**Prospects on the nano-plastic particles internalization and induction of cellular response in human keratinocytes**

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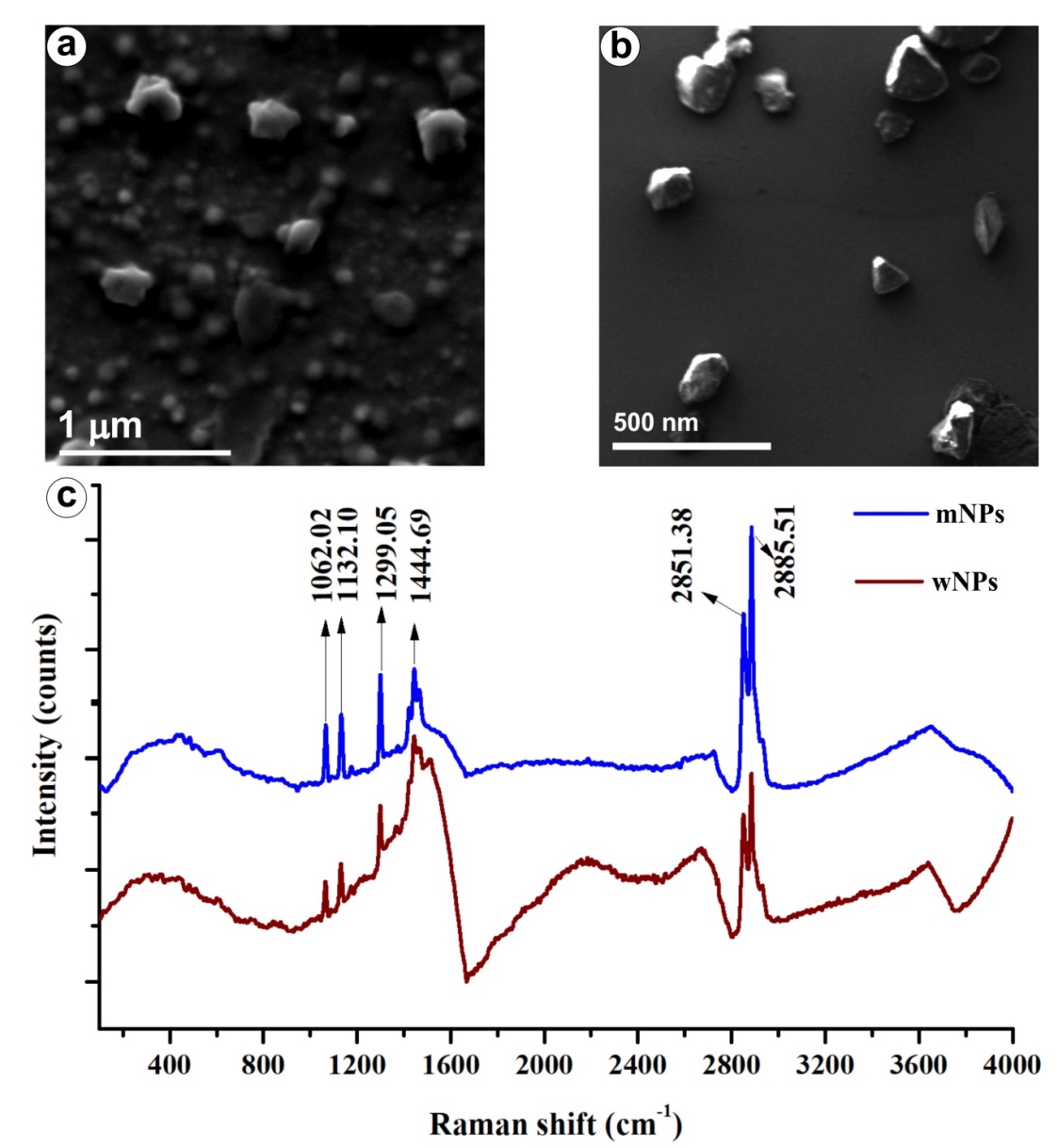
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