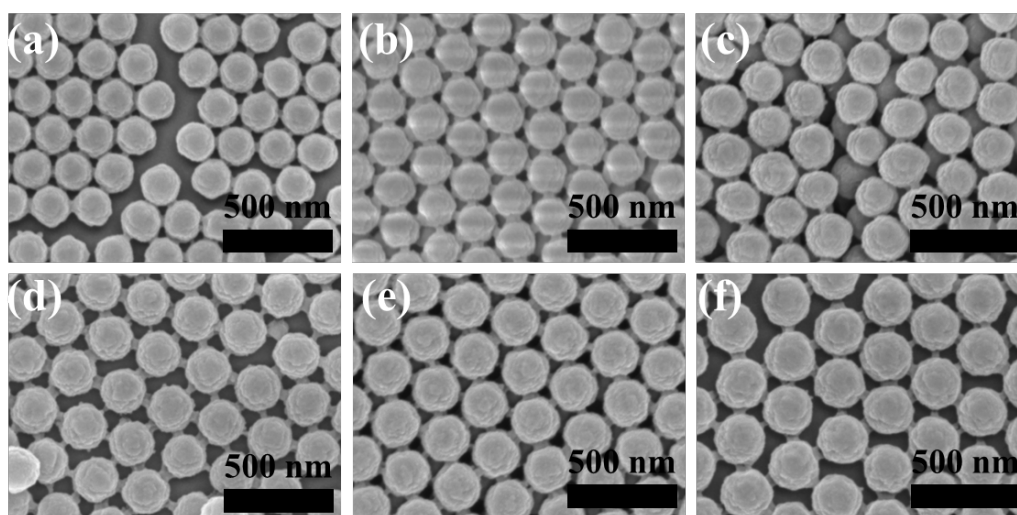


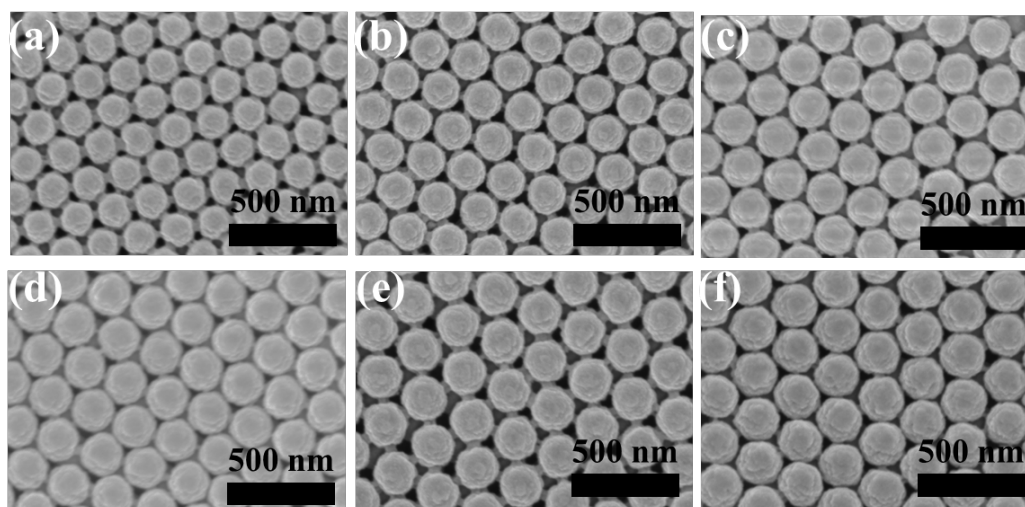
# The Supporting Information for

## Bio-Inspired Photoelectric Dual-mode Sensor Based on Photonic Crystals for Human Motion Sensing and Monitoring

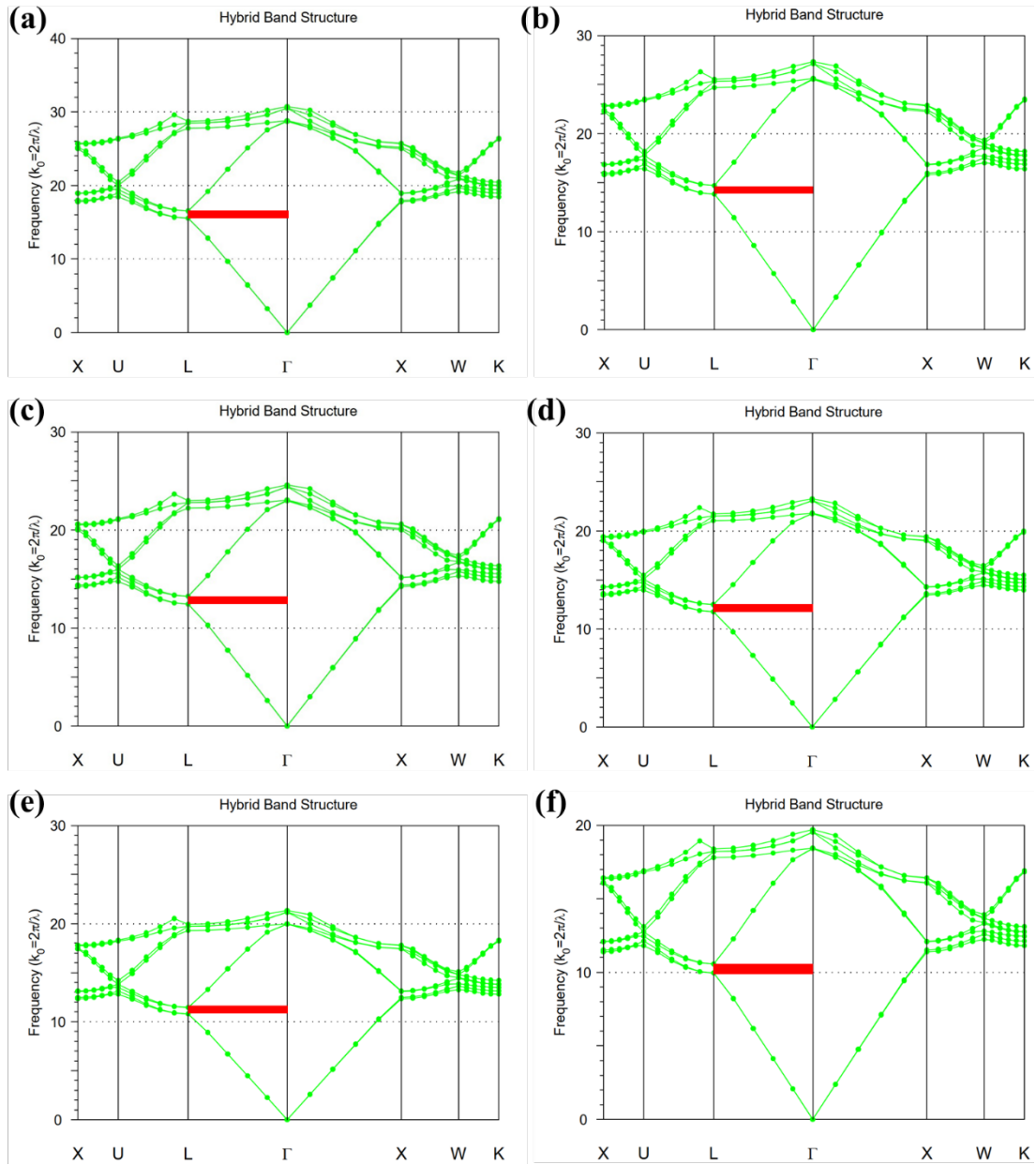
Wenxiang Zheng <sup>a</sup>, Zhibin Wang <sup>a</sup>, Mengnan Zhang <sup>a</sup>, Yanxin Niu <sup>a</sup>, Yuchuan Wu <sup>a</sup>, Pengxin Guo <sup>a</sup>, Niu Zhang <sup>b,\*</sup>, Zihui Meng <sup>a</sup>, Ghulam Murtaza <sup>c,\*</sup>, Lili Qiu <sup>a,\*</sup>



