

Biological Effects of Inorganic Nanoparticles on Isolated Mitochondria

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ATP production by mitochondria is essential in protein synthesis, cell proliferation and ion transportation. Recently, effect of inorganic nanoparticles on the ATP production has been studied in a cellular level by simply co-incubating the nanoparticles with cells. Here, we have systematically investigated effect of metal nanoparticles on the ATP production of mitochondria by coating the isolated mitochondria with the nanoparticles. First, we characterized the coating by electrostatic attraction between negatively-charged mitochondria and positively-charged metal nanoparticles. As-made metal nanoparticles-coated mitochondria was visualized by scanning electron microscopy (SEM) and dark-field microscopy. The ATP production from the metal nanoparticles-coated mitochondria was also compared with that from mitochondria without the nanoparticles.