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Dear Editor, *Nature*

Antimicrobial resistance (AMR) is a severe health challenge that lacks clear solutions. In this study, we examine competing hypotheses for the evolution of AMR:

1. Genetic Capitalism: Genes that confer antibiotic resistance are gained and not often lost in bacterial lineages, and;
2. Stabilizing Selection: Genes that confer antibiotic resistance are gained and lost often in bacterial lineages.

Using a large dataset analyzed through combined techniques from phylogenomics and data science, we show that many AMR genes associate to support the hypothesis for genetic capitalism and few for stabilizing selection. Moreover, we found a statistically significant difference between resistance mechanisms represented in the groups of genes associated with the competing theories. By understanding these differences, we suggest the promotion of antibiotic cycling against particular mechanisms found under stabilizing selection. We also purport increasing efforts surrounding the advancement of antibiotics responsive to these mechanisms, thus mitigating the risk for resistance under mechanisms found in genetic capitalism.

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Janies are the authors of the manuscript entitled “Persistence of Antimicrobial Resistance Genes Demonstrates Genetic Capitalism in *Escherichia coli*.”

On behalf of all authors, we thank you for considering our manuscript for publication.

Sincerely,

Colby T. Ford, Ph.D.

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