Stanford MEDICINE | Internal Medicine

Research Interest Group Newsletter

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Welcome!

Dear colleagues,

Welcome to the Winter 2022 edition of our medicine residency research newsletter!

This publication is aimed at both highlighting our residents' exciting projects as well as informing trainees and recruits about the scholarly work taking place at Stanford. We define research comprehensively, including scholarly work done in quality improvement, global health, outcomes research, medical education, clinical investigation, translational research, implementation science, qualitative studies, clinical trials, and device/service innovation.

This cycle, we're also focusing on highlighting one of our residents to share a bit more about their own research experience in residency, as well as some quick tips from a faculty mentor for residents looking to be more involved in research!

Resident Spotlight

Matthew Alkaitis, MD, PhD

Matt, tell us about yourself!

The most important things to know about me are that I love skiing, dogs and Greek yogurt. I have spent time across a broad range of fields and across wet-lab, dry-lab and clinical research. My PhD work was focused on analytical biochemistry, developing high-performance liquid chromatography and mass spectrometry assays to study nitric oxide signaling. During med school I expanded into computational research by joining a machine learning lab at MIT working on natural language processing for clinical endpoint extraction from medical records. During residency I've been working on bioinformatics tools for cell-free DNA. Following residency I'll be joining the Division of Hospital medicine – very excited to be sticking around as part of the Stanford community!

Quite the journey you've had! What part of your current work excites you the most?

I am currently working with mentors in both hematology (Tian Zhang, MD, PhD) and genomics (David Kurtz, MD, PhD) to develop cell-free DNA analysis methods in AML to assess minimal residual disease and monitor for relapse. The fun part about this work is trying to build analysis pipelines that work just as well if you start with sequencing data from 10 patients or 100 patients. These kinds of coding problems are both fun to solve, and potentially quite clinically useful – for example similar bioinformatics pipelines sit behind the HemeSTAMP reports we use to guide decision-making on Med8.

A more general problem I am interested in improving the clinical research experience for residents. The hypothesis is that using computational tools such as R or python can both contribute to a more interesting research experience and also improve the quality, fidelity and scalability of data processing compared to manually editing excel sheets. I'm interested in making these types of computational tools more easily accessible to residents with or without coding experience. I'm also interested to see whether the recent advances in large language models and coding co-pilot tools could make it even easier to implement computational methods. One idea is to develop a repository of bioinformatics tools to help residents get up and running in a coding environment and have example models to work from and adapt – if this sounds interesting to you, please reach out!

Very impressive, Matt! Do you have any tips for those looking to be involved with research?

Doing research within the constraints of a residency schedule if flat-out hard. Hopefully the following suggestions can help:

1. Talk to your peers. Share what you've learned as you look for labs or projects that would be a good fit. Learn from what has or hasn't worked from what your peers are doing.
2. Talk with R2s/R3s and fellows. R2/R3s can give you a general idea of which PIs might have research interests that could be a good fit. Fellows affiliated with labs you might be interested in working with can tell you more about the spectrum of projects that are active and might need an extra set of hands.
3. Talk to attendings you liked working with clinically. Ask them what projects they have in flight, what needs to fall in place for you to get involved (e.g., IRB approval, data transfers etc) and whether the project would be compatible with a resident schedule.

Lastly, think about pursuing a research angle that is relevant to the clinical work we do as residents - I have found this crossover helps reinforce the relevance of a given research project and builds appreciate for the technologies and knowledge base we rely on as clinicians.

Faculty Corner

We asked Fatima Rodriguez, the winner of our Resident Research Mentor Award this past spring during our 5th Annual Research Symposium, on more advice for those looking to become more involved in a research project. But first, a little about Dr. Rodriguez:

Fatima Rodriguez, MD, MPH is a preventive and general cardiologist in the Division of Cardiovascular Medicine at Stanford. Dr. Rodriguez received her medical training from Harvard Medical School. She completed her residency at Brigham and Women's Hospital and fellowship in Cardiovascular Medicine at Stanford University. She specializes in common cardiac conditions such as coronary artery disease, valvular heart disease, lipid disorders, and cardiovascular risk assessment in high-risk populations.

