Psychedelic Neuroscience: From Molecules to Minds
PSYC S3471
Course Syllabus - Summer 2025

Instructor: Dr. Broc Pagni **Seminar Time:** TR 5:30pm-8:40pm
E-mail: Broc.Pagni@nyulangone.org **Seminar Location:** 502 Northwest Corner Building
Office Hours: Friday, 11am-12pm (Virtual) **Number of Credits:** 3

Course Description:

Psychedelics are receiving growing attention in the fields of psychology, psychiatry, and neuroscience for their therapeutic potential. Psychedelic compounds like psilocybin, LSD, and DMT produce a wide range of changes to perception, ranging from visual perception to alterations in one's sense of self. When combined with psychological support or psychotherapy, psychedelics have been shown to lead to rapid and long-lasting therapeutic benefits for a wide range of mental health disorders, including major depression and alcohol use disorder. The acute alterations in perception and long-lasting clinical effects offer exciting insight into the relationship between the mind and the brain. This course will focus on the current state of research on the psychological and neurobiological effects of psychedelics. We will begin with a crash-course into the basics of neuroscience and research methodology. Next, the course will delve into how psychedelics alter brain functioning, both acutely during the drug effects as well as long after they have worn off. Studies covered will span molecular, cellular, and systems level analysis. A core element of the course will include reviewing methodological approaches and neuroscientific evidence for psychedelics interventions in the treatment of clinical/psychiatric disorders. We will also review the clinical data and link neurobiological findings to their practical application to move the field of psychedelic science forward. Throughout the course, there will be a specific focus on critical appraisal of research, identifying strengths and limitations surrounding current research, and important avenues for future research. Students should leave the class with an enhanced ability to evaluate research findings and a broad understanding of the mechanisms of action of psychedelics.

The format of the course will include lectures, class discussions and presentations, and guest speakers.

Prerequisites: PSYC 1001 and any 2000-level neuroscience course or permission of the instructor.

Course Role in the Department:

This seminar is designed for undergraduates majoring in Psychology or Neuroscience & Behavior, and for students participating in the Psychology Post-Baccalaureate Certificate program. It fulfills the following degree requirements:

- For the Psychology major or concentration in Columbia College and in the School of General Studies, and for the Psychology Post-Baccalaureate Certificate program, this course will meet the Group 2 (Neuroscience and Psychobiology) distribution requirement.

- For the Neuroscience and Behavior joint major, it will fulfill the Psychology requirement for an advanced psychology seminar (P5).

- For Psychology Post-Baccalaureate students and for Psychology majors, it will fulfill the seminar requirement.

Class participation:

Your class participation grade will be based on your active participation in the course. Active participation in the course involves making effective comments that integrate material, drawing on real-world experiences and observations, addressing questions raised by others, posing new questions to the class, offering thoughtful critiques of the research methodology used in a study and providing suggestions for how it might be improved, and participating in discussions following class presentations. Students who are concerned about their ability to contribute to class discussions should contact me during the first week of class. Additionally, if you expect that you will be unable to participate in a specific class due to being unable to attend because of emergency, religious reasons, sickness or some other unavoidable conflict, it is always a good idea to email me to let me know.

Class Presentations: Students will give a 10-minute individual presentation and lead a subsequent 10-minute class discussion on one of the articles assigned as homework. You will be providing your top 3 preferences for the week that you would like to present on. Detailed instructions for class presentations will be provided during the first week of class.

Response papers: To help prepare for class discussions, you will be asked to turn in 5 response papers (500-word minimum) that engages with the reading assignments for that week. You may select the classes for which you would like to submit your responses. In your papers, you may, among other things, synthesize findings and ideas presented in the readings and other materials, compare and contrast relevant viewpoints, identify criticisms, and present personal reflections on the materials. Response papers must be submitted to Courseworks before the beginning of class. Late papers will not receive credit. Grading criteria for response papers will be provided during the first week of class.

