

## **Panos Zanos, Ph.D.**

Assistant Professor of Neuropsychopharmacology  
Department of Psychology  
University of Cyprus

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### **Professional Experience**

**Aug 2021 – Assistant Professor of Neuropharmacology**

**Present** University of Cyprus, Department of Psychology, Nicosia, Cyprus  
Principal Investigator

Web-page: <https://www.ucy.ac.cy/dir/en/cb-profile/pzanos01>

**Aug 2019 – Assistant Professor of Neuroscience**

**Aug 2021** University of Maryland, School of Medicine, Baltimore, U.S.A.

Principal Investigator

Web-page: <https://www.medschool.umaryland.edu/profiles/Zanos-Panos/>

**Oct 2018 – Instructor / Research Associate**

**Aug 2019** University of Maryland, School of Medicine, Baltimore, U.S.A.

**Nov 2013 – Post-doctoral Research Fellow**

**Oct 2018** University of Maryland, School of Medicine, Baltimore, U.S.A.

### **Education**

**Aug 2010 – Ph.D. Neuropharmacology**

**Sep 2013** University of Surrey, Guildford, Surrey, U.K.

Thesis title: The role of oxytocin in drug addiction and relapse

**Sep 2007 – BSc (Hons) Biochemistry**

**July 2010** University of Surrey, Guildford, Surrey, U.K.

Final year project: The role of regulatory appetite peptides in drug addiction.

### **Professional Society Memberships**

1. American College of Neuropsychopharmacology (Associate Member - Current)
2. Mediterranean Neuroscience Society (Member – Current)
3. Alzheimer's Association (Member – Current)
4. Society of Neuroscience (postdoctoral membership – Past)
5. International Behavioral Neuroscience Society (postdoctoral membership – Past)
6. Society of Biology (undergraduate membership – Past)
7. British Pharmacological Society (3 years; undergraduate membership – Past)

### **Honors and Awards**

**2023** Marie Skłodowska Curie\_CoFund (Onisilos), as Supervisor (2 different fellowships)

**2021** Marie Skłodowska Curie Individual Fellowship (H2020)

**2018** Travel award to attend the 2018 ACNP Annual Meeting, Florida, U.S.A.

**2017** Best Postdoctoral Scholar award, University of Maryland, School of Medicine

- 2017** Society of Biological Psychiatry Travel Fellowship Award to attend the SOBP 2017 meeting in San Diego, CA, U.S.A.
- 2016** University of Maryland, Baltimore, Postdoctoral Travel Award (based on outstanding research achievements) to attend the Society for Neuroscience, SfN meeting in San Diego, CA, U.S.A.
- 2016** Best mentor award (Program in Neuroscience, University of Maryland, Baltimore; selected by students, peers and faculty)
- 2014** Best Poster Presentation award (Department of Psychiatry, University of Maryland, Baltimore)
- 2013** Award for best inter-faculty Ph.D. student of the University of Surrey, Guildford, U.K.
- 2013** Ruth Humphrey Fund to attend World Congress of Neurohypophysial Hormones (Bristol, U.K.)
- 2013** Best poster presentation prize, European opioid conference, Guildford, U.K.
- 2012** Best Oral Communication (FHMS festival of Research – University of Surrey, Guildford)
- 2011** Scholarship to attend Neuroscience School of Advanced Studies (Siena, Italy)
- 2011** Travel award to attend European Opioid Conference (Krakow, Poland)
- 2010** University of Surrey Award – BSc Biochemistry award for academic excellence
- 2007-2010** Scholarship for academic excellence – University of Surrey, U.K.

### **Zanos' Lab achievements**

1<sup>st</sup> post-doctoral trainee of the lab, Dr. Derrick Phillips, became an Assistant Professor at the University of Idaho immediately after finishing his postdoctoral training at the Zanos lab at UMB.

