

Figure 1. Ultraviolet-visible spectrum of the peak GNP<sub>s</sub>, RES-trans-GNP<sub>s</sub> and RES-nanoemulsion-GNP<sub>s</sub>.

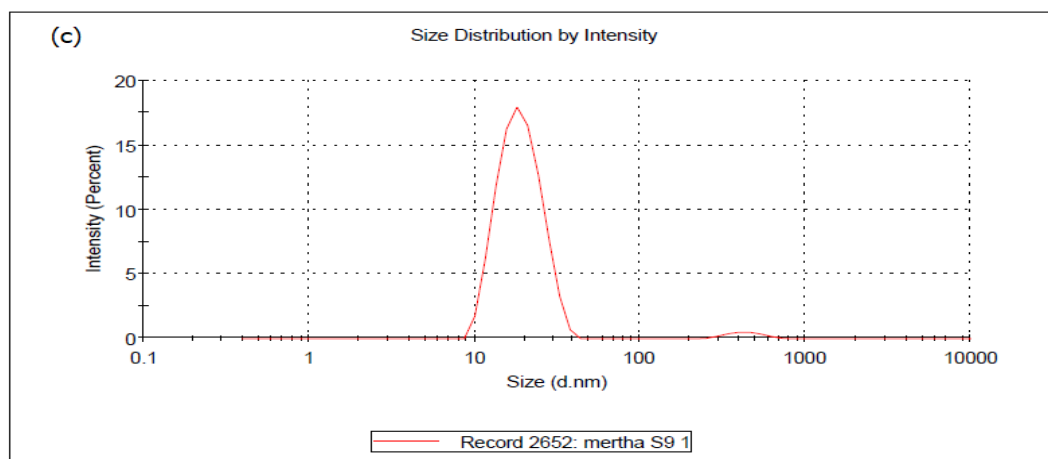
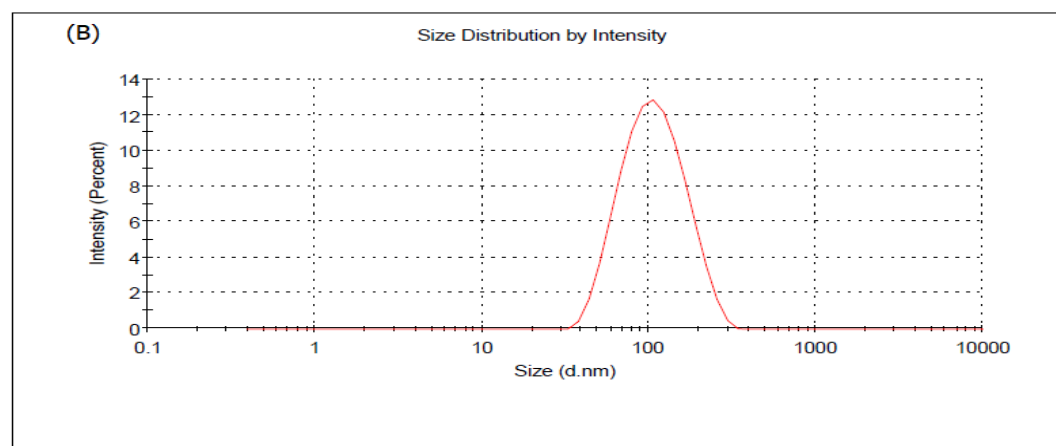
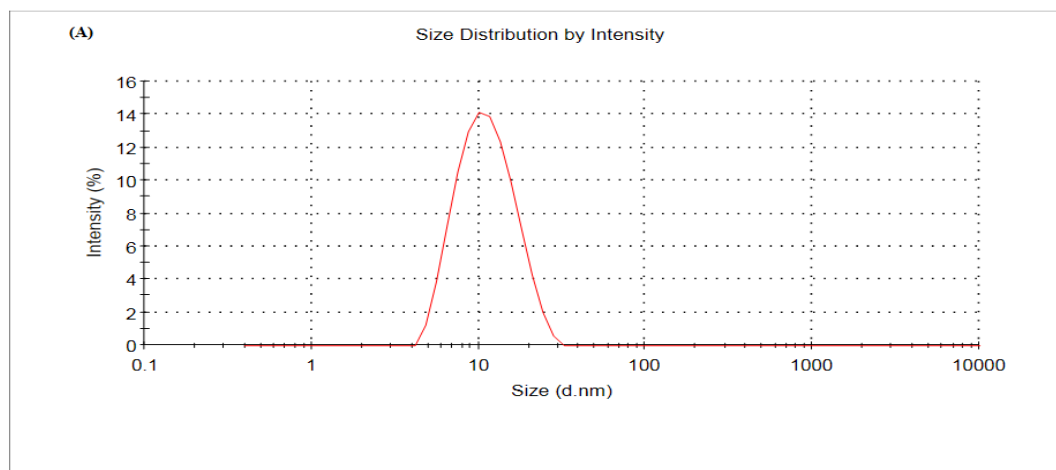
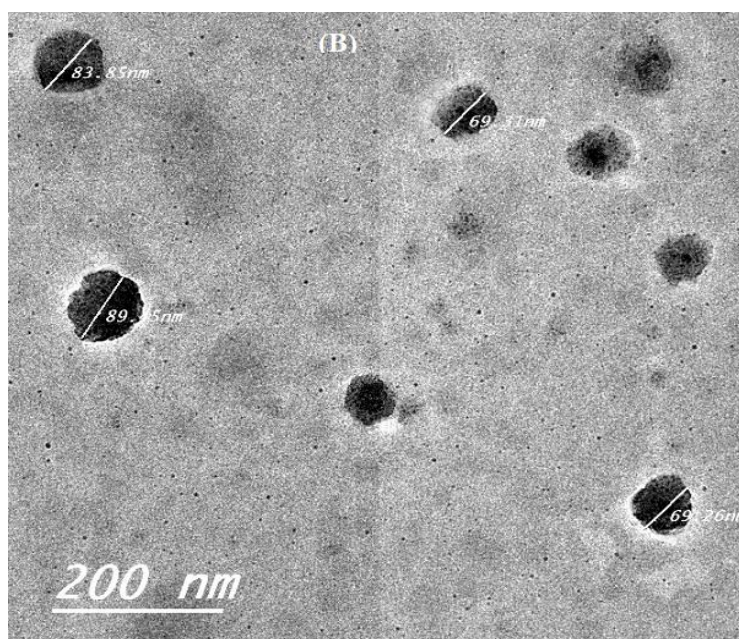
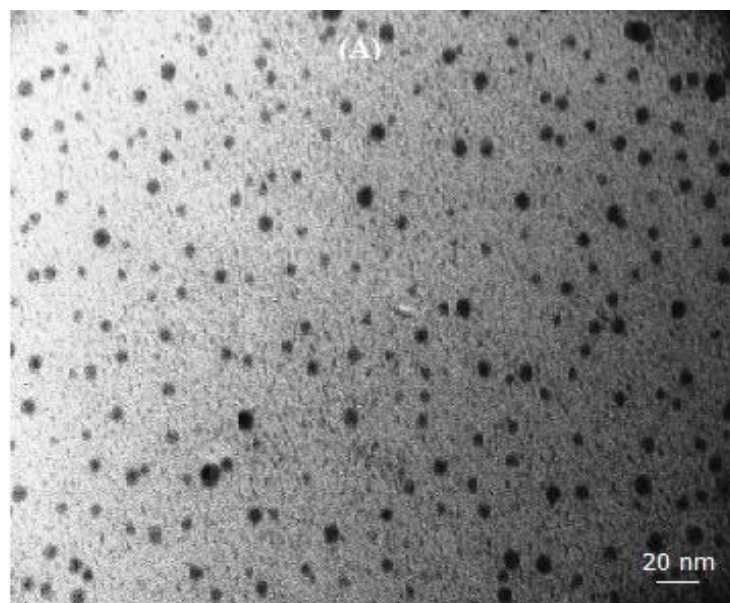


