

Mentorship and collaboration for research (success)

Department of Anesthesiology &
Perioperative Medicine
Faculty Development Series

11/8/2022

Keith M. Vogt, MD, PhD, FASA



<https://www.academicprofessionaldevelopment.org/>

Learning Objectives

- Describe my journey to becoming an independent investigator
- Emphasize the importance of mentors, advisors, and collaborators in any successful research program

MANY in the department have given me professional and career mentoring/advising.



Let's start with the highlights.



Mentored Research Training Grant: 2017-2019

Human memory encoding under anesthesia:
How pain affects hippocampal and amygdalar
contributions to memory

A comparative study between midazolam and
ketamine

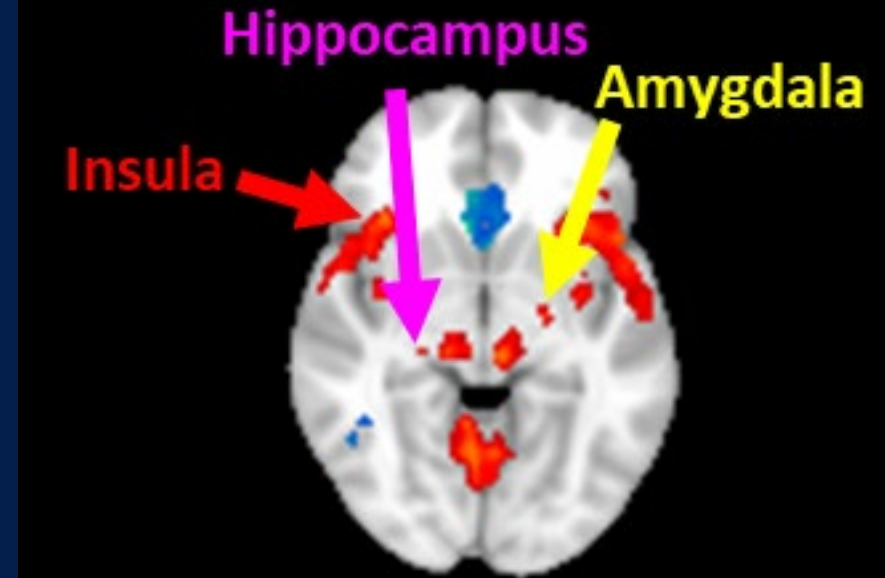
ANESTHESIOLOGY

Midazolam and Ketamine Produce Distinct Neural Changes in Memory, Pain, and Fear Networks during Pain

Keith M. Vogt, M.D., Ph.D., James W. Ibinson, M.D., Ph.D.,
C. Tyler Smith, M.D., Ally T. Citro, B.S., Caroline M. Norton, B.S.,
Helmet T. Karim, Ph.D., Vencislav Popov, Ph.D., Aman
Mahajan, M.D., Ph.D., M.B.A.,

Howard J. Aizenstein, M.D., Ph.D., Lynne M. Reder, Ph.D.,
Julie A. Fiez, Ph.D.

ANESTHESIOLOGY 2021; 135:69–82

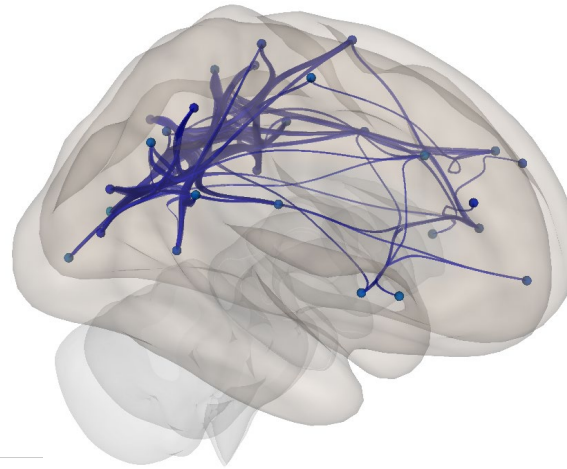
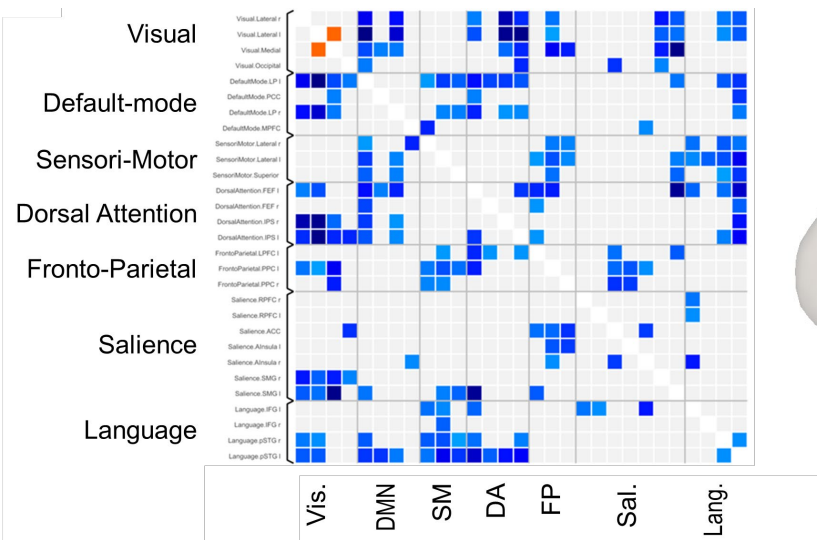


Editor's Choice: Midazolam and Ketamine Neuroimaging during Pain

Midazolam and Ketamine Produce Distinct Neural Changes in Memory, Pain, and Fear Networks during Pain Keith M. V...



Whole-brain network connectivity changes with midazolam sedation during task performance and periodic pain...



Neuroimaging to identify the neural correlates of anesthetic and analgesic action in humans

Project Number

1R35GM146822-01

Contact PI/Project Leader

VOGT, KEITH MICHAEL

Awardee Organization

UNIVERSITY OF PITTSBURGH AT
PITTSBURGH



Details



Contact PI/ Project Leader

Name

VOGT, KEITH MICHAEL [↗](#)

Title

ASSISTANT PROFESSOR, PHYSICIAN

Contact

[View Email](#)

Other PIs

Not Applicable

Program Official

Name

JUSTINOVA, ZUZANA

Contact

[View Email](#)

Organization

Name

**UNIVERSITY OF PITTSBURGH AT
PITTSBURGH**

City

PITTSBURGH

Department Type

ANESTHESIOLOGY

Organization Type

SCHOOLS OF MEDICINE

State Code

PA

Congressional District

18



Learning Objectives (Addended)

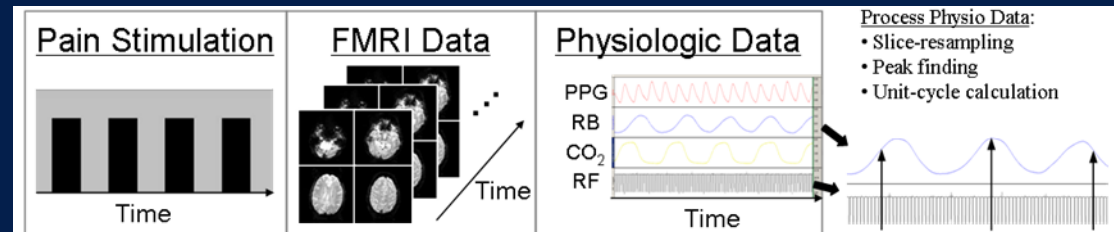
- Describe my journey to becoming an independent investigator
- Emphasize the importance of mentors, advisors, and collaborators in any successful research program
- Give a realistic picture of failure and criticism of one's ideas and work.

