

## Supporting Information for:

# Gold Nanoparticles: Tunable Characteristics and Potential for Nasal Drug Delivery

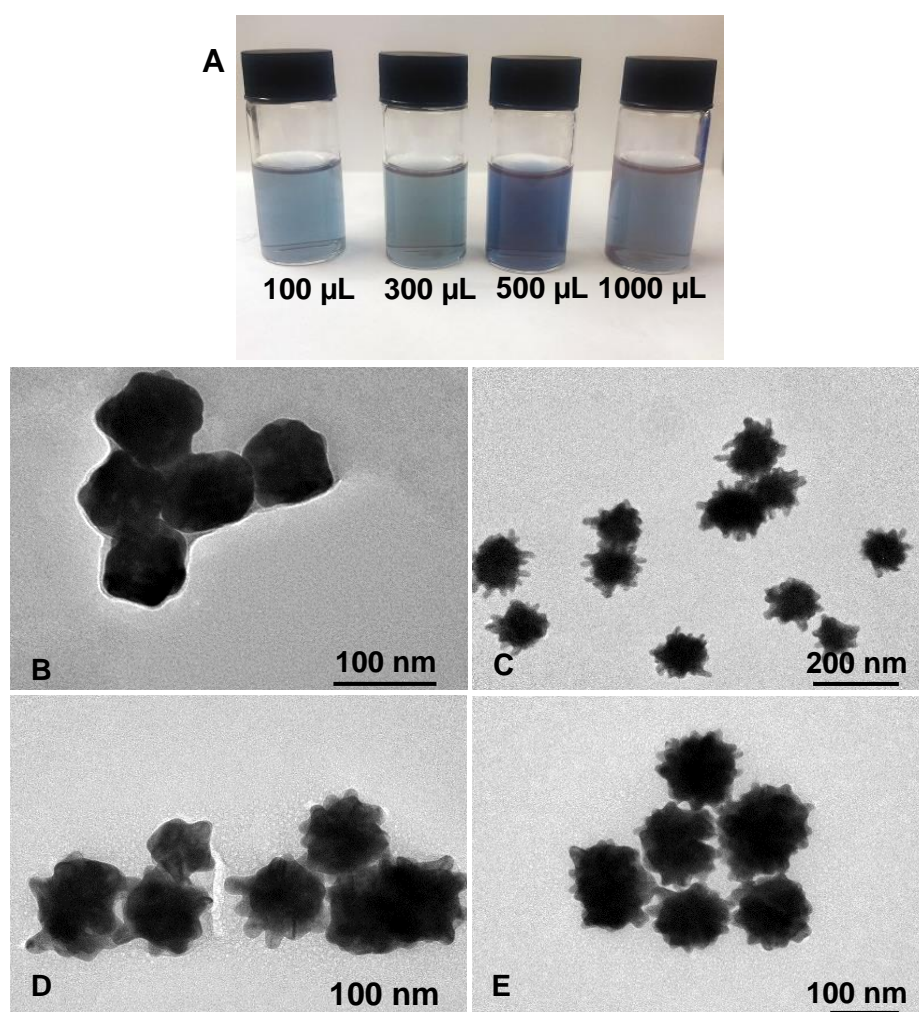
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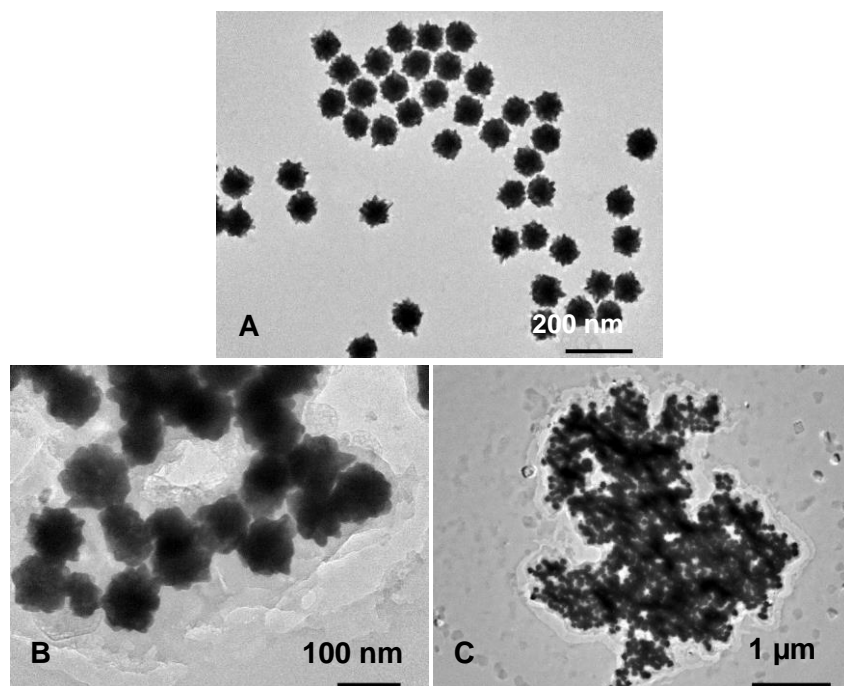
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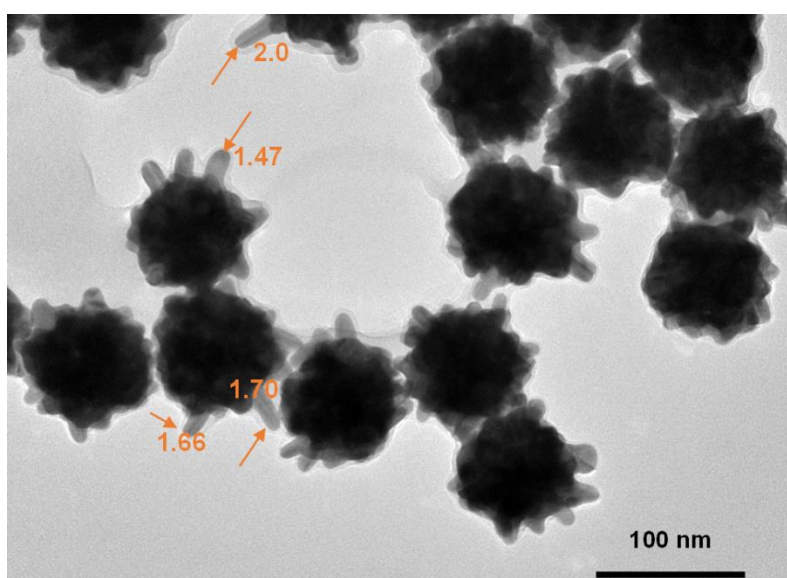