Dr. Rodriguez's research includes a range of topics relating to racial, ethnic, and gender disparities in cardiovascular disease prevention and developing novel interventions to address disparities.

Fatima Rodriguez, MD, MPH

What do you look for in a mentee who wants to get involved in a project?

The most of important trait I look for in a trainee is persistence. Finishing what you start is a key part of research success.

What things do you do to cultivate and foster your particular mentorship style?

I have a "more red = more love" mentoring style. I expect my mentees to work hard, finish what they start, and feel comfortable asking for help when needed.

What should we be looking for in a mentor or project during residency?

I always advise our talented trainees to do work that is 1) interesting; 2) feasible; and 3) fun. It's useful to find mentors with a track record of working with trainees that leads to presentations and publications.

Scholarly Work

Congratulations to the following residents for showcasing their research over the last few months! Below are the 66 posters, podium presentations, and publications (and likely more not being reported!) that you've reported and we've found on Pubmed* over the past few months.

Chiang, Ryan S., Aakash Desai, Michael J. Glover, Gavin Hui, Kavitha J. Ramchandran, Heather Wakelee, Mark P. Lythgoe, and Ali Raza Khaki. 2022. “Racial Diversity and Reporting in United States Food and Drug Administration Registration Trials for Thoracic Malignancies from 2006 to 2020.” *Cancer Investigation*, November, 1–5.

Chiang, Ryan S., Michael J. Glover, Ali Raza Khaki, and Sandy Srinivas. 2022. “Immunotherapy for Urothelial Carcinoma: Focus on Clinical Utility of Nivolumab.” *OncoTargets and Therapy* 15 (October): 1259–69.

Coombes, Caitlin E., Kevin R. Coombes, and Naleef Fareed. 2022. “Sequences of Events from the Electronic Medical Record and the Onset of Infection.” *Chemistry & Biodiversity* 19 (11): e202200657.

Devareddy, Ankita, Ashish Sarraju, and Fatima Rodriguez. 2022. “Health Disparities Across the Continuum of ASCVD Risk.” *Current Cardiology Reports* 24 (9): 1129–37.

Glover, Michael, Gavin Hui, **Ryan Chiang**, Philip Savage, Jonathan Krell, Maximilian Julve, Petros Grivas, Mark Lythgoe, and Ali Raza Khaki. 2022. “Disparity of Race Reporting in US Food and Drug Administration Drug Approvals for Urinary System Cancers from 2006 to 2021.” *BJU International* 129 (2): 168–70.

Koshkin, Vadim S., Nicholas Henderson, Marihella James, Divya Natesan, Dory Freeman, Amanda Nizam, Christopher T. Su, ..., **Ryan Chiang**, et al. 2022. “Efficacy of Enfortumab Vedotin in Advanced Urothelial Cancer: Analysis from the Urothelial Cancer Network to Investigate Therapeutic Experiences (UNITE) Study.” *Cancer* 128 (6): 1194–1205.

Shukla, Navika D., **Ryan S. Chiang**, and Alexander D. Colevas. 2022. “Metastatic Parotid Gland Carcinoma With ERBB2 Amplification With Complete Response to Fam-Trastuzumab Deruxtecan.” *Journal of the National Comprehensive Cancer Network: JNCCN* 20 (2): 102–4.

Gomez, Sofia E., Muhammad Fazal, Julio C. Nunes, Shayena Shah, Alexander C. Perino, Sanjiv M. Narayan, Kamala P. Tamirisa, Janet K. Han, Fatima Rodriguez, and Tina Baykaner. 2022. “Racial, Ethnic, and Sex Disparities in Atrial Fibrillation Management: Rate and Rhythm Control.” *Journal of Interventional Cardiac Electrophysiology: An International Journal of Arrhythmias and Pacing*, October. https://doi.org/10.1007/s10840-022-01383-x.