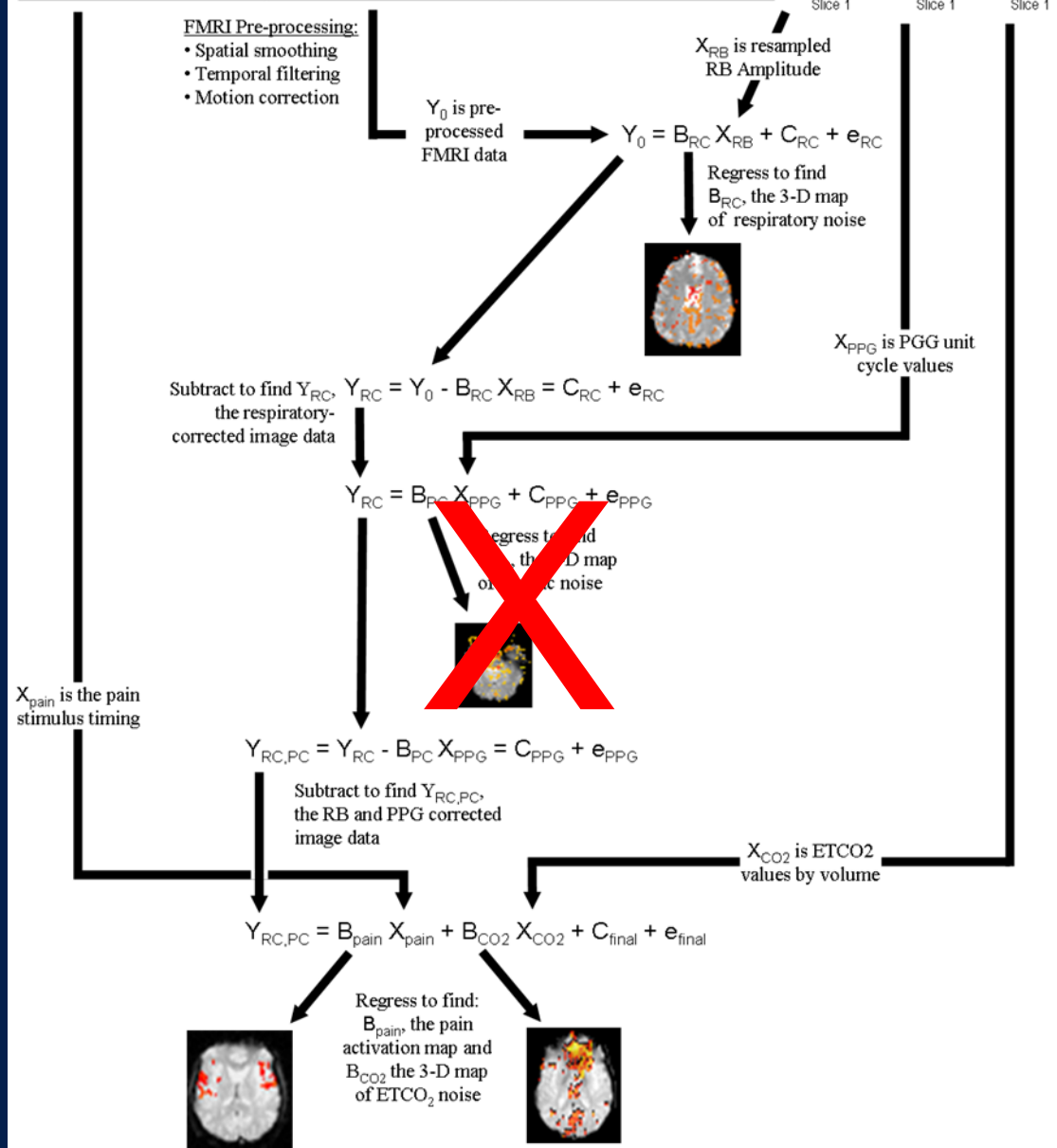
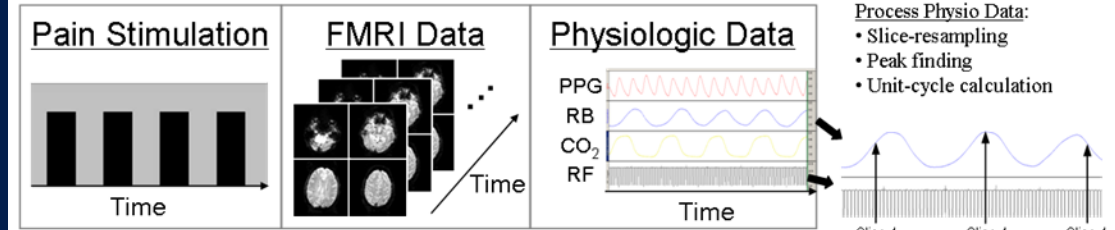
Let's start at the beginning.



Advisors and mentors are integral to PhD training.

- PhD, 2009 Biomedical Engineering
MSTP ■ Dissertation: Optimization of physiologic noise correction in functional magnetic resonance imaging
- MD, 2011





1540

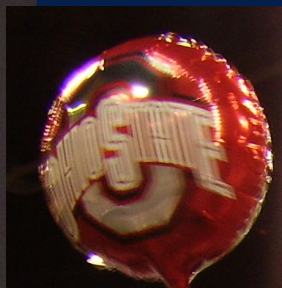


Functional MRI Activation from Painful Stimuli Differs between Right and Left Handed Subjects

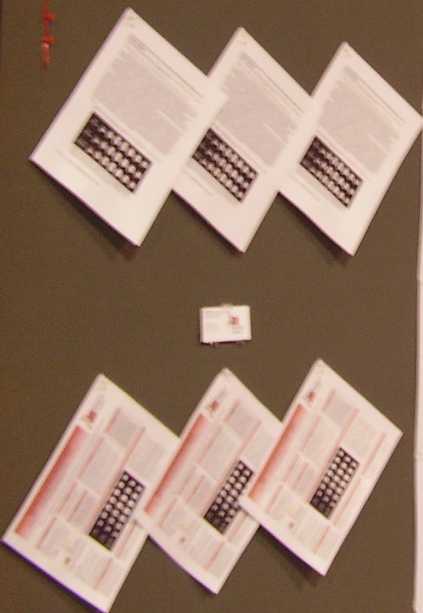
Keith M. Sugi^{1,2}, James W. Broman^{1,2}, Douglas J. Good^{1,2}, Peter Schumacher^{1,2}, Robert H. Small^{1,2,3}
¹Department of Anesthesiology, ²Department of Experimental Anesthesiology, ³Radiology, The Ohio State University, Columbus, Ohio

Functional MRI activation differs in several brain areas for left-handed compared to right-handed subjects receiving repeated painful right-sided electric nerve stimulations.

Background	Purpose	Methods	Abstract
<p>fMRI:</p> <ul style="list-style-type: none"> • MRI signal increase due to increased blood flow to the brain during functional activation. • Activation due to increased blood flow to the brain during functional activation. • Activation due to increased blood flow to the brain during functional activation. 	<p>These results directly compare the differences in the brain activation of right-handed (RH) and left-handed (LH) subjects in a pain fMRI experiment with repeated right hand electric nerve stimulation.</p>	<p>• Eleven (11) healthy adult volunteers underwent whole brain fMRI scanning in this Ohio State University IRB-approved pain fMRI study. The sample consisted of right-handed (2 females) subjects with age range: 20-34 (mean: 26.7 ± 3.8 years) and 4 left-handed (4 females) subjects with age 21-39 (mean: 27.1 ± 4.4 years).</p> <p>• Imaging was performed with a Philips Achieva 3T scanner using a gradient echo, echo planar imaging (EPI) sequence (TE = 30 ms, 90° flip) in which 30 axial slices gave whole brain coverage. These BOLD-weighted images were acquired with temporal resolution of 3 sec and spatial resolution of 3.75 x 3.75 x 4.6 mm.</p> <p>• Electric nerve stimulation was delivered to the digital nerve of the right index finger interfaced with 30 msec periods.</p> <p>• Noisy whole brain volumes acquired in each subject were analyzed for functional activation using FSL 4.1 with a significance level of $p < 0.05$. Preprocessing included correction for gross subject motion, spatial smoothing, and temporal high-pass filtering.</p> <p>• Functional activation maps were calculated using general linear modeling of the stimulus paradigm on the fMRI data.</p>	<p>Abstract</p> <p>Functional MRI (fMRI) activation differs in several brain areas for left-handed compared to right-handed subjects receiving repeated painful right-sided electric nerve stimulations. The purpose of this study was to compare the brain activation of right-handed (RH) and left-handed (LH) subjects in a pain fMRI experiment with repeated right hand electric nerve stimulation. The sample consisted of right-handed (2 females) subjects with age range: 20-34 (mean: 26.7 ± 3.8 years) and 4 left-handed (4 females) subjects with age 21-39 (mean: 27.1 ± 4.4 years). Imaging was performed with a Philips Achieva 3T scanner using a gradient echo, echo planar imaging (EPI) sequence (TE = 30 ms, 90° flip) in which 30 axial slices gave whole brain coverage. These BOLD-weighted images were acquired with temporal resolution of 3 sec and spatial resolution of 3.75 x 3.75 x 4.6 mm. Electric nerve stimulation was delivered to the digital nerve of the right index finger interfaced with 30 msec periods. Noisy whole brain volumes acquired in each subject were analyzed for functional activation using FSL 4.1 with a significance level of $p < 0.05$. Preprocessing included correction for gross subject motion, spatial smoothing, and temporal high-pass filtering. Functional activation maps were calculated using general linear modeling of the stimulus paradigm on the fMRI data.</p>
<p>Significance</p> <p>Significant differences between the fMRI activation maps of right-handed vs. left-handed subjects for a right-sided pain stimulation suggests that averaging the results of subjects with different hand dominance may be invalid.</p>	<p>Results & Discussion</p> <p>RH average</p> <p>LH average</p> <p>LH - RH difference</p> <p>• Painful right-sided electric nerve stimulation resulted in bilateral brain activation, as detected by functional MRI.</p> <p>• Overall, larger clusters and more intense activation was seen in the left-handed group, which were being stimulated on their non-dominant hand.</p> <p>• Insular activation was seen in the right hemisphere in both groups, with a superior and posterior shift in the left-handed group compared to the right-handed group.</p> <p>• Anterior cingulate activation was seen bilaterally in the right-handed group. In the left-handed group, the posterior portion of the cingulate activation was a small cluster of activation in the left hemisphere only.</p> <p>• Activation in the left primary somatosensory cortex was seen in both groups and right somatosensory activation was seen in the right-handed average.</p> <p>• Significantly greater activation was seen in the left-handed group in the following areas: insular, cerebellum, right cerebellar hemisphere, primary somatosensory cortex.</p> <p>• Pain activation from unilateral stimulation may be affected by subject hand dominance in several brain areas.</p>	<p>References</p> <p>1. Significant differences exist in fMRI activation from painful right-sided electric shock between right-handed and left-handed subjects.</p> <p>2. Great sensitivity of functional imaging data from both right and left hand dominant subjects in pain experiments using repeated painful right-sided electric nerve stimulation.</p>	<p>Poster & Author Information</p> <p>Presented at the American Society of Anesthesiologists Annual Meeting, October 2008 in Orlando, Florida.</p> <p>Chairman for this poster: Anesthesiology 7008.100, A1540</p> <p>Presented by: Keith M. Sugi, MD, PhD, Assistant Professor, The Ohio State University</p> <p>Co-presented by: Robert H. Small, MD, PhD, Professor, The Ohio State University</p>



1540



Functional MRI Activation from Painful Stimuli Differs between Right and Left Handed Subjects

Keith M. Sugi^{1,2}, James W. Broman^{1,2}, Douglas J. Good^{1,2}, Peter Schumacher^{1,2}, Robert H. Small^{1,2,3}
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Keith M. Van Meter, M.D., James W. Berman, M.D., Ph.D.
Departments of Anesthesiology and Radiology, The Ohio State University

Functional MRI activation in subjects receiving painful stimuli

Background

fMRI: Functional MRI activation in the brain is a result of increased blood flow to the brain in response to a stimulus. This is the basis of the BOLD (Blood Oxygen Level Dependent) signal. The BOLD signal is a measure of the change in the magnetic susceptibility of the blood due to the presence of deoxyhemoglobin. The BOLD signal is a measure of the change in the magnetic susceptibility of the blood due to the presence of deoxyhemoglobin. The BOLD signal is a measure of the change in the magnetic susceptibility of the blood due to the presence of deoxyhemoglobin.

