

Sahib Singh Khalsa, MD, PhD**PRESENT TITLES AND AFFILIATION:****Director of Clinical Operations**

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**Associate Professor of Community Medicine
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Citizenship: United States

SHORT NARRATIVE OF RESEARCH EXPERTISE:

The beating heart sends one of the most important signals to the brain, and the regulation between these organs is central for health and disease. My research uses an experimental medicine framework and pharmacological modulation of the heartbeat to examine the underlying sensory and regulatory brain circuits using brain imaging, electroencephalography, and computational modeling. We hypothesize that a dysregulated heart-brain relationship contributes to the onset and maintenance of several mental health conditions e.g., mood, anxiety, and eating disorders. By identifying how the brain and heart are dysregulated, this research will provide the biological basis for new treatments aimed at re-establishing balanced regulation between these organs. I have also begun to examine gut-brain relationships using non-pharmacologic neuroscientific methods from a similar perspective, with a focus on eating disorders. My central goals are to discover modifiable neuroscience-based treatment targets for psychiatric disorders, to develop tests to precisely identify these treatment targets in individual patients, and to design neuroscience-based therapies capable of ameliorating the symptoms and signs of mental illness.

SHORT NARRATIVE OF CLINICAL EXPERTISE:

My clinical expertise focuses on the assessment and treatment of anxiety disorders. I previously served as the Associate Director of the UCLA Anxiety Disorders Clinic, supervising resident physicians in the treatment of anxiety disorders, and was an attending psychiatrist in the UCLA OCD Intensive Outpatient Program. As founding Director of the Healthy Hearts Behavioral Medicine Program, an interdisciplinary endeavor started with the UCLA Cardiac Arrhythmia Center, I subspecialized in treating anxiety and mood disorders in individuals with cardiac arrhythmias. Current activities include supervision of the Laureate Institute for Brain Research diagnostic assessment team, performing safety monitoring and pharmacological treatment within clinical trials, running psychoeducation groups with inpatients from the Laureate Eating Disorders Program, and participating in psychiatry residency education in the form of journal club facilitation and individual mentorship.

EDUCATION:

- 06/2009 – 06/2013 Residency in Psychiatry (Chief Resident), University of California, Los Angeles (UCLA) Semel Institute for Neuroscience and Human Behavior, Los Angeles, CA
- 08/2002 – 05/2009 MD, University of Iowa Carver College of Medicine, Iowa City, IA
PhD, Neuroscience. University of Iowa, Iowa City, IA
- 08/1998 – 05/2002 BS in Psychology with honors, *magna cum laude*, State University of New York at Stony Brook, Stony Brook, NY

LICENSURE:

- 12/2014 – present Oklahoma State Medical License
02/2015 – present Oklahoma Bureau of Narcotics Registration
10/2010 – present California State Medical License

BOARD CERTIFICATION:

- 09/2013 – present Psychiatry, American Board of Psychiatry and Neurology, Certificate #66700

PROFESSIONAL EXPERIENCE:

- 02/2020 – present Director of Clinical Operations, Laureate Institute for Brain Research, Tulsa, OK
- 02/2020 – present Associate Professor (tenured), Oxley College of Health Sciences, University of Tulsa
- 02/2015 – 01/2020 Director of Clinical Studies, Laureate Institute for Brain Research, Tulsa, OK
- 02/2015 – 01/2020 Assistant Professor (tenure track), Oxley College of Health Sciences, University of Tulsa
- 01/2016 – present Volunteer Faculty, Department of Psychiatry, University of Oklahoma
- 06/2015 – present Community Affiliate, Laureate Psychiatric Clinic and Hospital
- 07/2014 – 01/2015 Assistant Professor in Residence, Department of Psychiatry, UCLA Semel Institute for Neuroscience and Human Behavior, Los Angeles, CA
- 07/2013 – 01/2015 Director, UCLA Healthy Hearts Behavioral Medicine Program, UCLA Cardiac Arrhythmia Center, Los Angeles, CA
- 07/2013 – 01/2015 Associate Director, UCLA Anxiety Disorders Program
- 10/2013 – 01/2015 Attending Physician, UCLA OCD Partial Hospitalization Program
- 07/2013 – 6/2014 Health Sciences Clinical Instructor, Department of Psychiatry, UCLA Semel Institute for Neuroscience and Human Behavior, Los Angeles, CA
- 06/2009 – 06/2013 Resident, Department of Psychiatry, UCLA Semel Institute for Neuroscience and Human Behavior, Los Angeles, CA

PROFESSIONAL ACTIVITIES:

Committee Service

06/2021 – current	Member, Executive Committee, International Society for Contemplative Research https://www.contemplativeresearch.org/
06/2020 – current	Co-Chair, Diversity Education Committee, LIBR
10/2020 – current	Member, Promotion and Tenure Committee, University of Tulsa Oxley College of Health Sciences
02/2019 – current	Member, Awards and Scientific Review Committee, International Conference on Eating Disorders
06/2018 – current	Member, Travel Award Committee, Society of Biological Psychiatry (SOBP)
04/2017 – 04/2019	Member, Review Board for Student Academic Concerns, University of Tulsa Oxley College of Health Sciences
12/2012 – 01/2015	Member, Grand Rounds and Continuing Medical Education (CME) Review Committee, UCLA Department of Psychiatry
11/2009 – 01/2015	Interviewer, UCLA Department of Psychiatry Residency Admissions Committee
02/2013 – 03/2014	Member, Philanthropy Ethics Committee, UCLA Neuropsychiatric Hospital
06/2012 – 06/2013	Member, Graduate Medical Education Committee (GMEC), UCLA
02/2011 – 06/2012	Co-President, Residency Council Committee, UCLA Department of Psychiatry
05/2008 – 05/2009	Member, MSTP Admissions Committee, University of Iowa

Professional Associations and Scholarly Societies

2022 – present	Associate Member, American College of Neuropsychopharmacology (ACNP)
2019 – present	Full Member, American Psychosomatic Society
2018 – present	Full Member, Society of Biological Psychiatry
2018 – present	F1000Prime Faculty Member
2017 – 2019	Chair, ADAA Genetics and Neuroscience Special Interest Group
2016	Conference Chair, Interoception Summit (www.iSummit2016.org)
2015 – 2016	ADAA Early Career Special Interest Group Chair
2015 – present	Professional Member, Oklahoma Psychiatric Physicians Association
2014 – 2019	Associate Member, Psychiatric Research Society
2013 – present	Professional Member, Academy for Eating Disorders (AED)
2013 – present	Professional Member, Anxiety and Depression Association of America (ADAA)
2012 – present	American Psychiatric Association, Professional Member
2012 – 2015	Professional Member, Southern California Psychiatric Association
2008 – present	Gold Humanism in Medicine Honor Society
2004 – 9,12	Professional Member, Society for Neuroscience

Editorial Services

2021 – present	Associate Editor, <i>Biological Psychology</i>
2021	Guest Editor, <i>PLoS Computational Biology</i>
2020	Guest Editor, <i>eLife</i>
2018	Guest Editor, <i>Biological Psychiatry Cognitive Neuroscience and Neuroimaging (CNNI)</i> Special Issue on Interoception and Mental Health

Grant and conference reviews (year of request):

- *Ad Hoc* Reviewer, *NCCIH Mind & Body Intervention Review ZAT1 SUP (04) Meeting* (2022)
- *Ad Hoc* Reviewer, *NIH Adult Psychopathology and Disorders of Aging (APDA) Study Section* (2021)
- *Ad Hoc* Reviewer, *NIMH Special Emphasis Panel ZMH1 ERB-Q Invasive Recording and Stimulating in Humans to Advance Neural Circuitry Understanding of Mental Health Disorders* (2021)
- Grant Reviewer, *Israel Science Foundation, Personal Research Grants Program* (2021)
- Grant Reviewer, *Defense Medical Research and Development Program (DMRDP) for the Department of Defense (DoD) Congressionally Directed Medical Research Programs* (2019)
- Grant Reviewer, *UK Medical Research Council Neurosciences and Mental Health Board* (2018, 2020)
- Grant Reviewer, *Center for Medicinal Cannabis Research (CMCR) Grants Program at the University of California, San Diego* (2019)
- Grant Reviewer, *UK Wellcome Trust Senior Research Fellowship in Clinical Science* (2018, 2021)
- Grant Reviewer, *Erwin Schroedinger Fellowship for the Austrian Science Fund* (Austrian research organization similar to the National Science Foundation) (2017)
- Conference Reviewer, *Anxiety and Depression Association of America* (2014, 2015, 2018)

Invited reviewer (year of first review):

- *American Journal of Psychiatry* (2017)
- *Behaviour Research and Therapy* (2014)
- *Behavioral and Brain Functions* (2015)
- *Bioessays* (2020)
- *Biological Psychiatry* (2013)
- *Biological Psychiatry: CNI* (top 10 reviewer in 2017)
- *Biological Psychology* (2015)
- *BMJ Open* (2020)
- *Brain and Behavior* (2013)
- *Brain Communications* (2020)
- *Brain Structure and Function* (2015)
- *Cerebral Cortex* (2017)
- *Cognition and Emotion* (2008)
- *Clinical Case Reports* (2020)
- *Current Biology* (2017)
- *Emotion* (2017)
- *European Journal of Neuroscience* (2014)
- *Frontiers in Psychiatry* (2019)
- *Human Brain Mapping* (2016)
- *International Journal of Psychophysiology* (2010)
- *International Journal of Behavioral Medicine* (2013)
- *JACC (Journal of the American College of Cardiology): Clinical Electrophysiology* (2022)
- *JAMA Psychiatry* (2018)
- *JAMA Network Open* (2021)
- *Journal of Affective Disorders* (2016)
- *Journal of Behavior Therapy and Experimental Psychiatry* (2015)
- *Journal of Clinical and Experimental Neuropsychology* (2008)
- *Journal of Psychiatric Research* (2017)
- *Journal of Psychopharmacology* (2018)
- *Journal of Psychosomatic Research* (2020)
- *International Journal of Psychophysiology* (2007)

- *Neuropsychologia* (2008)
- *Neuroimage Clinical* (2017)
- *Neuropsychopharmacology* (2017)
- *Neuroscience & Biobehavioral Reviews* (2019)
- *Personalized Medicine in Psychiatry* (2018)
- *Pharmacology, Biochemistry and Behavior* (2021)
- *Philosophical Psychology* (2019)
- *Philosophical Transactions of the Royal Society Series B* (2016)
- *Physiology and Behavior* (2021)
- *PNAS - Proceedings of the National Academy of Sciences* (2021)
- *Psychiatry Research* (2015)
- *Psychiatry Research: Neuroimaging* (2015)
- *Psychological Bulletin* (2015)
- *Psychological Medicine* (2016)
- *Psychological Science* (2012)
- *Psychoneuroendocrinology* (2018)
- *Psychophysiology* (2017)
- *Sensors* (2018)
- *Systematic Reviews* (2017)
- *The Journal of Physiology* (2017)
- *Translational Psychiatry* (2022)

Invited ad hoc reviewer (year of first request):

- *Archives of Neurology* (2005)
- *Nature Neuroscience* (2007)
- *Neuroimage* (2005)

Consulting Activities

- | | |
|-------------------|---|
| 02/2021 – present | Consultant, NIMH R01 MH125951 “CO2 Reactivity as a Biomarker of Non-response to Exposure-based Therapy” MPIs: Jasper Smits PhD and Michael Otto PhD. |
| 08/2019 – present | Consultant, NIH R01 grant application “Neural mechanisms of interoception of breathing in anxiety.” MPIs: Helen Lavretsky, MD and Paul Macey, PhD. |
| 09/2020 | Consultant, NIH Neuroscience Blueprint R01 grant application “Characterizing Primary Sensors and Effectors of Cardiopulmonary Interoception within Spinal Pathways.” UCLA Project PI: Olujimi Ajijola, MD, PhD. |
| 08/2019 – 01/2021 | Consultant, NCCIH P01 grant application “TRANSlational mechanisms of resPIRatory control and Emotion regulation in Mind- Body therapies (TRANSPIRE-MB)”. UCLA Project PIs: Helen Lavretsky, MD and Jack Feldman, PhD. |
| 07/2019 – present | Site Clinician, Adolescent Brain Cognitive Development (ABCD) Consortium, LIBR. |
| 09/2014 – 12/2014 | Laureate Institute for Brain Research (LIBR) Visiting Scholar. |
| 08/2011 – 06/2013 | Consulting Psychiatrist, San Fernando Valley Community Mental Health Center, Transitional Aged Youth & Field Capable Clinical Services. Van Nuys, CA. |

12/2010 – 06/2013 Associate Physician, UCLA Department of Psychiatry, Edythe London Laboratory. 2.5% effort.

