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## Electrolyzed-reduced water increases resistance to oxidative stress, fertility, and lifespan via insulin/IGF-1-like signal in *C. elegans*

Seul-Ki Park <sup>1</sup>, Sang-Kyu Park

## Affiliations

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### Abstract

Electrolyzed-reduced water (ERW) scavenges reactive oxygen species and is a powerful anti-oxidant. A positive correlation between oxidative stress and aging has been proved in many model organisms. In *Caenorhabditis elegans*, many long-lived mutants showed reduced fertility as a trade off against longevity phenotype. We aimed to study the effect of ERW on oxidative stress, fertility and lifespan of *C. elegans*. We also investigated the genetic pathway involved in the effect of ERW on resistance to oxidative stress and lifespan. We compared lifespan and fertility of worms in media prepared with distilled water and ERW. ERW significantly extended lifespan and increased the number of progeny produced. Then the effect of ERW on resistance to oxidative stress and lifespan of long-lived mutants was determined. ERW increased resistance to oxidative stress and lifespan of *eat-2*, a genetic model of dietary restriction, but had no effect on those of *age-1*, which is involved in insulin/insulin-like growth factor (IGF)-1-like signal. In addition, knockdown of *daf-16*, the downstream mediator of insulin/IGF-1-like signal, completely prevented the effect of ERW on lifespan. These findings suggest that ERW can extend lifespan without accompanying reduced fertility and modulate resistance to oxidative stress and lifespan via insulin/IGF-1-like signal in *C. elegans*.

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