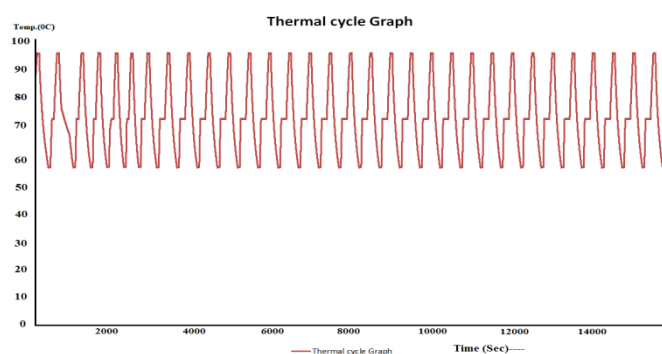
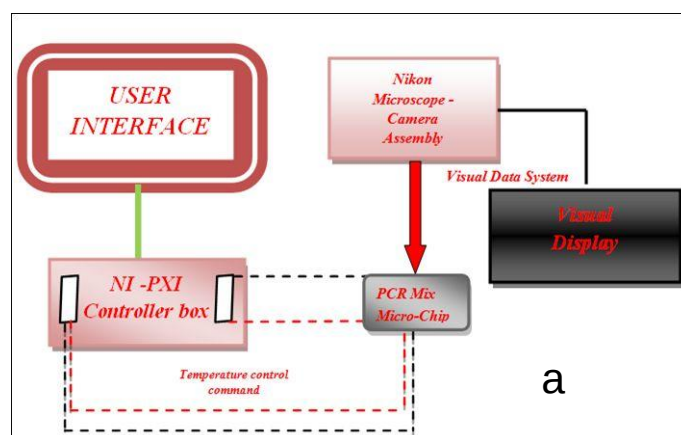


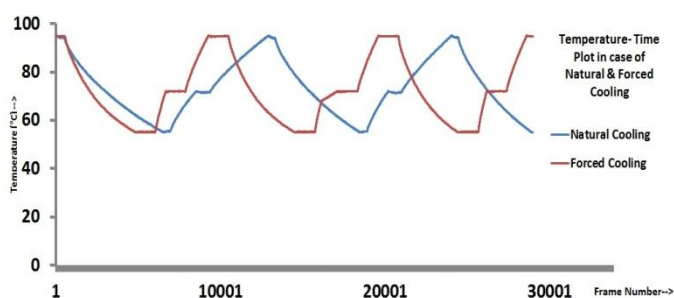
Integrated sorting, concentration and real time PCR based detection system for sensitive detection of microorganisms
 Monalisha Nayak¹, Deepak Singh², Himanshu Singh¹, Rishi kant¹, Ankur Gupta¹, Shashank Shekhar Pandey¹, Swarnasri Mandal¹, Gurunath Ramanathan^{2*} and Shantanu Bhattacharya^{1*}

¹Department of Mechanical Engineering, Indian Institute of Technology Kanpur, India, ²Department of Chemistry, Indian Institute of Technology Kanpur, India