HONORS AND AWARDS:

2019 Geoffrey Burnstock Award, International Society of Autonomic Neuroscience
 2016 Travel Award, American College of Neuropsychopharmacology
 2015 Young Investigator Award, Brain Behavior Research Foundation (formerly NARSAD)
 2015 Fellow, NHLBI Summer Institute on Randomized Behavioral Clinical Trials
 2015 Stuart G. Wolf Scholar Award, Totts Gap Institute
 2014 Travel Award, Society of Biological Psychiatry
 2014 Alies Muskin Early Career Leadership Award, ADA
 2013 Weil Scholar, UCLA Department of Psychiatry
 2012 Chief Resident, UCLA Department of Psychiatry Residency Program
 2012 Anxiety Disorders Clinic Chief Resident, UCLA Department of Psychiatry
 2008 Gold Humanism in Medicine Honor Society, University of Iowa Chapter
 2006-8 Wisconsin Health Emotions Research Institute Scholar/Fellow Travel Awards
 2006 Young Neuroscientist Travel Award, American Psychosomatic Society
 2005,7 Summer Fellow, Mind and Life Summer Research Institute
 2005 Medical Student Travel Award, American College of Physicians, Iowa Chapter

RESEARCH GRANTS RECEIVED:

R01MH127225 Khalsa 9/1/21-6/30/26
A neurocomputational assay of gastrointestinal interoception in anorexia nervosa \$1,913,179
 Combines an experimental medicine approach focused on gastrointestinal interoception with computational modeling to probe neural circuits of interoception and appetite-related gastric processing in anorexia nervosa.

R01MH123652 Savitz 5/14/21-4/30/26
Neural response to inflammatory challenge in major depressive disorder
 National Institute of Mental Health (NIMH) \$488,101 (Annually)
 The main goal of this research is to elucidate the immune pathways and neural circuitry underlying maladaptive homeostatic responses to inflammatory stimuli in a subgroup of patients with major depressive disorder.
 Role: Co-Investigator

R34AT009889 Khalsa 9/25/18-7/31/22
Investigating Floatation-REST as a Novel Technique for Reducing Anxiety and Depression
 National Center for Complementary and Integrative Health (NCCIH) \$264,801
 Investigates the feasibility, tolerability, and safety of multiple sessions of Floatation-REST (Reduced Environmental Stimulation Therapy) versus an active comparator in patients with anxiety and depression.

K23MH112949 Khalsa 5/01/17-3/31/22
Neural basis of meal related interoceptive dysfunction in anorexia nervosa
 NIMH Career development award \$1,000,944
 Career development award to investigate the basic question “how does the state of anticipating a meal induce fear and dysregulate the processing of body-relevant information in the brains of individuals with anorexia nervosa?”

ITI-214-106	Khalsa	2018-2020
<i>A Randomized, Placebo-Controlled, Double-Blind Study of Escalating Single Doses of ITI-214 in Healthy Volunteers to Determine Central Nervous System Engagement, Safety and Tolerability</i>		
Intra-Cellular Therapies Inc.		\$305,356
A single site study in healthy volunteers to examine the impact of single doses of ITI-214 on central nervous system engagement via functional magnetic resonance imaging (fMRI).		
P20GM121312	Paulus	2017-2020
<i>Neuroscience-based Mental Health Assessment and Prediction (NeuroMAP).</i>		
National Institute of General Medical Sciences (NIGMS) Centers of Biomedical Research Excellence		
<i>Neural basis of interoceptive dysfunction and anxiety in anorexia nervosa</i>		\$1,081,274
The NeuroMAP Center provides research, mentoring, career-development and operational infrastructure for neuroscience-based research to use individual differences on several biological levels together with sophisticated statistical approaches to generate clinically meaningful predictions for mental health.		
Role: Project PI		
BBRF Young investigator award	Khalsa	2016-2018
<i>Augmented interoceptive exposure training as a new treatment for anxiety in anorexia nervosa.</i>		
Brain & Behavior Research Foundation (BBRF, formerly NARSAD)		\$68,000
Examine pilot feasibility an acute pharmacological intervention in the context of aversive learning to make the experience of eating less anxiety provoking for individuals with anorexia nervosa.		
UCLA Oppenheimer Center	Khalsa	2014-2015
<i>A new anxiety treatment through augmented interoceptive exposure training</i>		
UCLA Oppenheimer Center Complementary and Integrative Medicine seed grant		\$30,000
Examine pilot feasibility of repeated exposure to isoproterenol-induced interoceptive sensations in individuals with irritable bowel syndrome		
UCLA CTSI	Khalsa	2014-2015
<i>A new anxiety treatment through augmented interoceptive exposure training</i>		
UCLA Clinical and Translational Science Institute (CTSI) seed grant program		\$54,010
Examine pilot feasibility of repeated exposure to isoproterenol-induced interoceptive sensations in individuals with panic disorder		
R01MH093535-02S2	Khalsa	2012-2013
<i>Interoception in anorexia nervosa and the relationship to anxiety and eating</i>		
NIMH Supplemental grant to Parent R01 grant.		\$194,959
Parent R01: Common and Distinct Phenotypes of Body Dysmorphic Disorder and Anorexia Nervosa		
Parent R01 Principal Investigator: Jamie D. Feusner.		
Administrative Supplement to Enable Continuity of Research Experiences of M.D./Ph.Ds. During Clinical Training.		
F31AT003061	Khalsa	2006-2008
<i>Meditation and interoception: the role of the insula</i>		
NCCIH		\$28,338
Predoctoral NRSA investigating the effect of long-term meditation on interoceptive awareness		

Francisco Varela Research Award Khalsa 2006-2008
Neural systems supporting interoceptive awareness in experienced and beginning meditators
 Mind and Life Institute Private Foundation \$10,000.
 Highly selective private foundation award to stimulate pilot studies on the effects of meditation

BIBLIOGRAPHY:

Summary of six most relevant publications from 2022 and 2021:

1. Teed AR, Feinstein JS, Puhl M, Lapidus RC, Upshaw V, Kuplicki RT, Bodurka J, Ajjola OA, Kaye WH, Thompson WK, Paulus MP, **Khalsa SS**. Association of Generalized Anxiety Disorder with Autonomic Hypersensitivity and Blunted Ventromedial Prefrontal Cortex Activity During Peripheral Adrenergic Stimulation: A Randomized Clinical Trial. *JAMA Psychiatry*. 2022 e214225. doi: 10.1001/jamapsychiatry.2021.4225. PMID: 35107563. IF 21.6

Shows that individuals with generalized anxiety disorder (GAD) exhibit autonomic hypersensitivity evidenced by elevated heart rates, heightened awareness of cardiorespiratory sensations, increased anxiety, and a blunted neural response localized to the ventromedial prefrontal cortex during low levels of peripheral beta-adrenergic stimulation. This provides important evidence of the pathophysiological neurocircuitry of interoception in GAD.
2. **Khalsa SS**, Clausen AN, Shahabi L, Sorg J, Gonzalez SE, Naliboff B, Shivkumar K, Ajjola O. Cardiac sympathetic denervation and mental health. *Autonomic Neuroscience* 2021 May; 232:102787. doi: 10.1016/j.autneu.2021.102787. PMID: 33631539. IF: 3.1

Finds that partial sympathectomy for refractory ventricular arrhythmias is associated with reduced anxiety but not depression or PTSD symptoms shortly after successful treatment. Lays the groundwork for prospective clinical surveillance and interventions focused on mental health in cardiac arrhythmias.
3. Mayeli A, Al Zoubi O, White EJ, Chappelle S, Kuplicki R, Smith R, Feinstein JS, Bodurka J, Paulus MP, **Khalsa SS**. Neural indicators of human gut feelings. *BioRxiv* 2021 doi:10.1101/2021.02.11.430867. Altmetric score on 03/04/21: 283 (top 5% of all research outputs scored by Altmetric).

Shows that an ingestible vibrating capsule produces reliable changes in stomach sensation and gastric-evoked brain activity. This minimally invasive approach could serve as a useful tool for understanding gut-brain interactions in healthy and clinical populations.
4. Smith R, Mayeli A, Taylor S, Al Zoubi O, Naegele J, **Khalsa SS**. Gut inference: A computational modelling approach. *Biological Psychology* 2021 164:108152. doi: 10.1016/j.biopsycho.2021.108152. PMID: 34311031. IF: 3.3

Applies Bayesian modeling via the active inference framework to a recently developed mechanosensory probe of gastrointestinal (GI) interoception. This computational approach offers promise as a clinical tool for studying individual differences in GI interoception in psychiatric and gastrointestinal disorders.
5. Berntson GG, **Khalsa SS**. Neural circuits of interoception. *Trends in Neurosciences* 2021 Jan;44(1):17-28. doi: 10.1016/j.tins.2020.09.011. PMID: 33378653. Impact Factor (IF): 13.8

Highlights recent advances and knowledge gaps that are important for accelerating progress in studying the neural circuitry of interoception. Part of a special issue on interoception convened by the NIH Neuroscience Blueprint Initiative.

6. Petzschner FH, Garfinkel SN, Paulus MP, Koch C, **Khalsa SS**. Computational models of interoception and body regulation. *Trends in Neurosciences* 2021 Jan;44(1):63-76. doi: 10.1016/j.tins.2020.09.012. PMID: 33378658. IF: 13.8

Defines the current landscape for computational models of interoception. Addresses these models' unique challenges in relation to translational research efforts and discusses what they can teach us about cognition as well as physical and mental health. Part of a special issue on interoception sponsored by the NIH Neuroscience Blueprint Initiative.

