Examining the Effects of Dietary Restriction on Mitophagy in C. elegans

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Aging is a process involving dynamic changes to the living body over time. From a biological standpoint, it relies on various molecular and cellular factors typically dependent on the environment. With the availability of breakthrough technologies (vaccines, antibiotics, nutrition, etc.), our longevity has increased. However, over half of people's newly extended lives are spent riddled with chronic diseases like dementia, Parkinson's, Alzheimer's, and cancers. We must focus on extending our healthspan (i.e. the number of years spent without disease) rather than solely on lifespan extension. With advances in technology, it may be possible to slow down the aging process through treatments, lifestyle changes, and therapies. This results in a higher quality of life, improved productivity, and reduced healthcare costs. Among lifestyle changes, one crucial factor is dietary restriction. We hypothesize that dietary restrictions, such as starvation, should increase mitochondrial autophagy and homeostatic regulation, and thus extend the healthspan. To test this hypothesis, We examined the effects of starvation on mitophagy in C. elegans. Through in vivo techniques, we found a greater association between starvation and tubular lysosome development during mitophagy, validating the potential of dietary restriction on increasing healthspan and reducing the onset of degenerative diseases in humans.

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