



Saratov State University

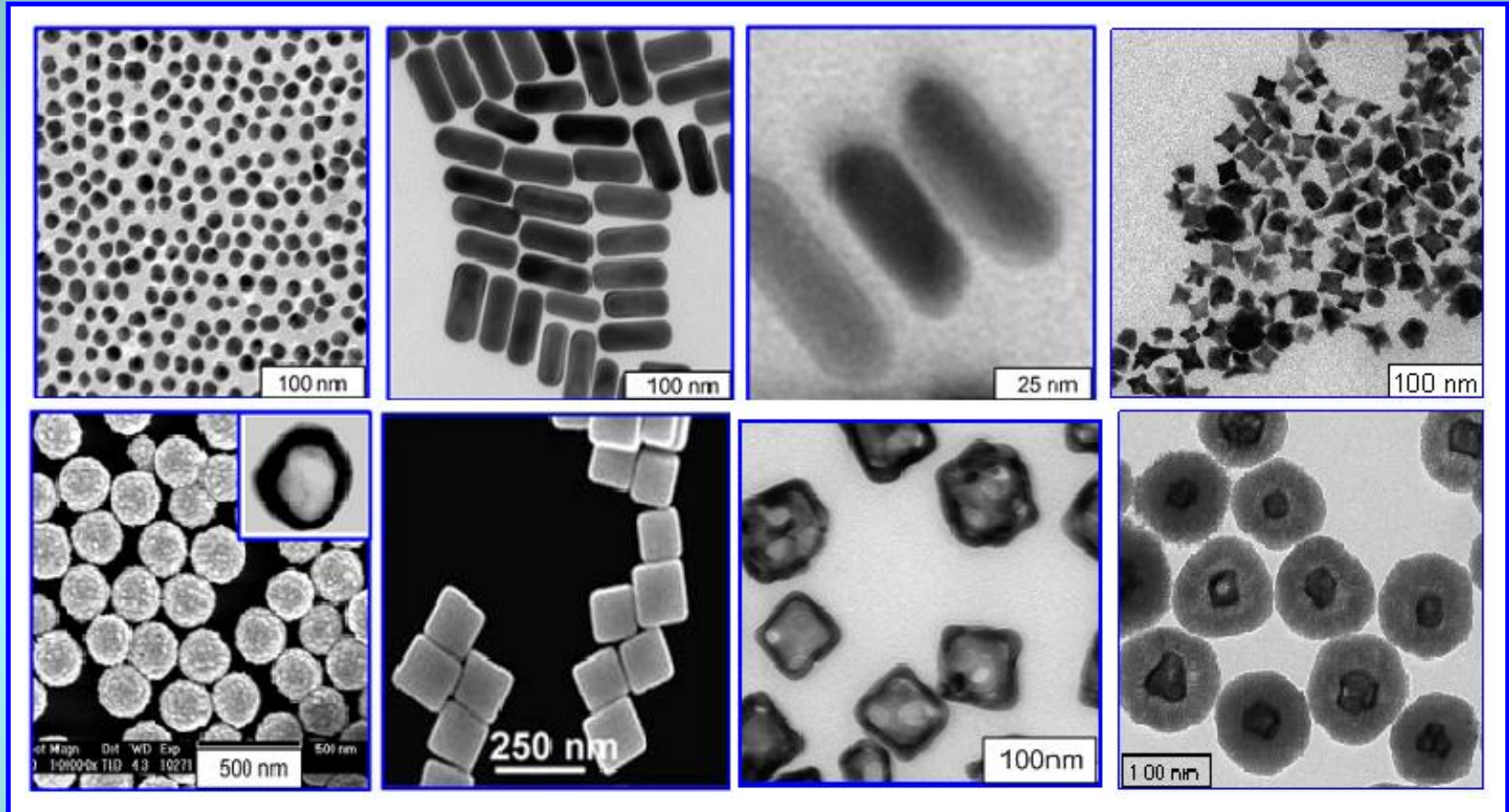
Plasmonic Nanopowders of Gold and Gold-Silver Nanoparticles

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Plasmon resonant nanoparticles we fabricate



