

VERONICA A. ALVAREZ, PHD

*Senior Investigator, National Institute of Mental Health
Section on Neurobiology of Compulsive Behaviors
Director, Center on Compulsive Behaviors
Intramural Research Program
National Institutes of Health*



Research Topics

Our research aims to understand the causes of substance use disorder (SUD). More specifically, we focus on the neuronal mechanisms that drive the high motivation to consume substances of abuse, and the compulsive aspects of SUD that generate a loss of control over consumption. Given that only a portion of individuals who are exposed to substances of abuse develop SUD, we are particularly interested in understanding the mechanisms that create vulnerability to SUD. The long-term goal of this research is to improve the treatment and prevention of SUD.

Biography

Dr. Alvarez graduated with honors in Neuroscience from the University of Buenos Aires, Argentina, in 1997. She pursued electrophysiology training under Dr. John Williams at OHSU's Vollum Institute, focusing on locus coeruleus neurons and opioid modulation. She then conducted postdoctoral research at Harvard Medical School with Bernardo Sabatini, investigating glutamatergic synapse plasticity using electrophysiology and two-photon imaging.

In 2008, Dr. Alvarez joined the NIH Intramural Research Program as a tenure-track Investigator, establishing her research program at the National Institute on Alcohol Abuse and Alcoholism (NIAAA). She gained tenure in 2015. Dr. Alvarez recently shifted her primary affiliation to the National Institute of Mental Health (NIMH) and holds a position as Senior Investigator, while maintaining secondary appointments at NIAAA and the National Institute on Drug Abuse (NIDA).

Dr. Alvarez co-directs the Center on Compulsive Behaviors, founded in 2017, uniting over 50 neuroscience labs across the NIH and supporting numerous postdoctoral fellowships. She is a three-time recipient of the NIH Director's Award (2021, 2020, 2015) and a two-time Outstanding Mentor Awardee (2015, 2018). Her research is funded by NIMH and NIAAA and includes collaborations on multiple R01 grants. Dr. Alvarez was also honored with the NIH Innovation Award (2017) and Challenge Award (2018) to establish the Center on Compulsive Behaviors.

Selected Publications

Da Silva, Matsui, Murray, Mamais, Authement, Shin, Shaw, Ron, Cookson and **Alvarez VA** (2024) [Leucine-rich repeat kinase 2 limits dopamine D1 receptor signaling in striatum and biases against heavy persistent alcohol drinking](#). *Neuropsychopharmacology* 49(5): 824–836.

Burke DA and **Alvarez VA** (2022) [Serotonin receptors contribute to dopamine depression of lateral inhibition in the nucleus accumbens](#) *Cell Reports*, 39(6):110795.

Markovic, Pedersen, Massaly, Vachez, Ruyle, Murphy, Abiraman, Shin, Garcia, Yoon, **VA Alvarez**, MR Bruchas, M Creed, JA Morón. (2021) [Pain induces somatic adaptations in Ventral Tegmental Area Dopamine neurons to drive anhedonia-like behavior](#). *Nature Neuroscience*, doi: 10.1038/s41593-021-00924-3.

Al-Hasani, Gowrishankar, Schmitz, Pedersen, Marcus, Shirley, Hobbs, Elerding, Renaud, Jing, Y Li, **VA Alvarez**, JC Lemos and MR Bruchas (2021) [Ventral tegmental area GABAergic inhibition of cholinergic interneurons in the ventral nucleus accumbens shell promotes reward reinforcement](#). *Nature Neuroscience*, doi.org/10.1038/s41593-021-00898-2.

Adrover, Shin, Quiroz, Ferré, Lemos, **Alvarez** (2020) [Prefrontal Cortex-Driven Dopamine Signals in the Striatum Show Unique Spatial and Pharmacological Properties](#). *Journal of Neuroscience* 40 (39), 7510-7522.

Bocarsly, da Silva E Silva, V Kolb, Luderman, Shashikiran, Rubinstein, Sibley, Dobbs, **Alvarez** (2019) [A mechanism linking two known vulnerability factors for alcohol abuse: low D2 receptors and heightened stimulation](#). *Cell Reports* 29(5):1147-1163

Dobbs, Kaplan, Bock, Phamluong, Shin, Bocarsly, Eberhart, Ron, **Alvarez** (2019) [D1 receptor hypersensitivity in mice with low striatal D2 receptors facilitates select cocaine behaviors](#). *Neuropsychopharmacology* 44: 805–816

Matsui and **Alvarez** (2018) [Cocaine Inhibition of Synaptic Transmission in the Ventral Pallidum Is Pathway-Specific and Mediated by Serotonin](#). *Cell Reports* 23(13):3852-3863.

Burke, Rotstein, **Alvarez** (2017) [Striatal local circuitry: a new framework for lateral inhibition](#). *Neuron* 96(2): 267-284.

Laguesse, Morisot, Shin, Liu, Adrover, Sakhai, Lopez, Phamluong, Griffin III, Becker, Bender, **Alvarez**, Ron (2017) [Prosapip1-dependent synaptic adaptations in the nucleus accumbens drive alcohol intake, seeking, and reward](#). *Neuron*, 96(1):145-159.

Lemos, Friend, Kaplan, Shin, Rubinstein, Kravitz, **Alvarez** (2016) [Enhanced GABA transmission drives bradykinesia following loss of dopamine D2 receptor signaling](#). *Neuron*, 90(4): 824-38.

Dobbs, Kaplan, Lemos, Matsui, Rubinstein, **Alvarez** (2016) [Dopamine regulation of lateral inhibition between striatal neurons gates the stimulant actions of cocaine](#). *Neuron*, 90(5): 1100-13.