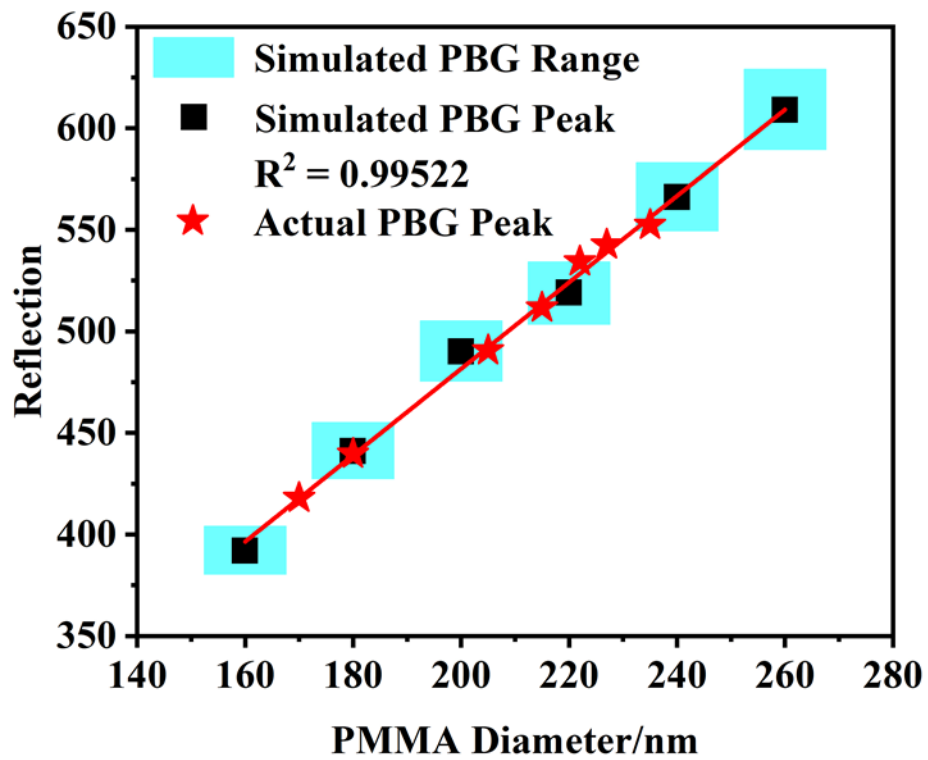
**Figure S1** The SEM of PMMA with (a)170 nm, (b) 180 nm, (c) 205nm, (d) 215 nm, (e) 222 nm, (f) 227 nm.



