Supplementary Table 1. The effect of the CuO nanoparticles on the weights of mice before and after treatment

|  |  |  |  |
| --- | --- | --- | --- |
| Groups | weight before treatment | Weight after treatment | P value |
| Control | 0.57±28 | 33±1 | 0.12 |
| Sham | 0.33±27.66 | 34±2.5 | 0.89 |
| 50 mg/kg CuO NPs | 1.8±29.33 | 34±1.5 | 0.77 |
| 100 mg/kg CuO NPs | 1.45±30.33 | 34±1.5 | 0.56 |
| 150 mg/kg CuO NPs | 0.85±29.75 | 34±1.7 | 0.62 |

Supplementary Table 2. The effect of the CuO nanoparticles on the weights of testes, testicular size and diameter of testes tubule and epididymis tubule

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Groups | Control | Sham | 50 mg/kg CuO NPs | 100 mg/kg CuO NPs | 150 mg/kg CuO NPs | P value |
| Weights of testes (mg) | 110±15.2 | 133±6.3 | 123±3.3 | 106±8.3 | 123±6.1 | 0.13 |
| Testicular size (mm) | 6.3±0.33 | 7.3±0.33 | 7±0.28 | 6.9±0.26 | 7.3±0.33 | 0.11 |
| Diameter of seminiferous tubules (µm) | 16±0.57 | 17±0.57 | 22.5±1.3 | 23.2±0.47 | 23±0.64 | 0.08 |
| Diameter of epididymis tubules (µm) | 12.8±0.61 | 12.6±0.68 | 19.4±0.57 | 10.5±0.64 | 9.4±0.74 | 0.09 |

Supplementary Table 3. Comparing the number of sertoli cells, leydic cells, fibroblast, blood vessels, seminiferous and epididymis tubules in different groups of mice after 18 days of treatment (\* P <0.05, \*\*P <0.01).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Groups | Control | Sham | 50 mg/kg CuO NPs | 100 mg/kg  | 150 mg/kg CuO NPs |
| Sertoli cells | 5.3±0.66 | 4.7±0.47 | 5.5±0.92 | CuO NPs | 3.3±0.33\* |
| Leydig cells | 9.2±1.50 | 10±2.10 | 10±1.71 | 8.5±0.64\*\* | 11±1.57 |
| Fibroblast | 3±0.81 | 4.2±0.94 | 3.2±0.93 | 14±2.30\*\* | 2.7±0.47 |
| blood vessels | 1.6±0.61 | 1.2±0.45 | 1.1±0.27 | 4.1±0.39\* | 0.7±0.11 |
| Seminiferous tubules | 239±11.1 | 216±3.2 | 220±9.1 | 1.6±0.45 | 210±2.2 |
| Epididymis tubules | 74±2.1 | 74.2±3.2 | 94±3.1 | 290±3.1\* | 86±2.1 |

Supplementary Table 4. Comparing the number of different Spermatogonial Stem Cells, Spermatocyte, Spermatid, and mature Sperms in different groups of mice after 18 days of treatment (\* P<0.05, \*\*P<0.01).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Groups | Control | Sham | 50 mg/kg CuO NPs | 100 mg/kg | 150 mg/kg CuO NPs |
| TypeB Spermatogonial Stem Cells | 26±2.9 | 33±3.7 | 52±6.1 | 62±3.1\*\* | 31.6±1.6 |
| Spermatocyte | 38.6±3.8 | 30±1.7 | 47±3.1 | 53.7±3.7 \* | 44.5±2.1 |
| Spermatid | 146.6±10.3 | 129.7±15.2 | 156.4±12.3 | 280±10.8 \*\*\* | 155±5.6 |
| Sperm (in epididymis) | 72±1.9 | 74±2.1 | 68±3.1 | 70±3.3 | 62±2.1 |