

Fig. S1 A real wave-shaped microfluidic chip (WMC) assisted multiplexed detection platform (WMC-MDP). **a** WMC-MDP components include channel layer, detection layer, base layer, holder plate, TM valve, and pins. **b** Image of the assembled WMC-MDP. The detection layer is placed between the channel and base layers to form the sandwich structure, and the TM valve is inserted through the sandwich structure to fit the additional features. WMC wave-shaped microfluidic chip, WMC-MDP wave-shaped microfluidic chip assisted multiplexed detection platform, TM valve translate-type mechanical valve

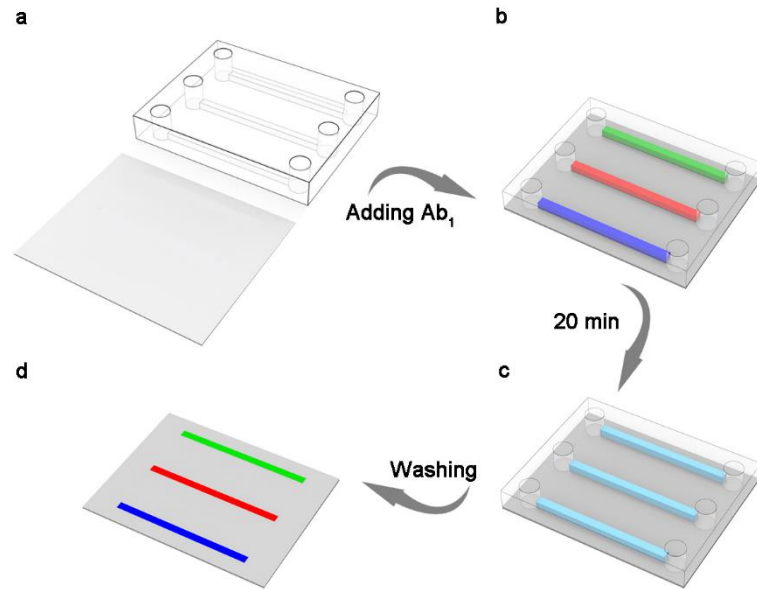


Fig. S2 Process of coating capture antibodies strips on detection layer. **a** Preparing a chip to coat capture antibodies strips and cutting the silicone film according to the designed size. **b** Placing the chip on the silicone film and injecting CRP-Ab₁, PCT-Ab₁, IL-6-Ab₁ into the channels. **c** After incubation for 20 min, injecting PBST buffer into channels to wash three times. **d** Removing the chip and obtaining the detection layer coated with capture antibodies strips. CRP-Ab₁ capture antibodies of c-reactive protein, PCT-Ab₁ capture antibodies of procalcitonin, IL-6-Ab₁ capture antibodies of interleukin-6, PBST phosphate buffered saline tween-20

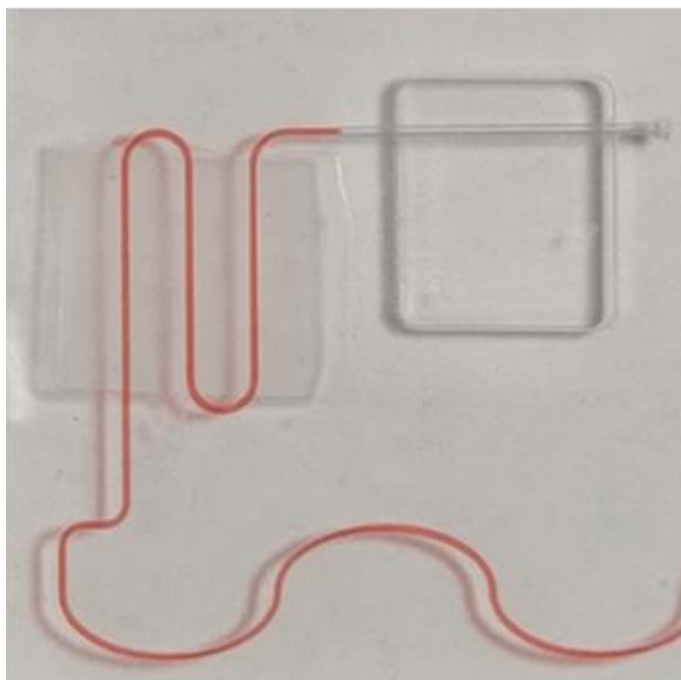


Fig. S3 The red ink flows in the channel. No liquid leakage indicates that the chip is qualified