Research Papers – Peer Reviewed (*Indicates shared first authorship)

1. Goldstein RZ, Leskovjan AC, Hoff AL, Hitzemann R, Bashan F, **Khalsa SS**, Wang GJ, Fowler JS & Volkow ND. Severity of neuropsychological impairment in cocaine and alcohol addiction: association with metabolism in the prefrontal cortex. *Neuropsychologia* (2004) 42: 1447-58. doi: 10.1016/j.neuropsychologia.2004.04.002. PMID: 15246283. Impact factor (IF): 2.9
2. **Khalsa SS**, Moore SA & Van Hoesen GW. Hughlings Jackson and the role of the entorhinal cortex in temporal lobe epilepsy: from Patient A to Doctor Z. *Epilepsy and Behavior* (2006) 9: 524-31. doi: 10.1016/j.yebeh.2006.07.017. PMID: 16942917. IF: 2.5
3. **Khalsa SS**, Rudrauf D, Damasio AR, Davidson RJ, Lutz A & Tranel D. Interoceptive awareness in experienced meditators. *Psychophysiology* (2008) 45: 671-8. doi: 10.1111/j.1469-8986.2008.00666.x. PMID: 18503485. IF: 4.0
4. **Khalsa SS**, Rudrauf D, Sandesara C, Olshansky B & Tranel D. Bolus isoproterenol infusions provide a reliable method for assessing interoceptive awareness. *International Journal of Psychophysiology* (2009) 72: 34-45. doi: 10.1016/j.ijpsycho.2008.08.010. PMID: 18854201. IF: 3.0
5. Feinstein JS, Rudrauf D, **Khalsa SS**, Cassell M, Bruss J, Grabowski TJ & Tranel D. Bilateral limbic system destruction in man. *Journal of Clinical and Experimental Neuropsychology* (2009) 17: 1-19. doi: 10.1080/13803390903066873. PMID: 19763994 IF: 2.0
6. **Khalsa SS**, Rudrauf D & Tranel D. Interoceptive awareness declines with age. *Psychophysiology* (2009) 46: 1130-6. doi: 10.1111/j.1469-8986.2009.00859.x. PMID: 19602175. IF: 4.0.
7. **Khalsa SS**, Rudrauf D, Feinstein JS, & Tranel D. The pathways of interoceptive awareness. *Nature Neuroscience* (2009) 12: 1494-6. doi: 10.1038/nn.2411. PMID: 19881506. IF: 21.4
8. **Khalsa SS**, Schiffman J, Bystritsky A. Treatment-resistant OCD: Options beyond first line medications. *Current Psychiatry* (2011) 10: 45-52.
9. Philippi C, Feinstein JS, **Khalsa SS**, Tranel D, Landini G, Williford K, Rudrauf D. Preserved self-awareness following extensive bilateral brain damage to the insula, anterior cingulate, and medial prefrontal cortices. *PLOS One* (2012) 7: e38413. doi: 10.1371/journal.pone.0038413. PMID: 22927899. IF: 3.2
10. Bystritsky A, **Khalsa SS**, Cameron M, Schiffman J. Current Diagnosis and Treatment of Anxiety Disorders. *Pharmacy and Therapeutics* (2013) 38: 30-57. PMID: 23599668.

11. **Khalsa SS**, Shahabi L, Ajjola OA, Bystritsky A, Naliboff BD, Shivkumar K. Synergistic application of cardiac sympathetic decentralization and comprehensive psychiatric treatment in the management of anxiety and electrical storm. *Frontiers in Integrative Neuroscience* (2014) 7: 1-14. doi: 10.3389/fnint.2013.00098. PMID: 2442712. IF: 2.2
12. Feusner JD, Moody T, Lai TM, Sheen C, **Khalsa S**, Brown J, Levitt J, Alger J, O'Neill J. Brain connectivity and prediction of relapse after cognitive-behavioral therapy in obsessive-compulsive disorder. *Front Psychiatry*. 2015 6: 74. doi: 10.3389/fpsy.2015.00074. PMID: 26042054. IF: 2.8
13. Li W, Lai TM, Loo SK, Strober M, Mohammad-Rezazadeh I, **Khalsa S**, Feusner J. Aberrant early visual neural activity and brain-behavior relationships in anorexia nervosa and body dysmorphic disorder. *Front Hum Neurosci*. 2015 9: 301. doi: 10.3389/fnhum.2015.00301. PMID: 26082703. IF: 2.7
14. **Khalsa SS**, Craske MG, Li W, Vangala S, Strober M, Feusner JD. Altered interoceptive awareness in anorexia nervosa: effects of meal anticipation, consumption and bodily arousal. *International Journal of Eating Disorders*. 2015 48: 889-97. doi: 10.1002/eat.22387. PMID: 25712775. IF: 3.7
15. **Khalsa SS**, Rudrauf D, Davidson RJ, Tranel D. The effect of meditation on regulation of internal body states. *Frontiers in Psychology* 2015. 6: 924. doi: 10.3389/fpsyg.2015.00924. PMID: 26217263. IF: 2.1
16. Feinstein, JS, ***Khalsa SS**, Salomons TV, Prkachin KM, Frey-Law LA, Lee JE, Tranel D, Rudrauf D. Preserved emotional awareness of pain in a patient with extensive bilateral damage to the insula, anterior cingulate, and amygdala. *Brain Structure and Function*. 2016 221: 1499-511. doi: 10.1007/s00429-014-0986-3. PMID: 25577137. IF: 3.8
17. **Khalsa SS**, Feinstein JS, Li W, Feusner JD, Adolphs R, Hurlemann R. Panic anxiety in humans with bilateral amygdala lesions: pharmacological induction via cardiorespiratory interoceptive pathways. *Journal of Neuroscience*. 2016 36: 3559-66. doi: 10.1523/JNEUROSCI.4109-15.2016. PMID: 27013684. IF: 6.2
18. Shivkumar K, Ajjola OA, Anand I, Armour JA, Chen PS, Esler MD, DeFerrari G, Fishbein MC, Goldberger JJ, Harper RM, Joyner MJ, **Khalsa SS**, Kumar R, Lane RD, Mahajan A, Po S, Schwartz PJ, Somers V, Valderrabano M, Vaseghi M, Zipes D. Clinical Neurocardiology—defining the value of neuroscience based cardiovascular therapeutics. *Journal of Physiology*. 2016 594: 3911-54. doi: 10.1113/JP271870. PMID: 27114333. IF: 5.2
19. Zhang A, Leow A, Zhan L, GadElkarim J, Moody T, **Khalsa S**, Strober M, Feusner JD. Brain connectome modularity in weight-restored anorexia nervosa and body dysmorphic disorder. *Psychological Medicine*. 2016 46: 2785-97. doi: 10.1017/S0033291716001458. PMID: 27429183. IF: 5.8
20. **Khalsa SS**, Kumar R, Patel V, Strober M, Feusner, JD. Mammillary body volume abnormalities in anorexia nervosa. *International Journal of Eating Disorders*. 2016 49: 920-9. doi: 10.1002/eat.22573. PMID: 27414055. IF: 3.7

21. **Khalsa SS**, Lapidus R. Can interoception improve the pragmatic search for biomarkers in psychiatry? *Frontiers in Psychiatry* 2016 7:121. doi: 10.3389/fpsy.2016.00121. PMID: 27504098. IF: 2.8
22. Hassanpour MS, Yan LR, Wang, DJ, Lapidus RC, Arevian AC, Simmons WK, Feusner JD, **Khalsa SS**. How the heart speaks to the brain: neural activity during cardiorespiratory interoceptive stimulation. *Philosophical Transactions of the Royal Society B*. 2016 371: 20160017. doi: 10.1098/rstb.2016.0017. PMID: 28080974. IF: 6.7
23. Avery JA, Burrows K, Kerr KL, **Khalsa SS**, Bodurka J, Paulus MP, & Simmons WK. How the brain wants what the body needs: the neural basis of positive alliesthesia. *Neuropsychopharmacology*. 2017 42: 822-30. doi: 10.1038/npp.2016.128. PMID: 27427215. IF: 7.9
24. Smith R, Thayer JF, **Khalsa SS**, Lane RD. The hierarchical basis of neurovisceral integration. *Neuroscience and Biobehavioral Reviews*. 2017 75: 274–296. doi: 10.1016/j.neubiorev.2017.02.003. PMID: 28188890. IF: 8.3
25. **Khalsa SS**, Portnoff LC, McCurdy-McKinnon D, Feusner JD. What happens after treatment? A systematic review of relapse, remission, and recovery in anorexia nervosa. *Journal of Eating Disorders* 2017 5: 20. doi: 10.1186/s40337-017-0145-3. PMID: 28630708. IF: 2.8. Received the Editor's award due to the highest citation count for 2017-2019.
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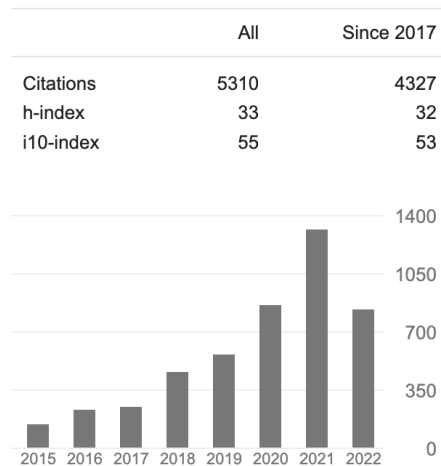
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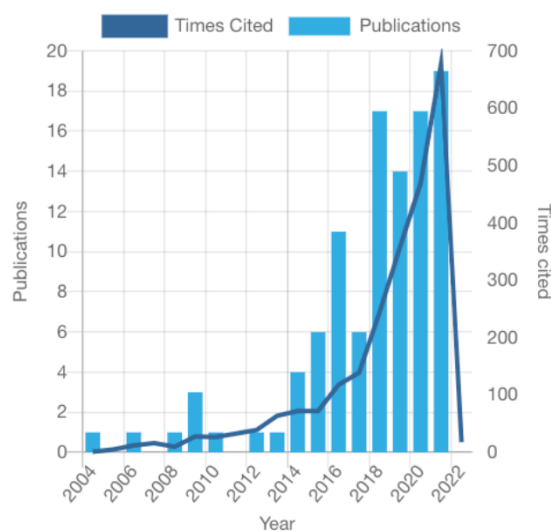
Book Chapters

1. **Khalsa SS** & Feinstein JS (2018). The somatic error hypothesis of anxiety. In M. Tsakiris & H. De Preester (Eds.), *The Interoceptive Mind: From Homeostasis to Awareness* (pp. 144-64). New York: Oxford University Press.
2. Smith R & **Khalsa SS** (*in press*). Interpreting the signals within: Meaning and prediction during interoception. In A. Garcia & A. Ibáñez (Eds.), *Routledge Handbook of Neurosemiotics*. Routledge Press.

