

Yolk protein synthesis in *Caenorhabditis elegans*: Potential regulation by estrogens?

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In vertebrates, the synthesis of vitellogenin, the precursor of yolk protein is estrogen regulated and a useful indicator of exposure to environmental estrogens. Vitellogenins are also synthesized in invertebrates, but the regulation of synthesis is not well documented except for insects and crustaceans. In *C. elegans* yolk proteins synthesized in the intestine have been identified, but little is known of the regulation of gene transcription and translation. Here we present evidence that suggests that yolk protein synthesis in *C. elegans* is estrogen sensitive. Cultures of *C. elegans* grown for 3-4 days with OP50/1 bacteria were exposed to 3 different concentrations of estradiol 17- (E_2). SDS-PAGE and Western blotting (antibody courtesy of T. Blumenthal) showed the expected size of vitellogenin proteins. There was a dose-dependent increase in yolk protein band intensity with exposure of cultures to 10^{-7} and 10^{-5} E_2 ; by contrast, exposure to 10^{-9} M E_2 suggests that at low dose E_2 may interfere with normal vitellogenin synthesis. A BLAST search of *C. elegans* genome did not reveal any estrogen response elements in the vitellogenin genes of *C. elegans*. However, the *C. elegans* genome contains several nuclear receptors which might mediate estrogen action. Since *C. elegans* is a ubiquitous soil nematode of known genetic composition and reproduces rapidly in the laboratory, it may be an appropriate model organism for testing the impact of xenobiotic mixtures and ground water.

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