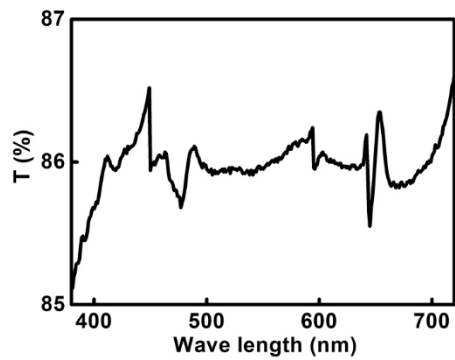


Fig. S4 Transmittance of WMC is in the range of 380-720 nm. The average transmittance is 85.97%. The transmittance at 425 nm is 86.04%. T transmittance, WMC wave-shaped microfluidic chip

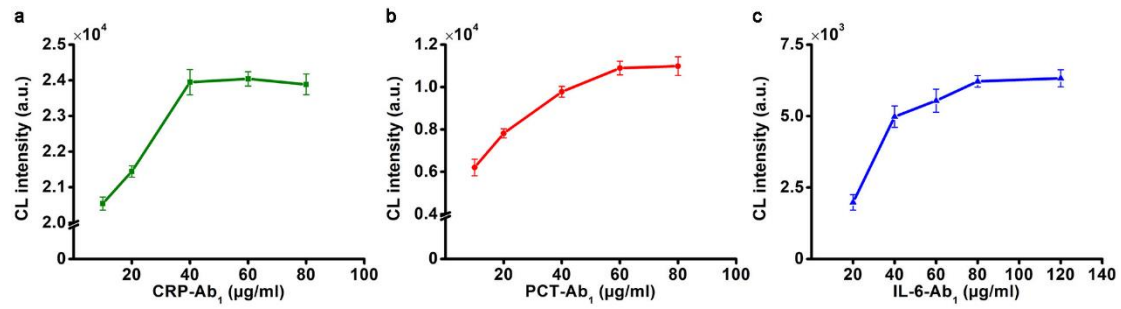


Fig. S5 Optimization of capture antibodies in WMC-MDP. **a** CL intensity for detecting 10 μg/ml of CRP with 10, 20, 40, 60, 80 μg/ml of CRP-Ab₁ and 75 μg/ml of CRP-Ab₂. **b** CL intensity for detecting 0.8 ng/ml of PCT with 10, 20, 40, 60, 80 μg/ml of PCT-Ab₁ and 75 μg/ml of PCT-Ab₂. **c** CL intensity for detecting 100 pg/ml of IL-6 with 20, 40, 60, 80, 120 μg/ml of IL-6-Ab₁, 75 μg/ml of B-IL-6-Ab₂ and 4 μg/ml of SA-HRP. WMC-MDP wave-shaped microfluidic chip assisted multiplexed detection platform, CL chemiluminescence, CRP c-reactive protein, CRP-Ab₁ capture antibodies of c-reactive protein, CRP-Ab₂ detection antibodies of c-reactive protein, PCT procalcitonin, PCT-Ab₁ capture antibodies of procalcitonin, PCT-Ab₂ detection antibodies of procalcitonin, IL-6 interleukin-6, IL-6-Ab₁ capture antibodies of interleukin-6, B-IL-6-Ab₂ detection antibodies of interleukin-6 conjugated with biotin, SA-HRP horseradish peroxidase conjugated with streptavidin