Gomez, Sofia E., Calvin E. Hwang, Daniel Seung Kim, Victor F. Froelicher, Matthew T. Wheeler, and Marco V. Perez. 2022. “Premature Ventricular Contractions (PVCs) in Young Athletes.” *Progress in Cardiovascular Diseases* 74 (October): 80–88.

Sarraju, Ashish, Gabriela Spencer-Bonilla, Sukyung Chung, **Sofia Gomez**, Jiang Li, Paul Heidenreich, Latha Palaniappan, and Fatima Rodriguez. 2022. “Statin Use in Older Adults for Primary Cardiovascular Disease Prevention Across a Spectrum of Cardiovascular Risk.” *Journal of General Internal Medicine* 37 (11): 2642–49.

Gomez, Sofia E., Ashish Sarraju, and Fatima Rodriguez. 2022. “Racial and Ethnic Group Underrepresentation in Studies of Adverse Pregnancy Outcomes and Cardiovascular Risk.” *Journal of the American Heart Association* 11 (5): e024776.

Hu, Kelly A., Jeanne Shen, Kerri Rieger, Mike T. Wei, and John Gubatan. 2022. “Subcutaneous Sweet Syndrome Successfully Treated With Ustekinumab in a Patient With Ulcerative Colitis.” *ACG Case Reports Journal* 9 (11): e00881.

Joshi, Mugdha, Keizra Mecklai, Ronen Rozenblum, and Lipika Samal. 2022. “Implementation Approaches and Barriers for Rule-Based and Machine Learning-Based Sepsis Risk Prediction Tools: A Qualitative Study.” *JAMIA Open* 5 (2): ooac022.

Karhu, Elisa, and Linda Nguyen. 2022. “Safety and Efficacy of EUS-Guided Celiac Plexus Block in the Evaluation of Patients with Median Arcuate Ligament Syndrome Anatomy for Possible Surgery.” *Igiena* 1 (1): 57–61.

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Kim, Daniel Seung, Matthew T. Wheeler, and Euan A. Ashley. 2022. “The Genetics of Human Performance.” *Nature Reviews. Genetics*23 (1): 40–54.

Sandhu, Alexander T., Jimmy Zheng, Neil Kalwani, Anshal Gupta, Jamie Calma, Megan Skye, **Roy Lan**, Brian Yu, John Spertus, and Paul Heidenreich. 2022. “Impact of Patient-Reported Outcome Measurement in Heart Failure Clinic on Clinician Health Status Assessment and Patient Experience: A Sub-Study of the PRO-HF Trial.” *Circulation. Heart Failure*, November.

Oliveira, Rudolf K. F., Peter S. Nyasulu, Adeel Ahmed Iqbal, Muhammad Hamdan Gul, Eloara V. M. Ferreira, **John William Leclair**, Zin Mar Htun, et al. 2022. “Cardiopulmonary Disease as Sequelae of Long-Term COVID-19: Current Perspectives and Challenges.” *Frontiers of Medicine* 9 (November): 1041236.

Molina, Alfonso, Lan Xiao, Quinn T. Ostrom, Lisa G. Rosas, and Peter L. Greenberg. 2022. “Epidemiologic Evaluation of Clinical Outcomes in Ethnic Minorities with Myelodysplastic Syndromes.” *Leukemia Research* 119 (August): 106907.

Molina, Alfonso, Muffly, L. “Disparities and Incomplete Capture of Race/Ethnicity Data in Adults with Hematologic Malignancies Referred for Cellular Therapies.? Society of Hematologic Oncology 2022 Annual Meeting. 2022 [Poster Presentation]

Dawson, Walter D., Erin Smith, Laura Booi, **Maia Mosse**, Helen Lavretsky, Charles F. Reynolds 3rd, Jeffrey Cummings, et al. 2022. “Investing in Late-Life Brain Capital.” *Innovation in Aging* 6 (3): igac016.