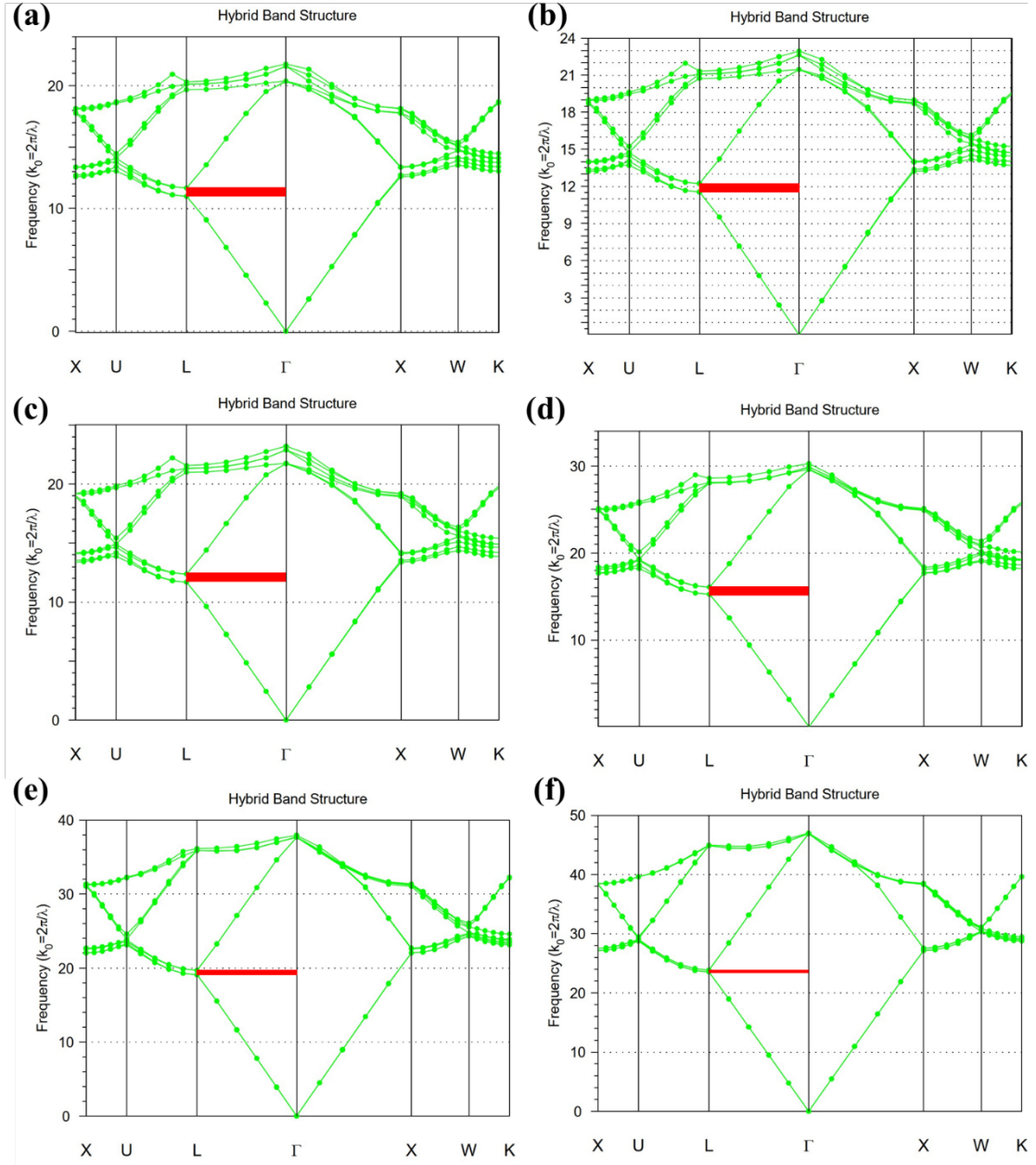
**Figure S2** The SEM of PMMA photonic crystals with (a)170 nm, (b) 180 nm, (c) 205nm, (d) 215 nm, (e) 222 nm, (f) 227 nm.



**Figure S3** The simulated results of PMMA photonic crystals with RSOFT software (a) 160 nm, (b) 180 nm, (c) 200 nm, (d) 220 nm, (e) 240 nm, (f) 260 nm.



**Figure S4** The analysis of the relationship between PMMA diameter and reflection peak.



**Figure S5** The simulation results of PBG tuning of 235 nm PMMA PCs with lattice distance reduced to (a) 100.2%, (b) 93.267%, (c) 91.715%, (d) 62.959, (e) 48.07% and (f) 38.279% of the initial lattice distance.

