

**Supplementary Materials of the Manuscript:**

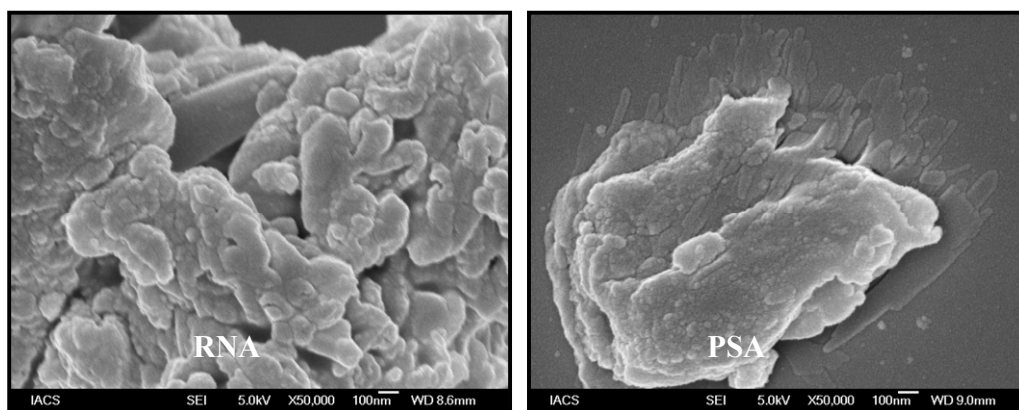
**Optical and Electronic Properties of Polyaniline Sulfonic Acid – Ribonucleic acid -  
Gold Nanobiocomposites**

Parimal Routh, Ashesh Garai and Arun K. Nandi\*

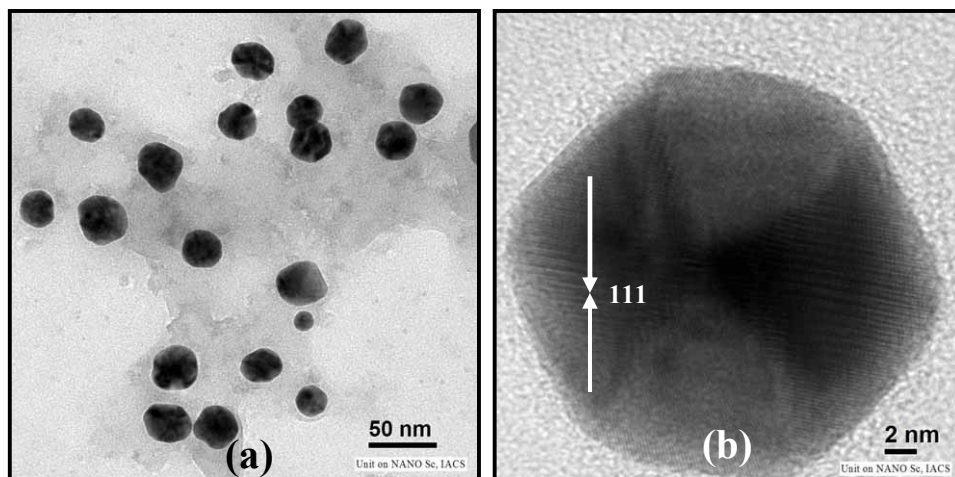
Polymer Science Unit, Indian Association for the Cultivation of Science, Jadavpur,  
Kolkata-700 032, India