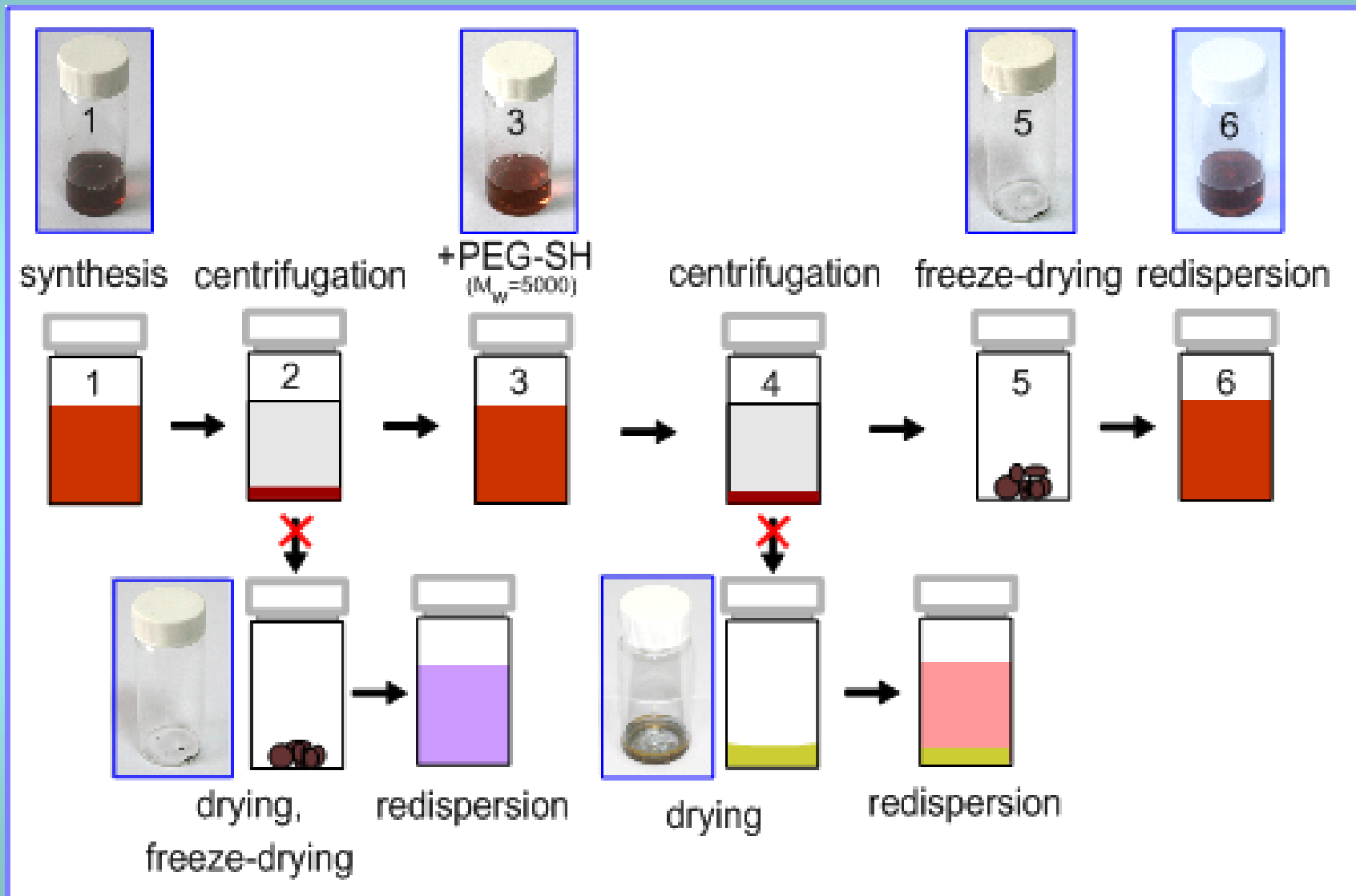
Plasmon resonant nanoparticles are usually fabricated in colloid form by chemical wet synthesis

The Goal: To develop universal strategy for fabrication of plasmonic nanopowders (dried gold and gold-silver nanoparticles)