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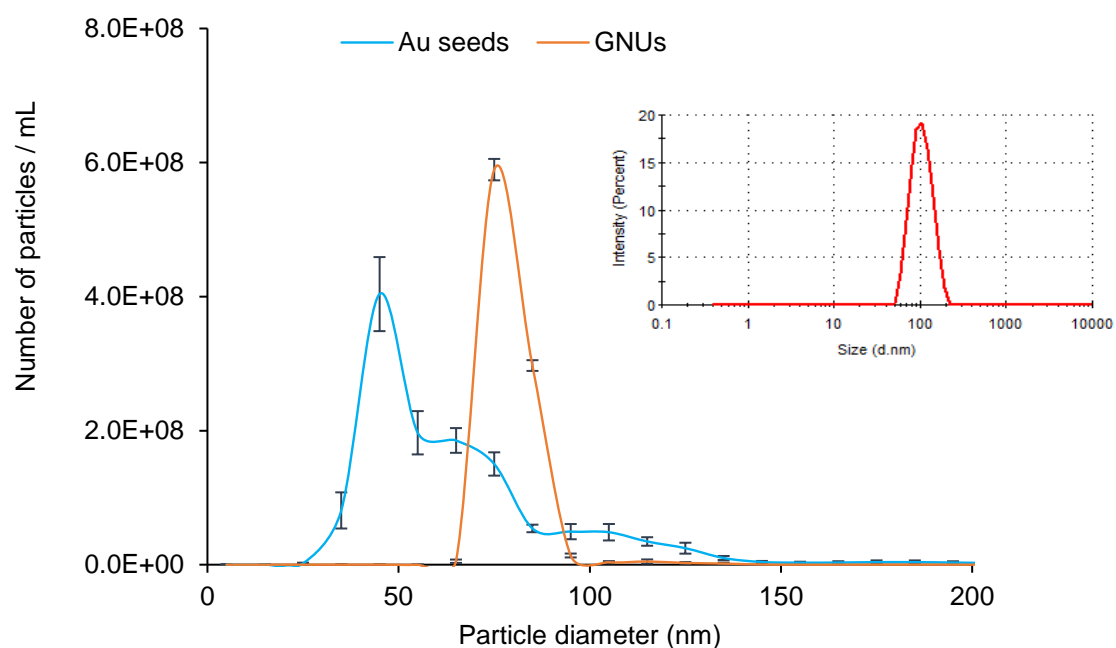
**Figure S1.** (A) Gold nanourchin suspensions generated with different volumes of 15 mM hydroquinone and (B-E) TEM images of the resulting GNUs using 100 μL (B), 300 μL (C), 500 μL (D) and 1000 μL (E) of HQ.



