

**BIOGRAPHICAL SKETCH**

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NAME: Chenchen Wang

eRA COMMONS USER NAME (credential, e.g., agency login): CHENWANG

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Huainan Medical University	MD	1983	Medicine
McGill University	Fellowship	1997	Rheumatology
McGill University	MSc	1999	Epidemiology & Biostatistics
Massachusetts Institute of Technology Overseas Entrepreneurs Education Center	Certificate	2011	Executive Business Administration

**A. Personal Statement**

Chenchen Wang, MD, MSc, a Professor at Tufts University School of Medicine and Director of the Center for Integrative Medicine at Tufts Medical Center, holds a strong record of research, publication, and mentoring. Dr. Wang has cultivated a high standard for multidisciplinary research in integrative medicine for healing. Her scientific and scholarly career has involved the broad *multidisciplinary and innovative* investigation of mind-body medicine for conditions combining theory, concepts, research design, and analytical approaches as well as basic, clinical, and psychosocial sciences. Collaborating with multidisciplinary teams in the U.S. and across the world, she and her team have greatly expanded and enhanced knowledge of the field of Complementary and Integrative medicine. In terms of clinical efficacy and effectiveness research, she has led the demonstration of the effects of Tai Chi interventions on health outcomes in: 1) a variety of chronic conditions (*JAMA Arch Intern Med, 2004*); 2) widespread pain and wellbeing (*New Engl J Med, 2010; BMJ, 2018; JAMA 2018*); 3) osteoarthritis pain (*Arthritis & Rheum, 2009; Annals of Intern Med, 2016*); 4) Posttraumatic stress disorder in military populations (*BMJ Open, 2016; J Clin Psychol, 2018*); 5) Systemic lupus erythematosus (*Current Rheumatology Reports 2018; Health Care Reviews 2018; Lupus, 2019*). In terms of mechanism research, she has led groundbreaking mind-body studies on the immune system (*PLoS One, 2014*), muscle physiology of arthritis (*Arthritis & Rheum, 2015; Osteoarthritis Cartilage, 2016*), and neurobiology of fibromyalgia (*Brain Imaging Behav, 2019, Molecular Brain, 2021*). In addition, Dr. Wang has also led and provided significant mentorship to global researchers, explored undiscovered analgesic effects for chronic pain conditions, and produced a series of innovative paper (over 100 publications in the past decade).

**Ongoing and recently completed projects that I would like to highlight:**

K24 AT007323-A Wang (PI)	National Center for Complementary and Integrative Health	12/01/2013-12/01/2024
	Mentoring and Research in Patient-Oriented Integrative Medicine	
R01 AT006367 Wang (PI)	National Center for Complementary and Integrative Health	07/01/2022-06/30/18
	Tai Chi and Fibromyalgia	
Innovation Award Wang (PI)	Rheumatology Research Foundation	07/01/2019-06/30/2022
	Neurobiological Mechanisms of Mind-body Therapy for Osteoarthritis	

## Citations:

- a. **Wang C**, Schmid CH, Fielding RA, Harvey WF, et al (2018). Effect of Tai Chi versus aerobic exercise for fibromyalgia: a comparative effectiveness randomized controlled trial. *The BMJ*; 360: k851. doi: 10.1136/bmj.k851. *JAMA*, 2018;319:2069; *Annals of Internal Medicine*; 2018 doi:10.7326. PMID: PMC5861462.
- b. **Wang C**, Iversen MD, Schmid CH, Harvey WF, Wong JB, Fielding RA, Driban JB, Price LL, Rones R, McAlindon T (2016), Comparative effectiveness of Tai Chi versus physical therapy for knee osteoarthritis, a randomized trial. *Annals of Internal Medicine*. 165: 77-86. PMID: PMC4960454.
- c. **Wang C**, Schmid CH, Rones R, Kalish R, Goldenberg DL and McAlindon T (2010). A randomized trial of Tai Chi for fibromyalgia. *New England Journal of Medicine*. 363: 743-54. PMID: PMC3023168.
- a. Kong J, Huang Y, Liu J, Yu S, Harvey W, Li W, **Wang C** (2021) . Altered functional connectivity between hypothalamus and limbic system in fibromyalgia. *Molecular Brain*, 202;14:17. doi: 10.1186/s13041-020-00705-2. PMID: 33472674.

