

Curriculum Vitae

Sara E. Berger, Ph.D.

Neuroscientist and Tech Ethics Enthusiast

Email: sara.e.berger@ibm.com

Linkedin [profile](#)

MIT Tech Review's 35 Innovators Under 35 for 2021 – [Visionary](#)

CURRENT RESEARCH AND INTERESTS

1. Researching ethical, legal, and social issues pertaining to the study of pain, neuroscience, biotechnologies, and other emerging and existing technologies (e.g., quantum computing, web3, digital health, machine learning, natural language processing and voice tech, etc);
2. Creating frameworks, methods, and tools for tech workers to become aware of historical and present sociotechnical implications, proactively mitigate ethical issues, and center or re-center meaningful and beneficial societal impact in their projects or products.

PRIOR AREAS OF SPECIALIZATION

Measuring & predicting pain and treatment-induced analgesia; Wearable and sensor-based technologies; Neuroimaging and quantitative sensory testing; Cognitive changes during pain chronification; Intersections of critical disability theory with neurological differences and chronic illnesses; Clinical research coordination and clinical trial design; Quantitative AI-based language analyses; Qualitative grounded theory-based language analyses

WORK EXPERIENCE

- 2021-Present **Research Staff Scientist (RSS) in Exploratory Sciences**
IBM T.J. Watson Research Center
Yorktown Heights, NY 10598
Manager: Dr. Stacy Hobson (Responsible and Inclusive Technology Team)
Team Lead: Core Frameworks, Methods, and Tools
- 2018-2021 **Research Staff Member (RSM) in Healthcare and Life Sciences**
IBM T.J. Watson Research Center
Yorktown Heights, NY 10598
Managers: Dr. Guillermo Cecchi (Psych-E Lab), Jeff Rogers (IoT+ Digital Health)
Primary Client: Boston Scientific; 5 academic collaborations
- 2016-2018 **Post-Doctoral Fellow**
IBM T.J. Watson Research Center
Yorktown Heights, NY 10598
Healthcare and Life Sciences Department

ADDITIONAL PROFESSIONAL ROLES

- 2022-present **Institute of Neuroethics (IoNX)**
Advisory Board Member
- 2022-present **IEEE Brain Standards**
Member of Wellness Neurotech Working Group
- 2021-2022 **IBM Research Diversity and Inclusion Council**

Women's Community Representative

2020-2021 **IBM's Diversity and Inclusion Taskforce**
Mobilization and Cultural Change Team Member

2020-present **IBM Neuroethics Workstream**
Co-sponsored by IBM Research, AI Ethics Board, Chief Privacy Office, HR, & Government/Regulatory Affairs
Technological Resources, Ethical Principles, and Point-of-View Co-Lead
NeuroX Seminar Series Co-Lead
Neuroethics Journal Club Co-Lead

2020-present **Frontiers in Pain Research Journal**
Research Editor

EDUCATION

2010–2016 **Northwestern University**
Chicago, IL 60611
Ph.D., Neuroscience, Systems and Cognition Emphasis (November 2016)
Feinberg School of Medicine, Physiology Department
Advisor: Dr. A. Vania Apkarian (Pain & Passions Lab)
Additional Concentration: Medical Humanities & Bioethics

2006-2010 **Macalester College**
St. Paul, MN 55105
B.A. with Honors - Magna Cum Laude (May 2010)
Major: Neuroscience Studies, Concentration: Psychology
Minor: Women, Gender, and Sexuality Studies (WGSS)
Advisor: Dr. Eric P. Wiertelak (Pain Studies Lab)

RESEARCH EXPERIENCE

03/2021 – present **Researcher (Responsible and Inclusive Technology and Tech Ethics)**
IBM Research Yorktown
Exploratory Sciences Pillar
Supervisor: Dr. Stacy Hobson
Primary Projects: Developing Research- and Enterprise-wide resources for proactive mitigation of negative sociotechnical downstream impacts

12/2016 – 03/2021 **Researcher (Computational Psychiatry/Neuroimaging - Digital Health)**
IBM Research Yorktown
Department of Healthcare and Life Sciences, Impact Sciences Pillar
Supervisors: Dr. Guillermo Cecchi & Dr. Jeff Rogers
Primary Projects: Developing multimodal multidimensional chronic pain assessments for patients with spinal cord stimulation (Boston Scientific)

06/2011 – 11/2016 **Graduate (Ph.D) Student Research & Clinical Research Coordinator**
Northwestern University
Department of Physiology
Supervisor: Dr. A.V. Apkarian
Dissertation: Psychological, Linguistic, and Neurological Biomarkers of Placebo Response in Chronic Pain; Ethics of Placebo Research