### **Teaching/Supervising**

- Aug 2019 – Present**      **Supervising** 2 postdoctoral researchers, 2 research assistants and co-supervising one graduate student at the University of Maryland. Currently supervising 6 postdoctoral fellows, 2 Ph.D. students and 2 Research Assistants in the Zanos laboratory at the University of Cyprus.
- Sep 2020 - Aug 2021**      **Special Researcher** at the Department of Psychology, University of Cyprus, teaching Neuroscience and Pharmacology classes to Undergraduate and Graduate students.
- 2017-2018**      **Visiting Lecturer** St. Elizabeth's Hospital; Lectures on "Mechanisms of action of novel fast-acting antidepressants", to Psychiatrist Residents
- 2010-2013**      **Lecturing** Undergraduate Students on Biology at the University of Surrey; **Teaching** Addiction Neuropharmacology to A-level Summer-school students

### **Ph.D. Dissertation Committee Member**

- 09/14/2020 - present**      Alexandra McCoy; UT Health San Antonio
- 05/29/2020 - present**      Carolyn Doty; University of Maryland, Baltimore
- 08/30/2019 - 07/28/2020**      Jaclyn Highland; University of Maryland, Baltimore

### **Grant Support**

#### **Active Funding**

- 01/03/23 – 31/08/24**      (Principal Investigator) - \$100,000  
*"Identification of viral-mediated pathogenic mechanisms in comorbid Alzheimer's Disease and Major Depression using Systems Bioinformatics"*.  
 Infectious Diseases Society of America (IDSA)
- 01/04/23 – 30/03/25**      (Supervisor/Coordinator) - €147,120  
*"Exploring the genetic and molecular underpinning of smoking addiction for the development of new therapeutic strategies"*. H2020-MSCA-COFUND-2020

- 01/09/23 – 31/08/25** (Supervisor/Coordinator) - €147,120  
*“Elucidation of ketamine function as an antidepressant with the use of human derived neural organoids and its implication to Neural Tube Defects”*. H2020-MSCA-COFUND-2020
- 01/09/23 – 31/08/25** (Supervisor/Coordinator) - €146,453  
*“Insights into the Role of Cytochrome P450 Lipid Mediators in Depression and Neurodegeneration”*. H2020-MSCA-COFUND-2020
- 23/08/21 – 23/08/24** (Principal Investigator) - €50,000  
*“Identifying biomarkers for drug addiction and comorbid neuropsychiatric disorders using EEG”*  
 Starting-package funds, Department of Psychology, University of Cyprus
- 31/03/21 – 30/11/24** (Principal Investigator) - €199,920  
*“Efficacy of Ketamine for the Prevention of Relapse in Patients with Comorbid Mood and Opioid-Use Disorders (OUD)”*. Research & Innovation Foundation – Excellence Hubs 2021.
- 23/08/21 – 22/08/24** (Principal Investigator) - \$20,000  
 (no-cost extension)  
*“Efficacy of Hydroxynorketamines in treating Comorbid Mood and Opioid-Use Disorders”*. Brain & Behavior Research Foundation. – Transfer to UCY
- 01/07/21 – 01/07/24** (Co-Investigator) - €200,000  
*“Cancer, allostatic load, and regulation of emotions: how stress and emotion regulation impact mental and physical health of breast and testicular cancer patients”*. CCRI 2020\_FUN\_001-000
- 09/01/22 – 09/01/25** (Marie Curie Fellow) - €145,941  
*“Identifying biomarkers of stress-induced neurophysiological changes and emotion regulation deficits to predict relapse during nicotine abstinence”*. H2020-MSCA-IF-2020 # 101031962
- 01/07/21 - 30/05/25** (Co-Investigator) - \$95,000  
*“Increasing Retention in Methadone Maintenance Treatment: Feasibility and Preliminary Efficacy of Adjunct Ketamine for the Treatment of Patients with OUD and Comorbid Depression”*. Science to systems cares grant program
- 15/07/19 - 14/07/24** (Principal Investigator) - \$50,000  
 (no-cost extension)  
*“Effects of ketamine’s metabolite (2R,6R)-HNK on opioid withdrawal-induced emotional impairment and drug-seeking reinstatement”*. NARSAD Young Investigator Grant (#26826)

### **Completed Grants**

- 17/09/18 - 14/03/24** (Co-Principal Investigator) - \$700,000  
*“Determining whether (2R,6R)-HNK can reverse sleep disturbances following chronic contingent and non-contingent opioid administration”*; NIH/NIMH 3R01MH107615-04S1
- 17/03/20 - 28/02/23** (Co-Investigator) - \$210,000  
*“Mechanisms of sustained anti-neuroinflammatory actions of (2R,6R)-HNK”*  
 NIH/NIMH R21 RAI145211A
- 19/08/19 – 23/08/21** (Principal Investigator) - \$500,000  
*“Identification of novel pharmacotherapies to treat comorbid substance use and mood disorders”*  
 Starting-package funds, Department of Psychiatry, University of Maryland
- 01/01/17 - 31/12/18** (Co-Investigator) - \$400,643  
*“AMPA mechanism of ketamine antidepressant action: validation in humans”*  
 NIH Bench to Bedside Award

