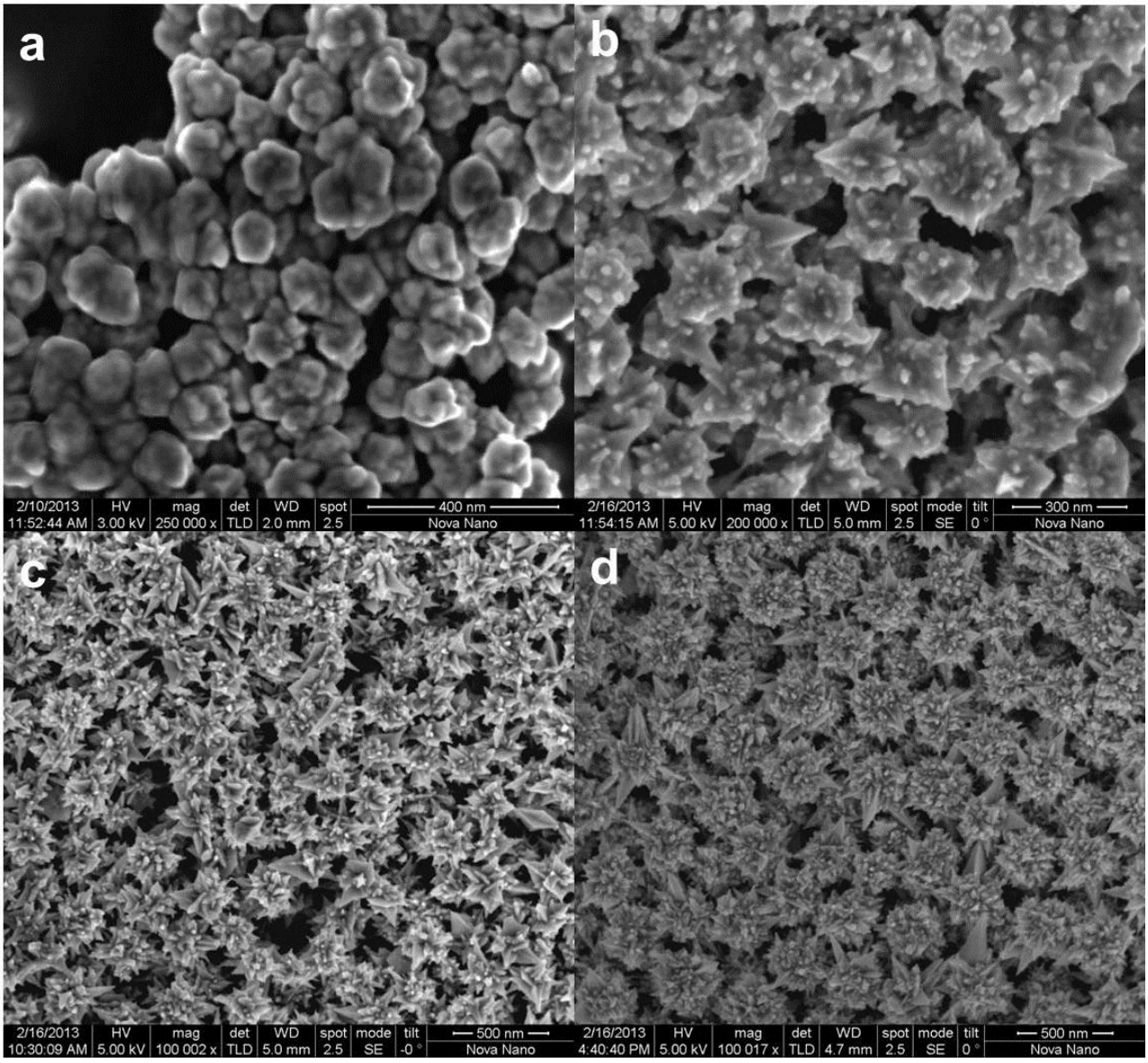


Fig. S3 SEM images of GNFs grown from Pt2 seeds with the amount of $HAuCl_4$ of (a) 0.1 mL, (b) 0.3 mL, (c) 1.0 mL, and (d) 2.0 mL.

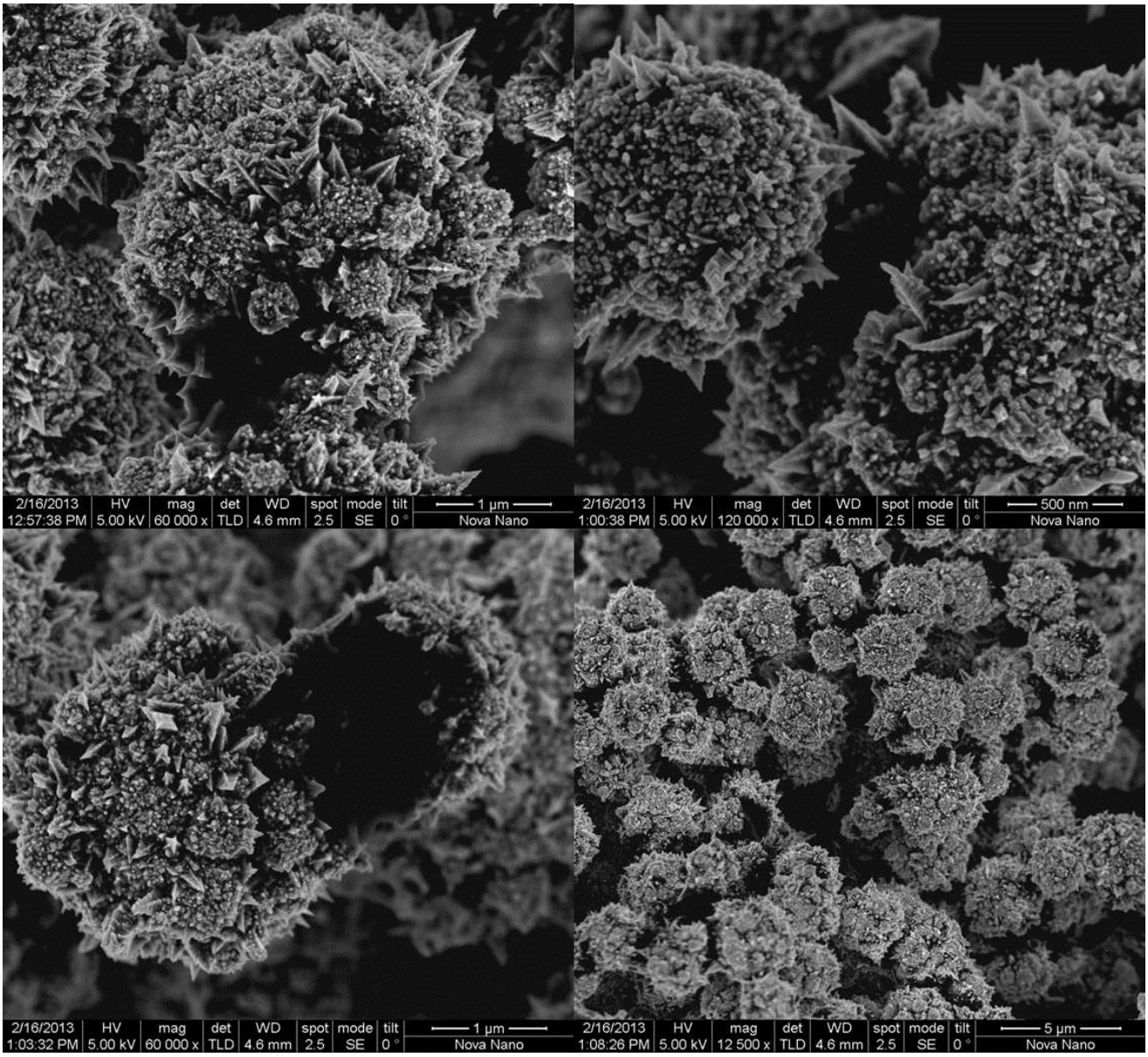


Fig. S4 SEM images of several hollow gold particles prepared with AgNO3 (2.0 mL, 0.015 M) and HAuCl4 (1.0 mL, 0.030 M).

