The Effects of Exercise at Different Stages of Life on the Longevity of C. elegans

Lyons, Grace

Garcia-Chope, Jose

Scientists have long emphasized the importance of exercise in maintaining a healthy and balanced existence. While exercise may decrease age-related degeneration, few studies have looked at the impact of exercise at different stages of life upon human longevity. This experiment investigated the effects of exercise at different stages of life on the longevity of Caenorhabditis elegans (C. elegans), a soil nematode with significant genetic similarities to humans. An electrotactic flow chamber (worm treadmill) was used to provide daily exercise to C. elegans. A total of three different experimental exercise groups were created: early in life (Early Exercise); late in life (Late Exercise); and throughout the entire lifespan (Whole Life Exercise). The control group was not exercised throughout their lives. On each day from the onset of exercise, the number of live worms in all four groups was tabulated. Consistent with the study's hypotheses, more worms in the Whole Life Exercise condition remained alive at later days in the experiment than worms in the No Exercise and Early Exercise conditions ($p<0.01$). More worms in the Late Exercise condition remained alive at later days than worms in the No Exercise and Early Exercise conditions ($p<0.01$). No differences emerged between the Whole Life Exercise condition and the Late Exercise condition in the percentages of worms alive at later days. In contrast to the study's hypotheses, fewer worms in the Early Exercise condition remained alive in comparison to the control group ($p<0.05$). Future research could investigate the underlying mechanisms that prevent degeneration in C. elegans as a result of exercise at different stages of life.

Awards Won:

Third Award of $1,000