



Shoa L. Clarke, MD, PhD

Assistant Professor of Medicine (Cardiovascular Medicine) and of Pediatrics
Medicine - Cardiovascular Medicine

CLINICAL OFFICE (PRIMARY)

- **Stanford Cardiovascular Clinic**

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Bio

BIO

Dr. Clarke is a preventive cardiologist and a physician-scientist focused on disease prevention. He earned his undergraduate degree in human biology from the Division of Nutritional Sciences at Cornell University before obtaining his MD and PhD (genetics) from Stanford University School of Medicine. He has completed clinical training in internal medicine (Brigham & Women's Hospital), pediatrics (Boston Children's Hospital), and cardiovascular medicine (Stanford Hospital), and he is board certified in all three specialties. His research is focused on 1) understanding complex disease genetics in diverse populations, 2) integrating monogenic and polygenic risk with clinical risk, 3) large-scale phenotyping using the electronic health record and medical images. His clinical practice focuses on identifying risk factors for cardiovascular disease with the goal of promoting health and longevity through evidence-based personalized treatment. He is interested in developing family-centric approaches for the treatment of adults and children carrying genetic risk for disease.

CLINICAL FOCUS

- Preventive Cardiology
- Genetics
- Familial Hypercholesterolemia
- Lipoprotein-a
- Lipids
- Coronary Artery Disease
- Coronary Artery Calcification
- Pediatrics
- Cardiovascular Disease

ACADEMIC APPOINTMENTS

- Assistant Professor - University Medical Line, Medicine - Cardiovascular Medicine
- Assistant Professor - University Medical Line, Pediatrics - Cardiology
- Member, Cardiovascular Institute

- Member, Maternal & Child Health Research Institute (MCHRI)

HONORS AND AWARDS

- Early Career Research Award, American Society for Preventive Cardiology (2024)
- Resource Centers for Minority Aging Research (RCMAR) Scientist, National Institute on Aging (2022)
- Chair Diversity Investigator Award, Stanford University Department of Medicine (2021)
- Chief Fellow, Stanford Division of Cardiovascular Medicine (2019)
- House Officer Research Award, Boston Children's Hospital (2016)
- Gilliam Fellow, Howard Hughes Medical Institute (2008 - 2013)

PROFESSIONAL EDUCATION

- Board certified, American Board of Internal Medicine , Cardiovascular Disease
- Board certified, American Board of Pediatrics , Pediatrics
- Board certified, American Board of Internal Medicine , Internal Medicine
- Fellow, Stanford University School of Medicine , Cardiovascular Medicine (2020)
- Resident, Brigham & Women's Hospital and Boston Children's Hospital , Internal Medicine and Pediatrics (2017)
- PhD, Stanford University School of Medicine , Genetics (2013)
- MD, Stanford University School of Medicine (2013)

LINKS

- Clarke Lab website: <https://clarkelab.stanford.edu/>
- Twitter: <https://twitter.com/ShoaClarke>

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Alexa Barad Zayat

Postdoctoral Research Mentor

Disha Sharma

Publications

PUBLICATIONS

- **A plasma proteomic signature for atherosclerotic cardiovascular disease risk prediction in the UK Biobank cohort.** *medRxiv : the preprint server for health sciences*
Gupte, T. P., Azizi, Z., Kho, P. F., Zhou, J., Chen, M., Panyard, D. J., Guarischi-Sousa, R., Hilliard, A. T., Sharma, D., Watson, K., Abbasi, F., Tsao, P. S., Clarke, et al
2024
- **Plasma proteomic signatures for type 2 diabetes mellitus and related traits in the UK Biobank cohort.** *medRxiv : the preprint server for health sciences*
Gupte, T. P., Azizi, Z., Kho, P. F., Zhou, J., Nzenkue, K., Chen, M., Panyard, D. J., Guarischi-Sousa, R., Hilliard, A. T., Sharma, D., Watson, K., Abbasi, F., Tsao, et al
2024
- **Genetically predicted lipoprotein(a) associates with coronary artery plaque severity independent of low-density lipoprotein cholesterol.** *European journal of preventive cardiology*
Clarke, S. L., Huang, R. D., Hilliard, A. T., Levin, M. G., Sharma, D., Thomson, B., Lynch, J., Tsao, P. S., Gaziano, J. M., Assimes, T. L.