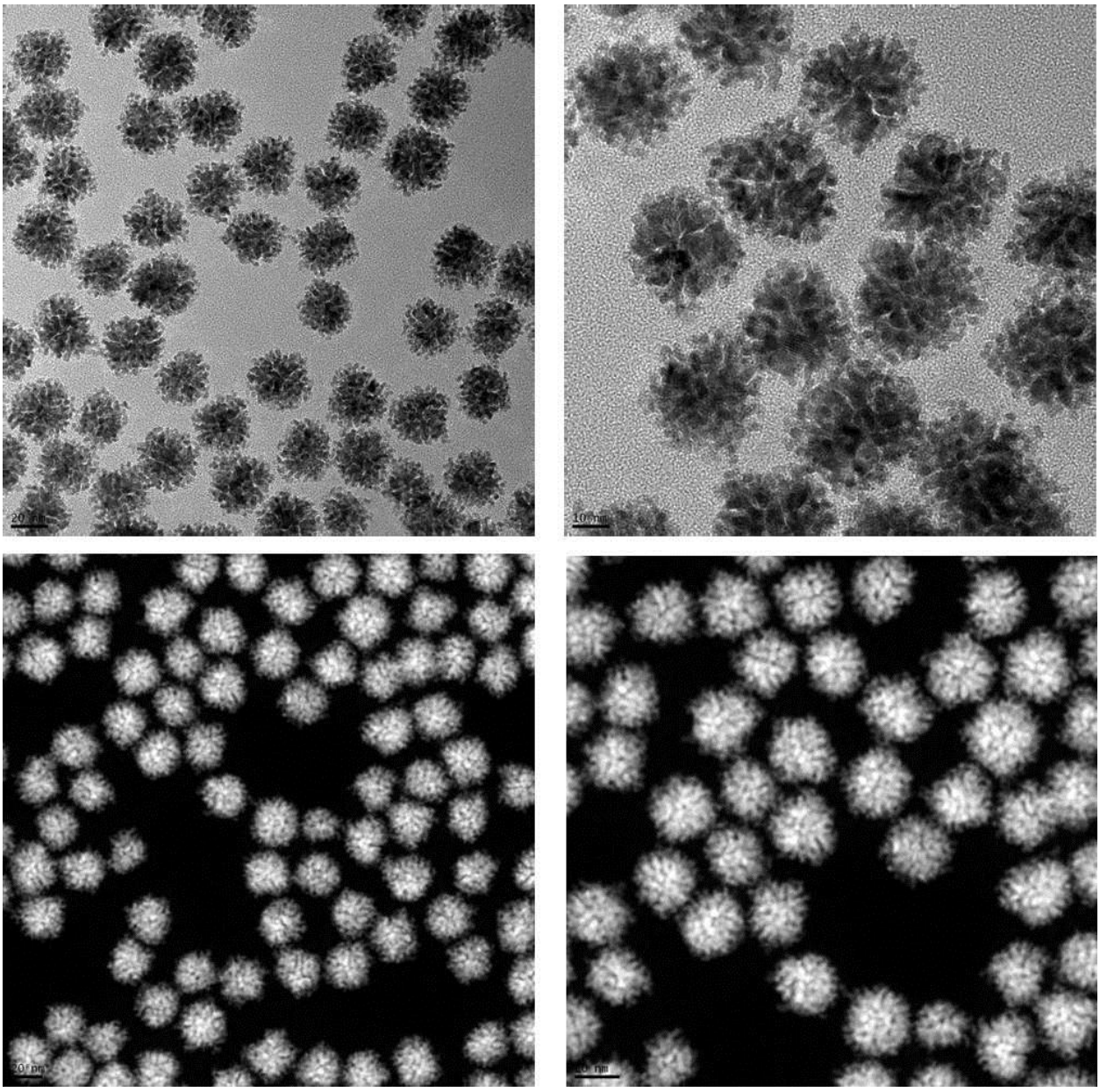


Fig. S5 TEM and STEM images of Pt1 seeds.

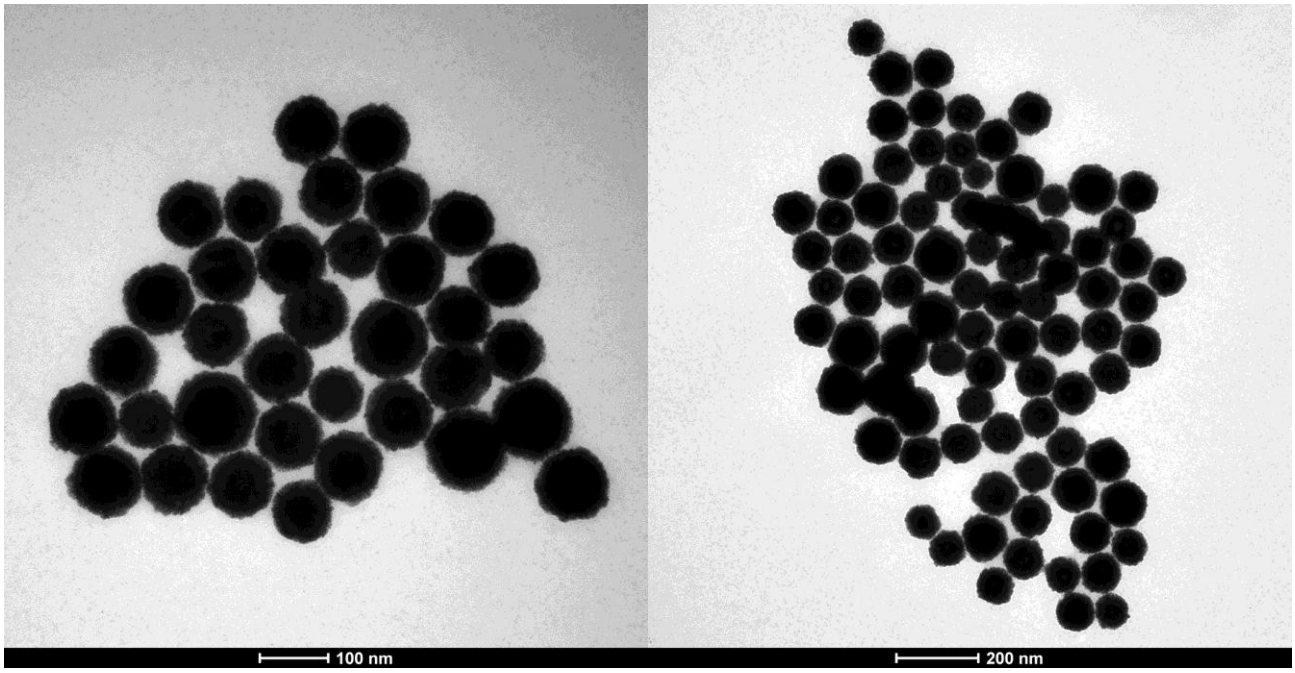


Fig. S6 TEM images of Pt2 seeds.

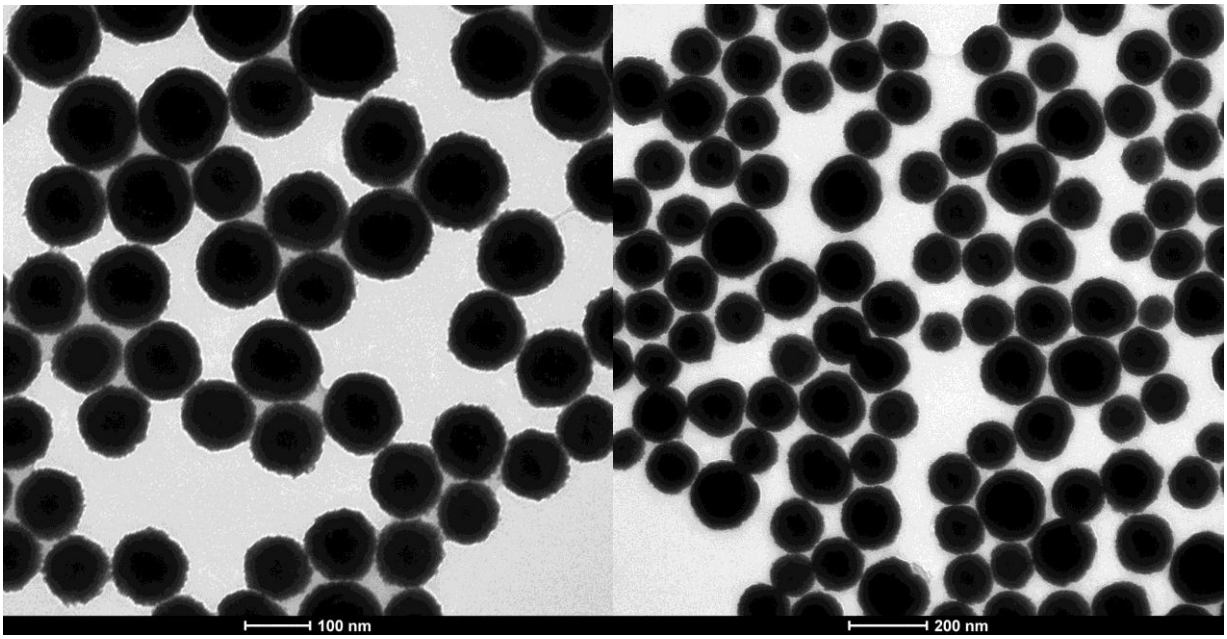


Fig. S7 TEM images of Pt3 seeds.

