Stanford

Paul Cheng MD PhD

Instructor, Medicine

CLINICAL OFFICES

- **Medicine**

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Bio

BIO

Dr. Cheng is a Cardiologist and Instructor at Stanford University School of Medicine in the Department of Medicine. Dr. Cheng received his BEng in Chemical Engineering and BSc in biology at MIT. He subsequently completed his MD/PhD at UCSF working in the Srivastava lab studying how extracellular morphogenic signals affect cardiac development and fate determination of cardiac progenitors. After finishing an internal medicine residency at Stanford, Paul has continued at Stanford as a fellow in cardiology. He is currently investigating molecular mechanisms behind genetic risk factors for human cardiovascular disease with a keen interest in amyloidosis, cardio-oncology, and atherosclerotic diseases. His current research focuses on the transcriptional regulation in smooth muscle cells utilizing both in vitro and in vivo models in combination with single-cell technologies to gain further insights into mechanisms that underlies genetic contributions to risk of human vascular and atherosclerotic diseases.

CLINICAL FOCUS

- Amyloidosis
- Cardio-Oncology
- Cardiovascular Disease

ACADEMIC APPOINTMENTS

- Instructor, Medicine

HONORS AND AWARDS

- Louis N. and Arnold M. Katz Basic Research Prize, American Heart Association (11/2021)
- K08 NIH Career Development Award, NIH/NHLBI (8/2020-7/2025)
- AHA Career Development Award, American Heart Association (1/2021-1/2024)
- Gerald Reaven Award for Basic Science, Stanford University Dept of Internal Medicine (2019)
- Ruth L. Kirschtein NRSA NIH Postdoctoral Fellowship (F32), NIH / NHLBI (2018-2020)
- Timothy F. Beckett, Jr. Award for Excellence in Teaching by a Medicine Fellow, Stanford Univ. Dept. of Internal Medicine (2017)

PROFESSIONAL EDUCATION

- Board Certification: Cardiovascular Disease, American Board of Internal Medicine (2020)
- Board Certification, American Board of Internal Medicine - Cardiovascular Medicine , Cardiovascular Medicine/Cardiology (2021)
- Fellowship: Stanford University Cardiovascular Medicine Fellowship (2020) CA
- Board Certification: Internal Medicine, American Board of Internal Medicine (2017)
- Residency: Stanford University Internal Medicine Residency (2016) CA
- Medical Education: University of California at San Francisco School of Medicine (2014) CA
- Fellow, Cardiology (2020)
- Resident, Stanford Internal Medicine (2016)
- MD, PhD, University of California, San Francisco (2014)

Publications

PUBLICATIONS

- **Human Coronary Plaque T Cells Are Clonal and Cross-React to Virus and Self.** *Circulation research*
  Roy Chowdhury, R., D'Addabbo, J., Huang, X., Veizades, S., Sasagawa, K., Louis, D. M., Cheng, P., Sokol, J., Jensen, A., Tso, A., Shankar, V., Wendel, B. S., Bakerman, et al
  2022: 101161CIRCRESAHA121320090

- **High-Throughput Precision Phenotyping of Left Ventricular Hypertrophy With Cardiovascular Deep Learning.** *JAMA cardiology*
  Duffy, G., Cheng, P. P., Yuan, N., He, B., Kwan, A. C., Shun-Shin, M. J., Alexander, K. M., Ebinger, J., Lungren, M. P., Rader, F., Liang, D. H., Schnittger, I., Ashley, et al
  2022

- **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

- **Ibrutinib-associated atrial fibrillation treatment with catheter ablation.** *HeartRhythm case reports*
  Kapoor, R., Fazal, M., Cheng, P., Witteles, R., Rhee, J., Baykaner, T.
  2021; 7 (11): 713-716

- **Arrhythmias Other Than Atrial Fibrillation in Those With an Irregular Pulse Detected With a Smartwatch: Findings From the Apple Heart Study.** *Circulation. Arrhythmia and electrophysiology*
  Perino, A. C., Gummidipundi, S. E., Lee, J., Hedlin, H., Garcia, A., Ferris, T., Balasubramanian, V., Gardner, R. M., Cheung, L., Hung, G., Granger, C. B., Kowey, P., Rumsfeld, et al
  2021: CIRCEP121010063

