

## **Designing DNT sensing bacteria based on computational models**

Shir Bahiri Elitzur<sup>1</sup>, Etai Shpigel<sup>2</sup>, Shimshon Belkin<sup>2</sup> and Tuller, Tamir<sup>1,3</sup>

<sup>1</sup>Department of Biomedical Engineering, Tel-Aviv University

<sup>2</sup>Dept. of Plant and Environmental Sciences, The Hebrew university of Jerusalem

<sup>3</sup>Sagol School of Neuroscience, Tel-Aviv University

The detection of buried landmines is a humanitarian issue of global proportions that is in acute need of a practical solution. Current mine detection technologies require the presence of personnel in the immediate area of the mines, along with the obvious risks involved. We propose a new approach for bio-sensing: The introduction of innovative computational modelling of gene expression to the “tailoring” and optimization of synthetic biology pathways for whole-cell biosensor design. This research is specifically based on the re-design and engineering of bacterial bioluminescence (*lux*) genes (promoters and coding regions) for enhancing its DNT detection and sensitivity performances. While in the present study buried landmine detection served as a model system, the approach can be adapted to diverse environmental, industrial or medical sensing applications.