CURRICULUM VITAE

Jason J. Kutch, PhD

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PROFESSIONAL APPOINTMENTS and EDUCATION:

ACADEMIC APPOINTMENTS:

2026-Present	Professor (with Tenure), Division of Biokinesiology and Physical Therapy, Herman Ostrow School of Dentistry of USC, University of Southern California
2019-2026	Associate Professor (with Tenure), Division of Biokinesiology and Physical Therapy, Herman Ostrow School of Dentistry of USC, University of Southern California
2011-2019	Assistant Professor, Division of Biokinesiology and Physical Therapy, Herman Ostrow School of Dentistry of USC, University of Southern California
2010-2011	Research Assistant Professor, Department of Biomedical Engineering, University of Southern California

COURTESY APPOINTMENTS:

2011-present	Department of Biomedical Engineering Viterbi School of Engineering University of Southern California, Los Angeles, CA

EDUCATION:

2008	Ph.D., Applied and Interdisciplinary Mathematics, University of Michigan
2001	B.S.E., Mechanical Engineering, Princeton University

POST-GRADUATE TRAINING:

2008-2010	Postdoctoral Research Associate, Biomedical Engineering; Mentor, Francisco Valero-Cuevas, University of Southern California

RESEARCH INTERESTS:

Dr. Kutch investigates how brain dysfunction contributes to chronic pelvic pain and other chronic overlapping pain conditions (COPCs). His current research is focused on developing non-invasive brain stimulation and immersive virtual reality approaches for augmenting chronic pain treatment.

ACADEMIC PROFILES:

ORCID: 0000-0002-2417-4879
Web of Science ResearcherID: B-3243-2018
MyNCBI Bibliography: https://www.ncbi.nlm.nih.gov/myncbi/jason.kutch.1/bibliography/public/
Google Scholar: https://scholar.google.com/citations?user=QOeSn50AAAAJ&hl=en

GRANTS, CONTRACTS, and OTHER RESEARCH FUNDING AWARDED:

Total Career Funding as PI or USC site PI: $8,471,329 ($7,802,472 as PI; $668,857 as USC site PI)

EXTERNAL GRANTS (FEDERAL/CORPORATE/FOUNDATION FUNDING):

Principal Investigator ($7,609,872):

08/2025 - 06/2030 Eunice Kennedy Shriver National Institute of Child Health & Human Development (NIH/NICHD)
Award: R01 HD117775
Title: Individual differences in brain morphology and connectivity to identify the mechanisms of comorbidities and treatment-refractory disease in females with endometriosis-associated pelvic pain
Role: Multiple PI (MPI) with Andrew Schrepf (corresponding MPI)
Funding: Total Costs: $2,969,745
Overall Aims: This proposal takes the novel step of centering the concept of centralized pain on pre-treatment neural features that can predict non-response to surgical hysterectomy or gonadotropin-releasing hormone (GnRH) agonist therapy for endometriosis, a chronic pelvic pain condition with a high degree of suspected pain centralization.

08/2020 - 04/2025 *(NCE to 4/2026)* **National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK)**
Award: R01 DK121724
Title: Motor Cortical Neuromodulation in Women with Interstitial Cystitis/Bladder Pain Syndrome: Reducing Pain by Improving Brain and Muscle Activity
Role: Corresponding PI with Larissa Rodriguez (MPI)
Funding: Total Costs ($1,815,000 + $622,631 supplement): $2,423,111 (Direct Costs $1,471,621 + $951,490 Indirect Costs)
Overall Aims: In this project, we are using a randomized controlled trial to test the hypothesis that repetitive transcranial magnetic stimulation (rTMS) directed at a cortical site that controls pelvic floor muscles can reduce pain and improve brain and muscle activity in women with IC/BPS.

08/2019-06/2022 **National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK)**
Award: U01 DK082370
Title: Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) Research Network Discovery Site
Role: MPI with MPIs Emeran Mayer and Larissa Rodriguez
Percentage of Effort: 25%
Funding: USC Subaward Total Costs: $758,927 (Direct Costs $515,040 + $243,887 Indirect Costs)
Overall Aims: This 3-year extension of the MAPP Phase II grant provided an additional 12 months of follow-up for the MAPP Symptom Patterns Study (SPS). It also provided time for the MAPP investigators to analyze the large amount of MAPP Phase II data that had been collected.

02/2017-01/2021 **National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK)**
Award: R01 DK110669

Title: Sensorimotor Impairments in Men with Chronic Prostatitis/Chronic Pelvic Pain Syndrome: Relationship of Resting State Brain Activity to Pelvic Floor Muscle Activation
Role: PI
Percentage of Effort: 20%
Funding: Total Costs: $1,345,590 ($863,900 Direct Costs + $481,690 Indirect Costs)
Overall Aims: In this project, we tested the hypothesis that men with chronic pelvic pain have changes in resting brain function associated with changes in muscle control underlying the dysfunction in this disorder.

09/2018-09/2020 **The Charles D. and Mary Bauer Foundation**
Award: Foundation Annual Award Funding
Title: Optimization of Spinal Manual Therapy for Shoulder Pain
Role: Multiple PI with Lori Michener (corresponding PI)
Percent of Effort: 5% effort (no salary)
Funding: Total Costs: $47,979
Overall Aims: The aims of this study were to characterize the central nervous system mechanisms using brain imaging and to identify predictors of a positive response to spinal manual therapy in patients with rotator cuff disease in order to optimize the delivery and treatment response to spinal manual therapy.

07/2016-06/2018 **Interstitial Cystitis Association**
Title: Cortical Neuromodulation to Reduce Symptoms of Interstitial Cystitis/Painful Bladder Syndrome
Role: PI
Funding: Total Costs: $50,000
Overall Aims: The goal of this pilot study was to determine if repetitive transcranial magnetic stimulation (rTMS) directed at motor cortical regions that control pelvic floor muscles can reduce symptoms and normalize brain function in women with Interstitial Cystitis/Painful Bladder Syndrome.

USC Site PI ($668,857 in subawards to USC)

05/2020-04/2026 **National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK)**
Award: U54 DK123755
Title: Sex-Related Differences in Brain Gut Microbiome Interactions in Irritable Bowel Syndrome
Role: Co-I (USC Site PI) with Emeran Mayer and Lin Chang (MPIs)
Year 1 Funding: $1,584,406 (Total Costs); USC Subaward: $76,184 ($46,172 Direct Costs + $30,012 Indirect Costs)
Overall Aims: This project aimed to gain a better understanding of the role of the gut microbiome and female sex hormones in the modulation of brain gut microbiome interactions in two of the most common disorders of the gastrointestinal tract, irritable bowel syndrome and chronic functional constipation.

07/2014-06/2019 **National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK)**
Award: U01 DK082370
Title: MAPP Research Network Second Phase
Role: Co-I (USC site PI) with MPIs Emeran Mayer and Larissa Rodriguez
Percentage of effort: 25%

Funding: $4,863,352 (Total Costs); USC Subaward: $592,673 ($359,475 Direct Costs + $233,198 Indirect Costs)
Overall Aims: The goal of the MAPP Research Network was to provide new insights into underlying etiology, natural history, and risk factors of Urologic Chronic Pelvic Pain Syndrome (UCPPS) in order to provide a translational foundation to facilitate future clinical intervention efforts and improve clinical management of the syndromes.

Co-Investigator:

07/2024-09/2027 **National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIH/NIAMS)**
Award: R01 AR083626
Title: Patient-Specific Factors of Recovery in Rotator Cuff Tendinopathy
Role: Co-I (with Lori Michener, PI)
Funding: Total Costs: $806,201
Overall Aims: Resistance exercise is a known effective treatment for rotator cuff tendinopathy, but not for everyone. Defining the tendon structural response to exercise will define tendon recovery and its relationship to patient outcomes. Characterizing how mediating factors of muscle deficits, brain pain and sensorimotor processing, and psychological factors influence the relationship between tendon recovery and patient outcomes will enable a patient-specific approach to rehabilitation.

01/2023 – 12/2024 **Foundation for Physical Therapy Research**
Title: Biomarkers of Tendon Recovery for Rotator Cuff Tendinopathy
Role: Co-I (with Lori Michener, PI)
Funding: Total Costs: $100,000
Overall Aims: Define tendon morphological changes with 4-week resistance exercise, how the associated muscle modulates tendon remodeling, and the relationship to patient-rated outcomes in patients with rotator cuff tendinopathy.

01/2014-12/2014 **American Physical Therapy Association**
Title: Augmenting Muscle Activation and Function Following Perinatal Brachial Plexus Injury
Role: Co-I (with Susan Duff, PI)
Percentage of effort: 5%
Funding: Total Costs: $24,456
Overall Aims: This research study investigated an intervention that aimed to augment diminished muscle activation and function after brachial plexus injury through self-generated, visual-auditory feedback triggered via biceps contraction.

INTERNAL GRANTS (UNIVERSITY FUNDING)

Principal Investigator ($192,600):

04/2023-03/2024 **SC-CTSI Multidisciplinary Pilot Funding Grant**
Award: Faculty Seed Grant
Title: The Neuroscience and Engineering of Ocean Wave Surfing as Therapy for Chronic Pain
Role: Corresponding PI with MPIs Heather Culbertson and James Finley
Funding: Total Direct Costs: $125,000

Overall Aims: The goal of this pilot study was to build a multidisciplinary team to study whether an ocean surf therapy program can improve chronic pain symptoms and brain network markers, and whether the surf therapy experience can be appropriately engineered in a virtual reality (VR) environment to address the scalability problems inherent in ocean access.

08/2015-07/2016 **USC Division of Biokinesiology and Physical Therapy**
Award: Faculty Seed Grant
Title: Brain Connectivity Associated with Lower Limb Coordination Deficits
Role: PI
Funding: Total Direct Costs: $15,000
Overall Aims: The goal of this pilot study was to use functional magnetic resonance imaging (fMRI) to study the association between brain functional connectivity and lower limb coordination deficits related to knee pain.

08/2013-08/2014 **USC Division of Biokinesiology and Physical Therapy**
Award: Faculty Seed Grant
Title: Identifying Cortical Mechanisms and New Potential Treatments of Urologic Chronic Pelvic Pain Syndrome
Role: PI
Funding: Total Direct Costs: $8,000
Overall Aims: The goal of this seed grant was to use transcranial magnetic stimulation to investigate cortical control of the pelvic musculature in healthy controls and patients with Urological Chronic Pelvic Pain Syndrome.

07/2012-06/2013 **USC CTSI Clinical/Translational Research Pilot**
Award: Pilot Grant
Title: Integrating Electromyography and Sonographic Imaging for Evidence-Based Physical Therapy for Chronic Pelvic Pain
Role: PI
Funding: Total Direct Costs: $30,000
Overall Aims: The goal of this pilot grant was to combine sonography and electromyography (EMG) to obtain objective measures to enhance clinical screening and better identify Chronic Prostatitis/Chronic Pelvic Pain Syndrome (CP/CPPS) patients appropriate for physical therapy.

