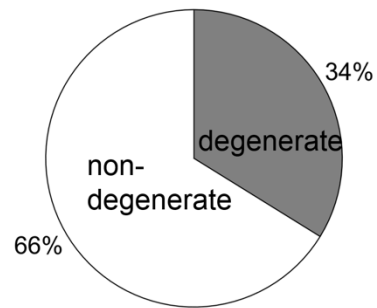
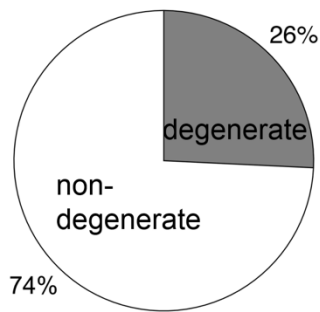
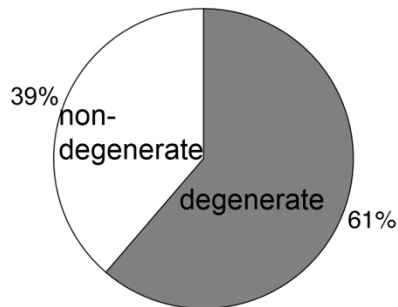


S6 Fig. Fraction of degenerate and non-degenerate branching solutions for material-cost optimizations. The surface-area constraint leads to degenerate solutions for **(a)** 26% (=163/633) of branching junctions in the mouse lung network and **(b)** 34% (=292/849) of branching junctions for the human head and torso network. Volume constraint leads to degenerate solutions for **(c)** 61% (=388/633) of branching junctions in the mouse lung network and **(d)** 68% (576=849) of branching junctions for the human head and torso network.

(a) Mouse lung, Cost: Surface-area **(b)** Human head and torso, Cost: Surface-area



(c) Mouse lung, Cost: Volume



(d) Human head and torso, Cost: Volume

