

P039 EPR-detectable “Free” Iron Levels as an Indirect Measure of Oxidative Stress in *C. elegans*

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Free radicals are difficult to measure directly, so alternative indirect methods can be used. One such technique utilizes the electron paramagnetic resonance (EPR) spectroscopy to measure Fe(III) levels at $g=4.3$, referred to as “free” iron. In *E. coli* and yeast, “free” iron levels directly correlated with the *in vivo* superoxide levels. We have previously developed this methodology for the nematode, *C. elegans*. In the current study, to uncover factors that modulate this indirect oxidative stress indicator, we have subjected age synchronized worm populations to various conditions that elevate *in vivo* free radical or iron concentrations. Worms subjected to hydrogen peroxide, paraquat, and heat shock treatments had elevated EPR-detectable iron. Also, worms raised at higher temperatures had increased “free” iron, with no change in total iron. In addition, growth on an iron-supplemented media yielded greater “free” iron levels. Since treatments that alter free radical levels and iron availability influence “free” iron levels, this method may be useful to quantify free radicals only when total iron levels are unchanged. However, this study underscores the link between free radicals and iron metabolism.