

Supporting Information

Label-free optical detection of cells grown in 3D silicon microstructures

Sabina Merlo,^a Francesca Carpignano,^a Gloria Silva,^a Francesca Aredia,^c A. Ivana Scovassi,^c Giuliano Mazzini,^{c,d} Salvatore Surdo,^b and Giuseppe Barillaro^b

^a Dipartimento di Ingegneria Industriale e dell'Informazione, Università di Pavia, Via Ferrata 1, 27100 Pavia, Italy.

^b Dipartimento di Ingegneria dell'Informazione: Elettronica, Informatica, Telecomunicazioni, Via G. Caruso 16, 56122 Pisa, Italy.

^c Istituto di Genetica Molecolare, CNR, Via Abbategrasso 207, 27100 Pavia, Italy.

^d Dipartimento di Biologia e Biotecnologie "L. Spallanzani", Università di Pavia, Via Ferrata 9, 27100 Pavia, Italy.

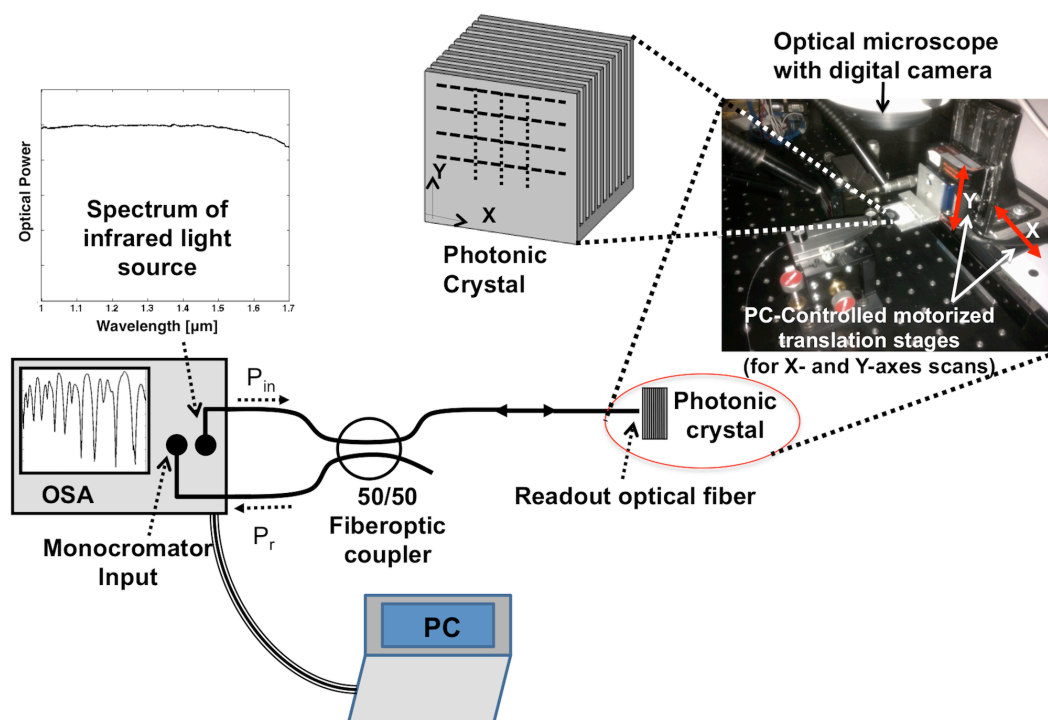


Figure S1. Measuring setup.

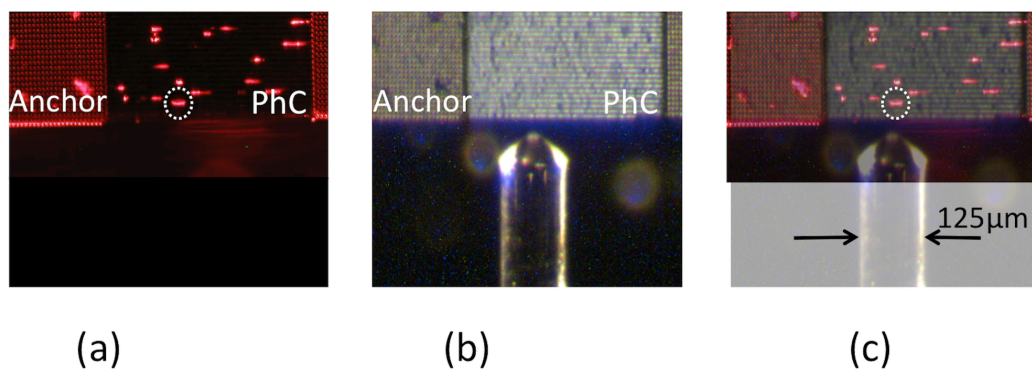


Figure S2. (a) Top view of an anchor structure and a PhC region obtained with the fluorescence microscope, after cell culture and fixation, highlighting cell positions thanks to red-PI labeling; (b) top view of the same regions obtained through the optical microscope in the fiberoptic setup, also showing the tapered lensed fiber tip in front of a cell populating the second gap; (c) superposition of the two images for data validation. A cell filling the second gap is circled in (a) and (b).