08/2012-05/2013 **University of Southern California Office of Undergraduate Programs**
Award: Undergraduate Research Associates Program
Title: Undergraduate Experience in Translational Chronic Pelvic Pain Research
Role: PI
Funding: $6,600
Overall Aims: The goal of this grant was to give 3 USC undergraduate students experience in studying the brain, muscle, and technology aspects of chronic pelvic pain.

08/2011-07/2012 **USC Division of Biokinesiology and Physical Therapy**
Award: Faculty Seed Grant
Title: A Critical Evaluation of Physical Therapy for Chronic Prostatitis/Chronic Pelvic Pain Syndrome (CP/CPPS)
Role: PI
Funding: Total Direct Costs: $8,000

Overall Aims: The goal of this seed grant was to classify patients with CP/CPPS according to how their pelvic pain and muscle activity change in response to manual physical therapy and body awareness relaxation training in order to determine if targeting muscle hyperactivity with physical therapy is broadly effective for treating CP/CPPS.

AWARDS, HONORS AND FELLOWSHIPS:

2016	USC Biokinesiology and Physical Therapy *Commendation for Excellence in Teaching*.
2013	USC Biokinesiology and Physical Therapy *Commendation for Excellence in Teaching*.
2012	Selected to deliver a Rackham Centennial Alumni Lecture, University of Michigan
2006	Alice Webber Glover Scholarship, University of Michigan
2007-2008	NIH F31 Pre-doctoral Training Fellowship
2002-2005	National Science Foundation VIGRE Fellowship
2001	Morgan W. McKinzie ’93 [best Mech. Eng.] Senior Thesis Prize, Princeton University
2001	Donald Janssen Dike Award, Princeton University
2000	John Marshall II Memorial Prize (Honorable Mention), Princeton University

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

2023-Present	International Surf Therapy Organization
2018-Present	International Association for the Study of Pain
2011-2020	International Pelvic Pain Society
2004-2017	Society for the Neural Control of Movement
2001-Present	Society for Neuroscience

II. ADMINISTRATIVE AND SERVICE ACTIVITIES

UNIVERSITY SERVICE:

USC DIVISION OF BIOKINESIOLOGY AND PHYSICAL THERAPY:

2025-present	**Director of Research Advancement,** and chair of Research Advancement Committee (RAC), Division of Biokinesiology and Physical Therapy
2022-2024	**Tenure/Tenure-Track Representative,** Division of Biokinesiology and Physical Therapy Faculty Council
2019-present	**Member,** Research Advancement Committee
2017-2019	**Member,** Faculty Affairs Committee
2013-present	**Member,** Information Technology Committee
2011-present	**Member,** PhD/MS Admissions Committee

USC PROGRAMS:

2011-present **Affiliated Faculty**, Neuroscience Graduate Program

2011-present **Affiliated Faculty,** Program in Biomedical and Biological Science
Keck School of Medicine

EDITORIAL ACTIVITIES:

2024-Present Section Editor, *Pain Measurement and Imaging (PAIN)*

SCIENTIFIC REVIEW FOR JOURNALS:

2023	*Cortex*
2022	*Journal of Neuroscience Methods*
2019	*Journal of Urology*
2019	*Neuroimage*
2019	*Neurourology and Urodynamics*
2019	*Neuroimage: Clinical*
2019	*Pain Reports*
2018, 2019, 2022	*Scientific Reports*
2018	*Cerebral Cortex*
2016	*Annals of Clinical and Translational Neurology*
2016	*Journal of Neuroscience*
2015, 2017-18, 2023-24	*Pain Measurement and Imaging (PAIN)*
2015	*Developmental Medicine & Child Neurology*
2015	*Arthritis Research & Therapy*
2014, 2016	*Journal of Pain*
2014	*Journal of Neural Engineering*
2014	*NeuroReport*
2013, 2015	*Medicine and Science in Sports and Exercise*
2013	*Biological Cybernetics*
2013	*Experimental Brain Research*
2012, 2014-2018	*PLoS One*
2012, 2014	*Journal of Biomechanics*
2012	*IEEE Transactions on Biomedical Engineering*
2012	*Medical & Biological Engineering & Computing*

2012	*Journal of Applied Biomechanics*
2011-2012, 2016, 2019	*Journal of Neurophysiology*
2011-2012, 2014, 2016	*PLoS Computational Biology*
2011	*Human Movement Science*
2011	J*ournal of Motor Behavior*
2011	*Journal of Orthopedic Research*

GRANT REVIEW:

2024	National Center for Complementary and Integrative Health Special Emphasis Panel - HEAL Initiative: Toward Developing Quantitative Imaging and Other Relevant Biomarkers of Myofascial Tissues for Clinical Pain Management (R61/R33, Clinical Trial Required)
2018	National Institutes of Health (NIH), Center for Scientific Review, Motor Function Speech and Rehabilitation (MFSR) Study Section
2013, 2016	U.S. National Science Foundation (NSF)
2013, 2014, 2015	U.S. Department of Veterans Affairs (VA)
2012, 2013, 2014	Southern California Clinical and Translational Science Institute (CTSI)

SERVICE TO PROFESSIONAL ORGANIZATIONS:

2020	**Secretary,** International Pelvic Pain Society (IPPS)
2015-2018	**Elected Board Member,** International Pelvic Pain Society (IPPS)

III. SCHOLARLY ACTIVITY

PUBLICATIONS:

Asterisks indicate direct students or post-doctoral mentee; underline indicates senior author.

INVITED COMMENTARY IN PEER-REVIEWED JOURNALS:

2025 **Kutch, J.J**. Preparing the brain for pain: New insights and potential biomarkers. *Pain, 166*(6), 1221-1222. doi: 10.1097/j.pain.0000000000003485. *Journal Impact Factor (2024) = 5.5*

2016 **Kutch, J.J.**, & Tu, F.F. Altered brain connectivity in dysmenorrhea: Pain modulation and the motor cortex. *PAIN*, *157*(1), 5-6. doi: 10.1097/j.pain.00000000000364. *Journal Impact Factor (2016) = 5.445*

PEER-REVIEWED JOURNAL ARTICLES – SYSTEMATIC REVIEWS:

2024 Flood, A., Cavaleri, R., Chang, W.J., **Kutch, J.J.**, Toufexis, C., & Summers, S.J. Noninvasive brain stimulation beyond the motor cortex: A systematic review and meta-analysis exploring effects on quantitative sensory testing in clinical pain. *Pain Medicine, 26*(2), 98-111. doi: 10.1093/pm/pnae103. *Journal Impact Factor (2024) = 3.0*

2019 Clemens, J.Q., Mullins, C., [*Subsequent authors before last author are listed alphabetically*] Ackerman, A.L., Bavendam, T., van Bokhoven, A., Ellingson, B.M., Harte, S.E., **Kutch, J.J**., Lai, H.H., Martucci, K.T., Moldwin, R., Naliboff, B.D., Pontari, M.A., Sutcliffe, S., & Landis, J.R. Urologic chronic pelvic pain syndrome: Insights from the MAPP Research Network. *Nature Reviews Urology, 16*(3), 187-200. doi: 10.1038/s41585-018-0135-5. *Journal Impact Factor (2019) = 11.0*

- **I wrote neuroimaging section**, and I am one of only two authors acknowledged in contribution section for analyzing data for the article.

PEER-REVIEWED JOURNAL ARTICLES – ORIGINAL RESEARCH:

2025 Schrepf, A.D. Locke, K., Moldwin, R., Williams, D.A., Till, S., Farrar, J., Landis, J.R., Tu, F.F., Rodriguez, L.V., Lai, H.H., Naliboff, B.D., **Kutch, J.J.**, Harte, S.E., Harris, R.E., Kreder, K.J., Spitznagle, T., McKernan, L., Yang, C., Clemens, J.Q., Mullins, C., & Clauw, D.J. Widespread pain moderates the response to centrally-acting therapies in an observational cohort of patients with Urologic Chronic Pelvic Pain Syndrome: A MAPP Research Network study. *Neurourology and Urodynamics, 44*(6), 1290-1295. doi: 10.1002/nau.70068. *Journal Impact Factor (2024) = 1.9*

2025 Banerjee, P., Montiel, M.P., Tomita, L., Means, O., **Kutch, J.J.**, & Culbertson, H. The impact of airflow and multisensory feedback on immersion and cybersickness in a VR surfing simulation. *IEEE Transactions on Visualization and Computer Graphics, 31*(5), 2445-2454. doi: 10.1109/TVCG.2025.3549125. *Journal Impact Factor (2024) = 6.5*

2025 Cavaleri, R.*, McLain, N.J.*, Heindel, M., Schrepf, A., Rodriguez, L.V., & **Kutch, J.J**. Peak alpha frequency is related to the degree of widespread pain, but not pain intensity or duration, among people with urologic chronic pelvic pain syndrome. *Pain Reports, 10*(2), e1251. doi: 10.1097/PR9.0000000000001251. *Journal Impact Factor (2024) = 3.1*

2025 Leech, K.A., Kettlety, S.A., Mack, W.J., Kreder, K.J., Schrepf, A., & **Kutch, J.J**. Brain predicted age in chronic pelvic pain: A study by the Multidisciplinary Approach to the Study of Chronic Pelvic Pain Research Network. *PAIN, 166*(5), 1060-1069. doi: 10.1097/j.pain.0000000000003424. *Journal Impact Factor (2024) = 5.5*

2025 McLain, N.*, Cavaleri, R.*, & **Kutch, J.J**. Peak alpha frequency differs between chronic back pain and chronic widespread pain. *European Journal of Pain, 29(*3), e4737. doi: 10.1002/ejp.4737. *Journal Impact Factor (2024) = 3.4*

2024 Johnson, E.V.*, Bachmann, M., Yani, M.S.*, Eckel, S.P., Garcia, G.I., Rodriguez, L.V., & **Kutch, J.J**. Reducing pain by improving brain and muscle activity with motor cortical neuromodulation in women with interstitial cystitis/bladder pain syndrome: A study protocol for a randomized controlled trial. *Trials, 25*(1), 609. doi: 10.1186/s13063-024-08450-w. *Journal Impact Factor (2024) = 2.0*

2024 Mawla, I., Schrepf, A., **Kutch, J.J.**, Helmuth, M.E., Smith, A.R., Ichesco, E., Yang, C.C., Andreev, V.P., Kreder, K.J., Bradley, C.S., Magnotta, V.A., Kirkali, Z., Harris, R.E., Lai, H.H., & Harte, S.E. Naturalistic bladder filling reveals subtypes in overactive bladder syndrome that differentially engages urinary urgency-related brain circuits: Results from the Symptoms of Lower Urinary Tract Dysfunction Research Network (LURN). *Journal of Urology, 211*(1), 111-123. doi: 10.1097/JU.0000000000003699. *Journal Impact Factor (2024) = 6.8*

