Electronic Supplementary Information

Time-Resolved and Temperature Tuneable Measurements of Fluorescent Intensity using a Smartphone Fluorimeter

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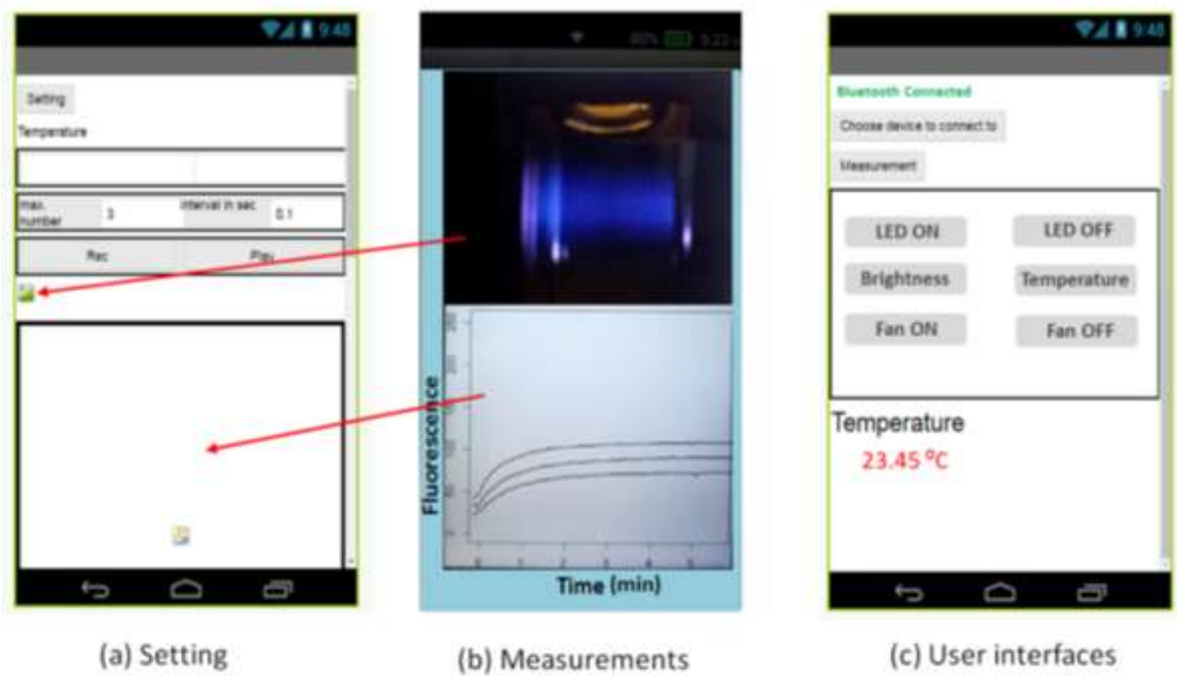

Fig. S1. Smartphone fluorimeter screen shots of the time and temperature dependence of fluorescence measured by the app: (a) Screen shot requesting time for measurement, number of images and time interval; (b) is an image of an actual measurement run using the smartphone fluorimeter. The graphical canvas shown at the bottom of this screen displays the fluorescence evolution over time; (c) Interface of component parameters in the instrument including LED ON/OFF switch. Screen shots (a) and (c) were taken whilst designing the app on a computer.

Table S1: Voltage (V) and current (I) measurements across all electronics components at different load conditions. Minimum load: when only excitation source (UV LED), temperature sensor and Bluetooth are connected to the Arduino module. Maximum load: When a 2 x 2 cm Peltier was added. The UV LED was OFF to reduce current load when the Arduino circuit was adjusting the temperature by driving the Peltier. This extended the lifetime to over an hour of continuous use. Power consumption by the temperature sensor and Peltier module were obtained from their specification sheets.