Final Paper: You will write an 8-10 page paper (double-spaced, Times New Roman 12-point font, one-inch margins) integrating and synthesizing research on a topic related to the course. Detailed instructions for the paper will be provided in class and posted on Courseworks. The final paper is due on June 28th. Grades for late papers will be reduced by 10% for each day they are late.

Grading:

20%: Class participation
20%: Response papers
20%: Class Presentation
40%: Final Paper (due on June 28th)

Part 1: Introduction

Lecture 1: Introduction to the Course; What are psychedelics? A brief review of the history of psychedelics and survey of current research

Readings

- Nichols, D. E., & Walter, H. (2020). The history of psychedelics in psychiatry. *Pharmacopsychiatry*, *54*(04), 151-166.
- Nutt, D., & Carhart-Harris, R. (2021). The current status of psychedelics in psychiatry. *JAMA Psychiatry*, *78*(2), 121-122.
- Hartogsohn, I. (2016). Set and setting, psychedelics and the placebo response: an extra-pharmacological perspective on psychopharmacology. *Journal of Psychopharmacology*, *30*(12), 1259-1267.

Additional Resources

- Golden, T. L., Magsamen, S., Sandu, C. C., Lin, S., Roebuck, G. M., Shi, K. M., & Barrett, F. S. (2022). Effects of setting on psychedelic experiences, therapies, and outcomes: A rapid scoping review of the literature. In Barret, F. S., & Preller, K. H. (Eds.), *Disruptive Psychopharmacology. Current Topics in Behavioral Neurosciences, (vol. 56)*. Springer.
- Johnson, M. W., Hendricks, P. S., Barrett, F. S., & Griffiths, R. R. (2019). Classic psychedelics: An integrative review of epidemiology, therapeutics, mystical experience, and brain network function. *Pharmacology & Therapeutics*, *197*, 83-102.
- Carhart-Harris, R. L., Roseman, L., Haijen, E., Erritzoe, D., Watts, R., Branchi, I., & Kaelen, M. (2018). Psychedelics and the essential importance of context. *Journal of Psychopharmacology*, *32*(7), 725-731.
- Mithoefer, M. (2013). MDMA-assisted psychotherapy: How different is it from other psychotherapy. MAPS Bulletin.
- Gründer, G., Brand, M., Mertens, L. J., Jungaberle, H., Kärtner, L., Scharf, D. J., ... & Wolff, M. (2024). Treatment with psychedelics is psychotherapy: Beyond reductionism. *The Lancet Psychiatry*, *11*(3), 231-236.
- TED Talk: The future of psychedelic-assisted psychotherapy, Rick Doblin. Available at: https://www.ted.com/talks/rick_doblin_the_future_of_psychedelic_assisted_psychotherapy?language=en

Part 2: Background into Clinical and Psychological Findings

Lecture 2: Psychedelic-Assisted Therapy for Psychiatric Disorders

Readings

- Mitchell, J. M., Ot'alora G, M., van der Kolk, B., Shannon, S., Bogenschutz, M., Gelfand, Y., ... & MAPP2 Study Collaborator Group. (2023). MDMA-assisted therapy for moderate to severe PTSD: A randomized, placebo-controlled phase 3 trial. *Nature Medicine*, *29*(10), 2473-2480.

- Raison, C. L., Sanacora, G., Woolley, J., Heinzerling, K., Dunlop, B. W., Brown, R. T., ... & Griffiths, R. R. (2023). Single-dose psilocybin treatment for major depressive disorder: A randomized clinical trial. *JAMA*, *330*(9), 843-853.

