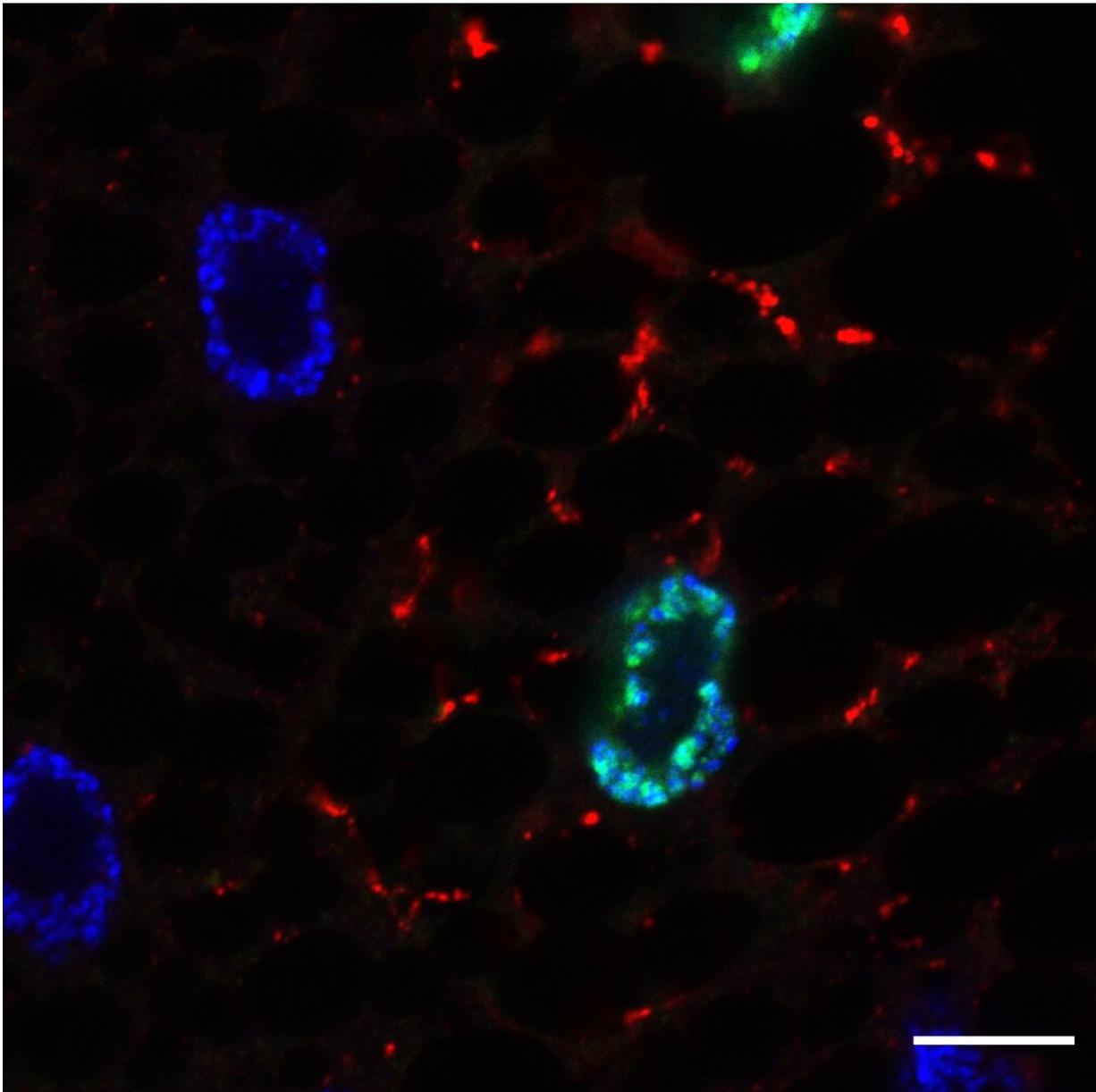


Scientists discover how cells respond to fasting

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Cells expressing GFP-Sequoia-LIR mutant (green nuclei) activate autophagy (shown by red puncta). Credit: University of Warwick

As modern life-styles and high calorie diets drive the UK's obesity levels up, researchers from the University of Warwick have found how cells respond to fasting and activate the process called autophagy, which means a healthier lifestyle can be promoted to help people maintain a healthy body weight.

The UK has the highest level of obesity in Western Europe, with its levels having more than trebled in the last 30 years, it is estimated that more than half of the population could be obese by 2050 in UK. Obesity is a significant risk factor for increased morbidity and mortality. The cause of the rapid rise in [obesity](#) has been blamed on modern lifestyles, including high-calorie diet.

Intermittent fasting, alternate-day fasting, and other forms of periodic caloric restriction are beneficial to maintain a healthy body weight and have gained popularity during the last few years. To respond to fasting, cells use [autophagy](#), a cellular self-recycling process.

A team of researchers led by Professor Ioannis Nezis from the School of Life Sciences, University of Warwick, discovered how cells activate [autophagy genes](#) during fasting. In the paper titled "Regulation of expression of autophagy [genes](#) by Atg8a-interacting partners Sequoia, YL-1 and Sir2 in Drosophila," published in the journal *Cell Reports* on the 26th May, Dr. Anne-Claire Jacomin, Dr. Stavroula Petridi, Ph.D. student Marisa Di Monaco and Professor Ioannis Nezis have discovered proteins which are required for the transcription of autophagy genes.

The proteins are called Sequoia, YL-1 and Sir2, these proteins interact

with the cytoplasmic autophagy-related protein Atg8a. These interactions recruit Atg8a in the nucleus to control the transcription of autophagy genes. This is the first study that uncovers a nuclear role of the cytoplasmic [protein](#) Atg8a.

Lead author of the research Professor Ioannis Nezis, from the School of Life Sciences at the University of Warwick, comments:

"Understanding the molecular mechanisms of activation of autophagy genes during [fasting](#) will help us to use interventions to activate the autophagic pathways to maintain a normal body weight and promote healthy well-being."

More information: Regulation of expression of autophagy genes by Atg8a-interacting partners Sequoia, YL-1 and Sir2 in *Drosophila*, *Cell Reports*, [DOI: 10.1016/j.celrep.2020.107695](https://doi.org/10.1016/j.celrep.2020.107695)

Provided by University of Warwick

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