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Progress in the understanding of iron metabolism and adaptation to iron deficiency

Thanks to research carried out in Lleida using brewer's yeast as a model

Iron deficiency or excess causes health problems in humans, such as anaemia, cardiovascular and liver diseases, diabetes, etc. The Signalling in Yeast research group at the Institute for Research in Biomedicine of Lleida (IRBLleida) and the University of Lleida (UdL) has carried out several studies using the non-pathogenic yeast *Saccharomyces cerevisiae* (brewer's yeast) as a model to understand the role of iron and its relationship with autophagy.

Autophagy is a natural mechanism that serves to clean the cell of toxic or useless elements and molecules, and subsequently recycle and, therefore, take advantage of those molecules that are valid for generating new cellular components. An alteration or anomaly in this process favours alterations in cells that could accelerate ageing and/or promote the appearance of human diseases such as cancers or neurological disorders, among other processes.

The Signalling in Yeast research group led by M. Ángeles de la Torre, and formed by Sandra Montellà, Núria Pujol and Imma Montoliu, has published an article in *The Biochemical Journal*, providing new insights into autophagy and its role in reversing iron deficiency. This is a first step for future research that may have applicability in new health treatments for people with iron deficiency. A second study, also related to iron metabolism and published in another prestigious international journal, *Biochimica et Biophysica Acta - Molecular Cell Research*, explores the signalling mechanisms within the cell to regulate iron accumulation.

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Research articles:

Montella-Manuel S, Pujol-Carrion N, Mechoud MA, de la Torre-Ruiz MA. [Bulk autophagy induction and life extension is achieved when iron is the only limited nutrient in *Saccharomyces cerevisiae*](https://pubmed.ncbi.nlm.nih.gov/33507238/) [<https://pubmed.ncbi.nlm.nih.gov/33507238/>]. *Biochem J*. 2021 Jan 28;BCJ20200849. doi: 10.1042/BCJ20200849. Epub ahead of print. PMID: 33507238.

Pujol-Carrion N, Pavón-Vergés M, Arroyo J, de la Torre-Ruiz MA. [The MAPK *Slf2*/Mpk1 plays a role in iron homeostasis through direct regulation of the transcription factor *Aft1*](https://pubmed.ncbi.nlm.nih.gov/33549702/) [<https://pubmed.ncbi.nlm.nih.gov/33549702/>]. *Biochim Biophys Acta Mol Cell Res*. 2021 Feb 4;118974. doi: 10.1016/j.bbamcr.2021.118974. Epub ahead of print. PMID: 33549702.



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