

# Multiple rearrangement of mitochondrial DNA in unfertilized human oocytes

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摘要

## Abstract

OBJECTIVE: To determine the rearrangement of mitochondrial DNA (mtDNA) in unfertilized human oocytes and compromised embryos to evaluate the fertilization capacity of oocytes. DESIGN: Prospective laboratory research. SETTING: IVF laboratory in a university hospital. PATIENT(S): One hundred twenty-four unfertilized oocytes, 98 arrested embryos, and 45 trippronucleate (3PN) embryos from 65 female patients undergoing in vitro fertilization (IVF). INTERVENTION(S): Unfertilized oocytes and poor quality embryos were collected 48 hours after IVF. MAIN OUTCOME MEASURE(S): Comparison of the frequency of mtDNA deletions and fertilization rates of oocytes. RESULT(S): Multiple deletions of mtDNA were found in unfertilized oocytes and arrested embryos obtained from IVF patients. A 4977-bp deletion was the most frequent deletion in human oocytes and embryos. About 66.1% of the unfertilized oocytes, 34.8% of the arrested or fragmented embryos, and 21.1% of the 3PN embryos harbored the 4977-bp deletion of mtDNA. There was a significant increase in the proportion of deleted mtDNA in unfertilized oocytes. CONCLUSION(S): Accumulation of mtDNA deletions may contribute to mitochondrial dysfunction and impaired ATP production. We conclude that the accumulation of rearranged mtDNA may interfere with fertilization of human oocytes and further embryonic development.