Google Scholar Citation Report (08/04/2022):



Web of Science Citation Report (01/03/2022):



Poster Abstracts

1. McCloskey DP, Coburn-Litvak PS, Tata DA, Pothakos K, Khalsa SS & Anderson, BJ. 21 days of stress-related hormones increase synapse numbers but not the capacity for oxidative metabolism in hippocampal CA3. *Society for Neuroscience Conference*, San Diego, CA, 2001
2. Khalsa SS & Kaboli P. HIV masquerading as ITP: when you see smoke think fire. *American College of Physicians Clinical Vignette Competition, Annual Conference*, San Francisco CA, 2005
3. Khalsa SS, Rudrauf D, Wexler A, Naqvi NH, Damasio AR, & Tranel D. Looking within: does meditative experience enhance interoceptive awareness? *Cognitive Neuroscience Society Conference*, San Francisco, CA, 2006
4. Khalsa SS, Rudrauf D, Wexler A, Naqvi NH, Damasio AR, & Tranel D. Looking within: does meditative experience enhance interoceptive awareness? *Society for Neuroscience Conference*, Atlanta GA, 2006
5. Khalsa SS, Rudrauf D, Damasio AR, Davidson RJ, Lutz A, & Tranel D. To feel or not to feel: interoceptive awareness in experienced meditators. *University of Colorado 22nd Annual National M.D./Ph.D. Student Conference*, Keystone, CO, 2007
6. Khalsa SS, Rudrauf D, Damasio AR, Davidson RJ, Lutz A, & Tranel D. To feel or not to feel: interoceptive awareness in experienced meditators. *Mind and Life Summer Research Institute*, Garrison NY, 2007
7. Khalsa SS, Rudrauf D, Sandesara C, Olshansky B & Tranel D. Bolus isoproterenol infusions provide a reliable method for assessing interoceptive awareness. *Society for Neuroscience Conference*, San Diego, CA, 2007
8. Feinstein JS, Khalsa SS, Salomons TV, Prkachin KM, Frey Law LA, Vance C, Lee JE, Morrison I, Stamy CD, Grabowski TJ, Tranel D & Rudrauf D. The experience of pain without the anterior cingulate and insular cortex. *Society for Neuroscience Conference*, Washington D.C., 2008
9. Khalsa SS, Rudrauf D, Feinstein JS, Grabowski TJ & Tranel D. Neural systems mediating interoceptive awareness. *Society for Neuroscience Conference*, Washington D.C., 2008
10. Khalsa SS, Hurlmann R, Feinstein JS, Li W, Feusner JD and Adolphs R Interoceptive sensations can induce panic in humans with bilateral amygdala damage. *Society for Neuroscience Conference*, San Diego, CA, 2013
11. Khalsa SS, Rudrauf D, Davidson RJ, & Tranel D. Interoceptive awareness in meditators during cardiorespiratory deviations in body arousal. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, 2013
12. Khalsa SS, Craske MG, Li W, Strober M & Feusner JD. Interoceptive awareness of induced cardiorespiratory sensations in anorexia nervosa during meal anticipation and consumption. *Society of Biological Psychiatry Conference*, New York, NY, May 2014.
13. Lawrence KE, Moody TD, Khalsa SS, Strober M, Bookheimer SY, Feusner JD. Body dysmorphic disorder and anorexia nervosa display differences in processing of fearful face stimuli. *International Obsessive Compulsive Disorder Foundation Annual Conference*, Los Angeles, CA, July 2014
14. Khalsa SS, Craske MG, Strober M, Feusner JD. Altered anxiety expression in anorexia nervosa: Effects of an Interoceptive Pharmacological Challenge with Isoproterenol. *American College of Neuropsychopharmacology Conference*, Phoenix, AZ, December 2014

15. Feusner JD, Zhang A, GadElkarim J, Zhan L, Moody T, Khalsa SS, Strober M, Leow A. Similar abnormalities in modular network organization in anorexia nervosa and body dysmorphic disorder. *American College of Neuropsychopharmacology Conference*, Phoenix, AZ, December 2014
16. Hutcheson NL, Lawrence K, Moody T, Khalsa SS, Strober M, Feusner JD. Reactivity and habituation to fearful face stimuli in body dysmorphic disorder and anorexia nervosa. *American College of Neuropsychopharmacology Conference*, Phoenix, AZ, December 2014
17. Hutcheson, NL, Moody, TD, Madsen, SK, Khalsa, SS, Feusner, JD. Reduced connectivity in body dysmorphic disorder and anorexia nervosa while viewing fearful faces. *Organization for Human Brain Mapping* Honolulu, HI, June 2015
18. Yan LR, Wang, DJ, Lapidus RC, Feusner JD, Khalsa SS. Brain activation during adrenergic interoceptive stimulation using concurrent BOLD and ASL fMRI. *Organization for Human Brain Mapping* Honolulu, HI, June 2015
19. Ajijola OA, Shahabi L, Khalsa SS, Naliboff BD, and Shivkumar, K. Non-invasive Neurophysiologic Quantification of Cardiac Sympathetic Denervation for Arrhythmia Management. *International Society for Autonomic Neuroscience*, Stresa, Italy, September 2015
20. Khalsa SS, Feinstein JS, Li W, Feusner JD, Adolphs R, Hurlmann R. A cardiorespiratory non-chemosensory interoceptive pathway to panic anxiety independent of the amygdala. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, December 2015
21. Feinstein JS, Khalsa SS, Paulus MP, Haase L, Adolphs R, Hurlmann R. Amygdala-independent pathways involved in the generation of interoceptive fear. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, December 2015
22. Avery JA, Burrows K, Kerr KL, Khalsa SS, Paulus MP, Simmons WK. The neural basis of positive alliesthesia in nicotine addiction. *Society for Research on Nicotine and Tobacco*, Chicago, IL. March, 2016
23. Samad M, Silverstein S, Khalsa SS, Shams L, Feusner JD. Associations between eating disorder and body dysmorphic disorder symptoms and low-level visual processing. *International Conference on Eating Disorders*, San Francisco, CA. May, 2016
24. Hassanpour MS, Luo Q, Bergamino M, Lapidus RC, Simmons WK, Feinstein JS, Paulus M, Luh WM, Bodurka J, Khalsa SS. Assessing the effects of cardiorespiratory variation on cerebral blood flow measured by ASL fMRI. *Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016
25. Hassanpour MS, Luo Q, Bergamino M, Lapidus RC, Simmons WK, Feinstein JS, Paulus M, Luh WM, Bodurka J, Khalsa SS. Assessing the impact of adrenergic interoceptive stimulation on brain activity using ASL fMRI. *Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016
26. Bergamino M, Hassanpour MS, Luo Q, Lapidus RC, Simmons WK, Feinstein JS, Paulus M, Luh WM, Bodurka J, Khalsa SS. Evaluation of the ANTs SyN coregistration for the purpose of improving perfusion fMRI analysis. *Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016

27. Luo Q, Wong C, Zotev V, Khalsa S, Bodurka J. Impact of a short breath holding task on spontaneous brain activity: simultaneous EEG-fMRI study. *Organization for Human Brain Mapping*, Geneva, Switzerland, June 2016
28. Khalsa SS, Hassanpour MS, Luo Q, Feinstein JS, Simmons WK, Bodurka J, Paulus MP. Brain activation in mid-insula dynamically tracks cardiorespiratory interoception. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, December 2016
29. Rangaprakash D, Hutcheson NL, Lawrence KE, Moody TD, Madsen S, Khalsa S, Strober M, Bohon C, Feusner JD. Aberrant fronto-limbic effective connectivity during repeated fearful face stimuli in body dysmorphic disorder and anorexia nervosa. *International Society for Magnetic Resonance in Medicine*, Honolulu, HI, April 2017 [Selected for E-poster presentation]
30. Hassanpour MS, Luo Q, Simmons WK, Feinstein JS, Paulus M, Luh W, Bodurka J, Khalsa SS. Cardiorespiratory noise correction improves the ASL signal. *International Society for Magnetic Resonance in Medicine*, Honolulu, HI, April 2017 [Selected for oral presentation]
31. Lapidus RL, Kuplicki R, Rhudy JL, Yeh H, Hassanpour MS, Simmons WK, Feinstein JS, Khalsa SS. Investigating the relationship between homeostatic threat, anxiety sensitivity, and negative valence processing. *Anxiety and Depression Association of America Conference*, San Francisco, CA, April 2017
32. Rangaprakash D, Hutcheson NL, Lawrence KE, Moody TD, Madsen S, Khalsa S, Strober M, Bohon C, Feusner JD. Aberrant fronto-limbic effective connectivity during repeated fearful face stimuli in body dysmorphic disorder and anorexia nervosa. *Organization for Human Brain Mapping*, Vancouver, Canada, June 2017
33. Ralph-Nearman C, Arevian AC, Khalsa SS, Feusner JD. Introducing Somatomap: A cross-platform mobile application for assessment of interoceptive, affective, and appearance-based concerns. *International Conference on Eating Disorders*, Prague, Czech Republic, June 2017 [Winner of the 2017 ICED Young Investigator Award]
34. Davenport M, Feinstein JS, Khalsa SS, von Leupoldt A, Davenport P. Respiratory load compensation during increasing load magnitudes in normal subjects. *International Society of the Advancement of Respiratory Psychophysiology*, Lille, France, September, 2017
35. Davenport PW, Feinstein JS, Khalsa SS, Davenport MP, Paulus MP, von Leupoldt A. Single Breath and 10-Breath Resistive Load Perception of Intensity and Unpleasantness in Individuals with Bilateral Insular and Amygdala Lesions. *International Society of the Advancement of Respiratory Psychophysiology*, Lille, France, September, 2017
36. Khalsa SS, Arevian AC, Ralph-Nearman C, Feusner JD. Introducing Somatomap: A mobile body-mapping application for assessment of perceptual disturbances across psychiatric disorders. *Technology in Psychiatry Summit*, Harvard/McLean Hospital, Boston, CA, November 2017
37. Khalsa SS, Kuplicki R, Yeh H, Clary K, Feinstein JS, Simmons WK, Tulsa 1000 Investigators, Paulus MP. Interoceptive dysfunction across psychiatric disorders: preliminary results from a large-scale

naturalistic study. *American College of Neuropsychopharmacology Conference*, Palm Springs, CA, December 2017