These results show that the brain activation in response to painful stimuli is different in right-handed and left-handed subjects. This suggests that the brain's response to pain is lateralized in the brain. This is the first time that this has been shown in a large group of subjects. This is the first time that this has been shown in a large group of subjects.

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References

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- MSTP
- PhD, 2009 Biomedical Engineering
 - Dissertation: Optimization of physiologic noise correction in functional magnetic resonance imaging
 - MD, 2011



- Anesthesiology Residency, 2015



- Postdoctoral (T32) Research Fellowship, 2017






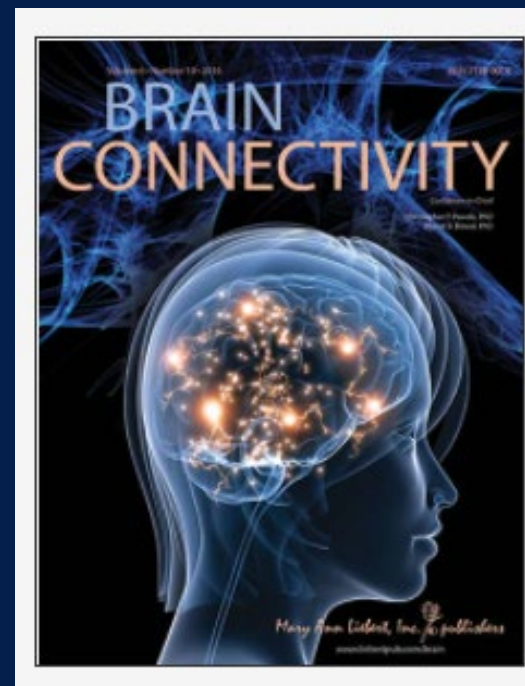
One of my most impactful research mentors was a peer & friend.

- Jim Ibinson, MD, PhD
- OSU MSTP, 2006
- UPMC Anesthesiology residency, 2010
- Pitt T32, 2012



Optimizing and Interpreting Insular Functional Connectivity Maps Obtained During Acute Experimental Pain: The Effects of Global Signal and Task Paradigm Regression

James W. Ibinson , Keith M. Vogt, Kevin B. Taylor, Shiv B. Dua, Christopher J. Becker, Marco Loggia, and Ajay D. Wasan



Human Posterior Insula Functional Connectivity Differs Between Electrical Pain and the Resting State

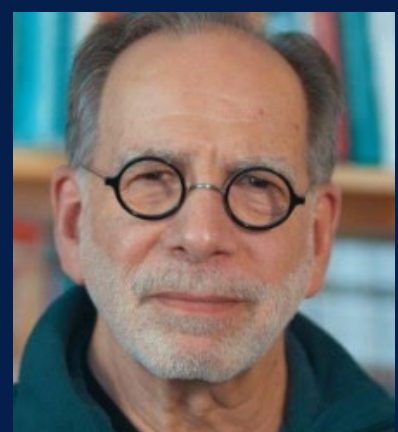
Keith M. Vogt, Christopher J. Becker, Ajay D. Wasan, and James W. Ibinson 

Published Online: 1 Dec 2016 | <https://doi.org/10.1089/brain.2016.0436>



Why am I not a primary pain researcher?

Mentorship



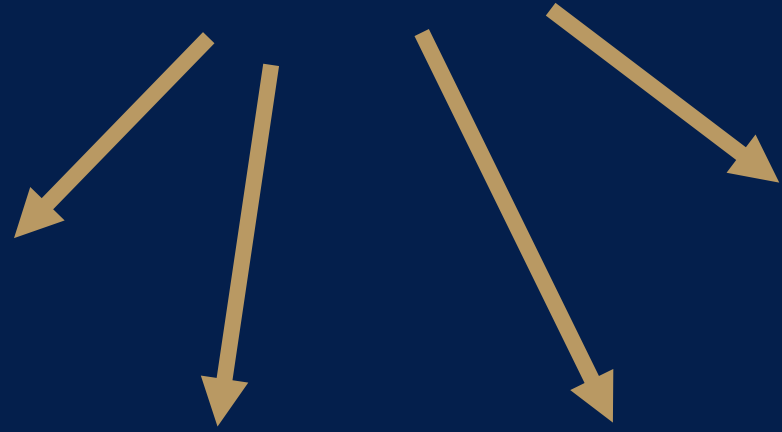
cn
up

Center for
Neuroscience

UNIVERSITY OF PITTSBURGH



BRAIN INSTITUTE





T32 Mentoring team




Julie Fiez, PhD

Lynne Reder, PhD

 University of Pittsburgh
Department of Psychology

**Carnegie
Mellon
University**


100 1915-2015
PSYCHOLOGY



T32 Mentoring team



Julie Fiez, PhD

- Research: learning (reading)
- Exclusively uses fMRI
- Record of NIH funding, and current R21

Lynne Reder, PhD

- Research: human memory
- Mostly did behavioral studies and computational/modeling work
- Used midazolam previously
- No funding (no interest)
- Retirement in ~5 years

ARTICLE

Effect of propofol on the medial temporal lobe emotional memory system: a functional magnetic resonance imaging study in human subjects

K. O. Pryor^{1,2,*}, J. C. Root^{1,2}, M. Mehta², E. Stern³, H. Pan³, R. A. Veselis²
and D. A. Silbersweig³

¹Department of Anesthesiology, Weill Cornell Medical College, 1300 York Avenue, New York, NY 10065, USA,

²Department of Anesthesia and Critical Care, Memorial Sloan Kettering Cancer Center, 1275 York Avenue,

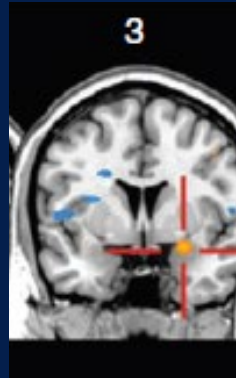
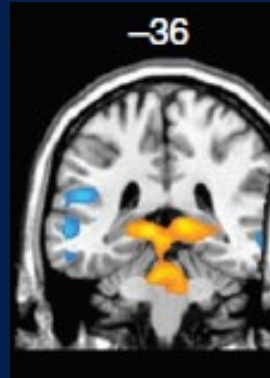
New York, NY 10065, USA, and ³Functional Neuroimaging Laboratory, Brigham and Women's Hospital, Harvard Medical School, 824 Boylston Street, Chestnut Hill, MA 02467, USA

Propofol may exhibit selectivity for inhibition of memory structures.

Hippocampus

Amygdala

Placebo





The amygdala plays important neuropsychiatric roles.

Amygdala activity:

- Is involved in fear conditioning
- Can occur after noxious stimuli
- Is correlated with anxiety & PTSD

Nat Rev Neurosci. 2015;16: 317-31

Prog Neuropsychopharmacol Biol Psychiatry. 2018; 87: 193-9.

Behavioural Brain Research. 2018; 223: 403-410.

... is under-explored under anesthesia

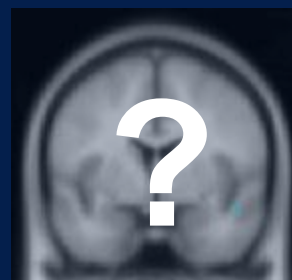
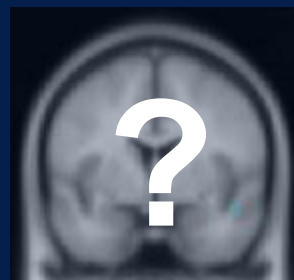


I created an experimental paradigm for medial temporal lobe modulation.