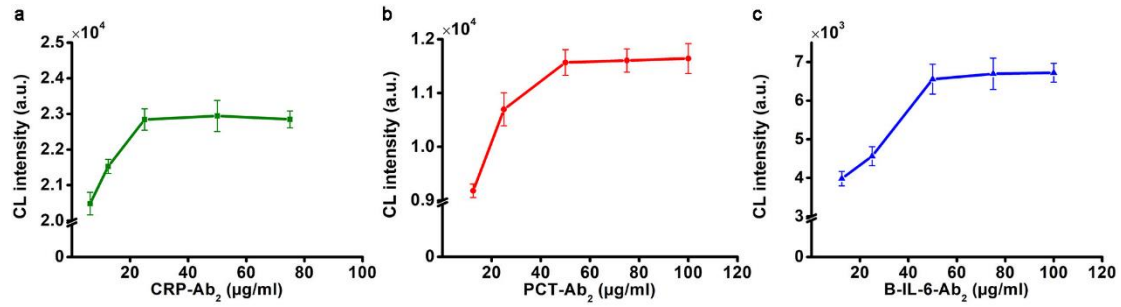


Fig. S6 Optimization of detection antibodies in WMC-MDP. **a.** CL intensity for detecting 10 μg/ml of CRP with 6.25, 12.5, 25, 50, 75 μg/ml of CRP-Ab₂ and 40 μg/ml of CRP-Ab₁. **b** CL intensity for detecting 0.8 ng/ml of PCT with 12.5, 25, 50, 75, 100 μg/ml of PCT-Ab₂ and 60 μg/ml of PCT-Ab₁. **c** CL intensity for detecting 100 pg/ml of IL-6 with 12.5, 25, 50, 75, 100 μg/ml of IL-6-Ab₂, 80 μg/ml of B-IL-6-Ab₁ and 4 μg/ml of SA-HRP. WMC-MDP wave-shaped microfluidic chip assisted multiplexed detection platform, CL chemiluminescence, CRP c-reactive protein, CRP-Ab₂ detection antibodies of c-reactive protein, CRP-Ab₁ capture antibodies of c-reactive protein, PCT procalcitonin, PCT-Ab₂ detection antibodies of procalcitonin, PCT-Ab₁ capture antibodies of procalcitonin, IL-6 interleukin-6, B-IL-6-Ab₂ detection antibodies of interleukin-6 conjugated with biotin, IL-6-Ab₁ capture antibodies of interleukin-6, SA-HRP horseradish peroxidase conjugated with streptavidin

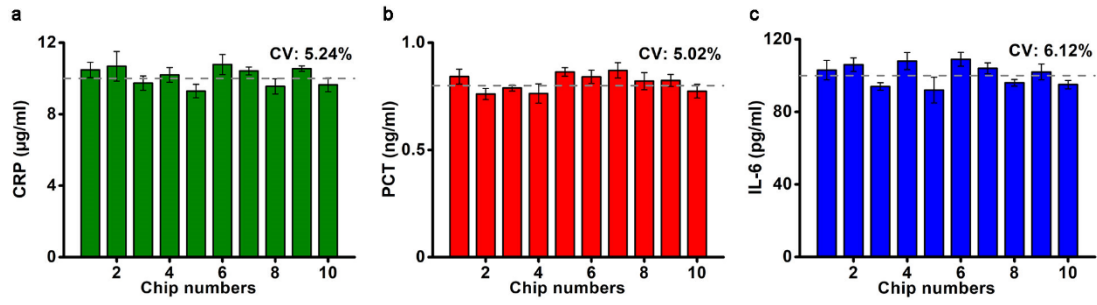


Fig. S7 Reproducibility of CRP, PCT, and IL-6. **a** Results of detecting 10 µg/ml CRP repeatedly in ten chips. **b** Results of detecting 0.8 ng/ml PCT repeatedly in ten chips. **c** Results of detecting 100 pg/ml IL-6 repeatedly in ten chips. CRP c-reactive protein, PCT procalcitonin, IL-6 interleukin-6, CV coefficients of variation

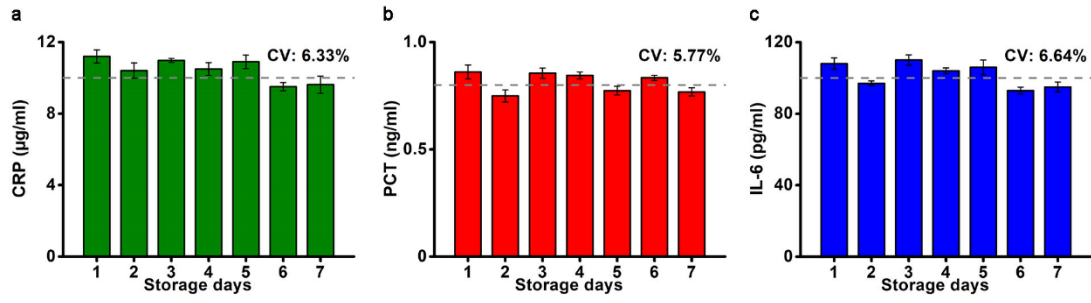


Fig. S8 Storage stability of CRP, PCT, and IL-6. **a** Results of detecting 10 µg/ml CRP in WMC-MDP, which have been stored for 1-7 days. **b** Results of detecting 0.8 ng/ml PCT in WMC-MDP, which have been stored for 1-7 days. **c** Results of detecting 100 pg/ml IL-6 in WMC-MDP, which have been stored for 1-7 days. CRP c-reactive protein, PCT procalcitonin, IL-6 interleukin-6, CV coefficients of variation, WMC-MDP wave-shaped microfluidic chip assisted multiplexed detection platform