The amount of H₂S produced was determined by measuring the UV-VIS absorbance at 670 nm and estimated with a ninhydrin test. The simultaneous expression of CysDes was induced 4 hours after the start of cultivation. The cells were grown in MOPS medium and harvested 10 hours after induction. To obtain high levels of CysE, we adopted a β-galactosidase cassette (BBa_K731500). CysDes converts the cysteine produced by CysE into hydrogen sulfide. The levels of cysteine produced were calculated based on a calibration curve with known concentrations of cysteine.

Once the black crust was formed we developed an application protocol to apply our engineered bacteria on the statues. We noticed a significant change by eye before and after bacteria application. We confirmed these results by scanning Electron Microscopy (SEM). Our system removes the black crust: before the treatment gypsum crystals were large (200-500 μm) and well structured, while after the application the crystals were smaller (50-30 μm) and luster the crystalline organization.

We obtained similar efficiencies with the two polymerases for the rrnBT1 terminator. The T7 terminator seemed more sensitive to RRAP change; however, our data suggest that this difference is due to the high mCherry increase observed with T7 RRAP.

With our platform and the easy protocol we developed, we obtained reproducible results with low standard deviations.