2024

- **Multi-Ancestry Polygenic Risk Score for Coronary Heart Disease Based on an Ancestrally Diverse Genome-Wide Association Study and Population-Specific Optimization.** *Circulation. Genomic and precision medicine*
Smith, J. L., Tcheandjieu, C., Dikilitas, O., Iyer, K., Miyazawa, K., Hilliard, A., Lynch, J., Rotter, J. I., Chen, Y. I., Sheu, W. H., Chang, K. M., Kanoni, S., Tsao, et al
2024: e004272
- **Impact of Measurement Noise on Genetic Association Studies of Cardiac Function**
Vukadinovic, M., Renjith, G., Yuan, V., Kwan, A., Cheng, S. C., Li, D., Clarke, S. L., Ouyang, D., Hunter, L., Altman, R. B., Ritchie, M. D., Murray, T., Klein, et al
WORLD SCIENTIFIC PUBL CO PTE LTD.2024: 134-147
- **Whole-genome sequencing uncovers two loci for coronary artery calcification and identifies ARSE as a regulator of vascular calcification.** *Nature cardiovascular research*
de Vries, P. S., Conomos, M. P., Singh, K., Nicholson, C. J., Jain, D., Hasbani, N. R., Jiang, W., Lee, S., Cardenas, C. L., Lutz, S. M., Wong, D., Guo, X., Yao, et al
2023; 2 (12): 1159-1172
- **A multi-ancestry polygenic risk score improves risk prediction for coronary artery disease.** *Nature medicine*
Patel, A. P., Wang, M., Ruan, Y., Koyama, S., Clarke, S. L., Yang, X., Tcheandjieu, C., Agrawal, S., Fahed, A. C., Ellinor, P. T., Genes & Health Research Team; the Million Veteran Program, Tsao, P. S., Sun, Y. V., et al
2023
- **Contemporary Polygenic Scores of Low-Density Lipoprotein Cholesterol and Coronary Artery Disease Predict Coronary Atherosclerosis in Adolescents and Young Adults.** *Circulation. Genomic and precision medicine*
Guarisch-Sousa, R., Salfati, E., Kho, P. F., Iyer, K. R., Hilliard, A. T., Herrington, D. M., Tsao, P. S., Clarke, S. L., Assimes, T. L.
2023: e004047
- **A genetically supported drug repurposing pipeline for diabetes treatment using electronic health records.** *EBioMedicine*
Shuey, M. M., Lee, K. M., Keaton, J., Khankari, N. K., Breeyear, J. H., Walker, V. M., Miller, D. R., Heberer, K. R., Reaven, P. D., Clarke, S. L., Lee, J., Lynch, J. A., Vujkovic, et al
2023; 94: 104674
- **Deep learning-enabled analysis of medical images identifies cardiac sphericity as an early marker of cardiomyopathy and related outcomes.** *Med (New York, N.Y.)*
Vukadinovic, M., Kwan, A. C., Yuan, V., Salerno, M., Lee, D. C., Albert, C. M., Cheng, S., Li, D., Ouyang, D., Clarke, S. L.
2023
- **Does low-density lipoprotein fully explain atherosclerotic risk in familial hypercholesterolemia?** *Current opinion in lipidology*
Clarke, S. L.
2023
- **The Value of Measuring Lipoprotein(a) in Children.** *Circulation*
Khoury, M., Clarke, S. L.
2023; 147 (1): 32-34
- **Implicating genes, pleiotropy, and sexual dimorphism at blood lipid loci through multi-ancestry meta-analysis.** *Genome biology*
Kanoni, S., Graham, S. E., Wang, Y., Surakka, I., Ramdas, S., Zhu, X., Clarke, S. L., Bhatti, K. F., Vedantam, S., Winkler, T. W., Locke, A. E., Marouli, E., Zajac, et al
2022; 23 (1): 268
- **Confounders mediate AI prediction of demographics in medical imaging.** *NPJ digital medicine*
Duffy, G., Clarke, S. L., Christensen, M., He, B., Yuan, N., Cheng, S., Ouyang, D.
2022; 5 (1): 188
- **Genetic evidence for causal relationships between age at natural menopause and the risk of ageing-associated adverse health outcomes.** *International journal of epidemiology*
Lankester, J., Li, J., Salfati, E. L., Stefanick, M. L., Chan, K. H., Liu, S., Crandall, C. J., Clarke, S. L., Assimes, T. L.
2022
- **The Contribution of Rare Variants to the Heritability of Coronary Artery Disease Based on 38,544 Whole Genome Sequences from the NHLBI TOPMed Program**

