)Jasper I. Mark

RTP, NC
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EDUCATION

University of North Carolina School of Medicine 08/2022 - 05/2026
Doctorate of Philosophy in Human Movement Science
Concentration in Neuromuscular Control and Motor Learning
*Royster Society of Fellows

University of North Carolina at Chapel Hill 08/2016-05/2020
Bachelor's in Exercise and Sport Science
Minors in Chemistry and Medical Anthropology
*Division I NCAA Cheer

PROFESSIONAL EXPERIENCE

Impulse Wellness, Inc – RTP, NC 2021-Present
Co-Founder & CEO

Yale School Of Medicine – New Haven, CT 2024-2025
Clinical Research Affiliate

Ascent Bio, Inc – New Haven , CT 2023-2024
Business & Research Strategy Consultant

THS Therapeutics – Philadelphia, PA 2022-2024
Business & Research Strategy Consultant

AKALAKA Co. – Durham, NC 2022-2023
Business & Research Strategy Consultant

HONORS

Royster Society of Fellows
Linda Dykstra Dissertation Fellowship, University of North Carolina, 2025
Carol Giuliani/Wellman Physical Therapy PhD Scholar, University of North Carolina, 2025
Society of Toxicology Immunotoxicology Specialty Section Best Paper of the Year Award, 2025
1789 Student Venture Fund Award, University of North Carolina, 2024
Nucleate Activator 1st Place, RTP, NC, 2023
Staff Professional Development Grant, University of North Carolina, 2021

Buckley Public Service Scholar, University of North Carolina, 2020
Student Undergraduate Research Fellowship, 2017
InterAct ChangeMaker Award, InterAct of Wake, 2016

PUBLICATIONS

Gangwani R, **Mark JI**, Huang BY, Cassidy JM. Associations between Structural Injury and Task-based Corticomuscular Connectivity after Stroke. *Frontiers in Neurology*. 2025 16(0). doi:10.3389/fneur.2025.1653349

Mark JI, Cunningham DA, Cassidy JM. Advancing Stroke Recovery through Operant Conditioning of Corticomuscular Coherence, *Restorative Neurology and Neuroscience*, 2025; 0(0). doi:10.1177/09226028251379344

Ugale, P, Siddika A,Adcock B, Pitts WS, **Mark JI**, Mills AC. Durability and Signal Quality Assessment of Rivet and Snap Connections for Wearable EMG Armband. *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*. 2025; 2025. 10.1109/EMBC58623.2025.11253586.

Ju B, **Mark JI**, Youn S, et al. Feasibility Assessment of Textile Electromyography Sensors for a Wearable Telehealth Biofeedback System. *Wearable Technologies*. 2025; 6:e26. doi:10.1017/wtc.2025.10012

Vaughn RM, Gangwani R, **Mark JI**, Fletcher K, Baratta JM, Cassidy JM. Predictive Utility of Self-Efficacy in Early Stroke Rehabilitation. *Topics in Stroke Rehabilitation*, 2024; 32(4), 362–370. https://doi.org/10.1080/10749357.2024.2403806

Mark JI, Riddle J, Gangwani R, Huang B, Fröhlich F, Cassidy JM. Cross-Frequency Coupling as a Biomarker for Early Stroke Recovery. *Neurorehabilitation and Neural Repair*. 2024; 38(7):506-517. doi:10.1177/15459683241257523

Guttenberg MA, Vose TA, Birukova A, Lewars K, Cumming RI, Albright MC, **Mark JI**, Salazar CJ, Swaminathan S, Yu Z, Sokolenko YV, Bunyan E, Yager MJ, Fessler MB, Que LG, Gowdy KM, Misharin AV, Tighe RM. Tissue-Resident Alveolar Macrophages Reduce Ozone-Induced Inflammation via MerTK-Mediated Efferocytosis. *American Journal of Respiratory Cell and Molecular Biology*. 2024; 70(6), 493-506. https://doi.org/10.1165/rcmb.2023-0390OC

Gangwani R, **Mark JI**, Vaughn RM, Holland H, Thorpe D, Alexander J, Surkar S, Cassidy JM. Corticomuscular Coherence in Unilateral Cerebral Palsy: A Preliminary Pediatric Biomarker Development Study, *Journal of Child Neurology*, 2023; 38(6-7):357:366. doi:10.1177/08830738231187010.