Supplementary Information

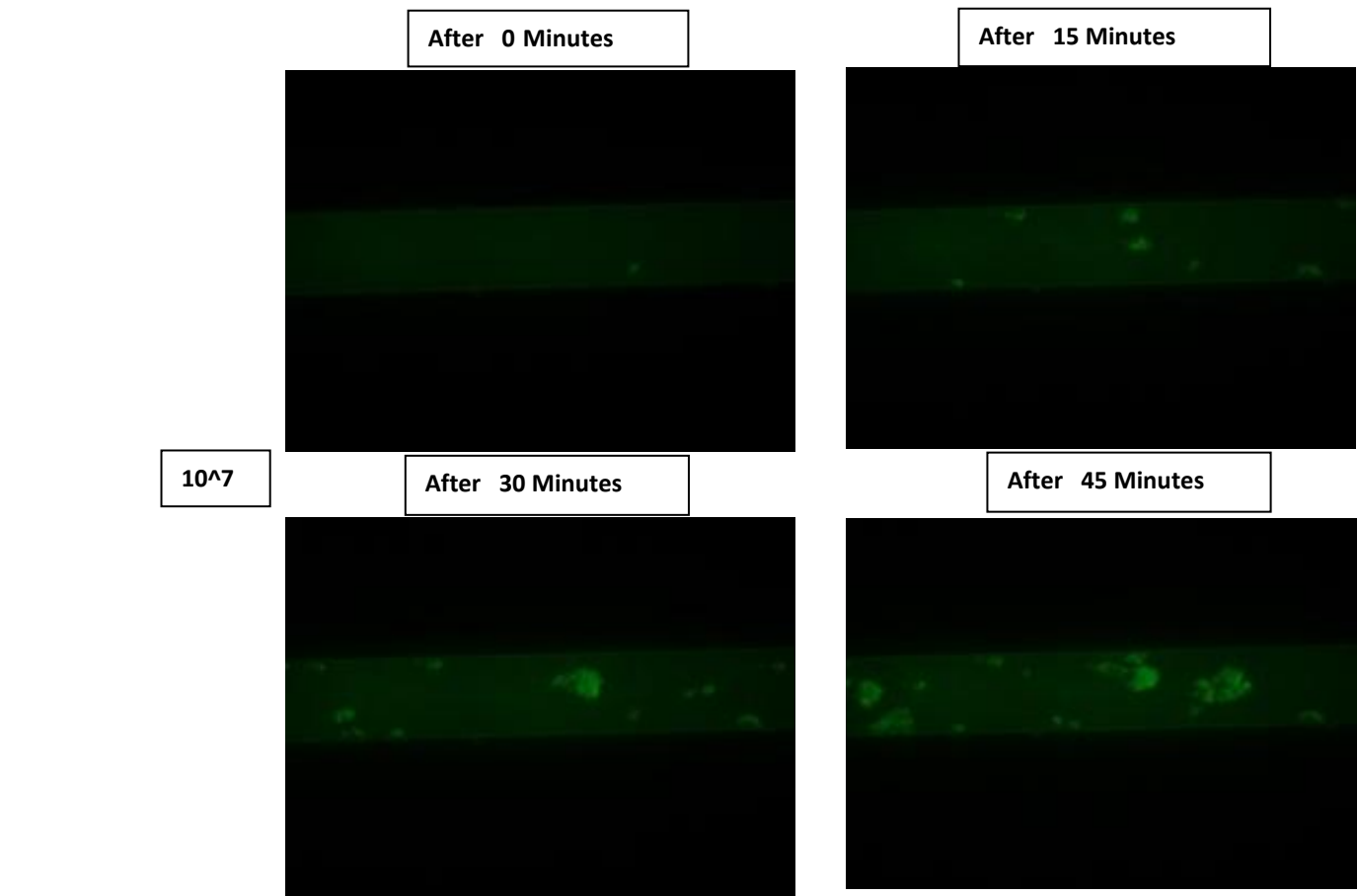
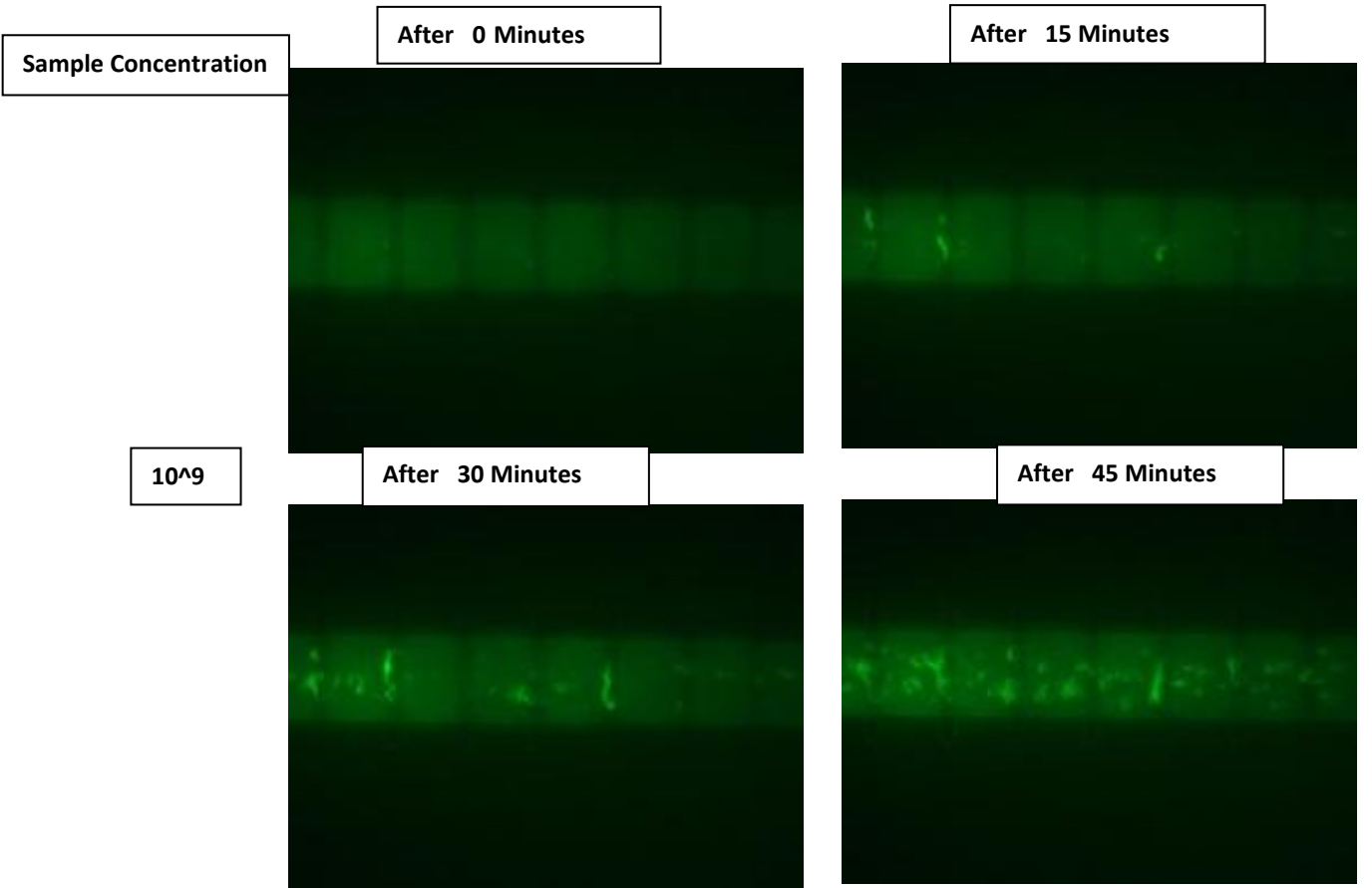


b

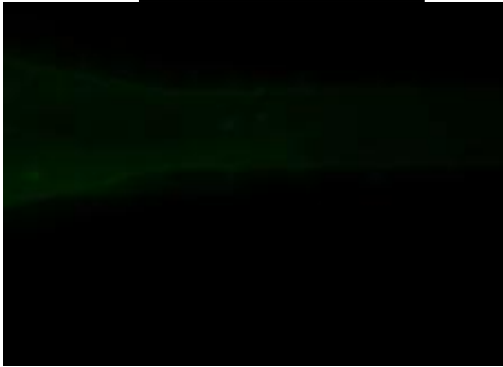


c

Figure S1:(a) Schematic of instrumentation of thermal cycling (b) Real signal plot of thermal cycling at some point of time within the PCR cycle (c) Comparison between natural and forced cooling.