## B. Positions, Scientific Appointments, and Honors

### Academic Appointments

2014-present	Professor of Medicine	Tufts University School of Medicine, MA
2008-2014	Associate Professor of Medicine	Tufts University School of Medicine, MA
2002-2008	Assistant Professor of Medicine	Tufts University School of Medicine, MA

### Hospital Appointments

2012-	Director, Center for Complementary and Integrative Medicine, Tufts Medical Center
2001-	Special Scientific Staff, Tufts Medical Center
1995-2000	Ogryzlo Rheumatology Fellow, McGill Montreal General Hospital, Jewish General Hospital, McGill University

### Honors

2020	Qi-Huang International Award, Institute of Science and Technology, China
2020	Best Reviewer Award for Annals of Internal Medicine in 2019, US
2019	Midcareer Investigator Award in Patient-Oriented Research, National Institute of Health
2018	FY2020 Innovative Research Award, American College of Rheumatology, US
2017	Appreciation Award for outstanding service as a member of National Advisory Council, U.S. Department of Health and Human Services
2016	Best Integrative Medicine Research Award, Clinical Research Prize, European Society of Integrative Medicine
2015	Conferences, Beijing, China; Taipei, Taiwan; and Las Vegas, US
2014	Outstanding Research Award and Keynote Presentation Awards in International
2013	National Center for Complementary & Integrative Medicine, Mentoring Award
2012	Scientist of the Year Award, World Congress on Qigong & Traditional Chinese Medicine
2010	International Tai Chi Symposium Outstanding Medical Research Award
2009	Boston Pepper Older Americans Independence Center Career Development Award
2008	American College of Rheumatology Health Professional Investigator Award
2006	Harvard University Emanuel and Lilly Shinagel Prize
2003	Tufts University School of Medicine Charlton Faculty Research Award
2001	Tufts-New England Medical Center Research Award
1998	Outstanding Quebec Graduate Student Award, "Fonds pour la Formation de Chercheurs et l'Aide à la Recherche" FRSQ-FCAR
1997	McGill University Award for Outstanding Merit as Clinical Rheumatology Fellow
1997	Outstanding Merit Award as Metro A. Ogryzlo Fellow, Canadian Rheumatology Association

## Professional Societies and Public Advisory Committees

2020-	DSMB Safety Officer, NIAMS/NIH
2019-	Ad hoc reviewer for the NIH HEAL, NIAMS, NCCIH and NIH Study Sections
2019-	Member of the International Association for the Study of Pain (IASP) audit committee
2017-	Expert Panel, American College of Rheumatology Guideline for the Pharmacologic and Non-Pharmacologic Management of Osteoarthritis of the Hand, Hip and Knee
2016-	Expert for the New England Journal of Medicine Group Open Forum
2015-	Vice Chairperson, World Federation of Chinese Medicine Societies
2014-	Scientific Affairs Committee, Tufts School of Medicine; Steering Committee, Tufts University
2013-2017	National Advisory Council, National Center for Complementary and Integrative Health, NIH
2008-2012	Ad Hoc Reviewer, Study Sections: NIH Nursing Science: Adults and Older Adults; NIH Challenge Grant; NIH Clinical Research of Complementary Medical Care
2001-	Faculty Member of Association of American Medical Colleges