---

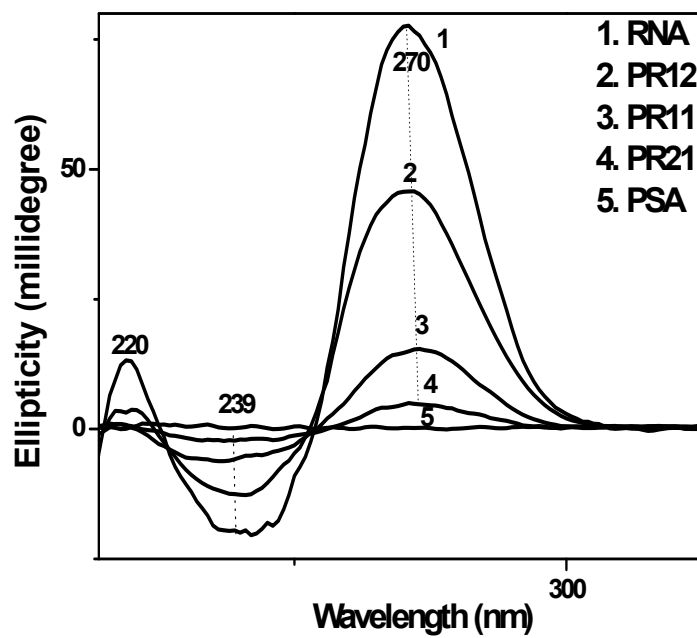
\* For correspondence: [psuakn@mahendra.iacs.res.in](mailto:psuakn@mahendra.iacs.res.in).



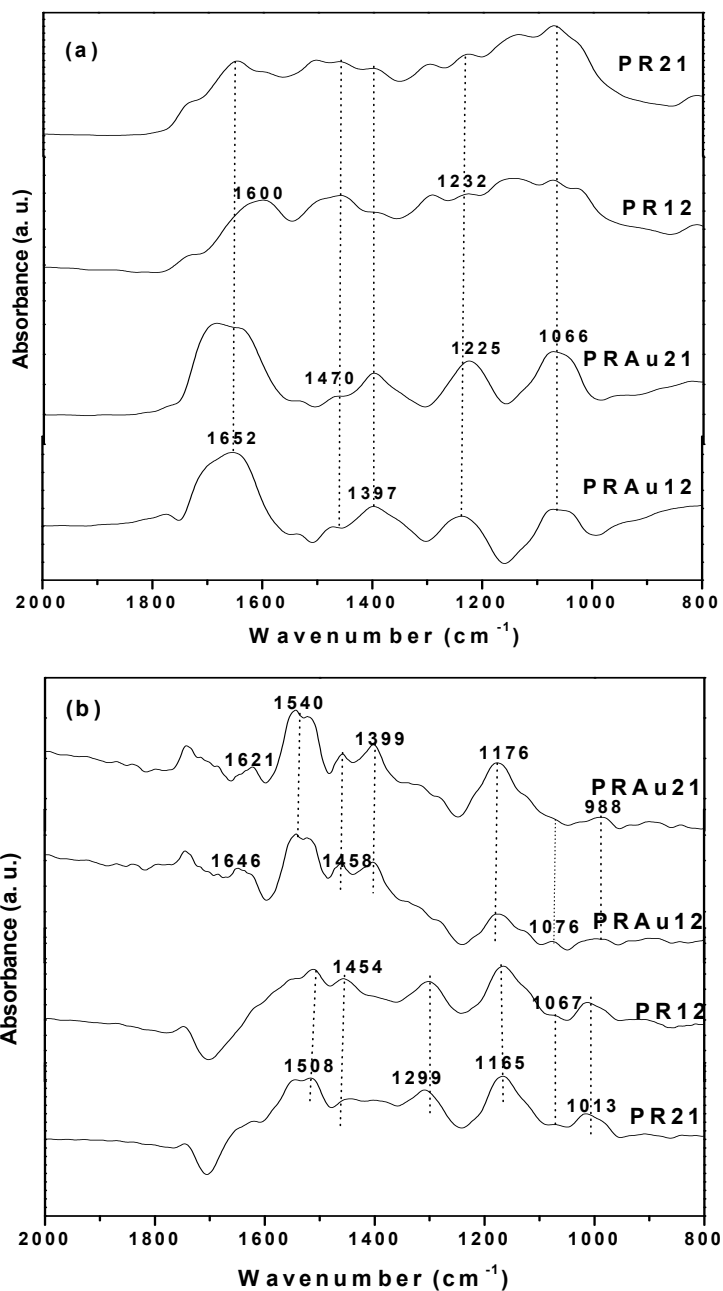
**Suppl. Figure -1** FE-SEM micrographs of RNA and PSA



