



Alexander Wilson

Postdoctoral Scholar, Radiological Sciences Laboratory

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Through his doctoral and postdoctoral studies Dr Wilson has focused on understanding and modeling the pathophysiology of cardiovascular disease, particularly the microstructural and biomechanical changes that underpin cardiac remodeling. Dr Wilson completed his PhD in bioengineering/physiology at the University of Auckland (New Zealand), and has held postdoctoral positions at the University of South Florida Heart Institute (2018-2019) and Stanford University Department of Radiology (2019-present).

Dr Wilson is currently a member of the Cardiac MRI Research Group at Stanford University (PI: Professor Daniel Ennis), and works on a range of projects including (i) using tissue clearing techniques to understand the fundamental branching structure of the myocardium (ii) developing new diffusion tensor MRI reconstruction techniques for extracting cardiac microstructure and pathology (iii) using MRI and histology to understand the myocardial structural and functional improvements brought about by ACE inhibitor treatment.

Dr Wilson's research interests include:

- # Cardiac mesostructure and mesofunction (doi: 10.1152/ajpheart.00059.2022)
- # Perfused ex vivo human heart preparations
- # Diffusion tensor imaging
- # Cardiomyocyte connectivity (doi: 10.1007/978-3-030-78710-3)
- # Ventricular torsion
- # Machine learning techniques for cardiac MRI (doi: 10.3390/bioengineering10020166)
- # Machine learning techniques for myocardial histology (doi: 10.13140/RG.2.2.17606.34883)
- # Analysis of collagen structure (doi: 10.1161/res.129.suppl_1.P377)
- # Assessment of diastolic function (doi: 10.13140/RG.2.2.11415.50081)

HONORS AND AWARDS

- First Prize, AIMI-HIAE COVID-19 Researchathon, Stanford University (2020)
- Finalist, John Hubbard Memorial Prize in recognition of excellence in studies towards a PhD, New Zealand Medical Sciences Congress (2017)
- Travel Fellowship, World Congress of Biomechanics (2014)
- First Class Honors, Master of Operations Research, University of Auckland (2012)
- First Prize, John Carman Prize for best oral presentation by a graduate student, New Zealand Medical Sciences Congress (2012)
- Distinction in Theoretical Statistics, University of Auckland (2009)

- Merit, Postgraduate Diploma in Science (Medical Sciences), University of Auckland (2009)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Society for Cardiovascular Magnetic Resonance (2020 - present)
- Member, International Society for Magnetic Resonance in Medicine (2020 - present)
- Trainee Committee Member, Functional Imaging and Modeling of the Heart (2020 - 2021)
- Organization Committee Member, 2020 Radiological Sciences Laboratory Retreat, Stanford University (2020 - 2020)
- Member, American Heart Association (2019 - present)

STANFORD ADVISORS

- Daniel Ennis, Postdoctoral Faculty Sponsor

LINKS

- ORCID: <https://orcid.org/0000-0002-5438-9707>
- Google Scholar: <https://scholar.google.com/citations?user=21voaB4AAAAJ&hl=en&inst=5746887945952177237&oi=sra>
- ResearchGate: https://www.researchgate.net/profile/Alexander_Wilson2
- John Carmen Award for Biomedical Engineering: <https://www.auckland.ac.nz/en/abi/our-research/research-groups-themes/heart-mechanics-metabolism/media-coverage/Heart-failure-research-wins-award.html>

Research & Scholarship

LAB AFFILIATIONS

- Daniel Ennis (9/16/2019)

Publications

PUBLICATIONS

- **Myocardial Segmentation of Tagged Magnetic Resonance Images with Transfer Learning Using Generative Cine-To-Tagged Dataset Transformation.** *Bioengineering (Basel, Switzerland)*
Dhaene, A. P., Loecher, M., Wilson, A. J., Ennis, D. B.
2023; 10 (2)
- **Myocardial Mesostructure and Mesofunction.** *American journal of physiology. Heart and circulatory physiology*
Wilson, A. J., Sands, G. B., LeGrice, I. J., Young, A. A., Ennis, D. B.
2022
- **Formulation and Characterization of Antithrombin Perfluorocarbon Nanoparticles.** *Methods in molecular biology (Clifton, N.J.)*
Wilson, A. J., Zhou, Q., Vargas, I., Palekar, R., Grabau, R., Pan, H., Wickline, S. A.
2020; 2118: 111-120
- **Myocardial Laminar Organization Is Retained in Angiotensin-Converting Enzyme Inhibitor Treated SHR** *Experimental Mechanics*
Wilson, A. J., Sands, G. B., Wang, V. Y., Hasaballa, A. I., Pontre, B., Young, A. A., Nash, M. P., LeGrice, I. J.
2020
- **Microstructurally Motivated Constitutive Modeling of Heart Failure Mechanics.** *Biophysical journal*
Hasaballa, A. I., Wang, V. Y., Sands, G. B., Wilson, A. J., Young, A. A., LeGrice, I. J., Nash, M. P.
2019
- **Increased cardiac work provides a link between systemic hypertension and heart failure** *PHYSIOLOGICAL REPORTS*
Wilson, A. J., Wang, V. Y., Sands, G. B., Young, A. A., Nash, M. P., LeGrice, I. J.
2017; 5 (1)
- **Three-Dimensional Quantification of Myocardial Collagen Morphology from Confocal Images**

Hasaballa, A. I., Sands, G. B., Wilson, A. J., Young, A. A., Wang, V. Y., LeGrice, I. J., Nash, M. P., Pop, M., Wright, G. A.
SPRINGER INTERNATIONAL PUBLISHING AG.2017: 3–12

- **Image-driven constitutive modeling of myocardial fibrosis** *INTERNATIONAL JOURNAL FOR COMPUTATIONAL METHODS IN ENGINEERING SCIENCE & MECHANICS*

Wang, V. Y., Nistrawska, J. A., Wilson, A. J., Sands, G. B., Young, A. A., LeGrice, I. J., Nash, M. P.
2016; 17 (3): 211–21

- **Microstructural Remodelling and Mechanics of Hypertensive Heart Disease**

Wang, V. Y., Wilson, A. J., Sands, G. B., Young, A. A., LeGrice, I. J., Nash, M. P., VanAssen, H., Bovendeerd, P., Delhaas, T.
SPRINGER-VERLAG BERLIN.2015: 382–89

- **Field-Based Parameterisation of Cardiac Muscle Structure from Diffusion Tensors**

Freytag, B., Wang, V. Y., Christie, G., Wilson, A. J., Sands, G. B., LeGrice, I. J., Young, A. A., Nash, M. P., VanAssen, H., Bovendeerd, P., Delhaas, T.
SPRINGER-VERLAG BERLIN.2015: 146–54