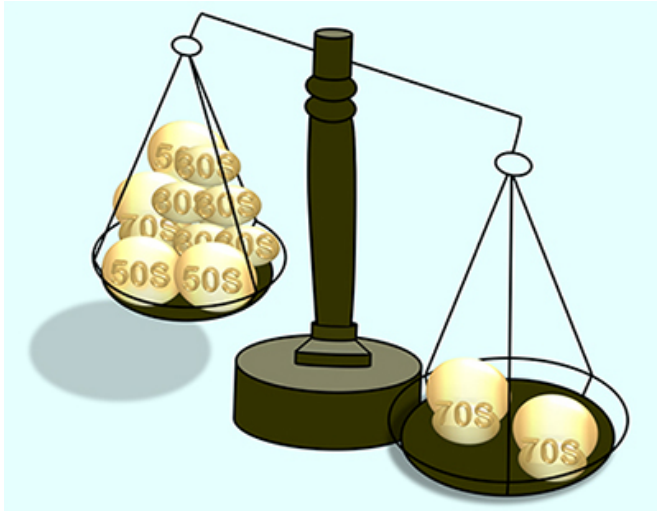


In creation of cellular protein factories, less is sometimes more

14 October 2016



ribosomes, thereby hindering the creation of proteins.

"It is a clear case of less is more," said Eduardo Groisman, professor of microbial pathogenesis and senior author of the paper published Oct. 13 in the journal *Molecular Cell*.

Provided by Yale University

Credit: Yale University

Ribosomes are the cellular machines that make proteins, the molecules that carry out the majority of life's functions. To make ribosomes, cells need to make an abundance of amino acids (the raw material of proteins) and adenosine triphosphate (ATP, the energy currency required to run the ribosome). However, the assembly of functional ribosomes also requires magnesium.

Yale postdoctoral fellow Mauricio Pontes has discovered a genetic "program" that enables cells to make functioning [ribosomes](#) even when magnesium is scarce.

The first step involves activation of genes that inhibit ATP production. Because a large fraction of cellular magnesium is associated with ATP, a decrease in ATP levels makes magnesium available for ribosome assembly. Less ATP, however results in less energy, so fewer ribosomes are produced. However, without this program, cells create more ribosomal precursors but, lacking magnesium, they cannot produce functioning

APA citation: In creation of cellular protein factories, less is sometimes more (2016, October 14)
retrieved 25 September 2020 from <https://phys.org/news/2016-10-creation-cellular-protein-factories.html>

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