

## Characterization and utilization of biofilm-modulating genes on conjugative elements

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Biofilms pose significant challenges across various sectors including healthcare, water treatment, the food industry, and many more. Plasmid conjugation, which promotes the horizontal transfer of genes providing bacteria protective attributes, is studied mostly in the context of antimicrobial resistance. This research aims to investigate the interplay between biofilm and plasmid conjugation. Specifically, we aim to discover whether conjugative elements can also actively modulate biofilm formation and degradation. Using bioinformatic analyses we detected biofilm-modulating genes on conjugative elements. We aim to understand their impact on biofilm dynamics by testing the ability of these genes to induce the formation or dispersal of biofilm in clinical strains of bacteria. Combined with better characterization of anti-defense genes, we seek to facilitate the development of novel approaches to manage biofilm formation and degradation. Additionally, we aim to understand whether the transfer of biofilm-inducing plasmids can promote or exacerbate, antimicrobial resistance, which poses a significant threat to human health. This research aims to enhance our understanding of biofilm-plasmid interactions, potentially informing new approaches to biofilm management and contributing to the efforts in addressing the challenge biofilm poses in clinical and biotechnological settings.