**Signalling pathways controlling the generation of the pharyngeal arches**



Supervisors – Prof Anthony Graham and Dr Esther Bell

Centre for Developmental Neurobiology

King’s College London

(anthony.graham@kcl.ac.uk, esther.bell@kcl.ac.uk )

The pharynx is an important region of the body that is involved in many key processes including feeding, respiration, immune and endocrine activities. Although the mature organisation of the pharynx is highly intricate and complex, this territory has its developmental origin in a series of bulges, the pharyngeal arches, found on the lateral surface of the embryonic head. However, we know little about how the development of the pharynx is directed and it is important to understand this, both with respect to how this critical region of the body emerges but also because there are numerous birth defects that present with malformations of this territory. The aim of this project is to understand the mechanisms that control the sequential generation of the pharyngeal arches. We aim to study the interplay between the main signalling pathways that are involved in this process (FGF, RA (retinoic acid) and WNT) and how these impact upon the development of the arches. We further aim to modulate the levels of these signalling pathways to determine if we can alter the number of pharyngeal pouches, and thus arches, generated during development and to assess what effects this has for the anatomy of this region.

Figure – Expression of xTbx1 in the pharyngeal arches of a xenopus embryo. Tbx1 is a gene that is associated with the human 22q11.2 deletion syndrome, which affects 1 in 4000 people