Rocheleau, G., Clarke, S. L., Hasbani, N. R., Peyser, P. A., Vasan, R. S., Rotter, J. I., Saleheen, D., Assimes, T. L., De Vries, P. S., Do, R., Natl Heart Lung Blood Inst NHLBI
WILEY.2022: 527

- **A multi-layer functional genomic analysis to understand noncoding genetic variation in lipids.** *American journal of human genetics*
Ramdas, S., Judd, J., Graham, S. E., Kanoni, S., Wang, Y., Surakka, I., Wenz, B., Clarke, S. L., Chesi, A., Wells, A., Bhatti, K. F., Vedantam, S., Winkler, et al
2022; 109 (8): 1366-1387
- **Large-scale genome-wide association study of coronary artery disease in genetically diverse populations.** *Nature medicine*
Tcheandjieu, C., Zhu, X., Hilliard, A. T., Clarke, S. L., Napolioni, V., Ma, S., Lee, K. M., Fang, H., Chen, F., Lu, Y., Tsao, N. L., Raghavan, S., Koyama, et al
2022
- **Race and Ethnicity Stratification for Polygenic Risk Score Analyses May Mask Disparities in Hispanics** *CIRCULATION*
Clarke, S. L., Huang, R. L., Hilliard, A. T., Tcheandjieu, C., Lynch, J., Damrauer, S. M., Chang, K., Tsao, P. S., Assimes, T. L.
2022; 146 (3): 265-267
- **Use of Polygenic Risk Scores for Coronary Heart Disease in Ancestrally Diverse Populations.** *Current cardiology reports*
Dikilitas, O., Schaid, D. J., Tcheandjieu, C., Clarke, S. L., Assimes, T. L., Kullo, I. J.
2022
- **Genetic interactions drive heterogeneity in causal variant effect sizes for gene expression and complex traits.** *American journal of human genetics*
Patel, R. A., Musharoff, S. A., Spence, J. P., Pimentel, H., Tcheandjieu, C., Mostafavi, H., Sinnott-Armstrong, N., Clarke, S. L., Smith, C. J., V.A. Million Veteran Program,, Durda, P. P., Taylor, K. D., et al
2022
- **Using Mendelian randomisation to identify opportunities for type 2 diabetes prevention by repurposing medications used for lipid management.** *EBioMedicine*
Khankari, N. K., Keaton, J. M., Walker, V. M., Lee, K. M., Shuey, M. M., Clarke, S. L., Heberer, K. R., Miller, D. R., Reaven, P. D., Lynch, J. A., Vujkovic, M., Edwards, T. L.
2022; 80: 104038
- **Mendelian randomization supports bidirectional causality between telomere length and clonal hematopoiesis of indeterminate potential.** *Science advances*
Nakao, T., Bick, A. G., Taub, M. A., Zekavat, S. M., Uddin, M. M., Niroula, A., Carty, C. L., Lane, J., Honigberg, M. C., Weinstock, J. S., Pampana, A., Gibson, C. J., Griffin, et al
2022; 8 (14): eabl6579
- **Coronary Artery Disease Risk of Familial Hypercholesterolemia Genetic Variants Independent of Clinically Observed Longitudinal Cholesterol Exposure.** *Circulation. Genomic and precision medicine*
Clarke, S. L., Tcheandjieu, C., Hilliard, A. T., Lee, M., Lynch, J., Chang, K. M., Miller, D., Knowles, J. W., O'Donnell, C., Tsao, P., Rader, D. J., Wilson, P. W., Sun, et al
2022: CIRCGEN121003501
- **ZEB2 Shapes the Epigenetic Landscape of Atherosclerosis.** *Circulation*
Cheng, P., Wirka, R. C., Clarke, L. S., Zhao, Q., Kundu, R., Nguyen, T., Nair, S., Sharma, D., Kim, H. J., Shi, H., Assimes, T., Kim, J. B., Kundaje, et al
2022
- **Broad clinical manifestations of polygenic risk for coronary artery disease in the Women's Health Initiative.** *Communications medicine*
Clarke, S. L., Parham, M., Lankester, J., Shadyab, A. H., Liu, S., Kooperberg, C., Manson, J. E., Tcheandjieu, C., Assimes, T. L.
2022; 2: 108
- **The power of genetic diversity in genome-wide association studies of lipids.** *Nature*
Graham, S. E., Clarke, S. L., Wu, K. H., Kanoni, S., Zajac, G. J., Ramdas, S., Surakka, I., Ntalla, I., Vedantam, S., Winkler, T. W., Locke, A. E., Marouli, E., Hwang, et al
2021
- **Time to Relax the 40-Year Age Threshold for Pharmacologic Cholesterol Lowering.** *Journal of the American College of Cardiology*
Heidenreich, P. A., Clarke, S. L., Maron, D. J.
2021; 78 (20): 1965-1967
- **The Propagation of Racial Disparities in Cardiovascular Genomics Research.** *Circulation. Genomic and precision medicine*
Clarke, S. L., Assimes, T. L., Tcheandjieu, C.

