

Figure S1

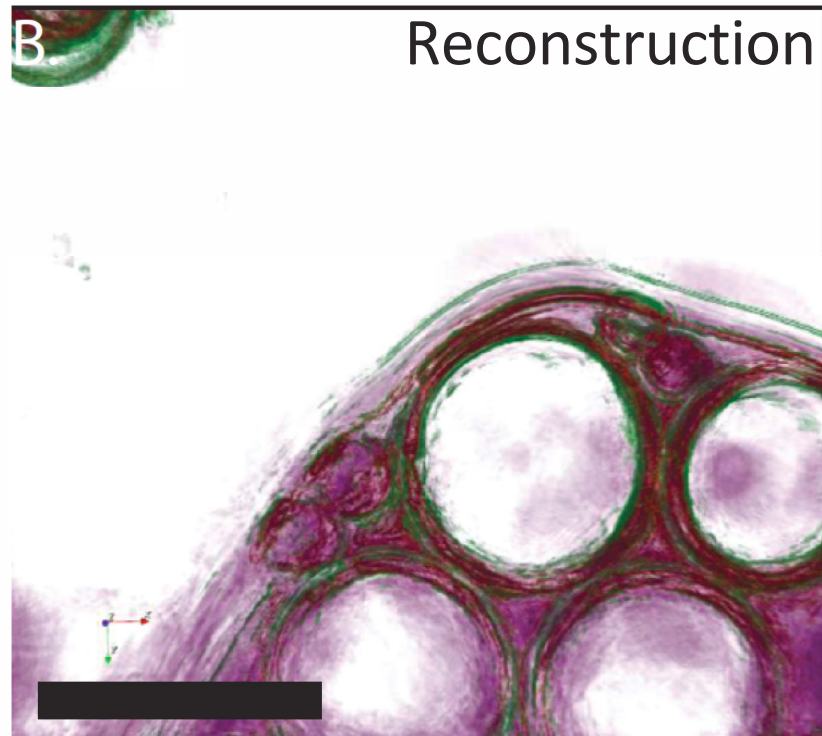
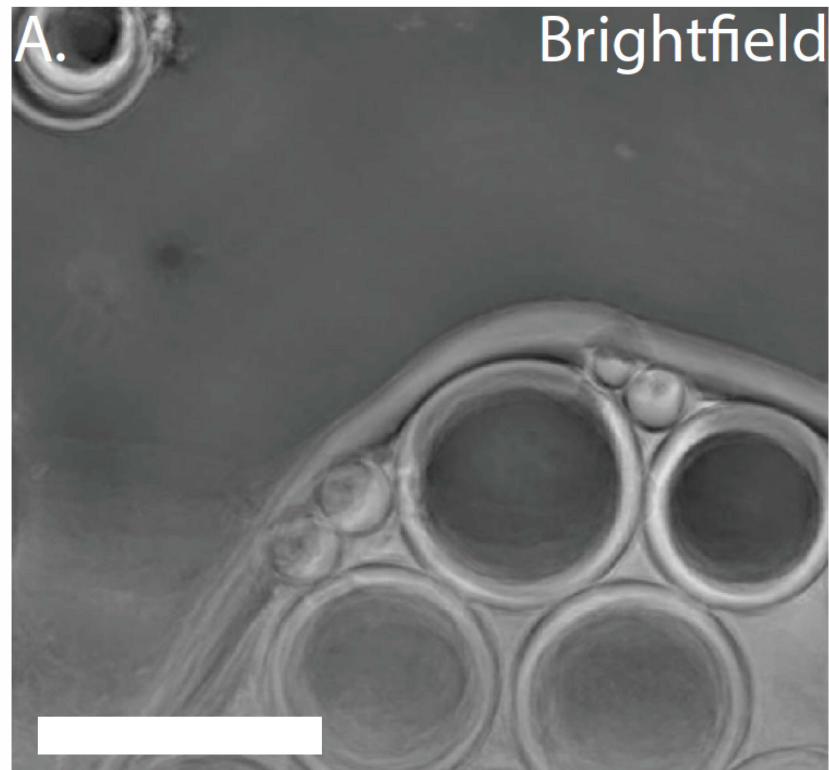
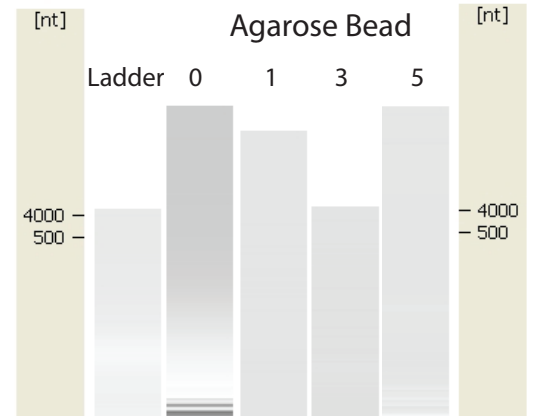
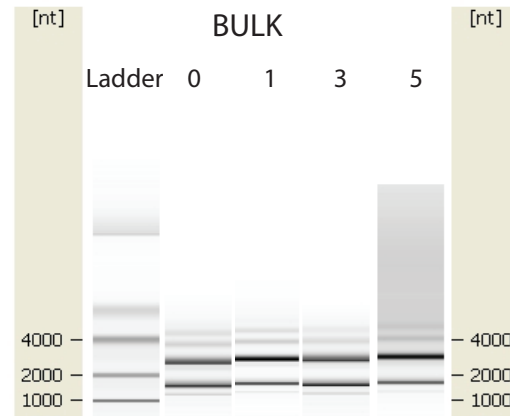