Hippocampus

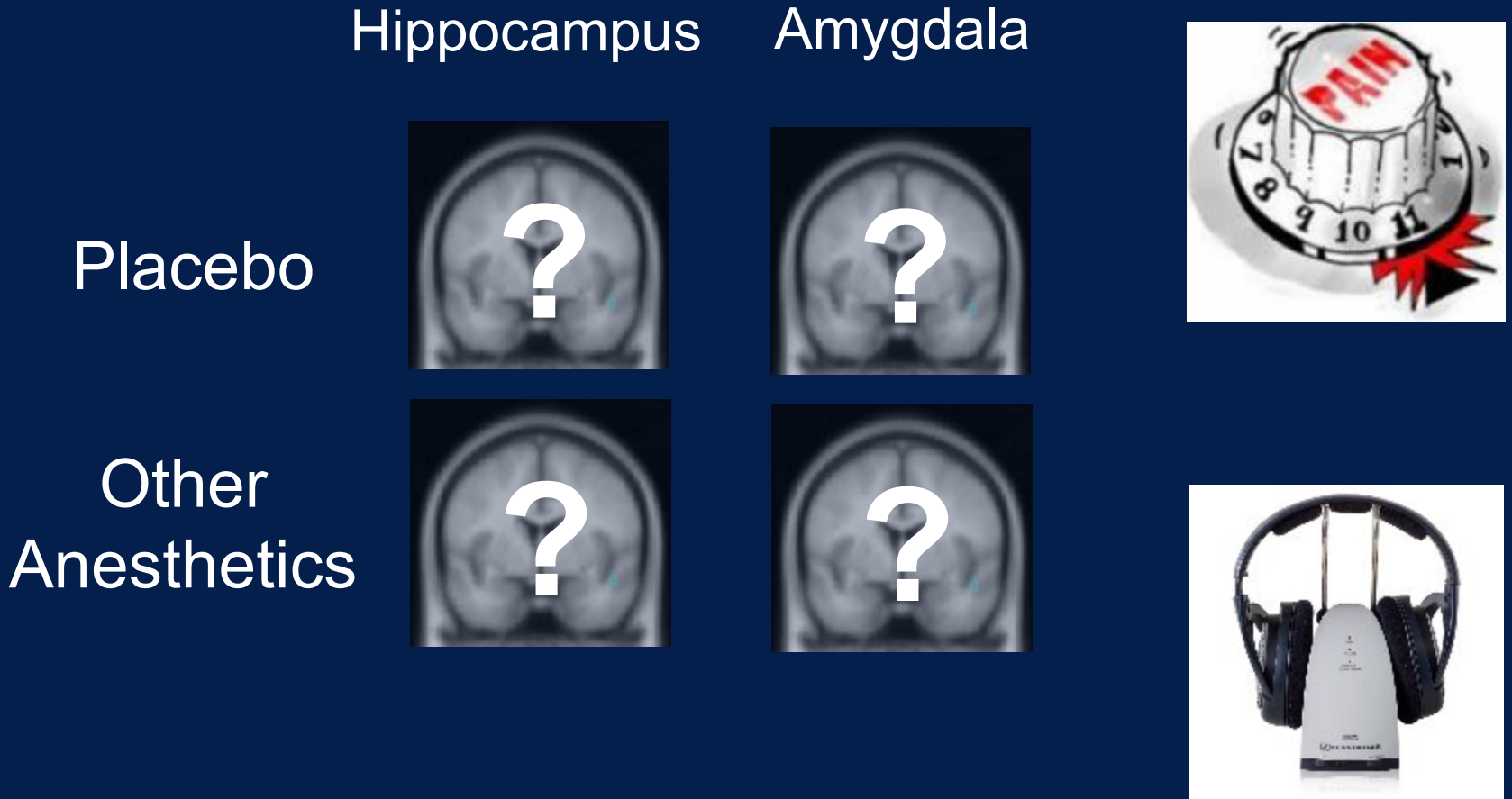
Amygdala

Placebo




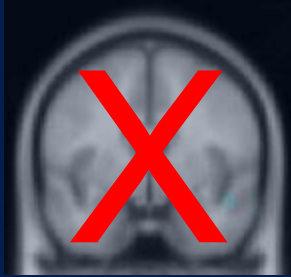


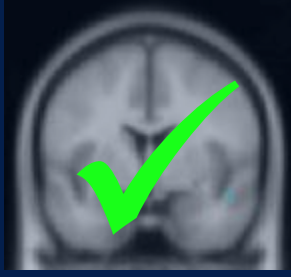
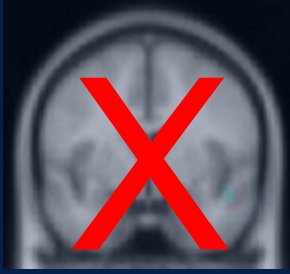




I created an experimental paradigm for medial temporal lobe modulation under clinically-relevant conditions.



Predicted effects for midazolam and ketamine suggested a double-dissociation.

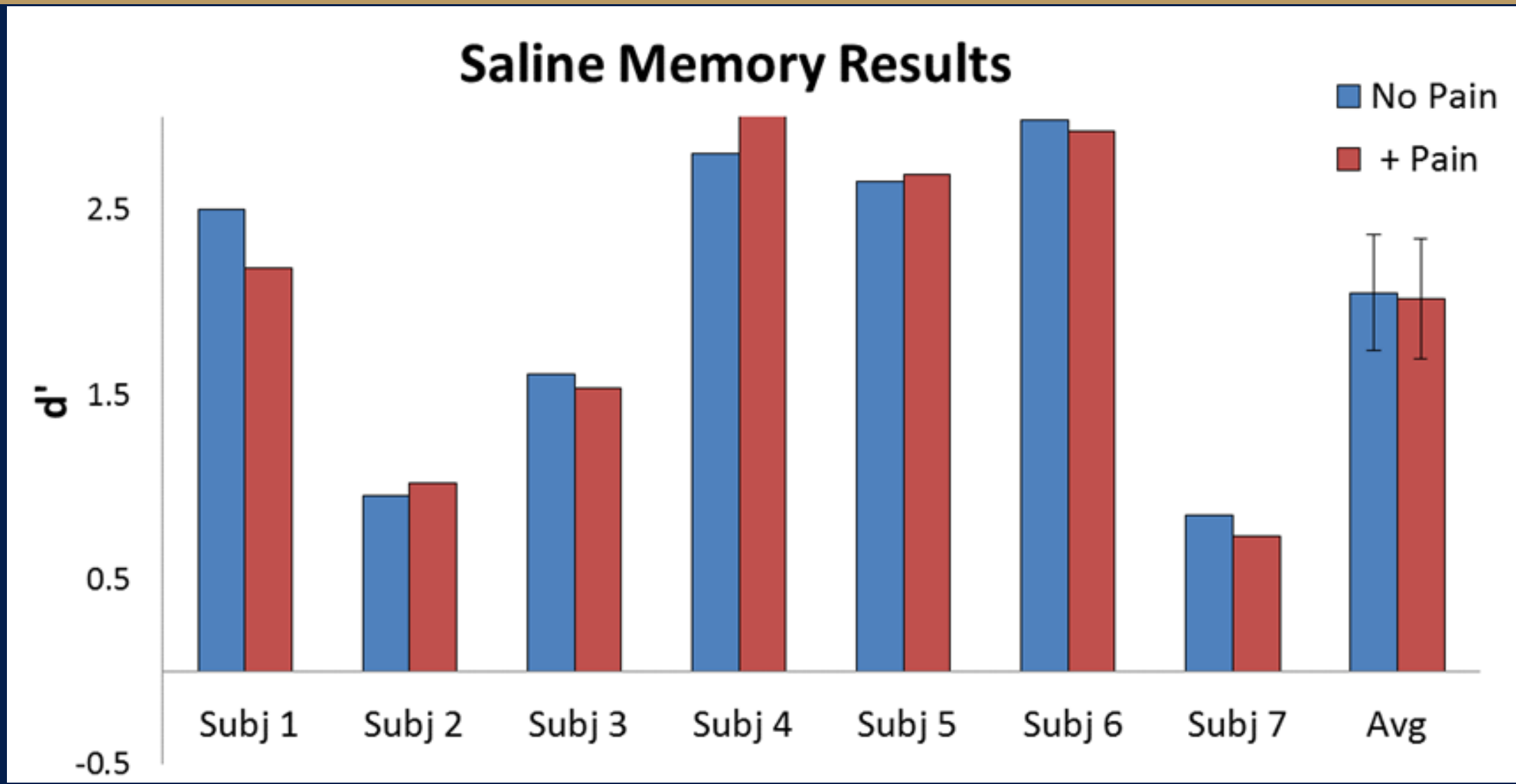
	Hippocampus	Amygdala	
No Drug			
Midazolam			
Ketamine			



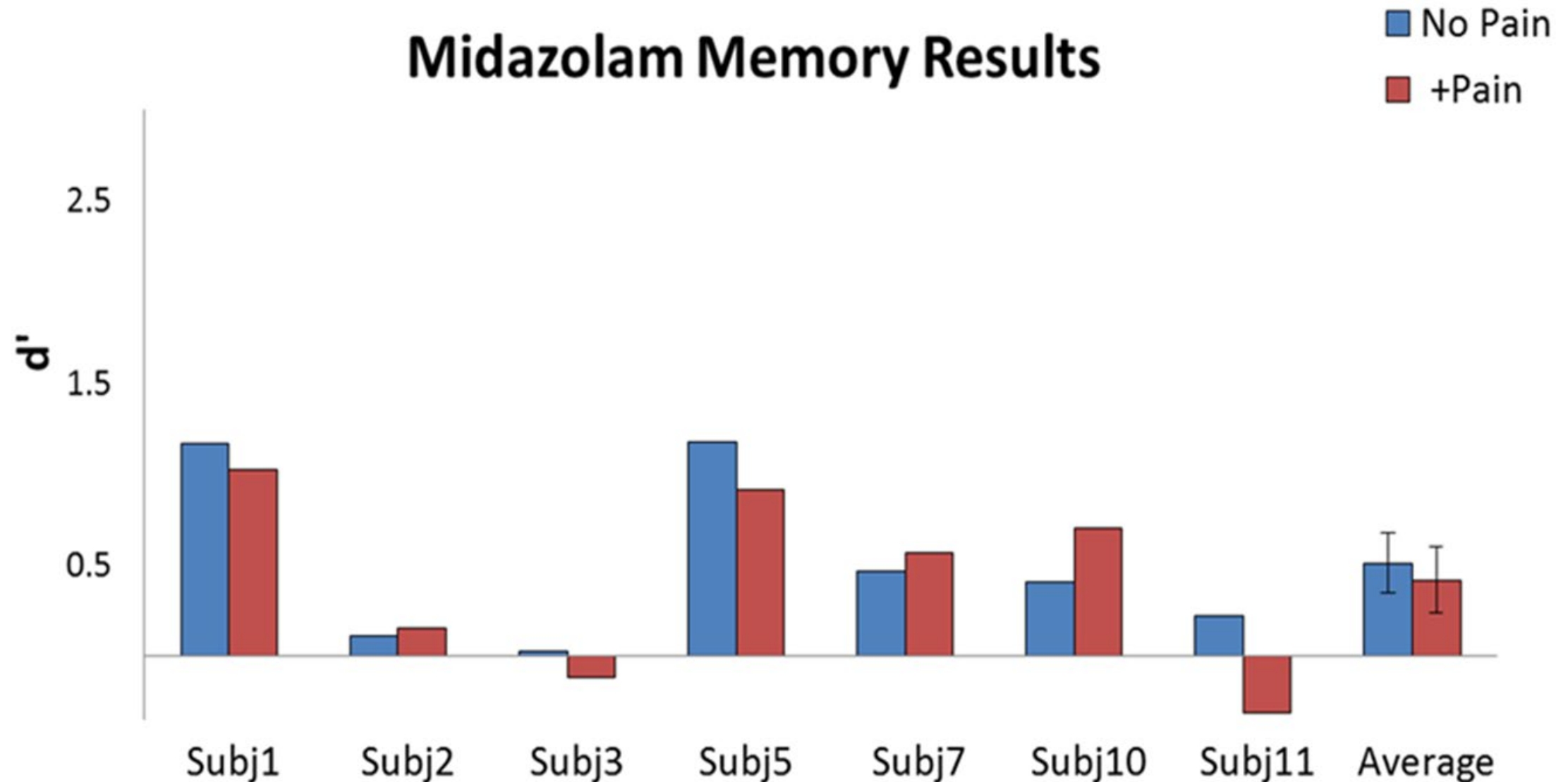
I had many outcome measures.