Figure 2: Particle size distribution curve of (A) GNPs, (B) RES-trans-GNPs and (C) RES-nanoemulsion-GNPs.



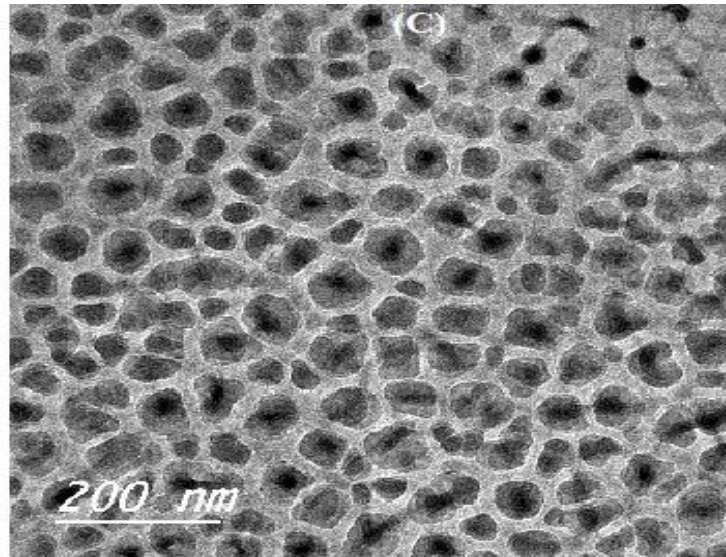


Figure 3. Photomicrograph of (A) GNPs, (B) RES-trans-GNPs and (C) RES-nanoemulsion-GNPs using TEM.

