Supporting Information

All-printed point-of-care immunosensing biochip for one drop of blood diagnostics

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Figure S1. The equipment for the PC-FLISA (photonic crystal-fluorescence immunosorbent assay) biochip. The inset is an enlarged picture of the printing chip.

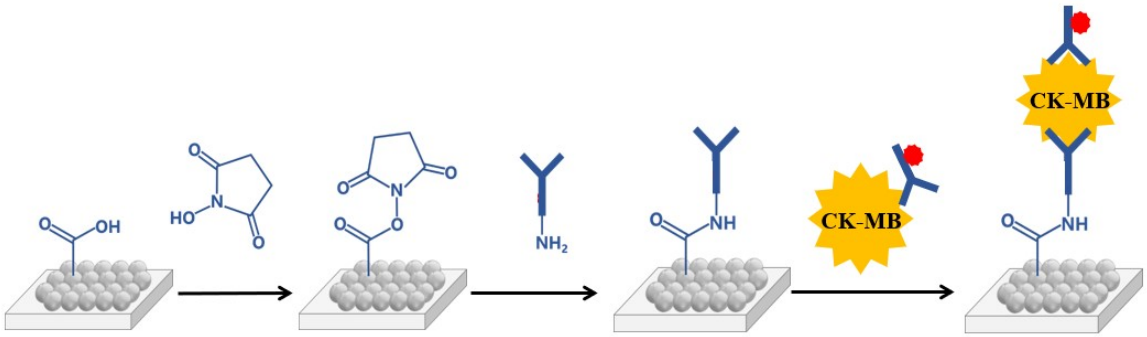

Figure S2. Diagram of the double antibody sandwich detection mechanism of the PC-FLISA chip.

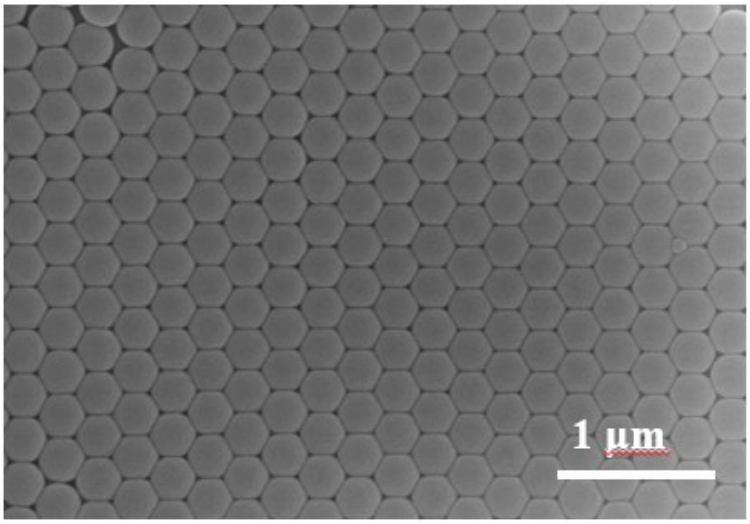

Figure S3. The photonic crystal can be fixed on the substrate material after oven sintering at 110 ^{o}C for 10 min