Figure S1. Interferometric imaging of the emulsions containing agarose TXTL beads (A.) Bright field imaging [scale bar = 50 microns] (B.) Tomographic reconstruction of the respective TXTL beads found in panel (A.) [scale bar = 50 microns] From the refractive differences of the emulsions containing agarose beads, the various colors indicate different phases, the utilized components from the oil-surfactant outer layer of the emulsion (green) to the agarose beads themselves (white).

# Figure S2

A.



B.

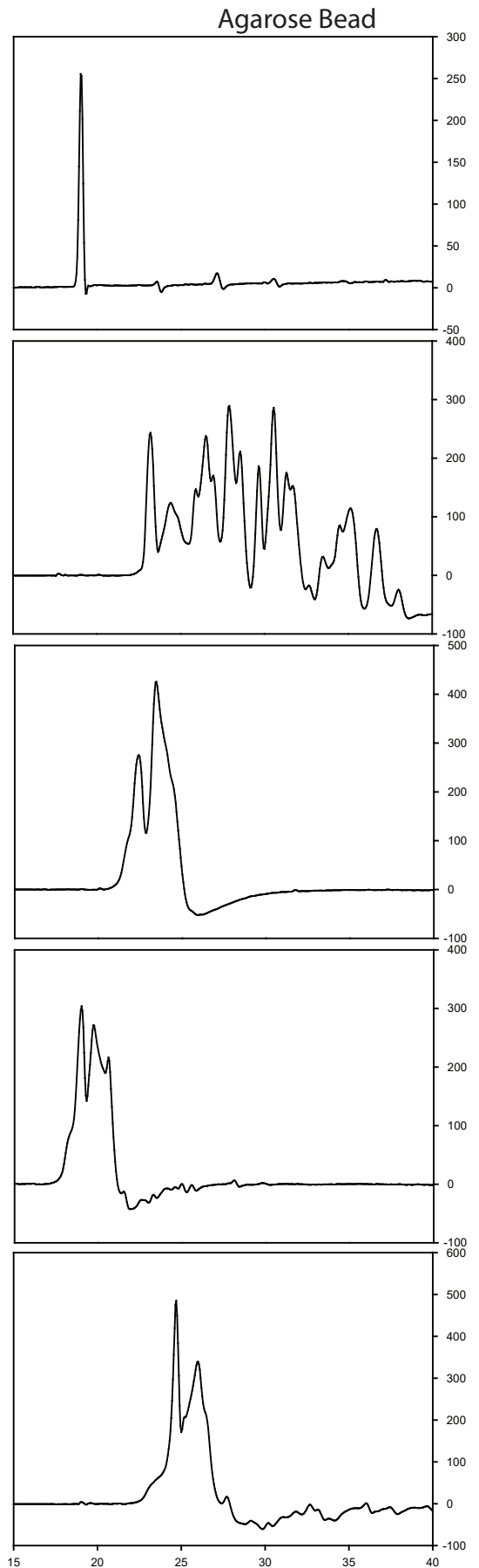
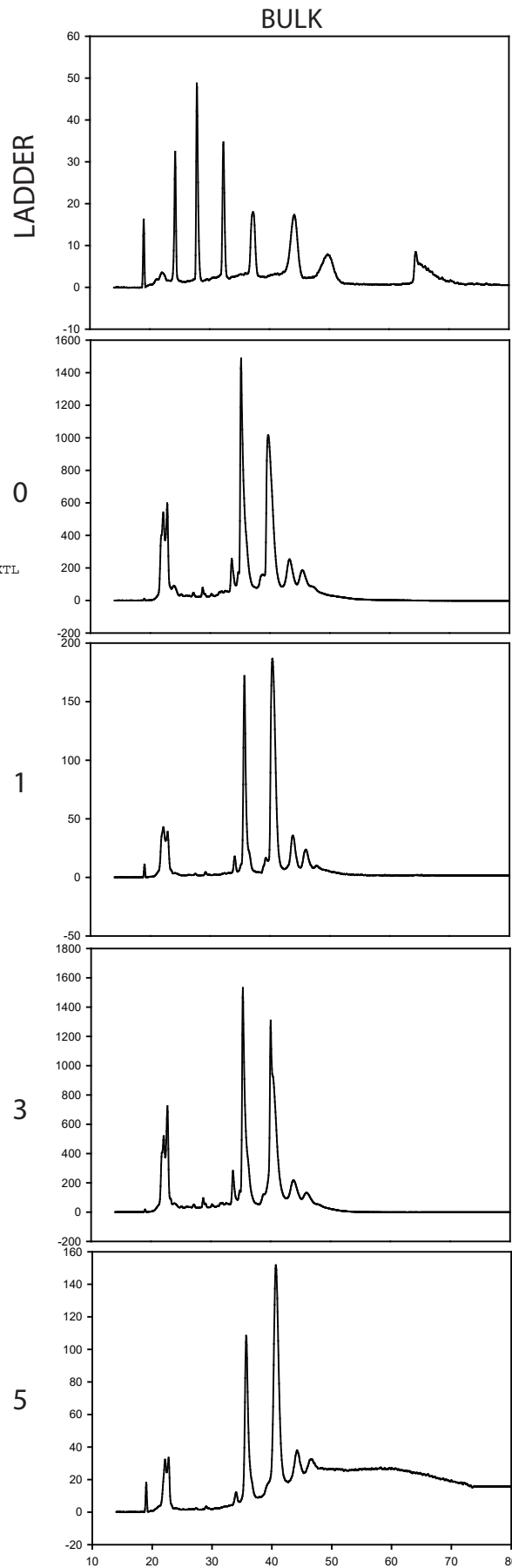
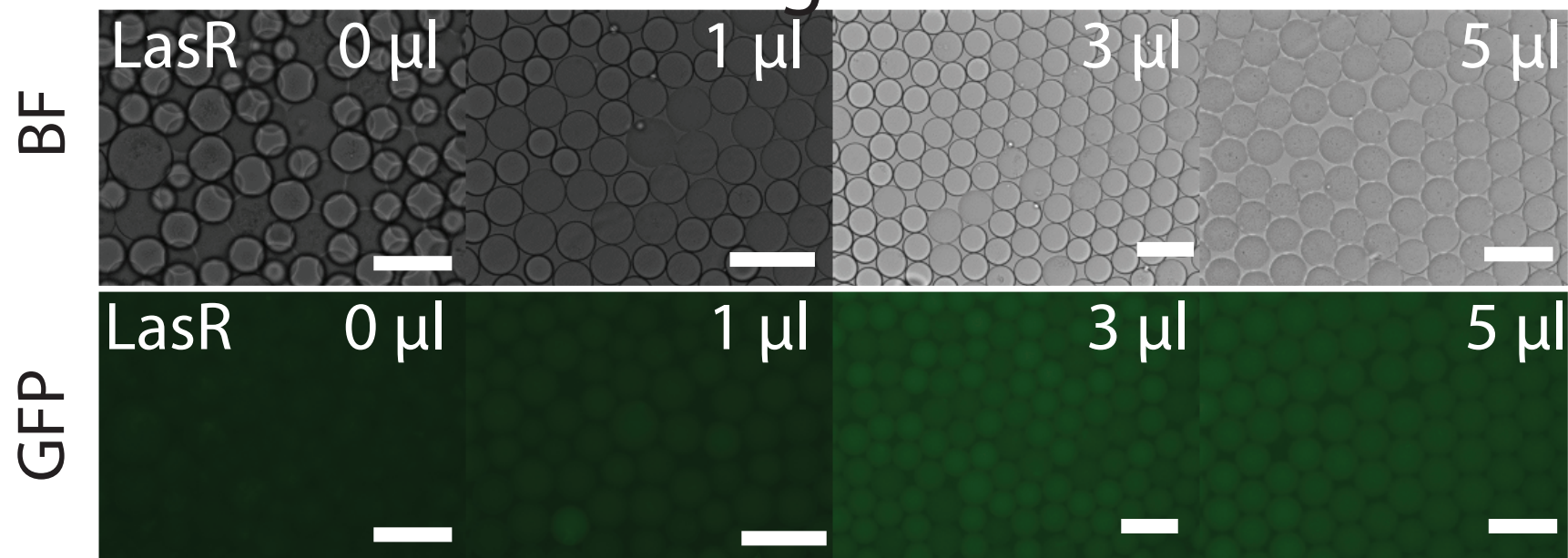


