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the entire pre-ranked differential expression gene lists to gain a complete pathway analysis throughout all annotated genes. Our analysis revealed over-represented groups of pathways in schizophrenia, particularly in immunity and synapse, suggesting the disruption of these pathways plays an important role in schizophrenia pathophysiology. In addition, we observed several novel pathways, including ubiquitin-independent protein catabolic process. Finally, we found that the top hits in our GSEA analysis are involved in olfactory sensing, possibly explaining the olfactory dysfunction reported in schizophrenia patients. By comparing differential expression gene profiles with 51 antipsychotic treatment datasets, we demonstrated that our results were not influenced by antipsychotic treatment.

Conclusions: Taken together, we found pyramidal neuron-specific changes in immunity, synapse, and olfactory dysregulation in schizophrenia, providing new insights for the cell-subtype specific pathways of chronic schizophrenia.

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Keywords: Schizophrenia, Neuronal Immunity, Pyramidal Neurons, Synapse, Olfactory

Translating Immediate Effects of Ketamine on Dentate Gyrus Structure in Healthy Human Subjects

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Background: Ketamine's antidepressant effects are thought to be elicited by rapid changes in synaptic plasticity, however onset and timing of these neuroplastic changes is unresolved. A study in a rat model of depression demonstrated that apical dendritic spine deficits in CA1 pyramidal neurons were rapidly restored within one hour (1). In this study, we aimed to translate immediate effects of ketamine on CA1 structure in healthy human subjects with structural magnetic resonance imaging (MRI) and hippocampal subfield measurements.

Methods: We conducted a randomized, double-blind, placebo-controlled crossover MRI study with in 31 healthy subjects (14f, mean age 25.2). We conducted two structural T1-weighted MRIs (3T, MPRAGE) within a single session, one before and one 45min after infusion of S-ketamine (bolus of 0.11mg/kg, followed by a maintenance infusion of 0.12mg/kg over 20 min). At a second time-point all subjects received placebo (0.9% NaCl). We calculated volume differences 'post-pre ketamine/placebo for dentate gyrus subfields (as measured with FreeSurfer 6.0; CA1, CA3, CA4, GC_ML_DG, both hemispheres) and compared these with t-tests.

Results: During MRI scanning, subjects received 7.6+/-1.5 mg esketamine, corresponding to a total dose of 0.11mg/kg body weight. Although psychotomimetic effects were evident, there was no significant volume changes in dentate gyrus' subfield volumes 45min after ketamine compared to placebo (all uncorrected $p > 0.05$).

Conclusions: We did not detect volume increases in subfield layers of the human hippocampus. However, these results are

valuable for future studies. To detail increases in dentate gyrus volumes, future translational studies should evaluate higher ketamine doses and later time-points of measurements.

Supported By: Austrian National Bank Grant P 14193

Keywords: Ketamine, Dentate Gyrus, Magnetic Resonance Imaging, Neuroplasticity

Transsaccadic Perception in Individuals With Schizophrenia and Bipolar Disorder With Psychotic Features

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Background: Patients with schizophrenia and bipolar disorder with psychotic features (PSY) experience a reduced ability to distinguish between origins of internally and externally generated sensations, which has been associated with hallucinations. It has been suggested that corollary discharge (CD), an internal copy of a motor command, may be compromised in PSY compared to healthy controls (HC).

Methods: In an ongoing study examining deficits in CD, we have recruited 10 PSY and 12 HC to date. Participants performed a transsaccadic detection paradigm in a behavioral and functional MRI scan session. Psychometric functions were derived based upon decisions driven by both visual error (VE) and CD. Symptoms were measured using the PANSS and Sense of Agency Scale (SOAS).

Results: PSYs displayed significantly more negative perceptual bias than HCs ($p = .049$), while perceptual thresholds were not significantly different between groups ($p = .5$) suggesting that SZPs mostly underestimated while HCs overestimated the presaccadic target location. PSYs displayed a significant inverse relationship between the perceptual threshold and the SOAS ($r = -.67$, $p = .046$) with a trend positive relationship between threshold and PANSS Positive symptoms ($r_s = .6$, $p = .07$).

Conclusions: These findings replicate previous work evaluating transsaccadic perception in individuals with psychosis and additionally link both psychotic symptoms and mental agency with these perceptual deficits. Further analysis of hypothetical VE-only psychometric curves and associated fMRI data will allow us to investigate the change in brain activity and connectivity associated with the observed CD deficits.