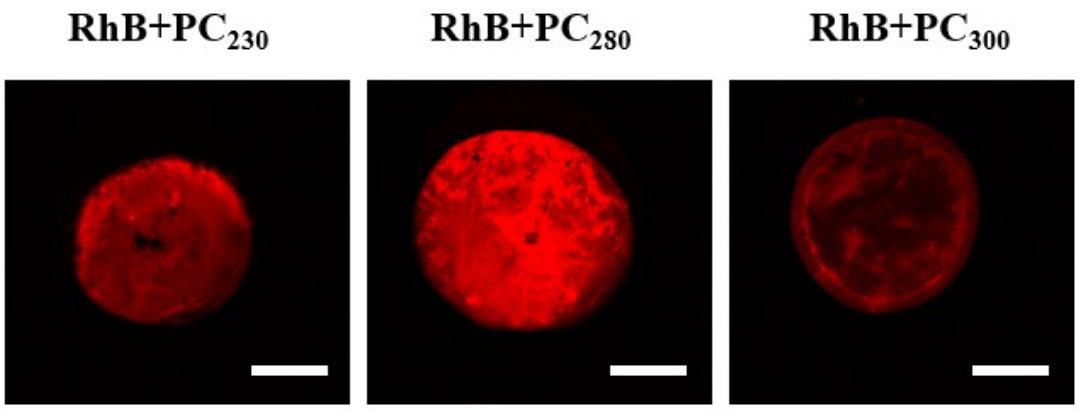

Figure S4. Fluorescence images and corresponding intensity with RhB-antibody (0.5 μL, 10 μg/mL) on PC_{230}, PC_{280} and PC_{300} dots, respectively. Sale bar: 200 μm.

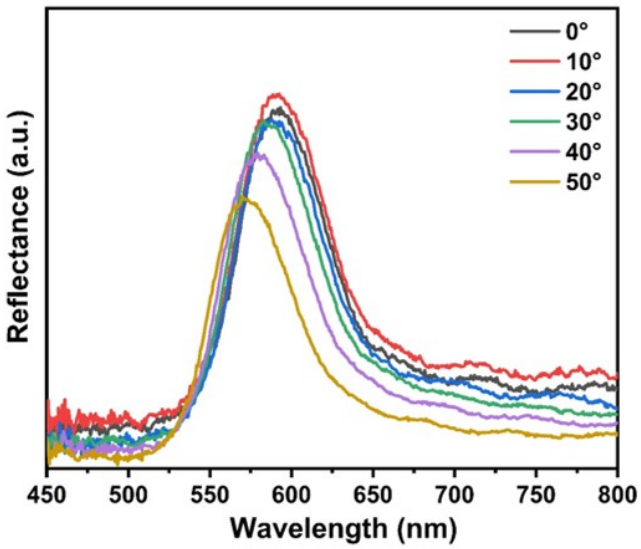

Figure S5. The reflectance spectra of PC_{260} with different angles.

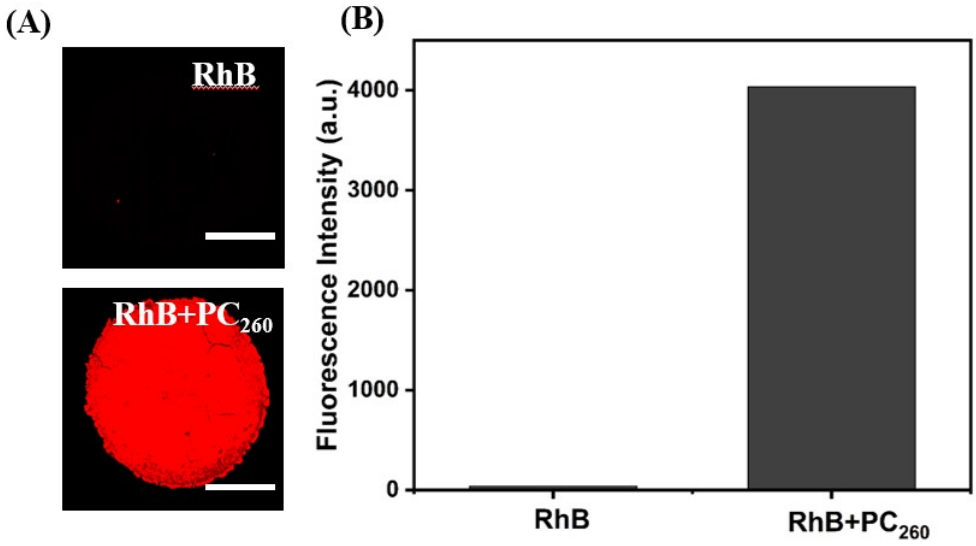

Figure S6. Gain effect of pure RhB on photonic crystals. (A) Fluorescence images with pure RhB (0.5 μL, 10 μg/mL) on PC_{260} dots and pure PET substrate; (B) Corresponding intensity of (A) with pure RhB (0.5 μL, 10 μg/mL) on PC_{260} dots and pure PET substrate. Scale bar: 200 μm.

