Docket #: S20-338

Molecular targets for modulation of dissociative and associative states

Stanford researchers in the Deisseroth Lab have discovered molecular targets and brain-circuit dynamics underlying dissociation in the brain. The targets enable the modulation of dissociation which is an important state for controlling many mental conditions.
The researchers have identified a list of known, off-patent drug compounds that are able to work on this target and could be repurposed for indications such as PTSD, Borderline Personality Disorder, epilepsy, and many more brain disorders.
With these findings, the team also developed methods for treating a subject for a dissociative disorder as well as methods of screening agents for the ability to modulate dissociative and associative states. In particular, the team discovered agents that alter rhythmic neural activity in the posteromedial cortex which can be used to modulate dissociative and associative states in a subject.

Stanford News article:
"Researchers pinpoint brain circuitry underlying dissociative experiences", Sept 19, 2020

NPR All Things Considered Podcast:
"Scientists Say A Mind-Bending Rhythm In The Brain Can Act Like Ketamine", Sept 16, 2020

Stage of Development

- Mice data
- Verified dissociation-like state in mice using optogenetics

Figure

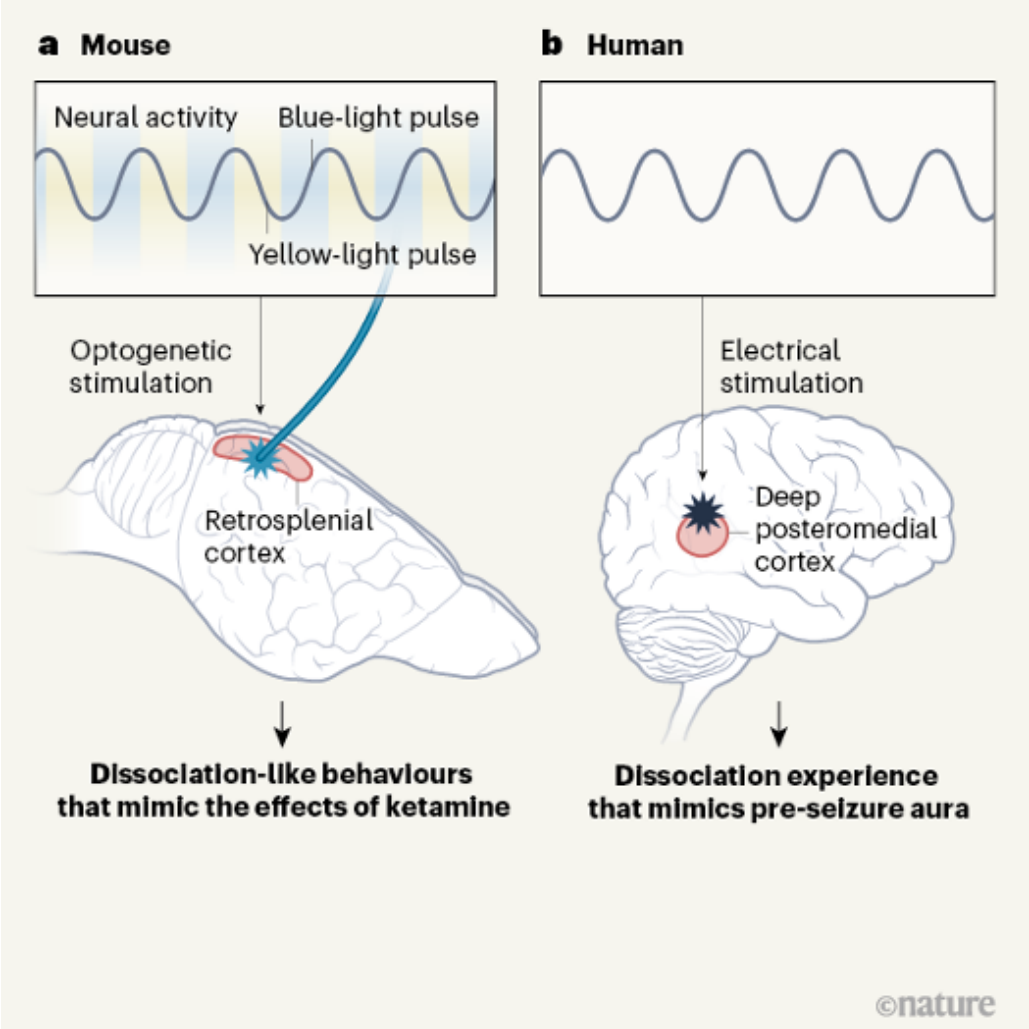


Figure description - Inducing a dissociative state. Dissociation is an altered state of consciousness in which people feel detached from reality. It can be triggered by the drug ketamine and can occur before a seizure in epilepsy. Image credit: Solt, Ken, and Oluwaseun Akeju. "The brain rhythms that detach us from reality." (2020).

Applications

- **Neurological disorders** including but not limited to PTSD, Borderline Personality Disorder, and epilepsy
- Other indications include chronic pain and heart rhythm manipulation

Advantages

- **Better-targeted therapies** for dissociation-related disorders

- **For drug repurposing** leading to cost and development time saving
- Can work on multiple indications
- Can also work with TMS and other neurostimulation therapies

Publications

- Vesuna, S., Kauvar, I.V., Richman, E. et al. Deep posteromedial cortical rhythm in dissociation. *Nature* 586, 87–94 (2020).
- Solt, Ken, and Oluwaseun Akeju. "The brain rhythms that detach us from reality." (2020).

Patents

- Published Application: WO2022035773
- Published Application: 20230270693
- Issued: 12,582,616 (USA)

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