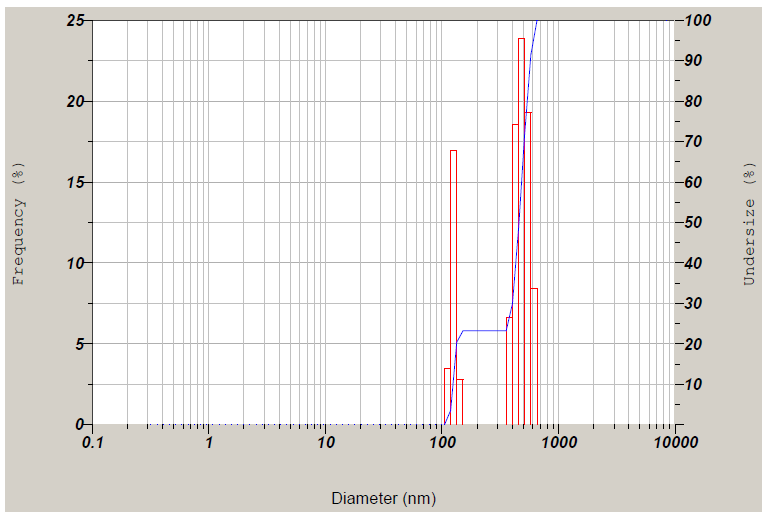
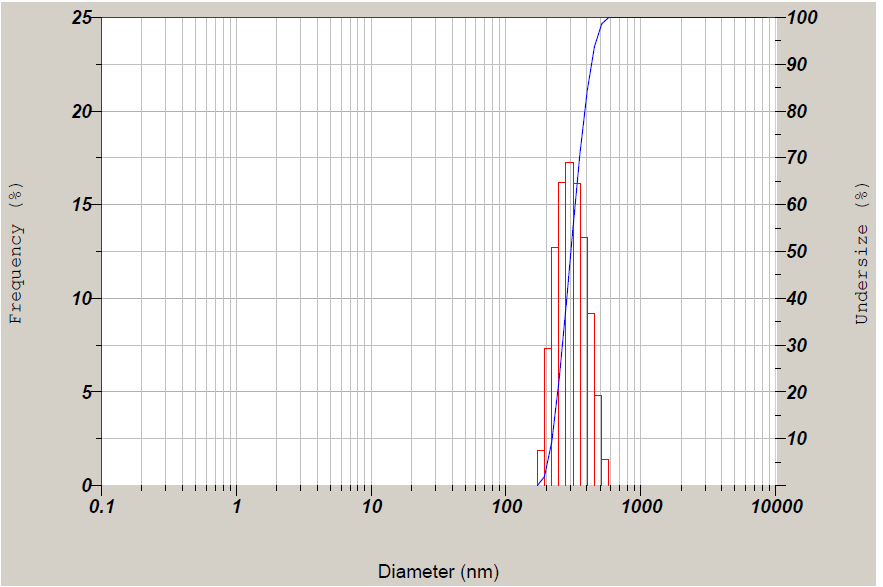
**Figure S1. Figure 1. Characterization NPs isolated from cosmetics.** (a) Scanning Electron Micrograph of mNPs, (b) wNPs, and (c) FT-Raman spectra of the mNPs and wNPs.

