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The Neuroscience of Ataxia

Newsletter by the CognAc Lab

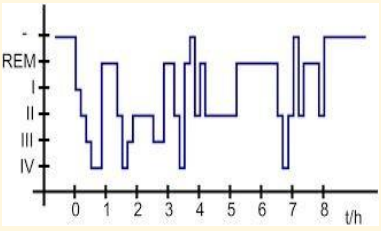
The Cognition and Action Lab at UC Berkeley hopes that you are staying safe and taking care of yourself during these difficult times. Since you have participated in our experiments in the past or expressed interest, we thought you would be interested in learning about some recent studies that have been conducted on ataxia and the cerebellum, the part of the brain affected in individuals with ataxia. We appreciate your help in assisting with our research and thought an e-newsletter would be a nice way to provide a sample of some recent findings in the scientific literature. We provide a short overview of each to summarize the key findings.

What's new in Ataxia research?

- In the past, research has focused on the cerebellum's role in **overt motor** behavior. More recently, the cerebellum's role in **covert mental** processes and social cognition is being explored. One key question here is whether cognitive and social skills can predict the extent and progression of ataxia. (link)

- Related studies also looked at non-motor changes that might be observed in individuals with ataxia. One recent study explored the role of the cerebellum in predicting sensory input based on previous knowledge of the environment. (link)

- Rapid eye movement (REM) sleep is the part of the sleep cycle during which a person dreams. This study reported that people with SCA2 have shorter periods of REM sleep than control participants, and that those with the greatest reduction in REM had the most severe ataxia symptoms. (link)



- The cerebellum is involved in a wide range of cognitive domains ranging from language and perception to social cognition. One open question is whether the cerebellum performs a similar function across different motor and cognitive domains, or if its functional role varies for different domains? (link)

- A technique called antisense oligonucleotide therapy has been effective in treating neurodegenerative diseases. Recently, it has been found to benefit those with SCA2 (link), SCA3 (link), and SCA7 (link). Antisense oligonucleotide therapy works by injecting nucleotides that bind to the part of the DNA that is responsible for neurodegeneration. As a result, this harmful part of the DNA isn't expressed.

Ongoing Ataxia Research at the CognAc Lab

William Saban, a post-doc in the lab, has developed a new platform for online neuropsychological testing (PONT), providing an opportunity for people from around the country to participate in our studies of how ataxia affects both motor and mental fluidity. PONT allows us to test many more participants than is typical in such studies, while making it convenient for the participants to do the study while at home. In one of our first studies with PONT, we are testing the impact of ataxia on the production of sequential movements, similar to what might be required to learn a specific sequence of key presses on a piano while sight-reading music.

Rich Ivry, Principal Investigator
Professor of Psychology and Neuroscience.

William Saban, Editor-in-Chief
Ph.D. in Clinical Neuropsychology.

Thank you for your continued interest in the lab's work!
For more information about the Cognition and Action lab at UC Berkeley and how to get involved, visit http://ivrylab.berkeley.edu/.

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