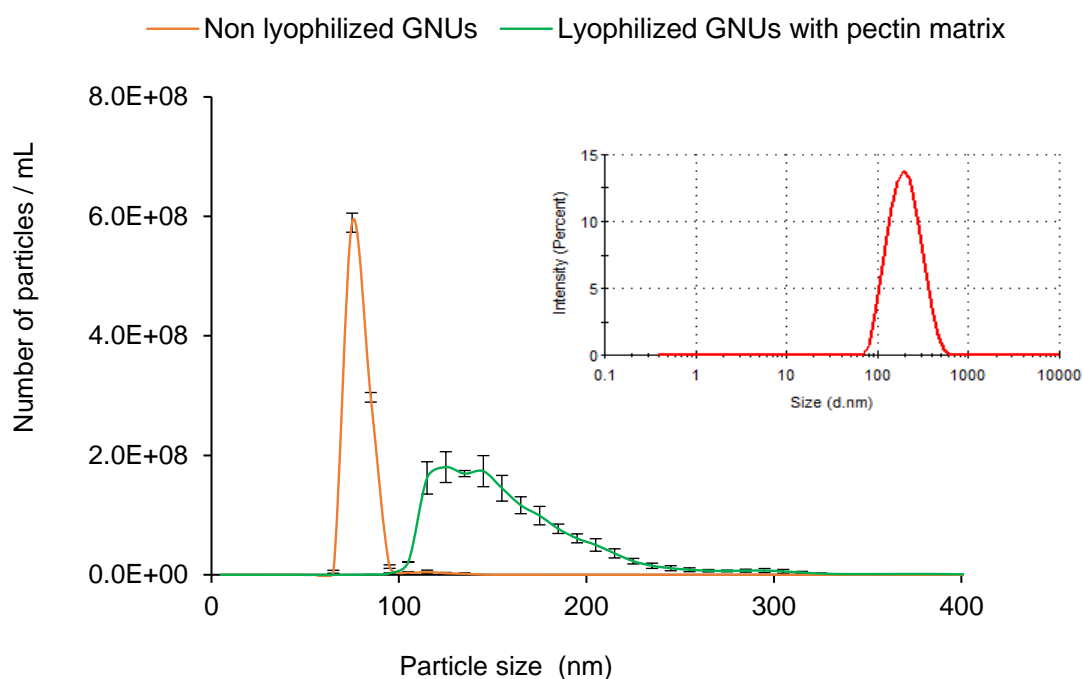
**Figure S2.** The effect of PEGylation on GNUs. TEM images of PEGylated (A) and non-PEGylated GNUs (B and C).



