

Colon cancer breakthrough could lead to prevention – and the foods that can help

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GIF demonstrating the autophagy process. Credit: University of Warwick

Colon cancer, Crohn's, and other diseases of the gut could be better treated – or even prevented – thanks to a new link between inflammation and a common cellular process, established by the University of Warwick.

Led by Dr Ioannis Nezis at Warwick's School of Life Sciences, new research demonstrates that [autophagy](#) – an essential process whereby cells break down and recycle harmful or damaged elements within themselves to keep our bodies healthy – causes tissue [inflammation](#) when dysfunctional, which in turn leaves us susceptible to harmful diseases, particularly in the gut.

Understanding this link could lead to more effective treatments for gut diseases – such as [colon cancer](#), irritable bowel syndrome, Crohn's disease and ulcerative colitis—giving healthcare professionals the ability to target the root cause of these diseases, by regulating and controlling autophagy.

Foods such as pomegranates, red grapes, pears, mushrooms, lentils, soybeans and green peas contain [natural compounds](#) which can activate autophagy, helping to prevent inflammation and gut diseases.

In a new paper published in *Nature Communications*, Dr Nezis and colleagues have identified a protein which is regulated by autophagy. Called Kenny, the protein contains a motif of [amino acids](#) that causes itself to be broken down by autophagy. When autophagy is dysfunctional, Kenny accumulates and causes inflammation.

The researchers identified this phenomenon in fruit flies, by turning

Kenny fluorescent—so it would be visible—and observing at a microscopic level that the protein was present in the cell where autophagy was occurring.

They also noted that dysfunctional autophagy causes serious inflammation in fruit flies – particularly in the gut – which makes tissue inflamed, causing disease, and making the lifespan of a fruit fly half that of other flies.

To prevent serious diseases of the gut caused by inflammation, Dr Nezis and his colleagues state that it is necessary to find ways to control and regulate autophagy.

Humans are in even more danger from the link between autophagy, inflammation, and a dysfunctional or diseased gut—because our bodies lack the regular motif of amino acids which Kenny uses in [fruit flies](#), making its breakdown by autophagy difficult to control or regulate.

Dr Ioannis Nezis, the lead author of the research, commented:

"Understanding the molecular mechanisms of selective autophagy and inflammation will help to use interventions to activate the autophagic pathway to prevent inflammation and promote healthy well-being during the life course.

"Natural compounds contained in fruits and vegetables like pomegranates, red grapes, pears, mushrooms, lentils, soybeans and [green peas](#) have been shown to activate autophagy, therefore inclusion of the above in our diet would help to prevent inflammation and alleviate the symptoms of gut diseases."

The paper, 'Kenny mediates selective autophagic degradation of the IKK complex to control innate immune responses', will be published in

Nature Communications.

More information: Radu Tusco et al. Kenny mediates selective autophagic degradation of the IKK complex to control innate immune responses, *Nature Communications* (2017). [DOI: 10.1038/s41467-017-01287-9](https://doi.org/10.1038/s41467-017-01287-9)

Provided by University of Warwick

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