38. Feinstein JS, Khalsa SS, Al Zoubi O, Yeh H, Simmons WK, Stein MB, Paulus MP. Examining the Anxiolytic Effect of Floatation-REST. *American College of Neuropsychopharmacology Conference*, Palm Springs, CA, December 2017
39. Maier A, Scheele D, Spengler F, Menba T, Mohr F, Stoffel-Wagner B, Khalsa SS, Gunturkun O, Maier W, Hurlemann R. Oxytocin Reduces a Chemosensory-Induced Fear Response Bias in Face Perception. *American College of Neuropsychopharmacology Conference*, Palm Springs, CA, December 2017
40. Clausen A, Aupperle R, Yeh H, Waller D, Payne J, Akeman E, Paulus MP, Tulsa 1000 Investigators†. Assessing Relationships Between Childhood Trauma and Brain Morphology in Large Community-Based Adult Sample. *American College of Neuropsychopharmacology Conference*, Palm Springs, CA, December 2017 †Tulsa 1000 Investigator
41. Lapidus RL, Puhl M, Kuplicki R, Simmons WK, Feinstein JS, Khalsa SS. Responses to Interoceptive and Nociceptive Homeostatic Perturbations in Eating Disorders. *International Conference on Eating Disorders*, Chicago, IL, April 2018
42. Khalsa SS, Moseman SE, Yeh H, Simmons WK, Paulus MP, Feinstein JS. Reduced Environmental Stimulation in Anorexia Nervosa. *International Conference on Eating Disorders*, Chicago, IL, April 2018
43. Davenport M, Feinstein J, Khalsa S, von Leupoldt A, Davenport P. Respiratory load compensation and perception during 10-breath sustained inspiratory resistive loading in normal subjects. *Experimental Biology*, San Diego, CA, April 2018
44. Davenport P, Davenport M, Feinstein J, Khalsa S, von Leupoldt A. Inspiratory Resistive (R) Load Endurance Testing in Normal Healthy Adults: Load compensation, effort sensation and affective perception. *Experimental Biology*, San Diego, CA, April 2018
45. Payne J, Clausen AN, Aupperle RL, Yeh H, Waller D, Akeman E, Paulus MP, Tulsa 1000 Investigators. Relationship Between Severity and Subtypes of Childhood Trauma and Brain Morphology in Adults. *Anxiety and Depression Association of America Conference*, Washington D.C., April 2018 †Tulsa 1000 Investigator
46. Khalsa SS, Moseman SE, Yeh H, Simmons WK, Paulus MP, Feinstein JS. A Clinical Trial Investigating the Safety and Tolerability of Floatation-Rest in Anorexia Nervosa. *Society of Biological Psychiatry*, New York, NY, May 2018
47. Feinstein JS, Khalsa SS, Yeh H, Stein MB, Paulus MP. Examining the Short-Term Anxiolytic Effect of Floatation-REST. *Society of Biological Psychiatry Conference*, New York, NY, May 2018
48. Puhl M, Lapidus RL, Simmons WK, Lignieres A, Feinstein JS, Paulus MP, Khalsa SS. Interoceptive prediction signals in the anterior insula. *Society of Biological Psychiatry Conference*, New York, NY, May 2018

49. Puhl M, Wong CK, Bodurka J, Khalsa SS. Influence of cardiorespiratory perturbation on cardioballistic peak timing variations in EEG-fMRI. *Organization for Human Brain Mapping*, Singapore, June 2018
50. Wong CK, Puhl M, Smith J, Khalsa SS, Bodurka J. Cardioballistic peak timing variations in EEG-fMRI: influence of age, weight, and heart rate. *Organization for Human Brain Mapping*, Singapore, June 2018
51. von Leupoldt A, Sucec J, Herzog M, Feinstein J, Khalsa SS, Davenport PW. Psychological mechanisms of breathlessness – a neural update about interactions of affective states and traits with dyspnea. *Dyspnea Society International Scientific Meeting*, Montreal, Canada, June 2018
52. Ralph-Nearman C, Arevian AC, Khalsa SS, Feusner JD. Somatmap: A Novel Cross-Platform Application for Assessment of Body-Related Disturbances Across Psychiatric Disorders. *American Psychological Association Annual Conference*, San Francisco, CA, August 2018 [1st place winner, Student-First-Authoring Poster Contest, Region of Europe]
53. Yeh HW, Bergamino M, Khalsa S, Paulus M. Consistency across brain normalization algorithms in DTI analyses. *Society for Neuroscience Annual Conference*, San Diego, CA, October 2018
54. Kuplicki R, Burrows KP, Paulus MP, Tulsa 1000 Investigators†. Both medicated and unmedicated subjects with mood and anxiety disorders show dysregulated interoceptive processing. *Society for Neuroscience Annual Conference*, San Diego, CA, October 2018 †Tulsa 1000 Investigator
55. Kirlic N, McDermott T, Aupperle R, Paulus M, Tulsa 1000 Investigators†. Neural and Behavioral Correlates of Approach-Avoidance Conflict in a Large Transdiagnostic Sample. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, December 2018 †Tulsa 1000 Investigator
56. Ford B, Yolken R, Aupperle R, Teague K, Tulsa 1000 Investigators†, Irwin M, Paulus M, Savitz J. Early Life Stress is Associated With Increased Odds of Cytomegalovirus Infection in Individuals With Major Depressive Disorder. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, December 2018 †Tulsa 1000 Investigator
57. Khalsa SS, Puhl M, Yeh H, Kuplicki R, Forthman K, Feinstein J, Victor T, Tulsa 1000 Investigators, Paulus MP. A Multi-level Approach to Interoception and Psychopathology. *American College of Neuropsychopharmacology Conference*, Hollywood, FL, December 2018
58. Lapidus RC, Puhl M, Wittmann M, Khalsa SS. Accelerated time perception during interoceptive arousal modulation in anorexia nervosa. *International Conference on Eating Disorders*, New York, NY, March 2019
59. Lapidus RC, Feinstein JS, Tulsa 1000 Investigators, Paulus MP, Khalsa SS. Anxiety Sensitivity is Related to Suffocation Fear in Eating and Mood/Anxiety Disorders. *Anxiety and Depression Association of America*, Chicago, IL, March 2019
60. DeVille D, Kuplicki R, Tulsa 1000 Investigators, Paulus MP, Khalsa SS. Reduced interoceptive responses to bodily threat in suicide attempters. *Anxiety and Depression Association of America*, Chicago, IL, March 2019

61. Davenport PW, Davenport M, Feinstein J, Khalsa S, von Leupoldt A. Inspiratory Work, Power and Drive During Multiple Breath Extrinsic Resistive Loading in Healthy Adults. *Experimental Biology Conference*, Orlando, FL, April 2019
62. Davenport PW, Davenport M, Feinstein J, Khalsa S, von Leupoldt A. Perception of Intensity and Unpleasantness for 1-Breath, 10-Breath and 10-Minute Inspiratory Resistive Loaded Breathing in Healthy Adults. *Experimental Biology Conference*, Orlando, FL, April 2019
63. Khalsa SS, Puhl M, Kaye W, Paulus MP. Meal related interoceptive dysfunction in anorexia nervosa. *Society of Biological Psychiatry Conference*, Chicago, IL, May 2019
64. Puhl M, Feinstein J, Hurlmann R, Khalsa SS. Compensation in the anterior insula following bilateral amygdala damage. *Society of Biological Psychiatry Conference*, Chicago, IL, May 2019
65. DeVille D, Kuplicki R, Tulsa 1000 Investigators, Paulus MP, Khalsa SS. Blunted cardiac interoception in suicide attempters. *Society of Biological Psychiatry Conference*, Chicago, IL, May 2019
66. Cosgrove KT, Aupperle RL, Kuplicki R, Khalsa S, Savitz J, Teague K, Paulus M. The relationship between ibuprofen, peroxisome proliferator-activated gamma receptor gene expression, and neural activation during an emotional faces task. *Society of Biological Psychiatry Conference*, Chicago, IL, May 2019
67. Al Zoubi O, Mayeli A, Tsuchiyagaito A, Misaki M, Zotev V, Aupperle R, Khalsa S, Feinstein J, Savitz J, Cha Y, Kuplicki R, Victor T, Refai H, Paulus M, Bodurka J. Mood and anxiety disorders affect brain temporal dynamics: evidence from EEG microstates. *Society of Biological Psychiatry Conference*, Chicago, IL, May 2019
68. Stewart J, Khalsa S, Kuplicki R, Tulsa 1000 Investigators, Paulus M. Interoceptive dysfunction in stimulant and opioid addiction. *Society of Biological Psychiatry Conference*, Chicago, IL, May 2019
69. Moradi M, Ekhtiari H, Kuplicki R, McKinney B, Stewart JL, Paulus MP, Tulsa 1000 Investigators† Resource Allocation Index as a Potential fMRI-based Biomarker for Substance Use Disorder: Negative Findings in T1000 Cohort *College on Problems of Drug Dependence Conference*, San Antonio, TX, June 2019 †Tulsa 1000 Investigator
70. Davenport PW, Davenport M, Feinstein J, Khalsa S, von Leupoldt A. Perception of intensity and unpleasantness for 10-breath inspiratory resistive loads: effect of sex, smoking and insula/amygdala lesion. *European Respiratory Society*, Madrid, Spain, September 2019
71. Mai S, Khalsa S, Schütz L, Gaus A, Müller F, Pollatos O. The effect of energy drinks on interoception and cognition in anxious students. *European Health Psychology Society Conference*, September, Dubrovnik, Croatia, September 2019
72. Ralph-Nearman C, Arevian AC, Puhl M, Weindel A, Moseman SE, Feusner JD, Khalsa SS. Visual mapping of body image disturbance in anorexia nervosa. *Eating Disorder Research Society Conference*, Chicago, IL, September 2019

73. Davenport M, Feinstein J, Khalsa S, von Leupoldt A, Davenport PW. Relationship between Perception, Inspiratory Work, Power, Drive and Load Compensation Index During Multiple Breath Extrinsic Resistive Loading in Healthy Adults. *International Symposium on Respiratory Psychophysiology Conference*, Geneva, Switzerland, October 2019
74. Khalsa SS, Puhl M, Upshaw V, Lapidus RC, Bodurka J, Thompson WK, Moseman SE, Kaye W, Paulus MP. Neural basis of meal related interoceptive dysfunction in anorexia nervosa. *American College of Neuropsychopharmacology Conference*, Orlando, FL, December 2019
75. DeVille DC, Aupperle R, Kuplicki R, Tulsa 1000 Investigators, Paulus MP, Khalsa SS. Attenuated insula and resting state network activation during interoceptive attention distinguishes suicide attempters from ideators and non-ideators. *Anxiety and Depression Association of America*, San Antonio, Texas, March 2020. [Cancelled due to Covid-19]
76. Teed AR, Lapidus RC, Upshaw R, Kuplicki R, Bodurka J, Feinstein JS, Paulus MP, Khalsa SS. Evidence for a peripheral cardiovascular hypersensitivity in generalized anxiety disorder. Late Breaking Abstract, *Society of Biological Psychiatry Conference*, New York, New York. May 2020 [Cancelled due to Covid-19]
77. Smith R, Kirlic N, Stewart J, Touthang J, Khalsa S, Kuplicki R, Paulus M, Aupperle R. Sensitivity to expected egative outcomes during approach-avoidance conflict in a transsdiagnostic patient sample: a computational (active inference) modeling approach. *Society of Biological Psychiatry Conference*, New York, New York. May 2020 [Cancelled due to Covid-19]
78. Lapidus RC, Upshaw V, Khalsa SS. Augmented Interoceptive Exposure Training For Food-Related Fear in Anorexia Nervosa: a Proof-of-Concept Study. *Intentional Conference on Eating Disorders (ICED2020 virtual)*, Sydney, Australia, June 2020. [Selected for oral presentation]
79. Ralph-Nearman C, Arevian AC, Sinik M, Chappelle S, Moseman SE, Feusner JD, Khalsa SS. Visual mapping of body image disturbance in anorexia nervosa reveals objective markers of illness severity. *Body Image and Prevention SIG; Intentional Conference on Eating Disorders (ICED2020 virtual)*, Sydney, Australia, June 2020 [Recipient of Body Image & Prevention SIG Early Career Abstract Award]
80. Ralph-Nearman C, Arevian AC, Sinik M, Kumar R, Moseman SE, Feusner JD, Khalsa SS. Test-retest reliability of a 3-dimensional visual assessment of body image disturbance in anorexia nervosa. *Eating Disorder Research Society Conference*, Virtual Meeting, October 2020
81. Teed AR, Lapidus RC, Upshaw V, Kuplicki RT, Bodurka J, Feinstein JS, Thompson WK, Paulus MP, Khalsa SS. Evidence of autonomic hypersensitivity and blunted ventromedial prefrontal cortex activity during interoceptive perturbation in generalized anxiety disorder. *American College of Neuropsychopharmacology Conference*, Virtual Meeting, December 2020
82. DeVille DC, Khalsa SS, Tulsa 1000 Investigators, Lapidus RC, White E, Paulus MP, Aupperle RL. A preliminary exploration of insula resting state functional connectivity and suicidal behaviors. *Society of Biological Psychiatry Conference*, Virtual Meeting, April 2021