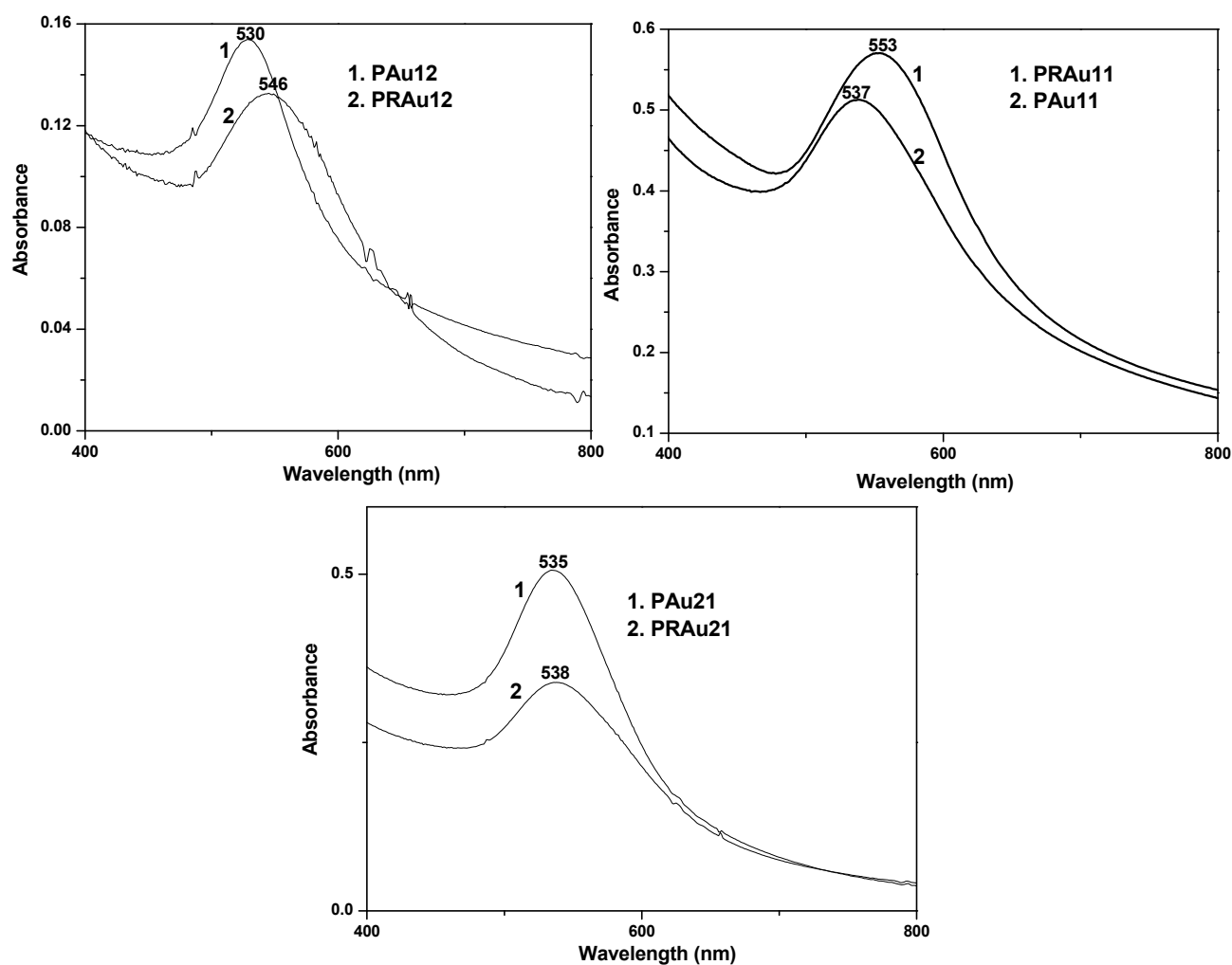
**Suppl. Figure - 2** TEM images of (a) Au nanoparticles on the PSA fibril produced by reduction of  $\text{Au}^{3+}$  with PSA under same condition as in PRAu11 hybrid and (b) HRTEM image of PRAu12 nanobiocomposite