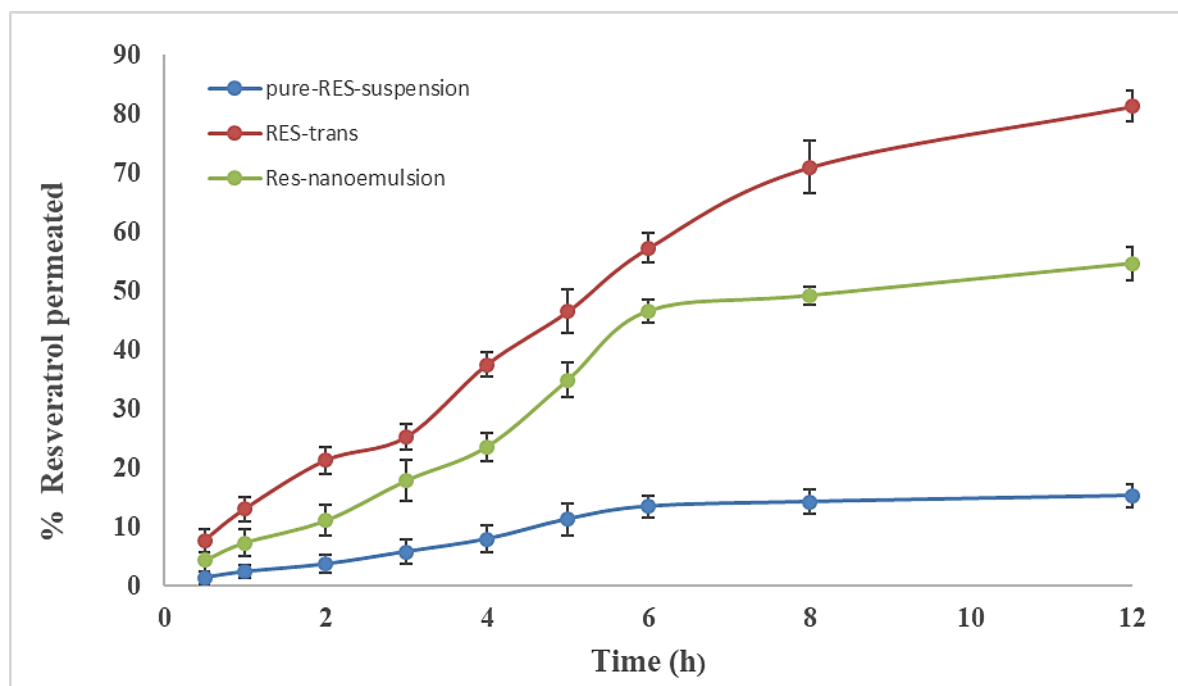


Figure 4. Ex vivo percent of permeation of the RES-transfersomes, RES-nanoemulsions and RES-suspension.