## **Patents and Inventions**

1. WO/2017/165877. Methods of using (2R,6R)-hydroxynorketamine and (2S,6S)-hydroxynorketamine in the treatment of depression, anxiety, anhedonia, suicidal ideation, and post-traumatic stress disorder. (Co-inventor).
2. WO/2017/165878. Crystal forms and methods of synthesis of (2R,6R)-hydroxynorketamine and (2S,6S)-hydroxynorketamine. (Co-inventor).
3. Use of (2R,6R)-hydroxynorketamine for the prevention of relapse to opioids following abstinence. (Near submission; Primary Inventor).

## **Journal manuscript reviewer (selected)**

Nature Neuroscience; Nature Communications; Neuron; PNAS; Biological Psychiatry; Molecular Psychiatry; Neuropsychopharmacology; Neuropharmacology; Psychopharmacology; Pharmacology, Biochemistry and Behavior; Physiology and Behavior; British Journal of Pharmacology; Journal of Neuroendocrinology; Behavioral Neuroscience; Current opinion in Behavioral Sciences; ACS Chemical Neuroscience; Translational Psychiatry.

## **Grant proposal reviewer**

Reviewer of grant proposals for the *National Science Center of Poland*

## **Publication List**

### **Peer-reviewed journal articles (Reverse Chronological Order)**

1. Onisiforou, A., **Zanos, P.** From viral infections to Alzheimer's Disease: Unveiling the mechanistic links through Systems Bioinformatics. *Journal of Infectious Diseases*, 2024, In Press.
2. Onisiforou, A., **Zanos, P.**, Georgiou, P. Molecular signatures of premature aging in major depression and substance use disorders. *Scientific Data*, 2024, In Press.
3. Onisiforou, A., **Zanos, P.**, Georgiou, P. Neuroendocrine Regulation of Anxiety. In: Charis, C., Panayiotou, G. (eds) *Anxiety Disorders and Related Conditions*. Springer, Cham.
4. Georgiou, A., Voskarides, K., **Zanos, P.**, Chatzittofis, A. Investigating the shared genetic basis and causal relationships between mucosa-associated lymphoid tissue inflammation and psychiatric disorders. *Frontiers in Psychiatry*, 2024, In Press.
5. Nguyen, T.M.L., Guilloux, J-P., Defaix, C., Mendez-David, I., Etting, I., Alvarez, J-C., McGowan, J.C., Highland, J.N., **Zanos, P.**, Jacqueline, L., Moaddel, M., Corruble, E., David, D.J., Gould, T.D., Denny, C.A., Gardier, A. Ketamine metabolism via hepatic CYP450 isoforms contributes to its sustained antidepressant actions. *bioRxiv*, 2024.04. 03.587904.
6. Onisiforou, A., Christodoulou, P., Zamba-Papanicolaou, E., **Zanos P.**, Georgiou P. Transcriptomic Analysis Reveals Sex-Specific Patterns in the Hippocampus in Alzheimer's Disease. *Frontiers in Endocrinology*, 2024, 15.
7. Bendis, P.C., Zimmerman, S., Onisiforou, A., **Zanos P.**, Georgiou P. The Impact of Estradiol on Serotonin, Glutamate, and Dopamine Systems. *Frontiers in Neuroscience*, 2024, 18.
8. Onisiforou, A., Michael, A., Georgiou, P., Mammadov, E., **Zanos, P.** Ketamine metabolites as next-generation pharmacotherapies for treating opioid addiction. *Neuropsychopharmacology*, 2024, 48 (481-481).
9. Loizou, P., Panayiotou, G., **Zanos, P.**, Paraskevopoulos, E. Exploring the neurofunctional impairments and cognitive biases concerning food and body related stimuli in anorexia nervosa: an integrated EEG and eye-tracking study protocol. *Plos One*, 2024, 19, e0299529.
10. Michael, A.\*, Onisiforou, A.\*, Georgiou, P., Koumas, M., Mammadov, E., Zanos, P. (2R,6R)-hydroxynorketamine facilitates extinction and prevents emotional impairment and stress-induced reinstatement in morphine abstinent mice. *bioRxiv*, 2023, 12.07.570550. \* Equal Contribution.

