



## Juyong Brian Kim

Assistant Professor of Medicine (Cardiovascular Medicine)

Medicine - Cardiovascular Medicine

### CLINICAL OFFICES

- **Cardiovascular Medicine**

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### Bio

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### CLINICAL FOCUS

- Cardiovascular Disease
- Coronary Artery Disease
- Acute Coronary Syndrome
- Percutaneous Coronary Intervention
- Aortic Valve Stenosis
- Transcatheter Aortic Valve Replacement
- Hypertension
- hyperlipidemia
- Prevention

### ACADEMIC APPOINTMENTS

- Assistant Professor - University Medical Line, Medicine - Cardiovascular Medicine
- Member, Bio-X
- Member, Cardiovascular Institute

### PROFESSIONAL EDUCATION

- Fellowship, Stanford University School of Medicine , General Cardiology (2015)
- Fellowship, Stanford University School of Medicine , Interventional Cardiology (2014)
- Residency: UCLA Medical Center Internal Medicine (2009) CA
- MPH, Mailman School of Public Health, Columbia University , Health Policy (2006)
- Medical Education: New York University School of Medicine (2006) NY
- BS, Massachusetts Institute of Technology , ChemE/Biology (2001)

## LINKS

- Get a Second Opinion: <https://stanfordhealthcare.org/second-opinion/overview.html>
- The Cardiovascular Link to Environmental ActioN (CLEAN) Lab: <http://med.stanford.edu/kimlab.html>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

The lifetime risk of developing cardiovascular disease (CVD) is determined by the genetic makeup and exposure to modifiable risk factors. The Cardiovascular Link to Environmental ActioN (CLEAN) Lab is interested in understanding how various environmental pollutants (eg. tobacco, e-cigarettes, air pollution and wildfire) interact with genes to affect the transcriptome, epigenome, and eventually disease phenotype of CVD. The current focus is to investigate how different toxic exposures can adversely remodel the vascular wall leading to increased cardiac events. We intersect human genomic discoveries with animal models of disease, in-vitro and in-vivo systems of exposure, single-cell sequencing technologies to solve these questions. Additionally, we collaborate with various members of the Stanford community to develop biomarkers that will aid with detection and prognosis of CVD. We are passionate about the need to reduce the environmental effects on health through strong advocacy and outreach.

(<http://kimlab.stanford.edu>)

### CLINICAL TRIALS

- Epicardial Delivery of XC001 Gene Therapy for Refractory Angina Coronary Treatment (The EXACT Trial), Recruiting

## Teaching

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### STANFORD ADVISEES

#### Postdoctoral Faculty Sponsor

Diana Melo, Guyu Qin, isabella damiani

#### Postdoctoral Research Mentor

isabella damiani

## Publications

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### PUBLICATIONS

- **Modulation of mouse laryngeal inflammatory and immune cell responses by low and high doses of mainstream cigarette smoke.** *Scientific reports*  
Easwaran, M., Martinez, J. D., Kim, J. B., Erickson-DiRenzo, E.  
2022; 12 (1): 18667
- **Global Longitudinal Strain and Biomarkers of Cardiac Damage and Stress as Predictors of Outcomes After Transcatheter Aortic Valve Implantation.** *Journal of the American Heart Association*  
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2022: e026529
- **Dissecting the Genomics of Spontaneous Coronary Artery Dissection.** *Circulation. Genomic and precision medicine*  
Weldy, C. S., Murtha, R., Kim, J. B.  
2022: 101161CIRCGEN122003867
- **Smad3 regulates smooth muscle cell fate and mediates adverse remodeling and calcification of the atherosclerotic plaque.** *Nature cardiovascular research*  
Cheng, P., Wirka, R. C., Kim, J. B., Kim, H. J., Nguyen, T., Kundu, R., Zhao, Q., Sharma, D., Pedroza, A., Nagao, M., Iyer, D., Fischbein, M. P., Quertermous, et al  
2022; 1 (4): 322-333

