



Colloquium

The Institute Colloquium: The ups and downs of motor circuit organization

Silvia Arber

University of Basel

Host:

Motor behavior represents the ultimate output of most nervous system activity. Its accuracy depends on precise connectivity of many different circuit modules, together controlling programs for motor output, computing predicted action and monitoring consequences of past action. Body movement entails the concerted activation of limb muscles innervated by specialized groups of spinal motor neurons, yet very little is known about synaptic organization and function of connectivity modules to diverse motor neurons, at the core of regulating motor output programs. This talk will focus on our recent work unraveling organizational and functional principles of neuronal circuits regulating the control of spinal motor neurons innervating limb muscles. Exploiting transsynaptic virus tools, mouse genetics and behavioral experiments, we found striking differences in anatomical and functional organization of direct connections to different motor neuron pools by distinct classes of spinal interneurons and supraspinal brainstem nuclei. Our studies on organization and function of descending brainstem command lines point towards the existence of segregated action maps to allow motor program diversification at the level of the brainstem, just one synapse away from motor neurons. Together, our findings demonstrate that functional differences discerned at the motor output level and important for appropriate motor behavior are engraved anatomically and genetically as differential spatial maps at the premotor level, both at spinal and supraspinal levels

Monday, December 9, 2013 04:30pm - 05:30pm

Raiffeisen Lecture Hall, Central Building



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