Mark JI, Ryan H, Fabian K, DeMarco, K, Lewek M, Cassidy JM. Aerobic Exercise and Action Observation Priming Modulates Functional Connectivity. *PLoS one*, 2023; 18(4): e0283975. doi:10.1371/journal.pone.0283975.

Cassidy JM, **Mark JI**, Cramer SC. Functional Connectivity Drives Stroke Recovery: Shifting the Paradigm from Correlation to Causation. *Brain*, 2022;145(4):1211-1228. doi:10.1093/brain/awab469.

PUBLICATIONS IN PREPARATION/UNDER REVIEW

Mark JI, Garnica-Agudelo, D, Cassidy JM. Stroke Recovery is Shaped by Cross-Network Connectivity and Cognitive-Motor Tract Injury. *Neuroimage: Clinical*, 2025

Mark JI, Gangwani R, Snyder C, Cassidy JM. Validation of Low-frequency Oscillatory Activity as an Indicator of Post-Stroke Injury and Recovery, *Clinical EEG & Neuroscience*, 2025

Mark JI, Gangwani R, Riddle J, Cassidy JM. Prefrontal Hierarchical Control of Corticomuscular Coherence in Stroke, *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 2025

Mark JI, Vallebona C, Garnica-Agudelo D, Campbell A, Glier S, Koenig T, Belger A. EEG Microstates Capture Stress-Induced Alterations in Adolescents at Risk for Psychosis, *Schizophrenia Research*, 2025

Mark JI, Baran I, Garnica-Agudelo D, Riddle J, Belger A. Stress-Induced Alterations in Cross-frequency Coupling in Adolescents at Risk for Psychosis, *Biological Psychiatry*, 2025

Gangwani R*, **Mark JI***, Zardozny S, Cassidy JM. Corticomuscular Coherence in Post-stroke Motor Function and Recovery. *Neurorehabilitation and Neural Repair*, 2025
*Denotes co-first authorship

PATENTS

Mark JI, Adcock BJ, Ryle BE, Pitts WS. Wearable biosignal device and system for individualized therapeutic feedback. WO 2024/073494 A1. International Publication Date: April 4, 2024.

PUBLISHED ABSTRACTS

Vaughn RM, Gangwani R, **Mark JI**, Cassidy JM. Abstract tp70: Preliminary associations between quality indicators, motor status, and self-efficacy in early stroke rehabilitation, *Stroke*, 2022; 53.suppl_1: ATP70-Atp70

Gangwani R, **Mark JI**, Vaughn R, Cassidy JM. Corticomuscular Coherence and Corticospinal Tract Injury Associations During Early Stroke Recovery, *Neurorehabilitation and Neural Repair*, 2022; 36(9):NP1-NP38

Mark JI, Gangwani R, Zheng E, Vaughn RM, Cassidy JM. Feasibility & Utility of Corticomuscular Coherence Measurement in Early Stroke Motor Recovery: A Preliminary Analysis, *Neurorehabilitation and Neural Repair,* 2021; 35(II):NP1-NP41

INVITED PRESENTATIONS

Turning Ideas into Products. Biomanufacturing Research Institute and Technology Enterprise (BRITE). Durham, NC. July 8th, 2025

Technology Translation: Bridging the Gap in STEM. Biomanufacturing Research Institute and Technology Enterprise (BRITE). Durham, NC. July 18th, 2024

Technology Research: Bridging the Gap in STEM. Biomanufacturing Research Institute and Technology Enterprise (BRITE). Durham, NC. July 17th, 2024

Electroencephalography measurements of cross-frequency coupling in stroke recovery, Society for Neuroscience Nano Symposium: Imaging and Assessment of Stroke Damage. Washington, DC. November 12th, 2023

Creating a Product. Biomanufacturing Research Institute and Technology Enterprise (BRITE). Durham, NC. July 19th, 2023

Prefronto-motor Cross-Frequency Coupling Provides Insight into Upper Extremity Task Performance During Early Post-Stroke Recovery, Human Movement Science Research Symposium. Chapel Hill, NC. May 5th, 2023.