2023 Wang, C.C., **Kutch, J.J.**, Labus, J.S., Yang, C.C., Harris, R.E., Mayer, E.A., & Ellingson, B.M. Reproducible microstructural changes in the brain associated with the presence and severity of urologic chronic pelvic pain syndrome (UCPPS): A 3-year longitudinal diffusion tensor imaging study from the MAPP Network. *Journal of Pain, 24*(4), 627-642. doi: 10.1016/j.jpain.2022.11.008. *Journal Impact Factor (2023) = 4.0*

2023 Schrepf, A.D., Mawla, I., Naliboff, B.D., Gallop, B., Moldwin, R.M., Tu, F., Gupta, P., Harte, S., Krieger, J.N., Yang, C., Bradley, C., Rodriguez, L., Williams, D., Magnotta, V., Ichesco, E., Harris, R.E., Clemens, Q., Mullins, C., & **Kutch, J.J**. Neurobiology and long-term impact of bladder-filling pain in humans: A Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) Research Network study. *PAIN, 164*(10), 2343-2351. doi: 10.1097/j.pain.0000000000002944. *Journal Impact Factor (2023) = 5.9*

2022 Macaulay, T.R., Hegarty, A., Yan, L., Duncan, D., Pa, J., **Kutch, J.J.**, La Rocca, M., Lane, C.J., & Schroeder, E.T. Effects of a 12-week periodized resistance training program on resting brain activity and cerebrovascular function: A nonrandomized pilot trial. *Neuroscience Insights, 17*, 26331055221119441. doi: 10.1177/26331055221119441. *Journal Impact Factor (2022) = 3.6*

2022 Hooyman, A., Garbin, A., Fisher, B.E., **Kutch, J.J.**, & Winstein, C.J. (2022). Paired associative stimulation applied to the cortex can increase resting-state functional connectivity: A proof of principle study. *Neuroscience Letters, 784,* 136753. doi: 10.1016/j.neulet.2022.136753. *Journal Impact Factor (2022) = 2.5*

2022 Gupta, P., Gallop, R., Spitznagle, T., Lai, H., Tu, F., Krieger, J.N., Clemens, J.Q., Bradley, C.S., Yang, C., Sutcliffe, S., Moldwin, R., Kreder, K., **Kutch, J.J.**, & Rodriguez, L.V. Is pelvic floor muscle tenderness a distinct urologic chronic pelvic pain syndrome (UCPPS) phenotype? Findings from the Multidisciplinary Approach to the Study of Chronic Pelvic Pain Research Network Symptom Pattern Study. *Journal of Urology, 208*(2), 341-349. doi: 10.1097/JU.0000000000002679. *Journal Impact Factor (2022) = 6.6*

2022 Yani, M.S.*, Eckel, S.P., Kirages, D.J., Rodriguez, L.V., Corcos, D.M., & **Kutch, J.J**. Impaired ability to relax pelvic floor muscles in men with chronic prostatitis/chronic pelvic pain syndrome. *Physical Therapy, 102*(7), pzac059. doi: 10.1093/ptj/pzac059. *Journal Impact Factor (2022) = 3.8*

2022 McLain, N.J.*, Yani, M.S.*, & **Kutch, J.J**. Analytic consistency and neural correlates of peak alpha frequency in the study of pain. *Journal of Neuroscience Methods, 368,* 109460. doi: 10.1016/j.jneumeth.2021.109460. *Journal Impact Factor (2022) = 3.0*

2021 Deutsch, G., Deshpande, H., Lai, H.H., **Kutch, J.J.**, & Ness, T.J. Cerebral perfusion and sensory testing results differ in interstitial cystitis/bladder pain syndrome patients with and without fibromyalgia: A site-specific MAPP Network study. *Journal of Pain Research, 14*, 3887-3895. doi: 10.2147/JPR.S343695. *Journal Impact Factor (2021) = 2.832*

2021 Hegarty, A.K., Hsu, M., Roy, J.S., Kardouni, J.R., **Kutch, J.J.**, & Michener, L.A. Evidence for increased neuromuscular drive following spinal manipulation in individuals with subacromial pain syndrome. *Clinical Biomechanics, 90*, 105485. doi: 10.1016/j.clinbiomech.2021.105485. *Journal Impact Factor (2021) = 2.034*

2021 Macaulay, T.R., Pa, J., **Kutch, J.J.**, Lane, C.J., Duncan, D., Yan, L., & Schroeder, E.T. 12 weeks of strength training improves fluid cognition in older adults: A nonrandomized pilot trial. *PLoS One*, *16*(7), e0255018. doi: 10.1371/journal.pone.0255018. *Journal Impact Factor (2021) = 3.752*

2021 Shih, Y., Fisher, B.E., **Kutch, J.J.**, & Powers, C.M. Corticomotor excitability of gluteus maximus and hip extensor strength: The influence of sex. *Human Movement Science*, *78,* 102830. doi: 10.1016/j.humov.2021.102830. *Journal Impact Factor (2021) = 2.397*

2021 Shih, H.S., Van Dillen, L.R., **Kutch, J.J.**, & Kulig, K. Individuals with recurrent low back pain exhibit further altered frontal plane trunk control in remission than when in pain. *Clinical Biomechanics, 87,* 105391. doi: 10.1016/j.clinbiomech.2021.105391. *Journal Impact Factor (2021) = 2.034*

2020 Mawla, I., Schrepf, A., Ichesco, E., Harte, S.E., Klumpp, D.J., Griffith, J.W., Strachan, E., Yang, C.C., Lai, H., Andriole, G., Magnotta, V.A., Kreder, K., Clauw, D.J., Harris, R.E., Clemens, J.Q., Landis, J.R., Mullins, C., Rodriguez, L.V., Mayer, E.A., & **Kutch, J.J**. Natural bladder filling alters resting brain function at multiple spatial scales: A proof-of-concept MAPP Network neuroimaging study. *Scientific Reports, 10*(1), 19901. doi: 10.1038/s41598-020-76857-x. *Journal Impact Factor (2020) = 4.38*

2020 Hegarty, A.K.*, Yani, M.S.*, Albishi, A.*, Michener, L.A., & **Kutch JJ**. Salience network functional connectivity is spatially heterogeneous across sensorimotor cortex in healthy humans. *Neuroimage, 221,* 117177. doi: 10.1016/j.neuroimage.2020.117177. *Journal Impact Factor (2020) = 6.556*

2020 Fenske, S.J.*, Bierer, D., Chelimsky, G., Conant, L., Ustine, C., Yan, K., Chelimsky, T., & **Kutch, J.J**. Sensitivity of functional connectivity to periaqueductal gray localization, with implications for identifying disease-related changes in chronic visceral pain: A MAPP Research Network neuroimaging study. *Neuroimage-Clinical*, *28,* 102443. doi: 10.1016/j.nicl.2020.102443. *Journal Impact Factor (2020) = 4.881*

2020 Varghese, R., **Kutch, J.J.**, Schweighofer, N., & Winstein, C.J. The probability of choosing both hands depends on an interaction between motor capacity and limb-specific control in chronic stroke. *Experimental Brain Research*, *238*(11), 2569-2579. doi: 10.1007/s00221-020-05909-5. *Journal Impact Factor (2020) = 1.972*

2020 Clemens, J.Q., **Kutch, J.J.**, Mayer, E.A., Naliboff, B.D., Rodriguez, L.V., Klumpp, D., Schaeffer, A.J., Kreder, K.J., Clauw, D.J., Harte, S.E., Schrepf, A.D., Williams, D.A., Andriole, G.L., Lai, H.H., Buchwald, D., Lucia, M.S., Mackey, S., Moldwin, R.M., Pontari, M.A., Stephens-Shields, A.J., Mullins, C., & Landis, J.R. The Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) Research Network: Design and implementation of the Symptom Patterns Study (SPS). *Neurourology and Urodynamics*, *39*(6), 1803-1814. doi: 10.1002/nau.24423. *Journal Impact Factor (2020) = 2.696*

2020 Barradas, V.R., **Kutch, J.J.**, Kawase, T., Koike, Y., & Schweighofer, N. When 90% of the variance is not enough: Residual EMG from muscle synergy extraction influences task performance. *Journal of Neurophysiol*ogy, *123*(6), 2180-2190. doi: 10.1152/jn.00472.2019. *Journal Impact Factor (2020) = 2.714*

2019 Kuo, Y.-L., **Kutch, J.J.**, & Fisher, B.E. Relationship between interhemispheric inhibition and dexterous hand performance in musicians and non-musicians. *Scientific Reports*, *9*(1), 11574. doi: 10.1038/s41598-019-47959-y. *Journal Impact Factor (2019) = 3.998*

2019 Gupta, A., Bhatt, R.R., Naliboff, B.D., **Kutch, J.J.**, Labus, J.S., Vora, P.P., Alaverdyan, M., Schrepf, A., Lutgendorf, S., & Mayer, E.A. Impact of early adverse life events and sex on functional brain networks

in patients with urological chronic pelvic pain syndrome (UCPPS): A MAPP Research Network study. *PLoS One*, *14*(6), e0217610. doi: 10.1371/journal.pone.0217610. *Journal Impact Factor (2019) = 2.74*

2019 Yani, M.S.*, Fenske, S.J.*, Rodriguez, L.V., & **Kutch, J.J**. Motor cortical neuromodulation of pelvic floor muscle tone: Potential implications for the treatment of urologic conditions. *Neurourology and Urodynamics*, *38*(6), 1517-1523. doi: 10.1002/nau.24014. *Journal Impact Factor (2019) = 2.037*

2019 Aguiniga, L.M., Yang, W., Yaggie, R.E., Schaeffer, A.J., Klumpp, D.J., & MAPP Research Network Study Group [*including* **Kutch, J.J.**]. Acyloxyacyl hydrolase modulates depressive-like behaviors through aryl hydrocarbon receptor. *American Journal of Physiology-Regulatory Integrative and Comparative Physiology, 317*(2), R289-R300. doi: 10.1152/ajpregu.00029.2019. *Journal Impact Factor (2019) = 3.026*

2019 Ackerman, A.L., Anger, J.T., & MAPP Research Network Study Group [*including* **Kutch, J.J.**]. Optimization of DNA extraction from human urinary samples for mycobiome community profiling. *PLoS One*, *14*(4), e0210306. doi: 10.1371/journal.pone.0210306. *Journal Impact Factor (2019) = 2.74*

2019 Nickel, J.C., Stephens-Shield, A.J., Landis, J.R., Mullins, C., & MAPP Research Network Study Group [*including* **Kutch, J.J.**]. A culture-independent analysis of the microbiota of female interstitial cystitis/bladder pain syndrome participants in the MAPP Research Network. *Journal of Clinical Medicine, 8*(3), 415. doi: 10.3390/jcm8030415. *Journal Impact Factor (2019) =3.303*

