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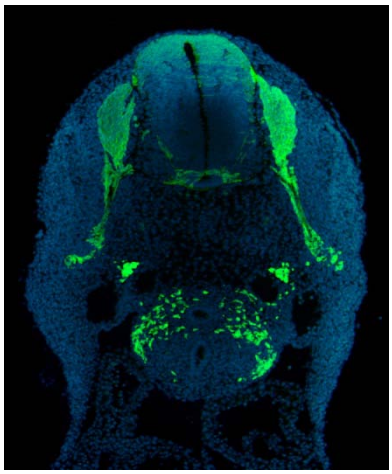
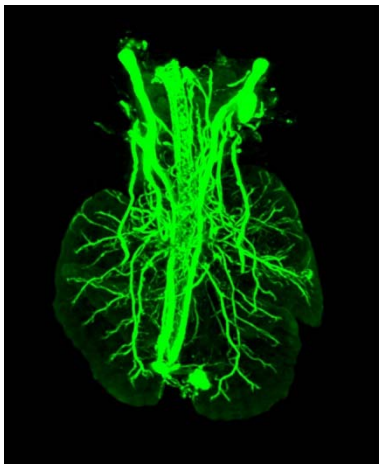
Investigation of the embryological origin and development of intrinsic ganglia within the mammalian lung

Project summary: In order for the lungs to develop and function properly, it is necessary that neurons form within the embryonic lungs and establish functional connections with other cell types such as smooth muscle and neuroepithelial bodies. During embryonic development, neural crest cells, a transient population of multipotent cells that gives rise to a wide variety of cell types throughout the embryo, migrate from the hindbrain into the foregut, from where they colonise the lungs. Since understanding the complex nature of lung diseases requires a broad scientific approach that will potentially lead to the development of therapeutic interventions, the overall aim of the project is to gain insight of the development, interactions, and possible functional roles of intrinsic lung neurons. To achieve this we use a range of cell tracing, labelling and physiological approaches within animal models and lung tissues. It is expected that the results will provide important information on how neural crest cells colonise the lung, the cell types they interact with, and the developmental and functional consequences of a deficiency of these cells within the lung. This work is important because it could lead to the identification of neural crest cell-related defects within the lung that have important implications for health and disease before and after birth.



Frozen section through a transgenic Wnt1-Cre;Rosa26YFP mouse embryo in which neural crest cells express yellow fluorescent protein



Optical projection tomography (OPT) three-dimensional reconstruction of trachea, esophagus and lungs from embryonic day 14.5 mouse, immunohistochemically stained with the neuronal marker Beta III tubulin