11. Onisiforou, A., Zanos, P. From Viral Infections to Alzheimer's Disease: Unveiling Mechanistic Links Through Systems Bioinformatics. *bioRxiv* 2023, 12.05.570187.
12. Christodoulou, C.C., Onisiforou, A., **Zanos, P.**, Zamba-Papanicolaou, E. Unraveling the transcriptomic signatures of Parkinson's Disease and Major Depression using single-cell and bulk data. *Frontiers in Aging Neuroscience*, 2023, In Press.
13. Onisiforou, A., Georgiou, P., **Zanos, P.** Role of group II metabotropic glutamate receptors in the antidepressant actions of ketamine. *Pharmacology, Biochemistry and Behaviour*, 2023, In Press (Vol. 223). doi: 10.1016/j.pbb.2023.173531.
14. **Zanos, P.\***, Brown K.A., Georgiou, P., Yuan, P., Zarate, C.A., Thompson, S., Gould, T.D. NMDA receptor activation-dependent antidepressant-relevant behavioral and synaptic actions of ketamine. *Journal of Neuroscience*, 2023, 43, 1038-1050. \* Corresponding Author
15. Brown K.A., **Zanos, P.**, Powels, C.F., Fix, C.J., Michaelides, M., Pereira, E.F.R., Moaddel, R., Gould, T.D. Ketamine preservative benzethonium chloride potentiates hippocampal synaptic transmission and binds neurotransmitter receptors and transporters. *Neuropharmacology*, 2023, 225:109403.
16. Georgiou, P., **Zanos, P.**, Mou, T-C., An, X., Gerhard, D., Dryanovski, I.D., Potter, E.L., Highland, J., Jenne, C., Stewart, B., Pultorak, K., Yuan, P., Powels, C., Lovett, J., Pereira, E., Clark, S., Tonelli, L., Moaddel, R., Zarate, C.A., Duman, R., Thompson, S., Gould, T.D. Experimenters' sex modulates mouse behaviors and neural responses to ketamine via corticotropin releasing factor. *Nature Neuroscience*, 2022, 25, 1191-1200.
17. Moaddel, R., **Zanos, P.**, Farmer, C.A., Kadriu, B., Morris, P., Lovett, J., Acevedo-Diaz, E., Cavanaugh, G., Yuan, P., Yavi, M., Thomas, C., Park, L.T., Ferrucci, L., Gould, T.D., Zarate Jr, C.A. Comparative Metabolomic Analysis in Plasma and Cerebrospinal Fluid of Humans and in Plasma and Brain of Mice Following Antidepressant-dose Ketamine Administration. *Translational Psychiatry*, 2022, 12, 1-9.
18. Bonaventura, J., Gomez, J.L., Carlton, M.L., Lam, S., Sanchez-Soto, M., Morris, P.J., Moaddel, R., Kang, H-J., **Zanos, P.**, Gould, T.D., Thomas, C.J., Sibley, D.R., Zarate Jr, C.A., Michaelides, M. Target deconvolution studies of (2R,6R)-hydroxynorketamine: an elusive search. *Molecular Psychiatry*, 2022, 27, 4144-4156.
