

**BIOGRAPHICAL SKETCH**

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NAME: Yingwei Yao

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

POSITION TITLE: Research Associate Professor

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
Peking University, Beijing, China	B.S.	07/1994	Electronics
Peking University, Beijing, China	M.S.	07/1997	Electronics
Princeton University, Princeton, NJ	Ph.D.	11/2002	Information Sciences
University of Minnesota, Minneapolis, MN	Postdoc	08/2004	Information Sciences

**A. Personal Statement**

I am excited to contribute to the important work to be conducted at the Florida-California Cancer Research, Education & Engagement (CaRE<sup>2</sup>) Health Equity Center. As a Research Associate Professor at the University of Florida, I have expertise in study design, power analysis, and statistical analysis, including longitudinal analysis and missing data processing; machine learning, including dimensionality reduction, model estimation, selection, validation, and testing; development of novel algorithms; and theoretical analysis of large systems. My expertise in these areas as well as my experience with data query and extraction from large complex databases make me well suited to serve as a member of the Bioinformatics, Statistical and Methodological Core (BSMC). As the co-director of BSMC at UF, I serve as liaison to the pilot project and assist the investigators in data analysis and study design. I have also provided statistical support to other cores and mentoring and training to CaRE<sup>2</sup> trainees. I look forward to continuing to work with this interdisciplinary research team to successfully complete the work proposed in the three cancer research projects and to develop future innovative projects that build upon them to improve cancer patient outcomes and reduce healthy disparity.

**B. Positions and Honors**

2004-2011 Assistant Professor, University of Illinois  
 2011-2015 Research Associate Professor, Statistician, University of Illinois  
 2015-current Research Associate Professor, Statistician, University of Florida

**C. Contributions to Science**

1. We examined the associations of symptoms including pain, fatigue, and depression with metabolite concentrations in breast cancer patients. We also identified genetic polymorphisms associated with acute and chronic pain in sickle cell patients.
  - a. Lyon, D. E., Starkweather, A., **Yao, Y.**, Garrett, T., Kelly, D. L., Menzies, V., ... & Jackson-Cook, C. (2017). Pilot Study of Metabolomics and Psychoneurological Symptoms in Women with Early Stage Breast Cancer. *Biological research for nursing*, 1099800417747411. PMID: PMC5873295