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**Figure S2. Dynamic light scattering size distribution analysis of NPs suspended in the cell culture medium for 24 hrs.** (a) The size distribution of mNPs, (b) Size distribution of wNPs

**a**

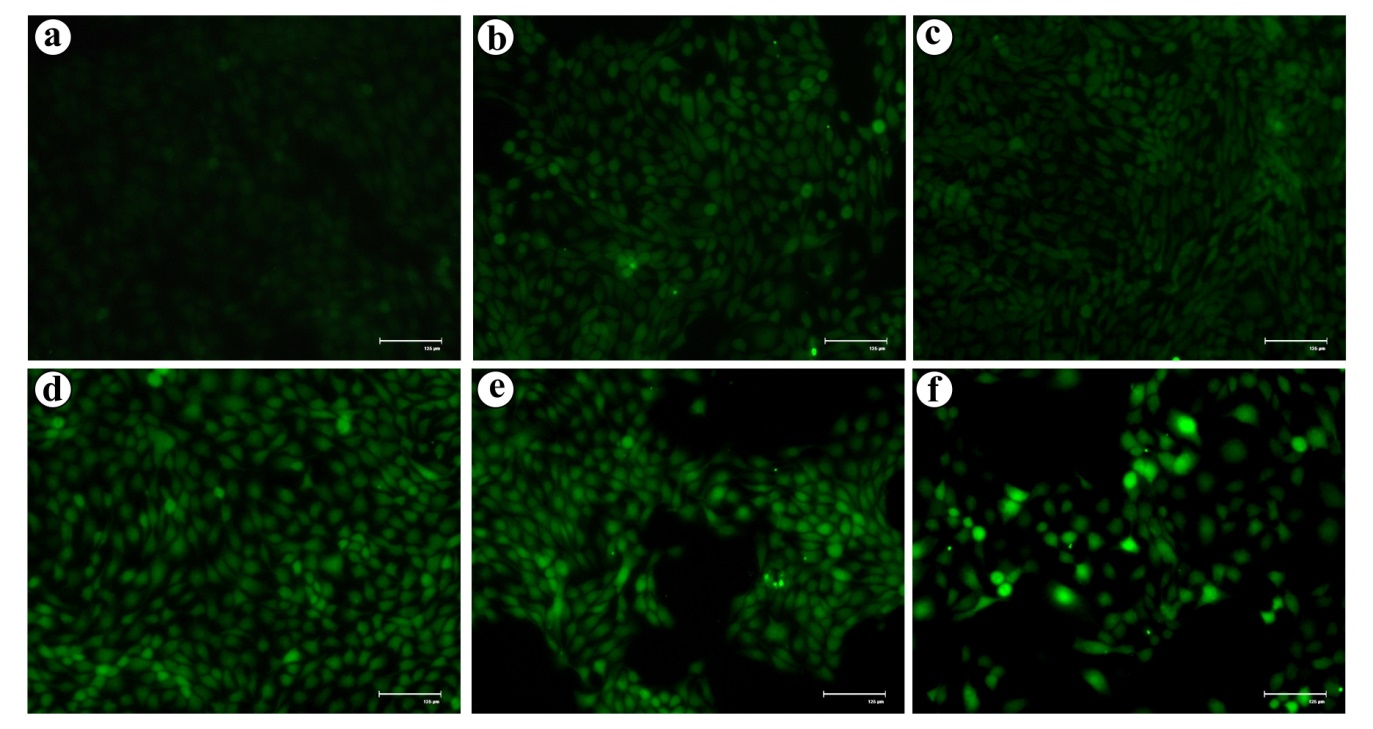
**b**



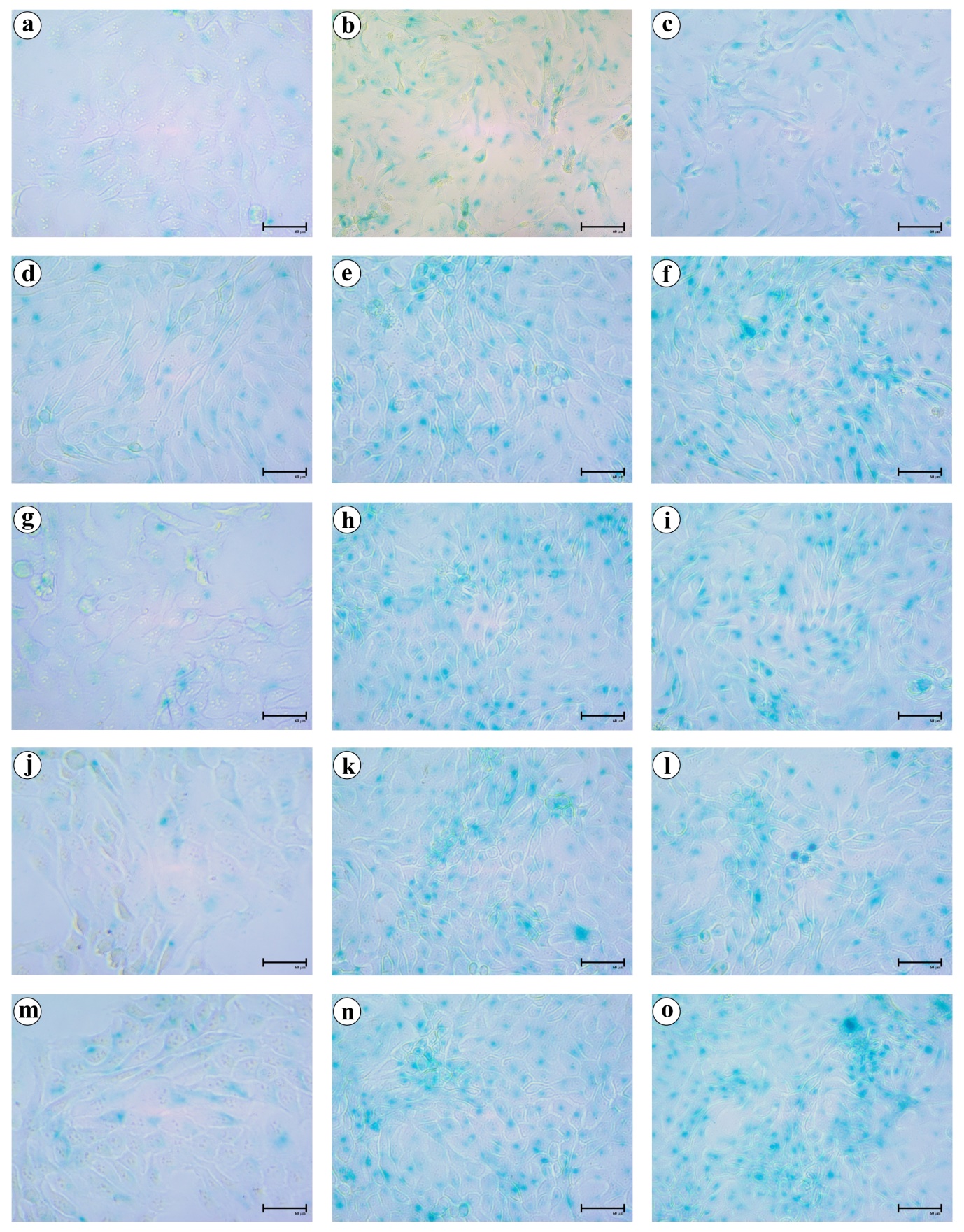
**Table S1. Mean MTT values of three independent experiments of the keratinocytes cells exposed to different nanoplastics particles for 24, 48, 72, 96, 120, and 144 hrs.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Time** | **Concentration** | | | | | |
| **0µg/ml** | **25µg/ml** | **50µg/ml** | **100µg/ml** | **250µg/ml** | **500µg/ml** |
| **PSNPs** | **24 hrs** | 0.456 | 0.418 | 0.403 | 0.428 | 0.435 | 0.425 |
| 0.423 | 0.454 | 0.436 | 0.462 | 0.394 | 0.388 |
| 0.401 | 0.391 | 0.375 | 0.406 | 0.418 | 0.367 |
| **48 hrs** | 0.818 | 0.732 | 0.828 | 0.756 | 0.701 | 0.774 |
| 0.687 | 0.815 | 0.884 | 0.838 | 0.921 | 0.839 |
| 0.747 | 0.829 | 0.782 | 0.805 | 0.855 | 0.818 |
| **72 hrs** | 1.518 | 1.797 | 1.689 | 1.742 | 1.667 | 1.755 |
| 1.465 | 1.796 | 1.874 | 1.564 | 1.524 | 1.629 |
| 1.578 | 1.615 | 1.658 | 1.81 | 1.84 | 1.642 |
| **96 hrs** | 2.22 | 2.585 | 2.714 | 3.041 | 3.037 | 2.371 |
| 2.674 | 3.138 | 2.976 | 2.724 | 2.569 | 2.286 |
| 2.499 | 3.024 | 3.286 | 3.526 | 2.487 | 2.91 |
| **120 hrs** | 3.468 | 4.59 | 3.466 | 3.43 | 3.522 | 3.44 |