Figure S2. Total RNA sequence analyses of bulk and agarose TXTL bead using the same LasR-based quorum sensing and reporting mechanism with different concentrations of LasR in each respective scenario

# Figure S3

A.



B.

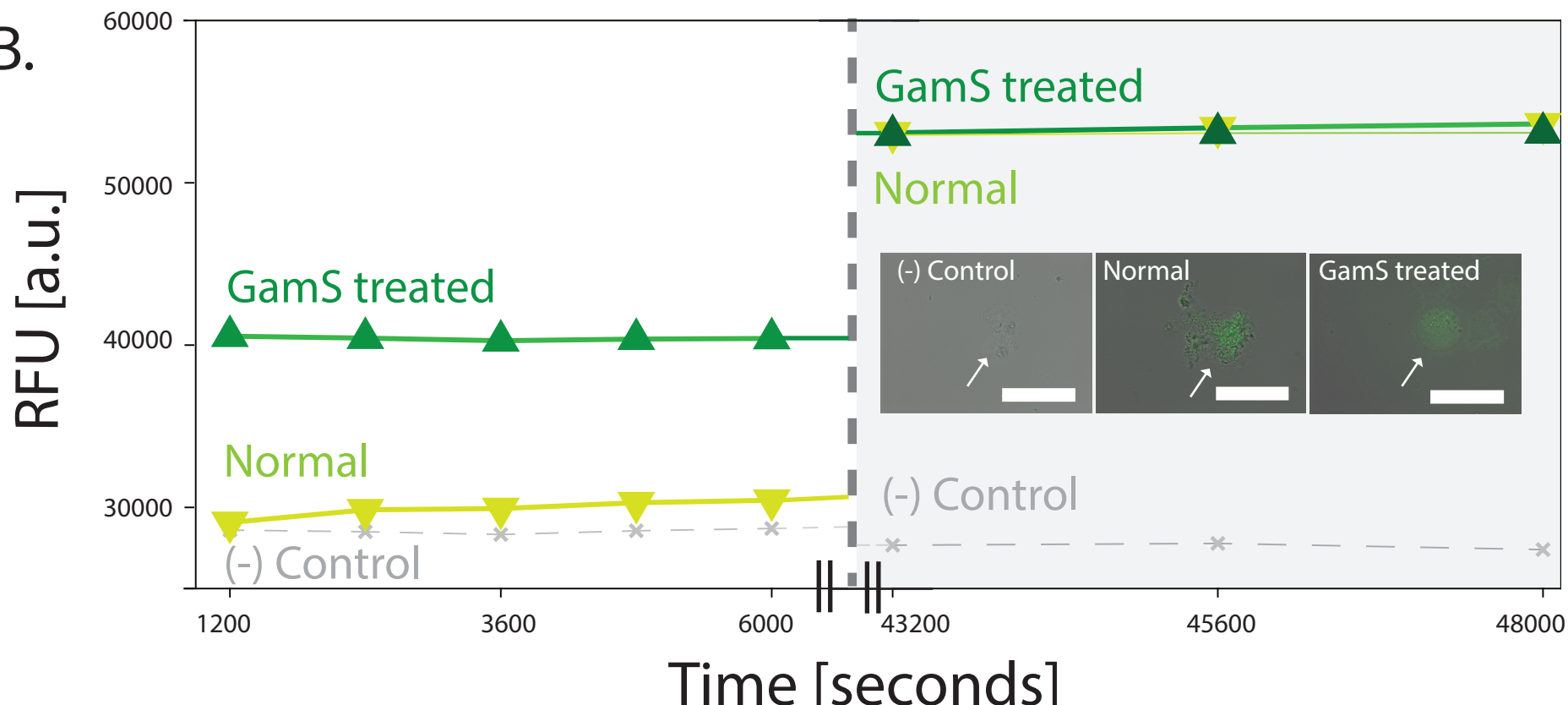
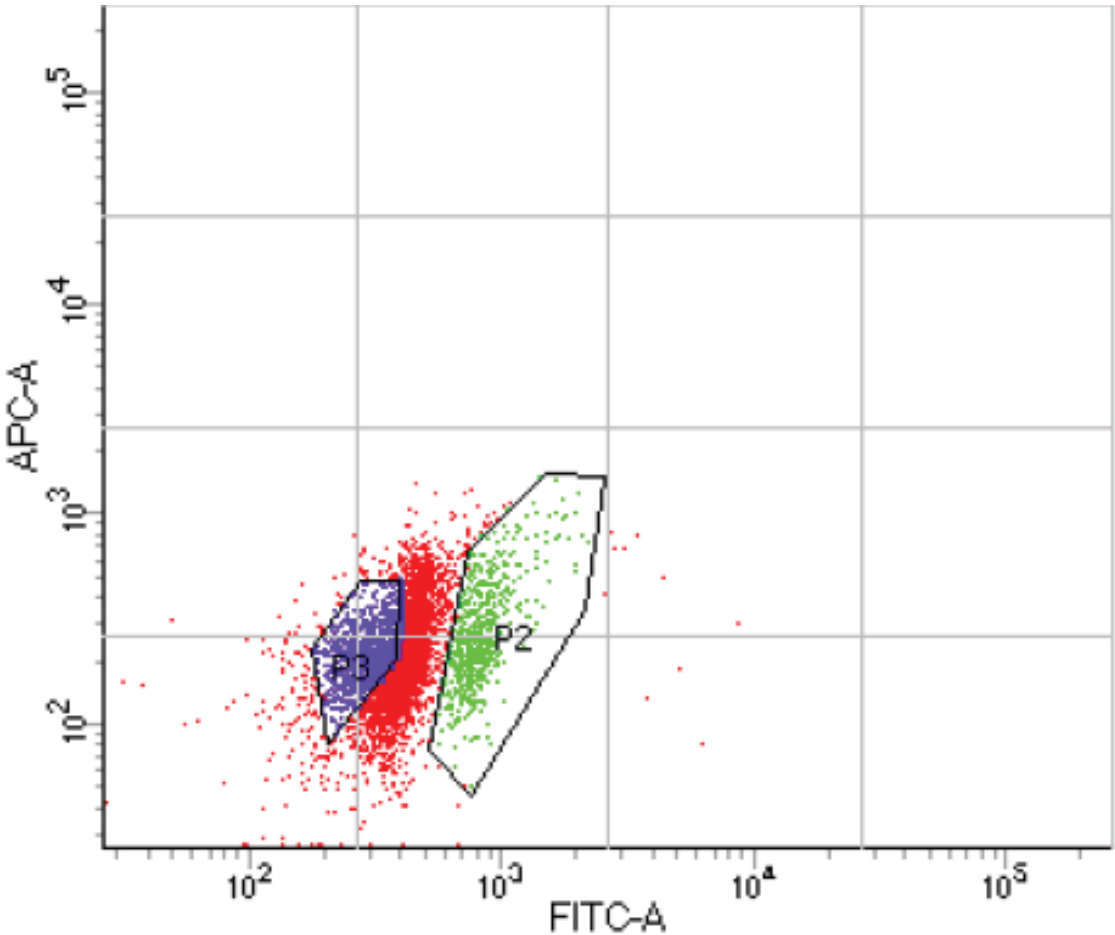


Figure S3. Stabilization of the LasR-based GFP signal (A.) By varying the LasR linear plasmid concentration, the GFP signal can be modulated [scale bar = 100 microns] (B.) The effect of the GFP signal following the addition of GamS to protect the linear plasmid from nucleases, in comparison to a non-GamS sample, can be observed to improve the GFP signal instantaneously [scale bar = 100 microns].

Figure S4

A.



B.