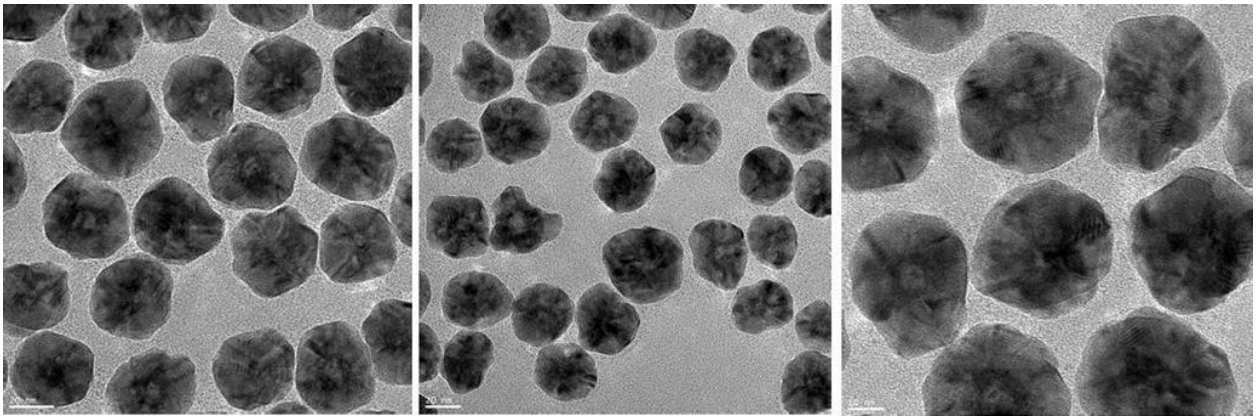


Fig. S8 TEM images of Pd1 seeds.

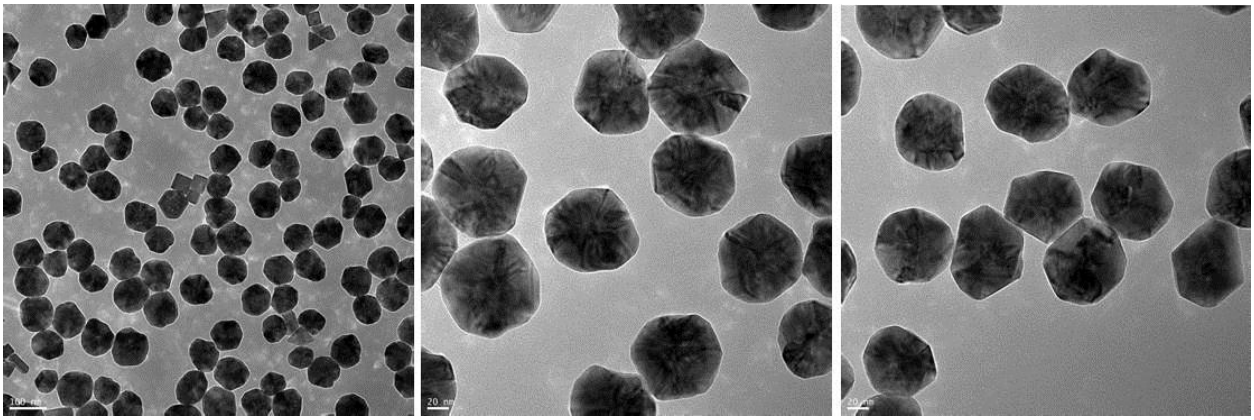
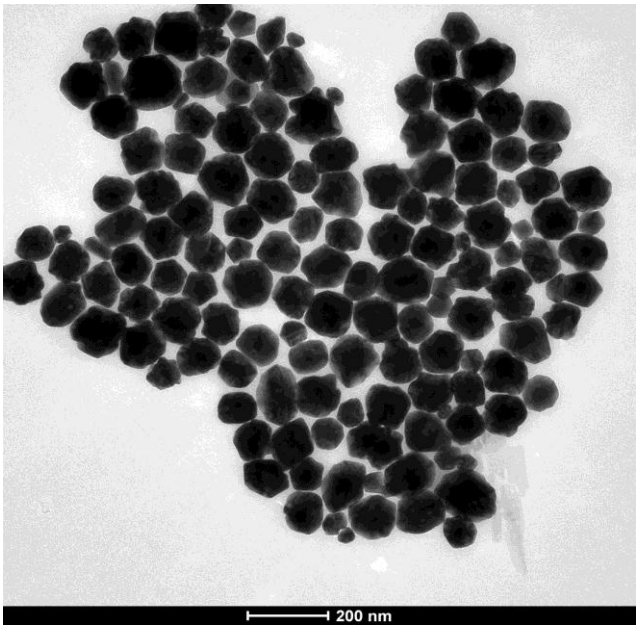


Fig. S9 TEM images of Pd2 seeds.



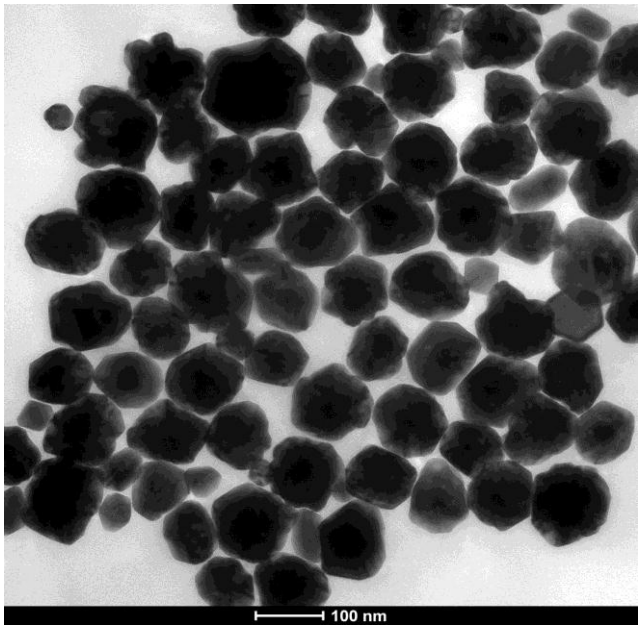


Fig. S10 TEM images of Pd3 seeds.