19. Georgiou, P., **Zanos, P.**, Mou, T-C., An, X., Gerhard, D., Dryanovski, I.D., Potter, E.L., Highland, J., Jenne, C., Stewart, B., Pultorak, K., Yuan, P., Powels, C., Lovett, J., Pereira, E., Clark, S., Tonelli, L., Moaddel, R., Zarate, C.A., Duman, R., Thompson, S., Gould, T.D. Experimenter sex modulates mouse biobehavioral and pharmacological responses. *BioRxiv*, doi.org/10.1101/2022.01.09.475572.
20. Georgiou, P., Mou, T-C., Potter, L., An, X., **Zanos, P.**, Patton, M., Pultorak, K., Clark, S., Ngyuyen, V., Powels, P., Prokai-Tatrai, K., Merchenthaler, I., Prokai, L., McCarthy, M., Mathur, B., Gould, T.D. Estradiol mediates stress-susceptibility in the male brain. *BioRxiv*, doi.org/10.1101/2022.01.09.475485.
21. Highland, J., Morris, P., Konrath, K., Riggs, L., Hagen, N., **Zanos, P.**, Powels, C., Moaddel, R., Thomas, C., Wang, A., Gould, TD. Hydroxynorketamine Pharmacokinetics and Antidepressant Behavioral Effects of (2,6)- and (5R)-Methyl-(2R,6R)-hydroxynorketamines. *ACS Chemical Neuroscience*. 2022, 4, 510-523.
22. Troppoli, T., **Zanos, P.**, Georgiou, P., Gould, TD., Rudolph, U., Thompson, S. Negative allosteric modulation of GABAARs at  $\alpha 5$  subunit-containing benzodiazepine sites reverses stress-induced anhedonia and weakened synaptic function in mice. *Biological Psychiatry*, 2022, 92, 216-226
23. Highland, J., Farmer, C., **Zanos, P.**, Lovett, J., Zarate, CA., Moaddel, R., Gould, TD. Sex-dependent metabolism of ketamine and (2R,6R)-hydroxynorketamine in mice and humans. *Journal of Psychopharmacology*. 2022, 36, 170-182.
24. Osman, A., Zuffa, S., Walton, G., Fagbodun, E., **Zanos, P.**, Georgiou, P., Kitchen, I., Swann, J., Bailey, A. Post-weaning A1/A2  $\beta$ -casein milk intake modulates depressive-like behavior, brain  $\mu$ -opioid receptors and the metabolome of rats. *iScience*. 2021, 24:103048.
25. Morris, P., Burke, R., Singh, A., Gould, T.D., Zarate, C.A., **Zanos, P.**, Moaddel, R., Thomas, C. A comparison of the pharmacology and NMDAR antagonism-associated neurotoxicity of ketamine, (2R,6R)-hydroxynorketamine, and MK-801. *Neurotoxicology and Teratology*. 2021, 87:106993.
26. Highland, J.N., **Zanos, P.**, Riggs, M.L., Georgiou, P., Clark, S.M., Morris, P.J., Moaddel, R., Thomas, C., Zarate, C.Jr., Pereira, E.F.R., Gould, T.D., Hydroxynorketamines: Pharmacology and potential therapeutic applications. *Pharmacological Reviews*, 2021, 63, 763-791.