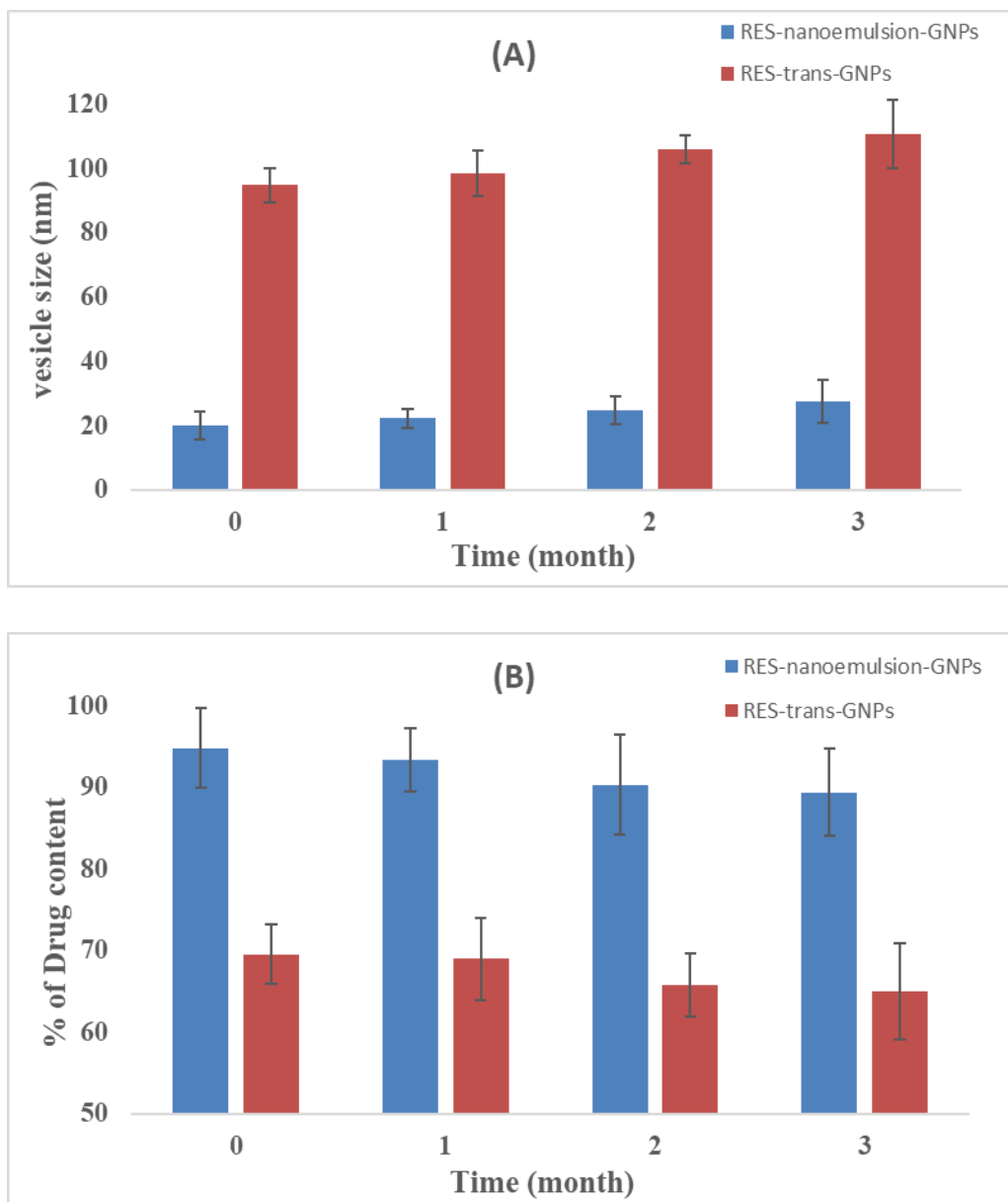
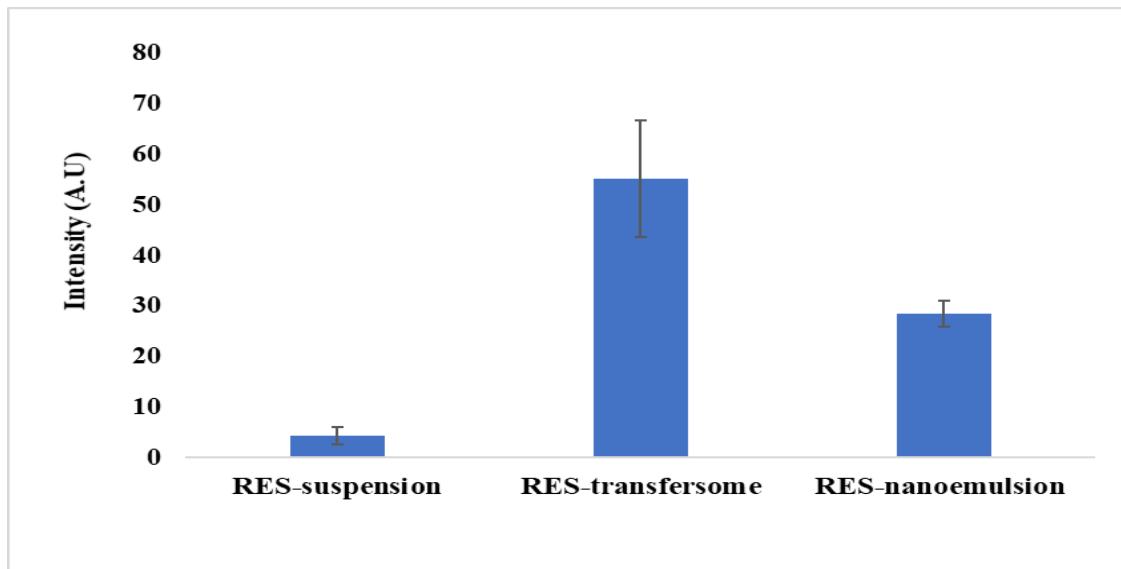
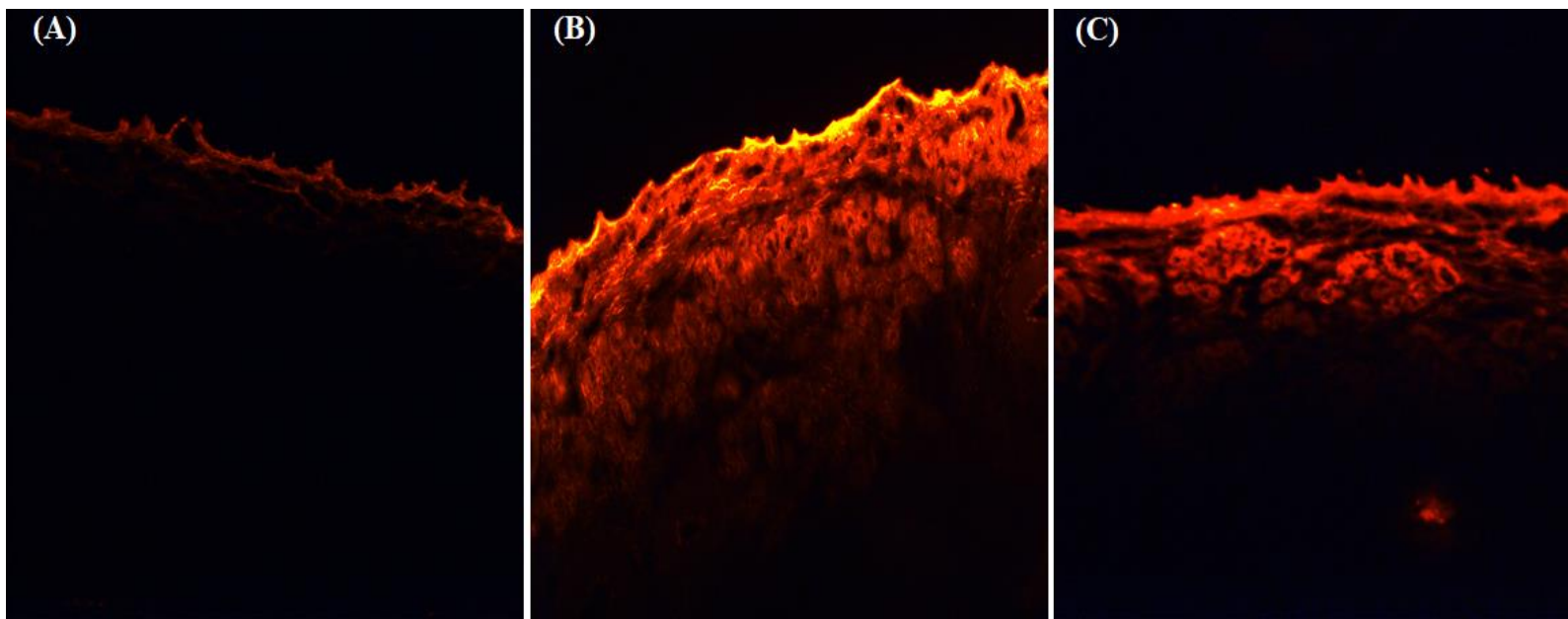