After 0 Minutes

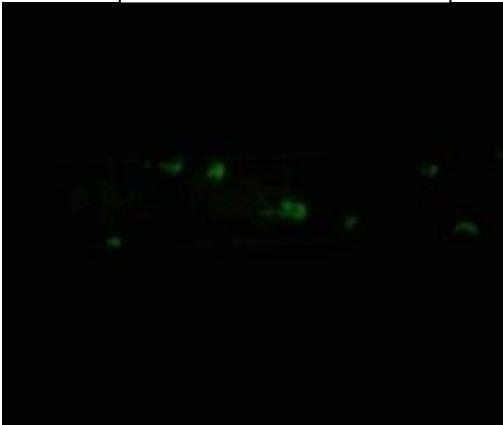


After 30 Minutes

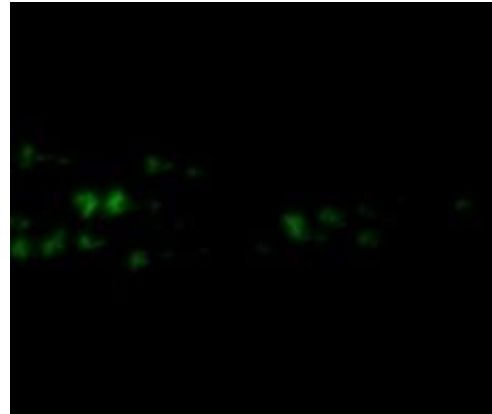


10^6

After 60 Minutes



After 120 Minutes



After 0 Minutes

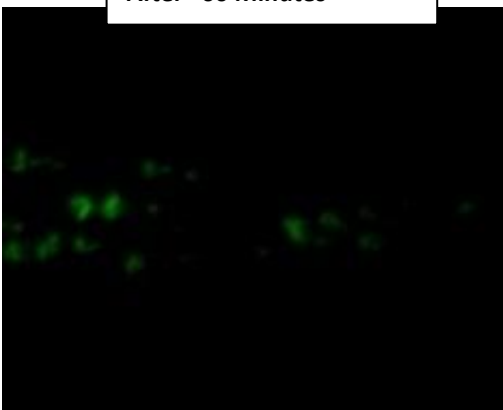


After 30 Minutes



10^4

After 60 Minutes



After 120 Minutes



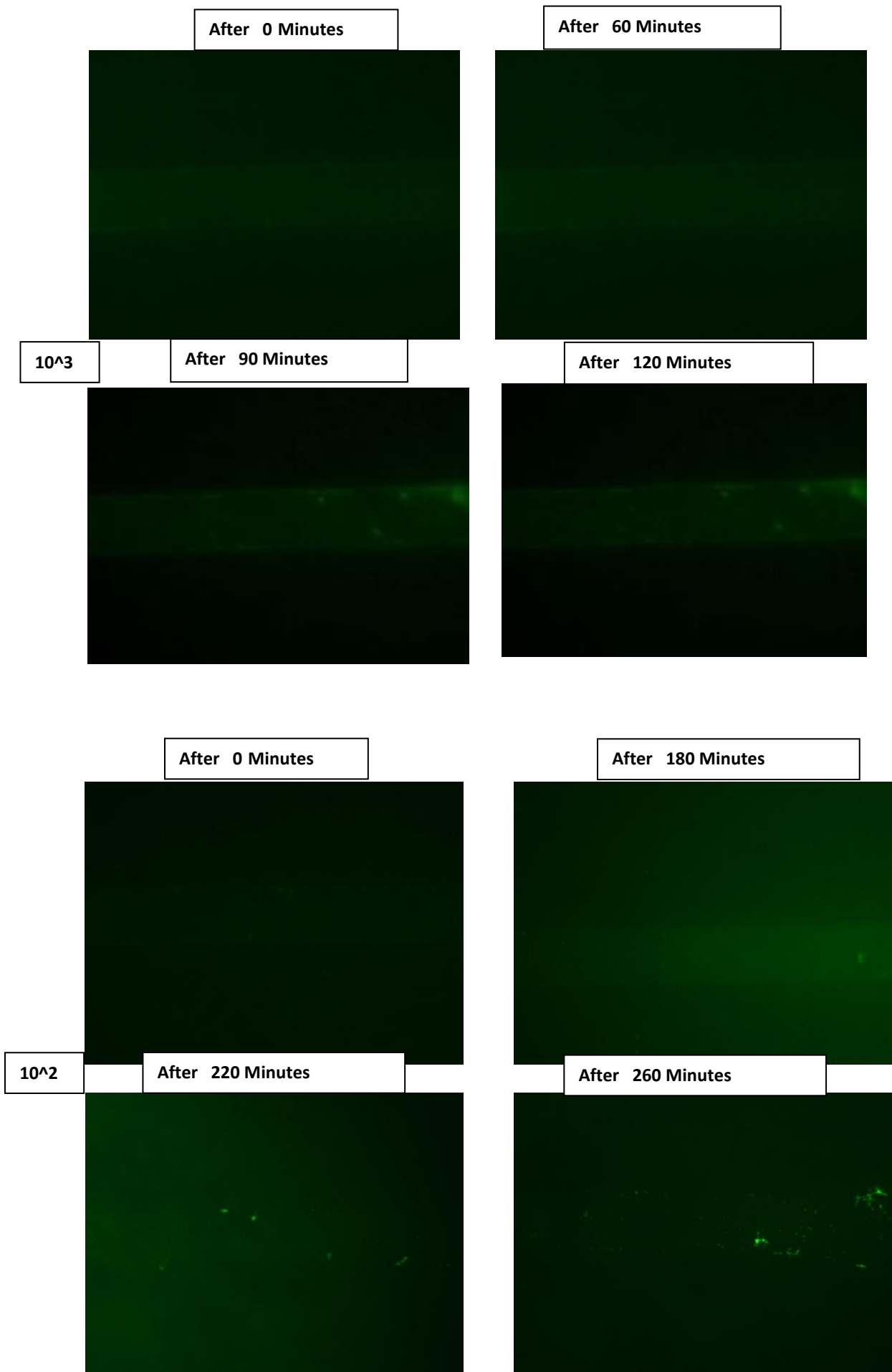


Figure S2: Optical micrographs of cell capture at representative time instances.