Additional Resources

- Bogenschutz, M. P., Ross, S., Bhatt, S., Baron, T., Forcehimes, A. A., Laska, E., ... & Worth, L. (2022). Percentage of heavy drinking days following psilocybin-assisted psychotherapy vs placebo in the treatment of adult patients with alcohol use disorder: A randomized clinical trial. *JAMA Psychiatry*, *79*(10), 953-962.
- Griffiths, R. R., Johnson, M. W., Carducci, M. A., Umbricht, A., Richards, W. A., Richards, B. D., ... & Klinedinst, M. A. (2016). Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial. *Journal of Psychopharmacology*, *30*(12), 1181-1197.
- Yao, Y., Guo, D., Lu, T. S., Liu, F. L., Huang, S. H., Diao, M. Q., ... & Han, Y. (2024). Efficacy and safety of psychedelics for the treatment of mental disorders: A systematic review and meta-analysis. *Psychiatry Research*, 115886.
- Garcia-Romeu, A., & Richards, W. A. (2018). Current perspectives on psychedelic therapy: Use of serotonergic hallucinogens in clinical interventions. *International Review of Psychiatry*, *30*(4), 291-316.
- Goodwin, G. M., Malievskaia, E., Fonzo, G. A., & Nemeroff, C. B. (2024). Must psilocybin always "assist psychotherapy"?. *American Journal of Psychiatry*, *181*(1), 20-25.
- Mathai, D. S., Mora, V., & Garcia-Romeu, A. (2022). Toward synergies of ketamine and psychotherapy. *Frontiers in Psychology*, *13*, 868103.
- Johnson, M. W., Richards, W. A., & Griffiths, R. R. (2008). Human hallucinogen research: Guidelines for safety. *Journal of Psychopharmacology*, *22*(6), 603-620.
- What Actually Happens During an MDMA Psychotherapy Session? Marcela Ot'alora. Available at: https://www.youtube.com/watch?v=dk5Al1GJ2gU
- Yaden, D. B., Earp, D., Graziosi, M., Friedman-Wheeler, D., Luoma, J. B., & Johnson, M. W. (2022). Psychedelics and psychotherapy: Cognitive-behavioral approaches as default. Frontiers in psychology, 13, 873279.
- Lecture: The role of music, set and setting in psychedelic therapy, Mendel Kaelen. Available at: https://www.youtube.com/watch?v=8rAgNmUJ0zk
- Bedi, G., Cotton, S. M., Guerin, A. A., & Jackson, H. J. (2023). MDMA-assisted psychotherapy for post-traumatic stress disorder: The devil is in the detail. *Australian & New Zealand Journal of Psychiatry*, *57*(4), 476-481.
- Nayak, S. M., Bradley, M. K., Kleykamp, B. A., Strain, E. C., Dworkin, R. H., & Johnson, M. W. (2023). Control conditions in randomized trials of psychedelics: An ACTTION systematic review. *The Journal of Clinical Psychiatry*, *84*(3), 47000.
- Leone, L., McSpadden, B., DeMarco, A., Enten, L., Kline, R., & Fonzo, G. A. (2024). Psychedelics and Evidence-based Psychotherapy: A systematic review with recommendations for advancing psychedelic therapy research. *Psychiatric Clinics*. https://doi.org/10.1016/j.psc.2024.02.006
- Whinkin, E., Opalka, M., Watters, C., Jaffe, A., & Aggarwal, S. (2023). Psilocybin in palliative care: An update. *Current Geriatrics Reports*, *12*, 50-59.

Lecture 3: How Do Psychedelics Work?: Psychological Mechanisms

Readings

- Roseman, L., Nutt, D. J., & Carhart-Harris, R. L. (2018). Quality of acute psychedelic experience predicts therapeutic efficacy of psilocybin for treatment-resistant depression. *Frontiers in Pharmacology*, *8*, 974.
- Levin, A. W., Lancelotta, R., Sepeda, N. D., Gukasyan, N., Nayak, S., Wagener, T. L., ... & Davis, A. K. (2024). The therapeutic alliance between study participants and intervention facilitators is associated with acute effects and clinical outcomes in a psilocybin-assisted therapy trial for major depressive disorder. *PloS one*, *19*(3), e0300501.