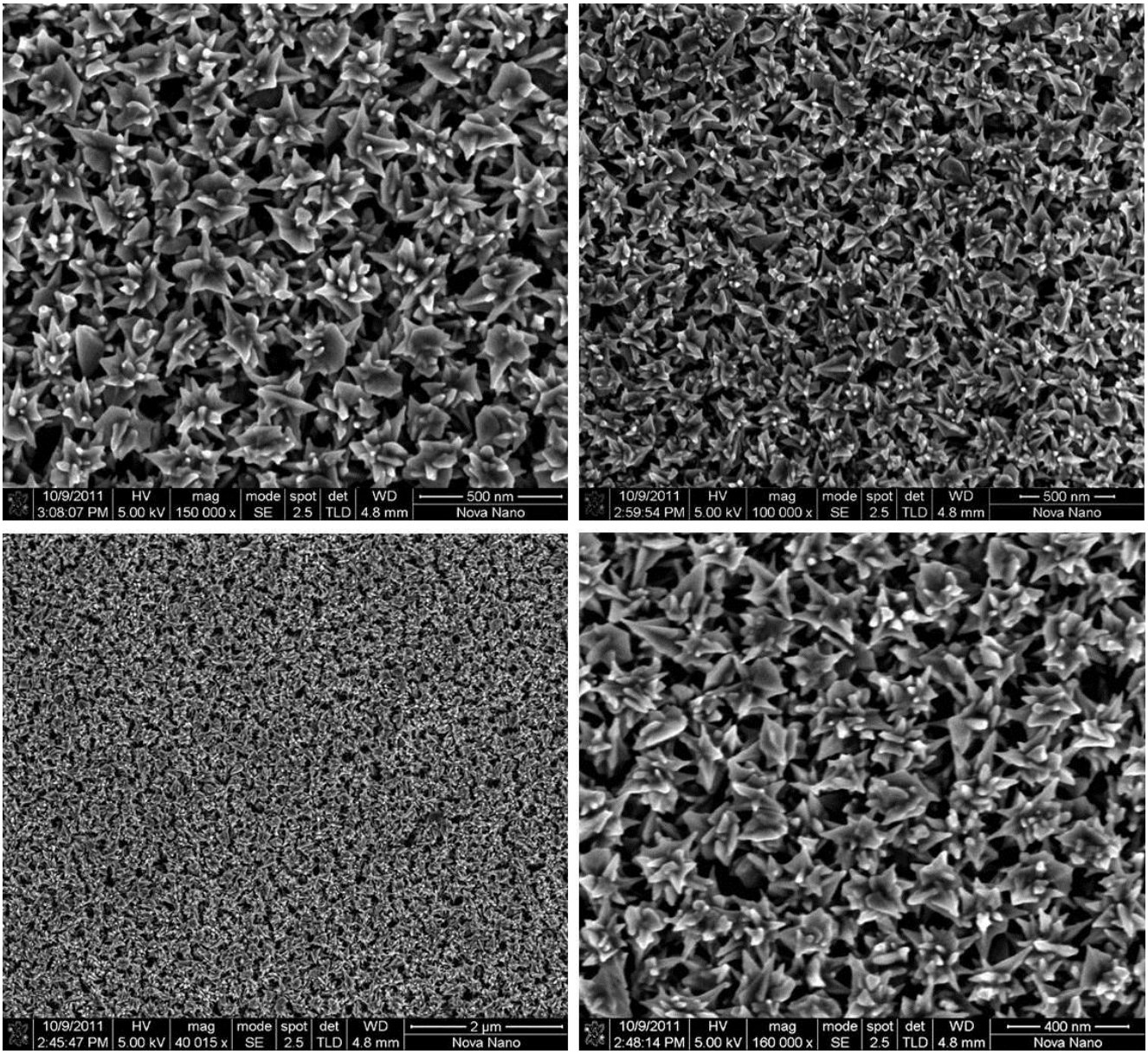


Fig. S11 SEM images of GNF-Pt1.

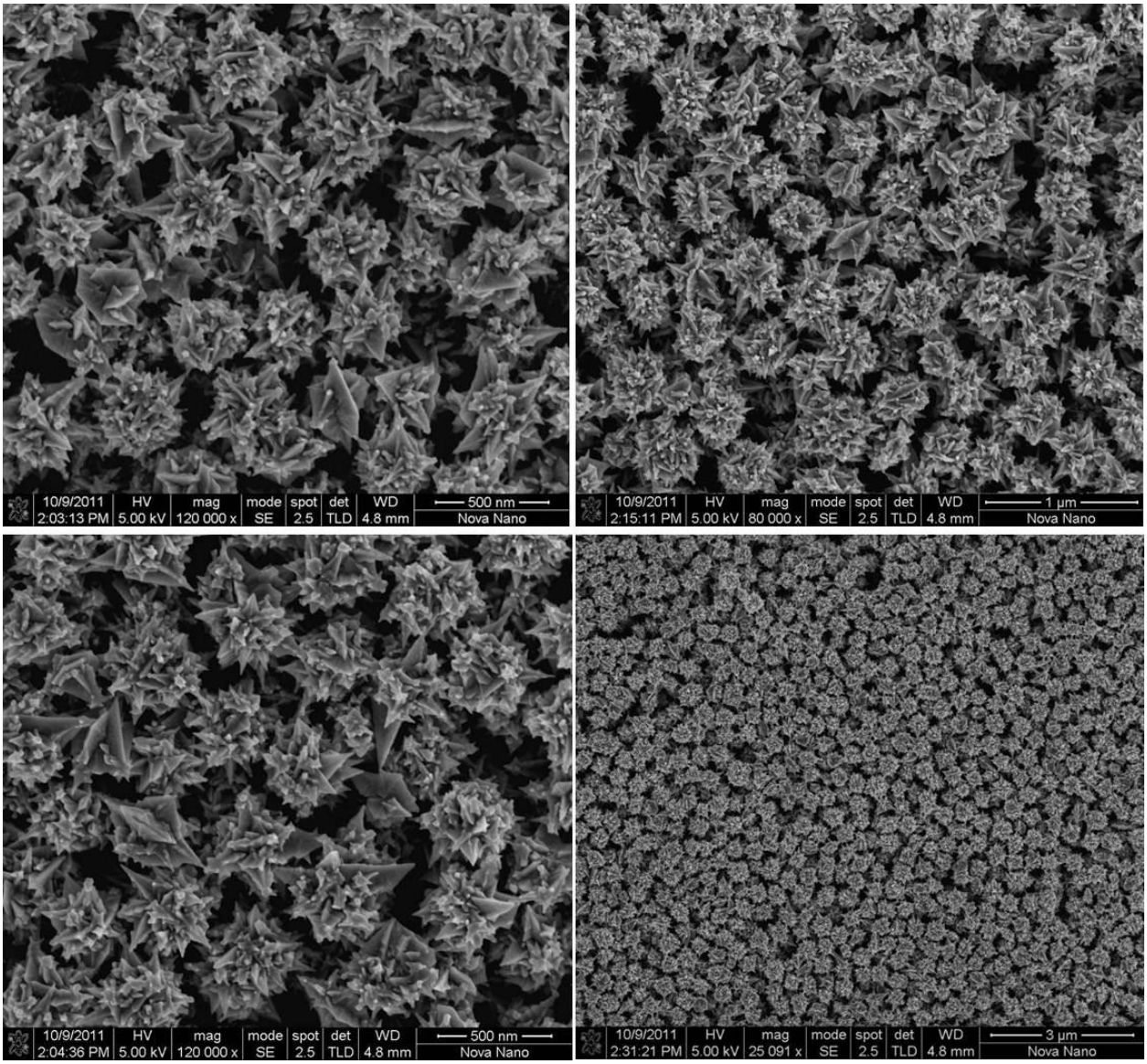


Fig. S12 SEM images of GNF-Pt2.