Electroencephalography measurements of cross-frequency coupling in stroke recovery, Society for Neuroscience Nanosymposium: Imaging and Assessment of Stroke Damage. Washington, DC. November 12th, 2023

Venture Connect 2023 Summit – Medical Device + Health Tech, Research Triangle Park, NC. March 29th, 2023

Merging Entrepreneurship and Research – Getting Started. Biomanufacturing Research Institute and Technology Enterprise (BRITE) Futures. Durham, NC. July 21, 2022.

Merging Entrepreneurship and Research – Seeking Funding. Biomanufacturing Research Institute and Technology Enterprise (BRITE). Durham, NC. June 23, 2022

POSTER PRESENTATIONS

Ugale P, Siddika A, Adcock B, Pitts WS, **Mark JI**, Mills AC. Durability and Signal Quality Assessment of Rivet and Snap Connections for Wearable EMG Armband. 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. July 14, 2025

Porbeni P, **Mark JI**, Cassidy JM. Changes in Corticospinal Excitability following EEG-EMG Biofeedback. Lampe Joint Department of Biomedical Engineering Summer Symposium. July 25, 2025

Mark JI, Cunningham DA, Cassidy JM. Biofeedback-based Operant Conditioning to Enhance Corticomuscular Coherence: A Study Protocol. Human Movement Science Curriculum Day. April 4, 2025.

Tsirigotis P, Yuan R, **Mark JI**, Riddle J, Fröhlich F, Fröhlich A, Rubinow D, Dayan E, Skelrov M. Goal-Directed Behavior and Reward Evaluation in Parkinson's Disease-Related Apathy, UNC School of Medicine Neurology Day. May 22, 2025

Winn AC, **Mark JI**, Belger A. Predicting Psychosis Risk using Machine Learning on EEG Microstate Data. BBSP Annual Poster Presentation. October 30, 2024

Vaughn RM, **Mark JI**, Gangwani R, Holland H, Thorpe D, Alexander J, Surkar SM, Cassidy JM. Resting-State Brain Activity Explains Bimanual Hand Use in Children with Unilateral Cerebral Palsy. American Academy for Cerebral Palsy and Developmental Medicine Annual Meeting. September 10, 2023

Mark JI, Gangwani R, Cassidy JM. Prefronto-motor Cross-Frequency Coupling Provides Insight into Upper Extremity Task Performance During Early Post-Stroke Recovery, Human Movement Science Research Symposium. May 5th, 2023.

Ju B, **Mark JI**, Youn S, Sennik B, Jur J, Mills A. EMG Sensing Armbands with Printed Electrodes for Human Monitoring. Smart Fabrics Summit of American Textiles Association. April 12, 2023

Gangwani R, **Mark JI**, Vaughn RM, Holland H, Thorpe D, Alexander J, Surkar SM, Cassidy JM. Corticomuscular Coherence in Unilateral Cerebral Palsy: A Preliminary Pediatric Biomarker Development Study. Combined Sections Meeting of American Physical Therapy Association. February 24, 2023

Gangwani R, **Mark JI**, Cassidy JM. Application of Corticomuscular Coherence in Early Stroke Rehabilitation. American Society for Neurorehabilitation Annual Meeting. March 15, 2023
Vaughn RM, Gangwani R, Mark JI, Fletcher K, Baratta JM, Cassidy JM. The Consideration of Self-Efficacy in Early-Stroke Rehabilitation. American Society for Neurorehabilitation Annual Meeting. March 14, 2023

Gangwani R, **Mark JI**, Vaughn RM, Cassidy JM. Corticomuscular Coherence and Corticospinal Tract Injury Association During Early Stroke Recovery. UNC Chapel Hill School of Medicine John B. Graham Student Research Society Research Day. November 11, 2022.