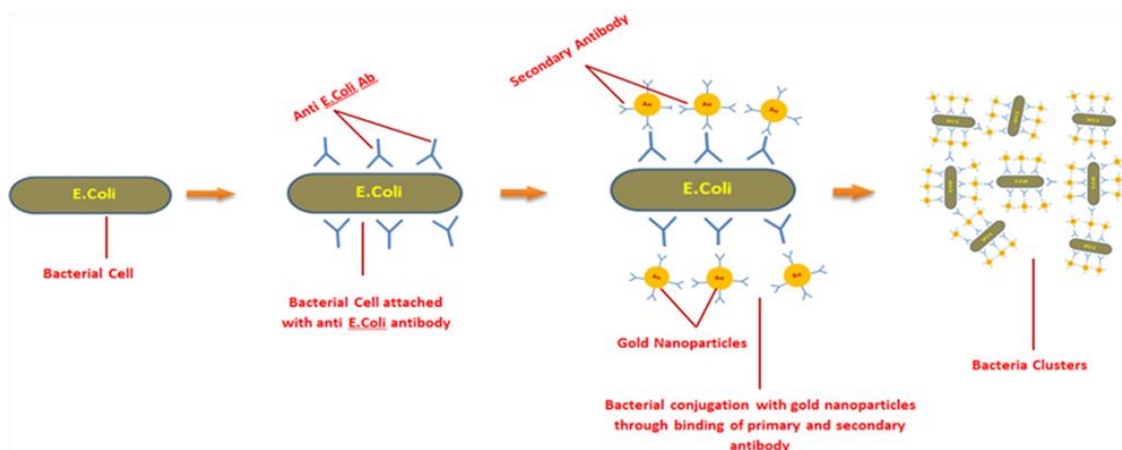


Figure S3: A schematic representation of nano-conjugation process.

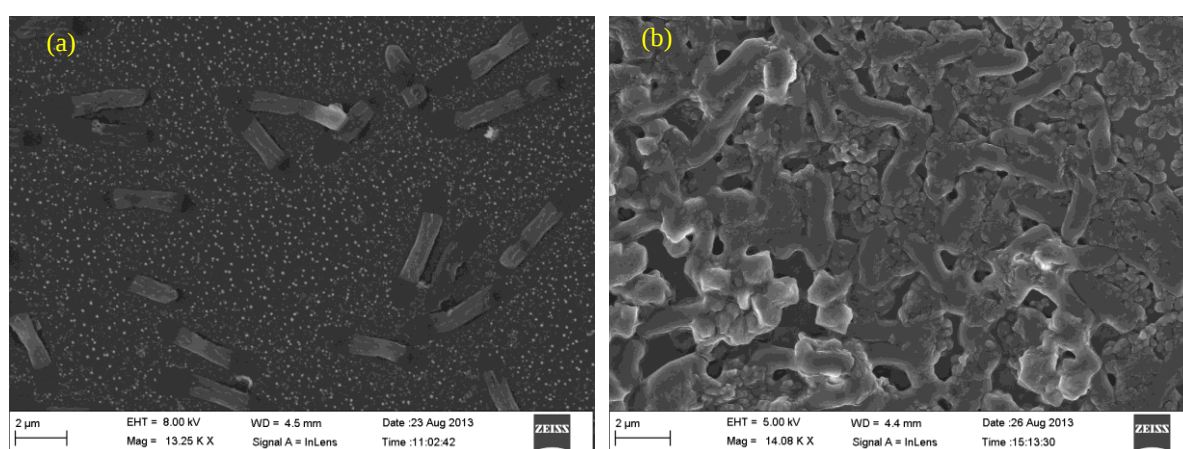


Figure S4 : SEM Images of (a) Normal bacterial cells, (b) Conjugated bacterial cells.

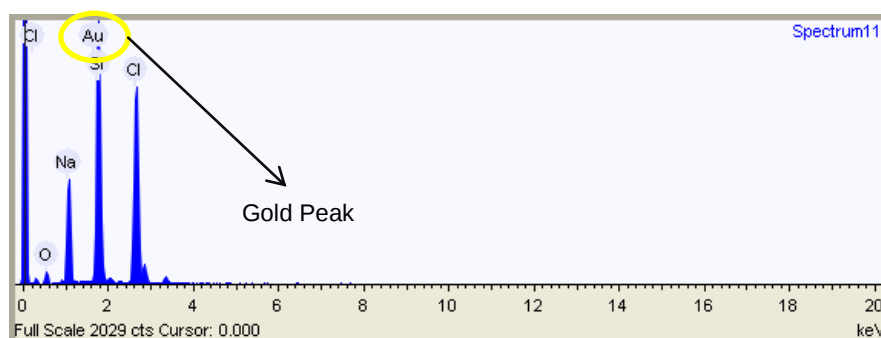


Figure S5 : EDX Spectrum showing the presence of gold nano particles in the nano conjugated bacterial cells(*E.coli*DH5 α).

