

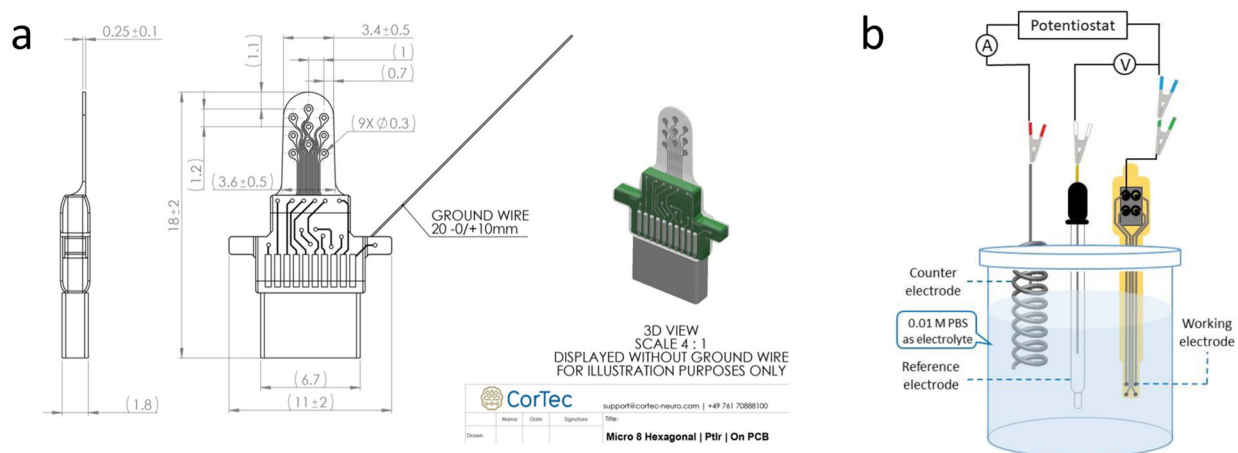


Figure S1: (a) Layout of the CorTec micro 8 hexagonal ECoG array [60], (b) Simplified EIS measurement setup

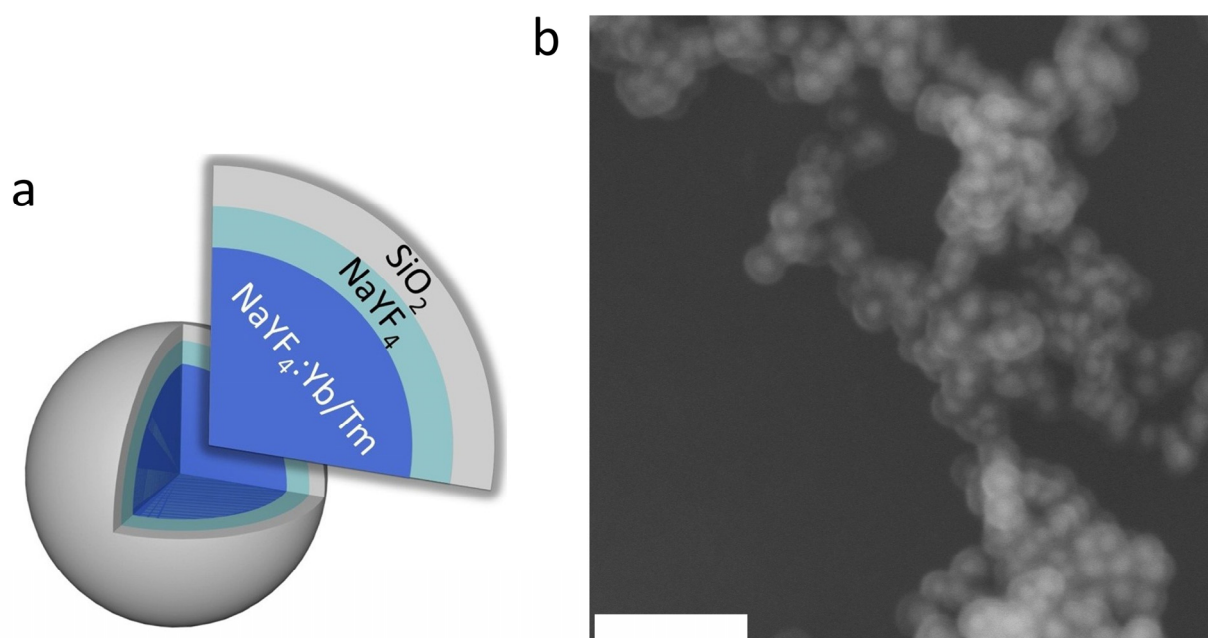


Figure S2: UCNP structure (a) Multilayer, core-shell structure of our UCNPs [61] (b) Visible multilayers under SEM (scalebar indicates 200 nm)

60. Cortec AirRay Grid Micro 8 Hexagonal ECoG Electrode. Available online: <https://www.cortec-neuro.com/products-and-services/electrodes/grid-and-strip/> (accessed on 29 August 2024).
61. Chen, S.; Weitemier, A.Z.; Zeng, X.; He, L.; Wang, X.; Tao, Y.; Huang, A.J.Y.; Hashimoto, Y.; Kano, M.; Iwasaki, H.; et al. Near-infrared deep brain stimulation via upconversion nanoparticle-mediated optogenetics. *Science* **2018**, *359*, 679–684. <https://doi.org/10.1126/science.aag1144>.