83. Ironside M, Kuplicki R, Forthman K, Tulsa 1000 Investigators, Paulus MP. Increased startle reflex in comorbid depression and anxiety. *Society of Biological Psychiatry Conference*, Virtual Meeting, April 2021
84. Zheng H, Smith R, Burrows K, Kuplicki R, Bodurka J, Tulsa 1000 Investigators, Teague K, Paulus MP, Khalsa SS, Savitz J. Inflammation is associated with abnormal interoceptive processing in major depressive disorder. *Society of Biological Psychiatry Conference*, Virtual Meeting, April 2021
85. Ralph-Nearman C, Arevian AC, Cazzato V, Bellard A, Davis G, Khalsa SS, Feusner JD. Somatomap 3-Dimensional visual assessment of body image perceptual accuracy related to eating disorder symptoms in male fashion models. *Eating Disorder Research Society Conference*, Virtual Meeting, September 2021
86. Lapidus RC, Davenport PW, von Leupoldt A, Feinstein JS, Upshaw VU, Chappelle S, Guzman D, Stewart JL, & Khalsa SS. Probing Perceptions of Dyspnea in Anorexia Nervosa using Resistive Inspiratory Breathing Loads. *Eating Disorder Research Society Conference*, Virtual Meeting, September 2021
87. Garland MM, Wilson R, Adamic E, Thompson WK, Arevian A, Stein MB, Paulus MP, Feinstein JS, Khalsa SS. Acute and additive effects of repeated REST (Reduced Environmental Stimulation Therapy) on symptoms in a clinically anxious and depressed sample. *Anxiety and Depression Association of America*, Denver, CO, March 2022.'
88. Mayeli A, Al Zoubi O, White EJ, Chappelle S, Kuplicki R, Smith R, Feinstein JS, Paulus MP, Khalsa SS. Neural indicators of human gut feelings: towards an interoceptive framework for understanding eating disorders. *Society of Biological Psychiatry Annual Conference*, New Orleans, Louisiana. 4/22/22.
89. Burrows K, Stewart JL, Figueroa-Hall LK, Kuplicki R, Alarbi AM, Tan C, Aupperle R, Guinjoan S, Victor TA, Risbrough VB, McKinney BA, Ramesh R, Savitz JB, Teague TK, Khalsa SS, & Paulus MP. Association of decreased microRNA-93 expression from neuronal-enriched extracellular vesicles and dysregulated brain interoceptive processing in major depressive disorder. *International Society for Extracellular Vesicles Annual Meeting*, Lyon, France, May 2022.
90. Figueroa-Hall LK, Burrows K, Alarbi AM, Tan C, Teague TK, McKinney B, Rajagopal R, Cha YC, Guinjoan S, Khalsa SS, Risbrough VB, Paulus MP & Savitz J. Characterization of human astrocyte-enriched extracellular vesicle miRNAs after an *in vivo* lipopolysaccharide challenge. *International Society for Extracellular Vesicles Annual Meeting*, Lyon, France, May 2022.

LECTURES AND ORAL PRESENTATIONS:

2022:

Khalsa SS, Powers A. Perceptual Dysregulation across Disorders: Toward a Computationally-Defined Psychiatric Nosology. Study Group Co-Chairs. *American College of Neuropsychopharmacology (ACNP) Annual Meeting*, Phoenix, Arizona. December 2022 (accepted symposium).

- Khalsa SS.** Invited speaker, *Gastronauts seminar series, October 2022, Duke University, Durham, North Carolina*. 10/4/22 (accepted talk).
- Khalsa SS,** Teed AR, Lapidus RC, Upshaw V, Finnemann J, Fletcher PC, Thompson WK, Moseman SE, Kaye WH, Paulus MP. Neural basis of meal-related interoceptive dysfunction in anorexia nervosa. *Eating Disorder Research Society Annual Conference, Philadelphia, Pennsylvania*. 09/16/22 (accepted talk).
- Khalsa SS.** Interoception, anxiety, and central autonomic function in psychiatric disorders. *Neuroimaging Seminar, Institute of Psychiatry Psychology and Neuroscience, King's College London, London, England* (virtual). 05/27/22.
- Khalsa SS,** Flux MC, Moseman SE, Chappelle S, Naegele J, Upshaw V, Morton A, Paulus MP, Feinstein JS. Impact of floatation therapy on body image and anxiety in anorexia nervosa: a randomized clinical efficacy trial. *International Conference on Eating Disorders, Monterrey, Mexico* (virtual, lecture pre-recorded). 06/09/22.
- Khalsa SS.** Interoception and mental health: towards an integrated understanding of mind body and brain interactions. *Closing keynote lecture, RCPsych Faculties of Neuropsychiatry and Academic Psychiatry Neuroscience Conference, London, England* (virtual). 05/13/22.
- Khalsa SS.** Interactions between anxiety, central autonomic function, and cardio-respiratory-gastric signaling: one (interoceptive) concept to rule them all? *Workshop on the Mind-Body Nexus, La Jolla, California*. 05/11/22. Invited workshop organized by the United States Army Research Office.
- Khalsa SS.** Neural circuits of interoception: decoding the cognitive, affective, and behavioral brain-body connections in mental health. *International Society of Magnetic Resonance in Medicine (ISMRM) Weekday Education Course, London, England* (virtual). 05/09/22. Workshop topic: Decision-making: when to follow your heart, trust your guts, or think with your head.
- Khalsa SS.** Interoception and mental health: towards an integrated understanding of mind body and brain interactions. *Keynote lecture, 9th Annual Mind Body Brain Symposium, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany* (virtual). 03/17/22
- Khalsa SS.** Association of generalized anxiety disorder with autonomic hypersensitivity and blunted vmPFC activity during peripheral adrenergic stimulation. *Anxiety and Depression Association of America (ADAA) Annual Meeting, Denver, Colorado*. 03/20/22. *Chair and organizer of symposium titled "Interoceptive Modulation in Anxiety and Depression: A Reboot". Speakers: Sahib Khalsa, Ryan Smith, Brian Dawkins, Jasper Smits.
- Khalsa SS.** Association of anxiety associated with autonomic hypersensitivity. *Quantum photonics Club, sponsored by Science Society, via Clubhouse Social Audio App* (virtual). 03/03/22
- Khalsa SS,** Aupperle RL, Choquette E. Tulsa Life Chart (TLC): Web-based Graphic Representation of the Life Course of Mental Health. *Joint meeting of the Central Oklahoma Psychiatric Society and the Tulsa Psychiatric Association* (virtual). 02/17/22.
- Khalsa SS.** Interoception and mental health: basic and clinical discoveries. *Center of Excellence for Stress and Mental Health (CESAMH), VA San Diego Healthcare System, San Diego, CA* (virtual). 01/02/22.

2021:

Khalsa SS. Gastrointestinal interoception in eating disorders: charting a new path. *Cognitive Social and Affective Neuroscience (CoSAN) lab meeting, Director: Salvatore Aglioti.* Rome, Italy (virtual). 10/27/21.

Khalsa SS. Impact of floatation therapy on body image and anxiety in anorexia nervosa: a randomized clinical efficacy trial. *Float Conference,* Milwaukee, WI (virtual). 08/27/21.

Khalsa SS. From sensations to symptoms: the role of interoception in mental health. *University of Essex, Department of Psychology and Centre for Brain Sciences.* Essex, U.K. (virtual). 06/03/21.

Khalsa SS. Interoception and mental health. *George Washington University Whole Health Seminar Series, Department of Pharmacology and Physiology, GW Institute for Biomedical Sciences, Co-sponsored by Office of Integrative Medicine and Health.* Washington D.C. (virtual). 05/25/21.

Khalsa SS. From sensations to symptoms: the role of interoception in mental health. *UCLA Psychiatry Grand Rounds, Semel Institute at UCLA, Department of Psychiatry.* Los Angeles, CA (virtual). 05/18/21.

Khalsa SS. Interoception: an inside view of physiology, behavior, and neurobiology. Discussant for symposium: "From heart to brain and back: novel findings and methodological challenges in interoception research." *63rd Tagung experimentell arbeitender Psychologen (TeaP) / 63rd Conference of Experimental Psychologists,* Ulm Germany (virtual). 03/14/21.

2020:

Khalsa SS. From sensations to symptoms: the role of interoception in mental health. *Stephenson School of Biomedical Engineering Seminar Series. The University of Oklahoma.* Oklahoma City, OK (virtual). 10/30/20.

Khalsa SS. Interoception and mental health. *Fifth National Congress on Neurofeedback, French Association of Biological Psychiatry and Neuropsychopharmacology.* La Rochelle, France (virtual). 10/02/20.

Khalsa SS. Computational modeling of interoceptive dysfunction across psychiatric disorders. *Computational Psychiatry Course.* Zurich, Switzerland (virtual). 09/11/20.

Khalsa SS. Investigations into the role of interoception in psychiatric disorders. Manos Tsakiris lab group meeting, *Royal Holloway University.* London, UK (virtual). 04/01/20.

Khalsa SS. From sensory perception to symptoms: investigating the role of interoception in psychiatric disorders. Psychiatry Grand Rounds, *University of Oklahoma-Tulsa Department of Psychiatry.* Tulsa, OK (virtual). 03/18/20.

Khalsa SS. Evidence of interoceptive dysfunction across psychiatric disorders. *Med-X lecture series, University of Tulsa,* Tulsa, OK. 02/21/20.

2019:

Khalsa SS. An update on clinical trials of floatation therapy for anorexia nervosa. *Float Conference*, Denver, CO. 09/28/19.

Khalsa SS. Association between bilateral cardiac sympathetic denervation and mental health. *International Society of Autonomic Neuroscience*. Los Angeles, CA. 7/25/19.

Khalsa SS. Charting a path forward for interoceptive neuroscience. *NIH Blueprint for Neuroscience Workshop: The Science of Interoception and Its Roles in Nervous System Disorders*. Bethesda, MD. 4/17/19.

Khalsa SS. The neuroscience of eating disorders and the impact of float sessions to improve symptoms. *American Athletic Conference*. Tulsa, OK. 3/30/19.

Khalsa SS. Introduction to the Genetics and Neuroscience Special Interest Group Symposium. *Anxiety and Depression Association of America Conference*, Chicago, IL, 3/29/19. *Chair and organizer of symposium titled “Failure to Launch? Promises and Pitfalls of Genetic/Neuroimaging Predictors in Mental Health”: Dr. Roy Perlis (Harvard University) and Dr. Isaac Galatzer-Levy (New York University).

