Plasmid carriage restricts lytic phage infection of *Enterococcus faecalis*

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Emerging multidrug resistant (MDR) bacterial infections are outpacing the development of new antibiotics. This is specifically relevant for MDR enterococci which are major contributors to hospital-acquired infections in humans. One possible alternative for combating MDR enterococci is bacteriophage (phage) therapy. While it is widely accepted that phages hijack host cellular processes for their propagation, mechanisms used by enterococci to restrict phage infection are understudied. We previously determined that the lytic enterococcal phage 47 (phi47) exhibits an extremely narrow host range. phi47 infects MDR *E. faecalis* strain SF28073 and does not infect the prototypical MDR *E. faecalis* strain V583. Considering these two strains are genetically similar, we discovered that phi47 was capable of infecting an isogenic strain of E. faecalis V583 that lacked three endogenous plasmids. These plasmids include pTEF1 and pTEF2 which are conjugative plasmids that resemble pheromone responsive plasmids, and pTEF3 which belongs to the pAMβ1 family of broad host range plasmids. Closer genomic comparison revealed that *E. faecalis* SF28073 lacks the pTEF plasmids, suggesting that an unidentified genetic feature(s) on one or more pTEF plasmid may be responsible for restricting lytic phage infection in *E. faecalis*. To investigate this hypothesis, we assessed phi47 infection of *E. faecalis* cells harboring plasmids pAD1 or pAM771, pheromone responsive plasmids that are genetically similar to pTEF1 and pTEF2, respectively. Neither plasmid successfully restricted lytic phi47 infection. However, *E. faecalis* cells harboring only pTEF2 from V583 were completely resistant to phi47 infection. There are no anti-phage mechanisms predicted to be on pTEF2. These findings provide important insight into the novel mechanisms used by enterococci to subvert phage infection. This information will be useful for the rational selection of therapeutic anti-enterococcal phages.