

Tabernantholog: A non-hallucinogenic psychedelic analog with therapeutic potential for heroin and alcohol addictions

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MILE HIGH LAB

Introduction

- The opioid epidemic is a nationwide healthcare concern, with the CDC estimating almost 100,000 lives lost due to opioid overdoses in 2021. This problem has found a home in Colorado as well, with 25 out of every 100,000 people in the state overdosing in the year of 2020.
- Psychedelics have previously been shown to reduce drug cravings, reduce relapse rates, and reduce depressive symptoms.
- We have modified a previously researched psychedelic, *Ibogaine*, to be non-hallucinogenic while still retaining its therapeutic properties after just one dose. We have decided to call this compound *Tabernantholog*, or TBG.

Tabernantholog

- *Tabernanthe iboga*, a shrub found in Central Africa is where both ibogaine and TBG are derived from. This plant is a central part of communities in Central Africa, and is thought to have healing properties.
- TBG is a simple modification of the ibogaine compound, which yields a non-hallucinogenic, non-toxic, compound which lowers drug craving and prevents relapse in pre-clinical assessments.
- Although the exact mechanism of action for the therapeutic effects of psychedelics is not completely understood, the leading theory is that they promote neuronal growth in key parts of the brain that drive drug seeking and relapse. This is often referred to as **neuroplasticity**.