Khalsa SS. Investigating the role of interoception in eating disorders using fMRI. *International Conference on Eating Disorders*. New York, NY. 03/16/19.

Khalsa SS. Maximizing recovery after weight restoration via relapse prevention in anorexia nervosa. *International Conference on Eating Disorders*. New York, NY. 03/15/19.

Khalsa SS. Examining the effects of psychotropic medication status in fMRI studies of eating and mood/anxiety disorders. *International Conference on Eating Disorders*. New York, NY. 03/14/19.

Khalsa SS. Evidence of interoceptive dysfunction across mental health disorders. *American Psychosomatic Society Conference*. Vancouver, Canada. 03/07/19.

Khalsa SS. The role of somatic error in interoceptive psychopathology. *American Psychosomatic Society Conference*. Vancouver, Canada. 03/08/19.

Khalsa SS. Introduction the Cannabis Conference afternoon plenary. *Cannabis Conference: What have we learned through scientific research?* Tulsa, OK, 1/17/19. *Moderator of afternoon plenary. Invited speakers: Dr. Jason Beaman (Chair, Oklahoma State University Department of Psychiatry), Dr. Scott Grantham (Medical Director, Laureate Psychiatric Hospital and Clinic), Dr. Gerry Clancy (President, University of Tulsa) and Terri White (Commissioner, Oklahoma Department of Mental Health and Substance Abuse Services).

Khalsa SS. Brain-body communication in psychiatric disorders. *Grand Rounds, University of Tulsa Oxley College of Health Sciences*, Tulsa, OK. 01/28/19.

2018:

Khalsa SS. Introduction to the Genetics and Neuroscience Special Interest Group Symposium. *Anxiety and Depression Association of America Conference*, Washington D.C., 4/6/18. *Chair and organizer of

symposium titled “Ketamine as a novel approach for treatment-resistant depression and anxiety” with invited speakers: Dr. Carlos Zarate (NIMH) and Dr. Chadi Abdallah (Yale University).

Khalsa SS. Enhancing interoception via perturbation of brain, body, and affect: implications for mental health. *Society for Affective Science*, Los Angeles, CA. Date: 04/28/18. Invited plenary flash talk.

Khalsa SS. Brain-body communication in eating disorders: basic and clinical neuroscience investigations. *University of California San Diego Eating Disorders Center for Treatment and Research*, San Diego CA. 5/01/18.

Khalsa SS. Interoception and mental health: a roadmap and some initial signposts. Psychiatry Grand Rounds, *West Los Angeles Veterans Administration (WLAVA)*, Los Angeles, CA. Date: 5/02/18.

Khalsa SS. Floatation-REST: A novel non-pharmacological therapy for reducing physiological and psychological stress. *UCLA Cardiac Arrhythmia Center Research and Innovation Lecture Series*. Los Angeles, CA. 05/03/18.

Khalsa SS. Exploring brain systems and mechanisms related to human consciousness and interoception. *International Congress of Integrative Medicine and Health*. Baltimore, MD. 05/09/18. Panel sponsored by NCCIH.

Khalsa SS. Investigating interoceptive dysfunction across psychiatric disorders. *Royal College of Psychiatrists Conference*. Birmingham, UK. 06/27/18.

Khalsa SS. Interoception and mental health: a roadmap and some initial signposts. *Psychiatry Seminar, Oxford University*. Oxford, UK. 06/29/18.

Khalsa SS. Interoception and functional neurological disorders. *Generating a Research Agenda in Functional Neurological Disorders Conference*. Emory University, GA. 09/14/18.

Khalsa SS. Clinical trials of floatation therapy for anorexia nervosa. *24th Annual Zarrow Mental Health Symposium*, Tulsa, OK. 10/05/18.

2017:

Khalsa SS. Multimodal pharmacological fMRI investigations of interoceptive communication between heart and brain. *University of Southern California, Laboratory of Neuroimaging (LONI), JJ Wang Laboratory*, Los Angeles, CA. 10/13/17.

Khalsa SS. Central neural correlates of peripheral beta-adrenergic tone in human. *UCLA Cardiac Arrhythmia Center Research and Innovation Lecture Series*. Los Angeles, CA. 10/11/17.

Khalsa SS. Mind body and brain: neuroscience-based investigations of contemplative practice. *Ayurveda: Health for Body and Mind Conference 2017*, Loyola Marymount University, Los Angeles, CA. 10/7/17.

Khalsa SS. Effects of reduced environmental stimulation in anorexia nervosa. *23rd Annual Zarrow Mental Health Symposium*, Tulsa, OK. 10/06/17.

Khalsa SS. Interoceptive dysfunction across psychiatric disorders. *International Symposium on New Approaches to Depression*, Institute of Cognitive Neurology (INECO) and the Institute of Neurosciences at Favaloro University, Buenos Aires, Argentina. 10/3/17.

Khalsa SS. Emerging methods for studying interoception. Institute of Cognitive Neurology (INECO), Agustin Ibanez Laboratory, Buenos Aires, Argentina. 10/2/17.

Khalsa SS. Floating and eating disorders. *Float Conference*, Portland, OR. 08/12/16.

Khalsa SS. The insular cortex dynamically maps changes in cardiorespiratory interoception. *Association for Psychological Science*, Boston, MA, 5/28/17. *Chair and organizer of symposium titled “Knowing how I feel: the role of interoception in emotion processing and regulation.”

Khalsa SS. Brain activation during dynamic changes in cardiorespiratory interoception. *Anxiety and Depression Association of America Conference*, San Francisco, CA, 4/8/17. *Chair and organizer of symposium titled “Threat from the inside: novel basic and clinical neuroscience approaches to interoceptive exposure.”

Khalsa SS. The effect of meditation on awareness and regulation of internal body states. *Grand Rounds*, University of Tulsa Oxley College of Health Sciences, Tulsa, OK. 01/20/17.

2016:

Khalsa SS. Interoceptive assessment. *Interoception Summit*, Tulsa, OK. 11/15/16. *Workshop moderator and conference organizer for inaugural interoception summit meeting.

Khalsa SS. Interoception ABCs. *Interoception Summit*, Tulsa, OK. 11/15/16. *Workshop moderator and conference organizer for inaugural interoception summit meeting.

Khalsa SS. Afferent heart-brain communication in humans: basic and clinical insights. *Cardiology Grand Rounds*, University of Oklahoma, Oklahoma City, OK. 10/07/16.

Khalsa SS. Floatation as a new treatment for anorexia nervosa. *22nd Annual Zarrow Mental Health Symposium*, Tulsa, OK. 09/30/16.

Khalsa SS. Mapping afferent heart-brain communication in humans. *UCLA Cardiac Arrhythmia Center*. Los Angeles, CA. 9/15/16.

Khalsa SS. How the heart speaks to the brain: neural activity during cardiorespiratory interoceptive stimulation. *International Society of Psychoneuroendocrinology*. Miami, FL. 09/09/16.

Khalsa SS. Floating and interoception. *Float Conference*, Portland, Oregon. 08/20/16.

Khalsa SS. When food rules the brain. *Healthy Brains Lecture Series*, Laureate Institute for Brain Research, Tulsa, OK. 07/28/16.

Khalsa SS. Convergent investigations of heart-brain communication. *Swiss Center for Affective Science*, University of Geneva, Geneva, Switzerland. 06/23/16.

Khalsa SS. Multifaceted investigations of interoception. *Laboratory of Cognitive Neuroscience* (Olaf Blanke Lab), Campus Biotech, Geneva, Switzerland. 06/23/16.

Khalsa SS. How the heart speaks to the brain: a multifaceted perspective. *Reading Emotions Conference*. Reading, England. 06/16/16.

Khalsa SS. How the heart speaks to the brain: neural activity during cardiorespiratory interoceptive stimulation. *Society of Biological Psychiatry Conference*. Atlanta, GA. 05/12/16. *Chair and organizer of symposium titled “Body to brain: illuminating the role of interoception in psychiatry.”

Khalsa SS. Altered anxiety expression and internal body representation during meal anticipation in anorexia nervosa: effects of an interoceptive pharmacological challenge. *International Conference on Eating Disorders*, San Francisco, CA. 05/07/16.

Khalsa SS. Augmented interoceptive exposure training as a new treatment for anxiety in anorexia nervosa. *National Association of Social Workers – Oklahoma Chapter*, Norman, OK. 03/04/16.

Khalsa SS. Mapping the heart-brain connection: an interoceptive update on basic and translational approaches. *UCLA Cardiac Arrhythmia Center Research and Innovation Lecture Series*. Los Angeles, CA. 02/04/16.

2015:

Khalsa SS. Augmented interoceptive exposure training as a new treatment for anxiety in anorexia nervosa. *21st Annual Zarrow Mental Health Symposium*, Tulsa, OK. 9/17/15.

Khalsa SS. Floating: a form of sensory enhancement (not deprivation). *Float Conference*, Portland, OR, 8/15/15.

Khalsa SS, Craske MG, Strober M, Lapidus RC, Feusner JD. Altered interoceptive awareness and anxiety expression in anorexia nervosa. *Association for Psychological Science Conference*, New York, NY, 5/24/15.

Khalsa SS, Kumar R, Patel V, Strober M, Feusner JD. Altered mammillary body volume in anorexia nervosa. *International Conference on Eating Disorders*, Boston, MA, 4/25/15.

Khalsa SS, Kuo A, Verdugo B, Bernacki J, Shivkumar KS. Detection and management of anxiety and depression due to interoceptive symptom burden in cardiac arrhythmias. *Anxiety and Depression Association of America Conference*, Miami, FL, 4/11/15. *Chair and organizer of symposium titled “Mechanisms of altered interoceptive awareness in anxiety and depression.” Co-chair: Daniel Pine. Discussant: Martin Paulus.

2014:

Khalsa SS. Unraveling the heart-brain connection: a proposed nomenclature and preliminary insights from ongoing investigations of subjective cardiovascular perception. *Laureate Institute for Brain Research*. Tulsa, OK. Date: 9/23/14.

Khalsa SS. Healthy hearts behavioral medicine program: clinical update and future directions. *UCLA Cardiac Arrhythmia Center Research and Innovation Lecture Series*. Los Angeles, CA. Date: 8/21/14.

Khalsa SS. Assessment and management of anxiety and depressive disorders in cardiac arrhythmias. *UCLA Women's Health Center*. Los Angeles, CA. Date: 8/18/14.

Khalsa SS. Interoceptive awareness in anorexia nervosa: effects of meal anticipation, consumption and bodily arousal. *University of California San Diego Eating Disorders Center for Treatment and Research*, San Diego CA. Date: 8/15/14.

Otelsberg M, Doronn S, Motivala SJ, **Khalsa SS.** ERP Exposed: A Hands On Experience. *International Obsessive Compulsive Disorder Foundation Annual Conference*. Los Angeles, CA. Date: 7/18/14.

Khalsa SS. Assessment and treatment of anxiety disorders in individuals with cardiac arrhythmias. *UCLA Medicine Pediatrics Grand Rounds*. Santa Monica, CA. Date: 5/14/14.

