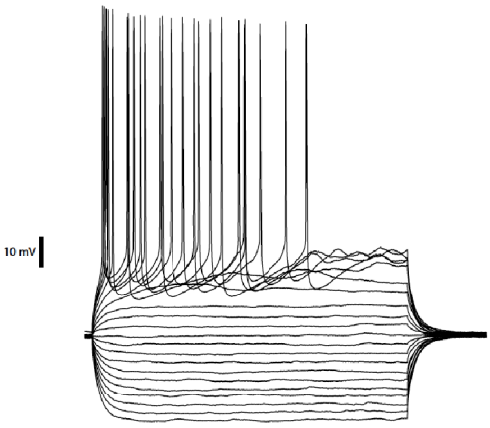
# PROJECTS:

## Influence of FoxP2 on song learning and the underlying neuronal activity

Area X is a brain structure in the avian basal ganglia that is important for song learning and plasticity. In zebra finches, FoxP2 increases in Area X in the period when young birds learn to sing (1). It has been shown that a down-regulation of FoxP2 using virus-mediated RNAi in Area X causes an incomplete and inaccurate imitation of tutor song (2). The exact link between changes in FoxP2 expression and song learning is yet unknown. The aim of my current projects is to investigate the effect of FoxP2 on the neuronal properties underlying song learning. For this reason I established slice electrophysiology in our lab. By combining FoxP2 knockdown techniques in Area X and subsequent electrophysiological recordings we investigate whether and how reduced levels of FoxP2 in spiny neurons affect their intrinsic and synaptic .properties

(1) S. Haesler et al., (2004), J Neurosci 24, 3164
(2) S. Haesler et al., (2007), PLoS Biol 5, e321

## Integration of new neurons into HVC: gap junctions in neuronal clusters




The song nucleus HCV is involved in song learning and song production. HVC is composed of a heterogeneous population of three different cell types: inhibitory interneurons , projection neurons that send axons towards the striatal nucleus Area X and others that project to the Robust nucleus RA. The latter produce bursts of firing sparsely at a single precise time during the premotor activity in RA (3). In adult zebra finches neurogenesis lead to incorporation of new neurons into HVC. This renewal of neurons raises the question whether the new neurons are ‘instructed‘ by the old ones. The functional units of this instruction might be served by gap junction, which are known to be expressed in HVC.
We use tracer injections and intracellular dye injections to investigate the presence of gap junctions between new and already existing neurons. This approach is combined with BrdU injections and a neurophysiological characterization to explore the development and formation of the physiological properties.

(3) Hahnloser et al. (2003), Nature. 2002 Sep 5; 419