- Explicit memory: words identified by memory testing
- Implicit memory:
 - Response time differences
 - Heart-rate increases
 - Electrodermal activity
- Brain activity:
 - Event-related functional MRI
 - Functional Connectivity

Pain seemed to have no effect on explicit memory under saline



Memory under midazolam was highly variable.





Ironically, these results were counter to previous seed grant reviewer feedback.

“The idea that acute pain will positively influence recall is entirely predictable and **probably** extensively shown in the literature. No novelties there.”

Feedback on my second departmental seed grant was very critical.

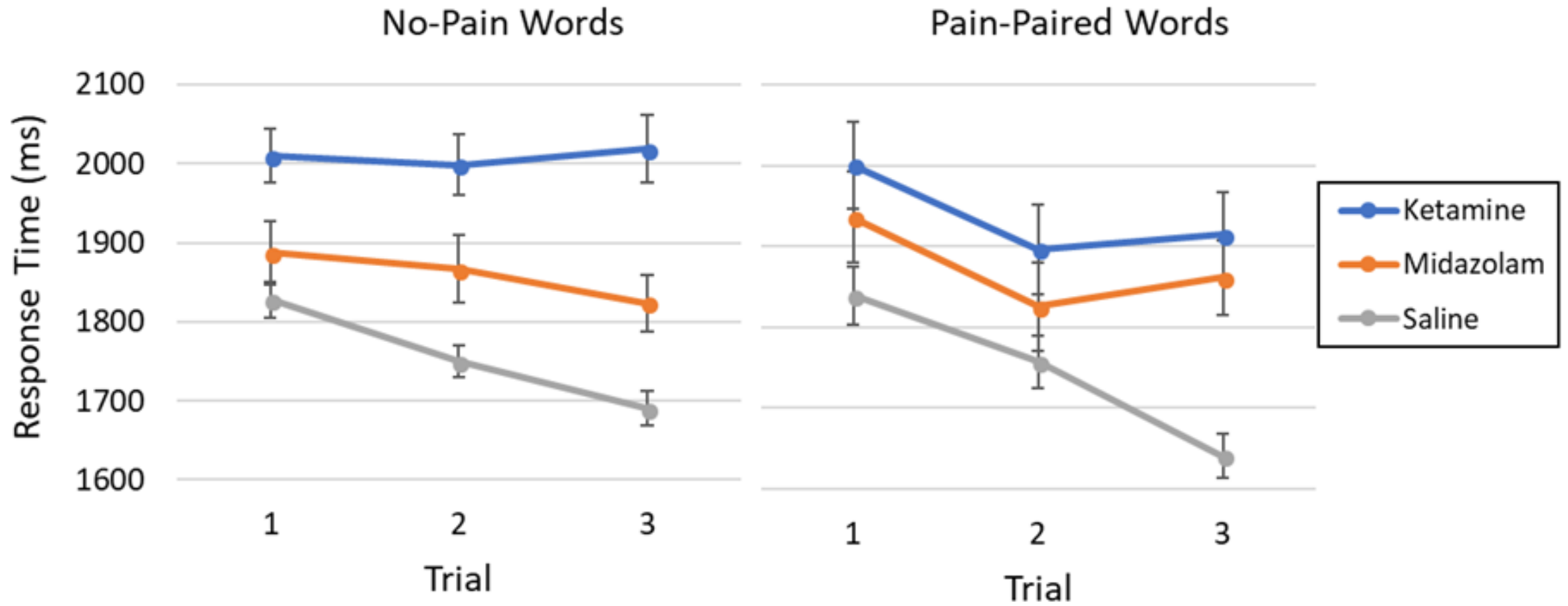
- ...the design appears muddled with too many variables (+/- pain, saline, midaz), with preliminary results already pointing to variability that appears to be independent of the variables manipulated.
- Fold in the use of fMRI to detect the neural correlates of memory formation, and it is not clear how anything meaningful can be generated from this study without a very large number of subjects.



I also had exploratory outcome measures.

- Explicit memory: words identified by memory testing
- Implicit memory:
 - Response time differences
 - Heart-rate increases
 - Electrodermal activity
- Brain activity:
 - Event-related functional MRI
 - Functional Connectivity

Response Time Data



I also had exploratory outcome measures.

- Explicit memory: words identified by memory testing
- Implicit memory:
 - Response time differences
 - Heart-rate increases
 - Electrodermal activity } Sympathetic response ... (during next-day testing)
- Brain activity:
 - Event-related functional MRI
 - Functional Connectivity

Early electrodermal activity data was promising for a learned conditioned response.





From: Vogt, Keith (MD) <kvogtkm@ummc.edu>
 Sent: Tuesday, August 13, 2019 4:48 PM
 To: Mauricio Delgado <delgado@psychology.rutgers.edu>
 Cc: Julie Fiez <fiez@nitl.edu>; Paola, Samantha <scolasj@ummc.edu>
 Subject: Re: ** Conditioning experiment

Mauricio,

Thank you for your thoughts and detailed + prompt response. It would be wonder time. I hope you are enjoying your summer travel.

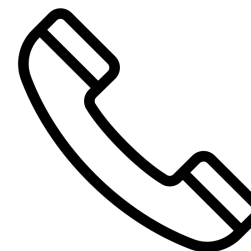
To respond to your comments below with some notes thoughts.

1- We did a habituation to the US, while titrating the nerve stimulator intensity; and ~7/10 even when experienced for 1 sec. We did not do a habituation (prelim expo: you're asking. In fact, we use a third mid-frequency tone for a volume check at the used subsequently). Perhaps this gets to two issues:

- a- Subjects may be getting too threatening/aversive of a US?
- b- They might not get the chance to discriminate the CS+ and CS- tones in a non add, before starting the US titration habituation I described?

2- Yes, subjects seem to show a SCR to the initial shocks in the US habituation phase: water, then let dry, then apply the BioPac EDA electrode gel. That was the main problem: subjects having a less robust EDA response is easy to implement by limiting to suit.

3- The CS tones are 2650ms long. The files are attached, so you can listen to them with, I was trying to make them more distinct than a single-frequency tone. When CS+ ends, the ITI is 8 seconds, with 0 to 2 seconds of jitter added in (may be unclear).



Of course, I also planned to do functional MRI.

- Explicit memory: words identified by memory testing
- Implicit memory:
 - Response time differences
 - Heart-rate increases
 - Electrodermal activity
- Brain activity:
 - Event-related functional MRI
 - Functional Connectivity

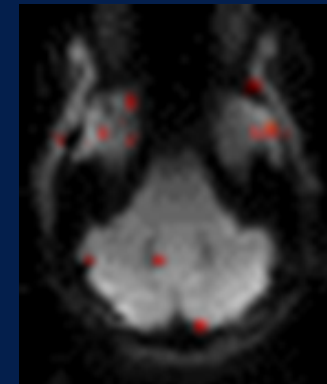


Fig 3.
Preliminary
fMRI
contrast for
remembered
vs. forgotten
words.

Human memory encoding under anesthesia: how pain affects hippocampal and amygdalar contributions to memory

Randomized within-subject, saline-controlled, crossover trial, midazolam vs. ketamine

FAER 
Foundation for Anesthesia
Education and Research



UPMC LIFE
CHANGING
MEDICINE

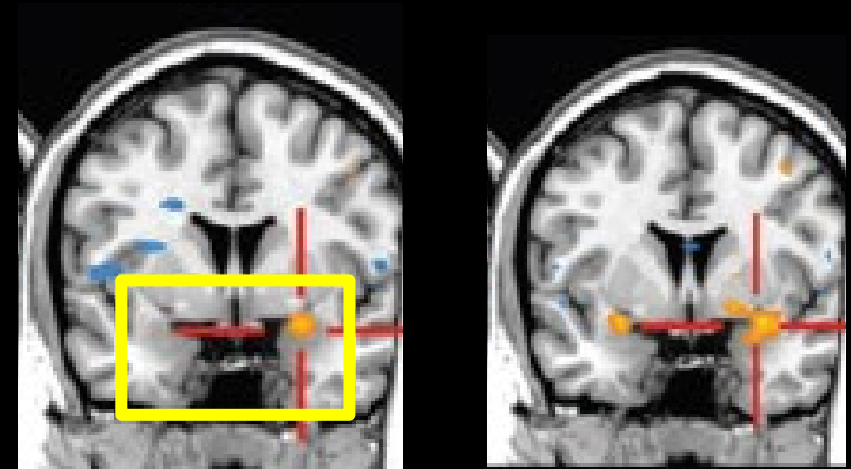
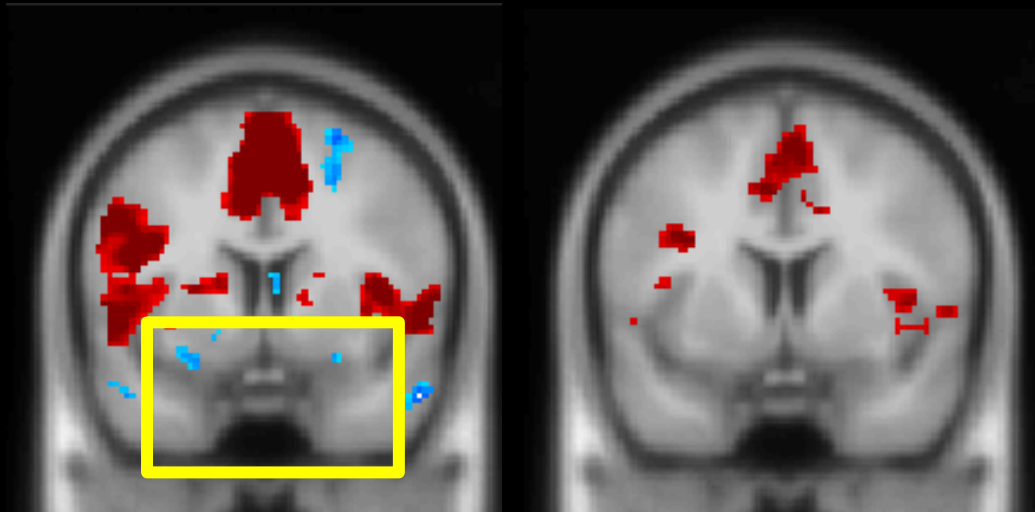
My initial imaging results didn't have robust hippocampal or amygdalar activation.