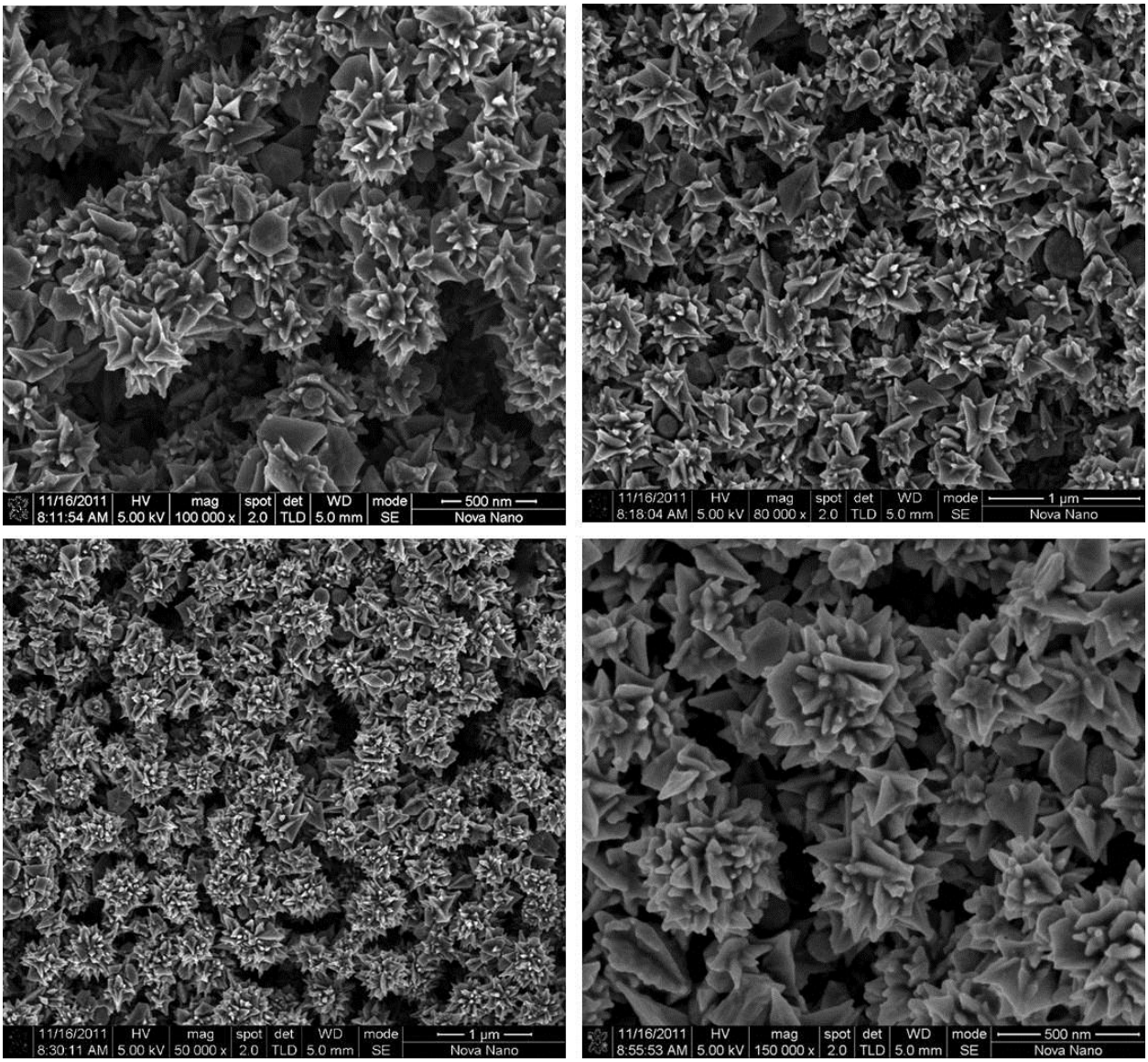


Fig. S13 SEM images of GNF-Pt3.

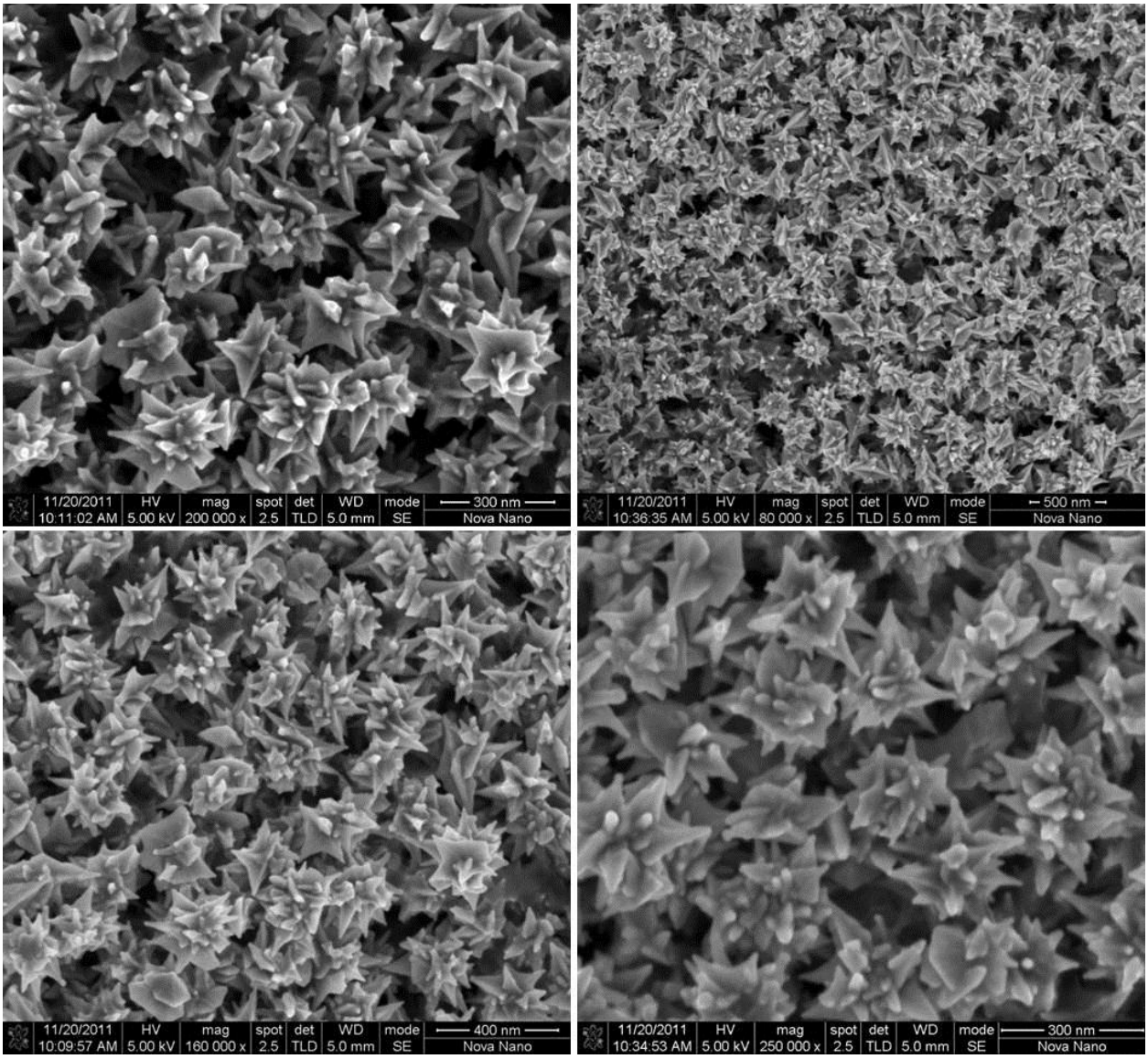


Fig. S14 SEM images of GNF-Pd1.

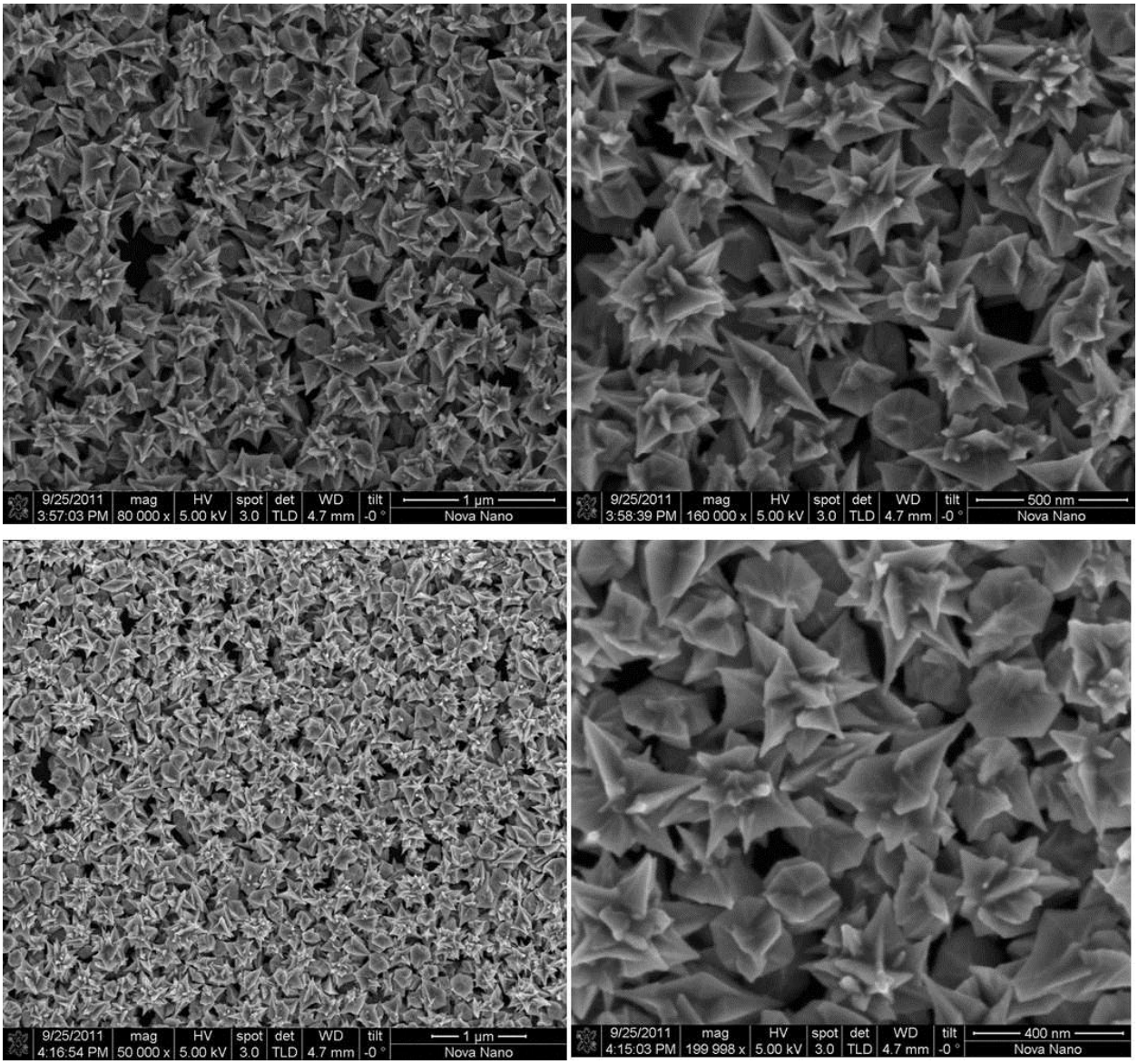


Fig. S15 SEM images of GNF-Pd2.