- b. Jhun, EH, Hu, X, Sadhu, N, **Yao, Y**, He, Y, Wilkie, DJ, Molokie, RE, and Wang, ZJ. (2018). Transient receptor potential polymorphism and haplotype associate with crisis pain in sickle cell disease, *Pharmacogenomics*, 19(5), 401-411.
  - c. Hu, X., Jhun, E. H., **Yao, Y.**, He, Y., Molokie, R. E., Wilkie, D. J., & Wang, Z. J. (2016). IL1A rs1800587 associates with chronic noncrisis pain in sickle cell disease. *Pharmacogenomics*, 17(18), 1999-2006. PMID: PMC5220521
  - d. Jhun, E., He, Y., **Yao, Y.**, Molokie, R. E., Wilkie, D. J., & Wang, Z. J. (2014). Dopamine D3 receptor Ser9Gly and catechol-O-methyltransferase Val158Met polymorphisms and acute pain in sickle cell disease. *Anesthesia & Analgesia*, 119(5), 1201-7. PMID:4205211
2. We conducted multiple studies utilizing statistical as well as data mining methods to analyze patient care plan data, which revealed valuable insights on the current state of palliative care in U.S. hospitals. We found that pain was under-diagnosed among end of life patients and that pain management goals were achieved for only a quarter of those diagnosed with pain. A potential solution is a transition to palliative care focusing on comfort with removal of unnecessary treatments, which has been shown to be associated with improved pain outcomes. In addition, we developed a prediction model for patient pain outcomes that can be used to provide clinical decision support of pain management.
- a. Al-Masalha, F., Xu, D., Keenan, G. M., Khokhar, A., **Yao, Y.**, Chen, J., ... Wilkie, D. J. (2013). Data mining nursing care plans of end-of-life patients: A study to improve healthcare decision making. *International Journal of Nursing Knowledge*, 24(1), 15-24. PMID: PMC3641782
  - b. **Yao, Y.**, Keenan, G., Xu, D., Khokhar, A., Al-Masalha, F., Dunn Lopez, K., Ansari, R., & Wilkie, D. J. (2013). Current state of pain care for hospitalized patients at end of life. *American Journal of Hospice and Palliative Medicine*, 30(2), 128-136. PMID: PMC3681818
  - c. Lodhi, M. K., Stifter, J., **Yao, Y.**, Ansari, R., Keenan, G. M., Wilkie, D. J., & Khokhar, A. A. (2015). Predictive Modeling for End-of-Life Pain Outcome Using Electronic Health Records. In *Advances in Data Mining: Applications and Theoretical Aspects* (pp. 56-68). Springer International Publishing. PMID: PMC4975539
  - d. **Yao, Y.**, Stifter, J., Ezenwa, M. O., Lodhi, M., Khokhar, A., Ansari, R., Keenan, G. M., & Wilkie, D. J. (2015). Infomarkers for transition to goals consistent with palliative care in dying patients. *Palliative & Supportive Care*, 13(5), 1427-34. PMID: PMC4685252
3. Pain is the most common manifestation of and a marker of severity for sickle cell disease. Our analysis of patient utilization data showed that patient pain intensity predicts the rate of acute health care utilization. In addition, we conducted quantitative sensory testing of patients with sickle cell disease, and found a high prevalence of neuropathic pain that was not being adequately treated. In order to reduce this type of pain, we tested the effectiveness of Trifluoperazine, which is a potent inhibitor of CaMKII $\alpha$  and is known to play a significant role in the development of neuropathic pain. Results of our Phase I trial were promising, and indicated that Trifluoperazine is an analgesic drug worthy of further testing in this patient population. In addition, we have also successfully conducted feasibility study of a web-based intervention to alleviate sick cell pain through a bio-behavioral approach.
- a. Ezenwa, M. O., Molokie, R. E., Wang, Z. J., **Yao, Y.**, Suarez, M. L., Angulo, V., & Wilkie, D. J. (2014). Outpatient pain predicts subsequent 1-year acute healthcare utilization among adults with sickle cell disease. *Journal of Pain and Symptom Management*, 48(1), 65-74. PMID: 4082743
  - b. Molokie, R. M., Wilkie, D. J., Wittert, H., Suarez, M. L., **Yao, Y.**, Zhao, Z., He, Y., & Wang, Z. J. (2014). Mechanism driven phase 1 study of Trifluoperazine in adults with sickle cell disease. *European Journal of Pharmacology*, 723, 419-24. PMID: PMC3959657
  - c. Ezenwa, M. O., Molokie, R. E., Wang, Z. J., **Yao, Y.**, Suarez, M. L., Pullum, C., . . . Wilkie, D. J. (2015). Safety and utility of quantitative sensory testing among adults with sickle cell disease: Indicators of neuropathic pain? *Pain Practice*. PMID: PMC4499503
  - d. Ezenwa, M.O., **Yao, Y.**, England, C.G., Molokie, R.E., Wang, Z.J., Suarez, M.L., & Wilkie, D.J. (2016). Feasibility of a Tablet-based Guided Audio-visual Relaxation Intervention for Reducing Stress and Pain in Adults with Sickle Cell Disease: A Randomized Controlled Pilot Study. *Journal of Advanced Nursing*. doi: 10.1111/jan.12895.

4. Information theory in general and theory of detection and estimation in particular have provided many methodological advances in data processing and analysis. My contribution in this area has included rigorous analysis of regularity and identifiability of the blind source separation problem, random matrix theory-based analysis of large systems, development of novel efficient algorithms for decentralized detection, and asymptotic theoretical analysis of performance in large networks.
- Yao, Y.,** Poor, H. V., & Sun, F. (2004). User capacity for synchronous multirate CDMA systems with linear MMSE receivers. *IEEE Transactions on Information Theory*, 50(11), 2785–2793.
  - Yao, Y.** & Giannakis, G. B. (2005). On regularity and identifiability of blind source separation under constant modulus constraints. *IEEE Transactions on Signal Processing*, 53(4), 1272–1281.
  - Yao, Y.** (2012). Group-ordered SPRT for decentralized detection. *IEEE Transactions on Information Theory*, 58(6), 3564-3574.
  - Zheng, L., **Yao, Y.**, Deng, M., & Yan, S. (2012). Decentralized detection in ad hoc sensor network with low data rate inter sensor communication. *IEEE Transactions on Information Theory*, 58(5), 3215-3224.

