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## BIOMEDICAL ENGINEERING



### Neural Circuits Involved with Saccade Adaptation



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**Abstract:** A saccade is a rapid eye movement that shifts the direction of gaze accurately from one object of interest to another. When weakening the extraocular muscles or using a behavioral deception caused saccades to miss their targets repeatedly, saccades gradually changed in amplitude to land near the target after several hundred trials. This gradual adjustment of saccade size to reduce the error produced by persistent saccadic dysmetria is called saccade adaptation, a kind of motor learning.

The saccade is an excellent model to study motor learning because there is a well established behavioral paradigm to induce saccade adaptation experimentally, its characteristics have been documented extensively, and its neuronal substrate is well known.

In this talk I will first describe the characteristics of saccade adaptation. Next, I will talk about the neural circuit that generates saccadic eye movement, and then I will show how the activity in that neural circuit changes to induce saccade adaptation. These data will converge on the conclusion that the oculomotor cerebellum is involved in the maintenance of saccade accuracy during changes in the oculomotor system brought on by such natural conditions as growth, injury and aging.

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