2018 Woodworth, D.C., Dagher, A., Curatolo, A., Sachdev, M., Ashe-McNalley, C., Naliboff, B.D., Labus, J.S., Landis, J.R., **Kutch, J.J.**, Mayer, E.A., Lee, R.S., Moses, M.A., & Ellingson, B.M. Changes in brain white matter structure are associated with urine proteins in urologic chronic pelvic pain syndrome (UCPPS): A MAPP Network study. *PLoS ONE*, *13*(12), e0206807. doi: 10.1371/journal.pone.0206807. *Journal Impact Factor (2018) = 2.776*

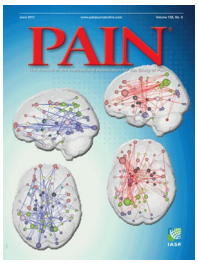
2018 Yani, M.S.*, Wondolowski, J.H., Eckel, S.P., Kulig, K., Fisher, B.E., Gordon, J.E., & **Kutch, J.J**. Distributed representation of pelvic floor muscles in human motor cortex. *Scientific Reports*, *8*(1), 7213. doi: 10.1038/s41598-018-25705-0. *Journal Impact Factor (2018) = 4.011*

2017 **Kutch, J.J.**, Ichesco, E., Hampson, J.P., Labus, J.S., Farmer, M.A., Martucci, K.T., Ness, T.J., Deutsch, G., Apkarian, A.V., Mackey, S.C., Klumpp, D.J., Schaeffer, A.J., Rodriguez, L.V., Kreder, K.J., Buchwald, D., Andriole, G.L., Lai, H.H., Mullins, C., Kusek, J.W., Landis, J.R., Mayer, E.A., Clemens, J.Q., Clauw, D.J., & Harris, R.E. Brain signature and functional impact of centralized pain: A Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) Network study. *PAIN*, *158*(10), 1979-1991. doi: 10.1097/j.pain.0000000000001001. *Journal Impact Factor (2017) = 5.559*

- **Editor's choice article (October 2017 Issue)**

2017 Smith, J.A., Albishi, A.*, Babikian, S.*, Asavasopon, S., Fisher, B.E., & **Kutch, J.J**. The motor cortical representation of a muscle is not homogeneous in brain connectivity. *Experimental Brain Research*, *235*(9), 2767-2776. doi: 10.1007/s00221-017-5011-7. *Journal Impact Factor (2017) = 1.806*

2017 **Kutch, J.J.**, Labus, J.S., Harris, R.E., Martucci, K.T., Farmer, M.A., Fenske, S.*, Fling, C., Ichesco, E., Peltier, S., Petre, B., Guo, W., Hou, X., Stephens, A.J., Mullins, C., Clauw, D.J., Mackey, S.C., Apkarian, A.V., Landis, J.R., & Mayer, E.A. Resting-state functional connectivity predicts longitudinal



pain symptom change in urologic chronic pelvic pain syndrome: A MAPP Network study. *PAIN*, *158*(6), 1069-1082. doi: 10.1097/j.pain.0000000000000886. *Journal Impact Factor (2017) = 5.559*

- **Cover article in June 2017 issue**

2017 Reyes, A., Laine, C.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. Beta-band corticomuscular drive reflects muscle coordination strategies. *Frontiers in Computational Neuroscience*, *11*, 17. doi: 10.3389/fncom.2017.00017. *Journal Impact Factor (2017) = 2.073*

2017 Duff, S.V., Sargent, B., **Kutch, J.J.**, Berggren, J., Leiby, B.E., & Fetters, L. Using contingent reinforcement to augment muscle activation after perinatal brachial plexus injury: A pilot study. *Physical & Occupational Therapy in Pediatrics*, *37*(5), 555-565. doi: 10.1080/01942638.2017.1290733. *Journal Impact Factor (2017) = 1.719*

2017 Babikian, S.*, Kanso, E., & **Kutch, J.J**. Cortical activity predicts good variation in human motor output. *Experimental Brain Research*, *235*(4), 1139-1147. doi: 10.1007/s00221-017-4876-9. *Journal Impact Factor (2017) = 1.806*

2016 Huang, L., **Kutch, J.J.**, Ellingson, B.M., Martucci, K.T., Harris, R.E., Clauw, D.J., Mackey, S., Mayer, E.A., Schaeffer, A.J., & Apkarian, A.V. Brain white matter changes associated with urological chronic pelvic pain syndrome: Multisite neuroimaging from a MAPP case-control study. *PAIN*, *157*(12), 2782-2791. doi: 10.1097/j.pain.0000000000000703. *Journal Impact Factor (2016) = 5.445*

2015 Woodworth, D., Mayer, E., Leu, K., Ashe-McNalley, C., Naliboff, B.D., Labus, J.S., Tillisch, K., **Kutch, J.J.**, Farmer, M.A., Apkarian, A.V., Johnson, K.A., Mackey, S.C., Ness, T.J., Landis, J.R., Deutsch, G., Harris, R.E., Clauw, D.J., Mullins, C., & Ellingson, B.M. Unique microstructural changes in the brain associated with urological chronic pelvic pain syndrome (UCPPS) revealed by diffusion tensor MRI, super-resolution track density imaging, and statistical parameter mapping: A MAPP Network neuroimaging study. *PLoS ONE*, *10*(10), e0140250. doi: 10.1371/journal.pone.0140250. *Journal Impact Factor (2015) = 3.057*

2015 Rana, M.*, Yani, M.S.*, Asavasopon, S.*, Fisher, B.E., & **Kutch, J.J**. Brain connectivity associated with muscle synergies in humans. *Journal of Neuroscience*, *35*(44), 14708-14716. doi: 10.1523/JNEUROSCI.1971-15.2015. *Journal Impact Factor (2015) = 5.924*

2015 **Kutch, J.J.**, Yani, M.S.*, Asavasopon, S.*, Kirages, D.J., Rana, M.*, Cosand, L.*, Labus, J.S., Kilpatrick, L.A., Ashe-McNalley, C., Farmer, M.A., Johnson, K.A., Ness, T.J., Deutsch, G., Harris, R.E., Apkarian, A.V., Clauw, D.J., Mackey, S.C., Mullins, C., & Mayer, E.A. Altered resting state neuromotor connectivity in men with chronic prostatitis/chronic pelvic pain syndrome: A MAPP Research Network neuroimaging study. *NeuroImage-Clinical*, *8,* 493-502. doi: 10.1016/j.nicl.2015.05.013. *Journal Impact Factor (2015) = 3.857*

2015 Roll, S.C., Rana, M.*, Sigward, S.M., Yani, M.S.*, Kirages, D.J., & **Kutch, J.J**. Reliability of superficial male pelvic floor structural measurements using linear-array transperineal sonography. *Ultrasound in Medicine and Biology*, *41*(2), 610-617. doi: 10.1016/j.ultrasmedbio.2014.09.008. *Journal Impact Factor (2015) = 2.298*

2014 Asavasopon, S.*, Rana, M.*, Kirages, D.J., Yani, M.S.*, Fisher, B.E., Hwang, D.H., Lohman, E.B., Berk, L.S., & **Kutch, J.J**. Cortical activation associated with muscle synergies of the human male pelvic

floor. *Journal of Neuroscience*, *34*(41), 13811–13818. doi: 10.1523/JNEUROSCI.2073-14.2014. *Journal Impact Factor (2014) = 6.344*

2014 Kilpatrick, L.A., **Kutch, J.J.**, Tillisch, K., Naliboff, B.D., Labus, J.S., Jiang, Z., Farmer, M.A., Apkarian, A.V., Mackey, S.C., Martucci, K.T., Clauw, D.J., Harris, R.E., Deutsch, G., Ness, T.J., Yang, C.C., Maravilla, K., Mullins, C., & Mayer, E.A. Alterations in resting state oscillations and connectivity in sensory and motor networks in women with interstitial cystitis/painful bladder syndrome. *Journal of Urology*, *192*(3), 947–955. doi: 10.1016/j.juro.2014.03.093. *Journal Impact Factor (2014) = 4.360*

2013 Dayanidhi, S., **Kutch, J.J.**, & Valero-Cuevas, F.J. Decrease in muscle contraction time complements neural maturation in the development of dynamic manipulation. *Journal of Neuroscience*, *33*(38), 15050–15055. doi: 10.1523/JNEUROSCI.1968-13.2013. *Journal Impact Factor (2013) = 6.747*

2013 Roll, S.C., & **Kutch, J.J**. Transperineal sonography evaluation of muscles and vascularity in the male pelvic floor. *Journal of Diagnostic Medical Sonography*, *29*(1), 3-10. doi: 10.1177/8756479312472394. *No ISI journal impact factor in 2013*

- **2nd place winner of the 2013 Kenneth R. Gottesfeld Award,** recognizing sonographer authors for the publication of outstanding research or review articles in the *Journal of Diagnostic Medical Sonography*

2012 Inouye, J.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. A novel synthesis of computational approaches enables optimization of grasp quality of tendon-driven hands. *IEEE Transactions on Robotics*, *28*(4), 958-966. doi: 10.1109/TRO.2012.2196189. *Journal Impact Factor (2012) = 2.571*

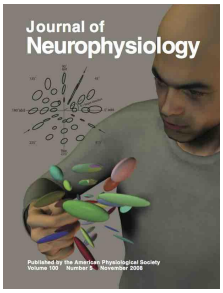
2012 **Kutch, J.J.**, & Valero-Cuevas, F.J. Challenges and new approaches to proving the existence of muscle synergies of neural origin. *PLoS Computational Biology*, *8(*5), e1002434. doi: 10.1371/journal.pcbi.1002434. *Journal Impact Factor (2012) = 4.867*

2011 **Kutch, J.J.**, & Valero-Cuevas, F.J. Muscle redundancy does not imply robustness to muscle dysfunction. *Journal of Biomechanics*, *44*(7), 1264-1270. doi: 10.1016/j.jbiomech.2011.02.014. *Journal Impact Factor (2011) = 2.434*

2010 **Kutch, J.J.**, Kuo, A.D., & Rymer, W.Z. Extraction of individual muscle mechanical action from endpoint force. *Journal of Neurophysiology*, *103*(6), 3535-3546. doi: 10.1152/jn.00956.2009. *Journal Impact Factor (2010) = 3.114*

2009 Valero-Cuevas, F.J., Hoffmann, H., Kurse, M.U., **Kutch, J.J.**, & Theodorou, E.A. Computational models for neuromuscular function. *IEEE Reviews in Biomedical Engineering*, *2,* 110-135. doi: 10.1109/RBME.2009.2034981. *No ISI journal impact factor*

2008 **Kutch, J.J.**, Kuo, A.D., Bloch, A.M., & Rymer, W.Z. Endpoint force fluctuations reveal flexible rather than synergistic patterns of muscle cooperation. *Journal of Neurophysiology, 100*(5), 2455-2471. doi: 10.1152/jn.90274.2008. *Journal Impact Factor (2008) = 3.648*



- **Cover article in November 2008 issue**
- Article of **outstanding** interest in review by Tresch, M.C., & Jarc, A. (2009). The case for and against muscle synergies. *Current Opinion in Neurobiology, 19,* 1-7.