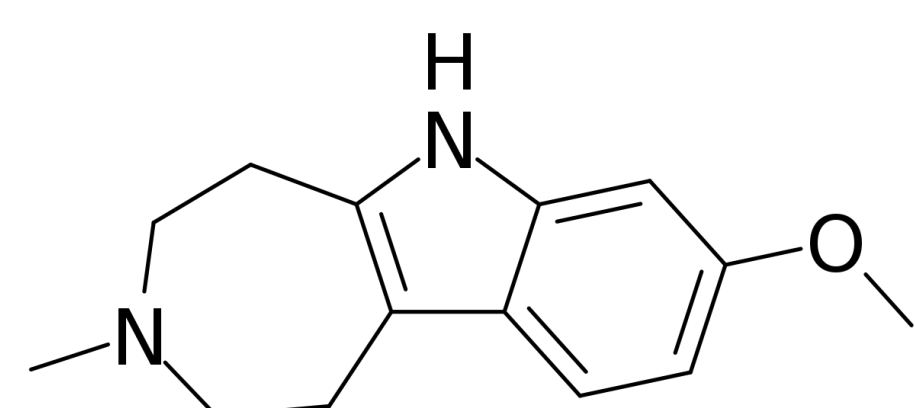


Figure 1: The chemical structure of Tabernantholog

Results

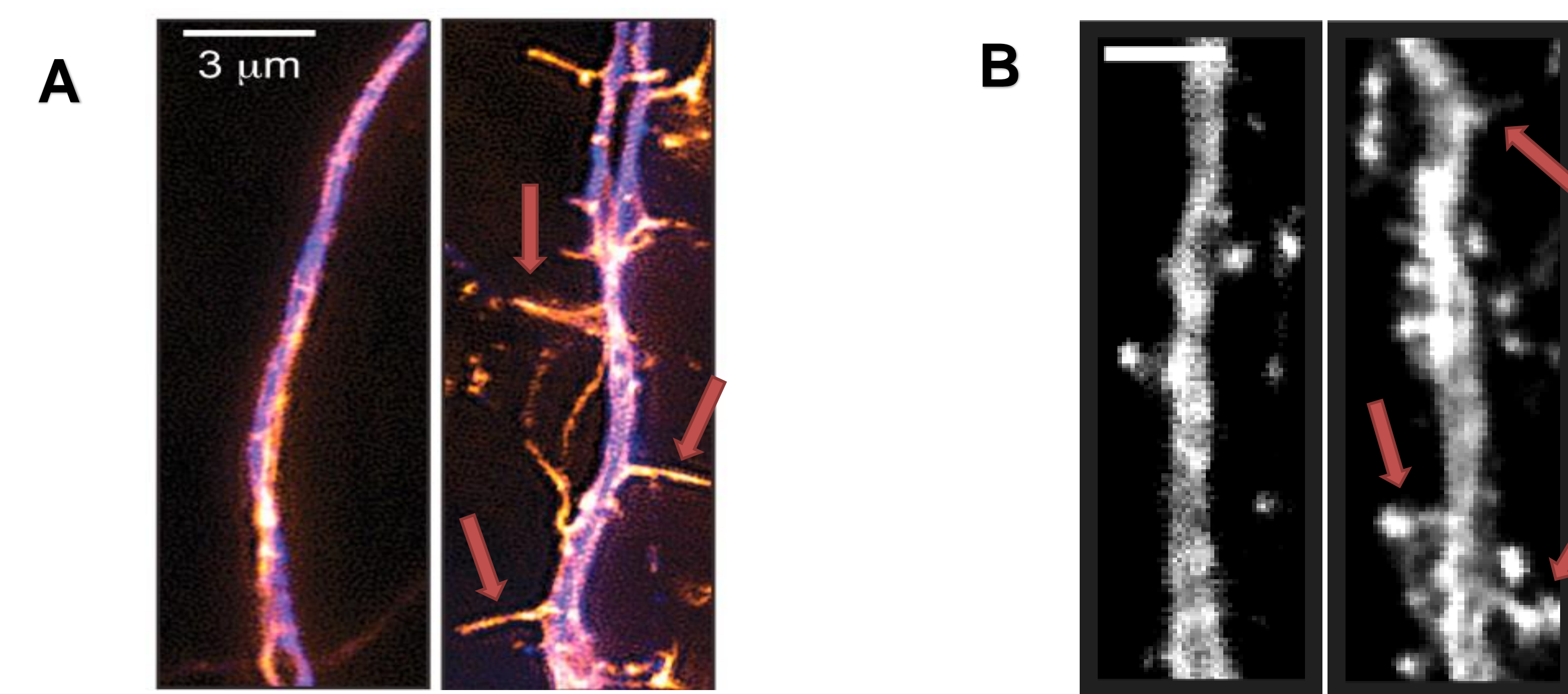


Figure 2: A) The effects on neuronal growth when a control is compared to LSD. B) The effects on neuronal growth when a control is compared to TBG. Notice the similarities of spinal growth in both groups as highlighted by arrows.

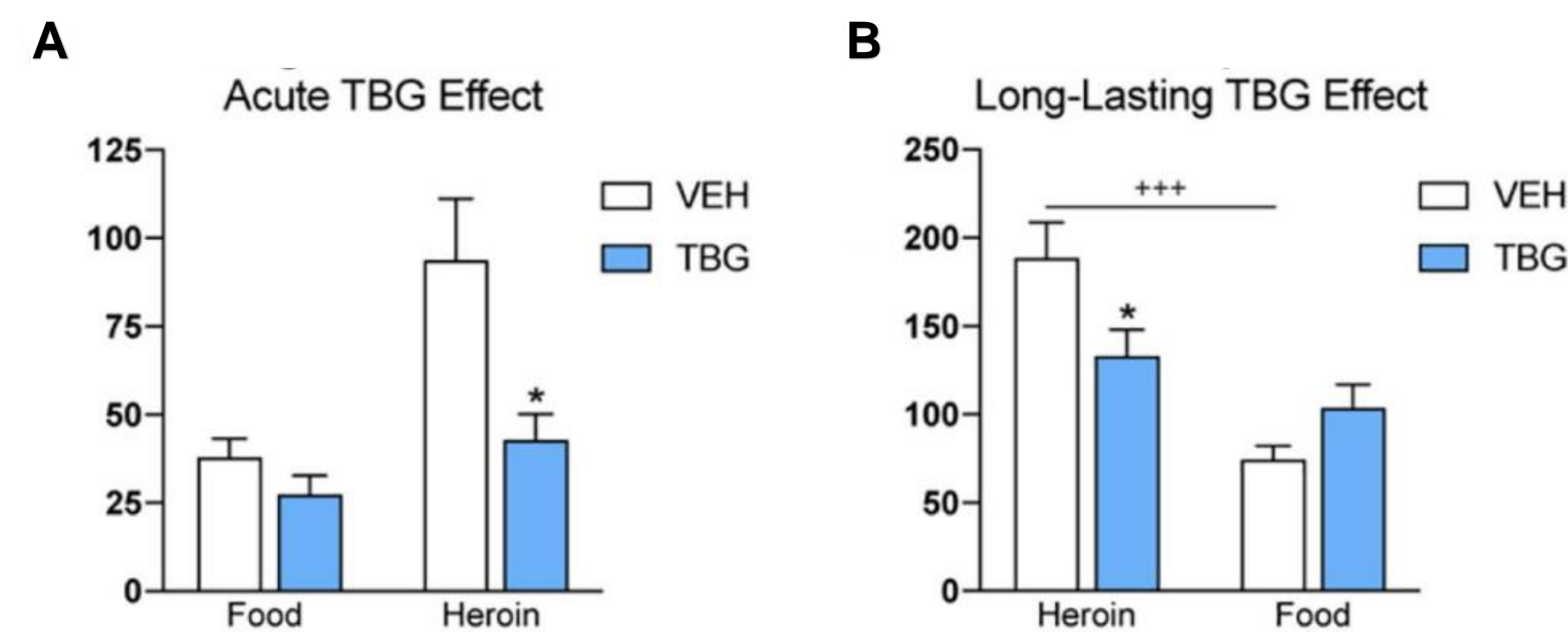


Figure 3: A) TBG acutely reduced motivation for heroin, while not affecting motivation for food. B) TBG reduces relapse in heroin but not food at least 2 weeks after initial dosing.