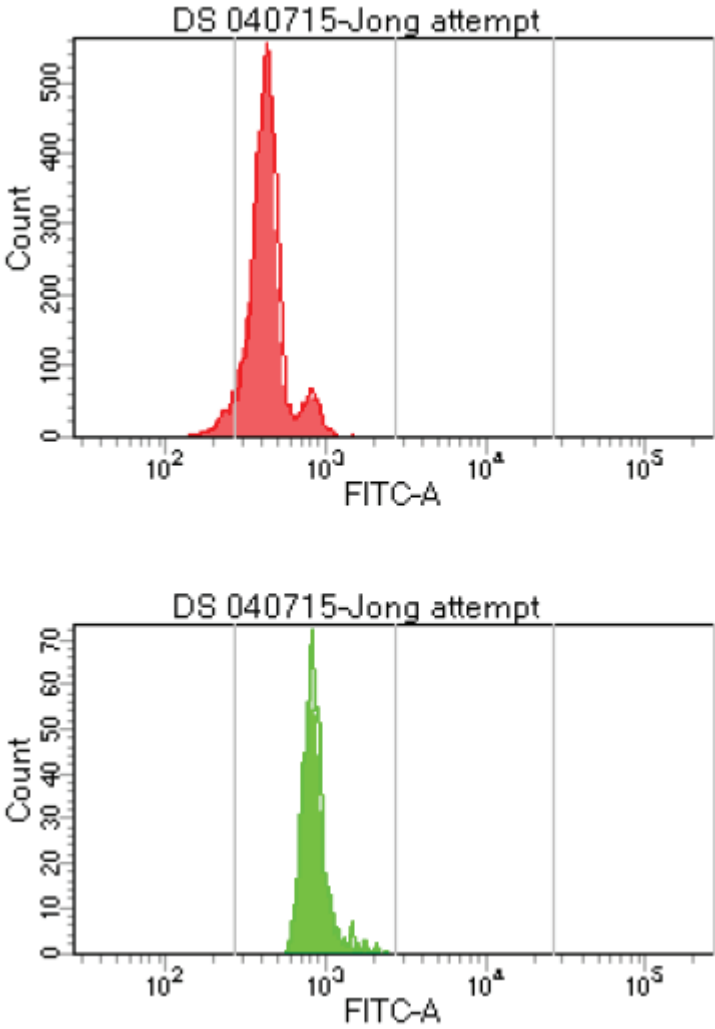


Figure S4. Flow cytometry/ FACS of the fractions of the agarose TXTL beads activated with HSL and fluorescing (A.) The total population sorted by flow cytometry and gated appropriately (B.) The activated population (green) differentiated by the non-activated population (red).

