

The effect of fasting or calorie restriction on autophagy induction: A review of the literature

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Autophagy is a lysosomal degradation process and protective housekeeping mechanism to eliminate damaged organelles, long-lived misfolded proteins and invading pathogens. Autophagy functions to recycle building blocks and energy for cellular renovation and homeostasis, allowing cells to adapt to stress. Modulation of autophagy is a potential therapeutic target for a diverse range of diseases, including metabolic conditions, neurodegenerative diseases, cancers and infectious diseases. Traditionally, food deprivation and calorie restriction (CR) have been considered to slow aging and increase longevity. Since autophagy inhibition attenuates the anti-aging effects of CR, it has been proposed that autophagy plays a substantive role in CR-mediated longevity. Among several stress stimuli inducers of autophagy, fasting and CR are the most potent non-genetic autophagy stimulators, and lack the undesirable side effects associated with alternative interventions. Despite the importance of autophagy, the evidence connecting fasting or CR with autophagy promotion has not previously been reviewed. Therefore, our objective was to weigh the evidence relating the effect of CR or fasting on autophagy promotion. We conclude that both fasting and CR have a role in the upregulation of autophagy, the evidence overwhelmingly suggesting that autophagy is induced in a wide variety of tissues and organs in response to food deprivation. ©

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Autophagy

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Fasting

aging

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cell stress

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human

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Review

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animal

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