06/2010 – 06/2011 **Laboratory Rotations**
Northwestern University

Departments of Physiology, Psychiatry, & Neurology
Supervisors: Dr. A. V. Apkarian, Dr. Lei Wang, & Dr. Jay Gottfried
Projects: neuroimaging of pain, psychiatric illness, & aversion/reward

08/2009 – 05/2010

Honors Research

Macalester College
Neuroscience/Psychology & WGSS Departments
Advisors: Dr. Eric P. Wiertelak, Dr. Corie Hammers, Dr. Joan Ostrove
Thesis: Intersections of Critical Disability and Neuroscience in Autism

01/2009 – 05/2009

Directed Research Project

Macalester College
Neuroscience/Psychology Department
Co-Advisors: Dr. Jeremy L. Loebach & Dr. Eric P. Wiertelak
Project: Measuring Human Pain Empathy with EEG & GSR

01/2008- 05/2010

Research Assistant, Lab Coordinator, & Lab Supervisor

Macalester College
Neuroscience/Psychology Department & WGSS Department
Supervisor: Dr. Eric P. Wiertelak (Pain Studies Lab)
Advisor: Dr. Scott Morganson (WGSS)
Tasks: Training students; Inventory management; Interviews

RESEARCH SKILLS

Techniques:

Passive and active speech collection in humans including ethnographic interviewing, Natural Language Processing (NLP), AI and Machine Learning (cross-validated multivariate regression and classification approaches), MRI (functional and anatomical) in humans, tactile and thermal psychophysical testing in animals and humans, EEG in humans, GSR in humans, cognitive task paradigms, survey/questionnaire design and implementation, implementing wearable and sensor-based technology in home environments, user studies for digital interfaces, behavioral testing in a variety of animal models of acute and chronic pain and in many experimental designs (open field, conditioned place preference, social recognition, social hierarchy, animal surgery and pharmacological injections, gavages, elevated plus maze, and T-maze)

Clinical Cohorts/Treatments:

Extensive experience with patients diagnosed with various pain conditions, including but not limited to: chronic low back and leg pain, peripheral neuropathies, osteoarthritis, complex regional pain syndrome (CRPS), fibromyalgia, chronic fatigue syndrome (CFS), chronic pelvic pain (chronic prostatitis, interstitial cystitis, irritable bowel syndrome), phantom limb pain, headache, and acute/subacute post-surgical pain; experience working with children and adults diagnosed on the Autism spectrum; analyzed data pertaining to Alzheimer's Disease, depression, anxiety, and addiction; investigated a variety of pain treatments including placebo, opioids, THC, SS(N)RIs and other antidepressants (e.g., Duloxetine), carbidopa & levodopa, NSAIDs, surgical anesthetics (e.g., ketamine and propofol), gaba-ergic drugs (e.g., Neurontin), pain-relief implants (e.g., pumps and stimulators), nerve blocks and lidocaine injections, acupuncture, TENS units, topical creams and lidocaine patches, and various OTC medicines (e.g., Naproxen)

Computer:

Proficient in: FSL, REDCap, STATA, Sigma Plot, SPSS, Statistica, Adobe Illustrator and Photoshop, Microsoft Office, Matlab, Bash, Awk

Also experienced with: Python, R, Jupyter Notebook, NVivo, Anymaze, QuickTime Editing Software, Final Cut Pro, Presentation, LabView, Freesurfer, SQL

Business & Leadership: Experience as team lead for a 2 key research tracks (one impacting entire business unit and another impacting a client of 5+ years); experience writing business-centered research proposals, statements of work (SOWs), grant proposals, and best practices/standard operating procedures (SOPs); experience with creating GANTT charts and milestone-based tables and providing condensed (<5 minute) research talks; completed professional media training

Coordinating: Clinical research coordinator for longitudinal randomized control trials with pain patients, which included: grant writing; protocol and task design; sponsor approval and pre-registration; FDA waivers; IRB correspondence; recruitment strategy; monitoring daily pain/mood ratings via a smartphone application and dashboard; 6 visits/person over a 2-month period; documenting and updating all adverse events and protocol deviations; handling, dispensing, and logging all medicinal study agents; conducting exit interviews; implementing quality control checks across a 15-person study team; creating and administering case report forms, informed consent forms, and source documentation;

Currently up-to-date in the following training and credentials: CITI GCPs, CITI Human/Social/Behavioral Research, EU-GDPR, adult and child CPR, Cyber Security Training

PATENTS

1. YOR8201703670US01 – “Delivering a chemical compound based on a measure of trust dynamics”
2. YOR8201703710US01 – “Updating a clinical trial participation status based on a measure of trust dynamics”
3. YOR8201703690US01 – “Updating a prescription status based on a measure of trust dynamics”
4. YOR8201703720US01 – “Assessing a treatment service based on a measure of trust dynamics”
5. YOR8201707756US01 – “Adjustment of Analgesic Stimulation Parameters Based on Trust Dynamic Measurements”
6. NU201809901-“Brain and Psychological Determinants of Placebo Pill Response in Patients with Chronic Pain”
7. NU2018100- “Neuropsychotypes of patients with chronic pain: groupings for personalized medicine”

PUBLICATIONS

Berger S* and Rossi, F *(2022). Artificial Intelligence and Neurotechnology: Learning from AI Ethics to Proactively Address an Expanded Ethics Landscape. *Communication of the Association for Computing Machinery (CACM)*; *IN PRESS*.

