## **Expanded View Figures**



## Figure EV1. 3D reconstruction of BALO depicts proximo-distal cell specification.

A, B Representative confocal picture (A) and 3D reconstruction (B) of a day 21 culture showing endogenous SCGB1A1 and SFTPC expression within BALO derived from EpCAM<sup>high</sup>CD24<sup>low</sup>Sca-1<sup>+</sup>SCGB1A1<sup>+</sup>SFTPC<sup>+</sup> cells isolated from *Scgb1a1<sup>mCherry</sup>Sftpc*<sup>VFP</sup> reporter mice. Scale bars represent 50 µm.



## Figure EV2. BALOs express markers of

A, B Representative scheme and confocal images of the BALO alveolar-like (A) and airway-like (B) structures. (A) Representative image of AEC II SFTPC staining (white asterisks) and AEC I endogenous PDPN expression in day 28 BALO isolated from the lungs of Pdpn<sup>GFP</sup> reporter mice. Scale bars represent 25  $\mu\text{m}.$  Dotted lines indicate the alveoli. (B) Representative fluorescence images of BALO's airway-like structures stained for  $\beta\text{-IV}$  tubulin^+ ciliated cells (red arrowheads) and SCGB1A1<sup>+</sup> club cells. Scale bars represent 25  $\mu m$  (left and