2021: CIRCGEN121003178

- **Associations of Genetically Predicted Lipoprotein (a) Levels with Cardiovascular Traits in Individuals of European and African Ancestry.** *Circulation. Genomic and precision medicine*
Satterfield, B. A., Dikilitas, O., Safarova, M. S., Clarke, S. L., Tcheandjieu, C., Zhu, X., Bastarache, L., Larson, E. B., Justice, A. E., Shang, N., Rosenthal, E. A., Shah, A., Namjou-Khales, et al
2021
- **BROAD CLINICAL MANIFESTATIONS OF POLYGENIC RISK FOR CORONARY ARTERY DISEASE IN THE WOMEN'S HEALTH INITIATIVE**
Parham, M., Clarke, S., Tcheandjieu, C., Hilliard, A., Assimes, T.
ELSEVIER SCIENCE INC.2021: 1511
- **Validation of an Integrated Risk Tool, Including Polygenic Risk Score, for Atherosclerotic Cardiovascular Disease in Multiple Ethnicities and Ancestries.** *The American journal of cardiology*
Weale, M. E., Riveros-Mckay, F., Selzam, S., Seth, P., Moore, R., Tarran, W. A., Gradovich, E., Giner-Delgado, C., Palmer, D., Wells, D., Saffari, A., Sivley, R. M., Lachapelle, et al
2021
- **The need for polygenic score reporting standards in evidence-based practice: lipid genetics use case.** *Current opinion in lipidology*
Wand, H. n., Knowles, J. W., Clarke, S. L.
2021
- **Combining Clinical and Polygenic Risk Improves Stroke Prediction Among Individuals with Atrial Fibrillation.** *Circulation. Genomic and precision medicine*
O'Sullivan, J. W., Shcherbina, A., Justesen, J. M., Turakhia, M., Perez, M., Wand, H., Tcheandjieu, C., Clarke, S. L., Rivas, M. A., Ashley, E. A.
2021
- **A New Era for Preventive Cardiology.** *Trends in cardiovascular medicine*
Clarke, S. L.
2021
- **Combining Clinical and Polygenic Risk Improves Stroke Prediction Among Individuals With Atrial Fibrillation**
Osullivan, J. W., Shcherbina, A., Justesen, J. M., Turakhia, M., Perez, M. V., Wand, H., Tcheandjieu, C., Clarke, S. L., Harrington, R. A., Rivas, M. A., Ashley, E. A.
LIPPINCOTT WILLIAMS & WILKINS.2020
- **Risk of Coronary Artery Disease Associated With Familial Hypercholesterolemia Genetic Variants is Independent of Historical Low-density Lipoprotein Cholesterol Exposure**
Clarke, S. L., Tcheandjieu, C., Hilliard, A., Lee, K., Lynch, J., Chang, K., Miller, D., O'Donnell, C. J., Tsao, P. S., Rader, D. J., Wilson, P., Sun, Y. V., Gaziano, et al
LIPPINCOTT WILLIAMS & WILKINS.2020
- **LPA Variants Are Associated With Aortic Valve Stenosis, Heart Failure and Chronic Kidney Disease**
Dikilitas, O., Satterfield, B. A., Safarova, M., Clarke, S. L., Tcheandjieu, C., Zhu, X., Bastarache, L., Larson, E. B., Justice, A. E., Shang, N., Rosenthal, E., Shah, A. S., Namjou-Khales, et al
LIPPINCOTT WILLIAMS & WILKINS.2020
- **Cardiorespiratory Fitness, Body-Mass Index, and Markers of Insulin Resistance in Apparently Healthy Women and Men.** *The American journal of medicine*
Clarke, S. L., Reaven, G. M., Leonard, D., Barlow, C. E., Haskell, W. L., Willis, B. L., DeFina, L., Knowles, J. W., Maron, D. J.
2020
- **Performance of Polygenic Risk Scores for Coronary Artery Disease in the Million Veteran Program**
Tcheandjieu, C., Zhu, X., Ma, S., Hilliard, A., Clarke, S. L., Lynch, J. A., Damrauer, S. M., Khera, A. V., Kathiresan, S., Tsao, P. S., Gaziano, J., Wilson, P. W., O'Donnell, et al
LIPPINCOTT WILLIAMS & WILKINS.2019
- **Genome-Wide Association Studies of Coronary Artery Disease: Recent Progress and Challenges Ahead.** *Current atherosclerosis reports*
Clarke, S. L., Assimes, T. L.
2018; 20 (9): 47

