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Poster Presentation. Title: Branching Morphogenesis in Human Lung Development.

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Abstract: Organs such as the lungs, pancreas, mammary glands, and kidneys contain an intricate network of epithelial tubules that tremendously increase their capacity to exchange molecules. In human lungs, about 480 million alveoli occupy the distal tip of these tubules and are the ground for gas exchange. In branching morphogenesis tubular trees are built by successive rounds of extension and ramification accompanying organ growth. Human lung development begins with a primordia at the origin of the left and right lungs budding from the foregut endoderm at about one month of gestation. Then, branching morphogenesis forms the basic architecture of the airways during the pseudoglandular phase between 5-17 post-conceptional weeks (PCW). Using immunostaining, tissue clearing, and light sheet imaging, we follow human lung development in 3D through the period of 6-12 PCW to answer the questions: What is the branching pattern of human lungs? What are the statistical, topological, and cellular organizations of the branching epithelium in early lung development? What factors determine the complex branching patterns at the organ scale?