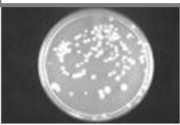
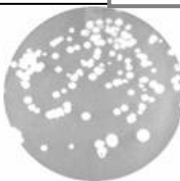
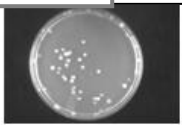
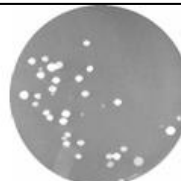
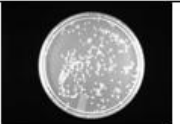
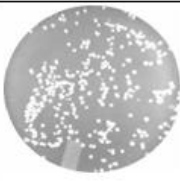
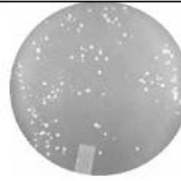
Concentration of cells (cfu/ml)	Plating Method			
	Pre DEP			Post DEP
10^7	 No of colonies= ~ 100		 No of colonies= ~ 30	
10^9	 No of colonies= ~ 200		 No of colonies= ~ 50	

Figure S6: Capturing efficiency testing by plating method of bacterial cells.

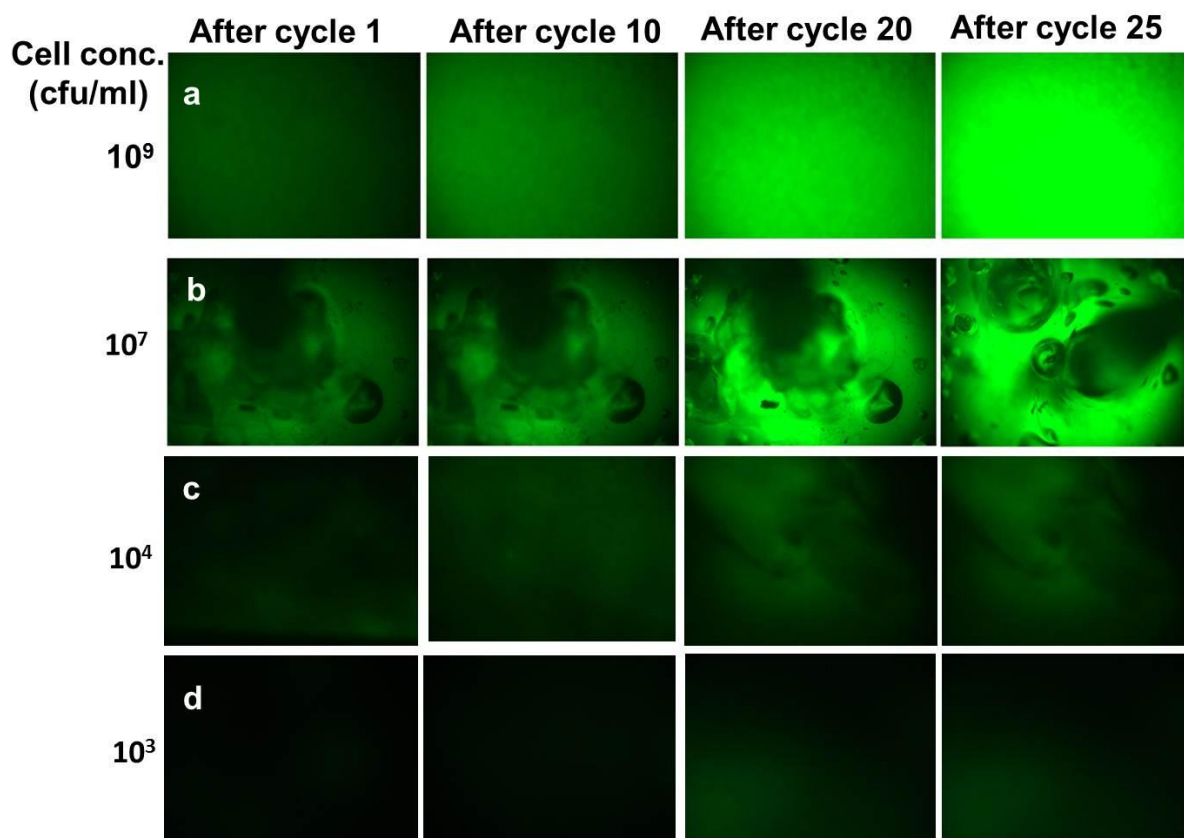
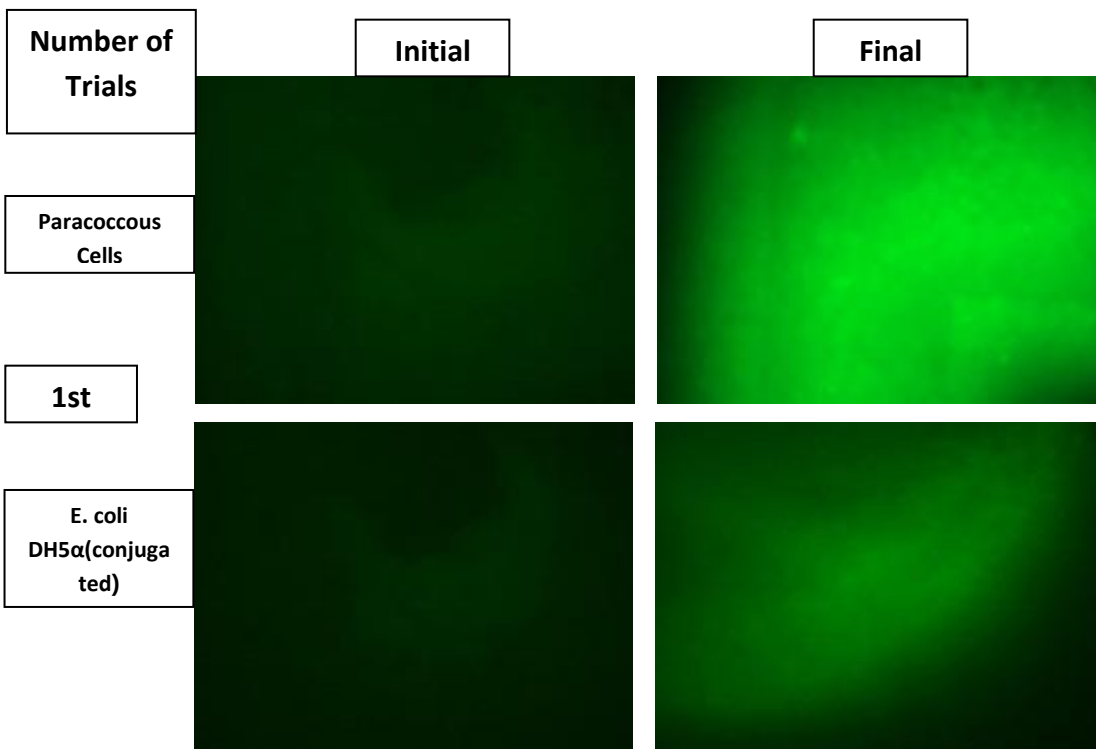
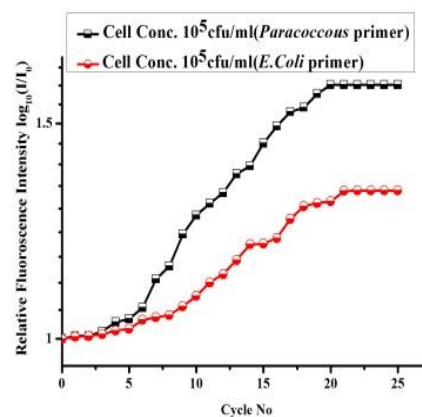
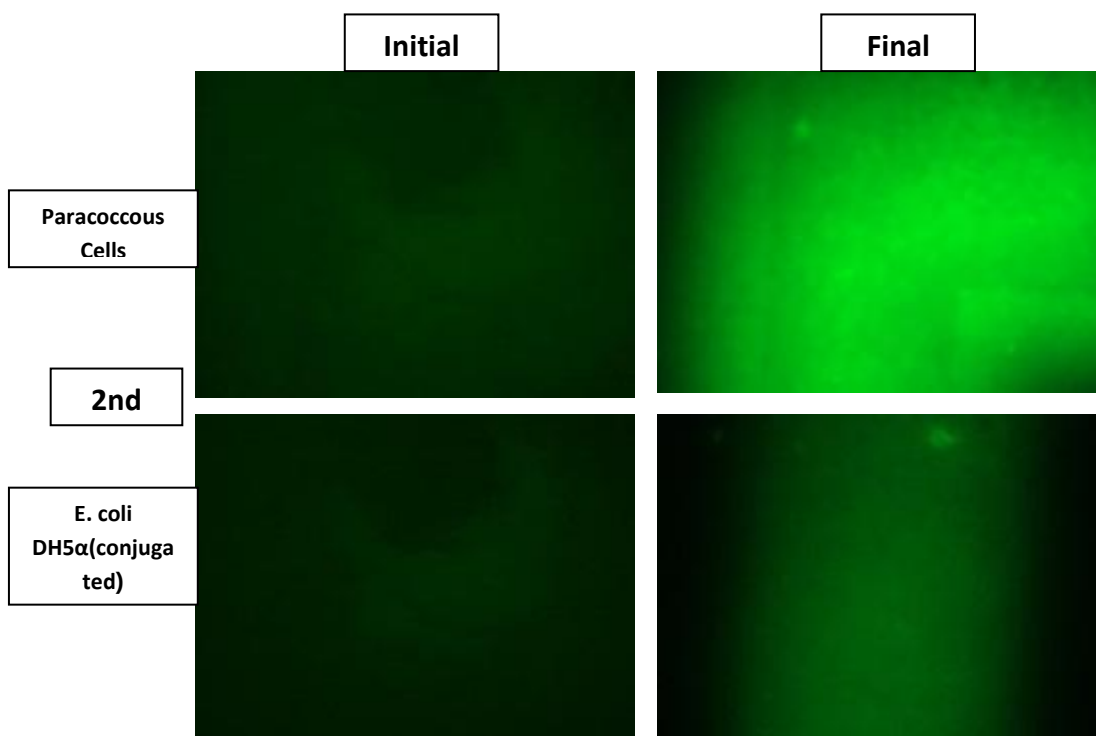
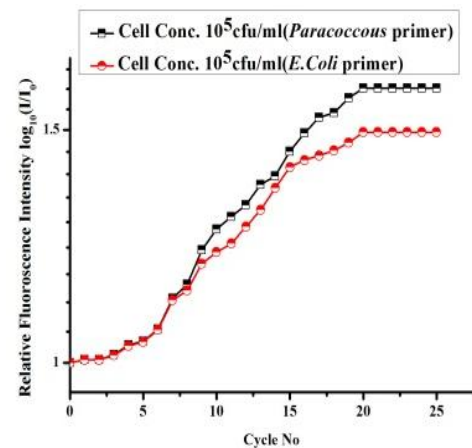


Figure S7: Real time snaps taken during real time PCR after 72°C (a) cell conc. 10^9 cfu/ml (b) 10^7 cfu/ml (c) 10^4 cfu/ml(d) 10^3 cfu/ml .