- **Erosion of Conserved Binding Sites in Personal Genomes Points to Medical Histories.** *PLoS computational biology*
Guturu, H., Chinchali, S., Clarke, S. L., Bejerano, G.
2016; 12 (2)
- **The enhancer landscape during early neocortical development reveals patterns of dense regulation and co-option.** *PLoS genetics*
Wenger, A. M., Clarke, S. L., Notwell, J. H., Chung, T., Tuteja, G., Guturu, H., Schaar, B. T., Bejerano, G.
2013; 9 (8)
- **PRISM offers a comprehensive genomic approach to transcription factor function prediction.** *Genome research*
Wenger, A. M., Clarke, S. L., Guturu, H., Chen, J., Schaar, B. T., McLean, C. Y., Bejerano, G.
2013; 23 (5): 889-904
- **Human Developmental Enhancers Conserved between Deuterostomes and Protostomes** *PLOS GENETICS*
Clarke, S. L., VanderMeer, J. E., Wenger, A. M., Schaar, B. T., Ahituv, N., Bejerano, G.
2012; 8 (8)
- **Coding exons function as tissue-specific enhancers of nearby genes** *GENOME RESEARCH*
Birbaum, R. Y., Clowney, E. J., Agamy, O., Kim, M. J., Zhao, J., Yamanaka, T., Pappalardo, Z., Clarke, S. L., Wenger, A. M., Loan Nguyen, L., Gurrieri, F., Everman, D. B., Schwartz, et al
2012; 22 (6): 1059-1068
- **Control of Pelvic Girdle Development by Genes of the Pbx Family and Emx2** *DEVELOPMENTAL DYNAMICS*
Capellini, T. D., Handschuh, K., Quintana, L., Ferretti, E., Di Giacomo, G., Fantini, S., Vaccari, G., Clarke, S. L., Wenger, A. M., Bejerano, G., Sharpe, J., Zappavigna, V., Selleri, et al
2011; 240 (5): 1173-1189
- **GREAT improves functional interpretation of cis-regulatory regions** *NATURE BIOTECHNOLOGY*
McLean, C. Y., Bristor, D., Hiller, M., Clarke, S. L., Schaar, B. T., Lowe, C. B., Wenger, A. M., Bejerano, G.
2010; 28 (5): 495-U155