Norman, Joshua S., Prashant Kotwani, Amy M Shui, Jennifer Dodge, Francis Yao, Neil Mehta. “A Modified RETREAT Score Incorporating AFP-L3 and DCP Biomarkers Improves Post-Liver Transplant HCC Recurrence Risk Prognostication.” AASLD The Liver Meeting. 2022. Washington DC. [Poster Presentation]

Matthaiou, Efthymia Iliana, Husham Sharifi, **Christian O’Donnell**, Wayland Chiu, Clark Owyang, Paulami Chatterjee, Ihsan Turk, et al. 2022. “The Safety and Tolerability of Pirfenidone for Bronchiolitis Obliterans Syndrome after Hematopoietic Cell Transplant (STOP-BOS) Trial.” *Bone Marrow Transplantation* 57 (8): 1319–26.

O’Donnell, Christian, Pablo Amador Sanchez, Andrew Moore, Ana Pacheco-Navarro, Jonasel Roque, Tara Ramaswamy, Mugdha Joshi, Shaun Pienkos, Joe Hsu, William Collins, Angela J. Rogers. “Increasing NT-proBNP is Associated with In-Hospital Mortality in ICU Patients with COVID-19.” American Thoracic Society Conference. San Francisco 2022. [Poster Presentation]

Sanchez, P.A., **Christian O’Donnell**, Roque, J., Asuni, T., Levitt, J.E., Rogers, A. “Manually-Traced Right Ventricular Global Longitudinal Strain Identifies Substantial Evidence of Dysfunction in Critically-Ill Patients, Not Captured by Conventional Measures.” 2022 American Thoracic Society Meeting. [Poster Presentation].

Lee, Geumbee, Emily Ray, Hong-Joon Yoon, Sabrina Genovese, Yeon Sik Choi, Min-Kyu Lee, Samet Şahin, ..., **Arman Ordabas**, et al. 2022. “A Bioresorbable Peripheral Nerve Stimulator for Electronic Pain Block.” *Science Advances* 8 (40): eabp9169.

Palanisamy, Srikanth, Mario Funes Hernandez, Tara I. Chang, and Kenneth W. Mahaffey. 2022. “Cardiovascular and Renal Outcomes with Finerenone, a Selective Mineralocorticoid Receptor Antagonist.” *Cardiology and Therapy* 11 (3): 337–54.

Pannu, Jaspreet, and Jeffrey S. Glenn. 2022. “Programmable Antivirals and Just-in-Time Vaccines: Biosecurity Implications of Viral RNA Secondary Structure Targeting.” *Health Security*, December.

Pannu, Jaspreet, Megan J. Palmer, Anita Cicero, David A. Relman, Marc Lipsitch, and Tom Inglesby. 2022. “Strengthen Oversight of Risky Research on Pathogens.” *Science* 378 (6625): 1170–72.

Pannu, Jaspreet, Jonas B. Sandbrink, Matthew Watson, Megan J. Palmer, and David A. Relman. 2022. “Protocols and Risks: When Less Is More.” *Nature Protocols*.

Levin, Michael G., Noah L. Tsao, Pankhuri Singhal, Chang Liu, Ha My T. Vy, **Ishan Paranjpe**, Joshua D. Backman, et al. 2022. “Genome-Wide Association and Multi-Trait Analyses Characterize the Common Genetic Architecture of Heart Failure.” *Nature Communications* 13 (1): 6914.

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Peng, Cynthia R., and Kimberly Schertzer. 2022. “Rapid Cycle Deliberate Practice in Medical Simulation.” In *StatPearls*. Treasure Island (FL): StatPearls Publishing.

Mackey, Cassandra, Jacob Feldman, **Cynthia Peng**, David P. Way, and Anne Messman. 2022. “How Do Emergency Medicine Applicants Evaluate Residency Programs in the Post-COVID-19 Era?” *AEM Education and Training* 6 (6): e10805.

Puram, Vikram Venkata, Brent Berry, Malik Ghannam, and Yuka Furuya. 2022. “Status Epilepticus in Post-Transplantation Hyperammonemia Involves Careful Metabolic Management.” *Life* 12 (10).