- **Arrhythmia Patterns in Patients on Ibrutinib.** *Frontiers in cardiovascular medicine*
  Fazal, M., Kapoor, R., Cheng, P., Rogers, A. J., Narayan, S. M., Wang, P., Witteles, R. M., Perino, A. C., Baykaner, T., Rhee, J.
  1800; 8: 792310

- **Single-Cell Transcriptomic Profiling of Vascular Smooth Muscle Cell Phenotype Modulation in Marfan Syndrome Aortic Aneurysm.** *Arteriosclerosis, thrombosis, and vascular biology*
  Pedroza, A. J., Tashima, Y., Shad, R., Cheng, P., Wirka, R., Churovich, S., Nakamura, K., Yokoyama, N., Cui, J. Z., Iosef, C., Hiesinger, W., Quertermous, T., Fischbein, et al
  2020: ATVBAHA120314670

- **Correction to: Cardiovascular Complications in Patients with COVID-19: Consequences of Viral Toxicities and Host Immune Response.** *Current cardiology reports*
  Zhu, H., Rhee, J., Cheng, P., Waliany, S., Chang, A., Witteles, R. M., Maecker, H., Davis, M. M., Nguyen, P. K., Wu, S. M.
  2020; 22 (5): 36

- **Molecular mechanisms of coronary disease revealed using quantitative trait loci for TCF21 binding, chromatin accessibility, and chromosomal looping.** *Genome biology*

Zhao, Q. n., Dacre, M. n., Nguyen, T. n., Pjanic, M. n., Liu, B. n., Iyer, D. n., Cheng, P. n., Wirka, R. n., Kim, J. B., Fraser, H. B., Quertermous, T. n.
2020; 21 (1): 135

- **The Environment-Sensing Aryl-Hydrocarbon Receptor Inhibits the Chondrogenic Fate of Modulated Smooth Muscle Cells in Atherosclerotic Lesions.** *Circulation*
  Kim, J. B., Zhao, Q. n., Nguyen, T. n., Pjanic, M. n., Cheng, P. n., Wirka, R. n., Travisano, S. n., Nagao, M. n., Kundu, R. n., Quertermous, T. n.
  2020
- **Cardiovascular Complications in Patients with COVID-19: Consequences of Viral Toxicities and Host Immune Response** *Curr Cardiol Rep*
  Zhu, H., Rhee, J., Cheng, P., Waliany, S., Chang, A., Witteles, R. M., Maecker, H., Davis, M. M., Nguyen, P. K., Wu, S. M.
  2020; 22 (5)
- **Outcomes in Patients With Cardiac Amyloidosis Undergoing Heart Transplantation.** *JACC. Heart failure*
  Barrett, C. D., Alexander, K. M., Zhao, H. n., Haddad, F. n., Cheng, P. n., Liao, R. n., Wheeler, M. T., Liedtke, M. n., Schrier, S. n., Arai, S. n., Weisshaar, D. n., Witteles, R. M.
  2020
- **Cardiovascular Risks in Patients with COVID-19: Potential Mechanisms and Areas of Uncertainty.** *Current cardiology reports*
  Cheng, P. n., Zhu, H. n., Witteles, R. M., Wu, J. C., Quertermous, T. n., Wu, S. M., Rhee, J. W.
  2020; 22 (5): 34
- **Coronary Disease Associated Gene TCF21 Inhibits Smooth Muscle Cell Differentiation by Blocking the Myocardin-Serum Response Factor Pathway.** *Circulation research*
  Nagao, M., Lyu, Q., Zhao, Q., Wirka, R. C., Bagga, J., Nguyen, T., Cheng, P., Kim, J. B., Pjanic, M., Miano, J. M., Quertermous, T.
  2019
- **TCF21 and AP-1 interact through epigenetic modifications to regulate coronary artery disease gene expression** *GENOME MEDICINE*
  Zhao, Q., Wirka, R., Trieu Nguyen, Nagao, M., Cheng, P., Miller, C. L., Kim, J., Pjanic, M., Quertermous, T.
  2019; 11
- **Large-Scale Assessment of a Smartwatch to Identify Atrial Fibrillation.** *The New England journal of medicine*
  Perez, M. V., Mahaffey, K. W., Hedlin, H., Rumsfeld, J. S., Garcia, A., Ferris, T., Balasubramanian, V., Russo, A. M., Rajmane, A., Cheung, L., Hung, G., Lee, J., Kowey, et al
  2019; 381 (20): 1909–17
- **Coronary artery disease genes SMAD3 and TCF21 promote opposing interactive genetic programs that regulate smooth muscle cell differentiation and disease risk** *PLOS GENETICS*
  Iyer, D., Zhao, Q., Wirka, R., Naravane, A., Trieu Nguyen, Liu, B., Nagao, M., Cheng, P., Miller, C. L., Kim, J., Pjanic, M., Quertermous, T.
  2018; 14 (10)
- **What's in a Name? Factors That Influence the Usage of Generic Versus Trade Names for Cardiac Medications Among Healthcare Providers** *CIRCULATION-CARDIOVASCULAR QUALITY AND OUTCOMES*
  Ouyang, D., Tisdale, R., Cheng, P., Chi, J., Chen, J. H., Ashley, E.
  2018; 11 (8)
- **Coronary artery disease genes SMAD3 and TCF21 promote opposing interactive genetic programs that regulate smooth muscle cell differentiation and disease risk.** *PLoS genetics*
  Iyer, D. n., Zhao, Q. n., Wirka, R. n., Naravane, A. n., Nguyen, T. n., Liu, B. n., Nagao, M. n., Cheng, P. n., Miller, C. L., Kim, J. B., Pjanic, M. n., Quertermous, T. n.
  2018; 14 (10): e1007681
- **HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS ASSOCIATED WITH IMPLANTATION OF VENTRICULAR ASSIST DEVICES AND OUTCOMES FOLLOWING SUBSEQUENT ORTHOTROPIC HEART TRANSPLANTATION (OHT)**
  Cheng, P., Davis, M., Ha, R., Martin, B., Banerjee, D.
  ELSEVIER SCIENCE INC.2017: 864
- **Persistent Fever Can be Associated with Transient but Severe Hemophagocytic Lymphohistiocytosis (HLH) in Adult Recipients of Ventricular Assist Devices (VAD) for Treatment of Cardiomyopathy (CM)**
  Martin, B., Cheng, P. A., Banerjee, D., Ha, R.
  AMER SOC HEMATOLOGY.2016