Additional Resources

- Watts, R., Day, C., Krzanowski, J., Nutt, D., & Carhart-Harris, R. (2017). Patients' accounts of increased "connectedness" and "acceptance" after psilocybin for treatment-resistant depression. *Journal of Humanistic Psychology*, *57*(5), 520-564.
- Crowe, M., Manuel, J., Carlyle, D., & Lacey, C. (2023). Experiences of psilocybin treatment for clinical conditions: A qualitative meta-synthesis. *International Journal of Mental Health Nursing*, *32*, 1025-1037.
- Davis, A. K., Barrett, F. S., So, S., Gukasyan, N., Swift, T. C., & Griffiths, R. R. (2021). Development of the Psychological Insight Questionnaire among a sample of people who have consumed psilocybin or LSD. *Journal of Psychopharmacology*, *35*(4), 437-446.
- Aday, J. S., Davis, A. K., Mitzkovitz, C. M., Bloesch, E. K., & Davoli, C. C. (2021). Predicting reactions to psychedelic drugs: A systematic review of states and traits related to acute drug effects. *ACS Pharmacology & Translational Science*, *4*(2), 424-435.
- Nayak, S. M., White, S. H., Hilbert, S. N., Lowe, M. X., Jackson, H., Griffiths, R. R., ... & Yaden, D. B. (2024). Psychedelic Experiences Increase Mind Perception but do not Change Atheist-Believer Status: A Prospective Longitudinal Study. *Journal of Psychoactive Drugs*.
- Zeifman, R. J., Wagner, A. C., Monson, C. M., & Carhart-Harris, R. L. (2023). How does psilocybin therapy work? An exploration of experiential avoidance as a putative mechanism of change. *Journal of Affective Disorders*, *334*, 100-112.

Part 3: Primer into Neuroscience

Lecture 4: Crash course into Neurobiology and Methodology

Readings

- Dowling, J. E. (2001). Neurons and networks: an introduction to behavioral neuroscience. Harvard University Press.
- Menon V. Large-scale brain networks and psychopathology: A unifying triple network model. *Trends Cogn Sci*. 2011;15(10):483-506. doi:10.1016/j.tics.2011.08.003

Additional Resources

- Seeley WW, Menon V, Schatzberg AF, et al. Dissociable intrinsic connectivity networks for salience processing and executive control. *J Neurosci*. 2007;27(9):2349-2356. doi:10.1523/JNEUROSCI.5587-06.2007

Part 4: Molecular and Cellular Mechanisms of Action

Lecture 5: How to psychedelics alter emotion, cognition, and perception?: Insight into the serotonin 2A receptor

Readings

- Yaden, D. B., & Griffiths, R. R. (2020). The subjective effects of psychedelics are necessary for their enduring therapeutic effects. *ACS Pharmacology & Translational Science*, *4*(2), 568-572.
- Olson, D. E. (2020). The subjective effects of psychedelics may not be necessary for their enduring therapeutic effects. *ACS Pharmacology & Translational Science*, *4*(2), 563-567.

Optional Reviews

- Kwan AC, Olson DE, Preller KH, Roth BL. The neural basis of psychedelic action. *Nat Neurosci*. 2022;(December 2021). doi:10.1038/s41593-022-01177-4
- Preller KH, Herdener M, Pokorny T, Liechti ME, Seifritz E, Vollenweider FX. The Fabric of Meaning and Subjective Effects in LSD- Induced States Depend on Serotonin 2A Receptor 2017:451-457. doi:10.1016/j.cub.2016.12.030
- Ray TS. Psychedelics and the human receptorome. *PLoS One*. 2010;5(2). doi:10.1371/journal.pone.0009019
- Vollenweider FX, Vollenweider-Scherpenhuyzen MFI, Bäbler A, Vogel H, Hell D. Psilocybin induces schizophrenia-like psychosis in humans via a serotonin-2 agonist action. *Neuroreport*. 1998;9(17):3897-3902. doi:10.1097/00001756-199812010-00024