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Keywords: Schizophrenia, Schizoaffective Disorder, Psychotic Bipolar Disorder, Positive Symptoms

Understanding Adolescent Vulnerability to Methamphetamine Use Disorder: The Role of Early Life Adversity, Impulse Control and Cognition

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Background: Among illicit substances, methamphetamine represents one of the greatest global health threats. More alarming, people aged as young as 15 have reported using meth in the past year. This is a major concern because adolescence is a period of heightened vulnerability to addiction. Evidence suggests that childhood adversity, poor impulse control and cognitive deficits may be contributing factors.

Methods: We recruited thirty-five current meth users (last use within 7 days) with a DSM-5 diagnosis of meth use disorder, and 35 matched-controls. Participants were administered the Childhood Trauma Questionnaire, the Barratt Impulsiveness Scale, and a cognitive task battery assessing speed of processing, cognitive flexibility, working memory, and inhibitory control. Inhibitory control was also assessed using a novel cue reactivity task that we developed consisting of the pseudo-randomized presentation of meth-related cues counter-balanced with food-related cues

Results: Linear regression analyses revealed that performance in the cognitive flexibility and inhibitory control tasks were positively associated with age of onset of meth use ($n=35$; $p=0.038$ and $p=0.014$ respectively), but not length or severity of use. Mediation analyses revealed that age-related cognitive impairments were not mediated by impulsiveness (p 's >0.05). Poor inhibitory control in people who started using meth in adolescence was associated with childhood trauma ($n=17$, $p=0.002$).

Conclusions: Our results suggest that impaired flexibility and inhibition during adolescence may be risk factors perpetuating meth use after experimentation, and may in part contribute to the development of meth use disorder later in life. In addition, childhood adversity may contribute to inhibitory control deficits if meth use occurs in adolescence.

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Keywords: Methamphetamine Addiction, Neurocognition, Early Life Adversity, Inhibition, Impulse Control

Understanding the Influence of Racial Discrimination on the Associations Between PTSD Symptoms, Physiological Arousal, and Health Among African American Women With Trauma Exposure

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Background: Despite a growing literature on experiences of trauma in marginalized communities, there is a dearth of literature examining the influences of racial discrimination in the experience of trauma and PTSD among these communities. Higher rates of PTSD are found among African Americans and researchers have noted that the stress of race-specific experiences such as racial discrimination could potentially exacerbate PTSD symptom responses and influence health. The current study examined the influence of racial discrimination on the link between PTSD symptoms and autonomic arousal as well as health complications (chronic health problems/functional impairments) in African American women with trauma exposure.

Methods: The study participants were ($N=75$) African American women recruited from a publicly funded urban hospital. Self-report measures included Experiences of Discrimination Questionnaire, SF-36 health questionnaire, trauma history and demographic data. Autonomic function was assessed by measuring electrocardiogram (ECG) data during an acoustic startle task. ECG data were collected using a Biopac MP150 system at a sampling rate of 1000 Hz, and heart rate high frequency heart rate variability (HF HRV) were calculated using HRV guidelines.

Results: Experiences of racial discrimination was significantly related to more PTSD symptoms ($r=.37$, $p<0.1$), greater report of health complications ($r=.41$, $p<.01$), and HF HRV ($r=-.22$, $p<.01$). Racial discrimination experiences related to police encounters/restaurant settings (combined) were particularly related to heightened startle responses ($r=-.39$). Racial discrimination also significantly moderated the relationship between PTSD and health complications (accounting for 19% of the variance).

Conclusions: These findings highlight the importance of acknowledging the effects of racism in trauma-exposed communities.

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Keywords: PTSD, Health, Trauma Exposure, African Americans

Using Brain Activations During Cognitive and Emotional Tasks for the Differential Diagnosis of Depressive States: A Functional Near-Infrared Spectroscopy Study

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Background: A depressive state can be present in many mental disorders, making which often clinically difficult to differentiate. The aim of this study was to evaluate the change of brain functions during cognitive and emotional tasks in depressed patients to help with differential diagnosis.

Methods: This study was approved by IRB of Yamaguchi University Hospital. Sixty-two depressed patients (17 with adjustment disorder (AD), 27 with major depressive disorder (MDD), and 18 with bipolar disorder (BD)) and 34 healthy control subjects (HC) were included. We used the verbal fluency task (VFT) and emotional words tasks including happy and threat words.

Relative change of oxygenated hemoglobin ([oxy-Hb]) in the frontal area was measured by functional near-infrared spectroscopy (fNIRS). We classified all the fNIRS channels into three frontal areas according to previous studies. We compared integral value of [oxy-Hb] of these three areas during the tasks in four groups by using Kruskal-Wallis test with post-hoc analysis.