- **Fibronectin mediates mesendodermal cell fate decisions.** *Development (Cambridge, England)*
  Cheng, P., Andersen, P., Hassel, D., Kaynak, B. L., Limphong, P., Juergensen, L., Kwon, C., Srivastava, D.
  2013; 140 (12): 2587-96
- **MicroRNA-10 regulates the angiogenic behavior of zebrafish and human endothelial cells by promoting vascular endothelial growth factor signaling.** *Circulation research*
  Hassel, D., Cheng, P., White, M. P., Ivey, K. N., Kroll, J., Augustin, H. G., Katus, H. A., Stainier, D. Y., Srivastava, D.
  2012; 111 (11): 1421-33
- **Notch post-translationally regulates #-catenin protein in stem and progenitor cells.** *Nature cell biology*
  Kwon, C., Cheng, P., King, I. N., Andersen, P., Shenje, L., Nigam, V., Srivastava, D.
  2011; 13 (10): 1244-51
- **Reporter-based isolation of induced pluripotent stem cell- and embryonic stem cell-derived cardiac progenitors reveals limited gene expression variance.** *Circulation research*
  van Laake, L. W., Qian, L., Cheng, P., Huang, Y., Hsiao, E. C., Conklin, B. R., Srivastava, D.
  2010; 107 (3): 340-7
- **A regulatory pathway involving Notch1/beta-catenin/Isl1 determines cardiac progenitor cell fate** *NATURE CELL BIOLOGY*
  Kwon, C., Qian, L., Cheng, P., Nigam, V., Arnold, J., Srivastava, D.
  2009; 11 (8): 951–U96
- **Evolution of an interloop disulfide bond in high-affinity antibody mimics based on fibronectin type III domain and selected by yeast surface display: Molecular convergence with single-domain camelid and shark antibodies** *JOURNAL OF MOLECULAR BIOLOGY*
  Lipovsek, D., Lippow, S. M., Hackel, B. J., Gregson, M. W., Cheng, P., Kapila, A., Wittrup, K. D.
  2007; 368 (4): 1024-1041