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

<http://www.ncbi.nlm.nih.gov/sites/myncbi/yingwei.yao.1/bibliography/48388245/public/?sort=date&direction=descending>

**D. Additional Information: Research Support and/or Scholastic Performance**

**Ongoing**

**U54CA233444** (Odedina, Wilkie, MPIs) 7/1/2018-6/30/2023  
 NIH/NCI  
*2/3 Florida-California Cancer Research, Education and Engagement (CaRE2) Health Equity Center*  
 The CaRE2 Health Equity is proposed by the University of Florida, Florida A&M University (FAMU) and the University of Southern California-Norris Comprehensive Cancer Center (USC-NCCC) to eliminate cancer health disparities in Florida, California and nationally. Role: Other – Core Lead

**R01HD091210** (Schlaeger, PI) 9/1/2017-8/31/2022  
 NIH/HD  
*Double-blind Phase 2 RCT: Effect of Acupuncture on Patient Vulvodynia Outcomes*  
 Our long-term goal is to demonstrate the effects of acupuncture for the treatment of vulvodynia. Role: Co-I

**1R01NR018416-01** (Keenan, Dunn Lopez, Yao, MPIs) 9/20/2019-7/31/2022  
*Tailored Clinical Decision Support Formats Designed to Improve Palliative Care for Cancer and Chronically Ill Patients: A Pre-Clinical Test*  
 NIH/NINR  
 The goal of this research is to develop a tailored clinical decision support interface to improve nursing performance in palliative care. Role: PI/PD.

**1 R21 AG062884-01** (Ingibjargardottir-Bjarnadottir, Lucero, MPIs) 4/1/2019-3/31/2021  
 NIH/NIA  
*Advancing Interdisciplinary Science of Aging through Identification of Iatrogenic Complications: The UF EHR Clinical Data Infrastructure for Enhanced Patient Safety among the Elderly (UF-ECLIPSE)*  
**R21 Phase:** Identify and test the feasibility of text-mining pipelines to process registered nurses' (RNs) progress notes for prediction of hospital-acquired falls. **R33 Phase:** Determine and evaluate the structural and human resources of an expanded research-data infrastructure to support sustained interdisciplinary aging studies. Role: Co-I (effort begins in Year 2, 4/1/2020).

**R01CA207026** (Wilkie, Erden, MPIs) 9/1/2017-6/30/2020  
*Evaluating the Tablet-based Turkish-PAINReportIt for Assessing Pain of Lung Cancer Patients Post Thoracotomy in TURKEY*  
 NIH/National Cancer Institute

The goal of this research partnership between research scientists in Turkey and the U.S. is to manage pain related to lung cancer after thoracotomy by using computers to minimize some of the barriers related pain assessment and thereby support clinical care processes for assessment of pain. Role: Co-I

**No number** (Kobetz, Vadaparampil, Wilkie, MPIs)

12/5/2018-12/4/2019

Florida Academic Cancer Center Alliance

*FACCA Disparities Think Tank*

Develop and implement Florida-wide cancer pilot project across three cancer centers focused on reducing cancer health disparities in Florida. Role: Co-I

### **Completed**

**R01 HL124945-01** (MPIs: Wilkie, Molokie, Wang)

9/01/2014–5/31/2019

NIH/NHLBI

*Phenotypic Characterization of Chronic Pain in Adults with Sickle Cell Disease*

In this project, we will identify chronic pain phenotypes based on type of sensitization and pain characteristics. Then we will identify genetic and epigenetic characteristics, pain treatment, environmental factors, and quality of life scores associated with each phenotype. Role: Co-I

**R01 HL114404** (Gallo, A. Wilkie, D.J. MPIs)

2/15/2012 – 1/31/2017 (NCE)

NIH, National Heart, Lung and Blood Institute

Sickle Cell Reproductive CHOICES: Efficacy of a Primary Prevention Intervention.

The goal of this study is to complete a 24-month randomized controlled study of the effect of an innovative, tailored computerized program for reproductive decision making in the sickle cell community.

Role: Statistician.

**No number** (Boyd, AD, PI)

UIC Roybal Center

02/01/2014 – 01/31/2017 (NCE)

*My IDEA, a tailored patient Cardiac Catheterization app.*

The goal of this project is to determine the feasibility of My IDEA among elderly minority patients receiving cardiac stents.

Role: Co-I

**IH-1304-6553** (Wilkie, DJ PI)

10/01/2013 – 12/30/2016

Patient-Centered Outcomes Research Institute

*Computerized PAINRelievelt Protocol for Cancer Pain Control in Hospice*

This project specifically aimed to compare usual hospice care and PAINRelievelt groups for effects on: 1) Patient outcomes (analgesic adherence; worst pain intensity, satisfaction, and misconceptions) and lay caregiver outcome (pain misconceptions) in a diverse sample of 250 cancer patient-caregiver dyads receiving hospice care; and 2) Nurse outcomes (obtained appropriate analgesics for patient) in a sample of hospice nurses.

Role: Co-I