Berger SE* and Baria AT* (2022). Assessing pain research: a narrative review of emerging pain methods, their technosocial implications, and opportunities for multidisciplinary approaches. *Frontiers in Pain Methods*. June 2, 3 (article 896276); doi: 10.3389/FPain.2022.896276

Berger SE* and Rossi, F* (2022). Addressing neuroethics issues in practice: lessons learnt by tech companies in AI ethics. *Neuron (Neuroview)*. <https://doi.org/10.1016/j.neuron.2022.05.006>.

Vachon-Preseu, Abdullah TB, **Berger SE**, Huang L, Griffith JW, Schnitzer TJ, Apkarian AV. (2022) Validating a biosignature predicting placebo pill response in chronic pain in the settings of a randomized controlled trial. *PAIN*, May 1; 163(5):910-922. doi: 10.1097/j.pain.0000000000002450.

Greenberg J, Ringrose K, **Berger S**, VanDodick J, Rossi F, New J. Privacy and the Connected Mind: Understanding the Data Flows and Privacy Risks of Brain-Computer Interfaces. (2021). *White paper collaboration between IBM and Future of Privacy Forum*. <https://fpf.org/wp-content/uploads/2021/11/FPF-BCI-Report-Final.pdf>

Berger, S* and Rossi F*. (2021) The Future of AI Ethics and the Role of Neurotechnology. AIOAI'21 1st Workshop on Adverse Impacts and Collateral Effects of Artificial Intelligence Technologies, Montreal, CA

Berger SE*, Branco P*, Vachon-Preseu E, Abdullah TB, Cecchi G, Apkarian AV. (2021). Quantitative language features identify placebo responders in chronic back pain. *PAIN*, Jun 1;162(6):1692-1704. doi: 10.1097/j.pain.0000000000002175. *This paper was an editor's choice featured article*.

Nagpal C, Wei D, Vinzamuri B, Shekhar M, **Berger S.E.**, Das S, Varshney (2020). Interpretable Subgroup Discovery in Treatment Effect Estimation with Application to Opioid Prescribing Guidelines. *Preprint in arxiv*

Vachon-Preseu*, E, **Berger SE**, Abdullah TB, Apkarian AV. (2019). Identification of traits and functional connectivity-based neurotraits of chronic pain. *PLoS Biology*, 17(8): e3000349.

D Reckziegel, Tetreault P, Ghantous M, Wakaizumi K, Petre B, Huang L, Jabakhanji, R, Abdullah T, Vachon-Preseu E, **Berger SE**, Baria A, Griffith JW, Baliki MN, Schnitzer TJ, Apkarian AV. (2019). Gender specific pharmacotherapy for blocking transition to chronic back pain: a randomized trial. *preprint in medRxiv*

Berger SE*, Vachon-Preseu E*, Abdulla TB, Baria AT, Schnitzer TJ, Apkarian AV (2018). Psychological and brain determinants of placebo pill response in chronic pain. *Nature Communications*, 9:3397. DOI: 10.1038/s41467-018-05859-1.

Berger SE, Vachon-Preseu E, Abdulla TB, Baria AT, Schnitzer TJ, Apkarian AV (2018). Hippocampal morphology mediates biased memories of chronic pain. *Neuroimage* 166: 86-98.

Vachon-Preseu E, Tetreault P, Petre B, Huang L, **Berger SE**, Torbey S, Baria AT, Mansour AR, Hashmi JA, Griffith JW, Comasco E, Schnitzer TJ, Baliki MN, Apkarian AV. (2016). Corticolimbic anatomical characteristics predetermine risk for chronic pain. *Brain*, 139(7):1958-1970. PMID: 27190016.

Vachon-Preseu, E., Centeno, MV., Ren, W., **Berger, S.E.**, Tetreault, P., Ghantous, M., Baria A.T., Farmer, M.A., Baliki, M.N., Apkarian, A.V. (2016). The Emotional Brain as a Predictor and Amplifier of Chronic Pain. *Journal of Dental Research*, 95(6): 605-612. PMID: 26965423.

