

Looking for Inspiration

We breathe no matter what. Breathing movements in mammals start episodically *in utero*, are continuous at birth, and except for the briefest of pauses, continue without respite. Recent experiments *in vivo* and *in vitro* have advanced our understanding of the neural origins and mechanisms involved in mammalian respiratory rhythm generation. Two distinct sites in the brain stem appear to participate in respiratory rhythm generation in mammals: the preBötzinger Complex (preBötC) first described and intensely investigated since 1990 plays a well-documented essential role in breathing in mammals of all ages, and a second site described in 2003-2005 called the parafacial respiratory group (pFRG) appears to play a role in neonatal and juvenile rodents and may under some conditions participate in the generation of respiratory rhythm. The preBötC and the RTN/pFRG appear to control inspiratory versus expiratory motor aspects of breathing, respectively, and are normally coupled. Since expiratory movements are ordinarily passive the preBötC is the predominant source of respiratory rhythm. Studying a measurable behavior like breathing under controlled *in vitro* conditions permits novel experiments that can reveal important features of the link between synapses/neurons and behavior that may have general applicability in understanding mammalian brain function.

Jack L. Feldman, Ph.D.
Distinguished Professor of Neurobiology
Department of Neurobiology, UCLA
Box 951763
Los Angeles, CA 90095-1763
Feldman@ucla.edu