



Extended Data Figure 5 | Multiplexed imaging of genetically engineered reporter variants.

a, Image of *arg2* *E. coli* culture 22 h after induction showing the presence of buoyant cells (top). Experiment repeated three times with similar results. Mass fraction of gas vesicles produced 22 h after induction (bottom). Line represents the mean. **b**, Ultrasound contrast from the whole population of cells expressing *arg1*, *arg2* or GFP. Lines represent the mean. **c**, Ultrasound contrast from the buoyancy-enriched population of cells expressing *arg1*, *arg2* or GFP. Lines represent the mean. **d**, Normalized optical density (representing the

intact fraction) of gas vesicles isolated from *E. coli* expressing *arg1* or *arg2* as a function of applied hydrostatic pressure. **e**, Normalized ultrasound intensity as a function of peak positive pressure from 0.6 to 4.7 MPa for *E. coli* expressing *arg1* or *arg2*. **f**, Acoustic collapse spectra derived by differentiating the data and curves in **e** with respect to applied pressure. **a–f**, Data are from three biological replicates per sample. **d–f**, Curves represent fits of the data using the Boltzmann sigmoid function to assist visualization.