2007 **Kutch, J.J.**, Suresh, N.L., Bloch, A.M., & Rymer, W.Z. Analysis of the effects of firing rate and synchronization on spike-triggered averaging of multidirectional motor unit torque. *Journal of Computational Neuroscience, 22*(3), 347–361. doi: 10.1007/s10827-007-0023-0. *Journal Impact Factor (2007) = 1.928*

2001 **Kutch, J.J.**, & Buchanan, T.S. Human elbow joint torque is linearly encoded in electromyographic signals from multiple muscles. *Neuroscience Letters*, *311*(2), 97-100. doi: 10.1016/S0304-3940(01)02146-2. *Journal Impact Factor (2001) = 2.021*

PEER-REVIEWED PROCEEDINGS PAPERS:

2025 Banerjee, P., Cherin, J., Upadhyay, J., Finley, J., **Kutch, J.J.**, & Culbertson, H. Perception and control of surfing in virtual reality using a 6-DoF motion platform. *EuroHaptics 2024 Conference Proceedings: International Conference on Human Haptic Sensing and Touch Enabled Computer Applications*, 455-468. doi: 10.1007/978-3-031-70061-3_38

2010 **Kutch, J.J.**, & Valero-Cuevas, F.J. Computational hypothesis testing for neuromuscular systems. *IEEE Engineering in Medicine and Biology Society 2010 Conference Proceedings*, 5436-5439. doi: 10.1109/IEMBS.2010.5626515

2010 **Kutch, J.J.**, & Valero-Cuevas, F.J. Complete solution sets for neuromuscular models reveal how mechanical constraints limit neural control options. *Proceedings of the 2010 ASME Summer Bioengineering Conference*, 863-864.

BOOK CHAPTERS:

2014 Inouye, J.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. Optimizing the topology of tendon-driven fingers: Rationale, predictions and implementation. In R. Balasubramanian & V.J. Santos (Eds.), *Human hands as an inspiration for robot hand development* (pp. 247-266). Springer.

DISSERTATION AND THESIS:

2008 **Kutch, J.J.** Signal in human motor unsteadiness: Determining the action and activity of muscles. Applied and Interdisciplinary Mathematics, University of Michigan.

2001 **Kutch, J.J.** State observability in neuromuscular control systems: Optimal subspace representations and EMG reconstructions. Mechanical Engineering, Princeton University.

- **Awarded best thesis in Mechanical Engineering**.

NEWS RELEASES:

2024 "Surfing for chronic pain." KTLA News. Available as of 11/5/2024 at: https://www.youtube.com/watch?v=2H2bF3PuLxA

2024 "Surfing to take away the suffering." Feature article in Princeton Alumni Weekly Magazine. Available as of 3/4/2024 at: https://paw.princeton.edu/article/surfing-take-away-suffering

2023 "Scientists probe how surfing could help chronic pain." USC News. Available as of 06/27/2023 at: https://pt.usc.edu/news/scientists-probe-how-surfing-could-help-chronic-pain/

2021 "Chronic prostatitis/pelvic pain syndrome series (part 1 of 3): The research/science perspective with Jason Kutch, PhD." The Prostate Health Podcast with Dr. Garrett Pohlman. Available as of 03/11/2021 at: https://www.prostatehealthpodcast.com/52

2020 "Grant supports research on chronic, debilitating condition in women." USC News. Available as of 10/29/2020 at: https://pt.usc.edu/2020/08/20/a-different-approach/

2020 "Scientists receive grant to research novel approach for treating painful pelvic disorder." HSC News. Available as of 10/29/2020 at: https://hscnews.usc.edu/scientists-receive-grant-to-research-novel-approach-for-treating-painful-pelvic-disorder

2019 "Pelvic pain researchers receive federal grant to continue groundbreaking study." USC News. Available as of 9/20/2019 at: https://news.usc.edu/160284/pelvic-pain-research-federal-grant-ucpps/

2017 "Chronic pelvic pain affects millions, but not much is known about it." USC News. Available as of 5/28/2018 at: https://news.usc.edu/116282/chronic-pelvic-pain-affects-millions-but-not-much-is-known-about-it/

2015 "Training the brain to reprogram muscles: Dr. Jason Kutch speaks on CPP." Pelvic Messenger. Available as of 5/28/2018 at: http://www.blogtalkradio.com/pelvicmessenger/2015/02/23/training-the-brain-to-reprogram-muscles-dr-jason-kutch-speaks-on-cpp

2014 "How pelvic muscles help delay urination." Digital Journal. Available as of 5/28/2018 at: http://www.digitaljournal.com/science/how-pelvic-muscles-help-delay-urination/article/409448

2014 "Neuro-insights into holding it." The Scientist. Available as of 5/28/2018 at: http://www.the-scientist.com/?articles.view/articleNo/41248/title/Neuro-Insights-into-Holding-It/

2014 "The neuroscience of holding it." USC News. Available as of 5/28/2018 at: https://pressroom.usc.edu/the-neuroscience-of-holding-it/

MAJOR PUBLIC PRESENTATIONS

INVITED, INTERNATIONAL KEYNOTE:

2023 **Kutch, J.J.** Disrupted central pain processing in individuals with chronic overlapping pain conditions (COPCs). *Pain Research at Western Symposium*. Western Bone and Joint Institute & Western Neuroscience Institute, University of Western Ontario, London, Ontario, Canada.

INVITED, KEYNOTE:

2024 **Kutch, J.J.** Surf therapy in real and virtual worlds: Scientific and engineering possibilities. *International Surf Therapy Organization (ISTO) Annual Meeting*. Manhattan Beach, CA.

2020 **Kutch, J.J.** [State of the Art Keynote Lecture] Motor cortical treatment targets for chronic pelvic pain: Big data, small data, and clinical trials. *The Society for Pelvic Research 5th Annual Meeting*. Virtual.

2016 **Kutch, J.J.** A moving story about brains: Blissful function and painful dysfunction in brain connectivity of movement control. *Herman Ostrow School of Dentistry of USC Research Day.* Los Angeles, CA.

INVITED, INTERNATIONAL:

2024 **Kutch, J.J.** Neural contributions to sexual pain. *International Society for the Study of Women's Sexual Health*. Long Beach, CA.

2024 **Kutch, J.J.** Pain imaging with an eye toward neuromodulation. *Human Pain Seminar Series Summit: Advances in Pain Neuroimaging—Harnessing Individual Differences to Delineate Mechanisms and Biomarkers of Disease*. University of Toronto Centre for the Study of Pain, Toronto, Ontario, Canada.

2023 **Kutch, J.J.** Disrupted central pain processing in individuals with chronic overlapping pain conditions (COPCs). *University of Toronto Centre for the Study of Pain Seminar*. Toronto, Ontario, Canada.

2023 **Kutch, J.J.** Chronic overlapping pain conditions: Neurobiology and clinical implications. *Balgrist University Hospital Seminar.* Zurich, Switzerland.

2022 **Kutch, J.J.** Transcranial magnetic stimulation of brain centers controlling pelvic floor muscles for the treatment of chronic pelvic pain. *2022 Winter Meeting of the Society of Urodynamics, Female Pelvic Medicine, and Urogenital Reconstruction (SUFU)*. San Diego, CA.

2021 **Kutch, J.J.** Motor cortical treatment targets for chronic pelvic pain: Big data, small data, and clinical trials. *4th International Brain Stimulation Conference.* Charleston, SC.

2020 **Kutch, J.J.** Pelvic pain with chronic overlapping pain conditions: Clinical impact, brain changes and a model for development. *2020 International Pelvic Pain Society Meeting*. Virtual.

2019 **Kutch, J.J.** Finding the central in centralized pain: Connectivity between the sensorimotor and pain networks in the human brain. *World Congress on Low Back and Pelvic Girdle Pain*. Antwerp, Belgium.

2018 **Kutch, J.J.** Functional/structural MRI to identify stratifying factors in chronic pelvic pain. *17th World Congress on Pain*, *International Association for the Study of Pain (IASP)*. Boston, MA.

2018 **Kutch, J.J.** Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP): Functional MRI for chronic pelvic pain. *International Continence Society*. Philadelphia, PA.

2017 **Kutch, J.J.** Decoding the past and future of symptoms from brain imaging in individuals with urologic chronic pelvic pain syndrome. *2017 International Pelvic Pain Society Meeting*. Washington, D.C.

2014 **Kutch, J.J.** Proving the existence of muscle synergies of neural origin. *International Workshop on Muscle Synergies*. Ospedale San Camillo, Venice, Italy.

2014 **Kutch, J.J.** Altered brain motor control networks in men with chronic pelvic pain: A MAPP Network neuroimaging study. *2014 International Pelvic Pain Society Meeting*. Chicago, IL.

2012 **Kutch, J.J.** Simultaneous pelvic floor physical therapy and functional brain imaging: Applications to mind-body interactions in chronic pain. *2012 International Pelvic Pain Society Meeting*. Chicago, IL.

2009 **Kutch, J.J.** Noise as a window to neuromuscular function: A tutorial. *Workshop on Noise, Delays and Balance Control*. Banff International Research Station for Mathematical Innovation and Discovery, Alberta, Canada.

2008 **Kutch, J.J.** Flexible motor action but simple neural architecture: Is it possible?" *Simon Fraser University Department of Biomedical Physiology and Kinesiology Seminar*. British Columbia, Canada.

2006 **Kutch, J.J.** Using spike-triggered averaging to investigate differential force generation and connectivity among motor units. *Motoneurons and their Firing Properties*. Panum Institute, Copenhagen, Denmark.

INVITED, NATIONAL:

2025 **Kutch, J.J.** Neural mechanisms of COPCs: From brain signals to immersive virtual reality. *University of Michigan Conference on Nociplastic & Chronic Overlapping Pain Conditions*. Ann Arbor, MI.

2024 **Kutch, J.J.** The brain in individuals with widespread body pain: What do we know and what can be done? *Washington University in St. Louis Program in Physical Therapy Seminar,* St. Louis, MO.

2022 **Kutch, J.J.** Central neuromodulation for pain: From pelvic pain to chronic overlapping pain conditions. *National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK) Workshop: Neurourology—Bridging Basic and Clinical Science to Understand Urologic Disease.* Virtual.

2022 **Kutch, J.J.** The brain in chronic pelvic pain: Summary of results from the MAPP Research Network. *Annual Meeting of the American Urological Association*. New Orleans, LA.

2022 **Kutch, J.J.** Mapping and modulating the brain in chronic pelvic pain: Insights from the MAPP Research Network that are directing new clinical trials. *United States Association for the Study of Pain (USASP) Abdominal and Pelvic Pain Special Interest Group (SIG)*. Virtual.