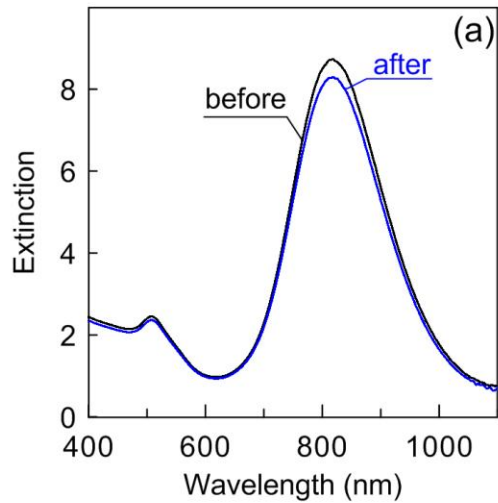
Requirements:

1. The strategy must be universal for various types of plasmon-resonant gold and composite nanoparticles.
2. Long time storage without changing of the properties.
3. Easy redispersion of nanopowders in water without any hard manipulations.

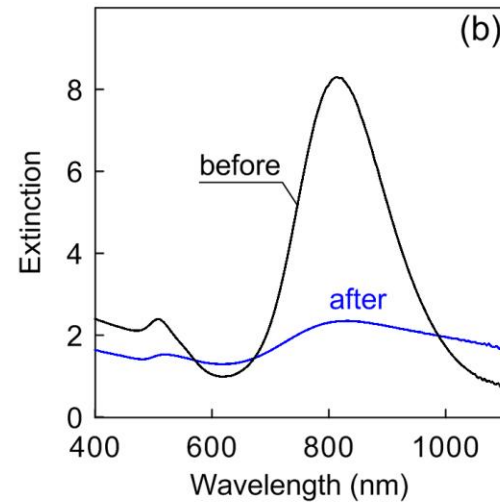
Stages of nanopowder synthesis



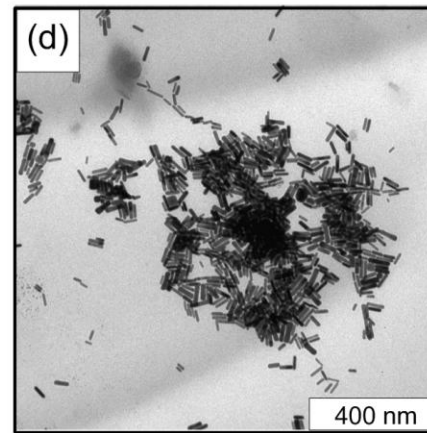
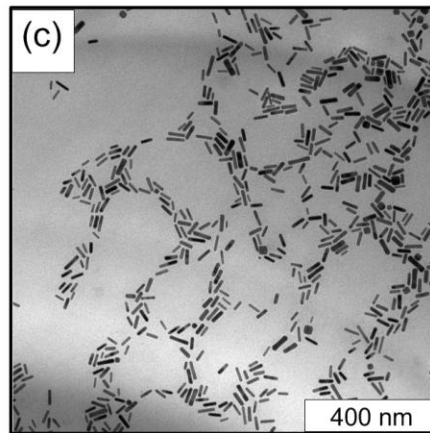
Powders of PEG-SH and CTAB coated gold nanorods



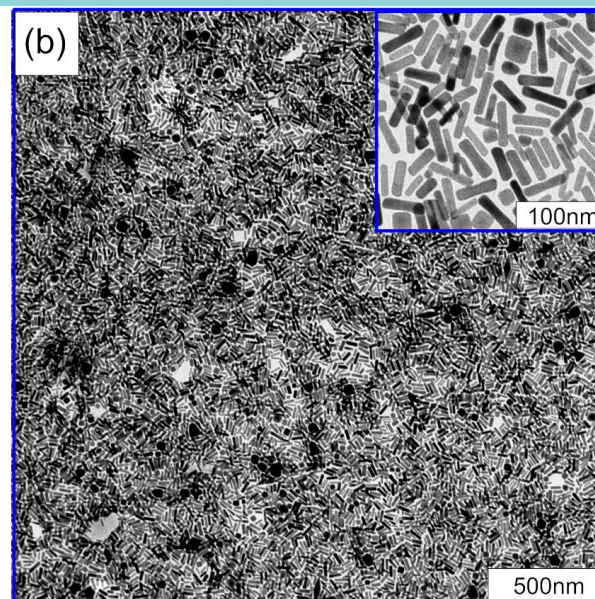
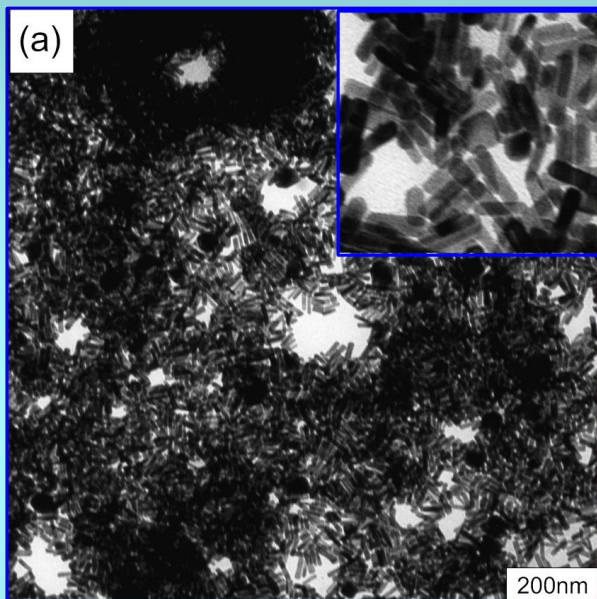
AuNR+PEG-SH



