Supplemental Information for

Enhanced Plasma Generation from Metal Nanostructures via Photoexcited Hot Electrons

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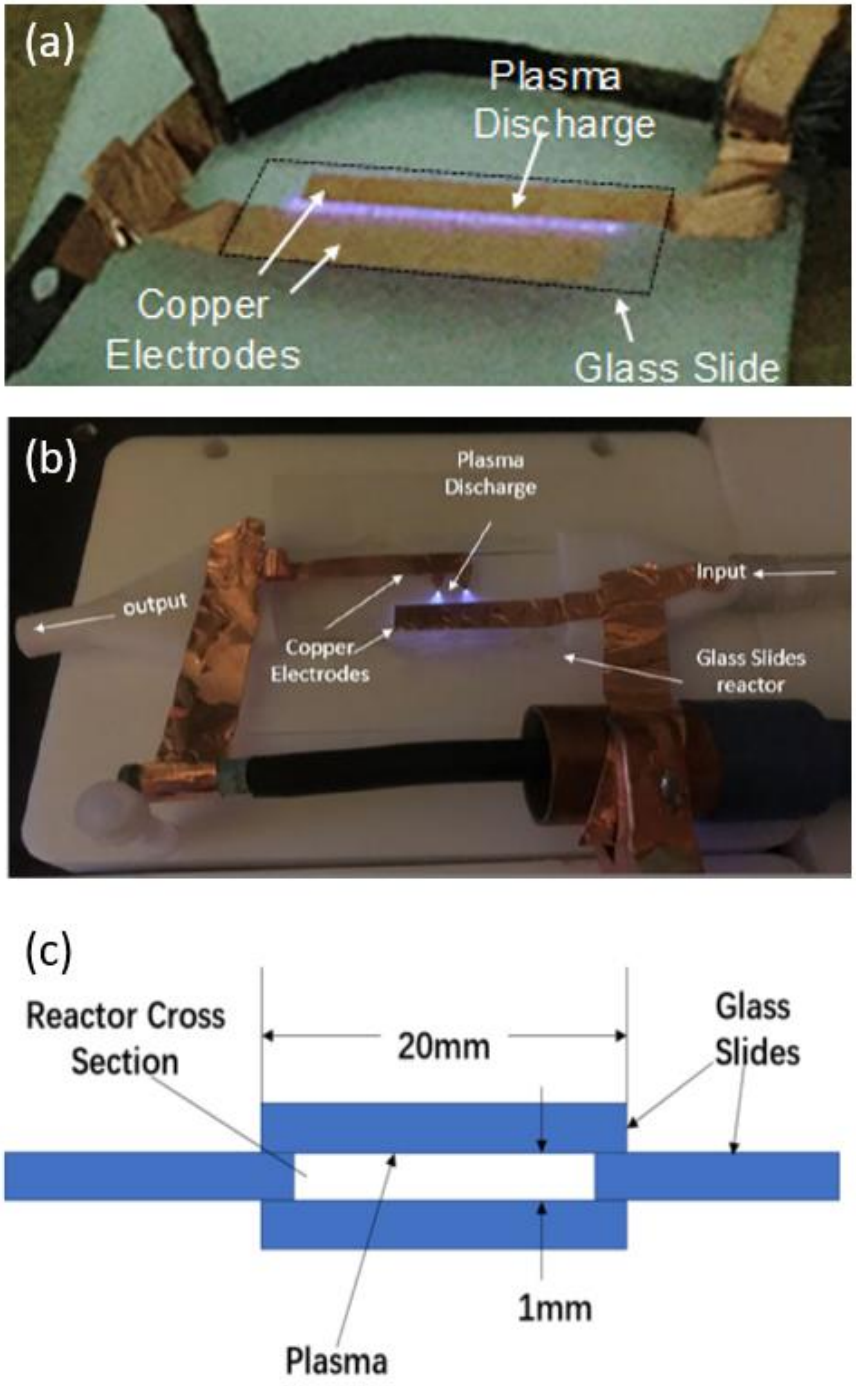

Figure S1. (a) Photograph of the nanosecond pulse plasma discharged across a 5mm gap on a glass slide and (b) an image of the glass slide reactor together with (c) cross-sectional diagram.

