

# **Antioxidant CoQ10 Restores Fertility by Rescuing Bisphenol A-Induced Oxidative DNA Damage in the *Caenorhabditis elegans* Germline**

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## **Abstract:**

Endocrine-disrupting chemicals are ubiquitously present in our environment, but the mechanisms by which they adversely affect human reproductive health and strategies to circumvent their effects remain largely unknown. Here, we show in *Caenorhabditis elegans* that supplementation with the antioxidant Coenzyme Q10 (CoQ10) rescues the reprotoxicity induced by the widely used plasticizer and endocrine disruptor bisphenol A (BPA), in part by neutralizing DNA damage resulting from oxidative stress. CoQ10 significantly reduces BPA-induced elevated levels of germ cell apoptosis, phosphorylated checkpoint kinase 1 (CHK-1), double-strand breaks (DSBs), and chromosome defects in diakinesis oocytes. BPA-induced oxidative stress, mitochondrial dysfunction, and increased gene expression of antioxidant enzymes in the germline are counteracted by CoQ10. Finally, CoQ10 treatment also reduced the levels of aneuploid embryos and BPA-induced defects observed in early embryonic divisions. We propose that CoQ10 may counteract BPA-induced reprotoxicity through the scavenging of reactive oxygen species and free radicals, and that this natural antioxidant could constitute a low-risk and low-cost strategy to attenuate the impact on fertility by BPA.