## **Supporting document**



**Figure S1.** UV-VIS spectra of modified AgNPs with (a) octadecanethiol and (b) dodecanethiol at concentration of 1.4 mM.

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Figure S2. Effect of optimization parameters for the extraction of gramicidin from spiked aqueous sample (0.53  $\mu$ M of gramicidin) by using modified AgNPs with dodecanthiol (a) extraction time; (b) pH; (c) salt; (d) temperature.



Figure S3: MALDI-TOF MS spectra of mixed proteins obtained (a) direct analyis of spiked urine sample; (b) by using modified AgNPs at room temperature with addition of salt and pH 7.0.