| 3.252 | 3.366 | 3.78 | 3.656 | 3.054 | 3.605 |
| 3.693 | 3.486 | 3.428 | 3.097 | 2.92 | 3.608 |
| **144 hrs** | 5.38 | 6.074 | 4.742 | 6.114 | 5.64 | 6.794 |
| 5.448 | 5.138 | 4.572 | 4.9 | 4.878 | 5.28 |
| 5.056 | 4.974 | 5.82 | 4.118 | 5.416 | 6.368 |
|  | | | | | | | |
| **mNPs** | **Concentration** | | | | | | |
|  | **0µg/ml** | **25µg/ml** | **50µg/ml** | **100µg/ml** | **250µg/ml** | **500µg/ml** |
| **24 hrs** | 0.456 | 0.401 | 0.384 | 0.394 | 0.329 | 0.270 |
| 0.423 | 0.393 | 0.437 | 0.403 | 0.289 | 0.229 |
| 0.401 | 0.389 | 0.406 | 0.433 | 0.301 | 0.209 |
| **48 hrs** | 0.818 | 0.77 | 0.888 | 0.716 | 0.417 | 0.075 |
| 0.687 | 0.838 | 0.801 | 0.742 | 0.441 | 0.076 |
| 0.747 | 0.794 | 0.783 | 0.679 | 0.468 | 0.078 |
| **72 hrs** | 1.518 | 1.65 | 1.555 | 1.333 | 0.766 | 0.093 |
| 1.465 | 1.552 | 1.52 | 1.223 | 0.807 | 0.101 |
| 1.578 | 1.502 | 1.483 | 1.416 | 0.677 | 0.076 |
| **96 hrs** | 2.22 | 2.558 | 2.921 | 2.3 | 1.189 | 0.095 |
| 2.674 | 2.987 | 3.146 | 2.38 | 1.141 | 0.098 |
| 2.499 | 2.875 | 3.19 | 1.808 | 1.142 | 0.095 |
| **120 hrs** | 3.468 | 3.168 | 3.095 | 2.668 | 1.81 | 0.086 |
| 3.252 | 3.19 | 3.534 | 2.759 | 1.742 | 0.094 |
| 3.693 | 3.444 | 2.912 | 2.797 | 1.66 | 0.086 |
| **144 hrs** | 5.38 | 6.666 | 4.62 | 5.83 | 3.84 | 0.146 |
| 5.448 | 5.626 | 5.176 | 5.316 | 4.182 | 0.156 |
| 5.056 | 6.224 | 4.706 | 4.56 | 4.184 | 0.148 |
|  | | | | | | | |
| **wNPs** | **Concentration** | | | | | | |