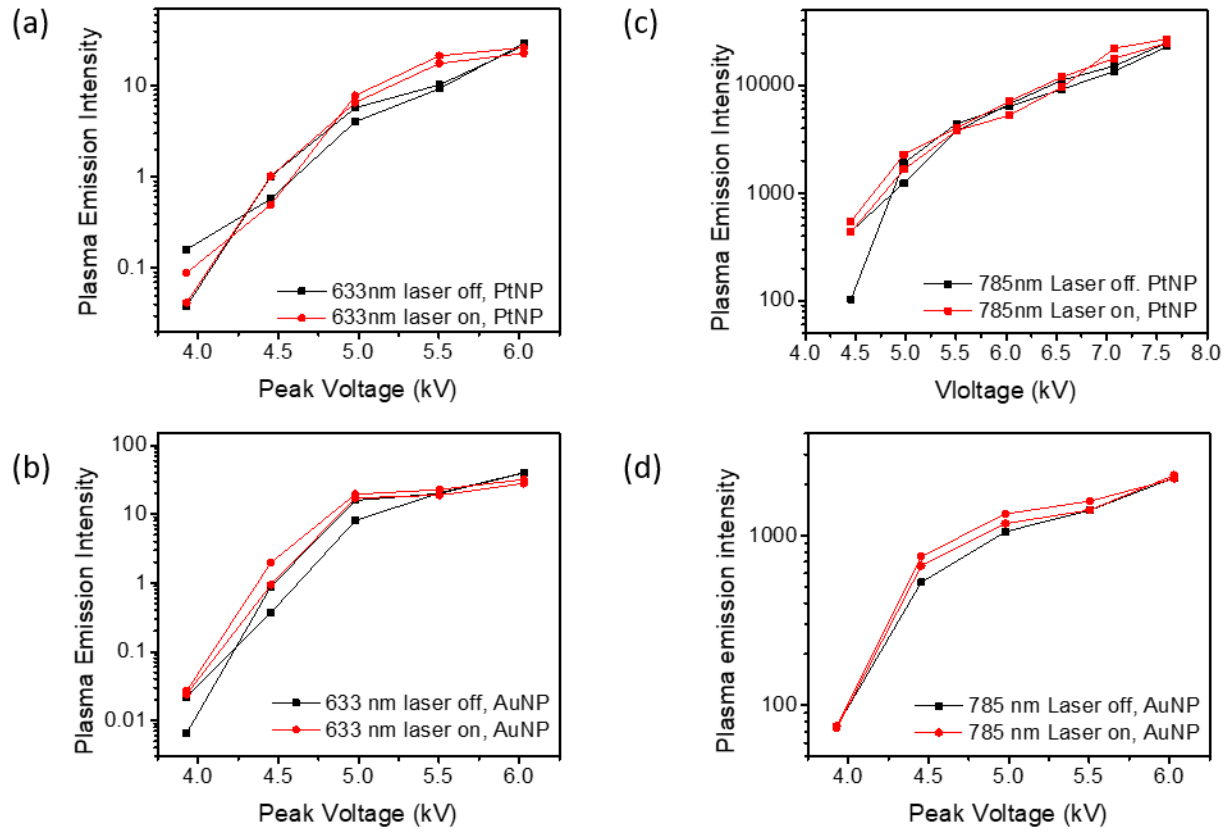

Figure S2. Plasma emission intensity of argon 912.3 nm emission peak discharged across (a) (c) Pt nanoparticles and (b) (d) Au nanoparticles with and without 633nm or 785nm laser irradiation. No obvious enhancement can be observed with laser irradiation of both wavelength for both metal nanoparticles.

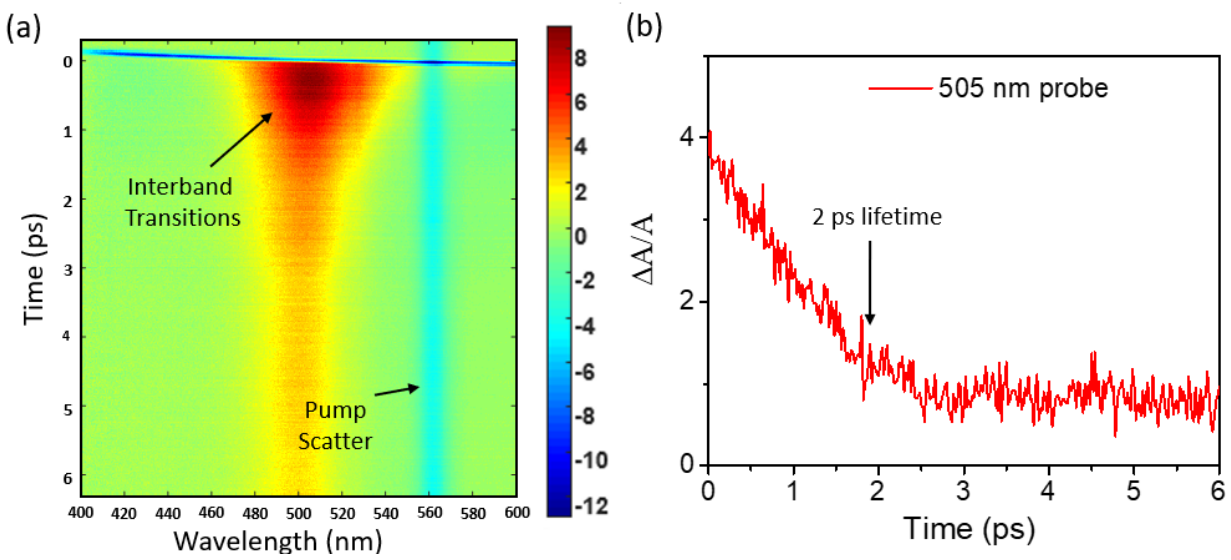

Figure S3. (a) Transient absorption spectra measured on a Au grating nanostructure plotted as a function of wavelength and time. (b) Time dependence obtained with a 505 nm probe wavelength. These results suggest that the lifetime of hot electrons inside gold nanostructures can be extend several psec.[1]

Reference

1. Wang, Y.; Shi, H.; Shen, L.; Wang, Y.; Cronin, S. B.; Dawlaty, J. M., Ultrafast Dynamics of Hot Electrons in Nanostructures: Distinguishing the Influence on Interband and Plasmon Resonances. *ACS Photonics* **2019,** *6* (9), 2295-2302.