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JOURNAL ARTICLE

Isolation and characterization of mitochondria from turkey spermatozoa

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A procedure was developed to rapidly isolate functional, intact mitochondria from turkey spermatozoa. Semen was collected from turkeys, pooled, and centrifuged to remove spermiphages and other cells. The sperm cells were then mechanically disrupted with a Dounce homogenizer, sonicated, and centrifuged using a discontinuous Percoll gradient. Electron microscopy revealed morphologically intact mitochondria. The isolated mitochondria exhibited cytochrome oxidase activity, oxygen consumption, and were stained by rhodamine 123, a fluorescent stain specific for functional mitochondria in eukaryotic cells. Mitochondrial DNA (mtDNA) was isolated and purified, and the genome was determined to be 16.457 +/- 0.07 kbp. Restriction fragment patterns were identified using the endonucleases EcoR1, HindIII, and BamH1. Mitochondrial DNA was also purified from turkey liver and testis, and no differences in the restriction enzyme patterns were found between somatic and germ cell mtDNA. It is concluded that mitochondria can be isolated from spermatozoa for metabolic or genetic study.

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