Ren W, Centeno MV, **Berger SE**, Wu Y, NA X, Liu X, Kondapalli J, Apkarian AV, Martina M, Sumeieier DJ. (2016). The indirect pathway of the nucleus accumbens shell amplifies neuropathic pain. *Nature Neuroscience*, 19(2):220-222. Doi: 10.1038/nn.4199.

Berger SE*, Baria AT*, Baliki MN, Mansour A, Herrmann KM, Torbey S, Huang L, Parks EL, Schnitzer TJ, Apkarian AV. (2014). Risky monetary behavior in chronic back pain is associated with altered modular connectivity of the nucleus accumbens. *BMC Research Notes*, 7: 739. doi: 10.1186/1756-0500-7-739.

Baliki MN, Mansour A, Baria AT, Huang L, **Berger SE**, Fields HL, Apkarian AV. (2013). Parceling human accumbens into putative core and shell dissociates encoding of values for reward and pain. *Journal of Neuroscience*, 33(41): 16383-93. doi: 10.1523/JNEUROSCI.1731-13.2013.

PAPERS IN PROGRESS

Branco P, **Berger SE**, Abdullah TB, Cecchi G, Apkarian AV. (*submitted; accepted with revisions in Pain*). Validation of quantitative language features to predict placebo response in chronic pain.

Elsayed-Ali S, Figueredo de Santana V, Becerra-Sandoval J, **Berger SE**. (*in progress, to be submitted to CHI 2022*). Responsible and Inclusive Cards: A Card-Based Online Tool for Critical Team Reflection

Jing F and **Berger SE**. (*in progress, versions to be submitted to CHI 2023 and CSCW 2023*). Leveraging participatory research methods in emerging technology research.

MEDIA COVERAGE

- **Macalester College Alumni Magazine:** <https://www.macalester.edu/news/2022/07/driving-the-future-of-ethical-technology/>
- **Advocacy for Women in STEM panel:** <https://www.youtube.com/watch?v=4FGnR8-YgCQ>
- **Gestalt AI podcast:** <https://gestaltit.com/utilizing-ai/stephen/how-ai-can-help-in-medical-care-and-pain-management-with-sara-e-berger-utilizing-ai-3x19/>
- **MIT 35 Under 35 Innovators:** <https://www.technologyreview.com/innovator/sara-berger/>
- **The Healthtech Podcast:** <https://anchor.fm/healthtech/episodes/200-The-Story-of-IBM-Research-with-Neuroscientist-Sara-Berger-epg0m3>
- **Faces of Digital Health Podcast:** <https://www.facesofdigitalhealth.com/blog/f131-how-can-we-better-measure-pain-sara-berger-ibm>
- **Axios Vitals:** https://www.axios.com/newsletters/axios-vitals-f62c1f51-a557-4e19-bab0-10f5001fb960.html?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosvitals&stream=top
- **Axios Future:** https://www.axios.com/newsletters/axios-future-58d3396c-e11e-4d62-9544-1fc9415c00e0.html?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosfutureofwork&stream=future
- **Andina:** <https://andina.pe/agencia/noticia-usan-inteligencia-artificial-para-sugerir-tratamientos-medicos-dolor-cronico-832112.aspx>
- **Wall Street Journal (WSJ):** <https://partners.wsj.com/boston-scientific/tools-of-transformation/the-personalization-of-pain-management/>
- **TIME Magazine:** <https://time.com/5392687/placebo-effect-pain/>

TALKS, PRESENTATIONS, & CONFERENCE PROCEEDINGS

Berger SE. (2022, September). Panelist for Center for Information Policy Leadership (CIPL) annual CPO executive retreat (topic: Privacy and Neurotechnologies). Washington DC.

Berger SE & Rossi F. (2022, September). *Neurotech is coming – stay tuned for an expanded AI ethics landscape*. Keynote speaker at AI for Good Digital Platform, organized by ITU in partnership with 40 UN

Sister Agencies. Virtual: <https://aiforgood.itu.int/event/neurotech-is-coming-stay-tuned-for-an-expanded-ai-ethics-landscape/>

Berger SE. (2022, February). *Traversing Pain*. Key note address - Innovation Design Engineering (IDE) at Royal College of Art and Imperial College, London.

Berger SE & Rossi F. (2021, August) *The Future of AI Ethics and the Role of Neurotechnology*. Panel talk at AIOAI'21: 1st Workshop on Adverse Impacts and Collateral Effects of Artificial Intelligence Technologies, Montreal, CA.

Berger SE. (2021, April). *The Future of Neuroscience Research – Ethical and Social Considerations*. Internal IBM presentation, adapted to 3 different audiences: Horizons Client Event, Historically Black Colleges and Universities (HBCU partners), and International Research Lab talk.

