Electronic Supplementary Material (ESI) for Lab on a Chip.

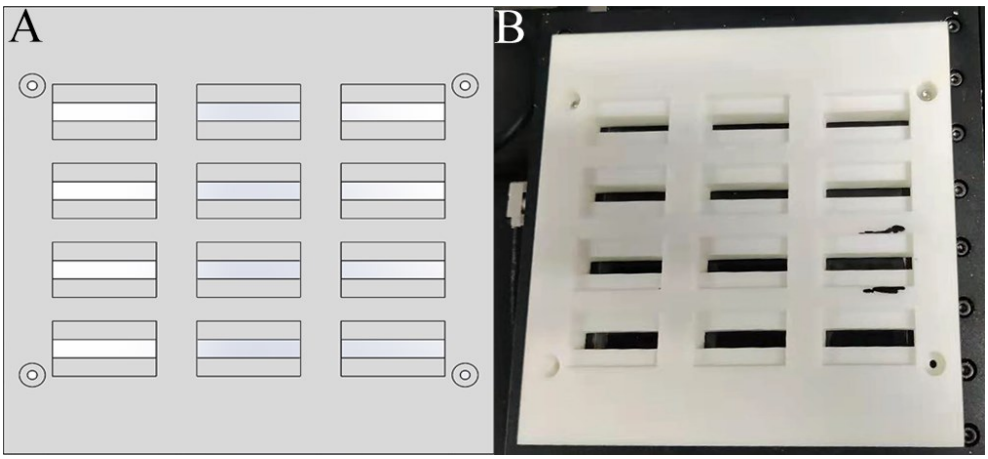

Fig.S1 The simulation diagram and physical diagram of working stage that can hold 12 ddPCR chips.