AuNR+CTAB



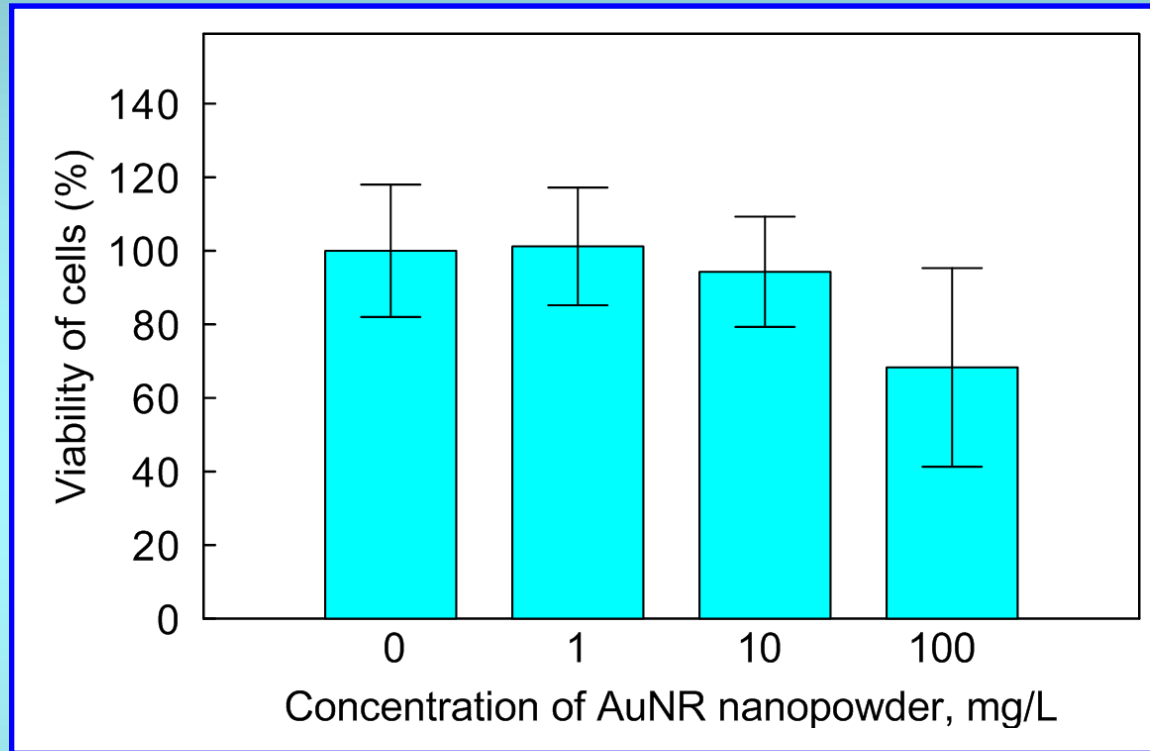
AuNR+PEG-SH after various types of drying