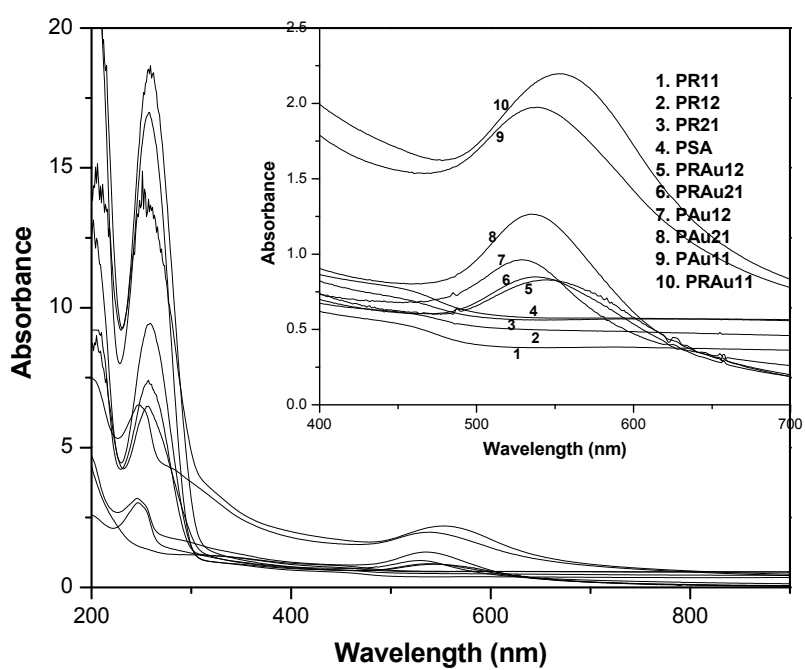
**Suppl. Figure -3** Normalized CD spectra of RNA, PSA and PR12, PR11 and PR21 hybrid solutions with respect to RNA concentration