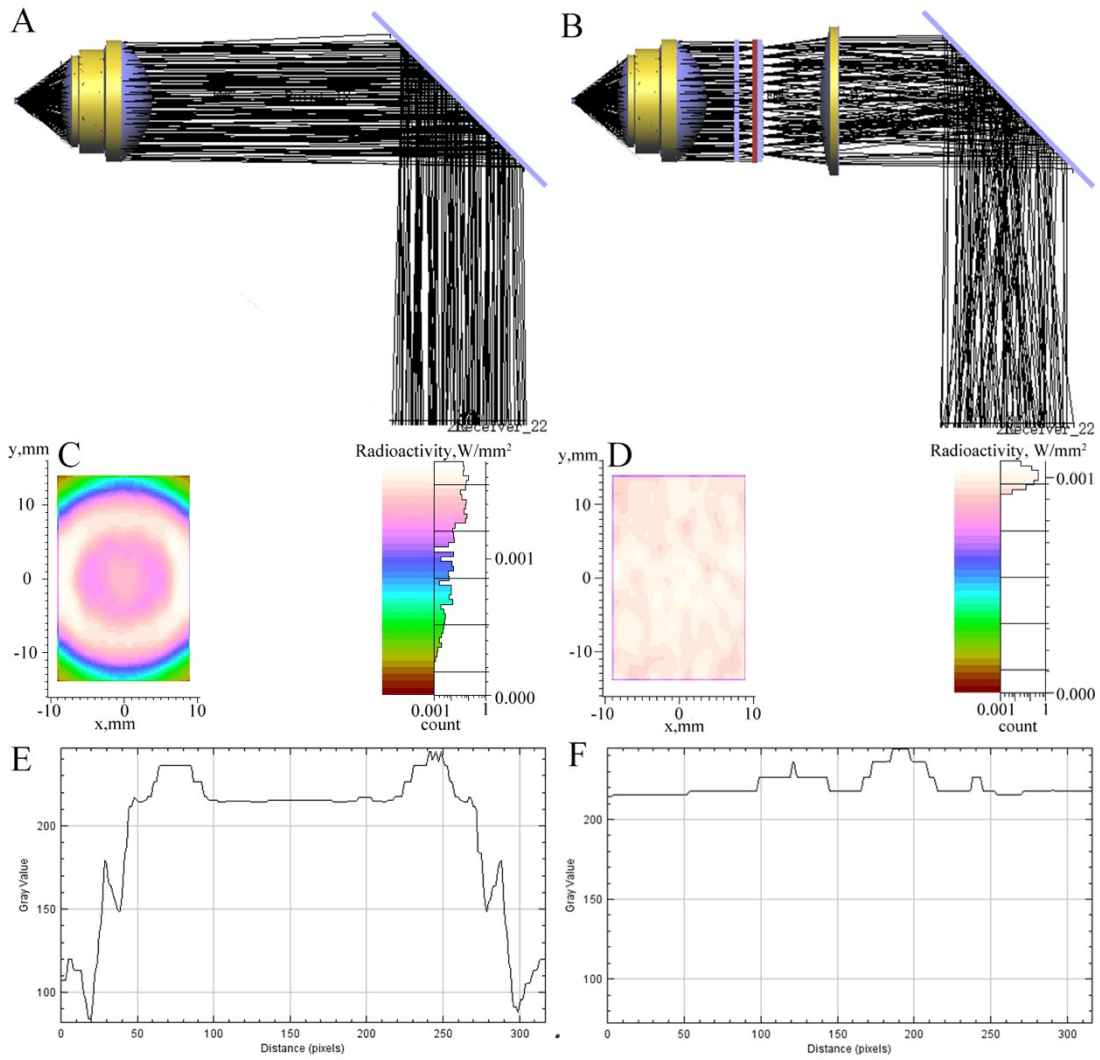

Fig S2 (A) Simulated light path diagram of traditional lighting system, (B) Simulated light path diagram of compound eye lighting system, (C) Simulate light uniformity map of traditional lighting system, (D) Illumination uniformity map of simulated compound eye lighting system, (E) Gray value of traditional lighting system diagram, (F) Gray value of compound eye lighting system diagram.

