

Invertible promoters mediate bacterial phase variation, antibiotic resistance, and host adaptation in the gut

Xiaofang Jiang, A. Brantley Hall, Timothy D. Arthur, Damian R. Plichta, Christian T. Covington, Mathilde Poyet, Jessica Crothers, Peter L. Moses, Andrew C. Tolonen, Hera Vlamakis, Eric J. Alm and Ramnik J. Xavier

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Switching ON resistance

Clonal bacterial colonies will often grow dissimilar patches, similar to a tortoiseshell pattern. These differing phenotypes arise by reversible mechanisms called phase variation. Jiang *et al.* developed an algorithm to survey bacterial genomes for invertible promoters that cause phase variation. Inverted repeats signal the presence of these promoters, which can flip between ON and OFF states catalyzed by phage integrase analogs called invertases. Invertible promoters linked to antibiotic resistance genes were widespread among vertebrate gut-associated organisms, including Bacteroidetes, Spirochaetes, and Verrucomicrobia. These bacteria are thus equipped and prepared for sudden environmental stress, including antibiotic exposure.

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