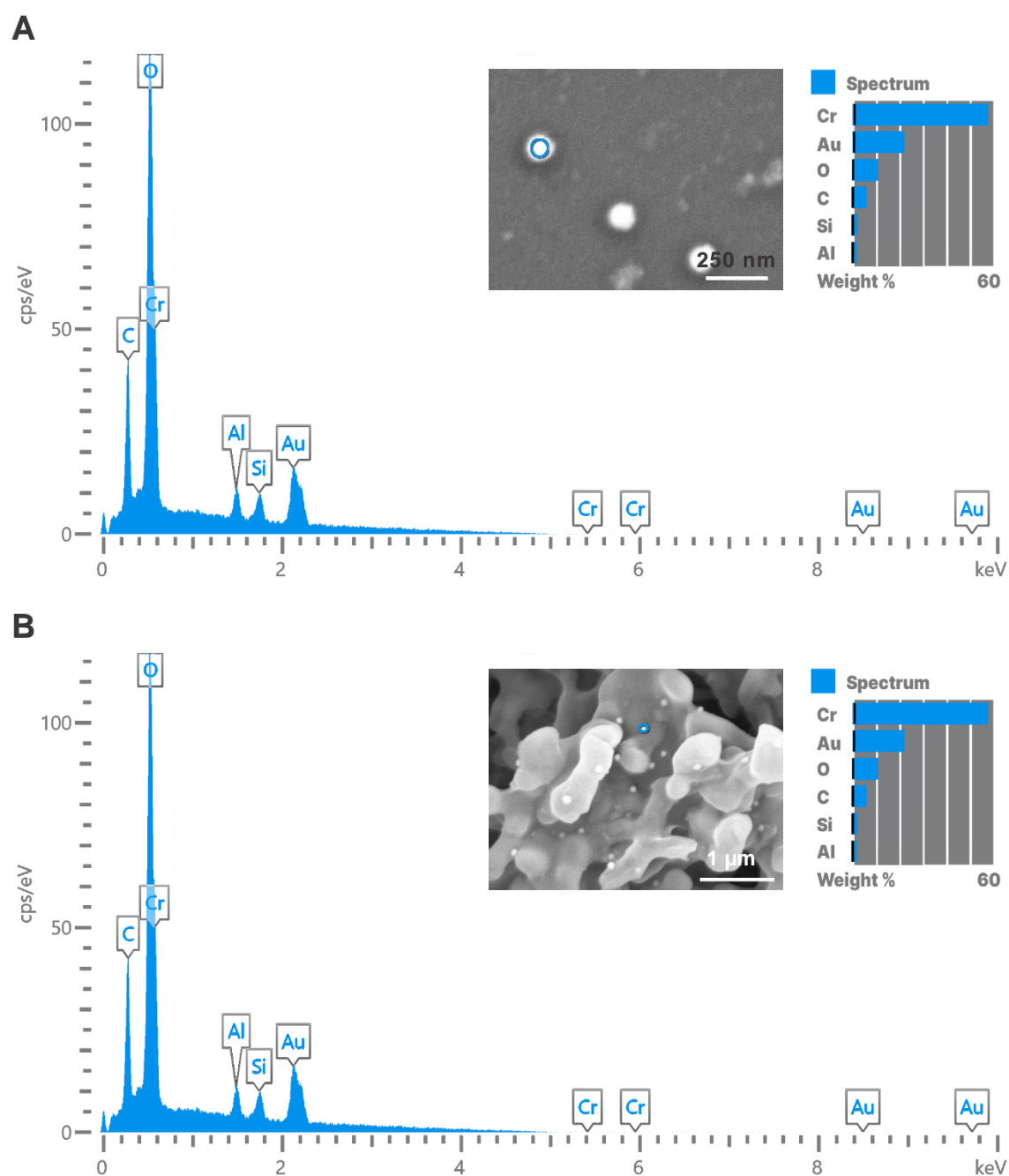
**Figure S3.** Measurement of selected spike aspect ratios on the optimized GNUs using ImageJ software.



**Figure S4.** Size distribution of GNUs in comparison to the initial seeds measured with a NanoSight NS500. Inset: Histogram of GNU particle size measured by DLS.



**Figure S5.** Size distribution of lyophilised pectin-based GNUs in comparison to the as-synthesised, non-lyophilised GNFs measured with the NanoSight NS500. Inset: Histogram of GNU particle size post-lyophilization measured by DLS.



**Figure S6.** FE-SEM-EDX analysis for element composition of gold nanourchins. A) GNUs deposited on mica, and B) GNUs on a mixed cellulose ester membrane.