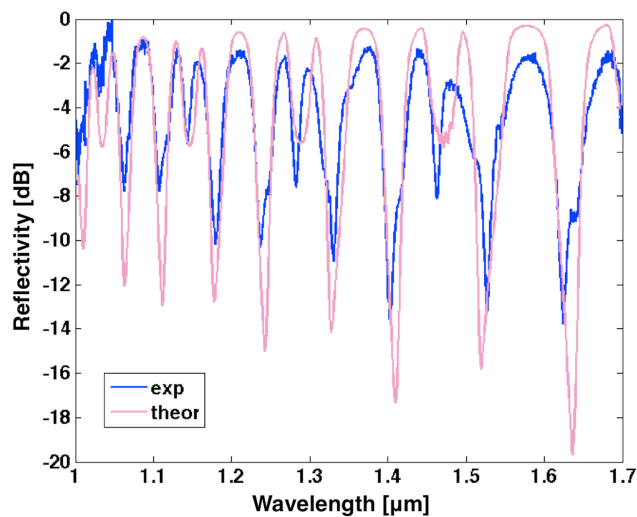


Figure S3. Calculated spectral reflectivity (pink trace) well fitting an experimentally detected spectrum (blue trace) relative to an empty PhC. Fitting parameters are: porosity value 0.646 and roughness value 20 nm (rms).

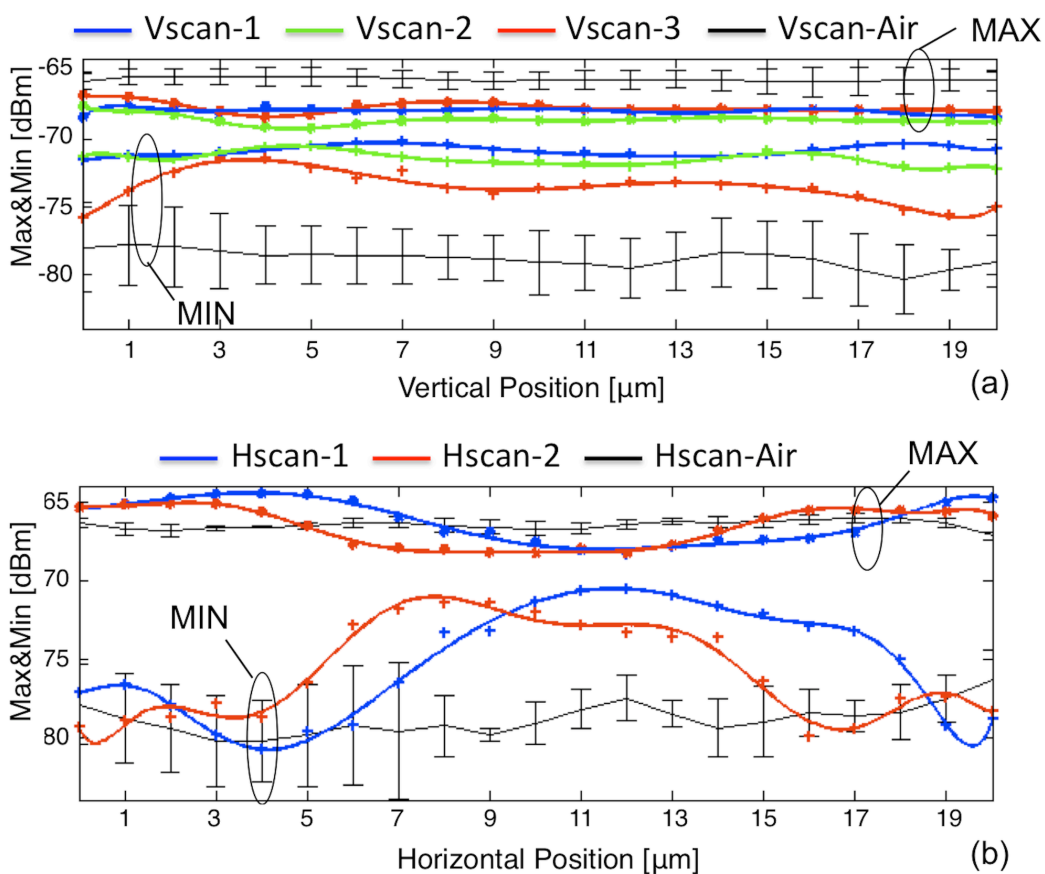


Figure S4. Reflected power maxima and minima: (a) collected along vertical scans, as functions of the vertical position, (b) collected along horizontal scans, as functions of the horizontal position. Thin black traces: mean value with error bars of the experimental results on PhC regions with only air in the gaps; colored symbols: experimental results obtained when crossing PhC regions with cells; blue, green and red traces: best fitting curves of the experimental data. Vscan-1 refers to data relative to a “first gap cell”, Vscan-2 refers to a “third gap cell” and Vscan-3 refers to a “second gap cell”. Meanwhile, Hscan-1 refers to a “first gap cell” (the same of Vscan-1) and Hscan-2 refers to a “third gap cell” (the same of Vscan-2).