- **Left Ventricular Hypertrophy and Biomarkers of Cardiac Damage and Stress in Aortic Stenosis.** *Journal of the American Heart Association*  
Stein, E. J., Fearon, W. F., Elmariah, S., Kim, J. B., Kapadia, S., Kumbhani, D. J., Gillam, L., Whisenant, B., Quader, N., Zajarias, A., Welt, F. G., Bavry, A. A., Coylewright, et al  
2022; e023466
- **Inter-racial differences in patients undergoing transcatheter aortic valve implantation.** *Heart (British Cardiac Society)*  
Kang, D., Ahn, J., Kim, J. B., Yeung, A., Nishi, T., Fearon, W., Cantey, E. P., Flaherty, J. D., Davidson, C. J., Malaisrie, S. C., Park, S. Y., Yun, S., Ko, et al  
1800
- **ZEB2 Shapes the Epigenetic Landscape of Atherosclerosis** *Circulation*  
Cheng, P., Wirka, R. C., Clarke, L., Zhao, Q., Kundu, R., Nguyen, T., Nair, S., Sharma, D., Kim, H., Shi, H., Assimes, T., Kim, J., Kundaje, et al  
2022; 145 (6): 469–485
- **Distance between valvular leaflet and coronary ostium predicting risk of coronary obstruction during TAVR.** *International journal of cardiology. Heart & vasculature*  
Oh, J., Kobayashi, Y., Kang, G., Nishi, T., Willemink, M. J., Fearon, W. F., Fischbein, M., Fleishmann, D., Yeung, A. C., Kim, J. B.  
1800; 37: 100917
- **Racial Differences in the Incidence and Impact of Prosthesis-Patient Mismatch After Transcatheter Aortic Valve Replacement.** *JACC. Cardiovascular interventions*  
Park, H., Ahn, J., Kang, D., Kim, J. B., Yeung, A. C., Nishi, T., Fearon, W. F., Cantey, E. P., Flaherty, J. D., Davidson, C. J., Malaisrie, S. C., Kim, S., Yun, et al  
2021
- **CTA pulmonary artery enlargement in patients with severe aortic stenosis: Prognostic impact after TAVR.** *Journal of cardiovascular computed tomography*  
Turner, V. L., Jubran, A., Kim, J. B., Maret, E., Moneghetti, K. J., Haddad, F., Amsallem, M., Codari, M., Hinostrroza, V., Mastrodicasa, D., Sailer, A. M., Kobayashi, Y., Nishi, et al  
2021
- **Immune biomarkers link air pollution exposure to blood pressure in adolescents.** *Environmental health : a global access science source*  
Prunicki, M., Cauwenberghs, N., Ataam, J. A., Movassagh, H., Kim, J. B., Kuznetsova, T., Wu, J. C., Maecker, H., Haddad, F., Nadeau, K.  
2020; 19 (1): 108
- **Quantifying the Influence of Wedge Pressure, Age, and Heart Rate on the Systolic Thresholds for Detection of Pulmonary Hypertension.** *Journal of the American Heart Association*  
Amsallem, M., Tedford, R. J., Denault, A., Sweatt, A. J., Guihaire, J., Hedman, K., Peighambari, S., Kim, J. B., Li, X., Miller, R. J., Mercier, O., Fadel, E., Zamanian, et al  
2020; e016265
- **The Environment-sensing Aryl-hydrocarbon Receptor Inhibits the Chondrogenic Fate of Modulated Smooth Muscle Cells in Atherosclerotic Lesions**  
Kim, J. B., Zhao, Q., Trieu Nguyen, Cheng, P., Wirka, R., Nagao, M., Kundu, R. K., Quertermous, T.  
LIPPINCOTT WILLIAMS & WILKINS.2020
- **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
- **Spontaneous Coronary Artery Dissection and ST-Segment Elevation Myocardial Infarction in an Anomalous LAD Artery** *JACC: Case Reports*  
Kang, G., Sarraju, A., Nishi, T., Rogers, I., Tremmel, J., Kim, J.  
2020
- **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
- **Immunologic effects of forest fire exposure show increases in IL-1# and CRP.** *Allergy*  
Prunicki, M. M., Dant, C. C., Cao, S. n., Maecker, H. n., Haddad, F. n., Kim, J. B., Snyder, M. n., Wu, J. n., Nadeau, K. n.  
2020
- **Cumulative Lifetime Burden of Cardiovascular Disease From Early Exposure to Air Pollution.** *Journal of the American Heart Association*

