

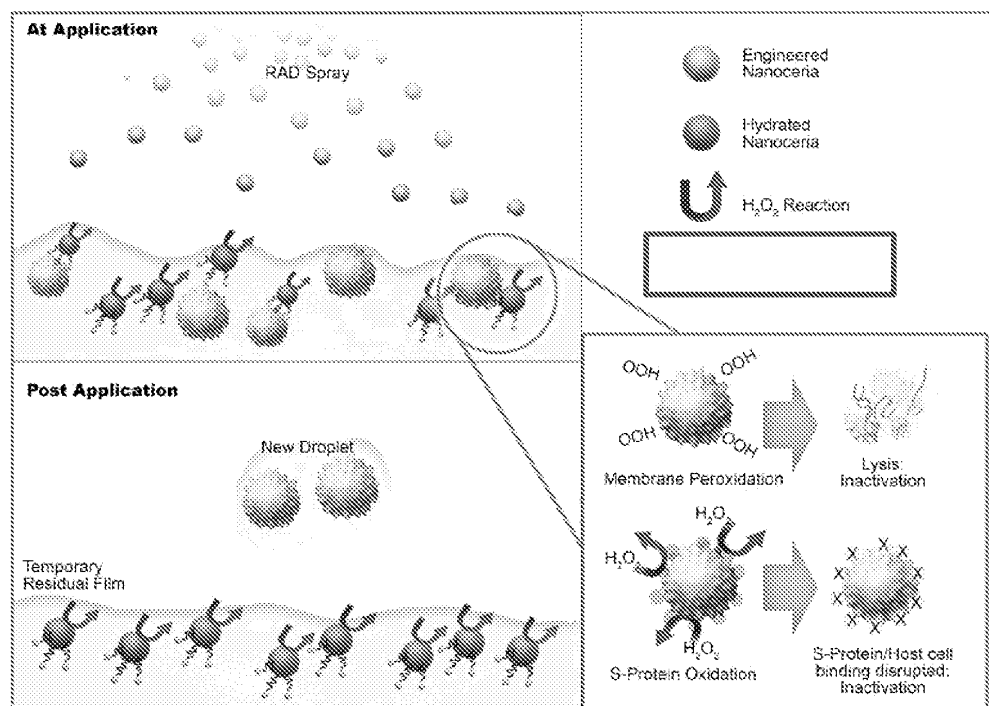


FIG. 1

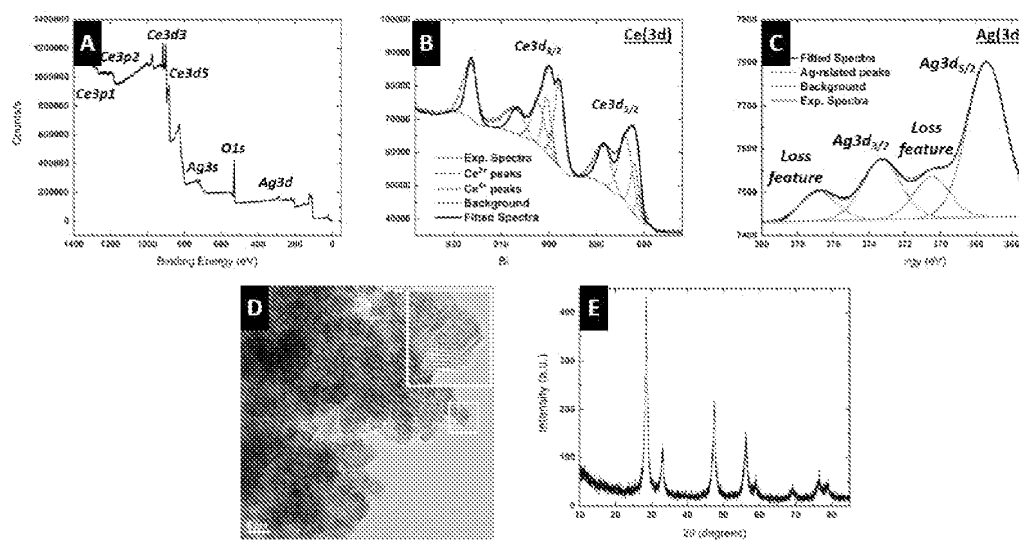


FIG. 2

Synthesis Flow Chart for AgCNP1

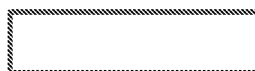
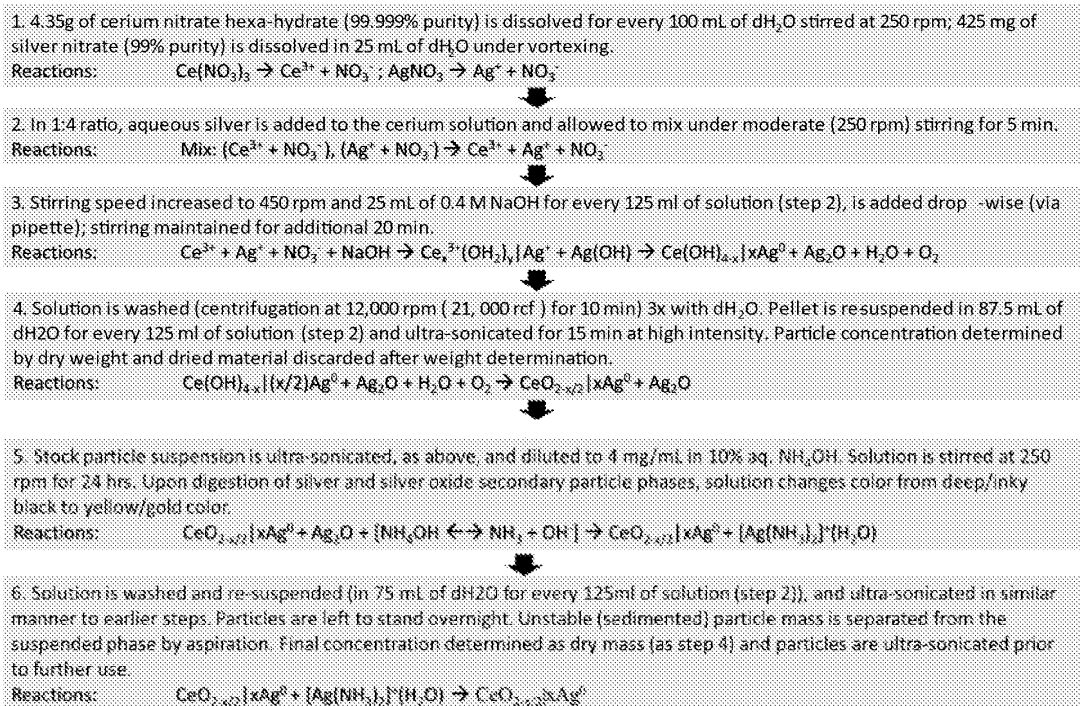


FIG 3A

Synthesis Flow Chart for AgCNP2

1. 228.27 mg of cerium nitrate hexa-hydrate (99.999% purity) is dissolved for every 100 mL dH₂O in a glass container. 523.55 μ L of 0.2 M aq. AgNO₃ (99% purity) was added to the cerium solution and vortexed for 2 min.

Reactions: $\text{Ce}(\text{NO}_3)_3 \rightarrow \text{Ce}^{3+} + \text{NO}_3^-$; $\text{AgNO}_3 \rightarrow \text{Ag}^+ + \text{NO}_3^-$



2. 4.19 mL of 3% hydrogen peroxide (stock) to every 100 mL of dissolved cerium nitrate hexahydrate is added quickly to the solution from step 1 and immediately vortexed for 2 min at highest rotation speed.

Reactions: $\text{Ce}^{3+} + \text{Ag}^+ + \text{NO}_3^- + \text{H}_2\text{O}_2 \rightarrow \text{Ce}^{4+}(\text{OOH})_2 | \text{Ag}^+ \rightarrow (\text{Ce}^{4+}(\text{OH})_{4-(x+y)})(\text{OOH})_x | \gamma\text{Ag}^0 + \text{Ag}^+$



3. Solution is stored in dark at room temperature with the bottle cap loose to allow for release of evolved gases. Solutions are left to age in these conditions for up to 3 weeks (monitoring solution color change from yellow to clear).

Reactions: $(\text{Ce}^{4+}(\text{OH})_{4-(x+y)})(\text{OOH})_x | \gamma\text{Ag}^0 + \text{Ag}^+ \rightarrow \text{CeO}_{2-y/2} | \gamma\text{Ag} + \text{H}_2\text{O} + \text{Ag}^+$



4. Particles are dialyzed against 4.2 liters of dH₂O over 2 days, (dialysis tubing –3500Da) with the water changed every 12 hours and stored in the same conditions as for ageing.