Freeze-drying

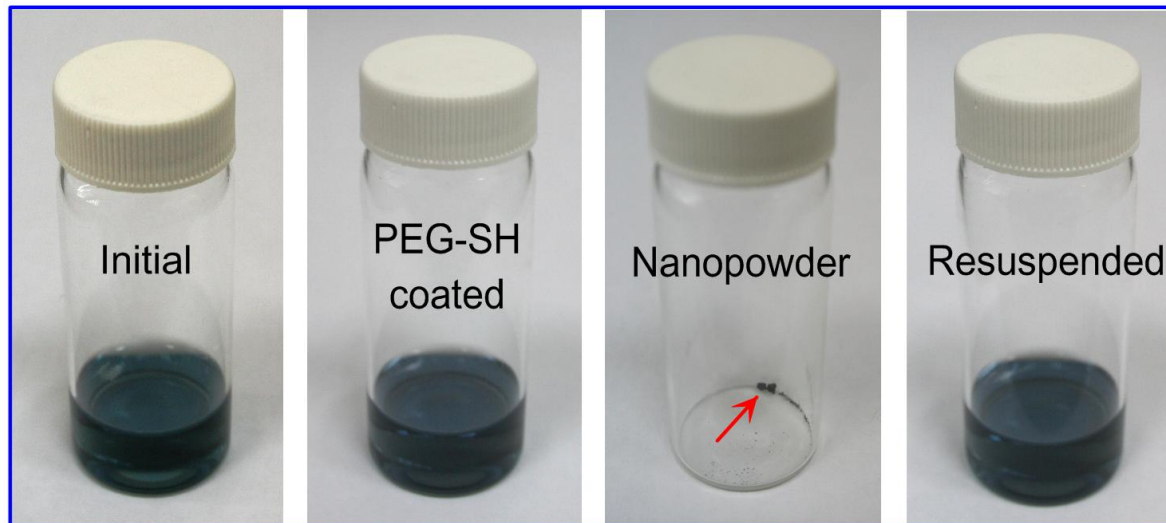
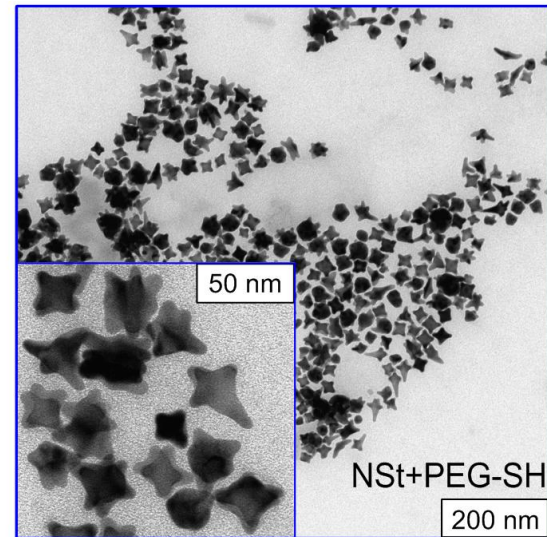
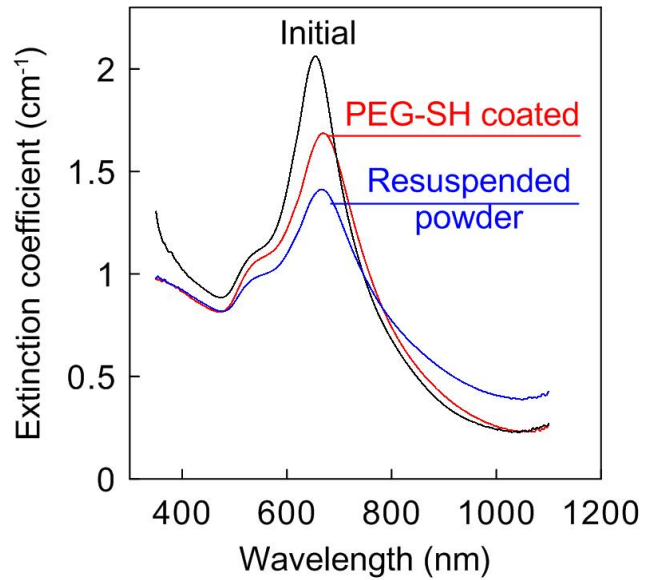
Room-temperature
drying