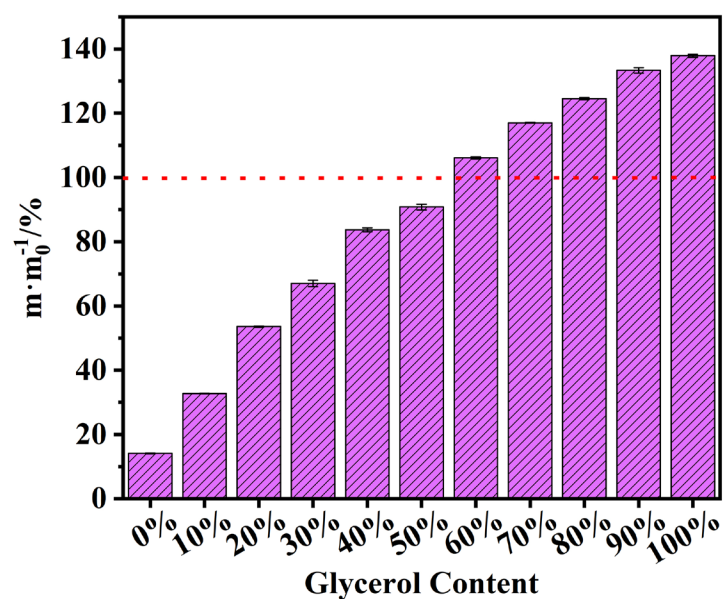


Figure S6 the water loss of 72h at 50% humidity and 35°C

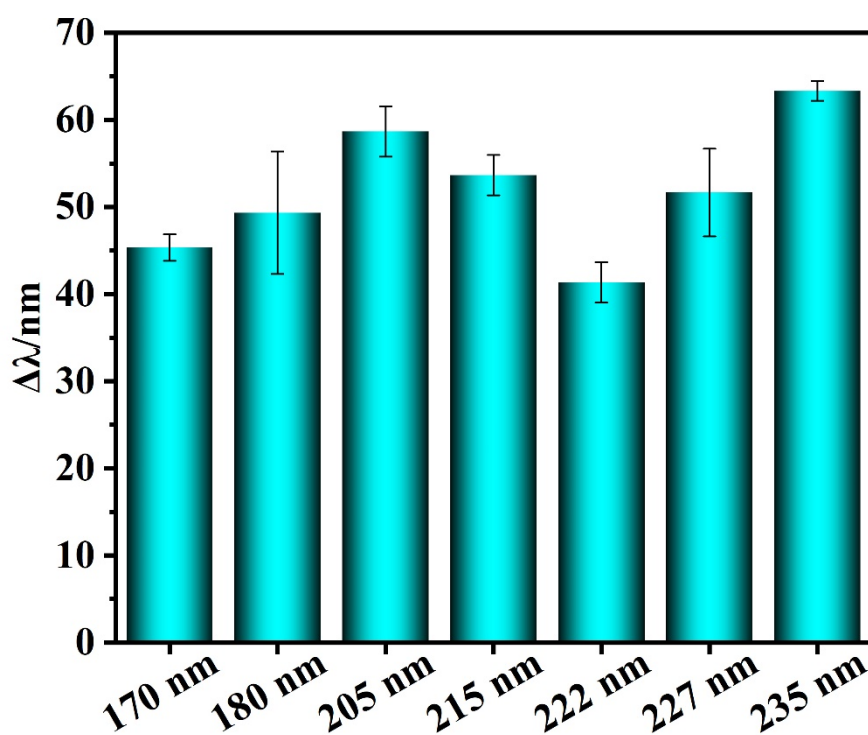
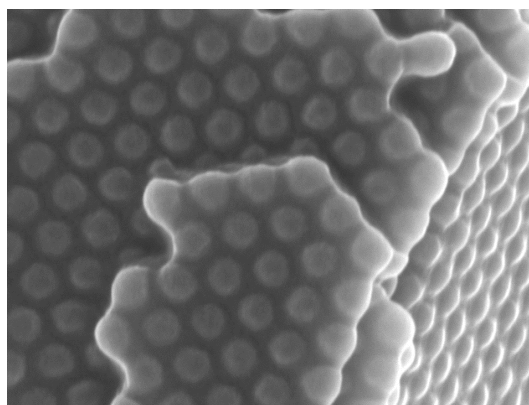
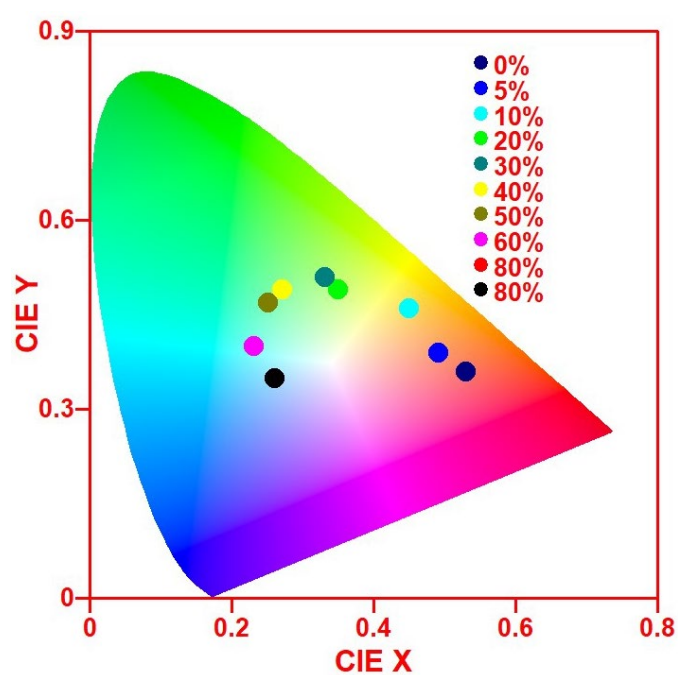