Relative Fluorescence increase with respect to number of cycle



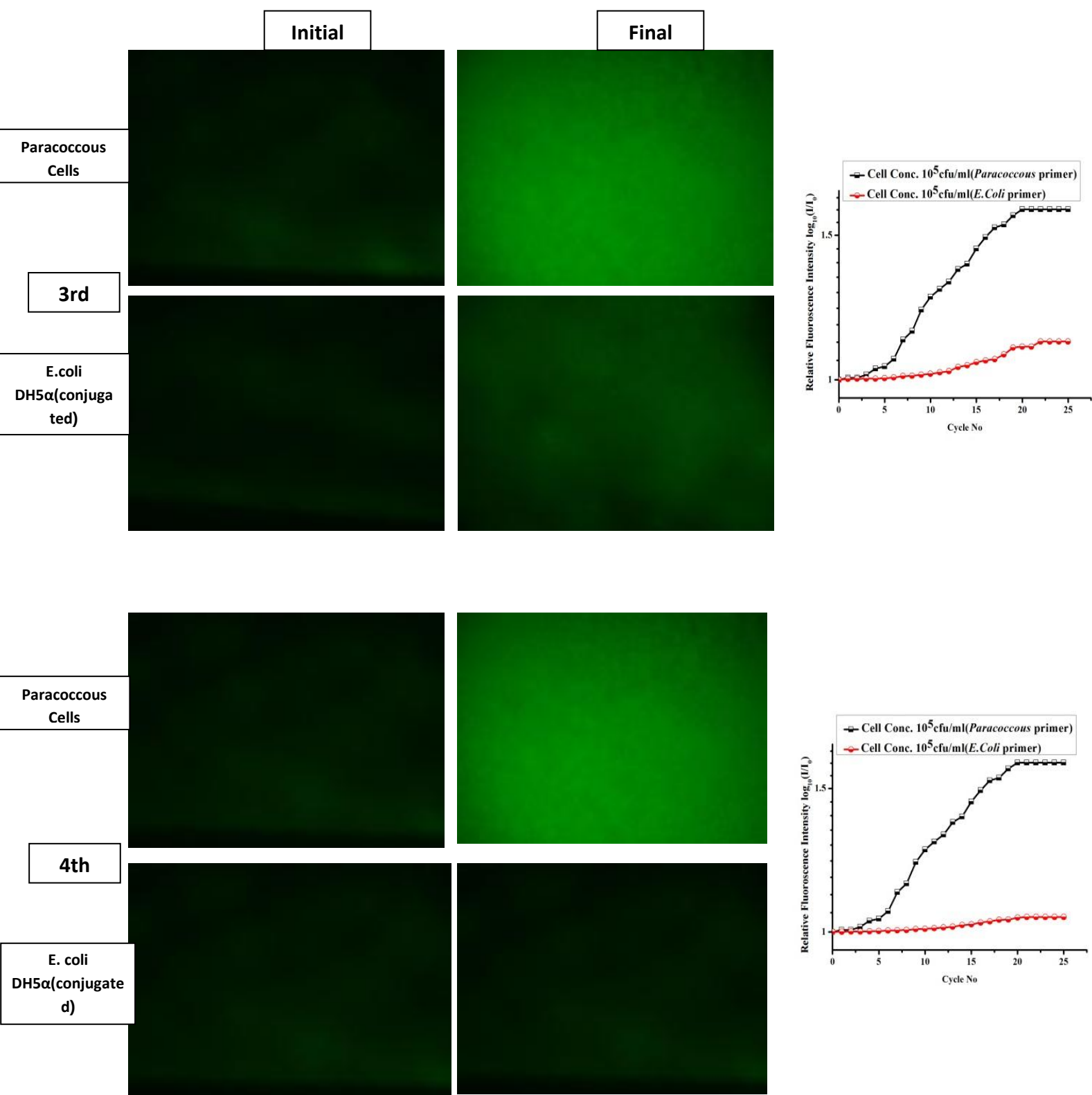


Figure S8: Optical micrographs obtained from RT-PCR of flow through solution after DEP and quantitative estimation of relative fluorescence increase in logarithm scale.