Figure 5. Effect of storage on (A) the vesicle size and (B) % of drug content of RES-trans-GNPs and RES-nanoemulsion-GNPs at  $25 \pm 3^\circ\text{C}$ .

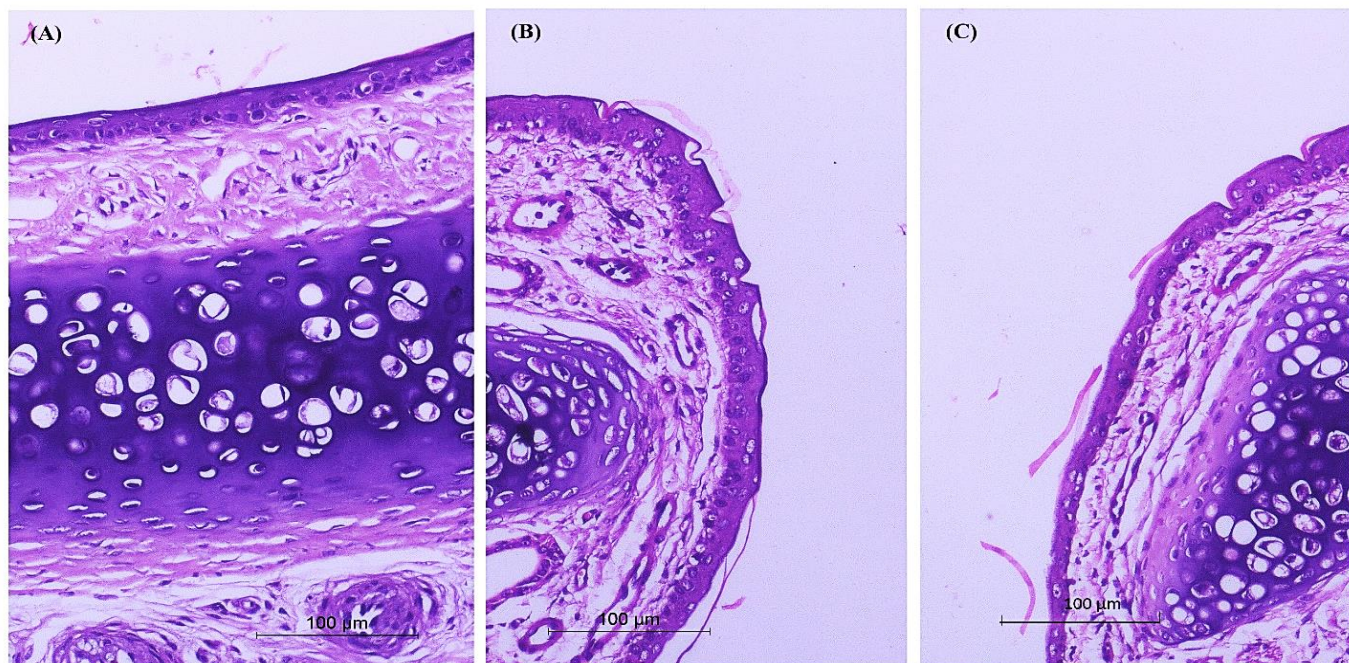


**Figure 6.** ImageJ analysis of florescent images, color intensity represents the nasal penetration.

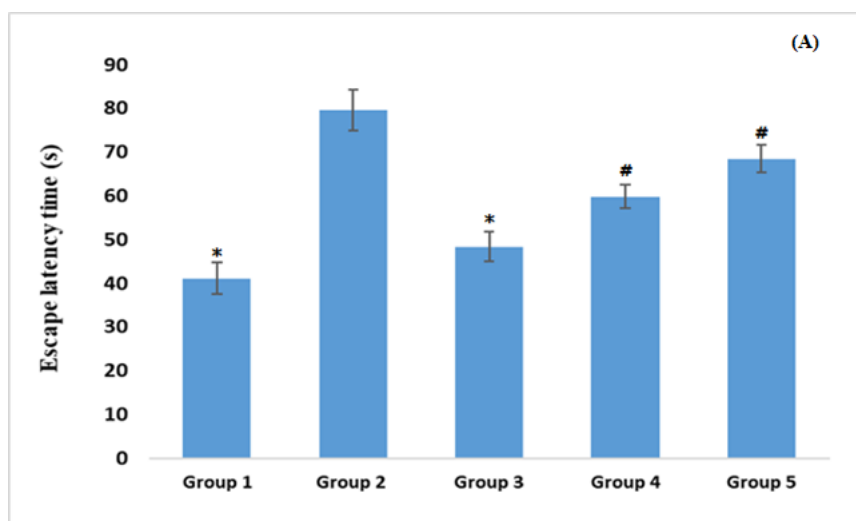