Saline

Midazolam

Saline

Propofol



Vogt, Unpublished data, 2019

Pryor, et al., Br J Anaesth. 2015;115 Suppl 1:i104

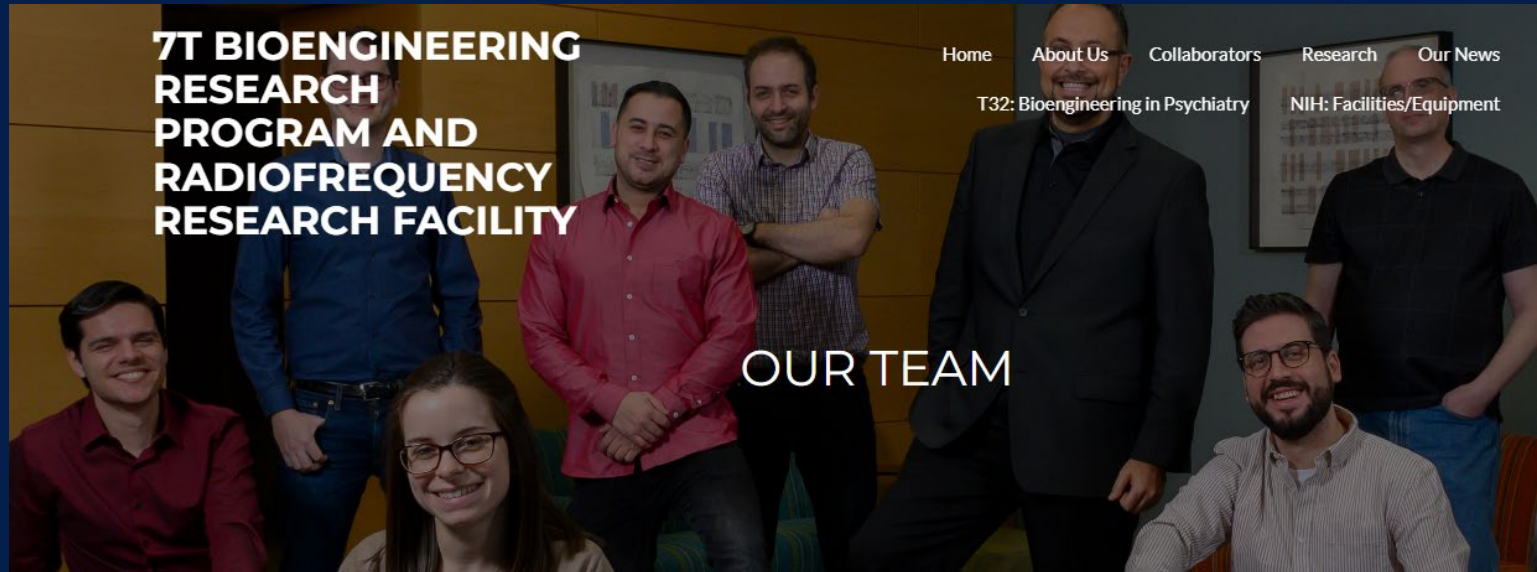
Realization: fMRI analysis techniques had developed significantly since my PhD.

- Accepted practices widely differed for:
 - Physiologic noise correction
 - Thresholding to correct for multiple comparisons
- Complicated experimental designs require many small, important decisions (assumptions) in analysis.
- Departmental statisticians are no help



Time for another mentor?

- Howard Aizenstein, MD, PhD (CompSci)
- Research: age-related cognitive and affective neuroscience
- Expert in cutting-edge & complex fMRI analysis techniques
- Many bioengineering students, postdocs, and collaborators

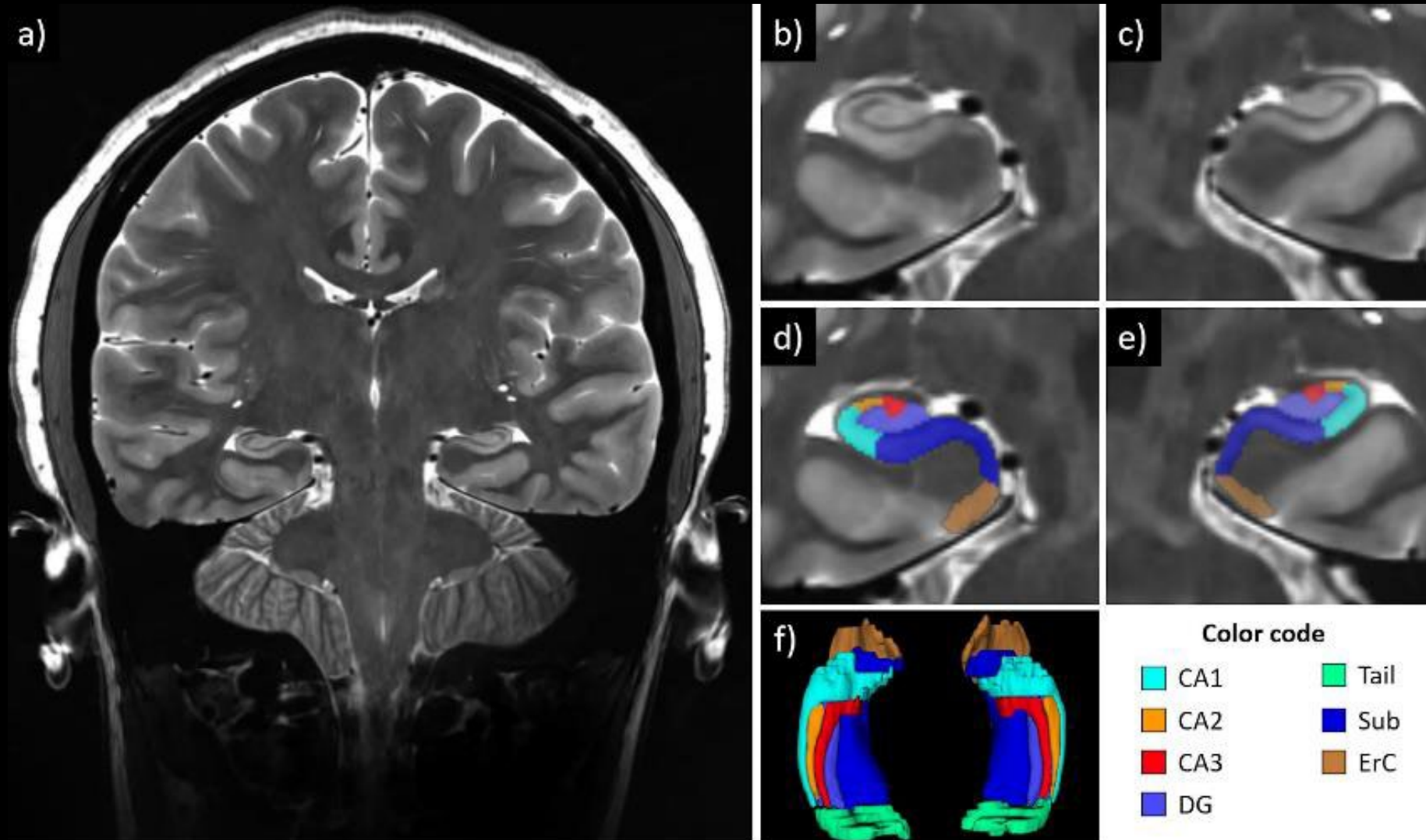


Collaboration with bioengineering has resulted in significant data acquisition enhancements.





Collaboration with bioengineering has resulted in significant data acquisition enhancements.



I did some of my own
networking too.



UPMC LIFE
CHANGING
MEDICINE



Networking at meetings can pay off.



ARTICLE

Effect of propofol on the medial temporal lobe emotional memory system: a functional magnetic resonance imaging study in human subjects

K. O. Pryor^{1,2,*}, J. C. Root^{1,2}, M. Mehta², E. Stern³, H. Pan³, R. A. Veselis²
and D. A. Silbersweig³

¹Department of Anesthesiology, Weill Cornell Medical College, 1300 York Avenue, New York, NY 10065, USA,

²Department of Anesthesia and Critical Care, Memorial Sloan Kettering Cancer Center, 1275 York Avenue,



Networking at meetings can pay off.





I got to meet a fellow anesthetic fMRI researcher.

 **Weill Cornell Medicine**
Anesthesiology



Kane Pryor, M.B.B.S.

