



# PROGRESS IN NEUROSCIENCE PINS



Seminar Series of the  
Brain & Mind Research Institute  
Weill Cornell Medical College (WCMC)  
&  
The Graduate Program in Neuroscience of  
WCMC and Sloan Kettering Institute

**\*WEDNESDAY\*, 3/12/14, 4 PM, coffee at 3:45 PM  
Weill Auditorium**

## The Ups and Downs of Motor Circuit Organization

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### Abstract:



Motor behavior represents the ultimate output of most nervous system activity. The organization and function of the mature nervous system relies on the precision with which defined neuronal circuits assemble into functional units during development. In the spinal cord, connections to motor neurons are formed by many distinct interneuron classes, by neurons with descending projections from supraspinal centers, and by proprioceptive sensory neurons, providing feedback from the periphery to coordinate motor output. This talk will focus on recent progress in understanding the organizational principles of neuronal circuits controlling motor behavior, with an emphasis on circuits communicating between the brainstem and spinal cord. Exploiting transsynaptic virus tools and mouse genetics, we unravel a striking anatomical organization of neuronal circuits interacting with functionally distinct motor modules at the level of the spinal cord.

### Recent relevant publications:

Tripodi, M., Stepien, A.E., and Arber, S. (2011). Motor antagonism exposed by spatial segregation and timing of neurogenesis. *Nature*, 479, 61-66.

Pivetta, C., Esposito, M.S., Sigrist, M., and Arber, S. (2014). Motor-circuit communication matrix from spinal cord to brainstem neurons revealed by developmental origin. *Cell*, 156, 537-548.

Esposito, M.S., Capelli, P., and Arber, S. (2014). Brainstem nucleus MdV mediates skilled forelimb motor tasks. *Nature*, published online Feb 2, 2014. <http://dx.doi.org/10.1038/nature13023>.



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