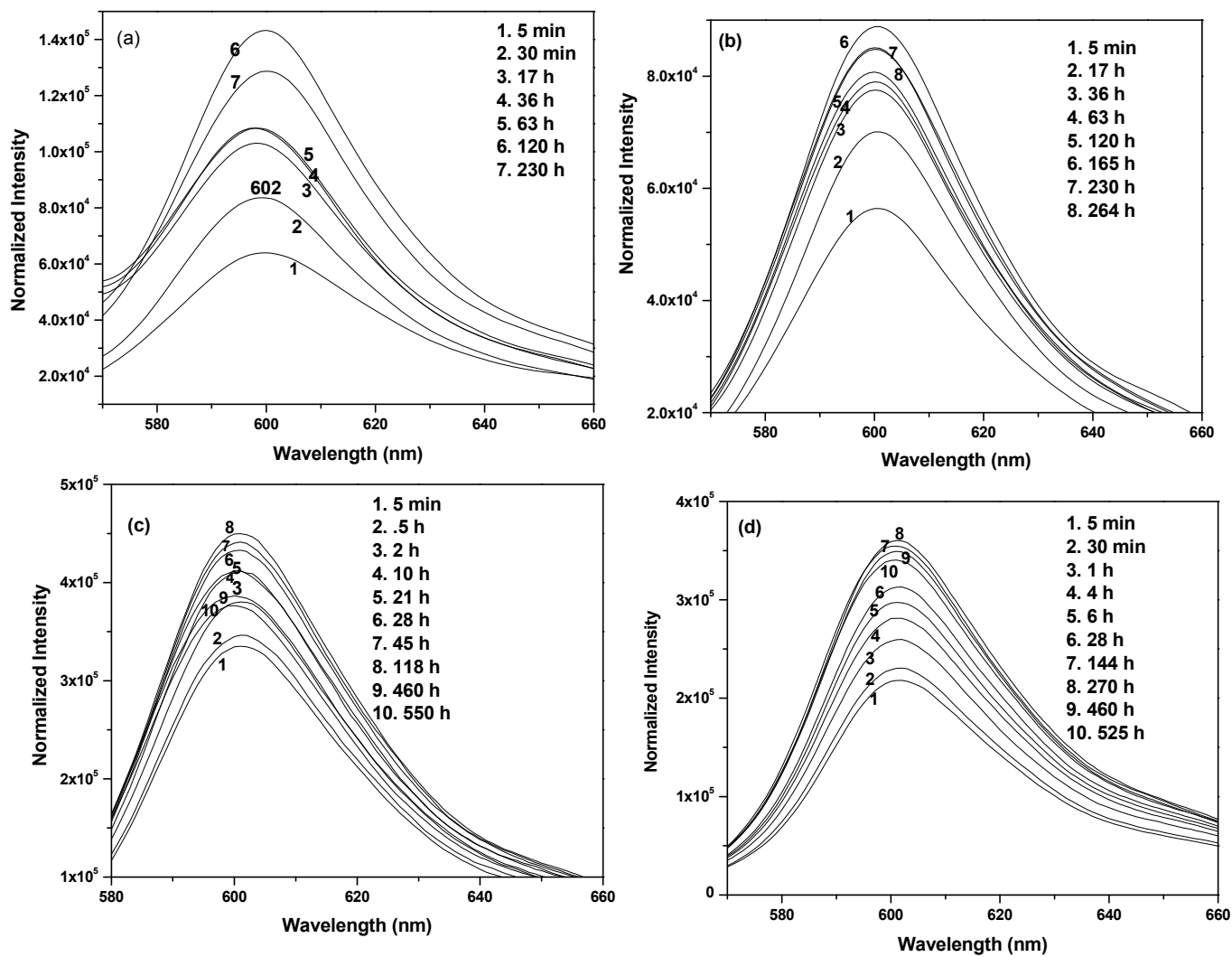
**Suppl. Figure - 4** FT-IR spectra of (a) PSA subtracted PR hybrids and PRAu composites at indicated compositions, (b) RNA subtracted PR and PRAu composites at indicated compositions



**Suppl. Figure – 5** Comparison of UV-vis spectra between indicated P Au and P RAu composites after 10 h produced under identical compositions