Richard Rauck², MD; PhD; **Sara E. Berger**^{1*}, PhD; Guillermo A. Cecchi^{1*}, PhD; Carla Agurto^{1*}, PhD; Elif Eyigoz¹, et al. (2021, January). *Chronic Pain Patients During COVID-19: A Multidimensional View Reveals Sub-Cohorts of Susceptibility and Resilience*. Podium talk presented virtually at annual North American Neuromodulation Society (NANS).

Berger SE. (2020, September) *Neuroethics and the Future of Neurotech*. Presented at IBM Research's AllHands Quarterly Impact Science Event. Yorktown Heights, NY.

Ostrand, R., **Berger SE**, & Cecchi, G. (2019, April). *Personalized, longitudinal assessment of cognitive disorders using spontaneous speech production at home*. Presented at NorthEast Computational Health Summit (NECHS). Providence, RI.

Berger SE. (2018, September). *Healthcare Internet of Things (IoT): Quantifying and Predicting Pain as an IoT Use-Case Scenario*: Presented at IBM ThinkLab's annual Multi-Client Event. Yorktown Heights, NY.

Berger SE (2013, May). *Changes in Mesolimbic Reward Circuitry and Processing in the Transition From Acute to Chronic Back Pain*. Presented at the annual DATA BLITZ for Northwestern's Cognitive Neuroscience Department.

Berger SE. (2010, May). *Deconstructing Traditional Viewpoints: Intersections of Neuroscience and Critical Disability Theory in the Exploration of Autism and Autistic Sexuality*. Talk given for public honors thesis defense. Macalester College, St. Paul, MN.

Berger SE Loebach, J.L., & Wiertelak, E.P. (2010, May). *I Feel Your Pain: Exploring the role of the human mirror neuron system and its extensions in the observation of nociception*. Talk given at the annual Midbrains Conference. St. Olaf College, Northfield, MN.

Berger SE. (2010, May). *Intersections of the Fornix and Feminism – Envisioning A Feminist Neuroscience*. Talk given for public presentation of WGSS senior seminar projects. Macalester College, St. Paul, MN.

POSTER PRESENTATIONS & CONFERENCE PROCEEDINGS

Zijun Yao¹, PhD; Mohamed Ghalwash¹, PhD; Daby Sow^{1*}, PhD; Pritish Parida¹, PhD; **Sara E Berger**¹, PhD, Richard Rauck², MD; PhD; Kristen Lechleiter¹³, MS; Roshini Jain¹³, MS; Brad Hershey¹³, MS; Dat Huynh¹³, PhD; Eric Loudermilk³, MD; Julio Paez⁴, MD; Louis Bojrab⁵, MD; John Noles⁶, MD; Todd Turley⁷, MD; Mohab Ibrahim⁸, MD, PhD; Amol Patwardhan⁹, MD, PhD; James Scowcroft¹⁰, MD; Rene Przkora¹¹, MD; Nathan Miller¹², MD; Gassan Chaiban¹³, MD; Matt McDonald¹³, MS; Jeffrey L.

Rogers1, PhD (2021, January). *Using Actigraphy With Personalized AI-models to Measure and Predict Chronic Pain*. Presented virtually at annual North American Neuromodulation Society (NANS) Meeting.

Sara E. Berger1*, PhD; Guillermo A. Cecchi1*, PhD; Carla Agurto1*, PhD; Elif Eyigoz1, Richard Rauck2, MD; PhD; Kristen Lechleiter13, MS; Roshini Jain13, MS; Brad Hershey13, MS; Dat Huynh13, PhD; Eric Loudermilk3, MD; Julio Paez4, MD; Louis Bojrab5, MD; John Noles6, MD; Todd Turley7, MD; Mohab Ibrahim8, MD, PhD; Amol Patwardhan9, MD, PhD; James Scowcroft10, MD; Rene Przkora11, MD; Nathan Miller12, MD; Gassan Chaiban13, MD; Matt McDonald13, MS; Jeffrey L. Rogers1, PhD (2021, January). *Chronic Pain Patients During COVID-19: A Multidimensional View Reveals Sub-Cohorts of Susceptibility and Resilience*. Presented virtually at annual North American Neuromodulation Society (NANS) Meeting.