2022 **Kutch, J.J.** Neuroimaging in MAPP: Insights into disease, and uncovering new treatment targets. *National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK) Workshop: Research Advances for Urologic Chronic Pelvic Pain Syndrome—Informing the Next Generation of Clinical Studies*. Virtual.

2021 **Kutch, J.J.** Motor cortical treatment targets for chronic pelvic pain: Big data, small data and clinical trials. *Center for Neuroregeneration Lecture Series*. Houston Methodist Academic Institute, Houston, TX.

2018 **Kutch, J.J.** Motor cortex and the real reason for chronic pain. *Ohio Musculoskeletal and Neurological Institute Seminar Series*. Ohio University, Athens, OH.

2017 **Kutch, J.J.** Neuroimaging of the motor system in chronic pelvic pain. *University of Florida Applied Physiology and Kinesiology Seminar.* Gainesville, FL.

2017 **Kutch, J.J.** Neuroimaging of the motor system in chronic pelvic pain. *Northwestern University Physical Therapy Seminar*. Chicago, IL.

2016 **Kutch, J.J.** Summary of neuroimaging findings from the MAPP Research Network. *Annual Meeting of the Society for Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU)*. New Orleans, LA.

2016 **Kutch, J.J.** Motor cortical changes in chronic pain: Is the core of the problem in the core of the brain? *2016 Combined Sections Meeting of the American Physical Therapy Association*. Anaheim CA.

2014 **Kutch, J.J.** The muscle synergies you didn't know you have: Cortical coordination of pelvic floor and non-pelvic floor muscles. *Sensory Motor Performance Program Seminar*. Rehabilitation Institute of Chicago, Chicago, IL.

2013 **Kutch, J.J.** Men's health issues: An introduction from front to rear. *2013 Combined Sections Meeting of the American Physical Therapy Association*. San Diego, CA.

2012 **Kutch, J.J.** Central and peripheral dynamics in chronic prostatitis/chronic pelvic pain syndrome. *Northwestern University Physiology Seminar*, Chicago, IL.

2012 **Kutch, J.J.** Is math the cause of or cure for chronic pain? New approaches to the perplexing problem of pain. **Invited lecture as distinguished alumnus** for series celebrating the Centennial of the Rackham Graduate School, University of Michigan, Ann Arbor, MI.

2012 **Kutch, J.J.** Neuromechanics and the spinal cord. *2012 Computational Sensorimotor Neuroscience Summer School*. Northwestern University, Chicago, IL.

2008 **Kutch, J.J.** Force variability as an indicator of neural control dimensionality. *Biomechanics: Muscle, Limb, and Brain*. Mathematical Biosciences Institute, The Ohio State University, Columbus, OH.

INVITED, STATE:

2021 **Kutch, J.J.** Unravelling fronto-parietal brain networks in chronic pain. *UCLA Computational Medicine Research Frontiers in Biomathematics Seminar Series*. Los Angeles, CA.

2020 **Kutch, J.J.** Motor cortical treatment targets for chronic pelvic pain: Big data, small data, and dlinical trials. *UCLA Neuromodulation Seminar.* Los Angeles, CA.

2015 **Kutch, J.J.** Unraveling a brain interface between skeletal muscle function and the viscera in humans. *13th Annual UCLA Center for the Neurobiology of Stress and Resilience Basic and Translational Science Symposium: Sex Differences and the Brain Gut Axis.* Los Angeles, CA.

2015 **Kutch, J.J.** Mapping and therapeutically targeting the brain network of pelvic floor muscle control. *UCLA Bioengineering Seminar*. Los Angeles, CA.

2012 **Kutch, J.J.** Simultaneous pelvic floor physical therapy and brain imaging in chronic pelvic pain. *19th Joint Symposium on Neural Computation* University of California-Riverside, Riverside, CA.

2012 **Kutch, J.J.** Simultaneous pelvic floor physical therapy and brain imaging in chronic pelvic pain. *UCLA Center for the Neurobiology of Stress and Resilience Seminar*. Los Angeles, CA.

2011 **Kutch, J.J.** Is math the cause of or cure for chronic pain? New approaches to the perplexing problem of pain. *6th Annual Symposium for the UCLA Biotechnology Training in Biomedical Sciences and Engineering Program*. Los Angeles, CA.

2009 **Kutch, J.J.** Muscle synergies without a brain or spinal cord. *UCLA Bioengineering Seminar*. Los Angeles, CA.

2008 **Kutch, J.J.** Non-invasive muscle activity measurement using physiological tremor in the human finger. *UCSD Orthopedics Seminar*. San Diego, CA.

INVITED, LOCAL:

2024 **Kutch, J.J.** Biohacking for pain: Exploring the mind-body connection with movement-based virtual reality. *USC Marshall School of Business Faculty/Staff Conference.* Los Angeles, CA.

2019 **Kutch, J.J.** Central and peripheral mechanisms of pain: The importance of where it hurts. *USC Symposium: Current Concepts in Spine*. Los Angeles, CA.

2012 **Kutch, J.J.** Simultaneous pelvic floor physical therapy and functional brain imaging: Applications to mind- body interactions in chronic pain. *USC Biokinesiology and Physical Therapy NeuroRehabilitation Seminar*. Los Angeles, CA.

2011 **Kutch, J.J.** Applying mathematical physiology to unravel compromised neuromuscular control in chronic pain. *USC Engineering, Neuroscience, and Health Seminar Series*. Los Angeles, CA.

2010 **Kutch, J.J.** May the best muscles win: New insights into how the nervous system controls multiple muscles. *USC Biomedical Engineering Seminar*. Los Angeles, CA.

2009 **Kutch, J.J.** Muscle redundancy revisited: If muscles are redundant, which one can you spare? *USC Biokinesiology Division Seminar*. Los Angeles, CA.

2007 **Kutch, J.J.** An experimental approach to muscle redundancy. *University of Michigan Mathematical Biology Seminar*. Ann Arbor, MI.

2007 **Kutch, J.J.** Non-uniform patterns of multidirectional isometric force noise. *Neural Signal Processing Seminar*. Rehabilitation Institute of Chicago, Chicago, IL.

2003 **Kutch, J.J.** Eigenfaces: Decomposing facial image databases into orthogonal components. *University of Michigan Applied Mathematics Seminar*. Ann Arbor, MI.

2002 **Kutch, J.J.** Hodgkin-Huxley: From neuron to equation. *University of Michigan Mathematical Biology Seminar*. Ann Arbor, MI.

2002 **Kutch, J.J.** Does the CNS encode torque to control movement? *Mid-Atlantic Motor Control Meeting*. University of Delaware, Newark, DE.

REFEREED, INTERNATIONAL:

2020 **Kutch, J.J.** Chronic pelvic pain syndromes: Recent developments in the pathophysiology, assessment and management of this poorly understood and multidimensional problem. *International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) Conference.* Melbourne, Australia. *Conference cancelled due to COVID-19*

2018 **Kutch, J.J.** Neuroimaging-derived biomarkers of chronic pelvic pain in the motor system. *International Society of Electrophysiology and Kinesiology (ISEK)*. Dublin, Ireland.

2017 **Kutch, J.J.** Neuroimaging of the motor system in chronic pelvic pain. *The Motor System in Acute and Chronic Pain Symposium at the 27th Annual Meeting of the Society for the Neural Control of Movement.* Dublin, Ireland.

2016 **Kutch, J.J.** Function and dysfunction in brain connectivity coordinating muscle synergies in humans. *International Society of Electrophysiology and Kinesiology (ISEK).* Chicago, IL.

2015 **Kutch, J.J.** Distinct motor cortical regions associated with human pelvic floor muscle synergies. *25th Annual Meeting of the Society for the Neural Control of Movement.* Charleston, SC.

2011 **Kutch, J.J.** EMG is not recruitment. *Myths and Monsters in Motor Control at the 21st Annual Meeting of the Society for the Neural Control of Movement*. San Juan, Puerto Rico.

2010 **Kutch, J.J.** Computational hypothesis testing for neuromuscular systems. *32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*. Buenos Aires, Argentina.

REFEREED, NATIONAL:

2013 **Kutch, J.J.** Cortical control of pelvic musculature: Stimulation and functional imaging. *Annual Meeting for the American Society of Biomechanics*. Omaha, NE.

2011 **Kutch, J.J.** Biomechanics to brain: Unraveling the complex neural connectivity of multi-muscle control. *Annual Meeting for the American Society of Biomechanics*. Long Beach, CA.

2010 **Kutch, J.J.** Biomechanical and experimental confounds to the detection of neurally-generated muscle synergies. *Annual Meeting for the American Society of Biomechanics*. Providence, RI.

2009 **Kutch, J.J.** Simple finger movements require complex coordination of excursions and forces across all muscles. *Annual Meeting for the American Society of Biomechanics*. State College, PA.

PUBLISHED ABSTRACTS:

2024 Upadhyay, J., Cherin, J.M., & **Kutch, J.J.** Effects of surf therapy on patients with chronic overlapping pain conditions: A pilot study. *International Association for the Study of Pain - World Congress of Pain*. Amsterdam, Netherlands.

2024 Heindel, M.D., **Kutch, J.J.**, Vila-Dieguez, O., & Michener, L.A. Dual dysfunction: Brain and tendon biomarkers of recovery for rotator cuff tendinopathy. *International Association for the Study of Pain – World Congress of Pain.* Amsterdam, Netherlands.

2023 Heindel, M.D., **Kutch, J.J.**, & Michener, L.A. Resting-state brain activity in rotator cuff tendinopathy revealed trait-like differences from pain-free controls. *Combined Sections Meeting of the American Physical Therapy Association*. San Diego, CA.

2022 Leech, K.A., Kettlety, S.A., Fan, S.X., Gasmin, E., & **Kutch, J.J**. Chronic pelvic pain is not associated with accelerated brain aging: A 3-year longitudinal study from the MAPP Research Network. *Society for Neuroscience (SfN) Annual Meeting.* San Diego, CA.

2022 Yani, M.S., & **Kutch, J.J**. Chronic pain intensity and affect disassociate in fronto-parietal networks. *Society for Neuroscience (SfN) Annual Meeting.* San Diego, CA.

2022 McLain, N.J., & **Kutch, J.J.** Brain connectivity changes associated with pain fluctuations in a 3-year longitudinal study of chronic pelvic pain: A MAPP Research Network study. *Society for Neuroscience (SfN) Annual Meeting.* San Diego, CA.

2021 Mawla, I., Schrepf, A., Helmuth, M.E., Ichesco, E., Lai, H.H., Yang, C., Smith, A.R., Andreev, V.P., **Kutch, J.J.**, Harte, S.E., & Harris, R.E. Latent class trajectory models of urge during natural bladder filling identifies subtypes of overactive bladder syndrome: A Symptoms of Lower Urinary Tract Dysfunction Research Network (LURN) study. *American Urological Association Annual Meeting*. Las Vegas, NV.

