

**Professor A. Graham
King's College London**

Student: V. Shone

Investigating the development of the pharyngeal apparatus

The pharyngeal apparatus has its developmental origin in a series of bulges found on the lateral surface of the embryonic head, the pharyngeal arches. The development of these structures is complex as it involves a number of embryonic cell populations. In the past it was generally believed that it was the neural crest that drove this process. It has, however, become increasingly apparent that the endoderm is a key player in orchestrating pharyngeal development. The segmentation of this tissue is central to the formation of the pharyngeal arches.

Yet, although the importance of the endoderm is being appreciated many questions remain unanswered. The aim of this project is to define the mode through which the pharyngeal endoderm becomes segmented to generate the pharyngeal pouches; these structures are key to the overall organisation of the pharyngeal apparatus during development. In doing this we will address three issues. Firstly, we will characterise the segmentation process paying particular attention to any differences between the anterior and posterior pharyngeal pouches. Secondly, we will determine which cellular processes are driving the infolding of endoderm to form the pouches. Finally, we will detail the interaction between the pharyngeal endoderm and the overlying ectoderm.

Our studies will help us define how the pharyngeal apparatus is constructed during normal development with a particular focus on the formation of the pharyngeal pouches. We also hope to shed light on what goes wrong in human conditions such as Branchio-oto-renal and Di George syndromes which present with pharyngeal deficits.

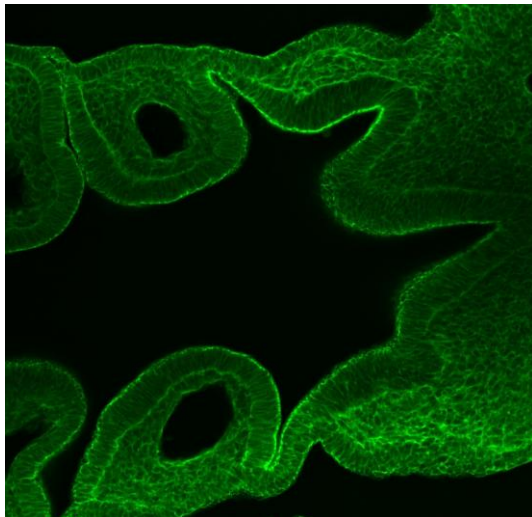


Figure – accumulation of supra-cellular actin cables, shown via Phalloidin staining, at the site of pharyngeal endodermal segmentation