Berger SE*, Rachel O*, Agurto C, Loudermilk E, Paez J, Rogers J. Cecchi G, Lechleter K, McDonald M, Rauck R. (2020, August) *A Method for Personalized Longitudinal Assessment of Chronic Pain Using Spontaneous Speech Production at Home*. Presented virtually at annual World Institute of Pain (WIP) Meeting

Reinen J, **Berger SE**, Agurto C, Ostrand R, Loudermilk E, Paez J, Lechleter K, Rauck R, Cecchi G, Rogers J. (2020, August) *Defining Multi-Dimensional Dynamic States of Chronic Pain Using a Mobile Clinical Platform*. Presented virtually at annual World Institute of Pain (WIP) Meeting

Agurto C, Parida P, **Berger SE**, Loudermilk E, Paez J, Lechleter K, Rauck R, McDonald M, Cecchi G, Rogers J. (2020, August) *Motion and Pain: Using Sensors During a Physical Assessment to Objectively Measure and Predict Chronic Pain Scores*. Presented virtually at annual World Institute of Pain (WIP) Meeting

Nagpal C, Wei D, Vinzamuri B, Shekhar M, **Berger S.E.**, Das S, Varshney (2020, April). *Interpretable Subgroup Discovery in Treatment Effect Estimation with Application to Opioid Prescribing Guidelines*. ACM CHIL, Toronto ON, Canada.

Richard Rauck, MD; Eric Loudermilk, MD; Julio Paez, MD; Louis Bojrab, MD; John Noles, MD; Todd Turley, MD; Mohab Ibrahim, MD, PhD; Amol Patwardhan, MD, PhD; James Scowcroft, MD; Rene Przkora, MD; Nathan Miller, MD; Gassan Chaiban, MD; **Sara E. Berger**, PhD; Mohamed Ghalwash, PhD; Pritish R. Parida, PhD; Tigran Tchakian, PhD; Carla Agurto, PhD; Jenna Reinen, PhD; Andrea Simonetto, PhD; Zijun Yao; Daby Sow PhD; Guillermo A. Cecchi, PhD; Jeffrey L. Rogers, PhD; Kristen Lechleiter, MS; Roshini Jain, MS; Brad Hershey, MS; Dat Huynh, PhD; Matt McDonald. (2020, July) *Moving Beyond VAS into Deep Personalization: Advanced Analytics and Data Metrics Unlock Innovative Method for Assessing Chronic Pain in SCS Patients - Utilizing Advanced Data Analytics to Derive Novel Multifactorial Outcome Metrics in Chronic Pain SCS Patients*. Presented at annual North American Neuromodulation Society (NANS) Meeting, Las Vegas, NV.

Berger SE, Vachon-Presseau E, Cecchi G, Abdullah T, Eyigoz E, Apkarian AV. (2019, July) *Quantitative language features associated with placebo response in chronic back pain patients*. Presented at Society for Interdisciplinary Placebo Studies (SIPS), Netherlands.

Vachon-Presseau, E., **Berger, S.E.**, Schnitzer, T.J., Apkarian, A.V. (2016, November). *The neuropsychological mechanisms of memory bias in chronic pain patients*. Presented at the annual meeting for the Society for Neuroscience, San Diego, CA.

Berger, S.E., Vachon-Presseau, E., Abdullah, T.B., Baria, A.T., Petre, B., Schnitzer, T.J., Apkarian, A.V. (2016, September). *Predicting placebo response in chronic low back pain patients using personality traits and neuroimaging biomarkers*. Presented at the bi-annual meeting of the International Association for the Study of Pain, Yokohama, Japan.

Vachon-Preseu, E., **Berger, S.E.**, Abdullah, T.B., Schnitzer, T.J., Apkarian, A.V. (2016, September). *Functional connectivity between frontal and sensorimotor networks predispose to placebo response in chronic back pain patients*. Presented at the bi-annual meeting of the International Association for the Study of Pain, Yokohama, Japan.

Berger, S.E., Vachon-Preseu, E., Davis, D.A., Schnitzer, T.J., Apkarian, A.V. (2015, October). *Hippocampal volume is associated with placebo propensity in a blinded randomized clinical trial with chronic low back pain patients*. Presented at the annual meeting of the Society for Neuroscience, Chicago, IL.

Vachon-Preseu E., **Berger, S.E.**, Huang, L, Tétreault, P., Apkarian, A.V., Baliki, M.N. (2015, October). *Reliability of structural connectivity hubs in human brain network*. Presented at the annual meeting of the Society for Neuroscience, Chicago, IL.

Berger, S.E., Centeno, M.V., Baliki, MN., Apkarian, A.V. (2013, November). *Co-administration of l-dopa and naproxen diminishes pain in both neuropathic and inflammatory animal models*. Presented at the annual meeting of the Society for Neuroscience, San Diego, CA.

Berger, S.E., Baria, A.T., Baliki, M.N., Mansour, A., Parks, E.L., Apkarian, A.V. (2013, June). *Chronic Back Pain Patients Show Differences in Behavior and Brain Activity During a Loss-Aversion Gambling Task*. Presented at the annual meeting of the Organization for Human Brain Mapping, Seattle, WA.