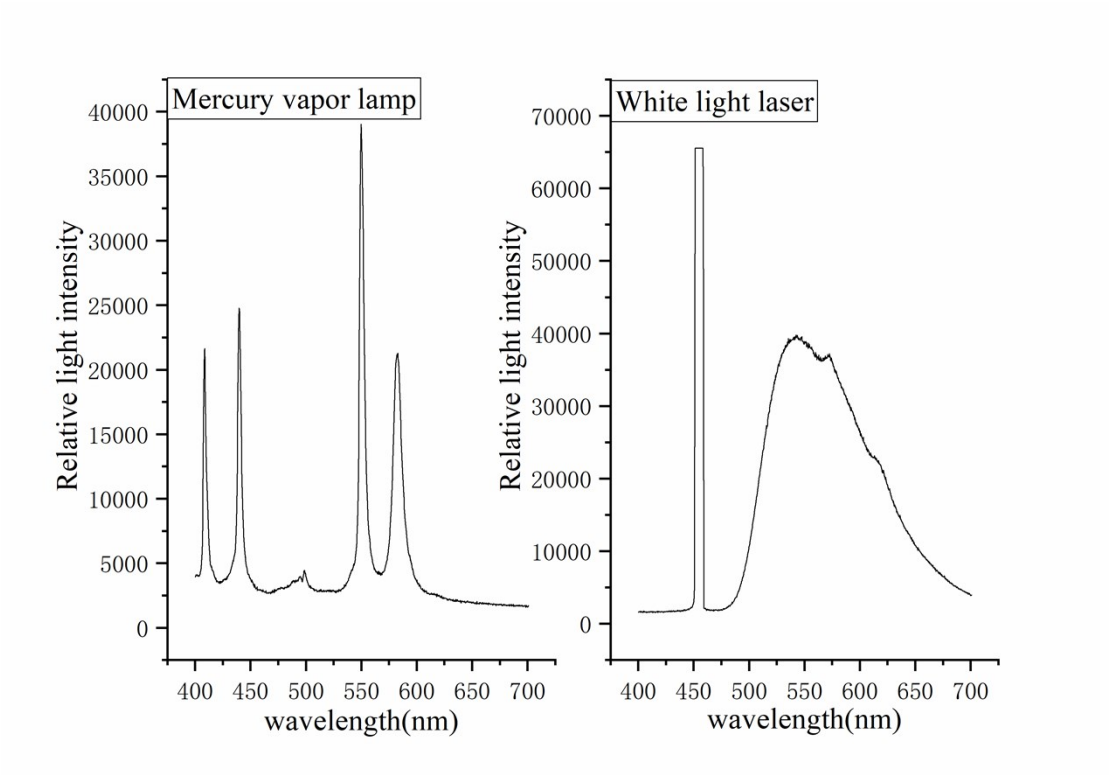

Fig.S3 The spectrum of the white light laser and mercury vapor

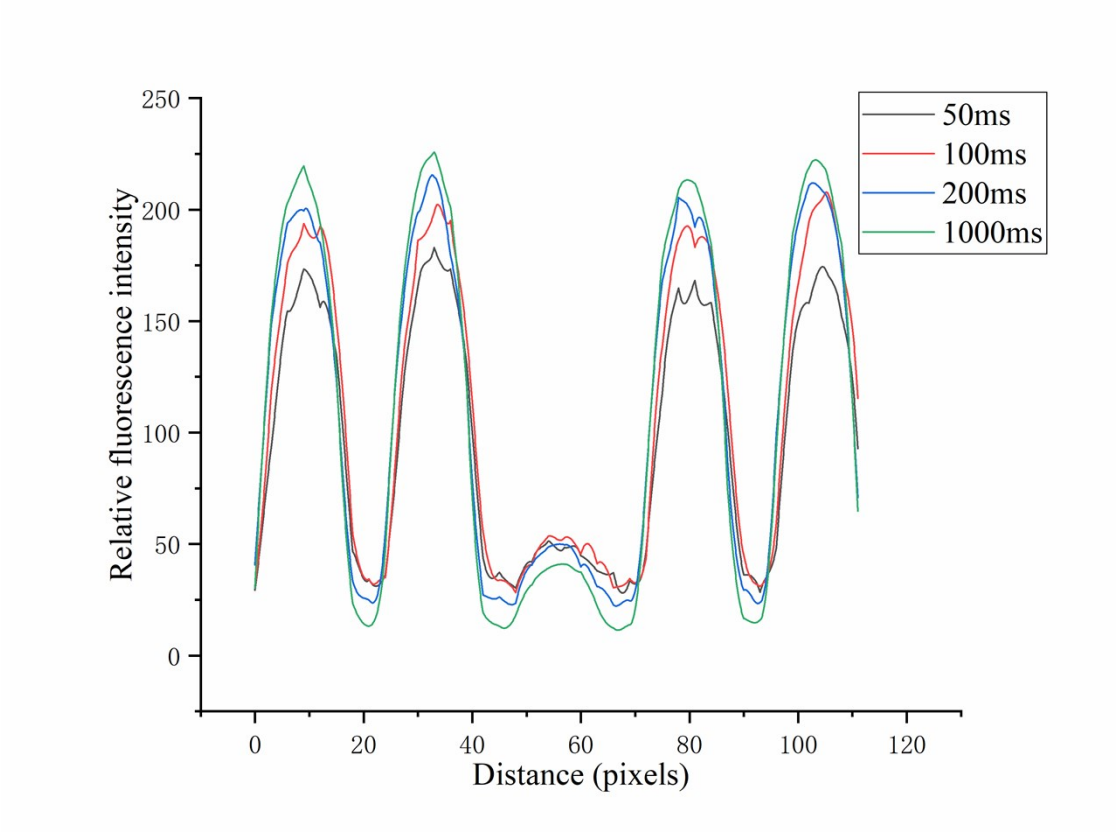

Fig.S4 Fluorescence intensity analysis of the micro reaction chamber at different exposure times.

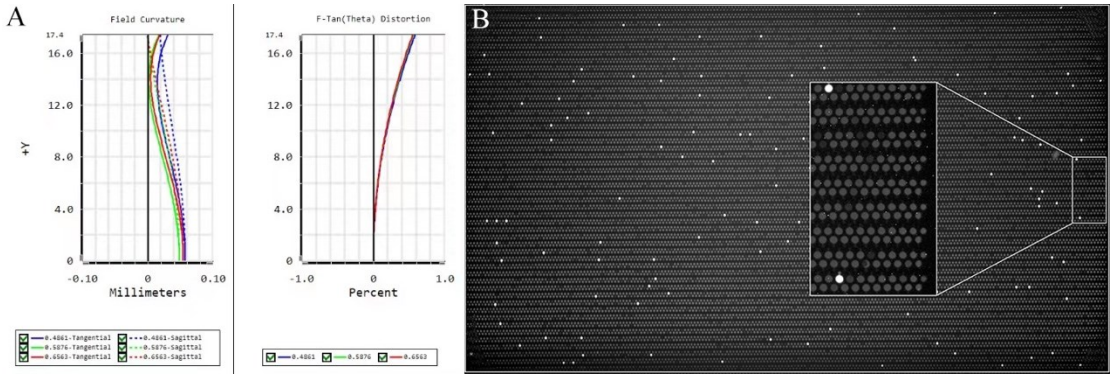

Fig S5 (A)Field curvature and distortion, (B) The micro chambers at the edge of the picture

Table Captions

Table S1 The specific values of the different light source in different cases.

Light source	Total light intensity	At 525nm	At 571nm	HEX	ROX
White light laser	0.554W	53.4mW	64.2mW	2.2mW	2.74mW
mercury vapor	0.548W	8.63mW	61.8mW	0.5mW	5.49mW

Table S2 The data analysis of different lighting methods

Concrete parameter	Traditional lighting system	Compound eye lighting system
maximum gray value	244.3	244.3
minimum gray value	91	222.5
illumination uniformity	54.27%	95.33%

Table S3 Parameters of compound eye lens array

Half width of microlens in X direction /mm	Half width of microlens in Y direction /mm	thickness /mm	Radius of curvature /mm	Materials
0.55	0.85	1	2.9	PMMA

Table S4 The statistical data of the droplet digital PCR assay

Expected concentration (copies/μL)	Experiment 1		Experiment 2		Experiment 3		Average (calculated concentration) (copies/μL)
	d_1	λ_1(copies/μL)	d_2	λ_2(copies/μL)	d_3	λ_3(copies/μL)	
1×10^1	15	1.10×10^1	24	1.70×10^1	17	1.20×10^1	1.33×10^1
1×10^2	156	1.10×10^2	180	1.27×10^2	141	0.90×10^2	1.09×10^2
1×10^3	1631	1.20×10^3	1583	1.10×10^3	1716	1.28×10^3	1.23×10^3
1×10^4	9329	0.93×10^4	10199	1.06×10^4	9129	1.03×10^4	1.01×10^4
1×10^5	19110	1.04×10^5	19091	1.16×10^5	19117	0.91×10^5	1.04×10^5