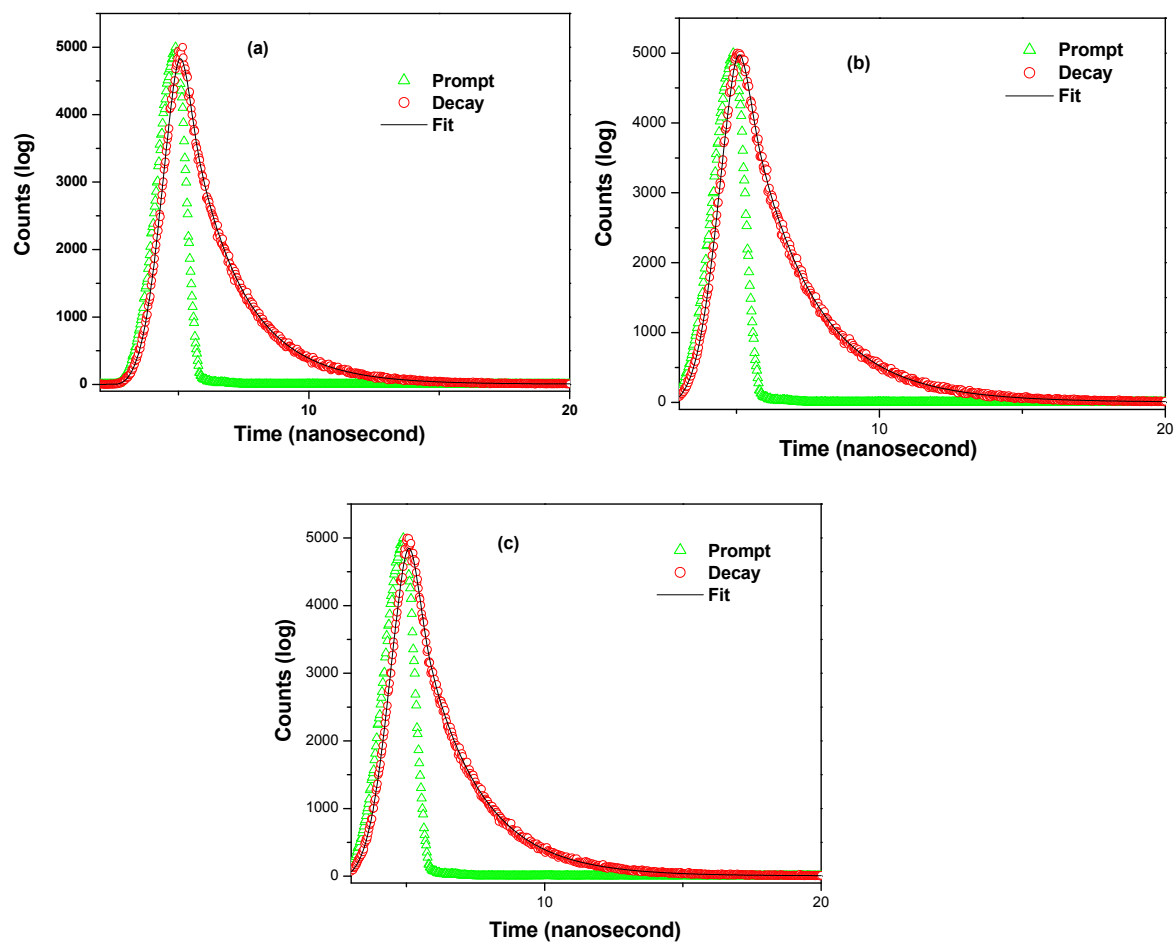


**Suppl. Figure – 6** Normalized UV-vis spectra of different solutions with respect to PSA concentration after 5 minutes (the enlarged spectra are shown in the inset)

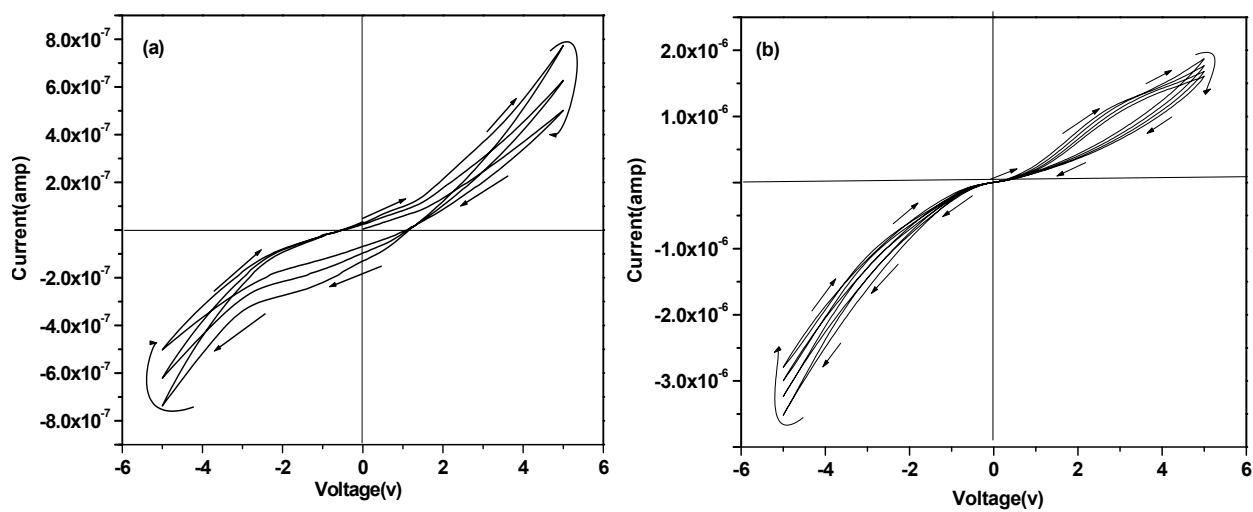


**Suppl. Figure - 7** Normalized PL spectra of (a) PR12, (b) PR21, (c) PRAu12 and (d) PRAu21 solutions with respect to PSA concentration at 30 °C for indicated aging times