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Sakulsaengprapha, Vorada, Jonathan P. Masterson 4th, Waverley He, Andrew Schilling, Galen Shi, and Simon C. Mathews. 2022. “Social Media Impact on Qualitative Performance Metrics: Analysis and Trends of Top Revenue Grossing U.S. Hospitals.” *Health Marketing Quarterly* 39 (3): 249–62.

Sayegh, Hoda, Christina Harden, Hijab Khan, Madhukar Pai, Quentin G. Eichbaum, Charles Ibingira, and Gelila Goba. 2022. “Global Health Education in High-Income Countries: Confronting Coloniality and Power Asymmetry.” *BMJ Global Health* 7 (5).

Somani, Sulaiman S., Rachel Golgorsky, Sean N. Neifert, Aly A. Valliani, Katherine E. Link, Viola J. Chen, Anthony B. Costa, and Eric K. Oermann. 2022. “Population Scale Latent Space Cohort Matching for the Improved Use and Exploration of Observational Trial Data.” *Mathematical Biosciences and Engineering: MBE* 19 (7): 6795–6813.

Somani, Sulaiman, van Buchem M, Sarraju A, Hernandez-Boussard T, Rodriguez F. “Topics and Sentiments Around Statins on Reddit Using Artificial Intelligence.” American College of Cardiology 72nd Scientific Session, New Orleans, LA. March 2023. [Moderated Presentation]

Honarvar, Hossein, Chirag Agarwal, **Sulaiman Somani**, Akhil Vaid, Joshua Lampert, Tingyi Wanyan, Vivek Y. Reddy, et al. 2022. “Enhancing Convolutional Neural Network Predictions of Electrocardiograms with Left Ventricular Dysfunction Using a Novel Sub-Waveform Representation.” *Cardiovascular Digital Health Journal* 3 (5): 220–31.

Song, Nancy, Molly Frean, Christian T. Covington, Maike Tietschert, Emilia Ling, Hassina Bahadurzada, Michaela Kerrissey, Mark Friedberg, and Sara J. Singer. 2022. “Patients’ Perceptions of Integrated Care Among Medicare Beneficiaries by Level of Need for Health Services.” *Medical Care Research and Review: MCRR* 79 (5): 640–49.

Sossenheimer, Philip H., Sushma Bharadwaj, Laura Johnston, and Vyjeyanthi S. Periyakoil. 2022. “Geriatrics Assessment in Older Adults Referred for Hematopoietic Cell Transplantation.” *Journal of the American Geriatrics Society* 70 (10): 3038–40.

Sung, Anthony D., **Vinay K. Giri**, Helen Tang, Krista Rowe Nichols, Meagan V. Lew, Lauren Bohannon, Yi Ren, et al. 2022. “Home-Based Hematopoietic Cell Transplantation in the United States.” *Transplantation and Cellular Therapy* 28 (4): 207.e1–207.e8.

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Testa, Stefano, **Mugdha Joshi**, Justin Lotfi, Bryant Lin, Maja Artandi, Kim F. Chiang, Kevin Chang, Baldeep Singh, and Linda N. Geng. 2022. “Training Internal Medicine Residents in Difficult Diagnosis: A Novel Diagnostic Second Opinion Clinic Experience.” *Journal of Medical Education and Curricular Development* 9 (March): 23821205221091036.

Testa, Stefano, Jyoti Kumar, Alex J. Goodell, James L. Zehnder, Kevin M. Alexander, Surbhi Sidana, Sally Arai, Ronald M. Witteles, and Michaela Liedtke. 2022. “Prevalence, Mutational Spectrum and Clinical Implications of Clonal Hematopoiesis of Indeterminate Potential in Plasma Cell Dyscrasias.” *Seminars in Oncology*, December.

