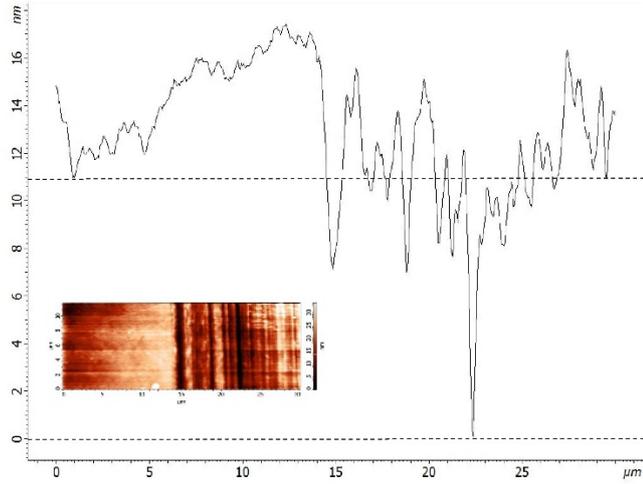


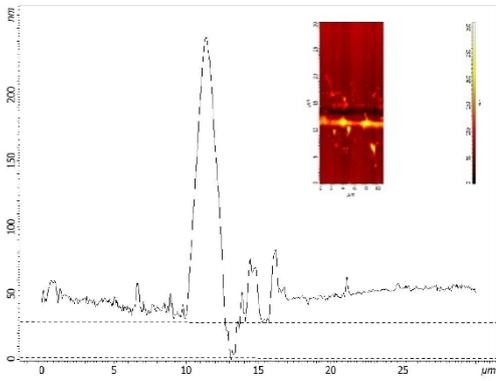
## The Elaboration of Effective Coatings for Photonic Crystal Chips in Optical Biosensors

### Measurement of the aldehyde groups concentration

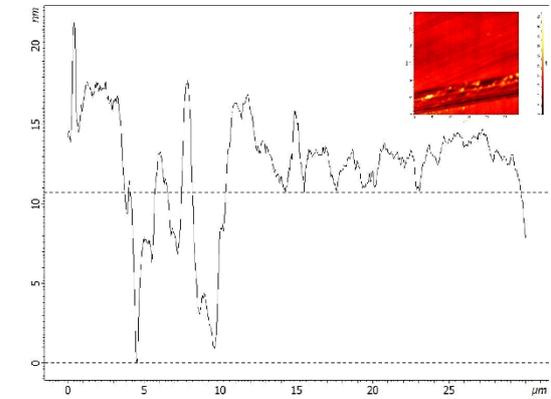
The aldehyde group concentration was measured by using p-nitrophenylhydrazine (NPH) in alcohol/phosphate buffer pH 5.3, that reacts equimolarly with aldehyde group, giving the corresponding hydrazones. A weighed portion of AD was dissolved in milli Q water to give a 5% solution. NPH was dissolved in alcohol/phosphate buffer pH 5.3 in ratio 1:20 (v/v). After that AD (100  $\mu$ l, 5% wt) and NPH (1 ml) were added to two tubes. The first sample was filtered using centrifugal filter unit Amicon (MWCO 60 kDa) just after the preparation; the second was incubated for 8 h and then filtered. The supernatants were collected and analyzed with spectrophotometer at  $\lambda_{\max}$ = 392 nm. Initial and final concentrations of NPH that had not reacted were determined using the calibration graph of optical absorption of p-NPH solution in alcohol : phosphate buffer pH 5.3 (ratio 1:20 v/v) at  $\lambda_{\max}$ = 392 nm. The aldehyde group concentration (in  $\mu$ M/g) was calculated as the concentration of NPH that have reacted with aldehyde groups.



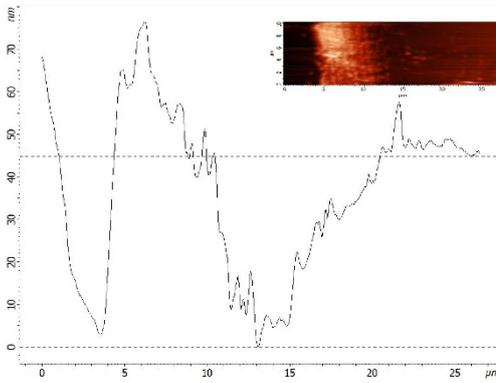
(a)



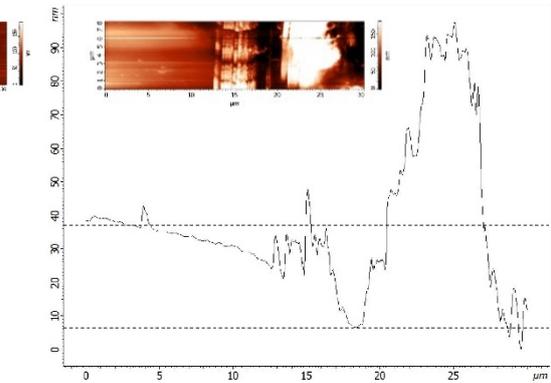
(b)



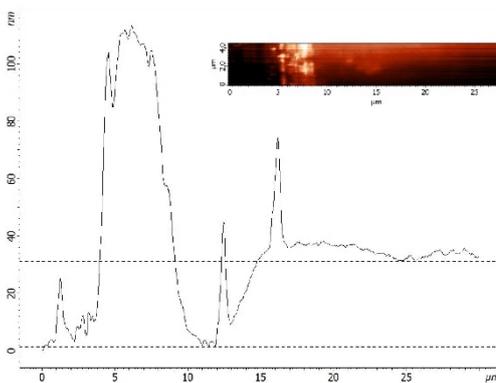
(c)



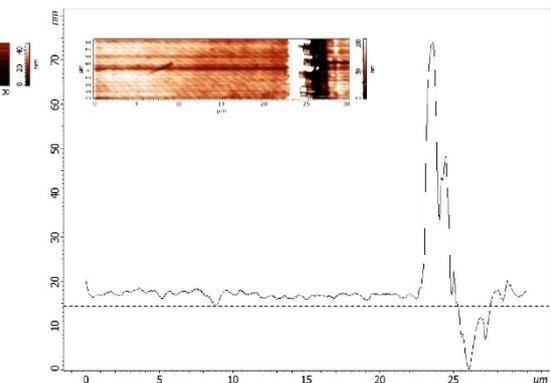
(d)



(e)



(f)



(g)

**Figure S1.** AFM image and cross-section of (a) APTES monolayer, the thickness is 10 nm; (b) ED Mw 5 kDa, the thickness is 26 nm; (c) ED Mw 5 kDa with immobilized BSA, the thickness is 12 nm; (d) ED Mw 50 kDa, the thickness is 40 nm; (e) ED Mw 50 kDa with immobilized BSA, the thickness is 30 nm; (f) ED Mw 500 kDa, the thickness is 30 nm; (g) ED Mw 500 kDa with immobilized BSA, the thickness is 17 nm.