

Name: Gal Yadid

Email: yadidg@mail.biu.ac.il

Use of psychedelic and epigenetic substances as novel approaches for treating substance addiction – hope or hype?

Gal Yadid^{1,2*}; Maya Angel Birnbaum¹; Liora Simha Chouchan¹; Hilla Pe'er-Nissan¹;
Pnina Shirel Itzhak¹; Iris Gispan^{1,2}; Adi Zulooff-Shani³; Elad Lax⁴; Moshe Szyf⁵

¹Neuropharmacology Laboratory, The Mina & Everard Goodman Faculty of Life Sciences, Bar-Ilan University, Ramat Gan 5290002, Israel; ²The Leslie and Susan Gonda (Goldschmied) Multidisciplinary Brain Research Center, Bar-Ilan University, Ramat Gan 5290002, Israel;

³ClearMind- Medicine; ⁴Ariel University; ⁵Department of Pharmacology and Therapeutics, McGill University, Montreal, QC, Canada

5-Methoxy-2-aminoindane (MEAI) is a psychoactive compound which has been used recreationally by many people, who reported that MEAI functioned like an “enough switch,” completely stopping people’s desire for alcohol consumption while also delivering an elated and sociable feeling that typically comes along with 1-2 drinks. Using the self-administration animal model, MEAI administration at a dose response manner was shown to had no reward effect, albeit significantly decreased cocaine consumption and relapse to its usage. Cluster analysis showed separation of the treated group to two subgroups, 60%-vs-40% of the total rats, responders vs no-responders respectively. Our data show that MEAI is a potential treatment for cocaine addiction, in particular, and for substance drug disorders in general. Further studies are needed to better characterize the responding population.

Several lines of evidence suggest a crucial role for epigenetic modification in forming and maintaining the drug-addicts. One of the basic epigenetic mechanisms is DNA-methylation, the covalent binding of a methyl group to cytosine to form 5-methylcytosine. The DNA-methylation landscape was shown to be altered in different animal models for drug addiction. A crucial factor for progress in behavioral and mental health epigenetics is the discovery of epigenetic markers in peripheral tissues. Our studies show data associated differences in behavioral phenotypes with changes in DNA methylation in T-cells and brain.

Keywords: DNA methylation, drug abuse, genome-wide analysis, drug-addiction, psychedelics