## **C. Contributions to Science**

### **1. Pioneered research in mind-body therapy on health outcomes in patients with chronic conditions**

Committed to patient-oriented research throughout her entire medical career, Dr. Wang pioneered clinical studies to confirm that multi-component mind-body approaches demonstrate numerous benefits for patients with a variety of chronic pain disorders. Her team has investigated novel behavioral interventions that target chronic medical conditions. Their findings were among the first to address the health benefits of Tai Chi, an ancient Chinese mind-body therapy still in widespread use today, revealing its ability to slow the progression of disease and improve the disabilities associated with chronic musculoskeletal pain. This research has resulted in the completion of six major NIH-funded trials. The team was the first to find that the physical and mental components of Tai Chi uniquely promote the integration of mind and body to enhance cardiovascular fitness, muscular strength, balance, and physical function. In addition, they found that mind-body therapies are associated with reduced stress, anxiety, and depression, as well as improved health-related quality of life and self-efficacy. Dr. Wang's publications provide evidence that self-management approaches to Tai Chi can safely be recommended to patients with chronic rheumatic pain –such as fibromyalgia, osteoarthritis, and rheumatoid arthritis – as a complementary and integrative approach to improving patient well-being. Importantly, the Department of Veteran Affairs recently accepted mind-body techniques as “approved approaches” for treating pain and PTSD in military populations and veterans. As evidenced, Dr. Wang's leading research has substantially changed the standard of care for chronic pain management and will continue to contribute to clinical decision-making for patient care. As evidenced, Dr. Wang's leading research has substantially changed the standard of care for chronic pain and will continue to contribute to clinical decision-making for patient care into the future. She has been and continues to be the primary investigator/mentor in all of these studies.

- a. **Wang C**, Schmid CH, Rones R, Kalish R, Goldenberg DL and McAlindon T (2010). A randomized trial of Tai Chi for fibromyalgia. *New England Journal of Medicine*. 363: 743-54. PMID: PMC3023168.
- b. **Wang C**, Iversen MD, Schmid CH, Harvey WF, Wong JB, Fielding RA, Driban JB, Price LL, Rones R, McAlindon T (2016), Comparative effectiveness of Tai Chi versus physical therapy for knee osteoarthritis, a randomized trial. *Annals of Internal Medicine*. 165: 77-86. PMID: PMC4960454.
- c. Niles BL, Mori DL, Polizzi CP, Kaiser AP, Ledoux AM, **Wang C** (2016). Feasibility, qualitative findings, and satisfaction of a brief Tai Chi mind-body program for veterans with posttraumatic stress symptoms. *BMJ Open* 6:e012464. PMID: PMC5168527.
- d. Seto A, Han X, Price LL, Harvey W, Bannuru RR, **Wang C** (2018). The role of personality in patients with fibromyalgia. *Clinical Rheumatology*; <https://doi.org/10.1007/s10067-018-4316-7>. PMID: 3076562. PMID: PMC6364301.

### **2. Introduced novel integrative therapeutic modalities and advanced fundamental science**

The team's investigations broadly include different types of integrative medicine research (such as acupuncture, diet and nutrition, massage therapy, Chinese medications, and Tibetan medicine), the economic evaluation of integrative medicine treatments, and the application of qualitative research methods in integrative medicine. Based on NCCIH's Strategic Plan to advance fundamental science for the progress of biomedicine, part of her team's strategy has been to unite behavioral,

neurobiological, and neuroimmunological mechanistic science in a synergistic fashion. All of the research is intended to inform, implement, and integrate future evidence-based medical practices.

- a. **Wang C**, Harris WS, Chung M, Lichtenstein AH, Balk EM, Kupelnick B, Jordan HS, and Lau J. (2006) N-3 fatty acids from fish or fish-oil supplements, but not Alpha-Linolenic Acid, benefit cardiovascular outcomes in primary and secondary prevention studies. *American Journal of Clinical Nutrition*. 84: 5-17. 17158445. PMID: PMC16825676.
- b. Morgan N, Irwin M, Chung M, **Wang C** (2014). The effects of mind-body therapies on the immune system: meta-analysis. *PLoS One*. 9:e100903. PMID: PMC4079606.
- c. Reid KF, Price LL, Harvey WF, Driban JB, Fielding RA, **Wang C** (2015). Muscle power is an independent determinant of pain and quality of life in knee osteoarthritis. *Arthritis and Rheumatism*. 67; 3166–3173. PMID: PMC4661064.
- d. Kong J, Wolcott E, Wang Z, Jorgenson K, Harvey WF, Tao J, Roncs R, **Wang C** (2018). Altered resting state functional connectivity of the cognitive control network in fibromyalgia and the modulation effect of mind-body intervention. *Brain Imaging Behav*. Epub ahead of print. PMID: PMC6214794.