# Figure S5

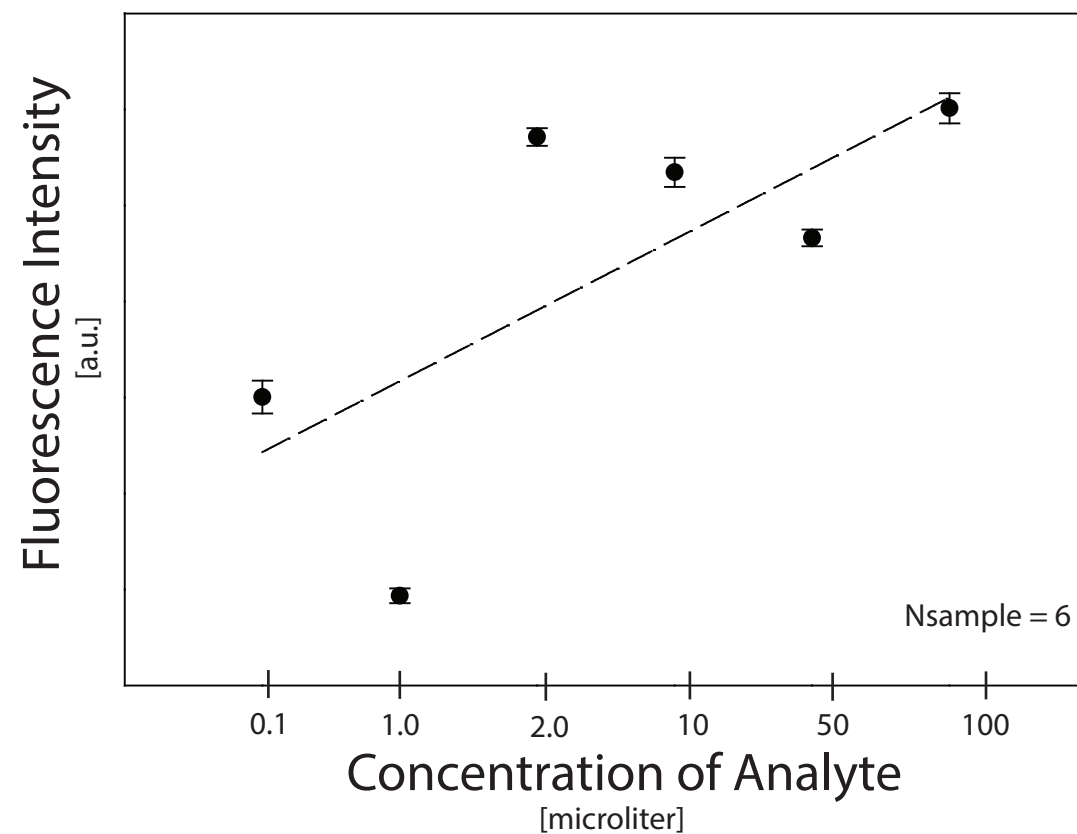
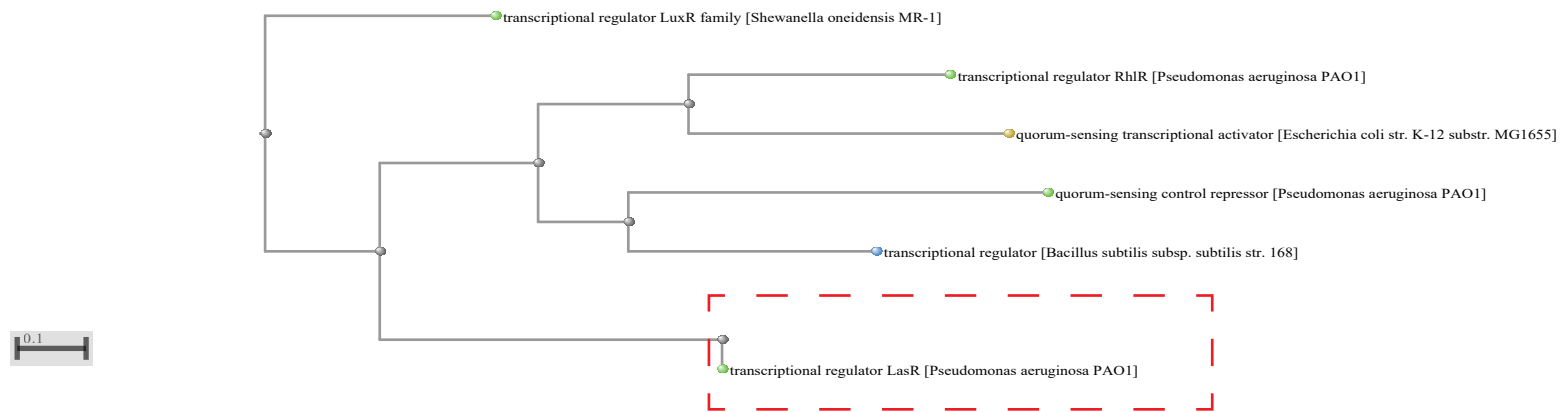


