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Identifying Potential Causes of Human Birth Defects through Genetic Studies of Worm Development

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Abstract

We will use the roundworm *Caenorhabditis elegans* to study the process of meiosis, which is involved in the formation of gametes (sperm and eggs). Its small size, rapid life cycle, transparency and well-annotated genome allows researchers to track the effects of mutations that disrupt gametogenesis. Our preliminary data demonstrated that a genetic screen for mutations that increase the viability of embryos produced by worms lacking SPO-11, a critical factor regulating meiotic chromosomal inheritance, can identify genes required for the accurate transmission of the genome from one generation to the next. To further test this hypothesis, we will continue this screen to identify additional regulators of meiosis. Our results will be relevant to human genetics, since key regulators of gametogenesis are highly conserved in both worms and vertebrates. Thus, we can learn about the causes of human birth defects by examining worm development. Consequently, these mechanisms will be relevant to understanding gametogenesis in humans and may aide in preventing genetic instability.

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