### 3. Pioneering methodology for novel comparative effectiveness trials of mind-body medicine

Dr. Wang and her team have been developing innovative research methodologies to estimate treatment effects in randomized clinical trials, especially for mind-body therapies in chronic rheumatic conditions. In NIH-funded R01 studies, she has pioneered the methodology by conducting novel comparative effectiveness trials for patients with chronic pain. This endeavor has now stimulated new research approaches.

- a. Balk E, Bonis P, Moskowitz, C Schmid C, Ioannidis J, **Wang C**, Lau J (2002). Correlation of quality measures with estimates of treatment effect meta-analyses of randomized trials. *JAMA*. 287: 2973-2982. PMID: PMC12052127.
- b. **Wang C**. Role of Tai Chi in the treatment of rheumatologic diseases (2012). *Current Rheumatology Reports*. 14:598-603. PMID: PMC23055009.
- c. **Wang C**, Iversen MD, McAlindon T, Harvey WF, Wong JB, Fielding RA, Driban JB, Price LL, Schmid CH (2014). Assessing the comparative effectiveness of Tai Chi versus physical therapy for knee osteoarthritis: design and rationale for a randomized trial. *BMC Complementary and Alternative Medicine*. 14:333. PMID: PMC4171546.
- d. **Wang C**, McAlindon T, Harvey WF, Wong JB, Fielding RA, Driban JB, Price LL, Schmid A, Scott TM, Schmid CH (2015). A novel comparative effectiveness study of Tai Chi versus aerobic exercise for fibromyalgia: study protocol for a randomized trial. *Trials*. 16:34 PMID: PMC4323027.

### 4. Mentoring

Supported by the prestigious NIH-funded K24 Award in Patient-Oriented Research, Dr. Wang has been mentoring clinical researchers worldwide to focus on patient-oriented clinical and translational integrative medicine with a multi-disciplinary team of trained scientists. She has an established track record of effectively mentoring medical trainees at various levels, including medical students, house officers, junior faculty, and pre-doctoral and postdoctoral fellows. Her experience and skills allow her to help trainees navigate various research-related challenges, including study design issues, implementation of clinical trials, logistical and analytical challenges associated with data collection and analysis, manuscript writing, and the submission process. Her mentoring efforts have resulted in the production of over 150 peer-reviewed publications by her trainees with her senior authorship in 2013-2021. These project topics have covered a variety of clinical integrative medicine disciplines, such as mind-body practice, nutrition research, health service utilization, both therapy, medical bugs for pain, herbal medicine, mechanisms of action, clinical trial methodology, historical research, outcome studies, as well as economic evaluation. Moreover, over 20 of her trainees have received their own NIH or other career grants. These funds have provided the opportunity to define the role of complementary and integrative medicine in the management of chronic medical conditions. In addition, Dr. Wang serves as an expert for the New England Journal of Medicine Group Open Forum (2017), member of the National Advisory Council for Complementary and Integrative Health at the NIH (2013-2017), and member of the Expert Panel of American College of Rheumatology Guideline Subcommittee for the 2021 Non-Pharmacologic Management of Osteoarthritis and Member of the International Association for the Study of Pain (IASP) audit committee.

- a. Marszalek J, Price LL, Harvey WF, Driban JB, **Wang C** (2017). Outcome expectations and osteoarthritis: benefits of exercise are associated with Self-Efficacy and Depression. *Arthritis Care & Research*. 69:491. PMID: PMC5219866.
- b. Lee AC, Harvey WF, Price LL, **Wang C**, et al (2017). Mindfulness is associated with psychological health and moderates pain in knee osteoarthritis. *Osteoarthritis Cartilage*. 25:824. PMID: PMC5183521.
- c. Lee AC, Harvey WF, Han X, Price LL, Driban JB, Bannuru RR, **Wang C** (2018). Pain and functional trajectories in symptomatic knee osteoarthritis
- d. Michelle Park, Yuan Zhang, Lori Lyn Price L, Bannuru RR, **Wang C** (2019). Mindfulness is associated with sleep quality among patients with fibromyalgia. *International J of Rheumatic Disease*. DOI: 10.1111/1756-185X.13756. PMID: PMC7054145.

**Complete List of Published Work in MyBibliography:**

<http://www.ncbi.nlm.nih.gov/sites/myncbi/chenchen.wang.1/bibliography/41141193/public/?sort=date&direction=ascending>