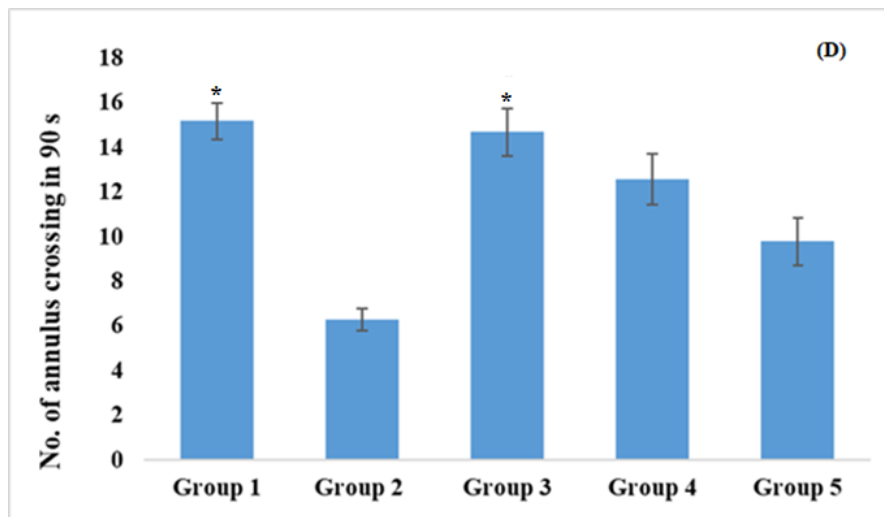
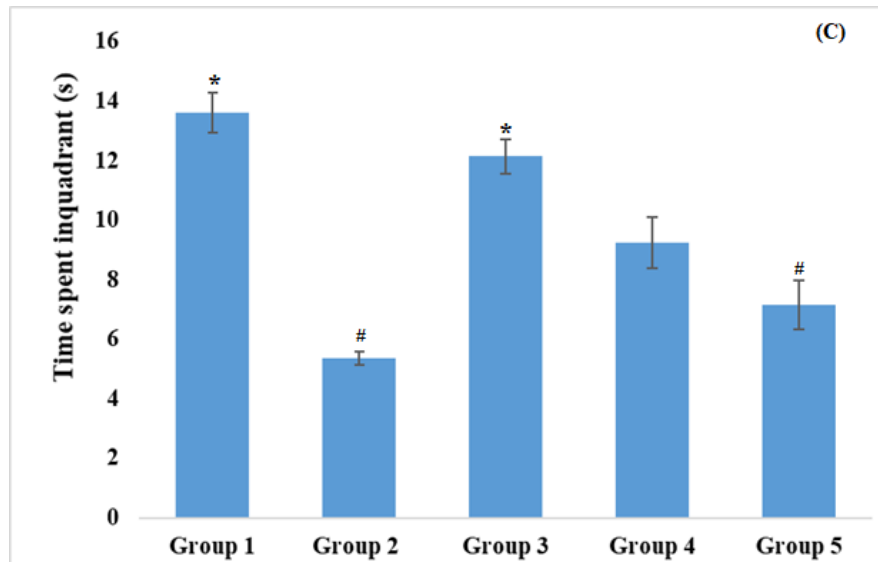
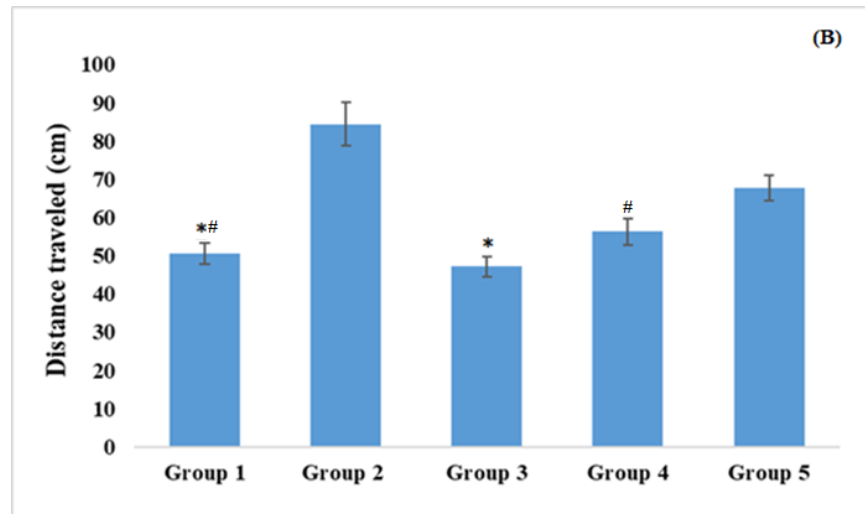
**Figure 7.** Nasal mucosal penetration study using fluorescence microscope imaging of (A) RES-suspension, (B) RES-transfersomes and (C) RES-nanoemulsion.