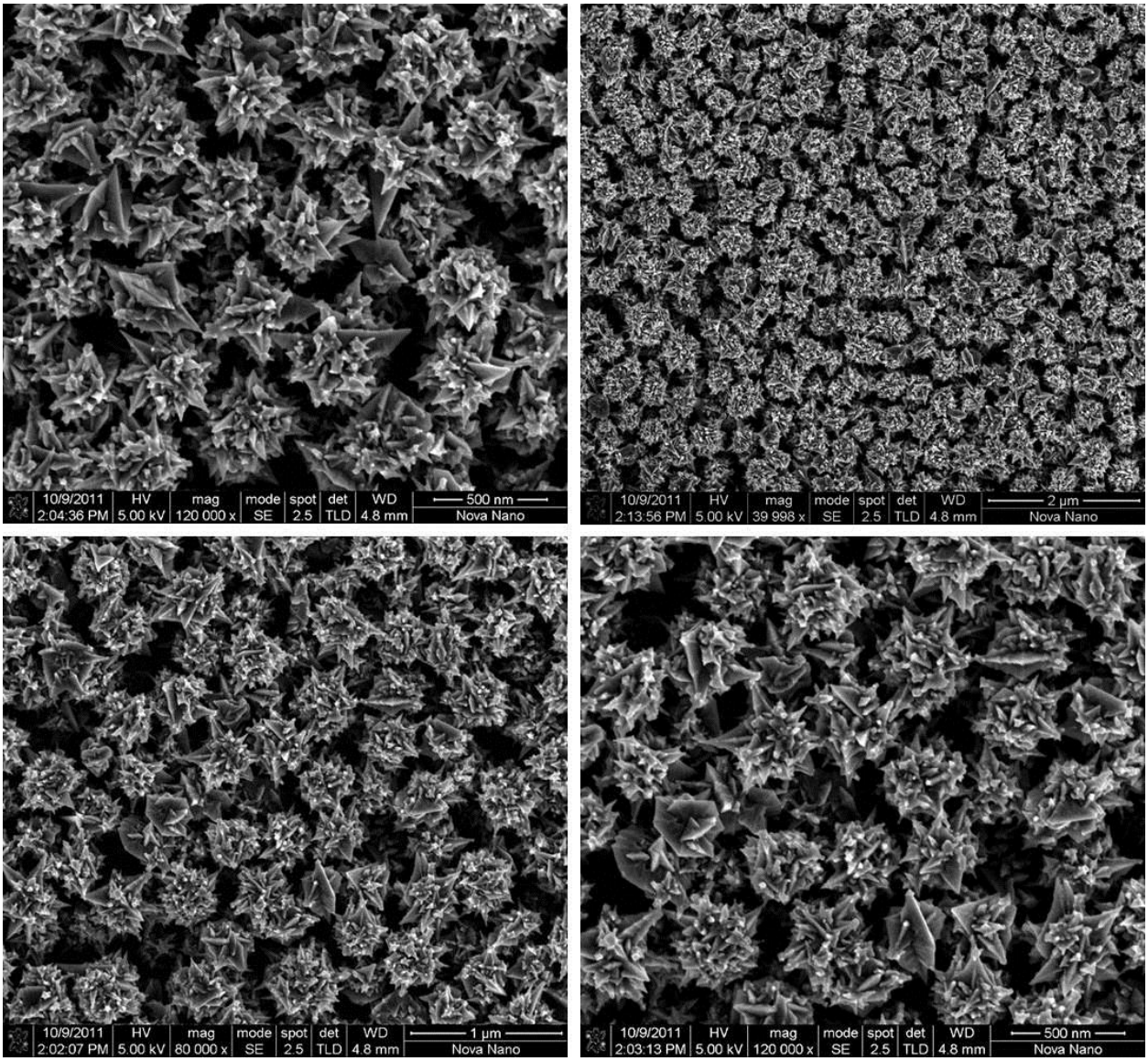


Fig. S16 SEM images of GNF-Pd3.

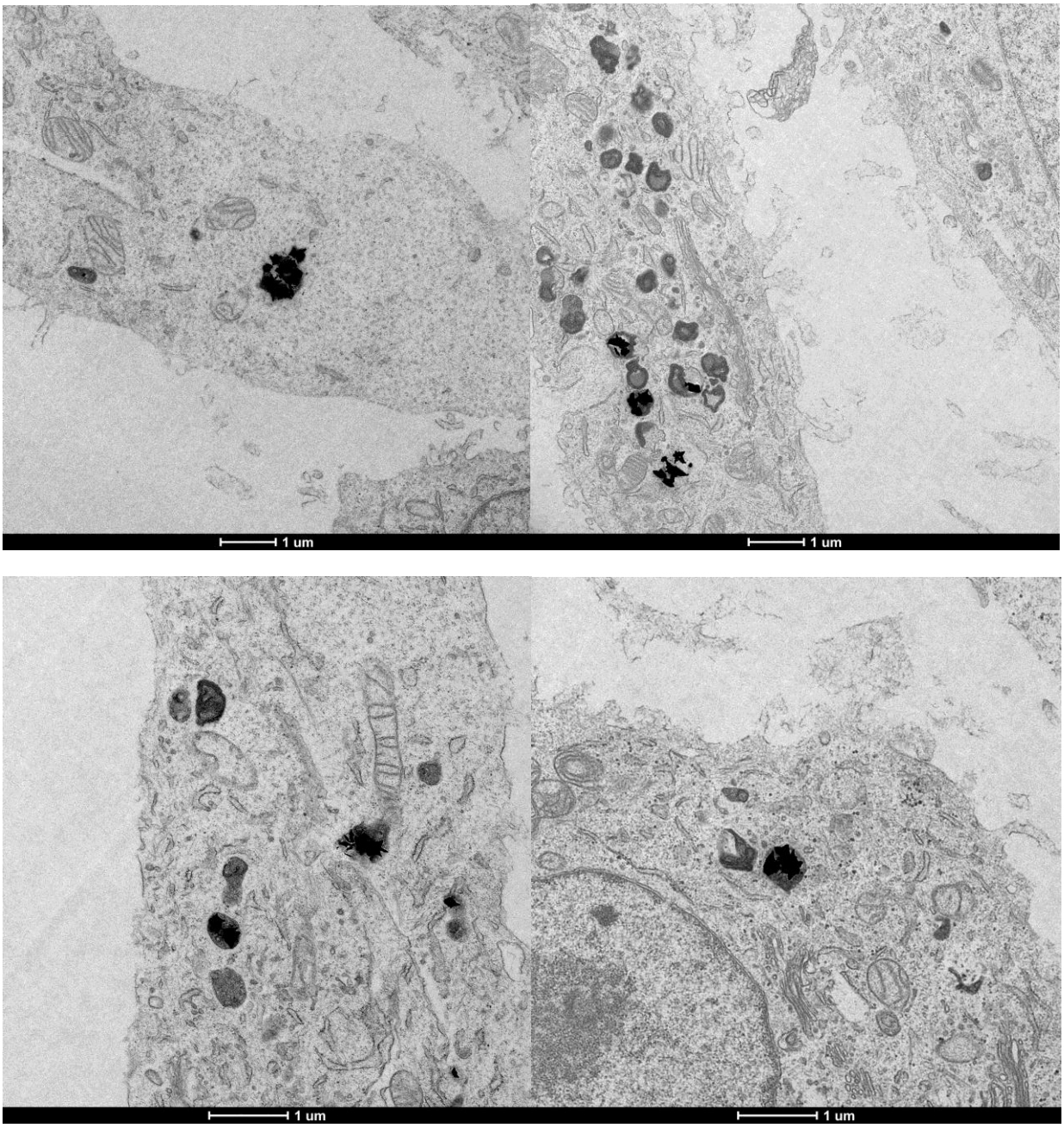


Fig. S17 TEM images of Hela cells incubated with GNF-Pd2.

