

Detection of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) with a microbial sensor

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Explosives such as hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) are common contaminants found in soil and groundwater at military facilities worldwide, but large-scale monitoring of these contaminants at low concentrations is difficult. Biosensors that incorporate aptamers μ with high affinity and specificity for a target are a novel way of detecting these compounds. This work describes novel riboswitch-based biosensors for detecting RDX. The performance of the RDX riboswitch was characterized in *Escherichia coli* using a range of RDX concentrations from 0-44 $\mu\text{mol l}^{-1}$. Fluorescence was induced at RDX concentrations as low as 0.44 $\mu\text{mol l}^{-1}$. The presence of 4.4 $\mu\text{mol l}^{-1}$ RDX induced an 8-fold increase in fluorescence and higher concentrations did not induce a statistically significant increase in response.