Reactions: $\text{CeO}_{2-y/2} | \gamma\text{Ag} + \text{H}_2\text{O} + \text{Ag}^+ \rightarrow \text{CeO}_{2-y/2} | \gamma\text{Ag}$

FIG. 3B

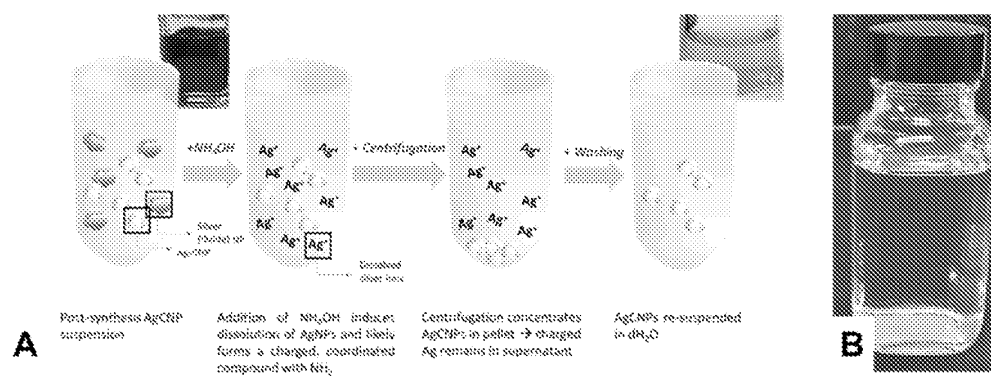


FIG. 4

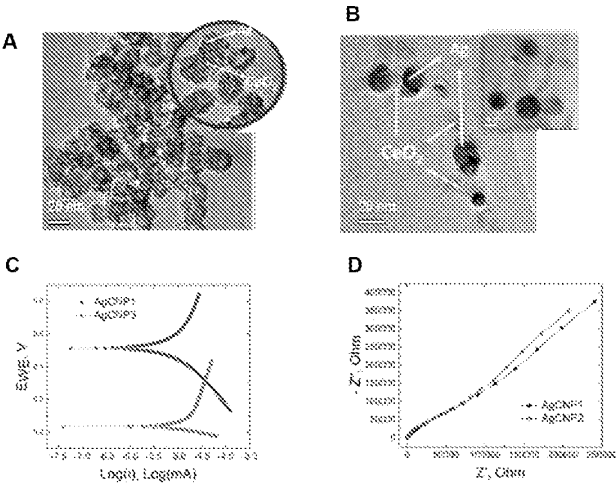


FIG. 5