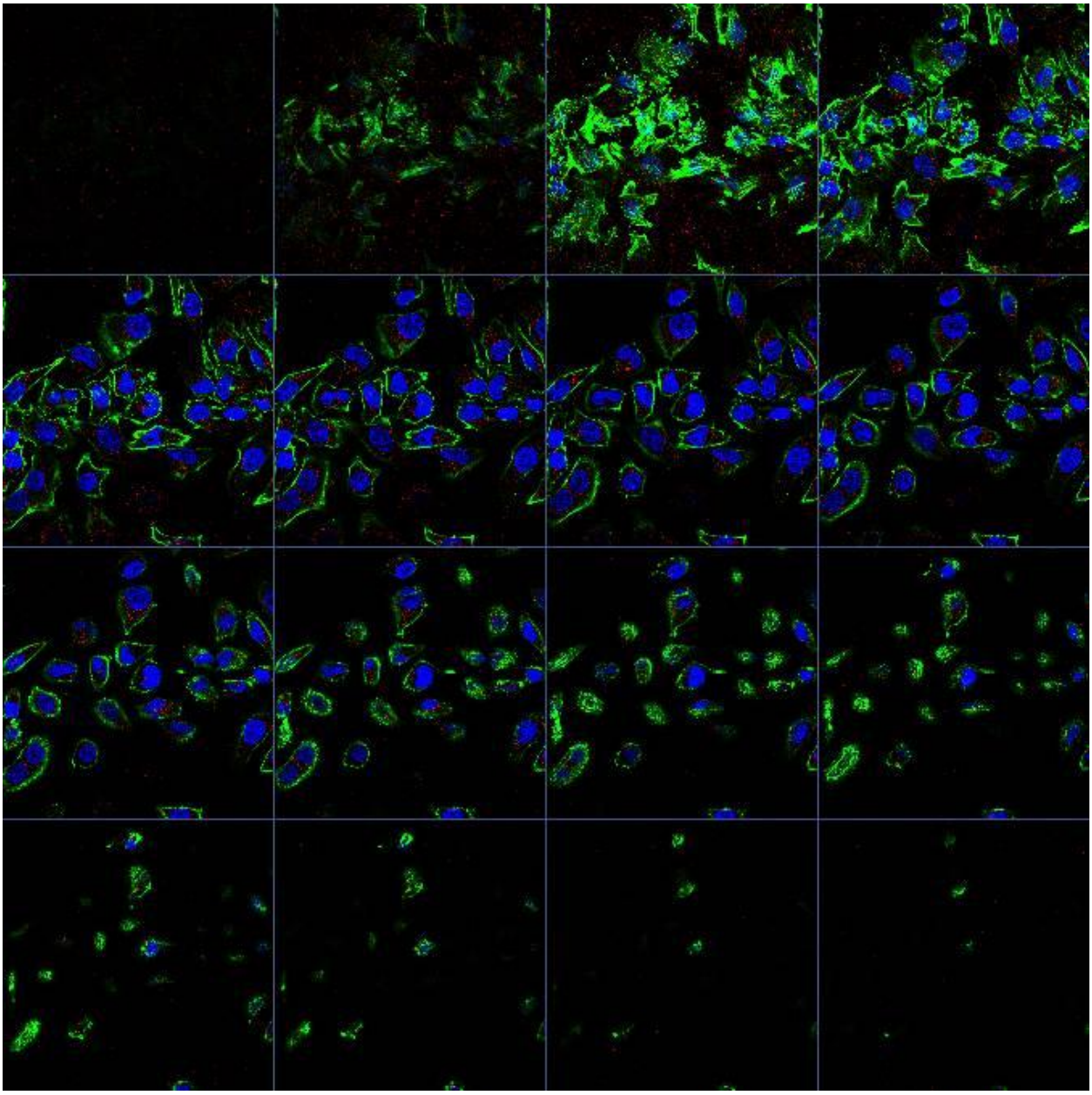


Fig. S18 Z-stacked CLSM images of Hela cells incubated with GNF-Pd2 for 3 hours.

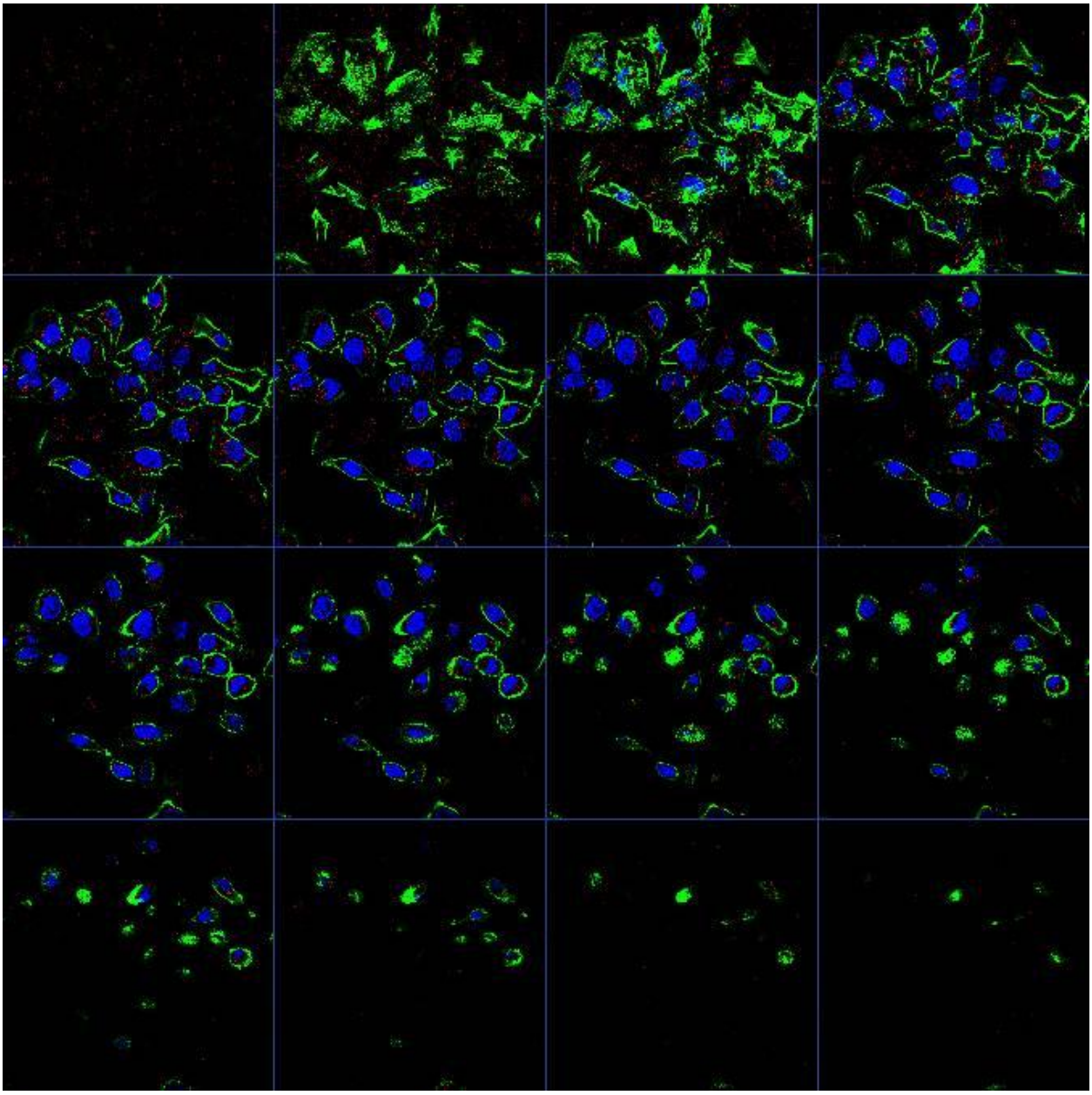


Fig. S19 Z-stacked CLSM images of Hela cells incubated with GNF-Pd2 for 6 hours.