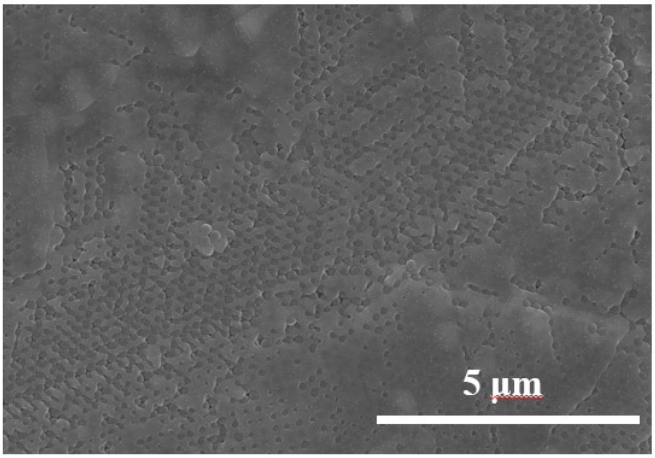

Figure S7. SEM image of the PC-FLISA chip after detection of target markers.

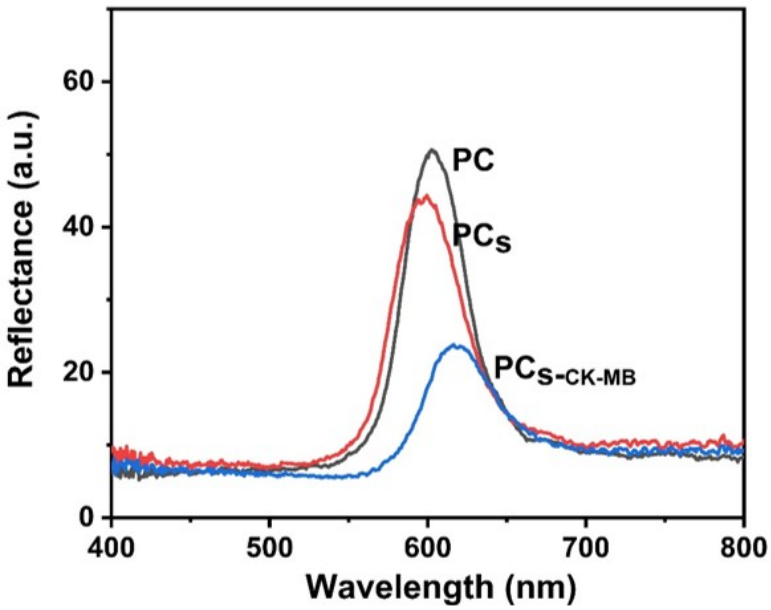

Figure S8. The reflectance spectra of pure photonic crystals, sintered photonic crystals and photonic crystals after detection. The closer arrangement of photonic crystal spheres after sintering is the reason for the blue shift of the spectra. Due to the adhesion of double antibody on the surface of the photonic crystal, the spectrum of the detected photonic crystal has a red shift and a significant decrease.