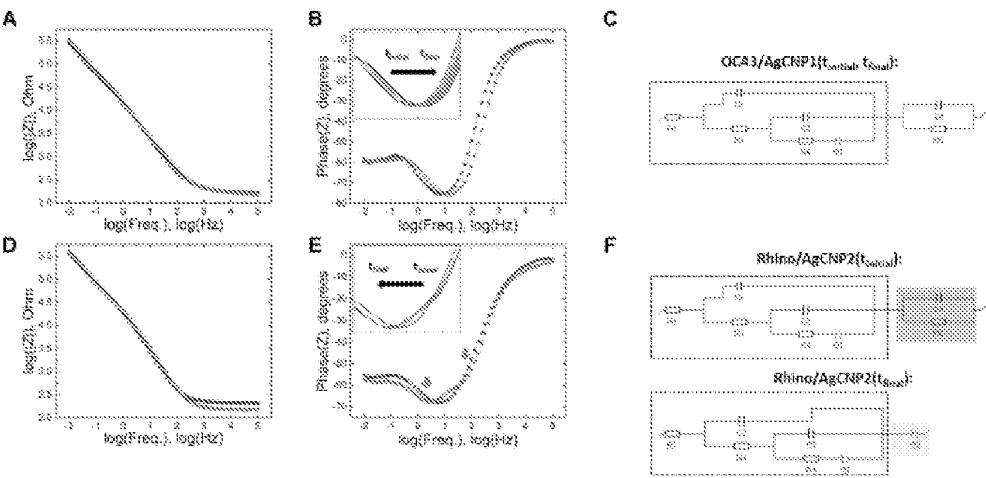


FIG. 6

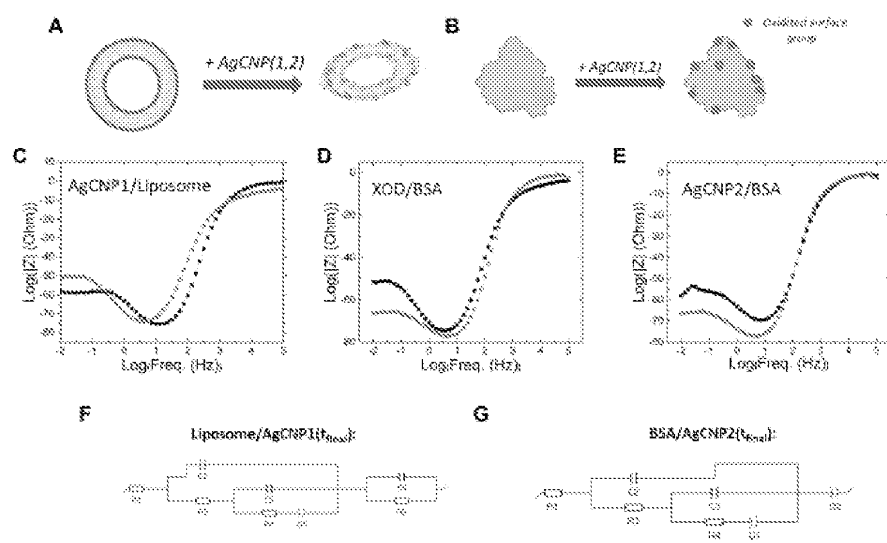


FIG. 7

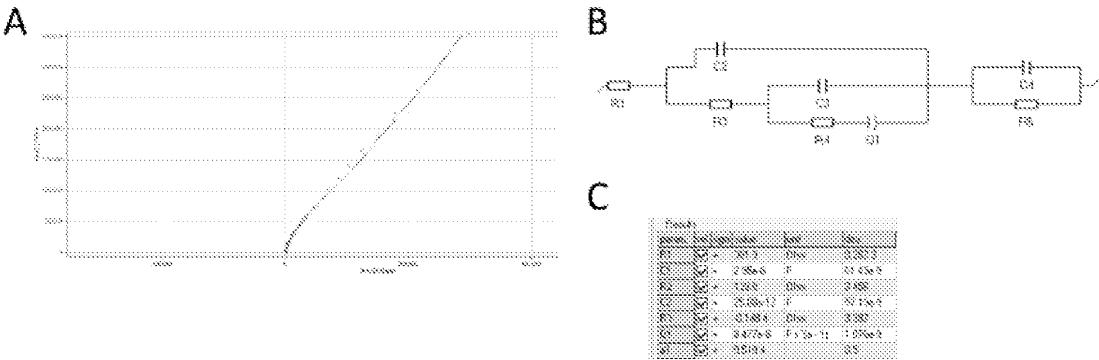


FIG 8

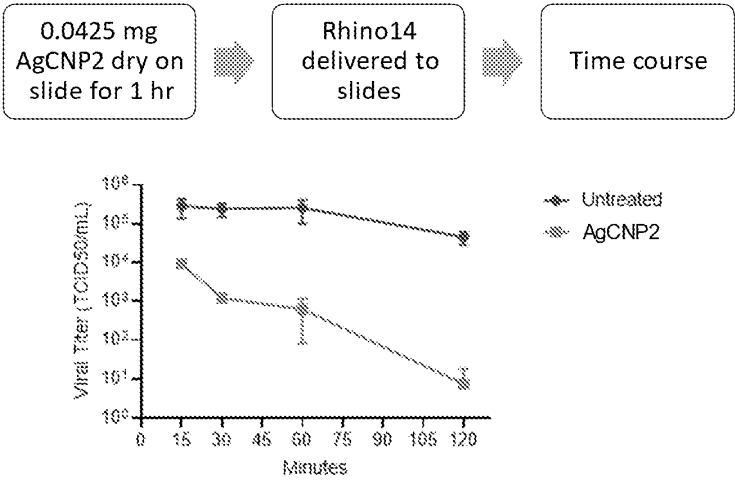


FIG 9

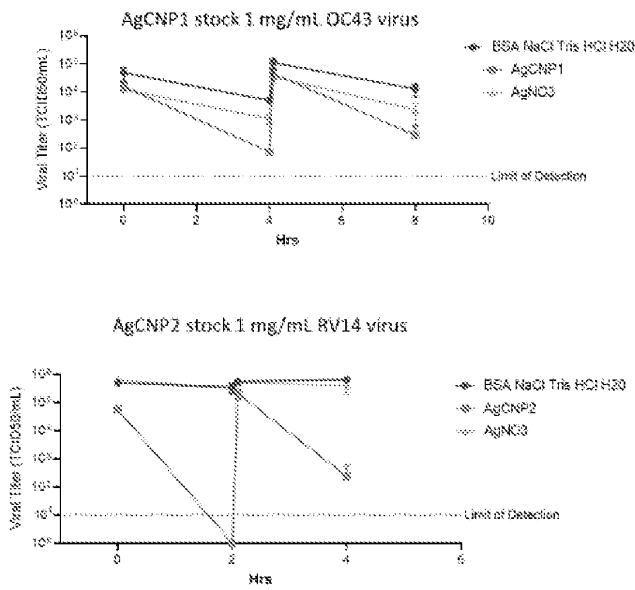


FIG 10