Additional Resources

- Becker AM, Klaiber A, Holze F, et al. Ketanserin reverses the acute response to LSD in a randomized, double-blind, placebo-controlled, crossover study in healthy subjects. doi:10.1093/ijnp/pyac075/6808755
- Valle M, Elda A, Rabella M, et al. Inhibition of alpha oscillations through serotonin-2A receptor activation underlies the visual effects of ayahuasca in humans. *Eur Neuropsychopharmacol*. 2016;26(7):1161-1175. doi:10.1016/j.euroneuro.2016.03.012
- Madsen MK, Fisher PM, Burmester D, et al. Psychedelic effects of psilocybin correlate with serotonin 2A receptor occupancy and plasma psilocin levels. *Neuropsychopharmacology*. 2019;44(7):1328-1334. doi:10.1038/s41386-019-0324-9
- Moreno JL, Holloway T, Albizu L, Sealfon SC, González-Maeso J. Metabotropic glutamate mGlu2 receptor is necessary for the pharmacological and behavioral effects induced by hallucinogenic 5-HT2A receptor agonists. *Neurosci Lett*. 2011;493(3):76-79. doi:10.1016/j.neulet.2011.01.046
- Nour, M. M., & Carhart-Harris, R. L. (2017). Psychedelics and the science of self-experience. *The British Journal of Psychiatry*, *210*(3), 177-179.

- Rosenblat, J. D., Leon-Carlyle, M., Ali, S., Husain, M. I., & McIntyre, R. S. (2023). Antidepressant effects of psilocybin in the absence of psychedelic effects. *American Journal of Psychiatry*, *180*(5), 395-396.
- Lecture: Psychedelic Therapy is Psychotherapy — Connecting the Dots Between Two Fields that Belong Together, Max Wolff. Available at: https://www.youtube.com/watch?v=8DyyeWI9Mq4

Lecture 6: Molecular and Cellular mechanisms Underlying Treatment of Mood Disorders

Readings

- Kwan AC, Olson DE, Preller KH, Roth BL. The neural basis of psychedelic action. *Nat Neurosci*. 2022;(December 2021). doi:10.1038/s41593-022-01177-4
- Ly C, Greb AC, Cameron LP, et al. Psychedelics Promote Structural and Functional Neural Plasticity. *Cell Rep*. 2018;23(11):3170-3182. doi:10.1016/j.celrep.2018.05.022

Additional Resources

- Vargas M V, Dunlap LE, Dong C, et al. Psychedelics promote neuroplasticity through the activation of intracellular 5-HT2A receptors. *Science*. 2023;379(6633):700-706. doi:10.1126/science.adf0435
- Hesselgrave N, Troppoli TA, Wulff AB, Cole AB, Thompson SM. Harnessing psilocybin: Antidepressant-like behavioral and synaptic actions of psilocybin are independent of 5-HT2R activation in mice. Proc Natl Acad Sci U S A. 2021;118(17):1-7. doi:10.1073/pnas.2022489118
- Morales-Garcia JA, Calleja-Conde J, Lopez-Moreno JA, et al. N,N-dimethyltryptamine compound found in the hallucinogenic tea ayahuasca, regulates adult neurogenesis in vitro and in vivo. Transl Psychiatry. 2020;10(1). doi:10.1038/s41398-020-01011-0
- Barrett FS, Zhou Y, Carbonaro TM, et al. Human Cortical Serotonin 2A Receptor Occupancy by Psilocybin Measured Using [11 C] MDL 100 , 907 Dynamic PET and a Resting-State fMRI-Based Brain Parcellation. 2022;2(January):1-11. doi:10.3389/fnrgo.2021.784576
- González-Maeso J, Weisstaub N V., Zhou M, et al. Hallucinogens Recruit Specific Cortical 5-HT2A Receptor-Mediated Signaling Pathways to Affect Behavior. *Neuron*. 2007;53(3):439-452. doi:10.1016/j.neuron.2007.01.008
- Scruggs JL, Patel S, Bubser M, Deutch AY. DOI-induced activation of the cortex: Dependence on 5-HT(2A) heteroceptors on thalamocortical glutamatergic neurons. *J Neurosci*. 2000;20(23):8846-8852. doi:10.1523/jneurosci.20-23-08846.2000
- Sloshower, J., Guss, J., Krause, R., Wallace, R. M., Williams, M. T., Reed, S., & Skinta, M. D. (2020). Psilocybin-assisted therapy of major depressive disorder using acceptance and commitment therapy as a therapeutic frame. *Journal of Contextual Behavioral Science*, *15*, 12-19.

