

RESEARCH PROJECT

 Institute
Life Technologies

LiveSense (Nano Tera Project)

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Description In this project a specially engineering strain of *E. coli* produces a fluorescent protein whenever it is contacted with arsenic-containing water. The main goal of this Nano Tera project was to develop a portable device allowing field measurements of arsenic contamination levels. It included contributions from Lausanne university (strain engineering), EPFL (microfluidics), and HES-SO (drying and conditioning of reporter strain, prototype building).

Several approaches were tested for the stabilization of the reporter cells. Freeze-drying the cultivated biomass in the presence of glucose, glycerol and yeast extract gave the best results with respect to survival rate and stability. Although a working prototype featuring a microfluidic cell retention system was built, alternative conditionings for the dried bacteria were tested. Best results were obtained by freeze-drying the cells directly in 1 mL cylindrical glass vials used for HPLC samples. The septum allowed direct rehydration with the sample to be tested and little work is needed to have the vial fit into a commercial, hand-held device for fluorescence intensity measurement and arsenic quantification.



HPLC vials with freeze-dried reporter bacteria



HPLC-vial under UV light after rehydration with arsenic-containing sample

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