|  | **0µg/ml** | **5µg/ml** | **10µg/ml** | **50µg/ml** | **100µg/ml** | **250µg/ml** |
| **24 hrs** | 0.456 | 0.410 | 0.454 | 0.407 | 0.396 | 0.352 |
| 0.423 | 0.455 | 0.420 | 0.421 | 0.400 | 0.340 |
| 0.401 | 0.394 | 0.397 | 0.439 | 0.383 | 0.343 |
| **48 hrs** | 0.818 | 0.781 | 0.95 | 0.723 | 0.629 | 0.417 |
| 0.687 | 0.78 | 0.885 | 0.763 | 0.605 | 0.455 |
| 0.747 | 0.8 | 0.805 | 0.694 | 0.668 | 0.43 |
| **72 hrs** | 1.518 | 1.433 | 1.621 | 1.372 | 0.872 | 0.503 |
| 1.465 | 1.578 | 1.905 | 1.475 | 1.12 | 0.651 |
| 1.578 | 1.627 | 1.677 | 1.543 | 1.155 | 0.635 |
| **96 hrs** | 2.22 | 2.775 | 3.118 | 2.358 | 1.655 | 0.454 |
| 2.674 | 2.124 | 3.265 | 3.121 | 1.678 | 0.754 |
| 2.499 | 2.374 | 2.479 | 2.483 | 1.865 | 0.662 |
| **120 hrs** | 3.468 | 3.416 | 3.172 | 3.156 | 2.724 | 0.637 |
| 3.252 | 3.464 | 3.037 | 3.137 | 2.555 | 1.07 |
| 3.693 | 3.311 | 2.861 | 3.465 | 3.013 | 1.18 |
| **144 hrs** | 5.38 | 6.25 | 5.276 | 4.97 | 4.104 | 0.72 |
| 5.448 | 6.018 | 5.054 | 5.028 | 4.978 | 1.774 |
| 5.056 | 6.744 | 5.89 | 5.784 | 4.834 | 1.548 |
|  | | | | | | | |
| **H2O2** | **Concentration** | | | | | | |
|  | **0µM** | **25µM** | **50µM** | **100µM** | **250µM** | **500µM** |
| **24 hrs** | 0.456 | 0.39 | 0.362 | 0.394 | 0.318 | 0.303 |
| 0.423 | 0.371 | 0.38 | 0.39 | 0.329 | 0.31 |
| 0.401 | 0.387 | 0.339 | 0.36 | 0.335 | 0.294 |
| **48 hrs** | 0.818 | 0.788 | 0.7 | 0.812 | 0.519 | 0.463 |
