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Supplemental Information

Density-Dependent Differentiation of Bacteria in Spatially Structured Open Systems

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Supporting Material

Density-Dependent Differentiation of Bacteria in Spatially Structured Open Systems

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SUPPLEMENTARY FIGURES

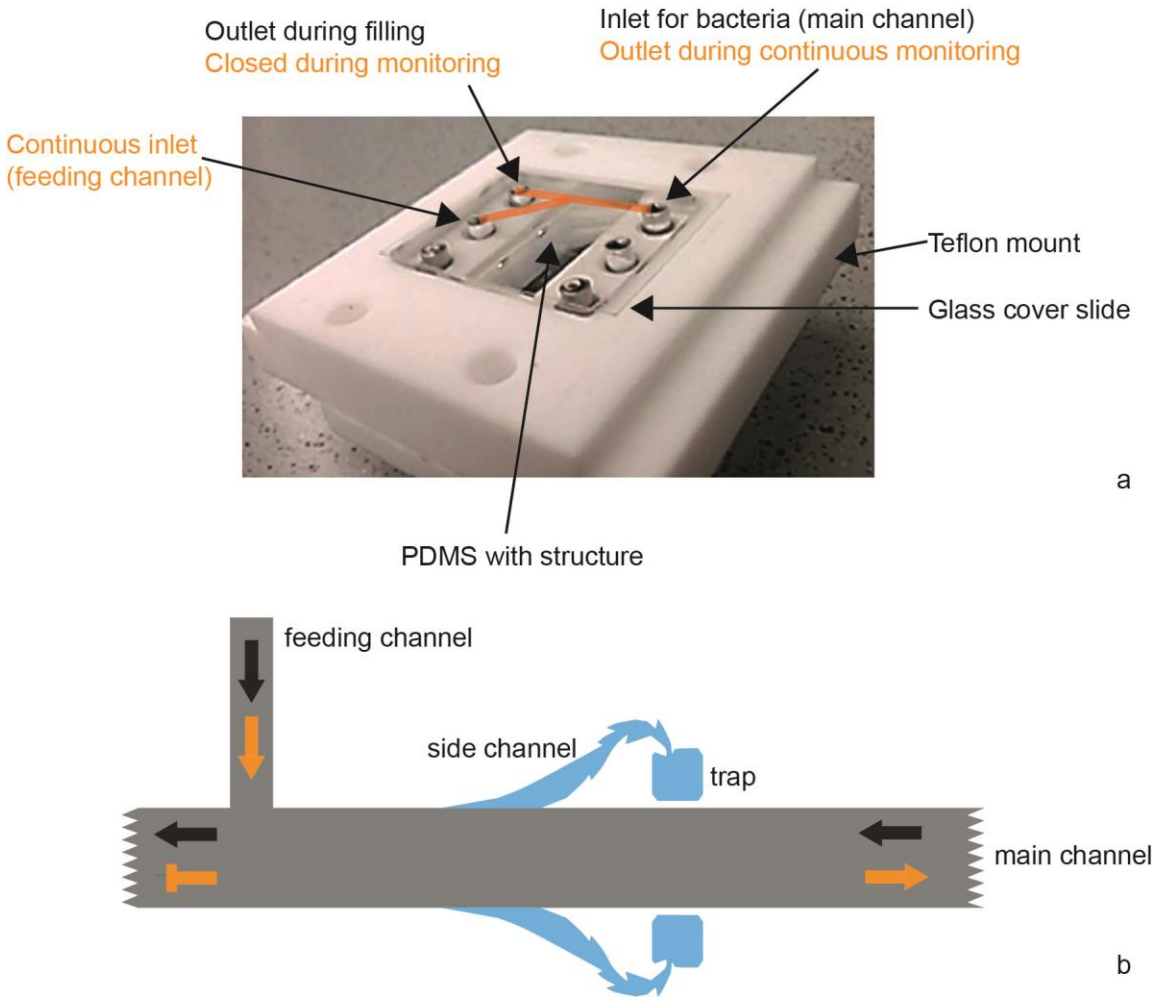

FIGURE S1 Microfluidic device. a) Photograph of microfluidic chamber. The teflon frame serves as mount for the microscope. The master defining the microstructures is mounted onto the teflon frame prior to casting of PDMS. After the curing process, cleaning and cutting, the master is replaced by a glass cover slide. The orange lines denote the location of the main channel and the feeding channel. b) Strategy