

Supplementary Information for RSC Advances:

Constructing One Dimensional Assembly of Poly Methylacrylic Acid Capping Gold Nanoparticles for Selective and Colorimetric Detection of Aminoglycoside antibiotics

Junbo Li · Ke Zhang · Liang Ju · Wenlan Wu · Jinwu Guo · Huiyun Zhou

Experimental Section

Self-assembly of the PMMA-@-AuNPs for detecting streptomycin.

The as-prepared PMMA-@-AuNPs solution was firstly diluted to one time by PBS buffer solution. The stock solution of 0.001M streptomycin and other antibiotics were prepared. All the detection of streptomycin and others antibiotics was performed at room temperature. Streptomycin (5 μ L) was successively added into 10ml PMMA-@-AuNPs solution and monitored by UV spectroscopy after 15min incubation. In the presence of streptomycin, the solution color turned gradually from wine to purple and blue. The addition was stopped when the second SPR band remained unchanged, indicating the assembly was finished. Other AMGs, including gentamicin, streptomycin, neomycin, kanamycins, and antibiotics (penicillin, tetracycline, terramycin and ilotycine), were tested under the same conditions. The self-assembly of the AuNPs and has the same process as PMMA-@-AuNPs.

Metal ions interference and screen

J. Li* · K. Zhang · J. Liang · W. Wu · J. Guo · H. Zhou

College of Chemical Engineering & Pharmaceutics, Henan University of Science & Technology,

Luo Yang 471023, Henan, China

E-mail: Lijunbo@haust.edu.cn

The certain concentration of Pb^{2+} was prepared and added into the 10ml PMMA-@-AuNPs solution till Pb^{2+} concentration to $400\mu M$. In the presence of Pb^{2+} , the solution color turns from wine to purple. Then, an equal amount of EDTA was added into solution. Finally, Streptomycin and other AMGs ($5\mu L$) were successively added into above mixed solution. Each step was monitored by UV spectrum after 30min incubation.

Results and Discussion

The formation of gold nanochains induced by gentamicin, neomycin and kanamycin is also confirmed by TEM images, shown in the Fig. 1s. From the result of streptomycin and Fig. 1s, the nanochains show the different aggregation level and particle number under the same amount of AMGs to drive the assembly of PMMA-@-Au NPs. It can be explained that those AMGs have the different structure and property, such as the water solubility and the number of amino group donor.

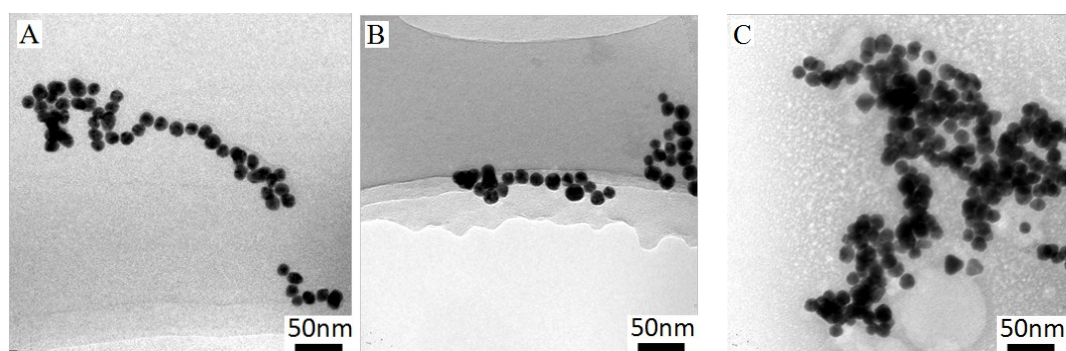


Fig. 1s. TEM image of PMMA@-Au NPs after addition of $10\mu l$ gentamicin(A), neomycin(B) and kanamycin(C), respectively.