Mark JI, Gangwani R, Cassidy JM. Functional Connectivity Between Brain and Affected Upper Extremity Increases During Early Post-Stroke Recovery. Human Movement Science and Biomechanics Research Symposium. April 29, 2022.

Gangwani R, **Mark JI**, Cassidy JM. Early Post-Stroke Corticomuscular Coherence Measures Positively Relate to Motor Recovery During Inpatient Rehabilitation. Human Movement Science and Biomechanics Research Symposium. April 29, 2022.

Gangwani R, **Mark JI**, Vaughn RM, Cassidy JM. Corticomuscular Coherence and Corticospinal Tract Injury Association During Early Stroke Recovery, American Society for Neurorehabilitation Annual Meeting. April 1, 2022.

Vaughn RM, Gangwani R, **Mark JI**, Cassidy JM. Preliminary Associations Between Quality Indicators, Motor Status, and Self-efficacy in Early Stroke Rehabilitation. International Stroke Conference. February 9, 2022.

Mark JI, Gangwani R, Zheng E, Vaughn RM, Cassidy JM. Feasibility & Utility of Corticomuscular Coherence Measurement in Early Stroke Motor Recovery: A Preliminary Analysis. American Society for Neurorehabilitation Annual Meeting. April 8, 2021.

Gangwani R, **Mark JI**, Adcock B, Vaughn RM, Cassidy JM. Corticomuscular Coherence and Corticospinal Tract Injury Association During Early Stroke Recovery. Society for Neuroscience. November 10, 2021.

Ryan H, Fabian K, **Mark JI**, Jeangilles J, Chowdhury R, Muthukrishnan H, Zheng E, Lewek M, Cassidy JM. Effects of Movement- and Cognitive-Based Priming on Brain Function. Combined Sections Meeting of American Physical Therapy Association. February 27, 2021.

Ryan H, Fabian K, **Mark JI**, Jeangilles J, Chowdhury R, Muthukrishnan H, Zheng E, Lewek M, Cassidy JM. Effects of Movement- and Cognitive-Based Priming on Brain Function. Human Movement Science Curriculum Symposium. March 20, 2020.

MacCormack, J. K., Perry, J. M., **Mark JI**, Lindquist, K. A.. Interoceptive sensitivity and physiological reactivity differentially predict emotional and somatic experiences. Poster presented at the Society for Affective Science. April 15, 2017 *Won Best Poster Award.

TEACHING ACTIVITIES

Teaching Assistant – University of North Carolina – Department of Exercise Science 2023
EXSS 385, Biomechanics of Sport

Teaching Assistant – University of North Carolina – Department of Physics 2017-2018
PHYS 114, General Physics I
PHYS 115, General Physics II

GRANTS ($5,168,376 in awarded funds)

Active

SBIR Fast-Track: Home-Based Stroke Rehabilitation: Researching and Developing the Bluetooth Electromyography-Based StrokeTherapeutic (BEST) System 2025-2027
NSF 24-582_2507703 - Impulse Wellness LLC
Role: PI, $1,572,305

Modulation of Beta Oscillatory Rhythms in Stroke to Promote Corticomuscular Circuit Function 2025-2027
1R21HD117319-01A1, NIH/NICHD - UNC Chapel Hill
PI: Jessica Cassidy, PT, DPT, PhD, $414,376
Role: Contributing Student Author & Graduate Research Assistant

Development of Methodology for the Future Study on Enhancing Corticomuscular Coherence through Biofeedback-Based Operant Conditioning 2025
FNNR Mini-Grant #602-2024 - Biomedical Instruments
Role: PI, $3,000