for filling the channel and for avoiding pollution of fresh medium with bacteria. Phase 1 (black arrows): Medium with bacteria is fed into the main channel. Medium is applied to the feeding channel. The left end of the main channel serves as outlet. Phase 2 (orange arrows): Once enough bacteria have settled within the side channels, the flow direction within the main channel is reversed by closing the left end of the main channel. The right end of the main channel serves as outlet.

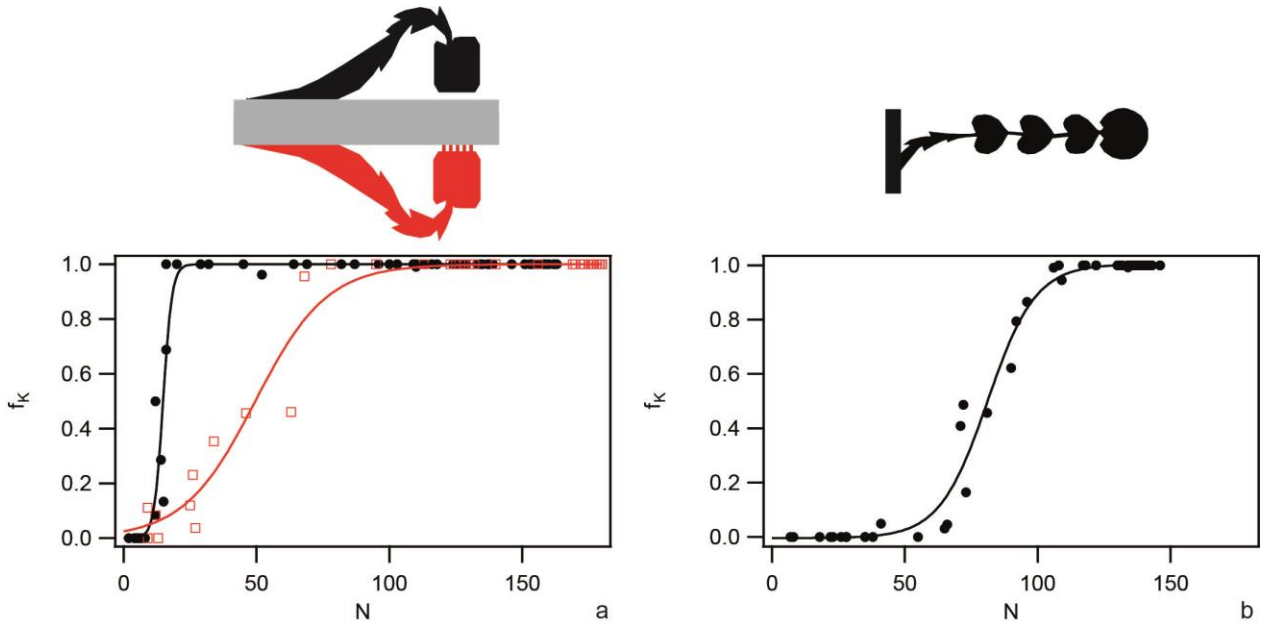

FIGURE S2 Determination of N_{half}. The fractions of competent cells f_K as a function of total number N per trap were plotted. Typical examples for individual traps for a) strong (red) and medium (black), and b) weak coupling. Full lines: Fit to $f_K(N) = f_K^{max}/\left(1 + e^{-(N-N_{half})/\mu}\right)$.