Berger, S.E., Baliki, M.N., Baria, A.T., Parks, E.L., Torbey, S., Herrmann, K.M., Schnitzer, T.J., and Apkarian, A.V. (2012, October). *Changes in Perception of Risk and Valuation of Monetary Rewards With Transition From Acute to Chronic Back Pain*. Presented at the annual meeting of the Society for Neuroscience, New Orleans, LA.

Farmer, M.A., **Berger, S.E.**, Mansour, A., Ellingson, B., Landis, J., Schaeffer, A.J., Mayer, E., and Apkarian, A.V. (2012, October). *White matter abnormalities associated with visceral pain: Preliminary data from the multidisciplinary approach to the study of chronic pelvic pain (mapp) network*. Presented at the annual meeting of the Society for Neuroscience, New Orleans, LA.

Baliki, M.N., Mansour, A., Baria, A.T., Huang, L., **Berger, S.E.**, Fields, H.L., & Apkarian, A.V. (2012, October). *Accumbens subdivisions differentiate salience and valence signals of pain and pleasure*. Presented at the annual meeting of the Society for Neuroscience, New Orleans, LA.

Barter, JB, **Berger, S.E.**, & Wiertelak, E.P. (2009, October). *Nucleus accumbens μ -opioid-mediated boost in food consumption is attenuated by D1-like dopamine antagonism*. Presented at the annual meeting of the Society for Neuroscience, Chicago, IL.

Berger, S.E., Loebach, J.L., & Wiertelak, E.P. (2009, October). *I Feel Your Pain: Exploring the role of the human mirror neuron system and its extensions in the observation of nociception*. Presented at the Faculty for Undergraduate Neuroscience Presented at the annual meeting of the Society for Neuroscience, Chicago, IL.

Tisel, S.M, **Berger, S.E.**, & Wiertelak, E.P. (2009, May). *Behavioral Expression of Neuroplastic Changes Incurred by Nociceptive Experience and Blocked by Scopolamine on Two Day Repeat Formalin Essay*. Presented at the annual Midbrains Conference. Macalester College, St. Paul, MN.

Berger, S.E. & Wiertelak, E.P. (2008, August). *The effects of altering the parameters in the current forced-swim test: Toward a more humane animal model of depression*. Presented at the Student-Faculty Collaboration Research Symposium, St. Paul, MN.

UPCOMING TALKS, PRESENTATIONS, PROCEEDINGS, & POSTERS

GRANTS

Advising:

- Canadian Institute of Health Research (CIHR) – consultant on pain biomarkers grant (2021)

Awarded:

- T32 NS047987 – NIH/NUIN Training Program on Human Cognition (2012-2014)

HONORS AND AWARDS

IBM internal Outstanding Technical Achievement Award for Measuring Chronic Pain - 2022

IBM internal Research Accomplishment Award for Measuring Chronic Pain – 2021

MIT Tech Review's 35 Under 35 Innovators (Visionary) – 2021

Editor's Choice Award for Outstanding Paper - 2021

IBM's First Patent Plateau – Winter 2018

Nominated for Forbes 30 under 30 – Summer 2017

WGSS Senior Award for Outstanding Scholarship, Spring 2010

Honorable Mention for the NSF GRFP, Spring 2010

Macalester College Travel Award, Fall 2009

Nominated for the German Graduate Schools of Neuroscience Award, Fall 2009

Macalester Travel Award for Research Abroad, Winter 2009

Student-Faculty Collaboration Fellowship, supported by NCCAM, Summer 2008

Nu Rho Psi Honor Society, inducted Spring 2008

COLAGE Scholarship, 2007-2008

The Margaret Weyerhaeuser-Driscoll Scholarship, 2006-2010

Holl Scholarship, 2006-2010

PFUND Scholarship, 2006-2007

Tesoro Scholarship, 2006-2010

Mid-Dakota Utility (MDU) Scholarship, 2006

National Honor Society, 2002-2006

PROFESSIONAL MEMBERSHIPS

International Neuroethics Society (INS) (2021-present)

Society for Interdisciplinary Placebo Studies (SIPS) (2018 to 2020)

International Association for the Study of Pain (IASP) (2015 to 2020)

Organization for Human Brain Mapping (OHBM) (2013 to 2020)

Society for Neuroscience (SfN) (2009 to 2020)

NON-PROFESSIONAL MEMBERSHIPS

Arthur Murray Dance Studio, Portland Dance Team (2019 to present)

Chicago Out Network, member (2011 to 2016)

NUIN Student-Sponsored Seminar Series, member (2010 to 2012)

PROFESSIONAL CERTIFICATIONS

Certified Zumba Instructor (2019 to present)