Lecture 7: Molecular and Cellular Mechanisms Underlying Treatment of Addiction and Neurological Disorders

- Meinhardt MW, Pfarr S, Fouquet G, et al. Psilocybin targets a common molecular mechanism for cognitive impairment and increased craving in alcoholism. Sci Adv. 2021;7(47):1-13. doi:10.1126/sciadv.abh2399
- Dakic, V., Minardi Nascimento, J., Costa Sartore, R. *et al.* Short term changes in the proteome of human cerebral organoids induced by 5-MeO-DMT. *Sci Rep* **7**, 12863 (2017). https://doi.org/10.1038/s41598-017-12779-5

Additional Resources

- Nardou R, Sawyer E, Song YJ, et al. Psychedelics reopen the social reward learning critical period. *Nature*. 2023;618(7966):790-798. doi:10.1038/s41586-023-06204-3
- Cameron LP, Benson CJ, Dunlap LE, Olson DE. Effects of N, N-Dimethyltryptamine on Rat Behaviors Relevant to Anxiety and Depression. *ACS Chem Neurosci*. 2018;9(7):1582-1590. doi:10.1021/acschemneuro.8b00134

Part 5: How Do Psychedelics Work?: Human Neuroimaging Studies

Lecture 8: Brain Activation and Functioning Connectivity

Readings

- Tagliazucchi E, Roseman L, Kaelen M, et al. Increased Global Functional Connectivity Correlates with LSD-Induced Ego Dissolution. *Curr Biol*. 2016;26(8):1043-1050. doi:10.1016/j.cub.2016.02.010
- Timmerman, C., Roseman, L., Haridasa, S., Rosasa, F., Luana, L., Kettnera, H., Martella JDE, Enzo Tagliazucchie, f, Carla Pallavicinif, Manesh Girng, Andrea Alamiah , Robert Leechi , David J. Nutta and RLCH. Human brain effects of DMT assessed via EEG-fMRI. *Proc Natl Acad Sci*. 2023;120:2017. doi:10.1073/pnas

Additional Resources

- Lebedev A V., Lövdén M, Rosenthal G, Feilding A, Nutt DJ, Carhart-Harris RL. Finding the self by losing the self: Neural correlates of ego-dissolution under psilocybin. *Hum Brain Mapp*. 2015;36(8):3137-3153. doi:10.1002/hbm.22833
- Roseman L, Leech R, et al. The effects of psilocybin and MDMA on between-network resting state functional connectivity in healthy volunteers. 2014;8(May):1-11. doi:10.3389/fnhum.2014.00204
- Timmermann C, Roseman L, Schartner M, et al. Neural correlates of the DMT experience assessed with multivariate EEG. *Sci Rep*. 2019;9(1):1-13. doi:10.1038/s41598-019-51974-4
- Carhart-Harris RL, Muthukumaraswamy S, Roseman L, et al. Neural correlates of the LSD experience revealed by multimodal neuroimaging. *Proc Natl Acad Sci U S A*. 2016;113(17):4853-4858. doi:10.1073/pnas.1518377113
- Müller F, Dolder PC, Schmidt A, Liechti ME, Borgwardt S. Altered network hub connectivity after acute LSD administration. NeuroImage Clin. 2018;18(August 2017):694-701. doi:10.1016/j.nicl.2018.03.005

