# Scientists discover process to undermine bacterial viral Salmonella infection

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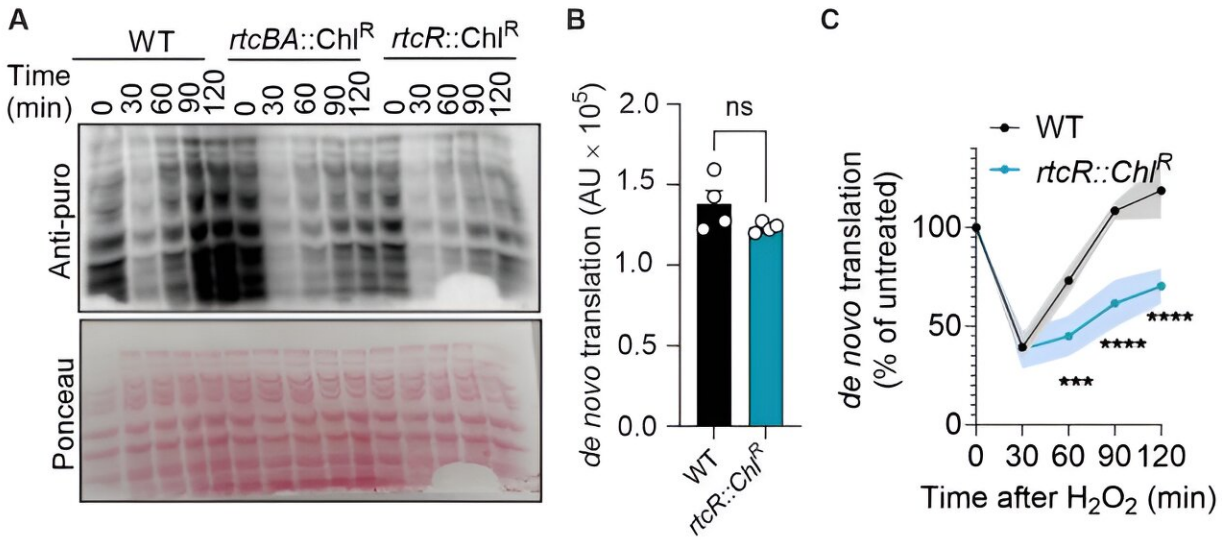


Deletion of RNA repair RtcR stalls de novo protein translation in S. enterica during oxidative stress. (A) Immunoblot and densitometry (B, C) of the puromycin+ proteome in wild-type (WT). Credit: *Science* (2024). DOI: 10.1126/science.adl3222

Researchers at the University of Colorado Anschutz Medical Campus have discovered a mechanism by which a bacterial virus undermines the virulence of Salmonella, allowing the host a chance to rehabilitate.

In a study published April 4 in *Science*, researchers identify a new way by which a bacterial virus limits the capacity of Salmonella to cause

infection.

The terminase protein within the bacterial Gifsy-1 prophage, or virus, is normally involved in genomic processing of viral DNA. However, upon oxidative stress, the terminase acquires the ability to break down transfer RNA (tRNA), ultimately compromising protein synthesis in Salmonella, a common cause of diarrhea in humans.

"We have discovered that a virus encoded in the Salmonella genome acts as the Achille's heel of this common human pathogen," says Andres Vazquez-Torres, Ph.D., professor of immunology and microbiology at the University of Colorado School of Medicine.

"This basic research can possibly provide a basis for exploring ways to treat Salmonella infections in humans," says Vazquez-Torres. "This new understanding can be exploited for our advantage—for example, we could benefit from the toxin produced by an endogenous virus to potentially treat patients with Salmonella infections that are resistant to antibiotics."

**More information:** Siva Uppalapati et al, Prophage terminase with tRNase activity sensitizes Salmonella enterica to oxidative stress, *Science* (2024). DOI: 10.1126/science.adl3222

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