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# Luminescence as a Valuable Tool for Bacteriophage Based Detection of Pathogens

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## Abstract

Bacteriophage are viruses that only infect bacteria and were first identified and isolated independently by Frederick Twort, a British pathologist in 1915. Approximately 10<sup>31</sup> phages exist in the biosphere with size varying between 20 and 200 nm. They contain a nucleic acid genome and structural proteins that form a protective capsid and binding moieties that allow phage to recognize, infect, and replicate within a defined group of host cells at varying specificities. Phage also have two distinct life cycles; the lytic cycle which simply replicates and produces progeny phage and the lysogenic cycle in which the phage incorporates its genome into the host genome and can revert to the lytic in response to environmental triggers. Due to their specificity phage have been coupled with various luminescent systems exploiting fluorescence and bioluminescence. This presentation will present a history of molecular manipulations of phage genomes (both lytic and lysogenic) for their use in detection of pathogenic bacteria and commercial applications this approach. However, numerous other phage luminescent approaches have been developed without the modification of phage genomes and they will be addressed as well.

**Keywords:** bacteriophage, luminescence, pathogens, food safety

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