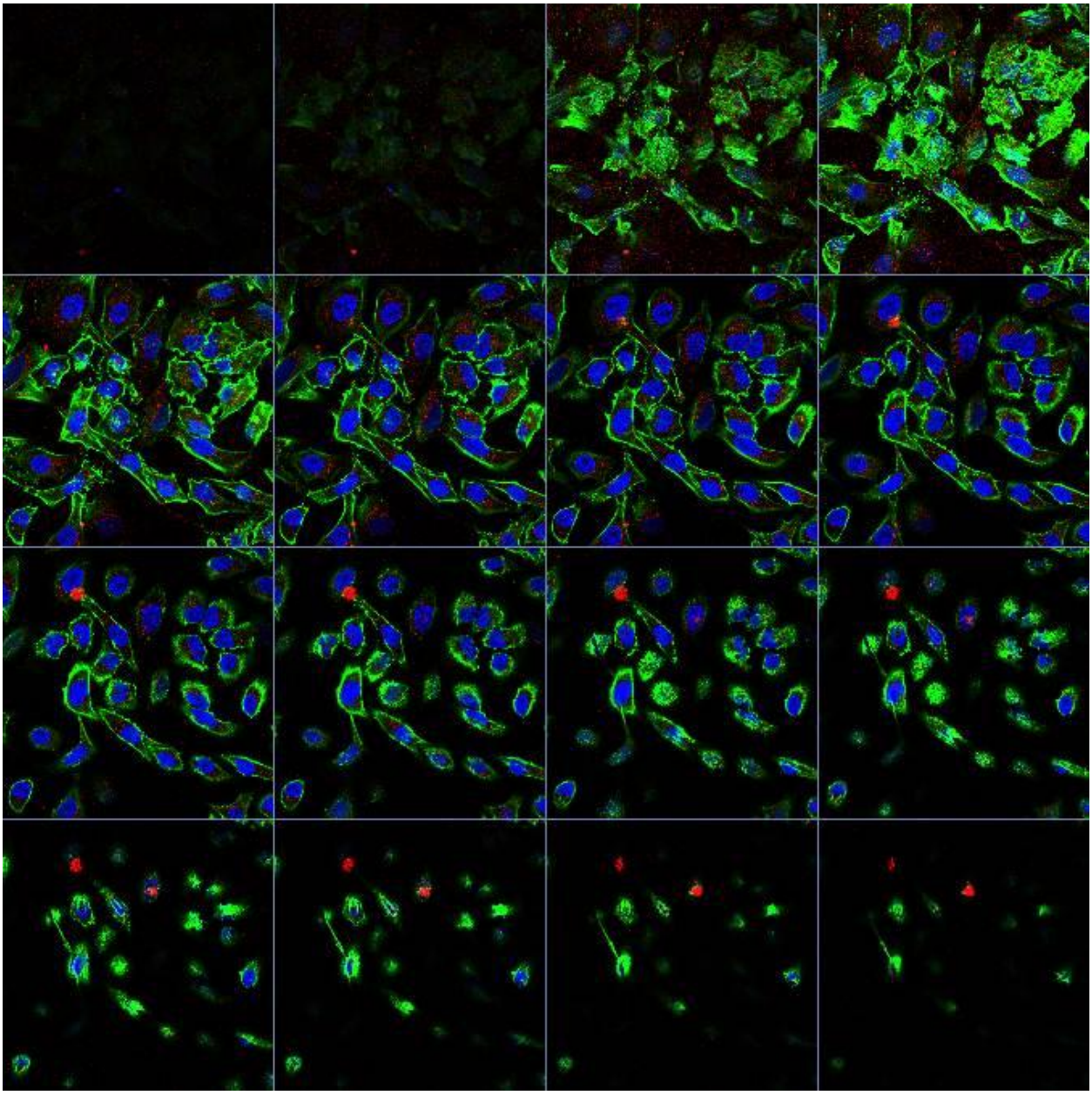


Fig. S20 Z-stacked CLSM images of Hela cells incubated with GNF-Pd2 for 12 hours.

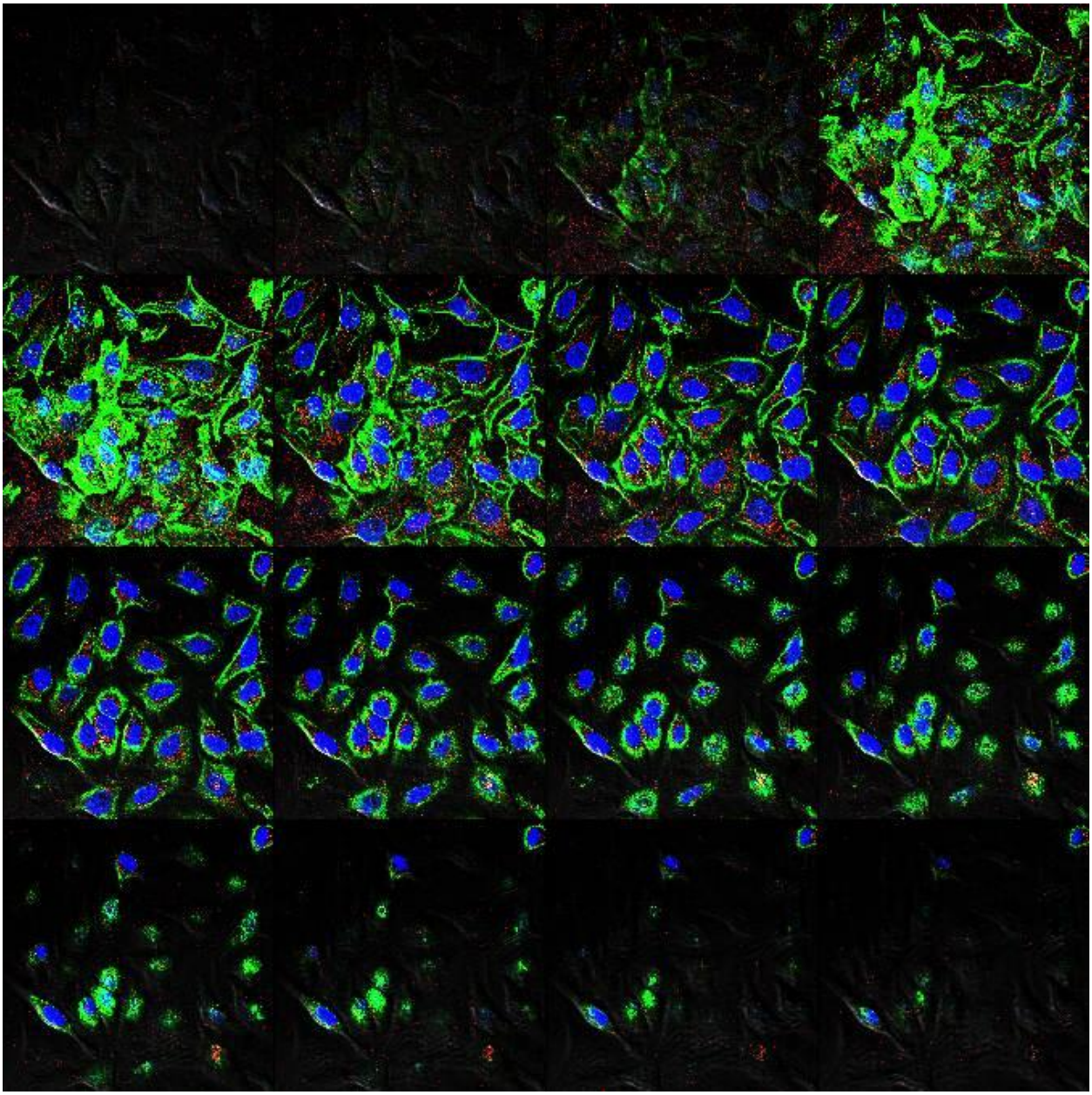


Fig. S21 Z-stacked CLSM images of Hela cells incubated with GNF-Pd2 for 24 hours.

EF=(Intensity of SERS *number of molecules in powder format under laser illumination volume)/ (Intensity of normal Raman of molecule *number of molecules absorbed on particles under laser illumination volume)

SERS enhancement factor can also be obtained as follows

EF=(Intensity of SERS *density of the molecules (number/cm^3)/ (Intensity of normal Raman of molecule * packing density of molecules (number/cm^2)* area of one GNR (cm^2)*density of GNR (number/cm^3))

1. Packing density of 1,10-phenanthroline : 1.0x10^14 molecules/cm^2
2. density of the molecule in powder format= how many molecule in 1 cm^3 : I used 10 µL of Phen (0.6 mM). This will be 6*10E-6*6.02E23 = 3.612E19 molecules/cm^3
3. density of the GNR= how many GNRs in 1 cm^3 :

area of one GNR (cm^2) : 4 * pi * (100^2) nm^2 = 1.257 E-7 cm^2

density of GNR (number/cm^3) : 6.12 E8/cm^3

EF = 50.8 *(3.612E19 molecules/cm^3)/(1.0x10^14 molecules/cm^2)/(1.257 E-7 cm^2)/ (6.12 E8/cm^3) = 2.4 x 10^5