Testa, Stefano, Ole A. W. Haabeth, Timothy R. Blake, Trevor J. Del Castillo, Debra K. Czerwinski, Ranjani Rajapaksa, Paul A. Wender, Robert M. Waymouth, and Ronald Levy. 2022. “Fingolimod-Conjugated Charge-Altering Releasable Transporters Efficiently and Specifically Deliver mRNA to Lymphocytes In Vivo and In Vitro.” *Biomacromolecules* 23 (7): 2976–88.

Mooney, Kelly L., Debra K. Czerwinski, Tanaya Shree, Matthew J. Frank, Sarah Haebe, Brock A. Martin, **Stefano Testa**, Ronald Levy, and Steven R. Long. 2022. “Serial FNA Allows Direct Sampling of Malignant and Infiltrating Immune Cells in Patients with B-Cell Lymphoma Receiving Immunotherapy.” *Cancer Cytopathology* 130 (3): 231–37.

Liang, Emily C., Juliana Craig, **Stefan Torelli**, Kristen Cunanan, Maria Iglesias, Sally Arai, Matthew J. Frank, et al. 2022. “Allogeneic Hematopoietic Cell Transplantation for Adult Acute Lymphoblastic Leukemia in the Modern

Era." *Transplantation and Cellular Therapy*28 (8): 490–95.

Weingarden, Alexa R., Olivia Treiger, **Lauren Ulsh**, Berkeley Limketkai, David Goldenberg, Philip Okafor, Irene Sonu, Neil Stollman, and Leila Neshatian. 2022. "Delivery of Fecal Material to Terminal Ileum Is Associated with Long-Term Success of Fecal Microbiota Transplantation." *Digestive Diseases and Sciences*, November.

Vasti, Elena C., Melanie D. Ashland, **Christian O'Donnell**, Fatima Rodriguez, Paul Wang, and Connor G. O'Brien. 2022. "Impact of Bradyarrhythmias Requiring Pacing on Outcomes in Patients With COVID-19." *JACC. Clinical Electrophysiology* 8 (12): 1583–85.

Vazquez-Reyes, Raul, Aaron Yeoh, Afrin Kamal. "Tacrolimus-Induced Esophageal and Colon Ulcers: A Case Report." American College of Gastroenterology Conference. October 2022. Charlotte, NC. [Poster Presentation]

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Fazal, Muhammad, **Chen Wei,** Katherine Lee Chuy, Kifah Hussain, Sofia E. Gomez, Shayena Shah Ba, Grzegorz Pietrasik, et al. 2022. "Tyrosine Kinase Inhibitor-Associated Ventricular Arrhythmias: A Case Series and Review of Literature." *Journal of Interventional Cardiac Electrophysiology: An International Journal of Arrhythmias and Pacing*, November.

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Witting, Celeste, Zammit A, Sarraju A, Ngo S, Hernandez-Boussard T, Rodriguez F. "Natural language processing to identify reasons for sex disparity in statin prescription." AHA 2022. Chicago, IL. 2022. [Poster Presentation]

Witting, Celeste, Gummipundi SE, Heidenreich PA, Knowles JW, Yong CM. "Diversity of cardiology fellowship candidates in the era of virtual interviews." AHA 2022. Chicago, IL, 2022. [Poster Presentation]

Woods, Emily, Nakasone TSM, Renault CA. "Factors associated with performance of transesophageal echocardiography in veterans with Staphylococcus aureus bacteremia." Stanford Internal Medicine Residency Research Symposium. Palo Alto, CA. 2022. [Poster Presentation]

Zehner, Nicholas, Laura Polding, Valeria Faraci Sindra, and Lisa Shieh. 2022. "Prospective Pilot Study of the Three Good Things Positive Psychology Intervention in Short-Term Stay Hospitalised Patients." *Postgraduate Medical Journal*, March.

**We created a little script in Python to scrape PubMed for all resident-related research (and manually combed through some matches to remove any false positive hits). Want to learn more about our code? Come join the coding session Matt is putting together - details soon!*

Interested in Joining?

If you'd like to be more involved with the Research Interest Group, please don't hesitate to reach out to the current leaders:

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Jassi Pannu, R3, jassi [at] stanford.edu