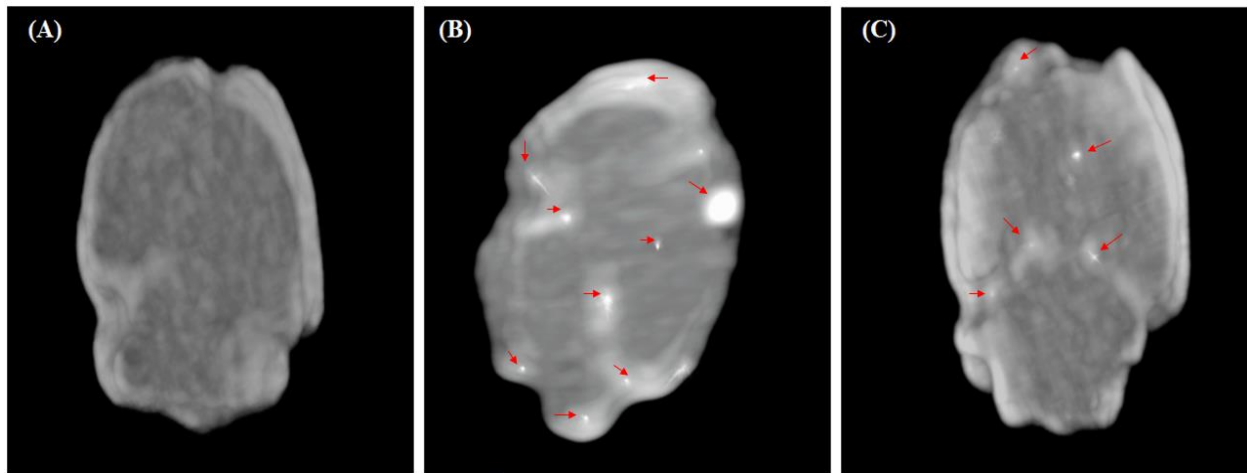
**Figure 8.** Light photomicrographs of (A) untreated rat nasal mucosa (B), rat nasal mucosa treated with RES-transferosomes and (C) rat nasal mucosa treated with RES-nanoemulsion.