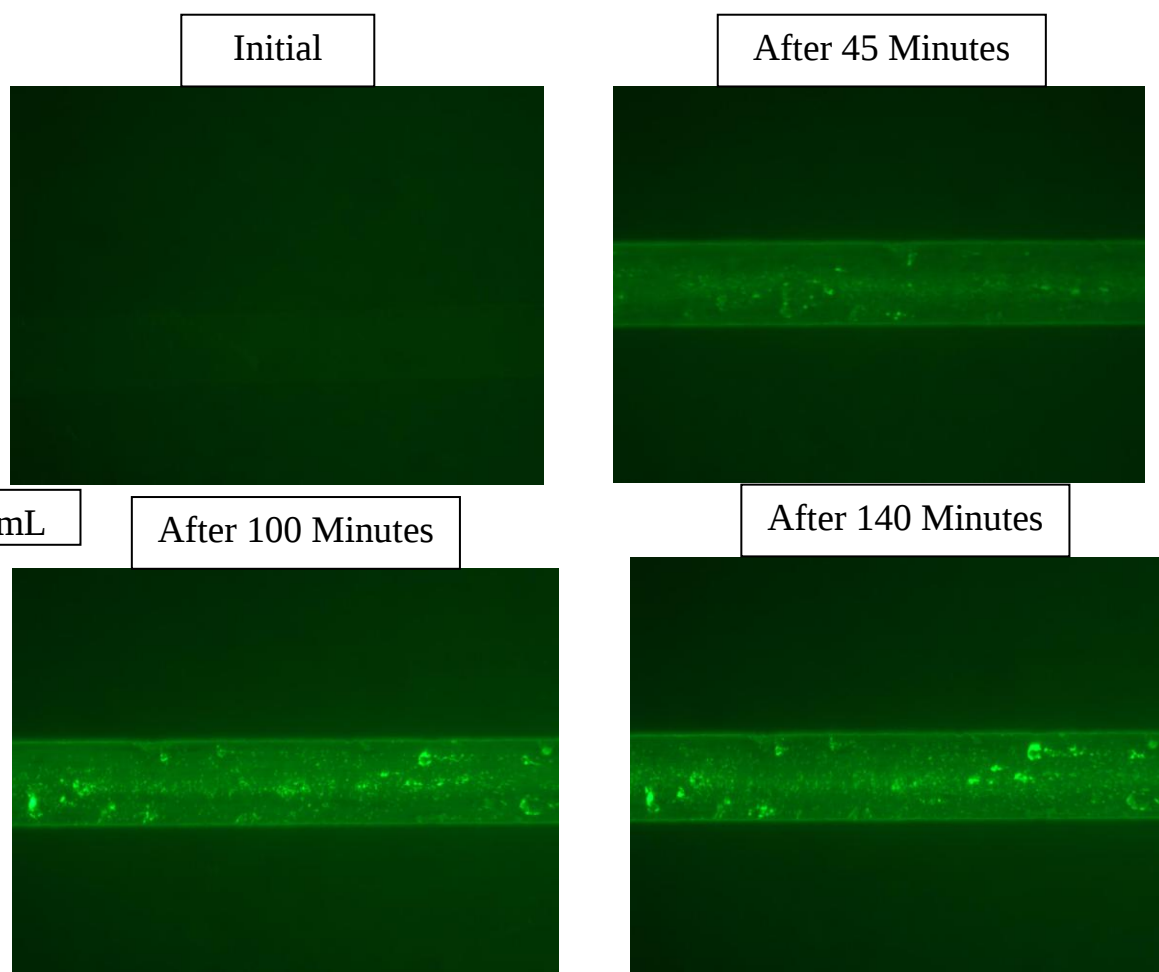


Figure S9: Optical micrographs of cell capture (Juice Sample) at representative time instances.

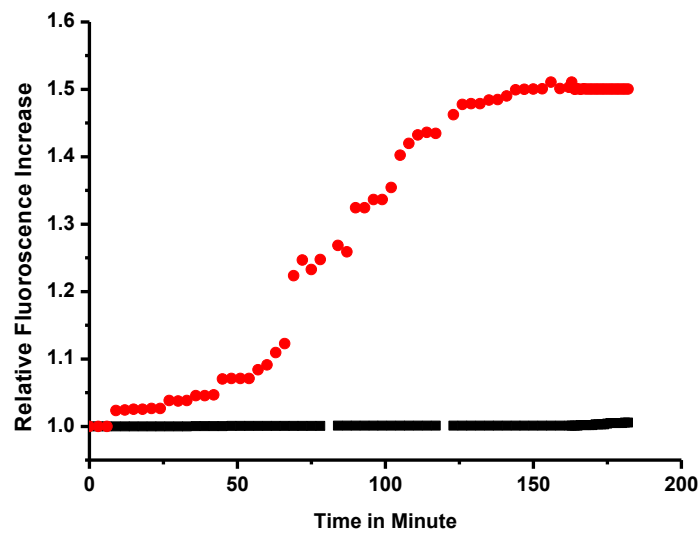


Figure S10: Plot showing the trend in increase in fluorescence intensity during DEP of bacterial Cells (Fruit Juice Sample).

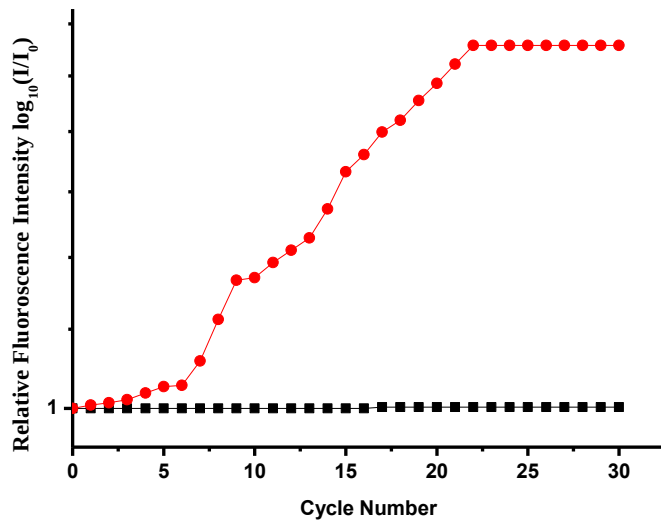


Figure S11: Plot showing the trend in increase in fluorescence intensity during Real time PCR of Captured bacterial Cells (Fruit Juice Sample).