## **Electronic Supplementary Information**

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## **Photodetector Fabrication**

Figure S1 shows the fabrication process of the femtogel interdigitated photodetector. A thin layer (24 nm) of the femtogel was uniformly coated on a 300 nm SiO<sub>2</sub>/Si substrate using the spin casting technique (Figure S2a and S2b) followed by baking the femtogel at 120°C for 30 min. The femtogel thin film was coated at a speed of 6000 rpm. The spinning speed was increased gradually in different steps, (i.e., 1000 rpm, 2000 rpm, 4000 rpm, and 6000 rpm) for 10 s in each step, which results in a uniform thin film at 24 nm thick followed by post-baking at 120°C for 10 min. Multiple layers (1.6 µm) of poly(methyl methacrylate) PMMA were coated onto the femtogel film followed by baking at 160°C for 10 min. Patterning the interdigitated electrodes with 18 fingers on each side with an initial distance of  $1 \mu m$  between each adjacent finger was conducted using an electron-beam lithography technique with an electron-beam dose of 275  $\mu$ C/cm<sup>2</sup>. The patterned structure was transferred into the substrate through the reactive ion etching process using oxygen as an etchant gas with an oxygen flow rate of 10 sccm, working pressure of 100 mTorr, radio frequency power of 50 W, and etching time of 10 min to remove the femtogel between the patterned interdigitated electrodes. In addition, 0.3 nm of Ti/60 nm Au was deposited onto the patterned structure using an electron-beam evaporation technique to form electrodes. In the next step, 800 nm thick PMMA was coated using spin coating, and the second electron-beam lithography process was carried out to write the channel, isolate the photodetector, and remove the excess femtogel. The femtogel photodetector with 577 nm distance between adjacent fingers (Figure 3S) was achieved by final liftoff process to remove the PMMA film from the top of the device.



Figure S1: Schematic diagram of femtogel photodetector fabrication process.



Figure S2: (a) Optical image and (b) SEM image of the 24 nm thick femtogel thin film deposited on a 300 nm SiO<sub>2</sub>/Si substrate using spin casting method.



Figure S3: The SEM image of the width of the femtogel

(577 nm) between fingers in the fabricated photodetector.