



Veronica Alvarez, PhD

Senior Investigator

Laboratory on Neurobiology of Compulsive Behaviors

National Institute of Alcohol Abuse and Alcoholism (NIAAA)

National Institute of Drug Abuse (NIDA)

National Institutes of Health

Lead Investigator

Center on Compulsive Behaviors (CCB)

Intramural Research Program (IRP)

National Institutes of Health

Research Topics

Research in the Alvarez laboratory is focused on identifying the circuits and understanding the synaptic mechanisms that drive reward seeking, reinforcement and compulsive behaviors. The Laboratory studies the effects of drugs of abuse on synapses and neuronal connectivity and its main focus so far is on stimulant drugs and alcohol. They apply multiple techniques ranging from approaches at the cellular and synaptic level to behavioral analysis and in vivo manipulations in wild-type and genetically-engineered mouse models with the purpose of revealing the cellular mechanisms that control reward-motivated behaviors and compulsive actions and drug seeking.

Biography

Dr. Alvarez graduated with honors from the School of Natural Sciences and earned a PhD degree in Neuroscience in 1997 from University of Buenos Aires, Argentina. She came to the US to train as an electrophysiologist with Dr. John Williams at the Vollum Institute at OHSU and she studied the firing properties of locus coeruleus neurons and its modulation by opioids. Dr. Alvarez then continued her postdoctoral training with Dr. Bernardo Sabatini at Harvard Medical School, where she studied mechanisms of functional and morphological plasticity at glutamatergic synapses using electrophysiology and two-photon imaging from 2002-2007. In 2008, she was recruited as tenure-track Investigator in the Intramural Research Program of NIAAA at NIH, where she established her research program and was granted tenure in 2015. She is currently a Senior Investigator and Laboratory Chief at NIAAA.

Dr. Alvarez holds a secondary appointment at NIDA and her laboratory receives additional funding from NINDS. Dr. Alvarez received the NIH Honor Awards in 2015 and the Outstanding Mentor Awards in 2015 and 2017. Dr. Alvarez earned the 2017 DDIR Innovation Award for the creation of the Center on Compulsive Behaviors (CCB) in the Intramural Research Program of the NIH.

Selected Publications

K. LeBlanc, T. London, Ilona Szczot, M.E. Bocarsly, Danielle Friend, Katrina Nguyen, Marda Mengesha, Marcelo Rubinstein, **V.A. Alvarez** and A. Kravitz (2018) Striatopallidal neurons control avoidance behavior in exploratory tasks. *Molecular Psychiatry*, in press.

D.A. Burke, H.G. Rotstein, **V.A. Alvarez** (2017) Striatal local circuitry: a new framework for lateral inhibition. *Neuron* 96(2): 267-284. REVIEW

J.H. Shin, M.F. Adrover, **V.A. Alvarez** (2017) Distinctive modulation of dopamine release in the nucleus accumbens shell mediated by dopamine and acetylcholine receptors. *Journal of Neuroscience* 10.1523/JNEUROSCI.0596-17.2017

S. Laguesse, N. Morisot, J.H. Shin, F. Liu, M.F. Adrover, S.A. Sakhai, M.F. Lopez, K. Phamluong, W.C. Griffin III, H.C. Becker, K.J. Bender, **V.A. Alvarez**, Dorit Ron (2017) Prosap1-dependent synaptic adaptations in the nucleus accumbens drive alcohol intake, seeking, and reward. *Neuron*, 96(1):145-159

J.C. Lemos, D.M. Friend, A.R. Kaplan, J.H. Shin, M. Rubinstein, A.V. Kravitz, **V.A. Alvarez** (2016) Enhanced GABA transmission drives bradykinesia following loss of dopamine D2 receptor signaling. *Neuron*, 90(4): 824-38.

L.K. Dobbs, A.R. Kaplan, J.C. Lemos, A. Matsui, M. Rubinstein, **V.A. Alvarez** (2016) Dopamine regulation of lateral inhibition between striatal neurons gates the stimulant actions of cocaine. *Neuron*, 90(5): 1100-13.

L. Dobbs, J.C. Lemos, **V.A. Alvarez** (2017) Restructuring of basal ganglia circuitry and associated behaviors triggered by low striatal D2 receptor expression: implications for substance use disorders. *Genes Brain Behavior* 16(1):56-70. REVIEW

Holroyd KB, Adrover MF, Fuino RL, Bock R, Kaplan AR, Rubinstein M, **Alvarez VA**. (2015) Loss of feedback inhibition via D2 autoreceptors enhances acquisition of cocaine taking and reactivity to drug-paired cues. *Neuropsychopharmacology* 40: 1495-509.

Bock R, Shin JH, Kaplan AR, Dobi A, Markey E, Kramer PF, Gremel CM, Christensen CH, Adrover MF and **Alvarez VA** (2013) Strengthening of accumbal indirect pathway promotes resilience to compulsive cocaine use. *Nature Neuroscience* 16: 632-8.