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Neuromodulation to Enhance Physical Activity Behavior

Only 5% of adults over 20 years of age engage in daily physical activity for at least 30 minutes, despite overwhelming evidence showing its many physical and mental health benefits. It is clear that incorporating enough physical activity or exercise in daily life is a challenge for most people. Current efforts use social, economic, psychological and/or environmental approaches to increase physical activity, but all have limited rates of success.

Researchers at Arizona State University have developed a novel system that targets the biology of the brain to increase physical activity levels. Physical activity levels might be increased by the repeated use of non-invasive transcranial direct current stimulation (tDCS), targeted to the dorsolateral prefrontal cortex, and coupled to an exercise/physical activity stimulus. When tested using a single-blinded parallel design on healthy subjects, it was shown that three weeks of active tDCS increased measures of daily physical activity. The intervention consisting of tDCS and exercise must be applied using specific conditions and parameters to increase daily motivation to move.

This technology has the ability to enhance physical activity and exercise behavior as well as help users adhere to exercise programs.

Potential Applications

- Neuromodulation to increase daily physical activity

Benefits and Advantages

- Focuses on the reward centers in the brain by regulating the desire and motivation to perform daily exercise/physical activity
- It might increase daily physical activity levels
- Safe and should be easily implemented
- Regulation of voluntary physical activity is linked to brain mechanisms involving the dopaminergic system which tDCS can specifically target

For more information about this opportunity, please see

[Ruiz-Tejada et al – MSSE - 2022](#)

[Ruiz-Tejada et al – Brain Sci - 2022](#)

For more information about the inventor(s) and their research, please see

[Dr. Katsano's departmental webpage](#)