

A gene that makes bacteria invincible against life-saving antibiotics spreads worldwide

- An international team led by Spain discovers how an almost unknown gene, **npmA2**, spreads through hospitals and farms, generating “superbugs” that are impossible to treat.
- The **npmA2** gene has been detected in strains from six countries and in human, animal and environmental samples, confirming that its spread is global.

Madrid, July 15, 2025 - Scientists at the Complutense University of Madrid, in collaboration with the Wellcome Sanger Institute in Cambridge, the Pasteur Institute in Paris and research centers in the Netherlands and Australia, warn of a gene called **npmA2** that is crossing borders and species, endowing dangerous bacteria with full resistance to aminoglycosides, a group of antibiotics vital when all else fails.

The researchers, who analyzed almost two million bacterial samples, confirm that this gene acts as a “genetic passport” that travels in a mobile fragment - a “Trojan horse” - and embeds itself in different bacteria, from the dreaded *Clostridioides difficile*, which causes serious intestinal infections, to *Enterococcus faecium*, responsible for hospital infections with a mortality rate of 30% in Spain.

“The **npmA2** is like a ghost: almost nobody knew of its existence and, without making any noise, it has begun to appear in different parts of the world and in bacteria that are already difficult to control,” warns Dr. **Bruno González-Zorn**, professor in the Department of Animal Health at the Complutense University of Madrid and director of the study published in *Nature Communications*.

The finding is especially worrying because these bacteria already show resistance to other drugs. “The **npmA2** gene makes these infections practically incurable,” explains Dr. **Carlos Serna**, co-author of the study. The **npmA2** gene has been detected in strains from six countries and in human, animal and environmental samples, confirming that its spread is global.

The authors stress that research into new strategies to combat infections and surveillance of antibiotic use are now more urgent than ever. “If we don’t act now, we are heading for an era where a simple infection is once again deadly,” warns Gonzalez-Zorn.

Reference: Serna, C., Matamoros, B.R., Pulido-Vadillo, M. *et al.* Global dissemination of npmA mediated pan-aminoglycoside resistance via a mobile genetic element in Gram-positive bacteria. *Nat Commun* **16**, 6360 (2025). DOI: [10.1038/s41467-025-61152-y](https://doi.org/10.1038/s41467-025-61152-y)