27. Elmer, G., Tapocik, J., Mayo, C., **Zanos, P.**, Gould, T.D. Ketamine metabolite (2R,6R)-hydroxynorketamine reverses behavioral despair produced by adolescent trauma. *Pharmacology, Biochemistry and Behavior*, 2020, 196:172973.
28. Potter, L.E., **Zanos, P.**, Gould, T.D. Antidepressant effects and mechanisms of Group II mGlu receptor-specific negative allosteric modulators. *Neuron*, 2020, 105, 1-3.
29. Park, L.T., Kadriu, B., Gould, T.D., **Zanos, P.**, Greenstein, D., Evans, J.W., Yuan, P., Farmer, C.A., Oppenheimer, M., George J.M., Adejo, L.W., Snodgrass, H.R., Smith, M.A., Henter, I.D., Machado-Vieira, R., Mannes, A.J., Zarate, C.A. A randomized trial of the N-methyl-d-aspartate receptor glycine site antagonist prodrug 4-chlorokynurenine in treatment-resistant depression. *International Journal of Neuropsychopharmacology*, 2020, 23, 417-425.
30. Zhang, Y., **Zanos, P.**, Jackson, I., Zhang, X., Zhu, X., Gould, T.D., Vujaskovic, Z. Psychological stress enhances tumor growth and diminishes radiation response in preclinical model of lung cancer. *Radiotherapy and Oncology*, 2020, 146, 126-135.
31. Krimmel, S.R.\*, **Zanos, P.\***, Georgiou, P., Colloca, L., Gould, T.D. Classical conditioning of antidepressant placebo effects in mice. *Psychopharmacology*, 2020, 237, 93-102. \* Equal contribution.
32. Riggs, L., Aracava, Y., **Zanos, P.**, Fischell, J., Albuquerque, E.X., Ferreira, E.F.R., Thompson, S.M., Gould, T.D. (2R,6R)-hydroxynorketamine rapidly potentiates hippocampal glutamatergic transmission through a synapse-specific presynaptic mechanism. *Neuropsychopharmacology*, 2020, 45, 426-436.
33. Highland, J.N., **Zanos, P.**, Georgiou, P., Gould, T.D. Group II metabotropic glutamate receptor blockade promotes stress resilience in mice. *Neuropsychopharmacology*, 2019, 44, 1788-1796.
34. **Zanos, P.**, Highland, J.N., Georgiou, P., Jenne, C.E., Morris, P.J., Moaddel, R., Xye, J.K., Zarate Jr, C., Gould, T.D. (2R,6R)-hydroxynorketamine exerts mGlu<sub>2</sub> receptor-dependent antidepressant actions. *PNAS*, 2019, 116, 6441-6450.
35. **Zanos, P.**, Highland, J.N., Xin, L., Georgiou, P., Stewart, B.W., Moaddel, R., Xye, J.K., Gould, T.D. (R)-ketamine exerts antidepressant actions partly via conversion to (2R,6R)-hydroxynorketamine, while causing adverse effects at sub-anesthetic doses. *British Journal of Pharmacology*, 2019, 176 2573-2592.
36. Rao, X., Asico L.D., **Zanos, P.**, Mahabeleshwar, G.H., Gangwar, R.S., Xia, C., Duan, L., Cisse, Y.M., Rengasamy, P., Jose, P.A., Gould, T.D., Nelson, R., Biswal, S., Chen, L.C., Zhong, J., Rajagopalan, S. Alpha2B-adrenergic receptor overexpression in the brain potentiates air pollution-induced behavior and blood pressure changes. *Toxicological sciences*, 2019, 169, 95-107.
37. Georgiou, P., **Zanos, P.**, Jenne, E.C., Gould, T.D. Sex-specific involvement of estrogen receptors in behavioral responses to stress and psychomotor activation. *Frontiers in Psychiatry*. 2019; 10:81.
38. Lumsden, E. \*, Troppoli, T.A. \*, Myers, S.J., **Zanos, P.**, Aracava, Y., Kehr, J., Moaddel, R., Kim, S., Wang, F-H., Schmidt, S., Jenne, C.E., Yuan, P., Morris, P.J., Zarate, Jr, C.A., Thomas, C. J., Traynelis, S.F., Pereira, E. F.R., Thompson, S.M., Albuquerque, E.X., Gould, T.D. Antidepressant-relevant concentrations of the ketamine metabolite (2R,6R)-hydroxynorketamine do not block NMDA receptor function. *PNAS*, 2019, 116,5160-5169.
39. **Zanos, P.**, Keyworth, H., Georgiou, P., Kitchen, I., Zimmer, A., Bailey, A. Chronic nicotine administration restores brain region specific upregulation of oxytocin receptor binding levels in a G72 mouse model of schizophrenia. *European Journal of Neuroscience*, 2018, 50, 2255-2263.
40. Rae, M., **Zanos, P.**, Georgiou, P., Chivers, P., Bailey, A., Camarini, R. Environmental enrichment enhances conditioned place preference to ethanol via an oxytocinergic-dependent mechanism in male mice. *Neuropharmacology*, 2018, 138, 267-274.
41. **Zanos, P.**, Moaddel, R., Morris, P.J., Riggs, L.M., Highland, J.N., Georgiou, P., Pereira, E.F.R., Albuquerque, E.X., Thomas, C., Zarate Jr, C., Gould, T.D. Ketamine and ketamine metabolite pharmacology: Insights into therapeutic mechanisms. *Pharmacological Reviews*, 2018, 70, 621-660.
42. **Zanos, P.\***, Gould, T.D. Mechanisms of ketamine action as an antidepressant. *Molecular Psychiatry*, 2018, 23, 811-817. \* **Corresponding author**
43. **Zanos, P.\***, Duman, R.S., Thompson, S.M., Zarate Jr, C., Gould, T.D. Convergent mechanisms underlying rapid antidepressant action. *CNS Drugs*, 2018, 32, 197-227. \* **Corresponding author**

