

## Coating of Mitochondria by Metal Nanoparticles

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Transplanting viable mitochondria into injured cells to replace damaged mitochondria has been recently studied as a novel treatment for autoimmune disease. However, this often suffers from poor cellular uptake of donor mitochondria, and one of possible causes is electrostatic repulsion between mitochondria and the cells. Hence, in order to improve the cellular uptake, it is desirable to alleviate the electrostatic repulsion. Here, we propose a surface coating of mitochondria by metal nanoparticles via electrostatic attraction. Once attached, positively charged metal nanoparticles are expected to reduce the net negative charge of the outer membrane of mitochondria. Nanoparticles with different surface charges (positive, negative, and neutral) are tested. The coating of mitochondria by the nanoparticles is systematically characterized by zeta potential measurement, dark-field microscopy, and electron microscopy, respectively.