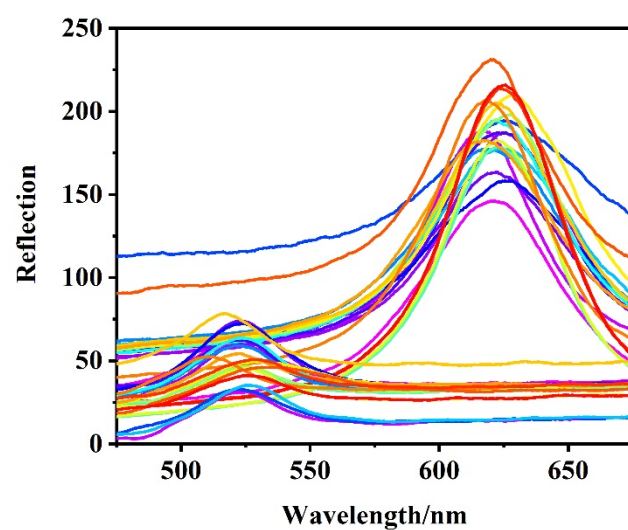
Figure S7 The difference between reflected peaks of PMMA PCs and PMMA PCs sensors with different diameters.



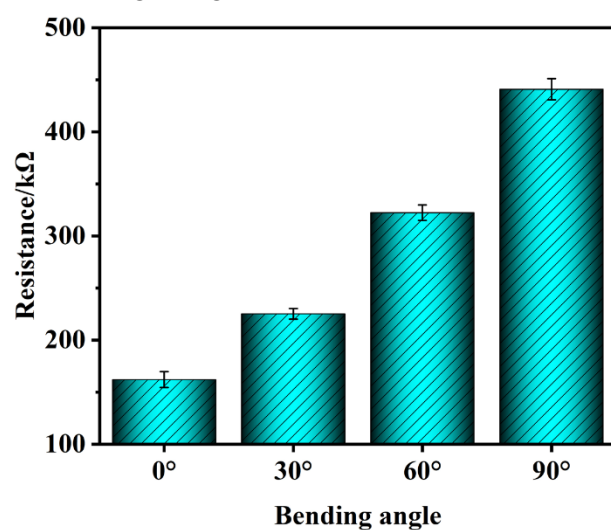
**Figure S8** The SEM of the dual-mode photoelectric sensor with 235 nm PMMA PCs.



**Figure S9** The CIE picture of the dual-mode photoelectric sensor with 235 nm PMMA PCs with different tensile strain.



**Figure S10** The cycling reflective spectrum of photoelectric dual-mode sensor based on 235 nm PMMA PCs when the bending changed from  $0^\circ$  to  $90^\circ$ .



**Figure S11** The resistance of the photoelectric dual-mode sensor based on 235 nm PMMA PCs when the bending changed from  $0^\circ$  to  $30^\circ$ ,  $60^\circ$  and  $90^\circ$ .