Abstract Submitted
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Growth of well-defined metal and oxide nanoparticles on biological surfaces VLADIMIR TSUKRUK, Georgia Tech — We present a brief overview of our recent studies in the field of bio-enabled surface-mediated growth of inorganic nanoparticles at room temperature and ambient conditions. We demonstrate that all titania, gold, and silver nanoparticles can be grown with relatively monodisperse diameter within 4-6 nm surrounded by biological shells of 1-2 nm thick. As biological templates we utilized ultrathin, molecular uniform and micropatterned surface layers of two different proteins: silk fibroin (for growth of gold and silver nanoparticles) and silaffin (for growth of titania nanoparticles). To identify the grown nanophases and chemical composition/secondary structure of biological templates we applied combined AFM, SEM, TEM, XPS, SERS, UV-vis, and ATR-FTIR techniques.

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