MTT assay with AuNR nanopowder

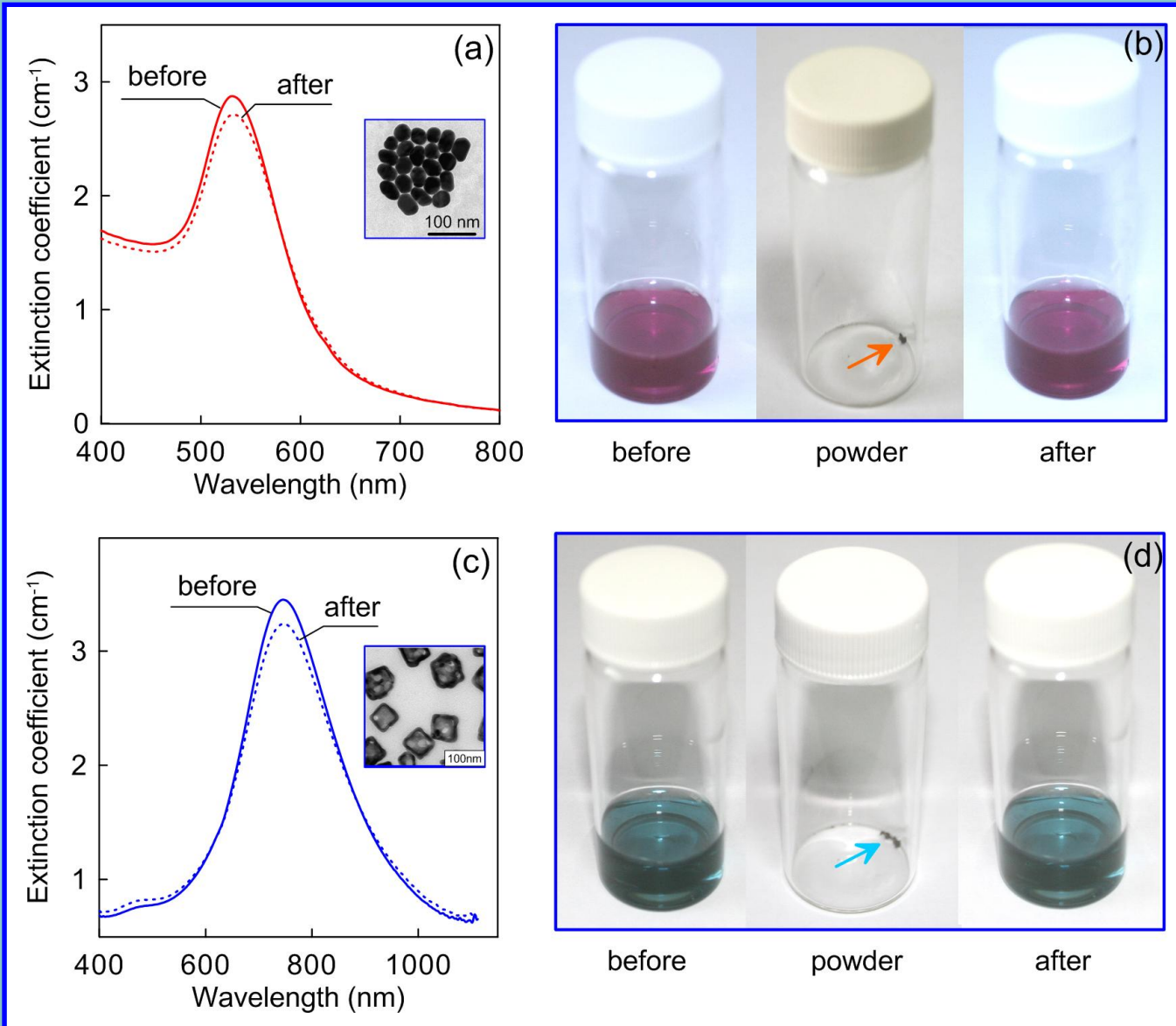


Typical concentrations for *in vivo* biodistribution and toxicity experiments: **0.1-10 mg/kg**

Gold Nanostars powders



Gold nanospheres and gold-silver nanocages powders



Easy redispersion of gold nanorods powder



Conclusions:

1. Using developed universal strategy we have fabricated nanopowders of 4 types of plasmonic nanoparticles.
2. These powders can be stored at room temperature and can be easily redispersed in water or buffer.
3. MTT assay showed the absence of cell toxicity of gold nanorod powder with concentrations up to 100 mg/L.

Thanks for your attention!



Laboratory of Nanobiotechnology:

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Panfilova; Prof Vladimir Bogatyrev; Dr Boris Khlebtsov.