Vice Chair for Academic Affairs
Director of Clinical Research
Director of Education
Associate Professor of
Associate Professor of

 Memorial Sloan Kettering Cancer Center

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Find a Doctor

Robert A. Veselis, MD

Neuroanesthesiologist

Titles
Vice Chair for Research, Department of Anesthesiology & Critical Care Medicine

Clinical Expertise
Critical Care Medicine; Neuroanesthesiology

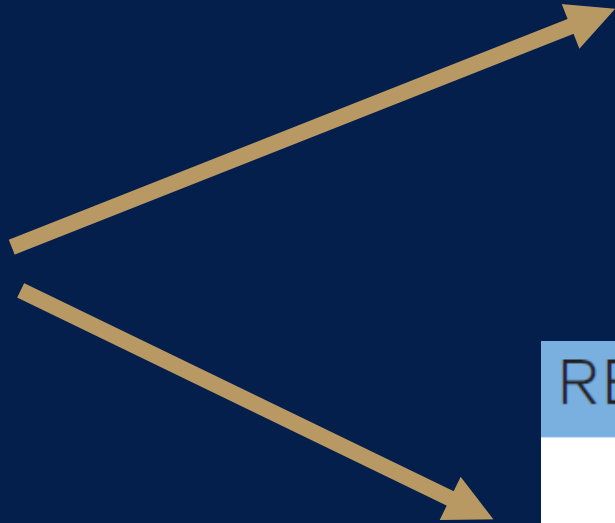




Our periodic discussions have helped clarify many specific experimental decision points.



Meeting one person opened many doors.



REVIEW

Curr Opin Anesthesiol 2022, 35:593–599



Anesthesia and the neurobiology of fear and posttraumatic stress disorder

Keith M. Vogt^{a,b,c,d} and Kane O. Pryor^e

NIH “summary statement” communicates (sometimes harsh) feedback.

SUMMARY STATEMENT

PROGRAM CONTACT:
Alison Cole
(301) 594-3827
colea@nigms.nih.gov

(Privileged Communication)

Release Date: 10/22/2018
Revised Date:

Application Number: 1 K23 GM132755-01

Principal Investigator

VOGT, KEITH MICHAEL

Applicant Organization: **UNIVERSITY OF PITTSBURGH AT PITTSBURGH**

Review Group: **SAT**
Surgery, Anesthesiology and Trauma Study Section

Meeting Date: 09/26/2018
Council: JAN 2019
Requested Start: 07/01/2019

RFA/PA: PA18-374
PCC: T2KAAC

 NIH “summary statement” communicates (sometimes harsh) feedback.

- ...“application does not demonstrate adequate understanding of the pharmacology of (anesthetics) ...
and there is no mentoring or didactic plan to achieve this” ...
- “Given the central nature of neuropharmacology to the career goals, inclusion of a mentor with expertise in this area” ...

There were no Pitt pharmacology faculty that would be a good fit as a mentor.

University of Pittsburgh
Pharmacology AND Chemical Biology

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[Home](#) > [Directory](#) > [Primary Faculty](#)

Primary Faculty



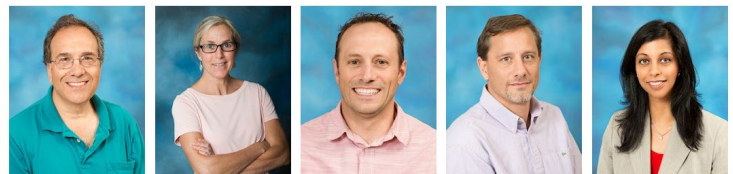
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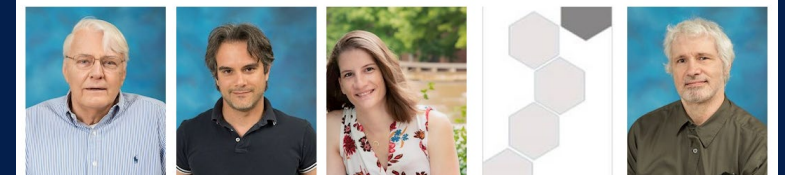
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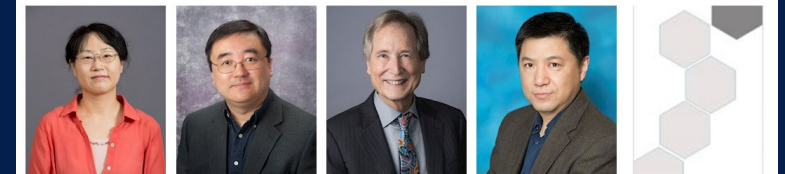
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 Call the NIH program officer.

- Alison Cole, PhD
- She advised me to find the best pharmacology mentor, even if not at U. Pitt.





WELCOME TO THE
**FRIENDS OF
FAER
BREAKFAST**
SATURDAY, OCTOBER 13
7:00 AM - 8:30 AM
Golden Gate Room



FAER
*Foundation for Assistance
Education and Research*



Steve Shafer, MD

- Professor @ Stanford University
- Research: Anesthetic pharmacology





This guy agreed to be my mentor.

Steve Shafer, MD

- Professor @ Stanford University
- Research: Anesthetic pharmacology
- Author, STANPUMP target-controlled infusion software
<http://opentci.org/code/stanpump>





DOSBox 0.74-2, Cpu speed: 3000 cycles, Fram...



Computer Controlled Infusion Pump. Revision: 12/18/99

SIMULATION

Drug: propofol Parameters: Schnider - no opioids

Current time: Day: 01 Time: 12:20:09

Elapsed time: 0 minutes 15 seconds

STANPUMP
running in MS-
DOS emulator

Location	Units	Predicted	Target
Plasma	ug/ml	3.34	
Effect Site	ug/ml	0.10	0.75

Total infused: 15.521 mg 0.222 mg/kg

Total infused: 1.552 mls

Pump rate: 0.000 ml/hr, 0.00 (ugs/kg/min)

Effect site level of 0.50 expected in 0.0 minutes

----- Functions -----

- F1: raise or lower the propofol level
- F2: change look-ahead concentration.
- F5: simulate as fast as possible.
- F6: select constant rate mode.
- F8: target the plasma concentration.
- F10: terminate infusion at end of study.

Pump status: OK

StanpumpR is an updated & enhanced pharmacokinetic modeling tool.

stanpumpR

Patient Covariates

Age

23.5

years months

Weight

63.6

kg lb

Height

163

cms inches

Sex

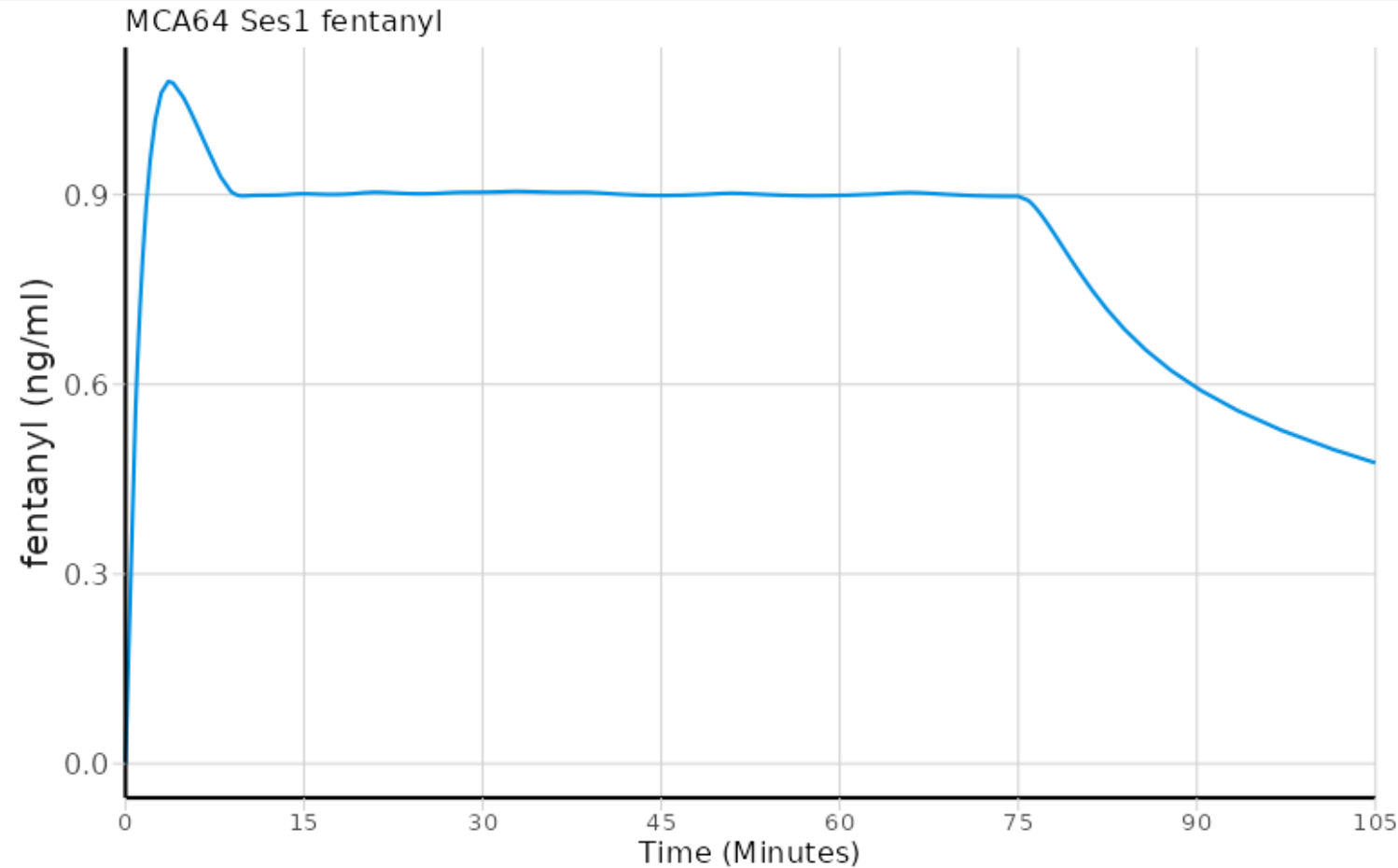
Male Female

Drug	Time	Dose	Units
fentanyl	0	46	mcg
fentanyl	4	1.4	mcg/kg/hr
fentanyl	8	2.8	mcg/kg/hr
fentanyl	10	2.1	mcg/kg/hr
fentanyl	14	1.9	mcg/kg/hr
fentanyl	20	1.7	mcg/kg/hr
fentanyl	27	1.6	mcg/kg/hr
fentanyl	32	1.5	mcg/kg/hr
fentanyl	38	1.4	mcg/kg/hr
fentanyl	50	1.3	mcg/kg/hr
fentanyl	65	1.2	mcg/kg/hr
fentanyl	75	0	mcg/kg/hr

Dose Table



Reference Time

none



Feedback on my K23 grant resubmission included

“The candidate responded well to critiques by including pharmacology training plan and including an expert in anesthetic pharmacology as a co-mentor.”