| 0.687 | 0.726 | 0.801 | 0.735 | 0.599 | 0.393 |
| 0.747 | 0.717 | 0.689 | 0.729 | 0.557 | 0.393 |
| **72 hrs** | 1.518 | 1.407 | 1.585 | 0.851 | 0.637 | 0.572 |
| 1.465 | 1.424 | 1.382 | 0.861 | 0.612 | 0.567 |
| 1.578 | 1.577 | 1.329 | 0.978 | 0.698 | 0.552 |
| **96 hrs** | 2.22 | 2.142 | 2.671 | 1.587 | 1.021 | 0.517 |
| 2.674 | 2.59 | 2.352 | 1.599 | 0.75 | 0.704 |
| 2.499 | 2.688 | 2.39 | 1.946 | 0.697 | 0.618 |
| **120 hrs** | 3.468 | 3.259 | 2.5 | 1.942 | 1.007 | 0.598 |
| 3.252 | 3.242 | 2.451 | 2.338 | 1.194 | 0.576 |
| 3.693 | 2.451 | 3.073 | 2.238 | 1.236 | 0.458 |
| **144 hrs** | 5.38 | 4.794 | 5.468 | 4.754 | 2.926 | 0.756 |
| 5.448 | 3.874 | 5.3 | 4.434 | 2.466 | 0.684 |
| 5.056 | 4.778 | 4.748 | 4.684 | 2.938 | 0.592 |

**Figure S3. Intracellular ROS measured by DCFH2-DA staining of keratinocytes under fluorescence microscope.** (a) control, (b) PSNPs (100 µg mL-1), (c) styrene (100 µg mL-1), (d) mNPs (100 µg mL-1), (e) wNPs (100 µg mL-1) and (f) H2O2 (100 µM). Scale bar - 125 µm.

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**Figure S4. NPs mediated induction of cellular senescence in the HaCaT cells.** (a) control, (b& c)H2O2 10& 50 µM, (d-f) PSNPs 10, 100 & 500 µg/mL, (g-i) styrene 10, 100 & 500 µg/mL, ( j-l) mNPs 10, 50 & 100 µg/mL and (m-o) wNPs 10, 50 & 100 µg/mL of, respectively. Scale bar - 60 µm.

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