

Monday, 12th February 2018 - 11 a.m.**Gilles FORTIN**

Invited by: Françoise MUSCATELLI

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A V0 core circuit for inspiration

Breathing involves permanent rhythmic contractions of skeletal muscles in a bilaterally synchronized manner. The executive control of respiration relies on sets of brainstem interneurons assembled into an ordered synaptic network: the respiratory central pattern generator (CPG). We investigate the relationship of defined neuronal subtypes to the organization of the respiratory CPG. We and others have previously demonstrated that the inspiratory rhythm generator —the preBötzinger complex (preBötC)— is composed of V0 glutamatergic neurons that arise from neural progenitors expressing the homeobox gene Dbx1. We have now used monosynaptic viral tracing from the inspiratory diaphragm muscle to locate, identify the origin and the excitatory or inhibitory nature of phrenic premotor neurons. Our work reveals the existence of a core inspiratory motor circuit in which V0 cell lineages form both the rhythm generator and its main premotor follower. This V0 core circuit features built-in redundant commissural connectivity to secure the bilateral (i) temporal synchronicity and (ii) balanced amplitude of rhythmic phrenic motor drives required for aspiration breathing.