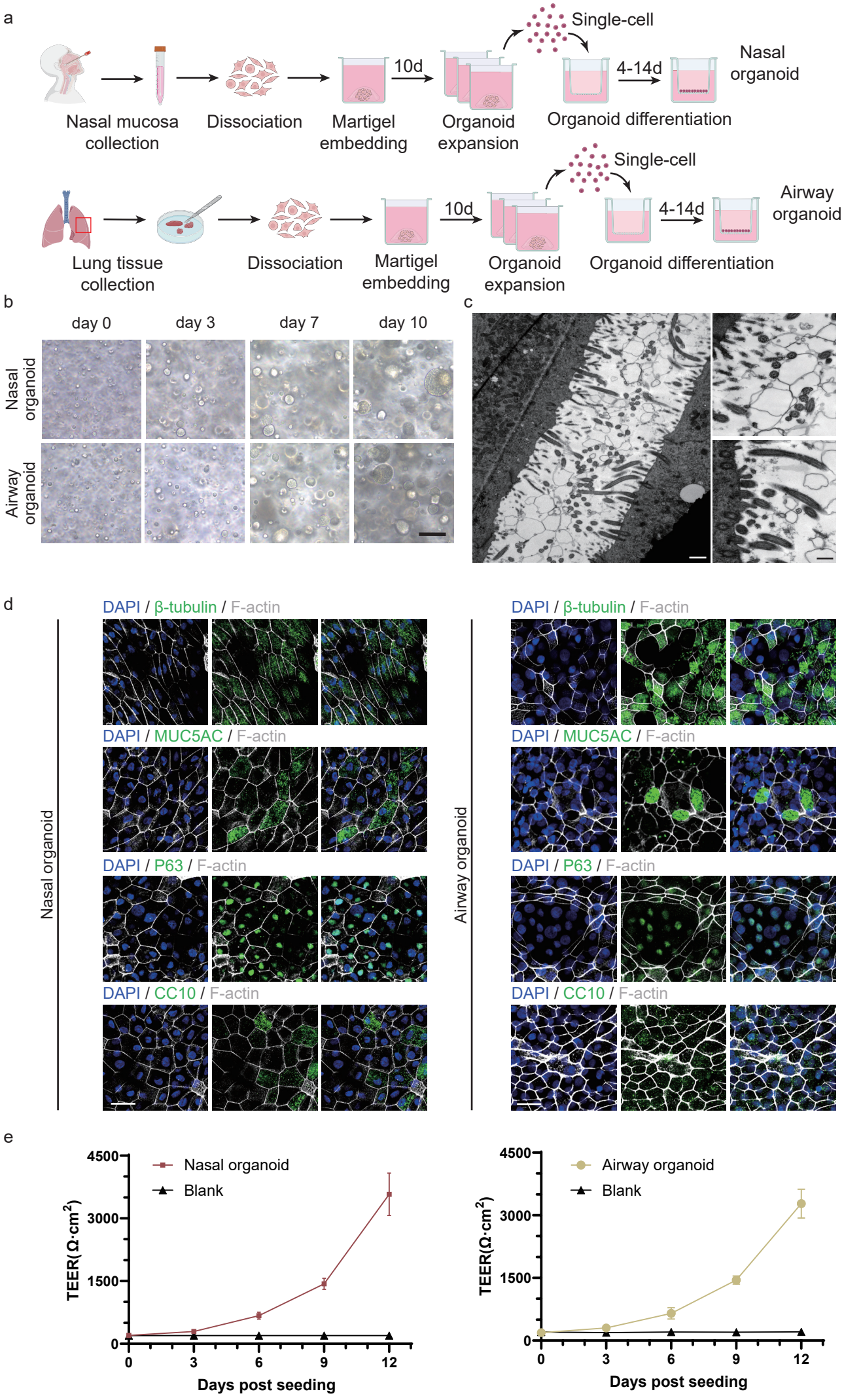
Extended Data Fig.2



Extended Data Fig. 2 | Establishment and characterization of patient-derived respiratory organoid models. a, Schematic workflow illustrating the derivation protocol for paired nasal organoids (top) from nasopharyngeal swabs and airway organoids (bottom) from resected lung tissue. The pipeline outlines the specific timelines for mechanical dissociation, organoid expansion (10 days), and differentiation (4-14 days). **b,** Representative bright-field microscopy images tracking the morphological development and expansion of nasal and airway organoids from day 0 to day 10. Scale bar, 100 μm. **c,** Transmission electron microscopy (TEM) micrographs revealing the ultrastructural organization of the differentiated organoid epithelium, highlighting the presence of mature motile cilia and microvilli. Scale bars, 1 μm (left) and 500 nm (right). **d,** Immunofluorescence validation of cellular heterogeneity in nasal (left) and airway (right) organoids. Tissues were stained for canonical lineage markers: β-tubulin (ciliated cells), MUC5AC (goblet cells), p63 (basal progenitors), and CC10 (club cells). Nuclei are counterstained with DAPI (blue). Scale bars, 20 μm. Images in b-d are representative of three independent biological replicates. **e,** Longitudinal assessment of epithelial barrier function. Transepithelial Electrical Resistance (TEER) was measured in differentiating nasal (left) and airway (right) organoids over 12 days post-seeding to confirm the formation of tight junctions. Data are presented as mean ± s.d.