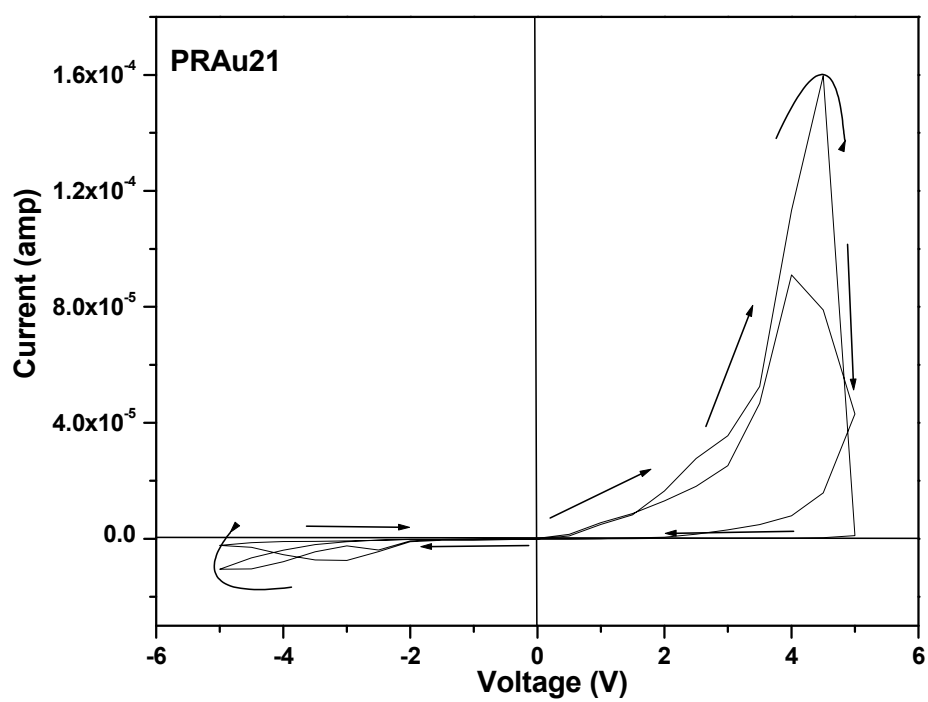




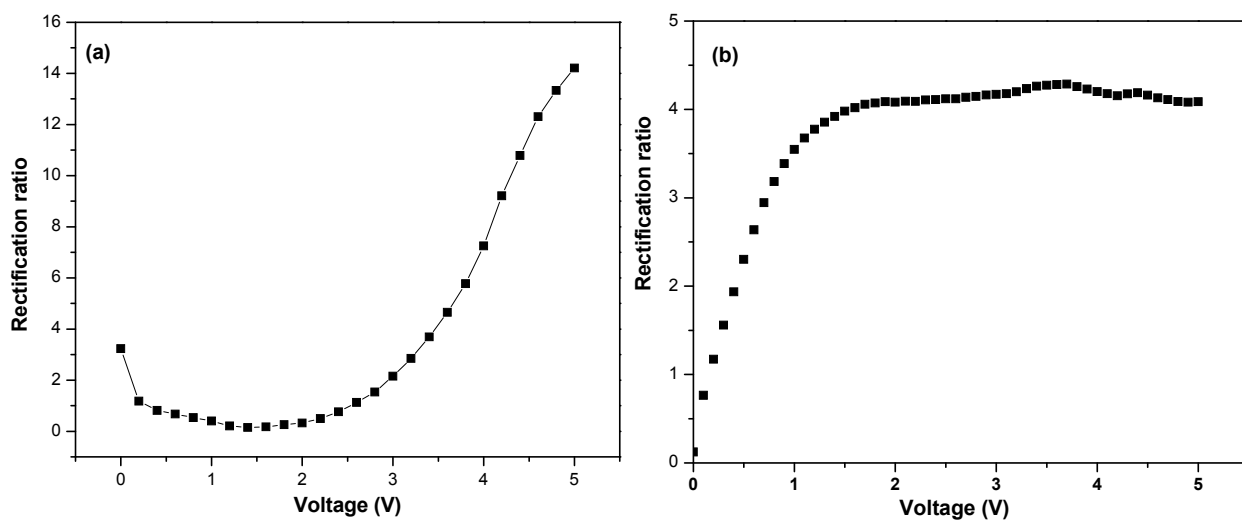
**Suppl. Figure -8** Time-resolved fluorescence decay of (a) PSA, (b) PR11 and (c) PRAu11 at 30 °C ( $\lambda_{\text{ex}} = 560$  nm)



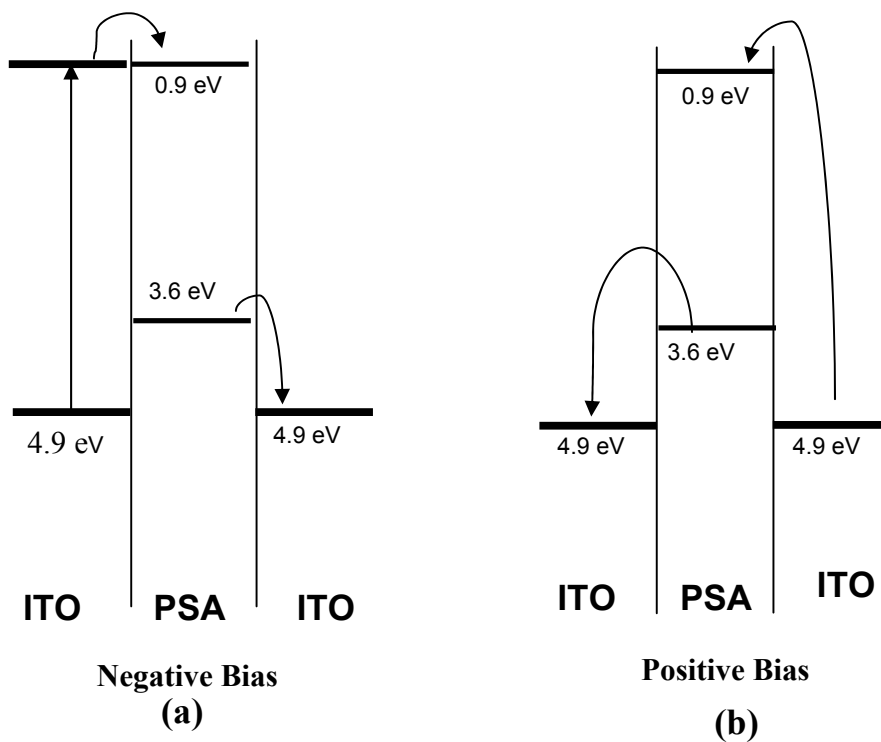
**Suppl. Figure - 9** Current-Voltage (I-V) characteristic curves of (a) PR12 and (b) PR21 system



**Suppl. Figure - 10** Current-Voltage (I-V) characteristic curves of PRAu21 system



**Suppl. Figure - 11** Plot of rectification ratio vs voltage of (a) PRAu11 and (b) PSA system



**Suppl. Figure - 12** Band energy diagram of PSA junction at two different bias directions. Bias was applied with respect to left ITO (in both positive and negative bias) electrode. Curved arrows represent electron transfer. All energy levels are drawn with respect to vacuum level ( $E = 0$ )