- Kim, J. B., Prunicki, M. n., Haddad, F. n., Dant, C. n., Sampath, V. n., Patel, R. n., Smith, E. n., Akdis, C. n., Balmes, J. n., Snyder, M. P., Wu, J. C., Nadeau, K. C. 2020; 9 (6): e014944
- **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
  - **Utility of High-Sensitivity and Conventional Troponin in Patients Undergoing Transcatheter Aortic Valve Replacement: Incremental Prognostic Value to B-type Natriuretic Peptide.** *Scientific reports*  
Kobayashi, Y., Kim, J. B., Moneghetti, K. J., Fischbein, M., Lee, A., Watkins, C. A., Yeung, A. C., Liang, D., Ozen, M. O., Demirci, U., Bowen, R., Fearon, W. F., Haddad, et al 2019; 9 (1): 14936
  - **Aortic Lumen Area Modifies the Association Between Aortic Calcification and Mortality After Transcatheter Aortic Valve Replacement**  
Rangavajla, G., Fearon, W., Elmariah, S., Kim, J., Gillam, L., Carr, J., Quader, N., Whisenant, B., Kapadia, S., Kumbhani, D., Bavry, A., Welt, F., Coylewright, et al  
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  - **PM2.5 concentration in the ambient air is a risk factor for the development of high-risk coronary plaques.** *European heart journal cardiovascular Imaging*  
Yang, S., Lee, S., Park, J., Lee, H., Kang, S., Lee, S., Kim, J. B., Choi, S., Kim, Y., Chang, H. 2019
  - **Atheroprotective roles of smooth muscle cell phenotypic modulation and the TCF21 disease gene as revealed by single-cell analysis.** *Nature medicine*  
Wirka, R. C., Wagh, D., Paik, D. T., Pjanic, M., Nguyen, T., Miller, C. L., Kundu, R., Nagao, M., Coller, J., Koyano, T. K., Fong, R., Woo, Y. J., Liu, et al 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
  - **Incremental value of calcifications of the aortomitral continuity after transcatheter aortic valve replacement.** *Radiology: Cardiothoracic Imaging*  
Willeminck, M. J., Maret, E., Moneghetti, K., Kim, J. B., Haddad, F., , et al 2019; 1 (5)
  - **Incremental Value of Aortomitral Continuity Calcification for Risk Assessment after Transcatheter Aortic Valve Replacement.** *Radiology. Cardiothoracic imaging*  
Willeminck, M. J., Maret, E. n., Moneghetti, K. J., Kim, J. B., Haddad, F. n., Kobayashi, Y. n., Nishi, T. n., Nieman, K. n., Cauwenberghs, N. n., Kuznetsova, T. n., Higashigaito, K. n., Sailer, A. M., Yeung, et al 2019; 1 (5): e190067
  - **TCF21 and AP-1 interact through epigenetic modifications to regulate coronary artery disease gene expression.** *Genome medicine*  
Zhao, Q. n., Wirka, R. n., Nguyen, T. n., Nagao, M. n., Cheng, P. n., Miller, C. L., Kim, J. B., Pjanic, M. n., Quertermous, T. n. 2019; 11 (1): 23
  - **Single Cell Characterization of Smooth Muscle Cell Phenotypic Modulation in vivo Reveals a Critical Role for the Coronary Disease Gene Tcf21 in Mice and Humans**  
Wirka, R., Kim, J. B., Wagh, D., Paik, D. T., Pjanic, M., Nguyen, T., Miller, C., Kundu, R. K., Coller, J., Zhu Kuixi, Chang, R., Koyano, T. K., Fong, R., et al  
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  - **Cytokines profile of reverse cardiac remodeling following transcatheter aortic valve replacement.** *International journal of cardiology*  
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  - **Cytokines profile of reverse cardiac remodeling following transcatheter aortic valve replacement** *INTERNATIONAL JOURNAL OF CARDIOLOGY*  
Kim, J., Kobayashi, Y., Kuznetsova, T., Moneghetti, K. J., Brenner, D. A., O'Malley, R., Dao, C., Wu, J. C., Fischbein, M., Miller, D., Yeung, A. C., Liang, D., Haddad, et al 2018; 270: 83–88
  - **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.  
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  - **Dynamic changes in aortic impedence after transcatheter aortic valve replacement and its impact on exploratory outcome.** *international journal of cardiovascular imaging*  
Kobayashi, Y., Kim, J. B., Moneghetti, K. J., Kobayashi, Y., Zhang, R., Brenner, D. A., O'Malley, R., Schnittger, I., Fischbein, M., Miller, D. C., Yeung, A. C., Liang, D., Haddad, et al  
2017