- Carhart-Harris, R. L., Erritzoe, D., Williams, T., Stone, J. M., Reed, L. J., Colasanti, A., ... & Nutt, D. J. (2012). Neural correlates of the psychedelic state as determined by fMRI studies with psilocybin. *Proceedings of the National Academy of Sciences*, *109*(6), 2138-2143.
- Schmidt A, Müller F, Lenz C, et al. Acute LSD effects on response inhibition neural networks. *Psychol Med*. 2018;48(9):1464-1473. doi:10.1017/S0033291717002914
- Interview: Annie Levy - Psilocybin Study Participant. Available at: https://www.youtube.com/watch?v=xYhtXI4Prpo

Lecture 9: Dynamical Systems Approach to Understanding Psychedelic Action

Readings

- Lord LD, Expert P, Atasoy S, et al. Dynamical exploration of the repertoire of brain networks at rest is modulated by psilocybin. Neuroimage. 2019;199(April):127-142. doi:10.1016/j.neuroimage.2019.05.060
- Siegel, J.S., Subramanian, S., Perry, D. et al. Psilocybin desynchronizes the human brain. Nature 632, 131–138 (2024). https://doi.org/10.1038/s41586-024-07624-5Preller KH,

Additional Resources

- Duerler P, Burt JB, et al. Psilocybin Induces Time-Dependent Changes in Global Functional Connectivity. *Biol Psychiatry*. 2020;88(2):197-207. doi:10.1016/j.biopsych.2019.12.027
- van der Kolk, B. A., Wang, J. B., Yehuda, R., Bedrosian, L., Coker, A. R., Harrison, C., ... & Doblin, R. (2024). Effects of MDMA-assisted therapy for PTSD on self-experience. *PLoS One*, *19*(1), e0295926.
- MAPS Manual for MDMA-Assisted Therapy for PTSD. Available at: http://maps.org/treatment-manual
- Video: Psychedelics could heal your trauma, says neuroscientist Rachel Yehuda. Available at: https://www.youtube.com/watch?v=A3TvqMwgEco

Lecture 10: Neuroimaging correlates of Therapeutic Effects

Readings

- Lebedev A V., Kaelen M, Lövdén M, et al. LSD-induced entropic brain activity predicts subsequent personality change. *Hum Brain Mapp*. 2016;37(9):3203-3213. doi:10.1002/hbm.23234
- Carhart-Harris, R.L., Roseman, L., Bolstridge, M. *et al.* Psilocybin for treatment-resistant depression: fMRI-measured brain mechanisms. *Sci Rep* **7**, 13187 (2017). https://doi.org/10.1038/s41598-017-13282-7

Additional Resources

- Smigielski, L., Kometer, M., Scheidegger, M., Krähenmann, R., Huber, T., & Vollenweider, F. X. (2019). Characterization and prediction of acute and sustained

response to psychedelic psilocybin in a mindfulness group retreat. *Scientific reports*, *9*(1), 14914.

- Kraehenmann R, Preller KH, Scheidegger M, et al. Psilocybin-induced decrease in amygdala reactivity correlates with enhanced positive mood in healthy volunteers. *Biol Psychiatry*. 2015;78(8):572-581. doi:10.1016/j.biopsych.2014.04.010
- Mertens LJ, Wall MB, Roseman L, Demetriou L, Nutt DJ, Carhart-Harris RL. Therapeutic mechanisms of psilocybin: Changes in amygdala and prefrontal functional connectivity during emotional processing after psilocybin for treatment-resistant depression. *J Psychopharmacol*. 2020;34(2):167-180. doi:10.1177/0269881119895520
- Carhart-Harris RL, Roseman L, Bolstridge M, et al. Psilocybin for treatment-resistant depression: FMRI-measured brain mechanisms. *Sci Rep*. 2017;7(1):1-11. doi:10.1038/s41598-017-13282-7
- Daws RE, Timmermann C, Giribaldi B, et al. Increased global integration in the brain after psilocybin therapy for depression. *Nat Med*. 2022;28(4):844-851. doi:10.1038/s41591-022-01744-z

Lecture 11: Theoretical Perspectives of How Psychedelics Work

Readings

- Swanson, L. R. (2018). Unifying theories of psychedelic drug effects. Frontiers in pharmacology, 9, 172.
- Carhart-Harris, R. L., & Friston, K. J. (2019). REBUS and the anarchic brain: toward a unified model of the brain action of psychedelics. *Pharmacological reviews*, *71*(3), 316-344.