2020 Mawla, I., Schrepf, A., Ichesco, E., **Kutch, J.J.**, Lai, H.H., Helmuth, M.E., Andreev, V.P., Harris, R.E., Kirkali, Z., Harte, S.E., & LURN Study Group. Subtypes of sensory sensitivity in overactive bladder syndrome: Results of neuroimaging and sensory testing from the Symptoms of Lower Urinary Rract Dysfunction Research Network (LURN). *Journal of Urology*, *203*(Suppl 4), e795.

2020 Locke, K., Lai, H.H., Pontari, M.A., Clemens, J.Q., Kreder, K.J., Krieger, J.N., Andriole, G.L., Mayer, E.A., **Kutch, J.J.**, Rodriguez, L.V., & Naliboff, B.D. Discovery, validation and novel visualization of subgroups in urologic chronic pelvic pain syndrome (UCPPS): Consensus clustering findings from the MAPP Research Network. *Journal of Urology*, *203*(Suppl 4), e104.

2020 Mawla, I., Schrepf, A., Ichesco, E., Harte, S.E., Harris, R.E., & **Kutch, J.J**. Naturalistic bladder filling as a tool to examine brain circuits of urinary urgency in healthy individuals: A MAPP Research Network study. *Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU) Annual Conference*. Scottsdale, AZ.

2019 Hegarty, A.K., Yani, M.S., Albishi, A., Michener, L.A., & **Kutch, J.J.** Salience network functional connectivity is spatially heterogeneous across sensorimotor cortex in healthy humans. *Society for Neuroscience (SfN) Annual Meeting.* Chicago, IL.

2019 Fenske, S., & **Kutch, J.J.** Resting state functional connectivity can predict progression of chronic pelvic pain. *Organization for Human Brain Mapping Annual Meeting*, Rome, Italy.

2019 Locke, K., Lai, H.H., Pontari, M.A., Clemens, J.Q., Kreder, K.J., Krieger, J.N., Andriole, G.L., Mayer, E.A., **Kutch, J.J.**, Rodriguez, L.V., Moldwin, R.M., Farrar, J.T., Mullins, C., & Landis, J.R. Pain profile discovery in urologic chronic pelvic pain syndrome (UCPPS): Consensus clustering findings from the MAPP Research Network. *American Urological Association Annual Meeting*. Chicago, IL.

2018 Albishi, A., Fisher, B., & **Kutch, J.J**. Neuroanatomical and functional substrates associated with single muscle representation. *Society of Neuroscience (SfN) Annual Meeting*. San Diego, CA.

2018 Garbin, A.J., Hooyman, A.M., **Kutch, J.J.**, & Fisher, B.E. Combining non-invasive brain technologies to detect and stimulate brain activity. *Society for Neuroscience (SfN) Annual Meeting*. San Diego, CA.

2018 Fenske, S., & **Kutch, J.J.** Predicting chronic pelvic pain symptom progression based on resting state functional connectivity. *Society for Neuroscience (SfN) Annual Meeting*. San Diego, CA.

2017 Yani, M.S.*, Fenske, S.*, & **Kutch, J.J.** Contribution of human motor cortex to interstitial cystitis/painful bladder syndrome: A pilot neuromodulation study guided by motor cortical control of pelvic floor muscles. *International Pelvic Pain Society*. Washington, D.C.

2016 Yani, M.S.*, Gordon, J., Eckel, S.P., Kirages, D.J., Asavasopon, S., & **Kutch, J.J**. Cortical activation associated with automatic control of pelvic floor muscles in women. *Society for Neuroscience (SfN) Annual Meeting*. San Diego, CA.

2016 Albishi, A.*, Smith, J., Fisher, B., & **Kutch, J.J.** Adjacent motor cortical areas have distinct brain functional connectivity. *Society for Neuroscience (SfN) Annual Meeting*. San Diego, CA.

2016 **Kutch, J.J.**, et al. Functional impact and neurologic signature of centralized pain among persons with urologic chronic pelvic pain syndromes (UCPPS). *16th World Congress on the Study of Pain, International Association for the Study of Pain (IASP)*. Yokohama, Japan.

2016 Babikian, S.*, Kanso, E., & **Kutch, J.J**. Neural signals associated with task-irrelevant movement variability in humans. *26th Annual Meeting of the Society for the Neural Control of Movement*. Montego Bay, Jamaica.

2015 Rana, M.*, Yani, M.S.*, Asavasopon, S.*, Fisher, B.E., & **Kutch, J.J.** Brain connectivity associated with muscle synergies in humans. *Society for Neuroscience (SfN) Annual Meeting*. Chicago, IL.

2015 Duff, S.V., Sargent, B., **Kutch, J.J.**, Berggren, J., & Fetters, L. Self-generated feedback to increase muscle activation in infancy. *Combined Sections Meeting of the American Physical Therapy Association.* Indianapolis, IN.

2015 Duff, S.V., Sargent, B., **Kutch, J.J.**, Berggren, J., & Fetters, L. Self-generated feedback to increase muscle activation in children. *American Academy for Cerebral Palsy and Developmental Medicine*. Austin, TX.

2014 Rana, M.*, Asavasopon, S.*, Kirages, D.J., Yani, M.S.*, Fisher, B.E., Lohman, E.B., Berk, L.S., & **Kutch, J.J.** Cortically-facilitated muscle synergies of the human pelvic floor. *Society for Neuroscience (SfN) Annual Meeting*. Washington, D.C.

2014 Asavasopon, S.*, Rana, M.*, Kirages, D.J., Yani, M.S.*, Lohman, E.B., Berk, L.S., & **Kutch, J.J.** Brain activation associated with decoupling muscle synergies of the human pelvic floor. *Society for Neuroscience (SfN) Annual Meeting*. Washington, D.C.

2013 Babikian, S., **Kutch, J.J.**, Kanso, E., & Valero-Cuevas, F.J. Feasibility of limb postures and slow motions throughout the workspace with muscles as elastic actuators. *Proceedings of the 6th International IEEE EMBS Conference on Neural Engineering*. San Diego, CA.

2013 Yani, M.S.*, Cosand, L.*, Rana, M.*, Kirages, D., & **Kutch, J.J.** The neural representation of the pelvic region and its implications for localizing the source of chronic pelvic pain. *23rd Annual Meeting of the Society for the Neural Control of Movement*. San Juan, Puerto Rico.

2011 Inouye, J.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. A comprehensive computational framework to evaluate grasp quality of tendon-driven hands with arbitrary topology. *Proceedings of the 21st Annual Meeting of the Society for the Neural Control of Movement.* San Juan, Puerto Rico.

2011 Inouye, J.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. Quantitative comparison of grasp qualities of two tendon-driven hands using a novel methodology. *Proceedings of the 15th Annual Grodins Graduate Research Symposium*. Los Angeles, CA.

2011 Inouye, J.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. Quantitative prediction of grasp impairment following peripheral neuropathies of the hand. *Proceedings of the 35th Annual Meeting of the American Society of Biomechanics*. Long Beach, CA.

2011 Inouye, J.M., **Kutch, J.J.**, & Valero-Cuevas, F.J. A novel methodology to compare grasp quality: Application to two dominant tendon-driven designs. *Proceedings of the 35th Annual Meeting of the American Society of Biomechanics*. Long Beach, CA.

2010 **Kutch, J.J.**, Kurse, M.U., & Valero-Cuevas, F.J. Muscle redundancy does not imply robustness to muscle dysfunction. *Society for Neuroscience (SfN) Annual Meeting*. San Diego CA.

2010 **Kutch, J.J.**, & Valero-Cuevas, F.J. Feasibility before optimality: What complete solution sets tell us about muscle redundancy and synergies. *Society for Neuroscience (SfN) Satellite Meeting: Advances in Computational Motor Control.* San Diego, CA.

2010 **Kutch, J.J.**, & Valero-Cuevas, F.J. Obtaining complete solution sets for neuromuscular models. *ASME 2010 Summer Bioengineering Conference*. Naples, FL.

2009 **Kutch, J.J.**, Kurse, M.U., Hoffmann, H., Kuo, A.D., & Valero-Cuevas, F.J. Muscle synergies may be artifacts of biomechanics rather than neural constraints, and are not necessary to simplify control. *Society for Neuroscience (SfN) Annual Meeting.* Chicago, IL.

2009 **Kutch, J.J.**, Kuo, A.D., & Rymer, W.Z. Non-invasively revealing the mechanical action of human muscle. *2009 Workshop on Multi-Scale Muscle Mechanics*. Woods Hole, MA.

2009 Kurse, M.U., **Kutch, J.J.**, Hoffmann, H., Fassola, I., Lipson, H., & Valero-Cuevas, F.J. A strain-energy approach to simulating slow finger movements and changes due to loss of musculature. *Annual Meeting for the American Society of Biomechanics*. State College, PA.

2009 Hoffmann, H., **Kutch, J.J.**, Kurse, M.U., & Valero-Cuevas, F.J. Control of muscle strain energy as a robust means to produce slow and accurate finger movements: Proof of concept via hardware and cadaver implementation. *19th Annual Meeting of the Society for the Neural Control of Movement*. Waikoloa Beach, HI.

2009 **Kutch, J,J,**, & Valero-Cuevas, F.J. All muscles are redundant, but some are less redundant than others. *19th Annual Meeting of the Society for the Neural Control of Movement*. Waikoloa Beach, HI.

2007 **Kutch, J.J.**, Chardon, M.K., Bloch, A.M., & Rymer, W.Z. Non-uniform patterns of signal-dependent noise during isometric force production at the human metacarpophalangeal joint. *17th Annual Meeting of the Society for the Neural Control of Movement*. Seville, Spain.

2006 **Kutch, J.J.**, Suresh, N.L., Kuo, A.D., Bloch, A.M. &, Rymer, W.Z. Analysis of firing rate and synchronization on spike-triggered averaging of multidimensional motor unit output. *45th Conference on Decision and Control*. San Diego, CA.

2006 **Kutch, J.J.**, Suresh, N.L., Kuo, A.D., Bloch, A.M., Rymer, W.Z. Effects of discharge synchrony on estimates of motor unit twitch force direction in the first dorsal interosseous muscle. *Society for Neuroscience (SfN) Annual Meeting.* Atlanta, GA.

2005 **Kutch, J.J.**, Kuo, A.D., & Bloch, A.M. Modeling optimal neural excitation of muscle. *Society for Neuroscience (SfN) Annual Meeting.* Washington, D.C.

2004 **Kutch, J.J.**, & Bloch, A.M. Muscular synergies and limb control: Toward a minimum synergy hypothesis. *14th Annual Meeting of the Society for the Neural Control of Movement*. Sitges, Spain.

2002 **Kutch, J.J.**, & Buchanan, T.S. Self-organizing maps and the representation of EMG signals in terms of muscular synergies. *4th World Congress of Biomechanics*. Calgary, Alberta, Canada.