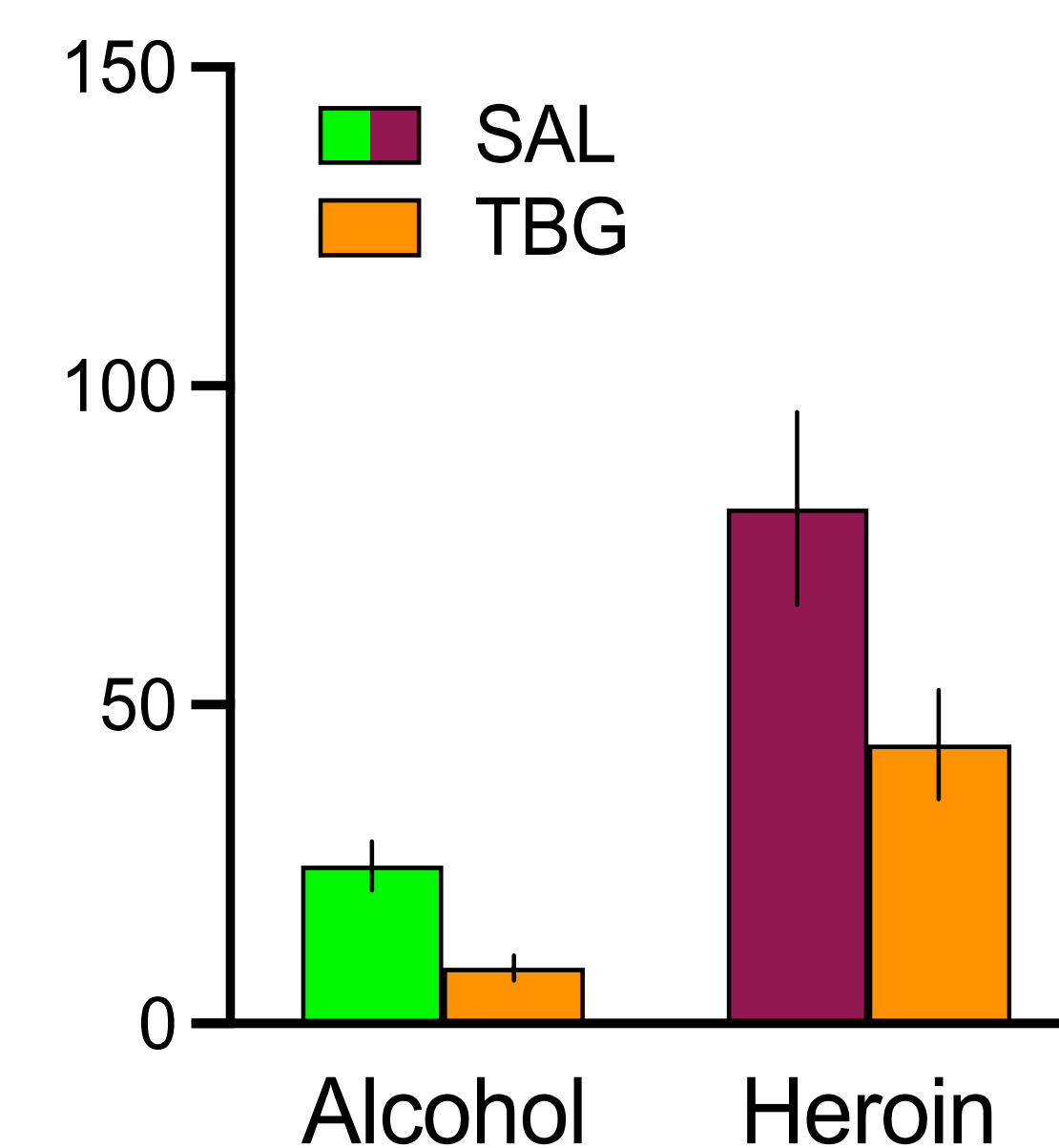
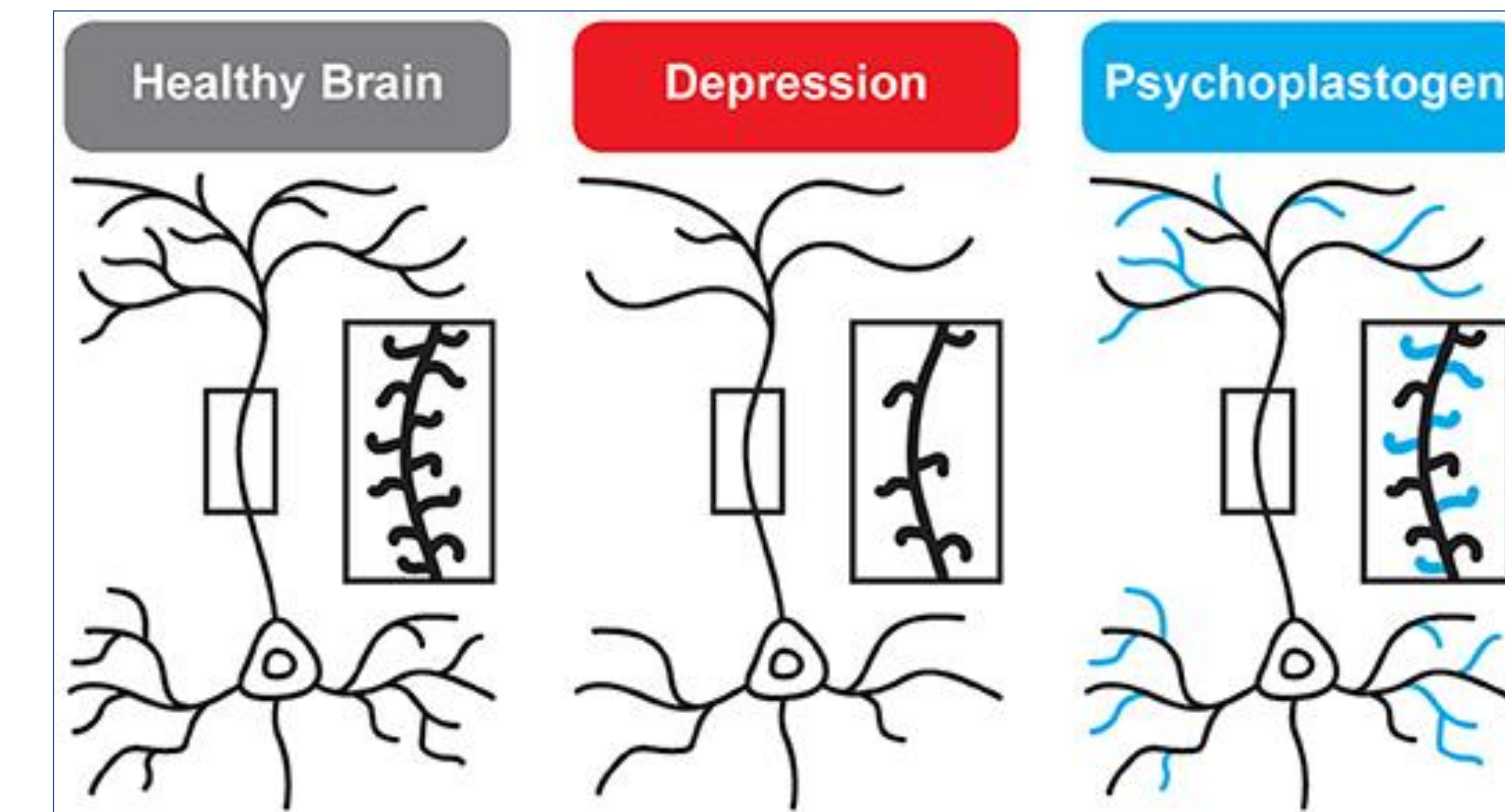


Figure 4: TBG acutely reduced motivation for both heroin and alcohol during a breakpoint test.

Discussion



- The effects of TBG, as well as other psychedelics seem to be driven by its neuroplastic effects in key areas of the brain.
- In 2021, the CDC estimated that opioid-related overdoses carried a cost of **\$11.1 Billion** just in the state of Colorado. The long-term relapse protection that TBG has displayed after just one dose means that it could have the potential to be a very **cost-effective** treatment for a variety of substance use disorders.
- TBG does not have hallucinogenic side effects after administration, but still has the therapeutic effects of conventional psychedelics. This makes TBG more accessible to the general public than conventional psychedelics, such as *psilocybin*.
- In addition to substance use disorders, psychedelics have shown promise in treating other psychiatric conditions such as PTSD and treatment-resistant depression. This promising field of medicine warrants further research.

References

- 1) CDC Opioid Mortality Reports
- 2) "Engineering safer psychedelics": J. Peters, D. Olson (2021)
- 3) Cameron et al. (2021), *A non-hallucinogenic psychedelic analogue with therapeutic potential*