

2023

- Les Treilles Workshop: Developmental Biology in the 21st C.

Invited Speaker.

Authors: Megumi Inoue, Ignacio Bordeu, Adrien Hallou, Edwin Hernandez-Garzon, Yorick Gitton, Gerard Couly, Benjamin Simons, Alain Chedotal.

(No abstract)

- EMBO Practical Workshop: Advanced Methods in Bioimage Analysis (Sept 2023).

Poster.

Authors: Megumi Inoue, Ignacio Bordeu, Adrien Hallou, Edwin Hernandez-Garzon, Yorick Gitton, Gerard Couly, Benjamin Simons, Alain Chedotal.

Abstract: Human lung development begins as an outgrowth of the foregut endoderm at around 4 post-conceptual weeks (PCW) and continues into toddlerhood. Past studies of human airway development have been restricted to the first few weeks due to technical limitations. Here, we study the airway tree in the left and right lungs between 5-12 PCW. What is the statistical, morphological, and cellular organization of the branching epithelium in early human lung development? We use whole-mount immunostaining, tissue clearing, and light-sheet microscopy to acquire 3D image datasets of the airway epithelium. In the adult human lungs. We map bronchopulmonary segments known in adult lungs to the developing lung. We develop an image processing pipeline to extract a “skeleton” of the branching tree which allows us to quantify and analyze the airway. To elucidate the balance between stereotypic and stochastic influences on the large-scale architecture of the human airway, we study the statistical features of the branching network across a critical period of branching morphogenesis.