Khalsa SS, Shahabi L, Ajjjola OA, Bystritsky A, Naliboff BD, Shivkumar K. Synergistic application of cardiac sympathetic decentralization and comprehensive psychiatric treatment in the management of anxiety and electrical storm. *Anxiety and Depression Association of America Conference*. Chicago, IL. Date: 3/29/14.

2013:

Khalsa SS. Interoceptive awareness in individuals with 1) anorexia nervosa and 2) bilateral amygdala damage. *UCSF Residency Research Track Retreat*. San Francisco, CA. Date: 5/17/13.

Khalsa SS. Effects of peripheral nervous system lesions on human anxiety and cardiac perception: preliminary findings from an ongoing case series. *UCLA Cardiac Arrhythmia Center Research and Innovation Lecture Series*. Los Angeles, CA. Date: 4/17/13.

Khalsa SS. The effects of meditation, aging, and brain injury on interoceptive awareness. *University of Wisconsin-Madison, Department of Psychiatry*. Madison, WI. Date: 3/1/13.

2012:

Khalsa SS. Effects of central and peripheral nervous system lesions on cardiac awareness. *UCLA Cardiac Arrhythmia Center Research and Innovation Lecture Series*. Los Angeles, CA. Date: 8/30/12.

Khalsa SS. The effects of meditation, aging, and brain injury on interoceptive awareness. *Grand Rounds, University of Arizona Department of Psychiatry*. Tucson, AZ. Date: 10/24/12.

2011:

Khalsa SS. Neural mechanisms of cardiovascular interoceptive awareness. *UCLA Research Track Supplementary Academic Research Curriculum (SARC) meeting*. Los Angeles, CA. Date: 1/19/11.

2010:

Khalsa SS. The pathways of interoceptive of awareness. *University of California – San Diego, Department of Psychiatry, Dr. Martin Paulus laboratory*. San Diego, CA. Date: 12/17/10.

2009:

Khalsa SS. The pathways of interoceptive of awareness. *UCLA, Department of Psychiatry, Cutting-edge Journal Club.* Los Angeles, CA. Date: 12/04/09.

2008:

Khalsa SS. Neural systems mediating interoceptive awareness, *University of Iowa, Department of Neurosurgery weekly conference.* Iowa City, IA. Date: 11/24/08.

2007:

Khalsa SS. Looking within: does meditation enhance interoceptive (self) awareness? *Unitarian Universalist Society of Iowa City.* Iowa City, IA. Date: 01/06/07.

Khalsa SS. The effect of meditation on awareness of internal body states. *Palmer College of Chiropractic.* Davenport, IA. Date: 08/27/07.

2006:

Khalsa SS. Neural systems supporting meditation and interoception. *University of Wisconsin-Madison, Department of Psychology, Richard Davidson laboratory.* Madison, WI. Date: 02/03/06.

Khalsa SS. Does the practice of meditation increase interoceptive awareness and body control? *Caltech University, Division of Humanities and Social Sciences, Ralph Adolphs laboratory.* Pasadena, CA. Date: 04/03/06.

Khalsa SS. Does the practice of meditation increase interoceptive awareness and body control? *University of Southern California, Department of Psychology, Antonio Damasio laboratory.* Los Angeles, CA. Date: 04/05/06.

2005:

Khalsa SS, Kaboli P. HIV masquerading as ITP: when you see smoke think fire. *University of Iowa, Department of Internal Medicine Grand Rounds.* Iowa City, IA. Date: 05/12/05.

TEACHING ACTIVITIES:

Postdoctoral Scholar Teaching

<u>Dates</u>	<u>Role</u>	<u>Name</u>	<u>Subsequent Position</u>
2021-present	Postdoc Mentor	Emily Choquette, PhD	Currently at LIBR
2021-present	Postdoc Mentor	Charles Verdonk, MD, PhD	Currently at LIBR
2019-present	Postdoc Mentor	Adam Teed, PhD	Currently at LIBR
2018-2020	Postdoc Mentor	Christina Ralph-Nearman, PhD	Postdoctoral Scholar, University of Louisville

2018-2019	Postdoc Mentor	Maria Puhl, PhD	Statistician, Statistica/TIBCO
2015-2017	Postdoc Mentor	Mahlega Hassanpour, PhD	Research Scientist, University of Utah

Graduate Student Teaching

<u>Dates</u>	<u>Role</u>	<u>Name/Institution</u>
08/22-present	Supervisor	Nicolas Wilzok, Visiting PhD student, University of Jena, Germany
11/21-present	Masters co-advisor	Henrik Bischoff, Stockholm University, Stockholm, Sweden
01/22-present	PhD committee	Kyoungeun Lee, University of Texas, Austin
08/21-present	PhD committee	Anni Hasratian, Southern Methodist University, Dallas
08/21-07/22	PhD committee	Beni Mulyana, University of Oklahoma
04/21-08/21	PhD examiner	Andrew Corcoran, Monash University, Australia
08/20-present	PhD advisor	McKenna Garland, Clinical Psychology, University of Tulsa
08/20-present	PhD advisor	Emily Adamic, Biological Sciences, University of Tulsa
08/15-08/21	PhD advisor	Rachel Lapidus, Clinical Psychology, University of Tulsa
04/18-05/19	PhD advisor	Danielle DeVille, Clinical Psychology, University of Tulsa
11/17	PhD committee	Nadia Zacharioudakis, mid-term committee member, Faculty of Psychology and Educational Sciences of the KU Leuven, Belgium
06/17-09/17	Supervisor	Sandra Mai, Visiting PhD student, University of Ulm, Germany
07/18-08/18	Supervisor	Elischa Kraus, Visiting PhD student, University of Griefswald, Germany
02/20-04/20	Supervisor	Jonas Steinhäuser, Visiting MD student, Technical University of Dresden, Germany
05/06/16	Faculty facilitator	International Conference on Eating Disorders Mentorship Roundtable Program

04/19/18	Faculty facilitator	International Conference on Eating Disorders Mentorship Roundtable Program
05/11/18	Faculty facilitator	Society of Biological Psychiatry (SOBP) Conference Career Development Roundtable for Travel Awardees for Predoctoral Student Scholars
03/14/19	Faculty facilitator	International Conference on Eating Disorders Mentorship Roundtable Program
03/17/19	Faculty facilitator	Society of Biological Psychiatry (SOBP) Conference Career Development Roundtable for Travel Awardees for Predoctoral Student Scholars

Resident Physician Teaching

<u>Dates</u>	<u>Role</u>	<u>Name/Institution</u>
08/26/15– present	Facilitator	U. of Oklahoma –Tulsa Psychiatry Resident Journal Club
2016 – 2018	Supervisor	Research Resident Rotation for 4th year OU-Tulsa psychiatry residents: Dr. John McMillin (2016-17), Dr. Anne Sutton (2017-18), Dr. Kelly Dunn (2018), Dr. Nicholas Musso (2018)
02/28/18	Facilitator	LIBR open house for Tulsa area Psychiatry residency programs: 1) University of Oklahoma –Tulsa and 2) Oklahoma State University
07/01/13 – 12/31/14	Supervisor	Cognitive Behavioral Psychotherapy and Medication Management, UCLA Anxiety Disorders Clinic, Outpatient Setting
07/01/13 – 12/31/14	Supervisor	Attending Physician on call, Emergency Department Setting

Medical Student Teaching

<u>Dates</u>	<u>Role</u>	<u>Name/Institution</u>
08/13/18-11/12/18	Facilitator	Patients, Physicians, and Society II: Clinical Ethics Second year medical student ethics course, OU-TU School of Community Medicine
09/13/17-09/14/17	Facilitator	Interactive Clinical Correlations 4 – Genetic Diseases Patient/family interview case presentation for 1st year medical students, OU-TU School of Community Medicine
11/04/16	Teacher	Cadaver patient presentation for 1 st year medical students,

2009 – 2013	Lecturer	Emergency Psychiatry, Suicide Risk Assessment, Psychiatry Clerkship for 3rd year Medical Students, UCLA
2008	Co-facilitator	Patient Centered Learning Group for 2nd year Medical Students, University of Iowa

Undergraduate Teaching

<u>Dates</u>	<u>Role</u>	<u>Location/ Setting</u>
11/30/20	Lecturer	University of Tulsa – Biomedical Engineering Seminar (ES 2011). Lecture title: Physiological Recording Devices in Human Health-Related Research
11/26/18	Lecturer	University of Tulsa – Biomedical Engineering Seminar (ES 2011). Lecture title: Physiological Recording Devices in Human Health-Related Research
11/27/17	Lecturer	University of Tulsa – Biomedical Engineering Seminar (ES 2011). Lecture title: Physiological Recording Devices in Human Health-Related Research
3/23/17	Host	University of Tulsa Early Careers in Community Medicine (ECCM) reception. Agenda: Introduction to LIBR
8/18/16	Lecturer	University of Tulsa – Principles of Neuroscience (Bio 4173/6173). Lecture title: The Autonomic Nervous System

Teaching Evaluation Scores

University of Tulsa Teaching Evaluation Scores (n=26)

	Knowledgeability	Style	Pace/timing	Content	Clarity	Overall
Mean	5.0	4.8	4.2	4.8	4.7	4.8
SD	0.1	0.5	0.8	0.5	0.7	0.4

Rating scale: 1 to 5 (higher numbers = better ratings)

UCLA Teaching Evaluation Scores (n=45)

	Command of subject	Organization	Timeliness	Encouraging	Enthusiasm	Patient care	Clinical acumen	Role Model	Punctuality	UCLA Teacher Comparison
Mean	6.4	6.6	6.5	6.3	6.3	6.5	6.5	6.5	6.6	6.1
SD	0.5	0.6	0.6	0.8	0.7	0.6	0.6	0.6	0.5	0.8

Rating scale: 1 (Among the Very Worst) to 7 (Among the Very Best)

OTHER TRAINEES AND VOLUNTEERS:

Name	Year	Subsequent Position
Nahal Sabrkhani, BA	2012-2013	Master's Student, UCLA Master's in Public Health
Vandan Patel	2013-2014	Medical Student, University of California-Riverside
Sarah Rind	2015-2016	PhD Student, Behavioral Neuroscience, Boston University
Eric Breese	2016-2018	Medical Student, University of Oklahoma
Austin Lignieres	2016-2017	Medical Student, University of Texas-Austin
Rachel Thun	2016	Master's Student
Audrey Stromberg	2016	Bachelor's Degree, Yale University
Sheridan Chappelle, BS	2016-2020	Medical Student, University of California-San Diego
Olivia Shadid, MD	2016	Psychiatry Residency, University of New Mexico
Rachel Wirginis, DO	2016	Family Medicine Residency, Oklahoma City
Alexandra Weindel	2018	Medical Student, Oklahoma State University
Gregory Morrissey, BS	2019	Medical Doctor, University College Dublin, Ireland
Megan Sinik, BS	2018-19	Medical Student, University of Iowa
Katie Baker, BS	2020-2021	Medical School Applicant
Ann Marie Flusche, BS	2019-2020	Medical School Applicant
Jessyca Naegele, BS	2020-2021	Medical Student, University of Oklahoma
Gabriel Morrison	2021-present	University of Tulsa undergraduate student (current)