TEACHING EXPERIENCE

Teaching Assistant: Fundamentals of Cognitive
& Behavioral Neuroscience (Graduate Level)
03/2012 – 05/2012

Department of Neuroscience
Northwestern University

Teaching Assistant: Fundamentals of Sensory
& Motor Systems Neuroscience (Graduate Level)
01/2012 – 03/2012

Department of Neuroscience
Northwestern University

Teaching Assistant: Behavioral Neuroscience
(Undergraduate Level)
01/2010 – 05/2010

Neuroscience/Psychology Dept.
Macalester College

Teaching Assistant: Brain, Mind, & Behavior
(Undergraduate Level)
08/2009 – 12/2009

Neuroscience/Psychology Dept.
Macalester College

Teaching Assistant: Exploring Sensation &
Perception (Undergraduate Level)
01/2009 – 05/2009

Neuroscience/Psychology Dept.
Macalester College

MENTORING

1. **Felicia Jing (Johns Hopkins – Political Science)**

Summer 2022

Internship Project: Piloting exercises, methods, and best practices for diverse and equitable participatory research and deliberation regarding emerging technology innovation and ethical considerations

2. **Shubhangi Gupta (Georgia Tech – Digital Media and Design)**

Summer 2022

Internship Project: Expanding, reconceptualizing, and operationalizing domains of risk for negative technology impacts, with a focus on data, safety, and community-centered considerations

3. **Maria Smith (UC Berkeley – Sociology)**

Summer 2022

Internship Project: Exploring narratives within industry research; understanding how narratives interact with business strategy and incentives and what the potential downstream positive and negative impacts might be

4. **Amber Hamilton (University of Minnesota - Sociology)**

Summer 2021

Internship Project: Developing repository of case studies regarding negative impacts to vulnerable communities, including Black, LGBTQIA+, and LatinX communities

5. **Salma Elsayed-Ali (University of Maryland - HCI)**

Summer 2021

Internship Project: Designing, building, and piloting a Responsible and Inclusive Card Tool for tech workers to implement during their research projects and prototyping phases

6. **Claire Lee (Princeton University – Computer Science and Neuroscience, PreMed)**

Summer 2018 to 2021

Projects: Quantifying impulsivity and ambiguous decision-making in a subclinical bipolar population using acoustic and semantic properties of language; predicting co-morbid anxiety and ADHD using Reddit posts

OTHER VOLUNTEER ACTIVITIES & EXTRACURRICULARS

Regulatory Horizon's Council (RHC) research on neurotech and emerging sociotechnical issues (2022)

AAAI Co-Chair for MIDCAR (Mid-career Diversity and Inclusion Workshop) (2022)

Washington University's Center for Neurotechnology – neuroethics journal club (2018 to 2019)

IBM's AI for Social Good – research mentor for opioid addiction (2018 to 2019)

IBM's Girls Go Tech – volunteer (2017 to present)

IBM ThinkLab Galaxy Storyteller – volunteer (2017 to present)

Women in STEM Career Engagement/Outreach – middle school lecturer (2017 to present)

Science March – participant (2017 to 2020)

Women's March – participant (2017 to 2020)

Center on Halsted – volunteer (2014 to 2016)

NU Bioethics Journal Club Committee (2012 to 2016)

NU Bioethics Symposium Committee – student member/organizer/panelist (2012); see:

- http://www.feinberg.northwestern.edu/sites/pthms/education/dpt-phd/translational_ethics.html
- <https://www.youtube.com/watch?v=ajCZlyT4iaU>

- http://www.feinberg.northwestern.edu/sites/pthms/education/dpt-phd/ethics_symp/Ed_panel.html

Brain Awareness Week - volunteer/local committee member (2008 to 2016)

Community Science Education Mural – painter (2010)

Nu Rho Psi Honor Society, Twin Cities Chapter – President (2009-2010)

Red Door Pediatric Therapy – intern (2008)

Autism Speaks Conferences, ND Chapter – volunteer (2008)

Minnesota Psychological Undergraduate Conference – volunteer (2007-2010)

Autism Society – summer camp counselor and personal care assistant (2007-2008)

PFUND – scholarship committee board member (2007)

Midbrains Neuroscience Conference – volunteer (2006-2010)

Minnesota Kid's Judge Neuroscience Fair – volunteer/organizer (2006-2010)

COLAGE – volunteer and speak-out team member (2006 to 2010)

PFLAG – volunteer and speaker (2006 to 2010)

HOBBIES

Competitive ballroom dancing, painting & drawing, Crossfit, running & hiking, aerial silks, perfecting my foodie identity, reading and watching scifi, volunteering at humane societies, rummy/cribbage/board games junkie, tattoo junkie