

**Supplementary Material Captions:**

**Supplemental Table 1 (ESM\_1)** Material Specifications from nanoComposix

**Supplemental Table 2 (ESM\_2)** Nanoparticle characterizations in MQ and FW

**Supplemental Fig. 1 (ESM\_3)** XPS analysis of custom synthesized AgSi NPs with three levels of amination (0.5x, 1x, 2x).

**Supplemental Fig. 2 (ESM\_4)** Dose responses for the SEF particles with varied surface amination.