Additional Resources

- Vollenweider, F. X., & Preller, K. H. (2020). Psychedelic drugs: neurobiology and potential for treatment of psychiatric disorders. *Nature Reviews Neuroscience*, *21*(11), 611-624.
- Kwan AC, Olson DE, Preller KH, Roth BL. The neural basis of psychedelic action. *Nat Neurosci*. 2022;25(11):1407-1419. doi:10.1038/s41593-022-01177-4

Part 6: Limitations, Concerns, and Future Directions

Lecture 12: Psychedelics: Ethical and Safety Concerns; Course Wrap-Up

Readings

- Schlag, A. K., Aday, J., Salam, I., Neill, J. C., & Nutt, D. J. (2022). Adverse effects of psychedelics: From anecdotes and misinformation to systematic science. *Journal of Psychopharmacology*, *36*(3), 258-272.
- Yaden, D. B., Potash, J. B., & Griffiths, R. R. (2022). Preparing for the bursting of the psychedelic hype bubble. *JAMA psychiatry*, *79*(10), 943-944.

Additional Resources

- Johnson, M. W. (2020). Consciousness, religion, and gurus: Pitfalls of psychedelic medicine. *ACS Pharmacology & Translational Science*, *4*(2), 578-581.
- Thrul, J., & Garcia-Romeu, A. (2021). Whitewashing psychedelics: Racial equity in the emerging field of psychedelic-assisted mental health research and treatment. *Drugs: Education, Prevention and Policy*, *28*(3), 211-214.
- Gukasyan, N. (2023). On blinding and suicide risk in a recent trial of psilocybin-assisted therapy for treatment-resistant depression. *Med*, *4*(1), 8-9.
- Simonsson, O., Hendricks, P. S., Chambers, R., Osika, W., & Goldberg, S. B. (2023). Prevalence and associations of challenging, difficult or distressing experiences using classic psychedelics. *Journal of Affective Disorders*, *326*, 105-110.
- Testimonial: Challenging, unresolved psychedelic experience: Testimonial from a trial participant, Mayram Jabir. Available at: https://www.youtube.com/watch?app=desktop&v=5jVgIxwgUZo&trk=feed_main-feed-card_ingested-content-summary-external-video-content
- Aday, J. S., Heifets, B. D., Pratscher, S. D., Bradley, E., Rosen, R., & Woolley, J. D. (2022). Great Expectations: Recommendations for improving the methodological rigor of psychedelic clinical trials. *Psychopharmacology*, *239*(6), 1989-2010.
- van Elk, M., & Fried, E. I. (2023). History repeating: Guidelines to address common problems in psychedelic science. *Therapeutic Advances in Psychopharmacology*, *13*, 20451253231198466.

Course Policies:

Fostering an Inclusive Classroom: Together, we will work to develop a classroom that is focused on curiosity, exploration, and critical thinking within an environment that is welcoming of a diversity of perspectives and identities. Please contact me if you experience any concerns that you feel threaten this element of the class throughout the course and we will work together to ensure these principles are upheld.

Students with special needs who may require classroom/test accommodations should make an appointment with me before or during the first week of class. You should also contact the Office of Disability Services (ODS) in Lerner Hall before the start of the course to register for these accommodations. The procedures for registering with ODS can be found at https://health.columbia.edu/content/disability-services, or by calling (212) 854-2388.

Academic Integrity:
Academic honesty will be strongly enforced. Columbia students commit to the Honor Code as follows: "I affirm that I will not plagiarize, use unauthorized materials, or give or receive illegitimate help on assignments, papers, or examinations. I will also uphold equity and honesty in the evaluation of my work and the work of others. I do so to sustain a community built around this Code of Honor." For further details on academic integrity, please see Academic Integrity | Columbia College.