

Sensitive and specific detection of gram-positive pathogens via engineered bacterial conjugation system

Yonatan Cohen¹, Avihu Yona¹, Yuval Dorfan²

1 -The Robert H. Smith Faculty of Agriculture, Food, and Environment, Hebrew University of Jerusalem

2 – Bio-engineering, Holon Institute of Technology (HIT), Holon

Gram-positive bacteria are a major player in many infections, capable of infecting virtually any system in the human body, with the rise of antimicrobial resistance strains mortality from bacterial infection is expected to surpass cancer as the leading cause of death by the year 2050. The gold standard for detecting such infections is isolating the infection on inductive agar plates, which requires long incubation and growth time.

We propose to use a bacterial conjugation system named Xport to transfer an engineered DNA payload that will integrate into the chromosome of the bacterial pathogen, resulting in an easy-to-read signal. Such a method will shorten the incubation time dramatically and will provide a fast and precise way to detect a wide array of pathogens.