44. Brown, P.L.\*, **Zanos, P.\***, Wang, L., Mayo C.L., Elmer, G.I., Gould, T.D., Shepard, P.C. Isoflurane but not halothane prevents and reverses helpless behavior: a role for burst suppression? *International Journal of Neuropsychopharmacology*, 2018, 21, 777-785. \*Equal contribution
45. **Zanos, P.**, Gould, T.D. Intracellular signalling pathways involved in (S)- and (R)-ketamine antidepressant actions. *Biological Psychiatry*, 2017, 83, 2-4.
46. Garcia-Carmona, J.A., Georgiou, P., **Zanos, P.**, Bailey, A., Laorden, M.L. Methamphetamine withdrawal induces activation of CRF neurons in the brain stress system in parallel with an increased activity of cardiac sympathetic pathways. *Naunym-Schmiedeberg Archives Pharmacology*, 2017, 391, 1-12.
47. Keyworth, H., Georgiou, P., **Zanos, P.**, Veloso Rueda A., Chen Y., Kitchen I., Camarini R., Cropley M., Alexis Bailey A. Wheel running during chronic nicotine exposure is protective against mecamylamine-precipitated withdrawal and up-regulates hippocampal  $\alpha 7$  nACh receptors in mice. *British Journal of Pharmacology*, 2017, 175, 1928-1943.
48. Morris, P.J., Moaddel R., **Zanos, P.**, Moore C.E., Gould T.D., Zarate C.A. Jr, Thomas, C.J. Synthesis and NMDA receptor activity of ketamine metabolites. *Organic letters*, 2017, 19, 4572-4575.
49. Georgiou, P., **Zanos, P.**, Bhat S., McCarthy, P., Merchenthaler, I., Tracy, J.K., Gould, T.D. Dopamine and stress system modulation of sex differences in decision-making. *Neuropsychopharmacology*, 2017, 43, 313-324.
50. **Zanos, P.**, Moaddel, R., Morris, P., Georgiou, P., Fischell, J., Elmer, G., Alkondon, M., Yuan, P., Pribut, H., Singh, N., Dossou, K., Fang, Y., Huang, X.P., Mayo, C., Albuquerque, E., Thompson, S., Thomas, C., Zarate Jr, C., Gould, T.D. BCA: Effects of a ketamine metabolite on synaptic NMDAR function. *Nature*, 2017, 546, E4-E5.
51. **Zanos, P.**, Nelson, M.E, Krimmel, S.R., Highland, J.N., Georgiou, P., Gould, T.D., Thompson, S.M. A negative allosteric modulator for alpha5 subunit-containing GABA receptors exerts a rapid and persistent antidepressant action without the side effects of the NMDA receptor antagonist ketamine in mice. *eNeuro*, 2017, 4, pii: ENEURO.0285-16.2017.
52. **Zanos, P.**, Georgiou, P., Weber, C., Robinson, F., Kouimtsidis, C., Niforooshan, R., Bailey, A. Oxytocin and opioid addiction revisited: Old drug, new applications. *British Journal of Pharmacology*, 2017, 175, 2809-2824.
53. Martynhak, B., Hogben, A., **Zanos, P.**, Georgiou, P., Andreatini, R., Kitchen, I., Archer, S., von Schantz, M., Bailey, A., van der Veen, D. Altered circadian response to night-time light exposure of PERIOD3 null mice associates with early onset of a depressive-like phenotype. *Scientific Reports*, 2017, 7:40399.
54. Gould, T.D., Georgiou, P., Brenner, L.A., Brundin, L., Can, A., Courtet, P., Donaldson, Z.R., Dwivedi, Y., Guillaume, S., Gottesman, I.I., Kanekar, S., Lowry, C.A., Renshaw, P.F., Rujescu, D., Smith, E.G., Turecki, G., **Zanos, P.**, Zarate Jr, C., Zunszain, P.A., Postolache, T.T. Animal models to improve our understanding and treatment of suicidal behavior. *Translational Psychiatry*, 2017, 7, 1-22.
55. Gould, T.D., **Zanos, P.**, Zarate Jr, C. Ketamine mechanism of action: separating the wheat from the chaff. *Neuropsychopharmacology*, 2016, 42, 368-369.
56. **Zanos, P.**, Moaddel, R., Morris, P., Albuquerque, E., Wainer, I., Thompson, S., Thomas, C., Zarate Jr, C., Gould, T.D. Antidepressant actions of ketamine versus Hydroxynorketamine. *Biological Psychiatry*, 2016, 81, 69-71.
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#### **Submitted or In-Revision peer-reviewed journal articles**

