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24 July 2024

Study with Columbia University on Spinocerebellar Ataxias

Partnership aligns with BlinkLab's strategy to enhance its AI-powered digital platform for sensory phenotyping and promote global adoption.

Highlights

- **New study in partnership with Columbia University, New York, to study the effect of aerobic physical exercise on neuroplasticity in adults with spinocerebellar ataxias ("SCA").**
- **Potential to demonstrate that the BlinkLab eyeblink conditioning test can serve as an effective biomarker for neuroplasticity in human SCA patients.**
- **Partnership will contribute to global adoption of the BlinkLab platform by world renowned centres and research institutions to study a variety of neurological disorders.**
- **Study will continue for up to 18 months and will recruit up to 62 adults with SCA.**
- **Collaboration agreement ensures that BlinkLab will have an option to exclusively licence any intellectual property developed as a direct result of the partnership.**

BlinkLab Limited (**ASX:BB1**) (**"BlinkLab"**, or "the **Company**"), an innovative digital healthcare company developing smartphone-based AI-powered diagnostic tests for neurological disorders, advises it will be participating in a clinical study in patients with spinocerebellar ataxias conducted by Columbia University, New York.

Henk-Jan Boele, CEO of BlinkLab commented:
"Since the very first successful test of the BlinkLab platform in the lab at Princeton University, our team's vision has always been to develop a tool that will someday be considered as a standard of care in the initial diagnosis of neurodevelopmental conditions where children have difficulties in processing sensory information, such as autism and ADHD. However, as a team of scientists we also envisioned the development of a research platform that would facilitate groundbreaking digital sensory phenotyping in neuropsychiatric conditions in a much broader sense. In the past few months we have made significant progress towards this goal as evident from the adoption rate of our technology among top researchers across a broad range of neuropsychiatric clinical disciplines. We know that research adoption will smoothen clinical adoption. Data generated from these studies will further inform our machine learning training and ensure BlinkLab remains the leader in the field of digital sensory phenotyping in humans."

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What is Spinocerebellar Ataxia?

Spinocerebellar ataxias are a group of disorders in which progressive cerebellar degeneration leads to severe disability and even death. An estimated 150,000 Americans are living with these diseases[1], and the average annual healthcare cost to the United States is over 1.9 billion dollars[2]. There are currently no effective treatments or cures for genetic causes of these diseases. Thus, there is a critical need to find treatments that slow disease progression and allow affected individuals to live more functional lives.

Researchers at Columbia University Medical Center demonstrated that aerobic training is a promising treatment for spinocerebellar ataxias, but the mechanism of action is not fully understood. Training may increase leg strength and endurance which allow compensation for balance deficits, but may also cause neuroplastic changes in the brain that are of benefit. In fact, long-term aerobic training in healthy individuals has been shown to create a fertile brain environment by increasing expression of plasticity-related genes and growth factors to support subsequent learning.

Prior work with in-person laboratory assessments has shown that individuals with spinocerebellar ataxia have impaired eyeblink conditioning, poor retention of learning, and difficulty increasing learning capacity across multiple training sessions. There are no published studies in humans examining the impact of exercise training on eyeblink conditioning, but a few animal studies have been conducted. Experimental animals that perform aerobic exercise are able to condition (i.e. associative learning tasks) significantly better than sedentary rats.

Dr. Scott Barbuto, Columbia University, commented on the study:

"*The current study will investigate the impact of acute and long-term aerobic training on eyeblink conditioning in individuals with spinocerebellar ataxia. The aim of this study is to demonstrate that aerobic training, but not balance training, causes neuroplastic changes in the cerebellum to enhance motor learning. Eyeblink conditioning has had limited use in clinical studies and is used more often in basic science research. Reasons for limited use include: the high cost of the standard equipment setup needed to test eyeblink conditioning and the need for extensive programming and data management skills to acquire and interpret data. Some studies have been conducted on individuals with spinocerebellar ataxia, but sample sizes are typically very small, ranging from 8-24 participants. With the use of BlinkLab, we will be able to test many individuals with ataxia and determine if differences exist between various types. We will also determine if exercise impacts eyeblink conditioning in individuals with ataxia, a topic that has not been investigated to date.*"

[1] Salman M.S. "Epidemiology of cerebellar diseases and therapeutic approaches." *The Cerebellum*. 2018; 17: 4-11

[2] Polek B, Roach MJ, Andrews WT, et al. "Burden of Friedreich's Ataxia to the Patients and Healthcare System in the United States and Canada." *Frontiers in Pharm.* 2013;4:66

Significance: Why is this study important for BlinkLab?
The use of the BlinkLab application is an innovative way to overcome the standard challenges of conducting eyeblink conditioning in a clinical setting. The ability to do assessments at home is particularly important to individuals with spinocerebellar ataxia, who have mobility issues and often find it difficult to travel to clinical settings for assessments. The BlinkLab application also eliminates the need for expensive equipment and produces data that is easy for researchers to use and interpret.

The proposed work will also provide the groundwork to use eyeblink conditioning as a biomarker for motor learning and outcome measure in a clinical trial for spinocerebellar ataxia and other diseases.

Study Design
Participants will be recruited from the Ataxia Clinic at the Neurological Institute of New York-Columbia University Medical Center ("CUMC"). The study aims to recruit up to 62 adults with spinocerebellar ataxias over 18 months. Participants will be excluded if they have other neurological conditions, heart disease, cognitive impairment, joint pain, inability to walk without assistance, no access to a smartphone, or medical instability. Recruited individuals will undergo eyeblink conditioning prior to the start of the study followed by assessments every 3-months during 6-month training protocol. After 6-months of training, individuals will be told they no longer need to train. A final assessment will be conducted 3-months post-training.

Terms of the Collaboration Agreement ("Agreement")

- *Responsibilities:* BlinkLab will provide access to its technology, data and shall facilitate the use of its platform during the term of the Agreement.
- *Financial arrangements*: None at the date of signing (to be determined via mutual agreement in the future and in a separate agreement).
- *Intellectual property ("IP")*: BlinkLab will have an option for an exclusive licence to acquire any intellectual property developed as a direct result of the partnership.
- *Term*: Two years from the date of signing (24 July 2024), unless terminated earlier in accordance with the provisions of the Agreement.
- *Termination*: Either party may terminate the Agreement with 20 days written notice to the other party, should either fail to meet their obligations.
- *Confidentiality*: Standard confidentiality terms for an agreement of this nature included.

This announcement has been approved by the Board of Directors.

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About BlinkLab Limited

BlinkLab, a company founded by neuroscientists at Princeton University, over the past several years has fully developed a smartphone based diagnostic platform for autism, ADHD, schizophrenia, and other neuropsychiatric conditions. BlinkLab's most advanced product is an autism diagnostic test that leverages the power of smartphones, AI and machine learning to deliver screening tests specifically designed for children as young as 18 months old. This marks a significant advancement, considering traditional diagnoses typically occur around five years of age, often missing the crucial early window for effective intervention. BlinkLab is led by an experienced management team and directors with a proven track record in building companies and vast knowledge in digital healthcare, computer vision, AI and machine learning. Our Scientific Advisory Board consists of leading experts in the field of autism and brain development allowing us to bridge the most advanced technological innovations with groundbreaking scientific research.