



Figure 1.
Extramitochondrial K^+ controls mitochondrial morphology and respiration. **a**, Mitochondria incubated in sucrose medium without K^+ and Pi has a condensed matrix and expanded cristae (left). When K^+ and Pi are added to the incubation medium, they are imported into the mitochondria, resulting in matrix swelling and narrowing of cristae (right). **b**, Oxygen consumption rate (OCR) of isolated mouse liver mitochondria preincubated in the sucrose medium and energized with pyruvate/malate upon exposure to 20 mM K - Pi or NMDG- Pi and subsequent addition of 1 mM Tris-ADP (upper) and 800 nM FCCP (lower). ETC inhibitors rotenone and antimycin (RA) were applied at the end of the experiment. *Right:* ΔOCR induced by application of ADP or FCCP. Statistical analysis was performed using two-tailed t-test. ***, $P < 0.01$. Mean \pm s.e.m. $n = 5$ –17. **c**, Cryo-ET tomograms of isolated mouse liver mitochondria incubated in the sucrose medium with 20 mM NMDG- Pi or K - Pi . Magenta triangles indicate cristae. Calibration bars are 100 nm.