1. Mammadov, E., Powels, C., Georgiou, P., Gould, T.D., **Zanos, P.\*** (2R,6R)-hydroxynorketamine prevents emotional impairment during protracted opioid withdrawal in mice. (Under Review).
2. Onisiforou, A., **Zanos, P.** Identification of key pathways contributing to the development of comorbid diseases: the case of Type II Diabetes and Neuropsychiatric Disorders. (Under Review).
3. Georgiou, P., Bohnenkamp, J., Panayiotou, G., **Zanos, P.\*** Long-term psychopathologies linked to COVID-19 in adolescents: Preclinical research to inform prevention (Under Review). \* Corresponding author
4. Phillips, D., Powels, C., Mammadov, E., Georgiou, P., Zanos, P.\* Sleep architecture disturbances during protracted opioid withdrawal in mice (In Preparation). \* Corresponding author
5. Georgiou, P., **Zanos, P.**, Hourani, S., Kitchen, I., Bailey, A. Alcohol administration and withdrawal induces brain region-specific alterations on the oxytocin and MOPr binding. (Under Review)

6. Georgiou, P., Potter, L., Mou, T-C., **Zanos, P.**, Patton, M., An, X., Pultorak, K., Clark, S., Ngyuyen, V., Prokai-Tatrai, K., Merchenthaler, I., Prokai, L., McCarthy, M., Mathur, B., Gould, T.D. Estradiol mediates stress-susceptibility in the male brain. (Under revision in *Nature Communications*)

### **Oral Presentations (selected)**

1. The International College of Neuropsychopharmacology (CINP), 2024. The role of GluN2A-containing NMDAR in the antidepressant actions of ketamine. **Symposium co-chair**.
2. 11<sup>th</sup> International Meeting on Metabotropic Glutamate Receptors, Taormina, Italy, 2024. "The role of mGlu<sub>2</sub> receptors in ketamine's behavioral actions". **Invited**.
3. Hellenic Society for Neuroscience, Athens, Greece, 2023. "NMDA receptor activation underlies ketamine's rapid antidepressant efficacy".
4. Mediterranean Neuroscience Society 2023 meeting. "Mechanisms of action of rapid-acting antidepressants". **Invited**.
5. 10<sup>th</sup> International Meeting on Metabotropic Glutamate Receptors, Taormina, Italy, 2021. "Convergent mechanism between the antidepressant actions of ketamine and mGluR<sub>2</sub> signaling pathways". **Invited**.
6. St. George's, University of London, Neuroscience seminar series 2021. 'Mechanisms of ketamine as an antidepressant'. **Invited**.
7. American College of Neuropsychopharmacology – ACNP, Hollywood, FL, U.S., 2018. 'Mechanisms underlying antidepressant actions of ketamine's (2R,6R)-hydroxynorketamine metabolite. **Invited**.
8. Society for Neuroscience, 2018, San Diego, U.S. '(2R,6R)-hydroxynorketamine exerts mGlu<sub>2</sub> receptor-dependent antidepressant actions'.
9. International Behavioral Neuroscience Society, Conference 2018, Florida, U.S. 'Ketamine and hydroxynorketamines: NMDAR inhibition independent mechanisms underlying rapid acting antidepressant efficacy'. **Symposium chair**.
10. European College of Neuropsychopharmacology, Congress 2017, Paris, France. 'Ketamine exerts NMDAR inhibition-independent antidepressant actions via its hydroxynorketamine metabolites'. **Invited**.
11. Baltimore Brain Series, NIDA 2017, Baltimore, USA. 'NMDAR inhibition-independent antidepressant actions of ketamine's metabolites'.
12. School of Biological Psychiatry, Annual meeting 2017, San Diego, California. 'Ketamine exerts NMDAR inhibition-independent antidepressant actions via its hydroxynorketamine metabolites'.
13. University of Maryland, Baltimore, Program in Neuroscience, Annual Retreat, Baltimore, U.S. 2014. '4-Cl-kynurenine, a prodrug of a selective glycine<sub>B</sub> NMDA receptor antagonist, induced rapid and sustained antidepressant effects without ketamine-related side effects'.
14. British Pharmacological Society (BPS) winter meeting, London, U.K. 2012. 'The oxytocin analogue carbetocin reverses impaired emotional-like behavior during prolonged abstinence from chronic morphine treatment'.
15. University Global Partnership Network Workshop: Genes and Behaviour, Guildford, Surrey, U.K. 2012. 'Carbetocin reverses emotional impairment during prolonged morphine withdrawal'.
16. British Pharmacological Society (BPS), London, U.K. 2011. 'Persistent brain region-specific up-regulation of the V1aR following chronic cocaine and morphine administration and withdrawal in mice.