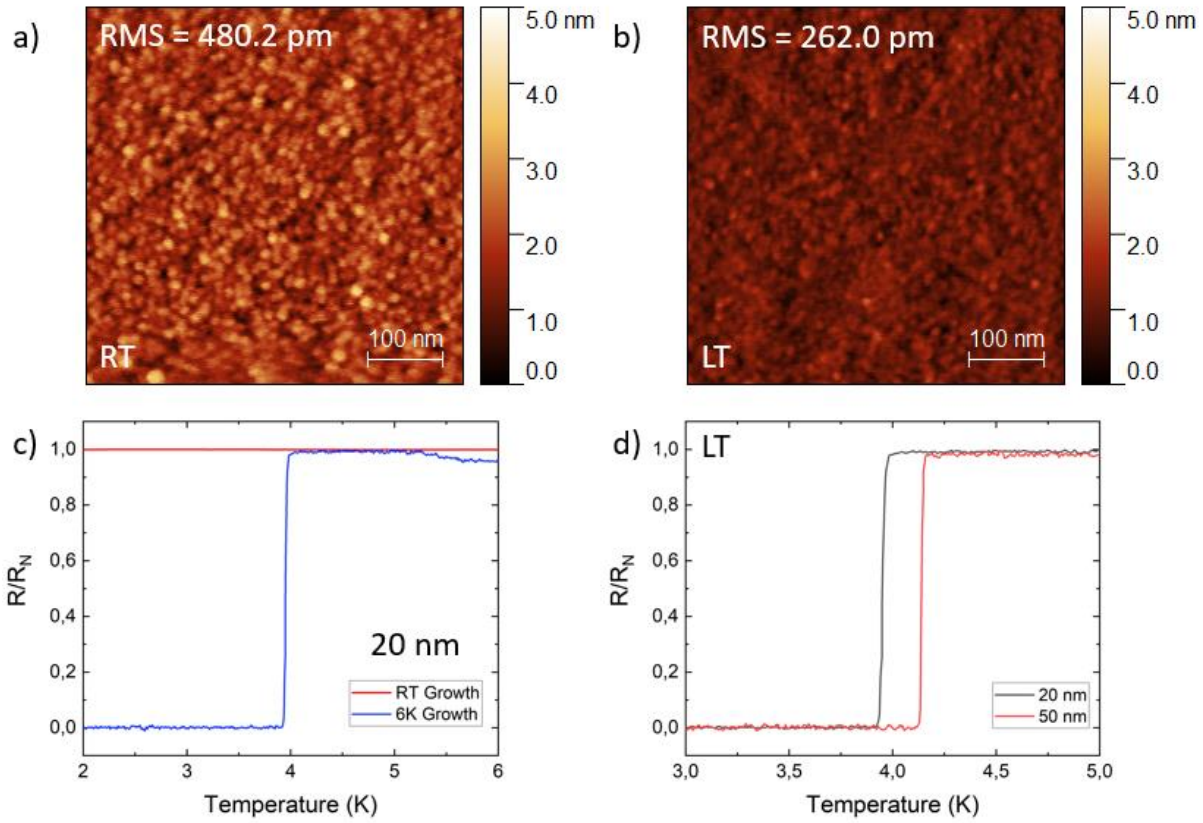

Fig 1. Initial structural and electrical characterization of Ta thin film. *a) Atomic Force Microscopy (AFM) image of the 20 nm tantalum grown at RT on SiO_2/Si. From this 500 x 500nm scan, the roughness is calculated to be RMS = 480.2 pm. b) AFM image of the tantalum grown at LT. From this 500 x 500nm scan, the roughness is calculated to be RMS = 262.0 pm. c) Four-probe resistance measurement of RT (red) and LT (blue) grown tantalum for a 20 nm thick film. Superconducting transition is observed at 3.95K. d) Four-probe resistance measurement LT grown tantalum for a 20 (black) and 50 (red) nm thick film. Superconducting transition for 50 nm thick film is observed at 4.14K.*