

The cup of youth

Comment on: Pietrocola F, et al. *Cell Cycle* 2014; 13:1987–94; PMID:24769862; <http://dx.doi.org/10.4161/cc.28929>

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Findings of scientists touching lifestyle issues or popular habits are often provokingly and controversially discussed. A behavior that is repeated over numerous years is likely to have profound implications on a person's life, and possibly on the society as a whole. While several customs are adopted regionally—for example, ingestion of yerba mate in South America or of hot spices in Asia—drinking coffee has become a habit worldwide. Accordingly, its consequences may virtually affect humankind.

In the June 15, 2014 issue of *Cell Cycle* Pietrocola et al. present delightful evidence that coffee consumption increases the levels of autophagy in mice.¹ Autophagy is a cellular recycling pathway and process of cell renewal.² Its deregulation has been linked to numerous diseases and to aging.^{3,4} Increased autophagy can be linked to longevity, and

several independent studies have shown that, among other conditions, nutrient and energy limitation as well as hypoxia increase the autophagic flux, implicating a possible reversion or delay of the aging process. Pietrocola et al. show that caffeine is not responsible for increased autophagy, and they speculate that polyphenols within coffee, which induce autophagy and reduce protein acetylation, are causative for the observed effects. While the effects of long-term coffee consumption are difficult to interpret, the article conclusively highlights that coffee rapidly induces autophagy in multiple tissues in mice in vivo, warranting future experiments studying the underlying mechanisms.

For ages there has been a debate over the effects of coffee on human health. Studies showing equally positive and negative effects of coffee consumption have reached a tie,

which renders the arguments of coffee believers and detractors inconclusive.⁵ This holds also true for the limited consumption of red wine. Interestingly, phenolic compounds present in red wine have also been shown to induce autophagy.⁶ Even cigarette smoke could be linked to autophagy stimulation.⁷ Hence, autophagy redeems beloved habits and customs with questionable or bad implications on human health if performed excessively. This brings us back to the famous alchemist Paracelsus who stated already in 1538 that “the dose makes the poison” (Paracelsus, dritte defensio, 1538). In the case of autophagy, it is vital for cellular detoxification, and specific stimulation of this stress response increases cellular fitness, having positive effects on health. Altogether, current scientific publications suggest that a famous statement of Oscar Wilde should be adapted to “an orderly passion for pleasure is the secret of remaining young”.

Author Note

V.I.D. is thankful to Patricia I Santos de Dumit for drawing the picture accompanying this article (Fig. 1).

References

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Figure 1. Drawing by Patricia I Santos de Dumit.