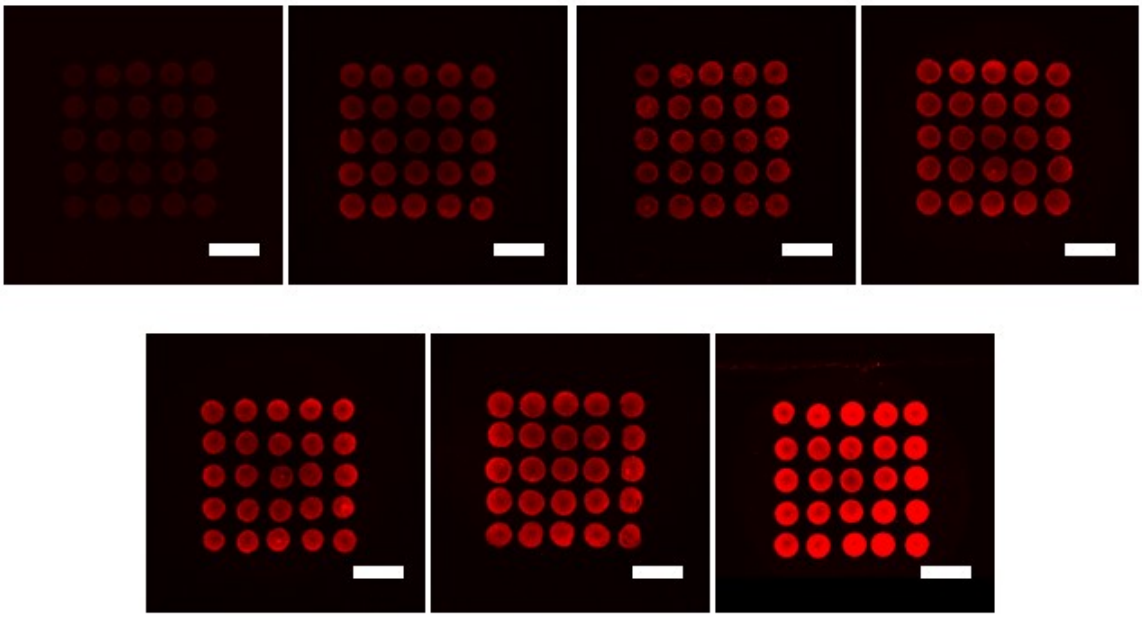

Figure S9. The overall fluorescence image of the blood dilution CK-MB samples of healthy human with different concentrations were detected by PC-FLISA chip. Scale bars: 1mm.

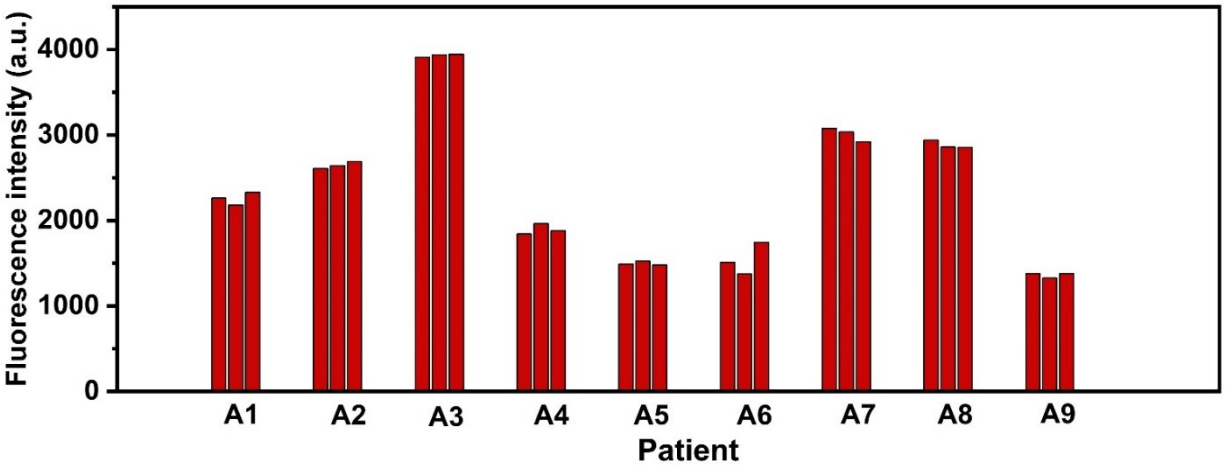

Figure S10. Histogram statistics of fluorescence intensity values of 9 patient samples, repeated for 3 times.

