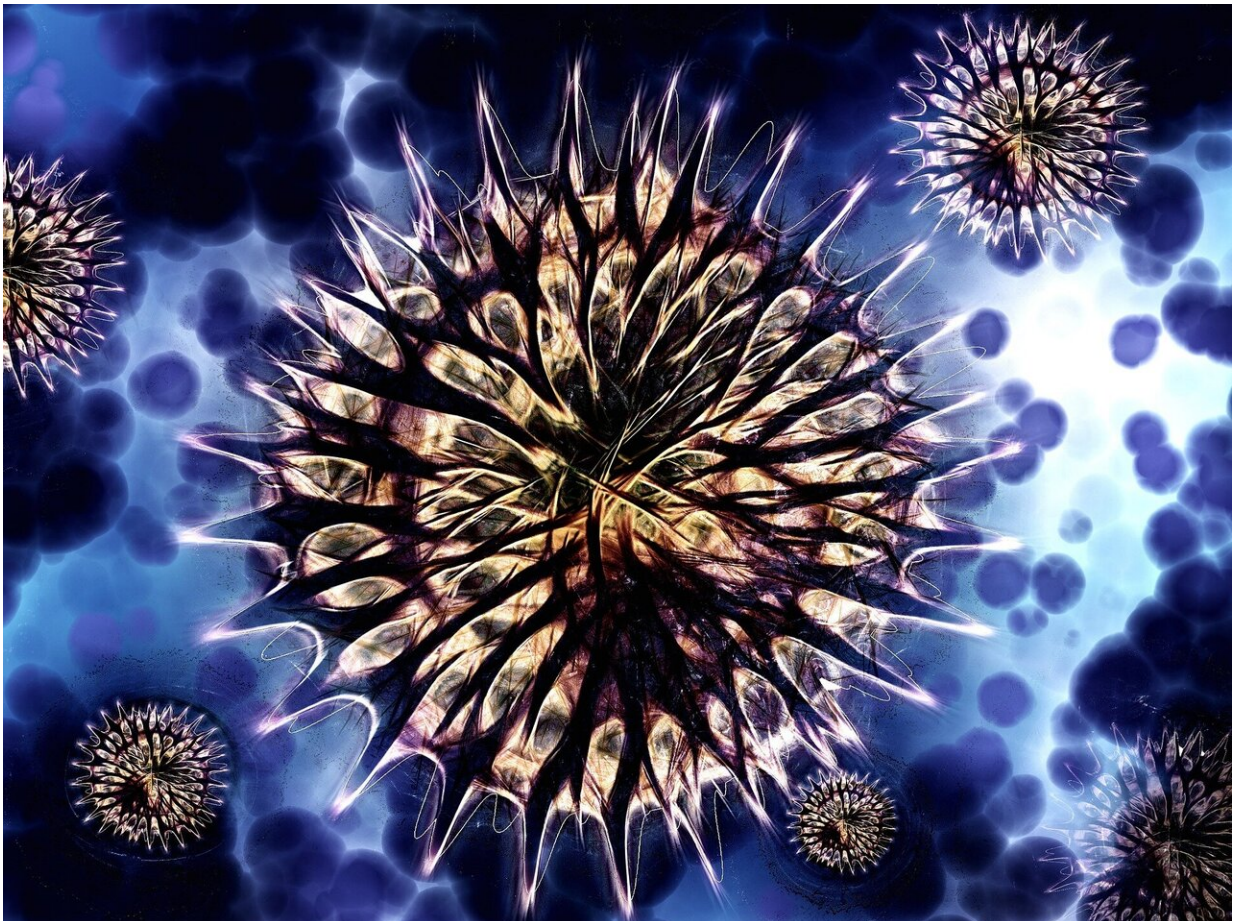


Gut microbiota: Evolution of bacteria with the mutagenic power of cancer cells

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The diversity of bacteria in the human gut is an important biomarker of

health, influences multiple diseases such as obesity and inflammatory bowel diseases and affects various treatments. How its diversity is maintained remains a mystery. Scientists led by Isabel Gordo have observed in real time the emergence of bursts of diversity in microbiota caused by bacterial cells with mutation rates similar to those of cancer.

Scientists have been realizing that bacteria can mutate and evolve in the intestines much faster than previously thought. But now, the researchers from the Instituto Gulbenkian de Ciência have found that certain bacteria cells called mutators can evolve to mutate at rates 1000-fold higher than normal, and thus generate bursts of diversity at unprecedented levels.

Using [laboratory mice](#) and focusing on a gut bacteria that colonizes all humans, they showed that amongst a sea of rubbish caused by many mutations that reduced the fitness of the mutators, there was a gem: a beneficial mutation that increases the ability of the bacteria to eat a specific sugar in the gut and is responsible for the burst of diversity observed. This finding helps to explain the uniqueness of the microbiome within each person and the variation observed after some therapeutic interventions.

In the future, researchers want to find ways to modulate the effects of mutations via diet interventions or chemical compounds.

More information: Ricardo S. Ramiro et al. Low mutational load and high mutation rate variation in gut commensal bacteria, *PLOS Biology* (2020). [DOI: 10.1371/journal.pbio.3000617](https://doi.org/10.1371/journal.pbio.3000617)

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