	Peltier		**Fan**		**LED**		**Bluetooth**	
	V (volts)	*I* (A)	*V* (volts)	*I* (mA)	*V* (volts)	*I* (mA)	*V* (volts)	*I* (mA)
Minimum load (LED, *T* sensor & Bluetooth module)	-	-	-	-	3.43	5.5	5	-
Maximum load 2 x 2 cm Peltier, Cooling fan, LED, *T* sensor & Bluetooth module)	0.92	0.41	2.83	-	3.01	0 (OFF)	2.83	-

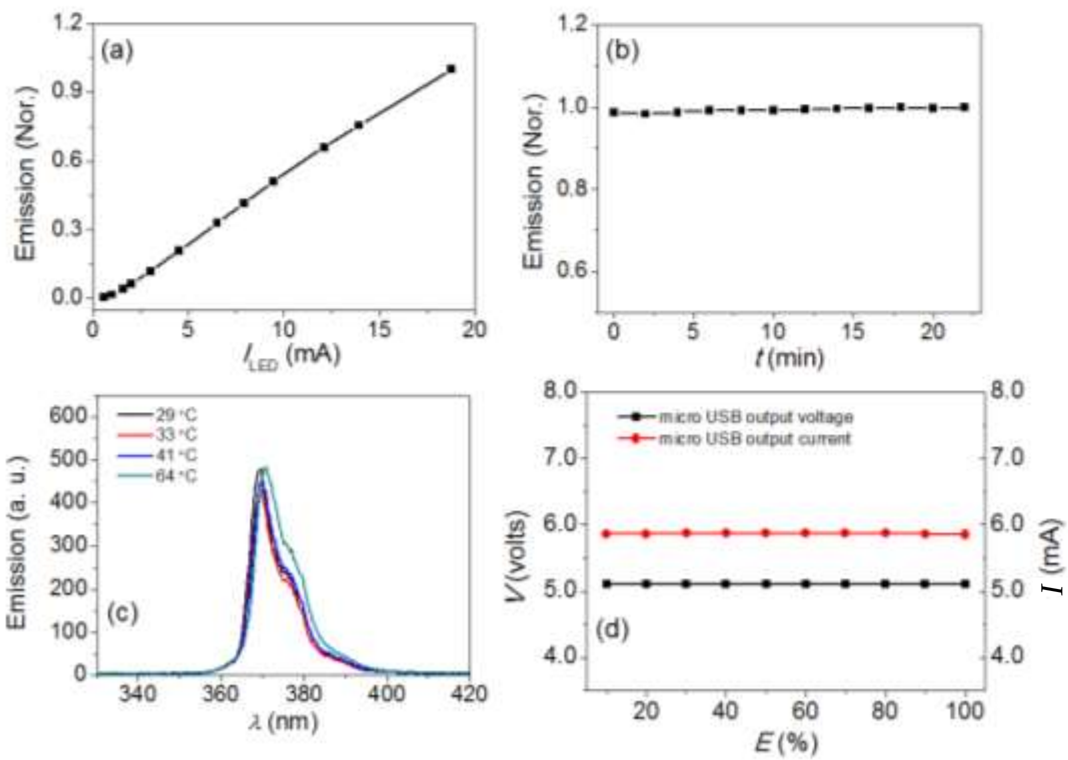

Fig. S2. Characterisation results of the excitation source and power supply of the smartphone fluorimeter: (a) Linearity of the optical emission at different levels of diode current (I_{LED}) at room temperature (22 ^{o}C); (b) stability of optical emission over the time (@ 22 ^{o}C, I_{LED} = 5.3 mA, V_{LED} = 3.2 V); (c) excitation spectra at different temperatures above room temperature (for clarity the spectra at 22 ^{o}C is not shown but is identical to 29 ^{o}C); and (d) stability of the supplied voltage, V and current, I, measured from the micro-USB over the discharging cycle of the smartphone battery energy, E, with an 83 Ω resistor in series. The results show that the existing internal driver regulation circuit of the smartphone can continue to provide a constant ~ 5 V output at the micro-USB port.