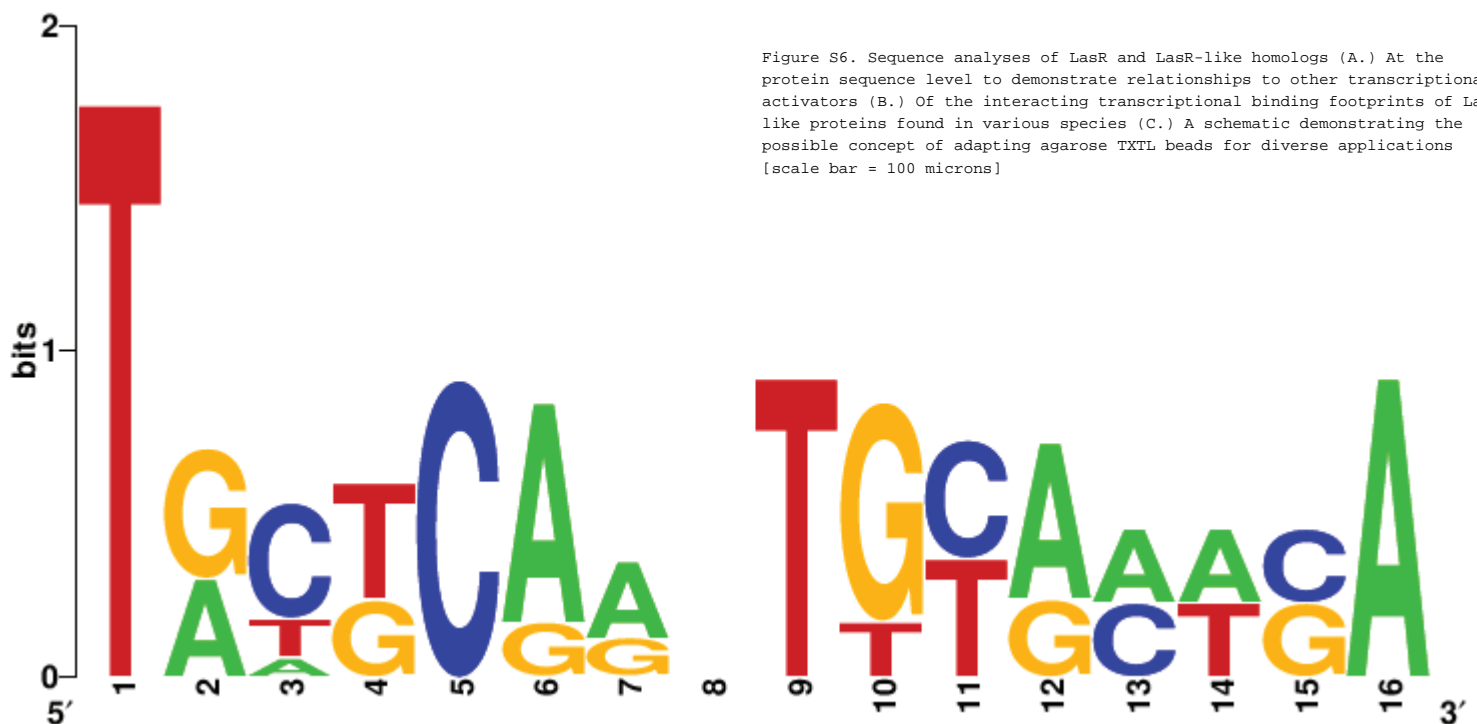
Figure S5. Plot of GFP signal intensity of the LasR-based agarose TXTL bead biosensor system in a real-world biological environment such as fecal analyte observed via plate-based fluorescence assay as a function of concentration of analyte

# Figure S6

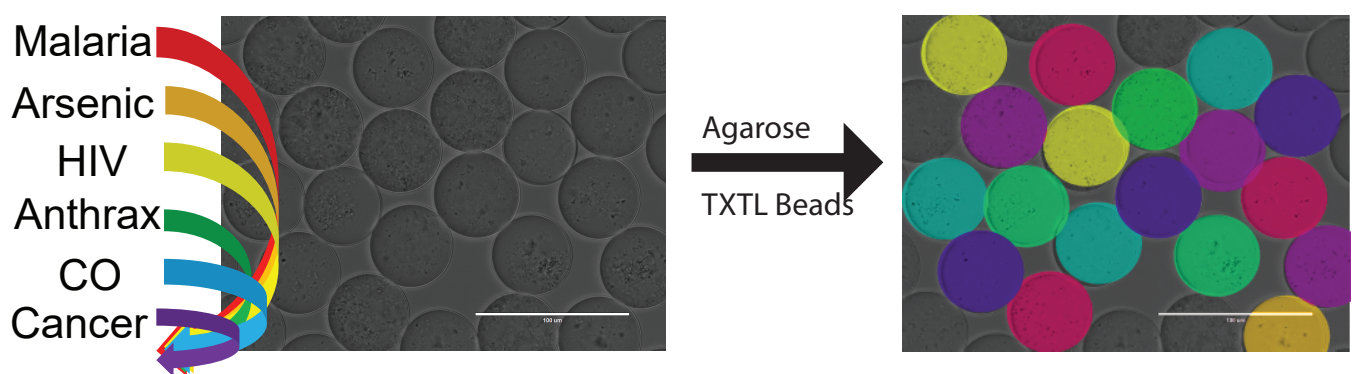
## A. Comparative Protein Sequences



## B. Consensus DNA-binding Sequences to LasR



## C. Adapting agarose TXTL for various Applications



Movie S1. 3D SIM imaging of the agarose TXTL beads in culture with *Pseudomonas* cells. An animation of the 3D reconstruction of *Pseudomonas aeruginosa* and activated agarose TXTL beads