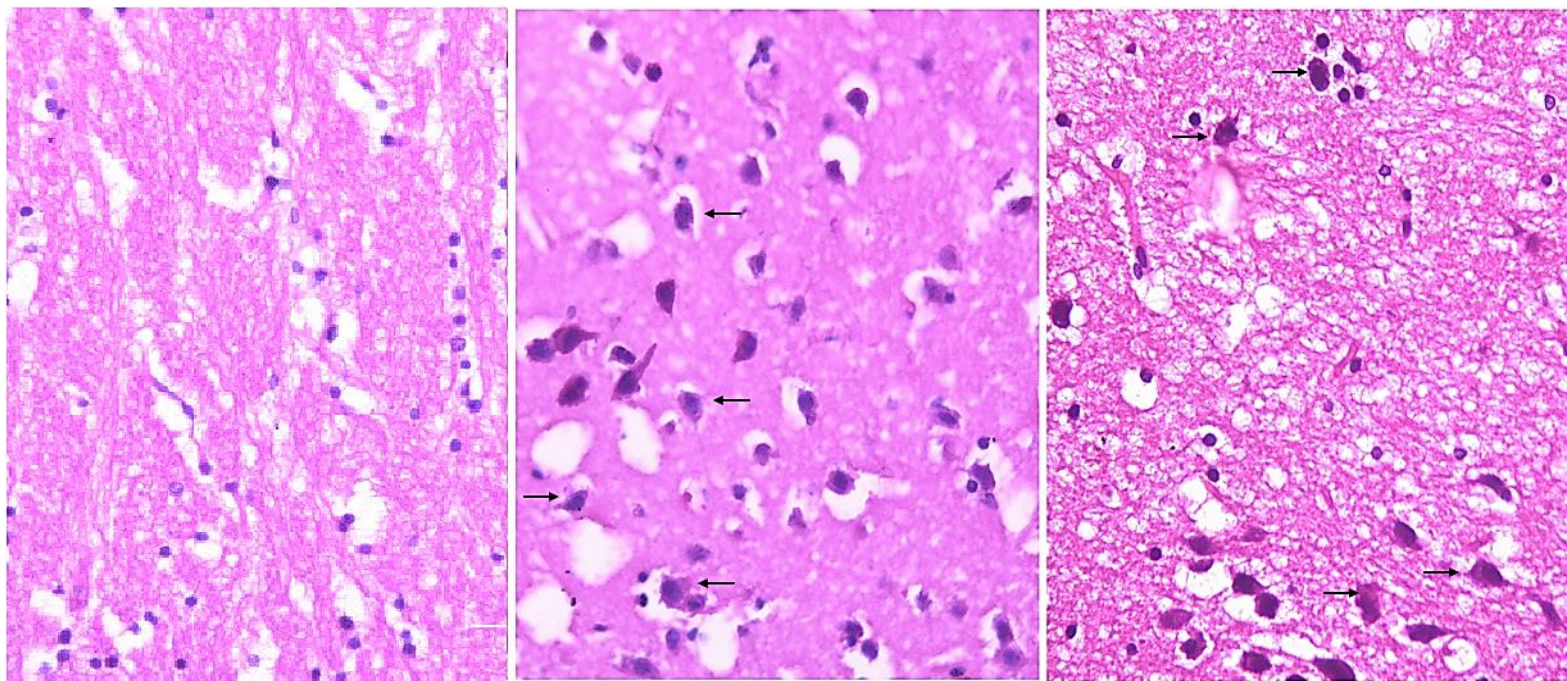




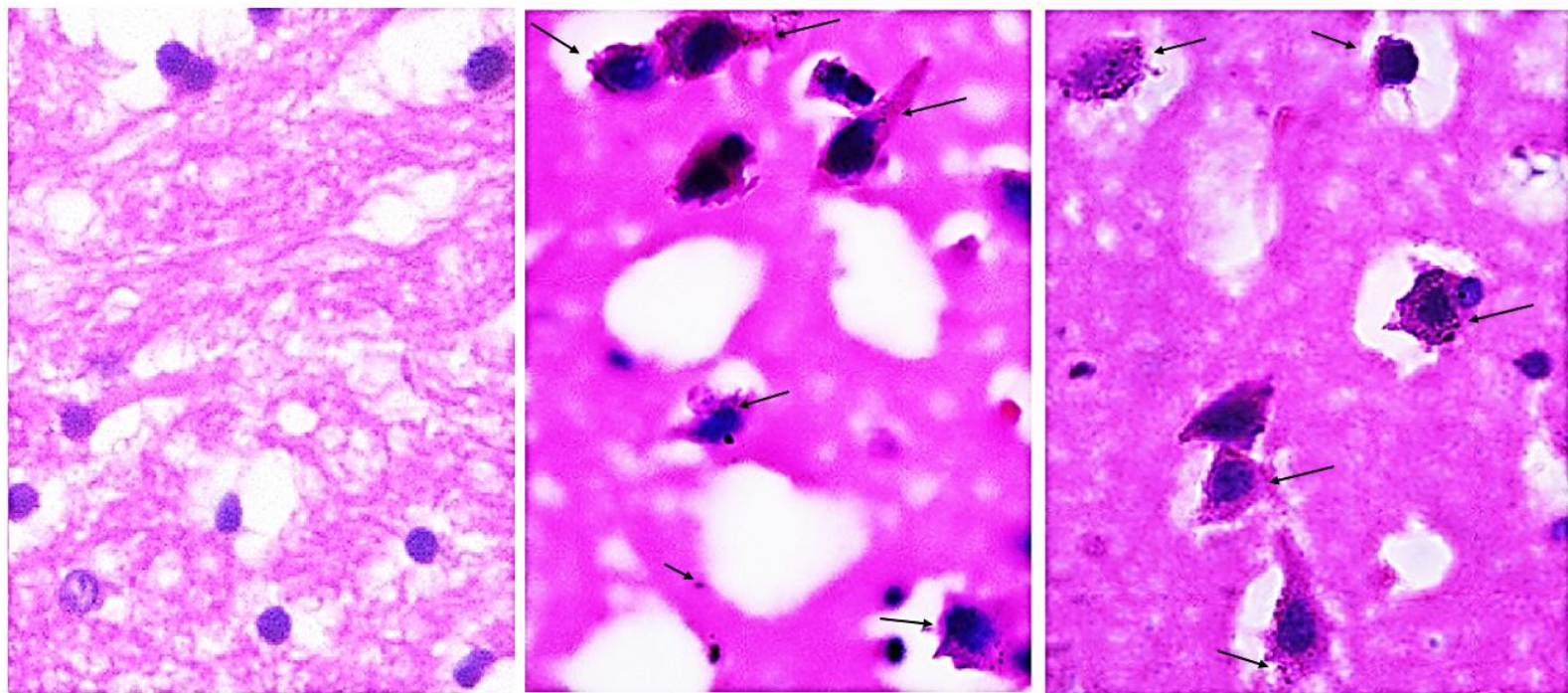
**Figure 9.** Pharmacodynamic study in scopolamine-induced amnesia model utilizing Morris Water Maze test, (A) Escape latency time. (B) Distance traveled. (C) Total time spent in target quadrant. (D) No of annulus crossings. Each data point represents the mean  $\pm$  SD (n=6). Statistical analysis was carried out using one-way ANOVA followed by Tukey's multiple comparison test; \* & # represents the insignificance at  $p < 0.05$ .



**Figure 10.** Computed tomography image represents the brain **cellular uptake** GNPs (red arrow) in (A) untreated control rat (B) RES-trans-GNPs treated rat (C) and RES-nanoemulsion-GNPs treated rat.



**Figure 11.** Light photomicrographs of brain tissues showing **cellular uptake** of GNPs; (A) untreated control rat (B) RES-trans-GNPs treated rat (C) and RES-nanoemulsion-GNPs treated rat. H&E,  $\times 400$ .



**Figure 12.** Light photomicrographs of brain tissues showing **cellular uptake** of GNPs of (A) untreated control rat (B) RES-trans-GNPs treated rat (C) and RES-nanoemulsion-GNPs treated rat. H&E,  $\times 1000$ .