  - **TCF21 and the environmental sensor aryl-hydrocarbon receptor cooperate to activate a pro-inflammatory gene expression program in coronary artery smooth muscle cells.** *PLoS genetics*  
Kim, J. B., Pjanic, M., Nguyen, T., Miller, C. L., Iyer, D., Liu, B., Wang, T., Sazonova, O., Carcamo-Orive, I., Matic, L. P., Maegdefessel, L., Hedin, U., Quertermous, et al  
2017; 13 (5)
  - **THE INFLAMMASOME PATHWAY IS ASSOCIATED WITH ADVERSE VENTRICULAR REMODELING FOLLOWING TRANSCATHETER AORTIC VALVE REPLACEMENT**  
Kim, J., Kobayashi, Y., Kouznetsova, T., Moneghetti, K., Brenner, D., O'Malley, R., Dao, C., Schnittger, I., Liang, D., Wu, J., Fischbein, M., Lee, A., Miller, et al  
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  - **GDF-15 (Growth Differentiation Factor 15) Is Associated With Lack of Ventricular Recovery and Mortality After Transcatheter Aortic Valve Replacement.** *Circulation. Cardiovascular interventions*  
Kim, J. B., Kobayashi, Y. n., Moneghetti, K. J., Brenner, D. A., O'Malley, R. n., Schnittger, I. n., Wu, J. C., Murtagh, G. n., Beshiri, A. n., Fischbein, M. n., Miller, D. C., Liang, D. n., Yeung, et al  
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  - **Moving Beyond Linear Formulas for Left Ventricular Mass in Aortic Valve Replacement** *Structural Heart*  
Moneghetti, K. J., Bouajila, S., Kobayashi, Y., Kim, J., Fearon, W., Haddad, F.  
2017
  - **A Computational Framework for Age-at-Death Estimation from the Skeleton: Surface and Outline Analysis of 3D Laser Scans of the Adult Pubic Symphysis** *Journal of Forensic Sciences*  
Stoyanova, D. F., Algee-Hewitt, B. F., Kim, J., Slice, D.  
2017
  - **Moving beyond linear formulas for left ventricular mass in aortic valve replacement** *Structural Heart: The Journal of the Heart Team*  
Moneghetti, K. J., Bouajila, S., Kobayashi, Y., Kim, J. B., Fearon, W., Haddad, F.  
2017; 1 (2)
  - **Incremental Value of Deformation Imaging and Hemodynamics Following Heart Transplantation: Insights From Graft Function Profiling.** *JACC. Heart failure*  
Kobayashi, Y. n., Sudini, N. L., Rhee, J. W., Aymami, M. n., Moneghetti, K. J., Bouajila, S. n., Kobayashi, Y. n., Kim, J. B., Schnittger, I. n., Teuteberg, J. J., Khush, K. K., Fearon, W. F., Haddad, et al  
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2016; 1-5
- **Coronary Artery Disease Associated Transcription Factor TCF21 Regulates Smooth Muscle Precursor Cells that Contribute to the Fibrous Cap.** *Genomics data*  
Nurnberg, S. T., Cheng, K., Raiesdana, A., Kundu, R., MILLER, C. L., Kim, J. B., Arora, K., Carcamo-Oribe, I., Xiong, Y., Tellakula, N., Nanda, V., Murthy, N., Boisvert, et al  
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- **Characterization of TCF21 Downstream Target Regions Identifies a Transcriptional Network Linking Multiple Independent Coronary Artery Disease Loci** *PLOS GENETICS*  
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- **Coronary Artery Disease Associated Transcription Factor TCF21 Regulates Smooth Muscle Precursor Cells That Contribute to the Fibrous Cap** *PLOS GENETICS*  
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2015; 11 (5)
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- **Presence of plaques predicts worse outcomes in multi-detector computed tomography in patients with stable chest pain syndrome** *INTERNATIONAL JOURNAL OF CARDIOLOGY*  
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- **Anti-Inflammatory Strategies for Plaque Stabilization after Acute Coronary Syndromes (vol 15, 327, 2013)** *CURRENT ATHEROSCLEROSIS REPORTS*  
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- **Paraoxonase-2 Modulates Stress Response of Endothelial Cells to Oxidized Phospholipids and a Bacterial Quorum-Sensing Molecule** *ARTERIOSCLEROSIS THROMBOSIS AND VASCULAR BIOLOGY*  
Kim, J. B., Xia, Y., Romanoski, C. E., Lee, S., Meng, Y., Shi, Y., Bourquard, N., Gong, K. W., Port, Z., Grijalva, V., Reddy, S. T., Berliner, J. A., Lusis, et al  
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