Feasibility of Dense-array Electrophysiology Fatigue Network Device (DEFEND) for Performance Monitoring and Evaluation 2023-2025
HT9425-23-S-SOC1-DL-073, DoD/SOCOM - Impulse Wellness LLC
Role: PI, $2,595,000

Completed:

Bluetooth Electromyography-based Stroke Therapeutic (BEST): Evaluation and Version Enhancement Research (EVER) 2024-2025
90BISB0032-01-00, ACL/NIDILRR - Impulse Wellness LLC

Role: PI, $575,000

Fabric-based Acquisition of Biosignals for Remote Insights and Collection 2022-2023
PFI-TT-23-538-01, National Science Foundation - NC State & Impulse Wellness LLC
Role: Co-PI, $550,000

SBIR Phase I: Wireless Electromyography Gesture Recognition Device (WERD) 2023
National Science Foundation - Impulse Wellness LLC
Role: PI, $275,000

NC SBIR Match Fund 2022
NCBSTI-FY2122M, One NC Small Business Program - Impulse Wellness LLC
Role: PI, $50,000

NC SBIR Incentive Fund 2022
NCBSTI-FY2122I, One NC Small Business Program - Impulse Wellness LLC
Role: PI, $6,000

SBIR Phase I: IW – Bluetooth Electromyography-based Stroke Therapeutic (BEST) 2022
90BISA0053, ACL/NIDILRR - Impulse Wellness LLC
Role: PI, $100,000

Multi-Institutional Lay Patient Navigation Program 2017-2021
Duke Endowment Fund - UNC Lineberger Comprehensive Care Center
PI: Jean Sellers, RN, MSN, $600,000
Role: Project Manager and Contributing Student Author

MENTORING EXPERIENCE

Graduate Students:

- Anthony Bshara, Duke - Fuqua School of Business
- Ayeesha Siddika, NC State - Fiber and Polymer Science, 2023-2025
- Alex Winn, UNC - Neuroscience, 2024
- Prateeti Ugali, NC State - Fiber and Polymer Science, 2023-2025
- Beomjun Ju, NC State - Fiber and Polymer Science, 2022-2023

Undergraduate Students:

- Preye Porbeni, NC/NC State - Biomedical Engineering, 2025
- Aidan Blumsack, UNC - Neuroscience and Chemistry, 2025
- Kyle Chan, UNC - Biostatistics, 2024-2025
- Skylar Foxworth, UNC - Neuroscience, 2024-2025
- Idil Baran, UNC - Psychology, 2024-2025
- Alec Nipp, UNC - Computer Science, 2024

Miguel Ruiz, UNC/NC State - Biomedical Engineering, 2022-2024
Cole Rathke, NC State - Electrical and Computer Engineering, 2022
Nate Kohen, NC State - Electrical and Computer Engineering, 2022
Nic Quance, NC State - Electrical and Computer Engineering, 2022
Ben Davis, NC State - Electrical and Computer Engineering, 2022

PROFESSIONAL SERVICE

Member, American Society for Neurorehabilitation, 2020 – Present
Member, International Society for Neuroregulation and Research, 2024
Ad-Hoc Peer Review, MedComm, 2024
Ad-Hoc Grant Proposal Reviewer, NSF Convergence Accelerator, 2023 and 2024 Member, Society for Neuroscience, 2022 – present
Member, National Academy of Sports Medicine, 2019 – 2022 Member, American Heart Association, 2017 – 2022
Member, Alpha Epsilon Delta, 2018 – 2020
Founder & Board Member, CPR Where You Are, 2017 – 2019

CERTIFICATIONS

Leadership and Management Certificate Program, *The Wharton School, University of Pennsylvania*, 2025
Community Health and Traditional Chinese Medicine, *Yunnan University of Traditional Chinese Medicine*, 2018
Regulatory Affairs Certificate: Medical Devices, *Regulatory Affairs Professional Society*, 2024
Certified Personal Trainer, *National Academy of Sports Medicine*, 2018
CPR & First Aid Instructor, *American Heart Association*, 2018
Emergency Medical Technician, *ACERIP*, 2017