	Notice of Award		
	<i>MENTORED PATIENT-ORIENTED RESEARCH</i> Department of Health and Human Services National Institutes of Health	Federal Award Date: 09/11/2019	
NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES			
Grant Number: 1K23GM132755-01A1			
FAIN: K23GM132755			
Principal Investigator(s): Keith Michael Vogt, MD			
Project Title: Anesthetic modulation of human memory during acute pain			

Neuroimaging to identify the neural correlates of anesthetic and analgesic action in humans

Project Number

1R35GM146822-01

Contact PI/Project Leader

VOGT, KEITH MICHAEL

Awardee Organization

UNIVERSITY OF PITTSBURGH AT
PITTSBURGH



Details



Contact PI/ Project Leader

Name

VOGT, KEITH MICHAEL [↗](#)

Title

ASSISTANT PROFESSOR, PHYSICIAN

Contact

[View Email](#)

Other PIs

Not Applicable

Program Official

Name

JUSTINOVA, ZUZANA

Contact

[View Email](#)

Organization

Name

**UNIVERSITY OF PITTSBURGH AT
PITTSBURGH**

City

PITTSBURGH

Department Type

ANESTHESIOLOGY

Organization Type

SCHOOLS OF MEDICINE

State Code

PA

Congressional District

18



UPMC | University of Pittsburgh
Medical Center

*Department of Anesthesiology &
Perioperative Medicine*

A-1305 Scaife Hall
3550 Terrace Street
Pittsburgh, PA 15261

September 20, 2021

It is with great enthusiasm that I am writing to support the NIGMS R35 MIRA application with PI Keith M. Vogt, MD, PhD. Keith is an exceptional early-stage investigator in my department here in the

Sincerely,

Aman Mahajan, MD, PhD, MBA
Professor; Peter and Eva Safar Chair
Department of Anesthesiology & Perioperative Medicine
University of Pittsburgh School of Medicine



UPM | University of Pittsburgh
 Departn
 Per  University of
 Pittsburgh

A-1305 Scaife Hall

Kenneth P. Dietrich School of Arts and Sciences

Department of Psychology

September 23, 2021

Dear Special Emphasis Panel Members,

I am writing to convey the greatest possible enthusiasm for the R35 ESI MIRA application, "Behavioral and neural correlates of anesthetic and analgesic action in humans", with PI and early-stage investigator Keith Vogt, MD, PhD. In summary, this application describes a highly significant research program that is poised to overcome a critical barrier to progress in the area of how anesthetic pharmacology affects brain function using a rigorous systems-neuroscience approach.

Julie A. Fiez
 Professor and Chair, Department of Psychology
 Professor, Department of Neuroscience
 Professor, Department of Communication Sciences & Disorders
 Senior Scientist, Learning Research & Development Center
 University of Pittsburgh,

Julie Fiez, Ph.D.

Office of the Chair
 3129 Sennot Square
 Pittsburgh, PA, 15271
 412-624-4501; fiez@pitt.edu

September 20, 2021

It is with great enthusiasm that I
 M. Vogt, MD, PhD. Keith is an
 Sincerely,

Aman Mahajan, MD, PhD, MBA
 Professor; Peter and Eva Safar C
 Department of Anesthesiology &
 University of Pittsburgh School



UPMC | University of Pittsburgh

Department of Psychiatry



University of Pittsburgh



University of Pittsburgh School of Medicine

Department of Psychiatry

Howard J. Aizenstein, M.D., Ph.D.
3501 Forbes Avenue
Oxford Building, Room 520.09.
Pittsburgh PA 15213
412-246-5464
aizensteinhj@upmc.edu

Kenneth P. Dietrich School of Arts and Sciences

Department of Psychology

September 17, 2021

September 23, 2021

Dear Review Group Members,

Dear Special Emphasis

Sincerely,

I am writing to convey the results of a study on the neural correlates of anxiety. This study was conducted by M. Vogt, MD, PhD. In summary, the study found that anxiety is associated with increased activity in the amygdala. This finding is important because it provides a biological basis for anxiety and may help to identify new treatments for anxiety disorders. The study was conducted using a rigorous system of data collection and analysis.

Howard J. Aizenstein MD, PhD
Charles F. Reynolds III and Ellen G. Detlefsen Endowed Chair of Geriatric Psychiatry
Professor of Psychiatry, Bioengineering, and Clinical and Translational Sciences
School of Medicine, University of Pittsburgh

Julie A. Fiez
Professor and Chair, Department of Psychology
Professor, Department of Neuroscience
Professor, Department of Communication Sciences & Disorders
Senior Scientist, Learning Research & Development Center
University of Pittsburgh,

September 20, 2021

It is with great enthusiasm that I welcome you to the University of Pittsburgh. M. Vogt, MD, PhD. Keith is an excellent researcher and a pleasure to work with. Sincerely,

Aman Mahajan, MD, PhD, MBA
Professor; Peter and Eva Safar Center for Health Equity Research
Department of Anesthesiology & Critical Care Medicine
University of Pittsburgh School of Medicine



University of
Pittsburgh



University of Pittsburgh School of Medicine

ard J. Aizenstein, M.D., Ph.D.
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xford Building, Room 520.09.
Pittsburgh PA 15213
412-246-5464
aizensteinhj@upmc.edu

September 21, 2021

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Swanson School of Engineering

306 Center for Bioengineering
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412-383-9713
Fax: 412-383-8788
www.engineering.pitt.edu/bioengineering

Dear Keith,

It is with
M. Vogt
Sincerely

I am happy to continue our ongoing collaboration and fully support your application to the R35 ESI MIRA program (PAR 20-117). We have been working closely for the past 2 years, in adapting and running your anesthetic drug functional MRI protocol on the 7 Tesla MRI scanner here at the University of Pittsburgh. I am committed to continue this support and assist with your projects throughout the grant years, including the series of proposed neuroimaging experiments.

Aman M
Professor:
Departm
Universi

atry

Tamer S. Ibrahim, PhD
Professor: Bioengineering, and Psychiatry
Director:
7 Tesla Bioengineering Research Program (7TBRP)



University of
Pittsburgh



University of Pittsburgh School of Medicine

ard J. Aizenstein, M.D., Ph.D.



STANFORD
SCHOOL OF MEDICINE

Stanford University Medical Center

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PHONE: (650) 725-5837

PAGER: (415) 607-1117

MOBILE: (650) 704-0558

E-MAIL: STEVEN.SHAFER@STANFORD.EDU

STEVEN L. SHAFER, MD
EMERITUS PROFESSOR OF ANESTHESIOLOGY,
PERIOPERATIVE AND PAIN MEDICINE

September 20, 2021

Dear NIH Study Section Members,

Sincerely,

September 21, 2021

Dear Keith,

I am happy to continue
application to the R35 E:

Sincerely,

Tamer S. Ibrahim, PhD

Professor: Bioengineering Emeritus Professor of Anesthesiology, Perioperative and Pain Medicine, Stanford University

Director:

7 Tesla Bioengineering Research Program (7TBRP)

Aman M
Professor
Department
University

It is with
M. Vogt
Sincerely

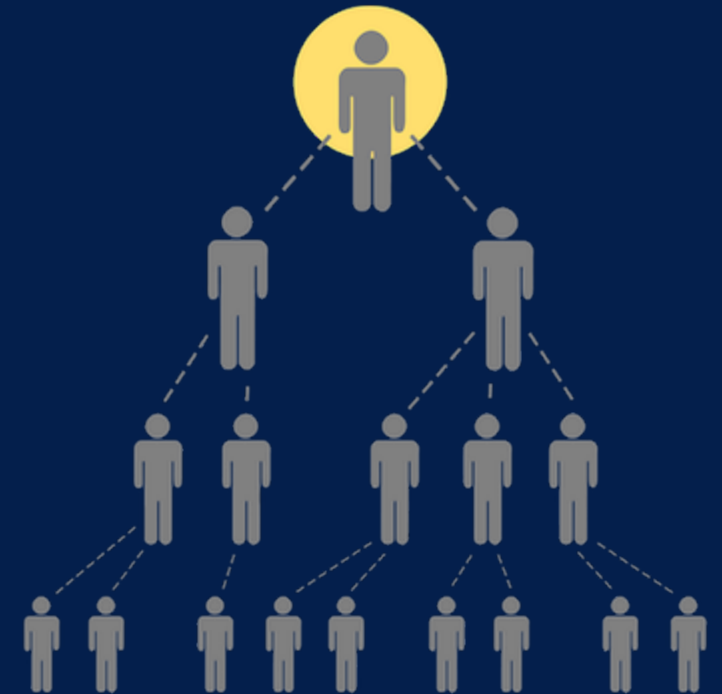


But that's not all.



 Mentors and collaborators are **THE** key to research success.

- Expand contextualization of prior work
- Refine experimental designs
- Leverage network of contacts for additional help



Finding mentorship and collaboration is not easy.

- It takes time to develop this network
- Not all interactions result in meaningful help
- Many (of your own) ideas/approaches are bad

Take home point:

Even the best-trained and/or most-experienced investigators should maximize input from mentors and collaborators to ensure research success!