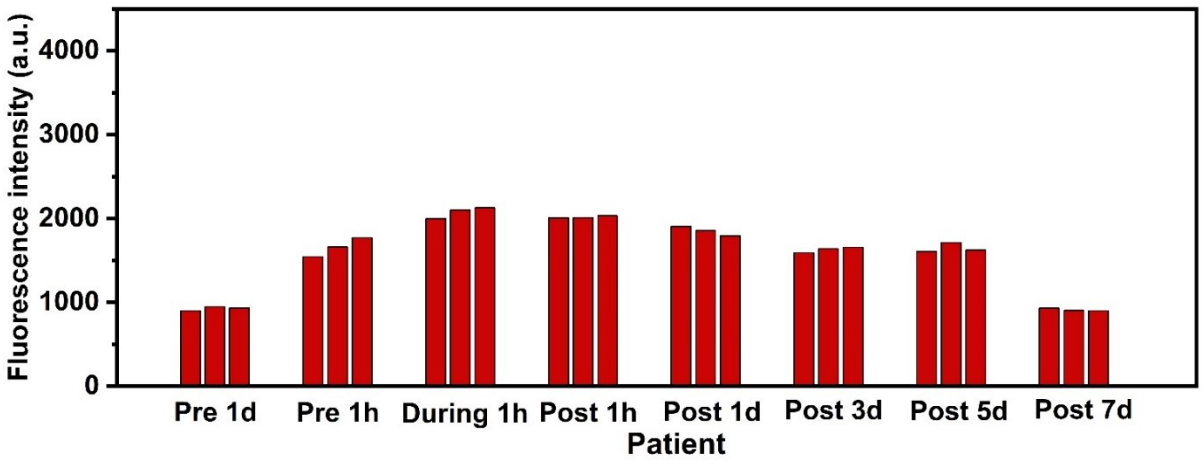

Figure S11. Histogram statistics of fluorescence intensity values of CK-MB for a patient during a general cycle of surgery, repeated for 3 times.

Table S1. The enhancement factors of the RhB-antibody fluorescence intensity enhanced by different PCs.

	PC_{230}	PC_{260}	PC_{280}	PC_{300}
Enhancement factor	**3.2**	**10.1**	**5.3**	**2.1**

Table S2. Coefficients of variation (CV) for the detection of CK-MB using the PC-FLISA chip (n=5).

Analyte	Added (ng/mL)	Detected (ng/mL)	CV (%)
CK-MB	5.0	5.0±0.75	6.45
	12.5	13±2.0	6.27
	20.0	20±2.5	7.86
	25.0	25±2.3	5.28
	50.0	51±2.10	2.22

Table S3. The change of fluorescence intensity with detection time of CK-MB (0.01ng/mL)

Time (min)	**1**	**5**	**10**	**15**	**30**	**60**
Fluorescence intensity (a.u.)	**7**	**66**	**434**	**556**	**856**	**963**

Table S4. CK-MB testing from nine different human whole blood samples by ELISA and PC-FLISA.

	ELISA(ng/mL)	PC-FLISA(FI)	PC-FLISA(ng/mL)
1	**23.60**	**2162**	**25.49**
2	**35.95**	**2329**	**40.98**
3	**45.20**	**2545**	**52.54**
4	**16.52**	**1854**	**13.06**
5	**10.63**	**1514**	**7.89**
6	**9.86**	**1518**	**7.96**
7	**73.07**	**2962**	**84.93**
8	**89.87**	**2980**	**86.95**
9	**6.27**	**1327**	**5.51**

*The blood sample of patients originally came from the PLA General Hospital.

Table S5. The changes of CK-MB in a patient with acute myocardial infarction at pre-operation, during operation and post-operation.

	Pre-operation	During operation	Post operation					
Time	**1d**	**1h**	**1h**	**1d**	**2d**	**3d**	**5d**	**7d**
ELISA(ng/mL)	**1.91**	**9.37**	**20.55**	**19.16**	**13.06**	**9.60**	**9.28**	**1.98**
PC-FLISA(FI)	**925**	**1656**	**2076**	**2017**	**1827**	**1627**	**1646**	**909**
PC-FLISA(ng/mL)	**1.75**	**9.28**	**20.58**	**19.82**	**13.2**	**9.40**	**8.94**	**1.96**

*The blood sample of patients originally came from the PLA General Hospital.