2001 **Kutch, J.J.**, & Buchanan, T.S. Individual muscle EMG reconstruction from joint torque. *Society for Neuroscience (SfN) Annual Meeting.* San Diego, CA.

IV. TEACHING AND MENTORING ACTIVITIES

Courses Developed and/or Presented:

University Courses Developed:

Fall 2023-Present	**PT 534: Neuroanatomy (4 units)** Residential Pathway Lead, 2023 - Present Neuroanatomy, taught from a basic science perspective, for second-year Doctor of Physical Therapy (DPT) students in the Residential Pathway. I have made extensive revisions to the course, adding new 3D visualizations based on real neuroimaging data of neural pathways relevant to physical therapy tests and neuropathology.
Spring 2012-2022	**PT 569: Principles of Neuroscience (4 units)** Course Director, 2013 - 2022 Neuroscience, taught from a basic science perspective, for second-year Doctor of Physical Therapy students. I substantially revised and developed the syllabus to include more live demos of neuroscience principles as well as examples from physical therapy practice.
Fall 2013	**BKN 599: Writing, Wikipedia, and Wizardry in Scientific Communication (3 units)** Course Director Course for MS and PhD students in the Biokinesiology program which aimed to develop scientific communication and writing skills by having students work in teams to enhance kinesiology content on Wikipedia.

University Courses Presented:

Spring 2013-Present	**BKN 550: Neurobehavioral Basis of Movement** I have contributed to this course with lectures titled “Motor neurons and their firing patterns: From Aplysia californica to humans living in California” and “Sensory and perceptual contributions to motor control”
Fall 2012-2022	**NEUR 532: Systems and Behavioral Neurobiology** **NSCI 525: Advanced Overview of Neurosciences II**

I have provided lectures in this series of courses for students in the Neuroscience Graduate Program. My lectures have been titled "Analytical techniques in sensorimotor neuroscience" and "Motor neurons and their firing patterns: From Aplysia californica to humans living in California"

Faculty, Post-doctoral Scholars, Graduate Students, and Undergraduates Mentored:

Junior Faculty, Mentor:

2022-Present **Eileen Johnson, PT, DPT, WCS**
Assistant Professor of Clinical Physical Therapy,
USC Biokinesiology and Physical Therapy

2019-Present **Kristan Leech, PhD, DPT, PT**
Assistant Professor,
USC Biokinesiology and Physical Therapy

Visiting Post-Doctoral Scholars, Primary Mentor:

2024-2024 **Rocco Cavaleri, PhD, B HlthSci (Hons 1), M Physio, APAM**
Academic Program Advisor, Physiotherapy, Western Sydney University
Visited my lab as part of the Fulbright Visiting Scholar program

Post-Doctoral Scholars, Primary Mentor:

2018-2022 **Amy Hegarty, PhD** (co-mentored with Dr. Lori Michener)
Subsequent Position: Analysis Services Program Manager,
Intermountain Neuroimaging Consortium

2017-2022 **Moheb S. Yani, PhD**
Subsequent Position: Research Scholar, Goodman-Luskin Microbiome Center,
David Geffen School of Medicine at UCLA

2012-2015 **Manku Rana, PhD**
Subsequent Position: Senior Healthcare Economics Analyst, UnitedHealth Group

Post-Doctoral Scholars, Ad-hoc Mentor:

2013-2015 **Susan Duff, PhD**
Subsequent Position: Associate Professor, Department of Physical Therapy, Chapman University

Doctoral Students, Committee Chair:

2023-Present **Jason Cherin** (USC Division of Biokinesiology and Physical Therapy)
Award: 2025 1st Place Division of BKN/PT Pre-Candidate Poster, USC Herman Ostrow School of Dentistry Research Day

2022-Present **Jayati Upadhyay** (USC Division of Biokinesiology and Physical Therapy)
Awards:
- 2025 USC Graduate Student Government Professional Development Grant
- 2025 USC Stevens Center for Innovation "Most Disruptive" Poster Award, USC Herman Ostrow School of Dentistry Research Day

- 2022 Provost Travel/Research Award, USC Graduate School

2019-2024 **Natalie McLain** (USC Division of Biokinesiology and Physical Therapy)
Subsequent Position: T90 University of Michigan HEAL PAIN Postdoctoral Research Fellow
Awards:
- 2022 1st Place Division of BKN/PT Poster, USC Herman Ostrow School of Dentistry Research Day
- 2022 Mentored Teaching Fellow, USC Center for Excellence in Teaching

2014-2020 **Sonja Fenske** (USC Neuroscience Graduate Program)
Subsequent Position: Postdoctoral Research Associate, Computational Neurology, Neuroscience & Psychiatry Lab, Newcastle University

2012-2017 **Moheb S. Yani** (USC Division of Biokinesiology and Physical Therapy)
Subsequent Position: Post-doctoral Research Associate, USC Division of Biokinesiology and Physical Therapy
Awards:
- 2018 Invited Presenter, Physiotherapy Forum, International Continence Society
- 2018 USC Postdoctoral Scholar Training and Travel Award, USC Office of Postdoctoral Affairs and the USC Postdoctoral Association
- 2017 USC Postdoctoral Scholar Training and Travel Award, USC Office of Postdoctoral Affairs and the USC Postdoctoral Association
- 2017 Top-ranked abstract and oral presentation invitation, 3rd World Congress on Abdominal & Pelvic Pain
- 2015 1st place Division of BKN/PT Poster, USC Herman Ostrow School of Dentistry Research Day

Doctoral Students, Committee Member:

2022-Present **Matthew Heindel** (USC Division of Biokinesiology and Physical Therapy)

2020-2023 **Clio Conzalezzacarias** (USC Neuroscience Graduate Program)

2019-2024 **Ravi Bhatt** (USC Neuroscience Graduate Program)

2017-2021 **Hai-Jung (Steffi) Shih** (USC Division of Biokinesiology and Physical Therapy)

2017-2019 **Victor Barradas** (USC Department of Biomedical Engineering)

2017-2021 **Alexander Garbin** (USC Division of Biokinesiology and Physical Therapy)

2016-2020 **Rini Varghese** (USC Division of Biokinesiology and Physical Therapy)

2016-2019 **Yo Shih** (USC Division of Biokinesiology and Physical Therapy)

2016-2018 **Irene Kuo** (USC Division of Biokinesiology and Physical Therapy)

2016-2019 **Andrew Hooyman** (USC Division of Biokinesiology and Physical Therapy)

2012-2015 **SooYeon Sun** (USC Division of Biokinesiology and Physical Therapy)

2011-2015 **Lindsey Anderson** (USC Division of Biokinesiology and Physical Therapy)

Current Position: Postdoctoral Research Fellow, Geriatric Research, Education, and Clinical Center, VA Puget Sound Health Care System

2010-2012 **Cornelius Raths** (USC Department of Biomedical Engineering)
Current Position: Senior Data Scientist, Veritone, Inc.

Doctoral Students, Mentor:

2016-2020 **Tim Macaulay** (USC Division of Biokinesiology and Physical Therapy)
Subsequent Position: Senior Scientist and Technical Monitor, National Aeronautics and Space Administration (NASA)

2015-2017 **Sarine Babikian** (USC Department of Mechanical Engineering)
Subsequent Position: Data Product Manager, Cadence

2014-2019 **Alaa Albishi** (USC Division of Biokinesiology and Physical Therapy)
Subsequent Position: Assistant Professor at King Saud University, Neuro-Rehabilitation Consultant, Head of the Neuro-Stimulation Laboratory (NSL)

2014-2015 **Alexander Reyes** (USC Department of Biomedical Engineering)
Subsequent Position: Science, Engineering and Technical Advisor, Bluemont Technology and Research, Inc.

2012-2014 **Skulpan Asavasopon** (Loma Linda University School of Allied Health Professions)
Subsequent Position: Associate Professor, Department of Physical Therapy, Loma Linda University
Awards:
- 2016 California Physical Therapy Association Faculty Research Award
- 2014 Loma Linda University Dissertation Research Award

2011-2013 **Louise Cosand** (USC Department of Psychology, Clinical Neuroscience track)
Subsequent Position: Director, Medical Affairs, Acadia Pharmaceuticals, Inc.

2011-2012 **Sudarshan Dayanidhi** (USC Division of Biokinesiology and Physical Therapy)
Subsequent Position: Assistant Professor of Physical Medicine and Rehabilitation, Northwestern University

2010-2012 **Joshua Inouye** (USC Department of Biomedical Engineering)
Subsequent Position: Principal R&D Engineer, Boston Scientific

Doctor of Physical Therapy (DPT) Students, Mentor:

2017-2019 **Gail Suchoknand**
Assisted in data collection for NIH-funded project (R01DK110669)

2017-2019 **Tessa Richards**
Assisted in data collection for NIH-funded project (R01DK110669)

2017-2019 **Chen Yang**
Assisted in data collection for NIH-funded project (R01DK110669)

2017-2019 **Alexandra Walker**
Assisted in data collection for NIH-funded project (R01DK110669)

2016-Present **DPT Mentor Program**
Esther Leon, Jessica Leu, Erika Lark, Lauren Lasorda, Arin Lane, Katelyn Leal, Lindsay Wofford, Alieh Zamany, Luke Carr, David Gofreed, Evan Harvey, Daniel Hernandez, Alicia Henigan, Matt Guttridge, Angela Hsieh, Jenny Hu, Lauren Jue, Samantha Kaneta, Samantha Lomen, Sarah Low

Undergraduate Students, Research Mentor:

2024 **Evelyne Morriseau (**Viterbi Summer Undergraduate Research Experience (SURE))

2024 **Xander Neary (**Viterbi Summer Undergraduate Research Experience (SURE))

2023 **Elijah Clarke (**Viterbi Summer Undergraduate Research Experience (SURE))

2023 **Bria Smith (**Viterbi Summer Undergraduate Research Experience (SURE))

2022-2024 **Olivia Means** (USC Biomedical Engineering)

2022-2024 **Mia Montiel** (USC Biomedical Engineering)

2022-2024 **Lauren Tomita** (USC Biomedical Engineering)

2020-2024 **Arike Coker** (USC Biomedical Engineering)

2012-2013 **Bashir Wyatt** (USC Health and Humanity)

2012-2013 **Harjot Hansra** (USC Undergraduate Neuroscience Program)

2012-2013 **Joey Huang** (USC Department of Biomedical Engineering)

High School Students Mentored:

2025-Present **Emily Yoon**
Troy High School in Fullerton, California

2015-2016 **Grant Givrad**
Engineering Health Academy, Francisco Bravo Medical Magnet High School

2014-2015 **Stephanie Salome**
Engineering Health Academy, Francisco Bravo Medical Magnet High School

2011-2012 **Carlos Gomez**
Engineering Health Academy, Francisco Bravo Medical Magnet High School