Stanford

Alison Schroer Vander Roest

Postdoctoral Research Fellow, Cardiology

Curriculum Vitae available Online

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BIO

My research interests are in the field of cardiac mechanobiology, seeking to understand how the mechanical environment in the heart influences cell behavior and cardiac function throughout pediatric development and disease. I completed my PhD at Vanderbilt working with Dave Merryman focusing on fibroblast activation and inflammatory cell recruitment after myocardial infarction. I was excited for the opportunity to pursue postdoctoral training at Stanford, initially under the mentorship of Dr. Beth Pruitt in mechanical and bioengineering and Dr. Jim Spudich in biochemistry. My postdoctoral project has focused on the effect of myosin mutations which cause hypertrophic cardiomyopathy (HCM) using human induced pluripotent stem cell (hiPSC) derived cardiomyocytes. I have learned techniques for hydrogel micropatterning and quantification of cellular scale forces through traction force and FRET microscopy. I have also participated in many exciting collaborations across Stanford (with Dr. Alex Dunn and Dr. Sean Wu), as well as collaborators at different institutions. My background in biomedical engineering has informed my quantitative and systems-based approach to biological questions, and my current appointment in the medical school working with Dr. Dan Bernstein has provided me with the opportunity to learn more about the realities of clinical care in pediatric cardiology.

INSTITUTE AFFILIATIONS

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

HONORS AND AWARDS

- Postdoctoral Fellowship, American Heart Association (01/01/2019-08/14/2021)
- K99 Pathway to Independence, NIH NHLBI (08/15/2021-2022)

PROFESSIONAL EDUCATION

- Master of Science, Vanderbilt University (2014)
- Doctor of Philosophy, Vanderbilt University (2016)
- Bachelor of Science, University of Virginia (2011)

STANFORD ADVISORS

- James Spudich, Postdoctoral Research Mentor
- Daniel Bernstein, Postdoctoral Faculty Sponsor

Publications

PUBLICATIONS

- **Hypertrophic cardiomyopathy beta-cardiac myosin mutation (P710R) leads to hypercontractility by disrupting super relaxed state.** *Proceedings of the National Academy of Sciences of the United States of America*

Vander Roest, A. S., Liu, C., Morck, M. M., Kooiker, K. B., Jung, G., Song, D., Dawood, A., Jhingran, A., Pardon, G., Ranjbarvaziri, S., Fajardo, G., Zhao, M., Campbell, et al
2021; 118 (24)

- **Molecular Mechanisms and Cellular Models of Hypertrophic Cardiomyopathy: Insights from a Surprising Mutation**
  Vander Roest, A. S., Liu, C., Kooiker, K. B., Morck, M. M., Pruitt, B., Campbell, K. S., Ruppel, K., Spudich, J. A., Bernstein, D.
  CELL PRESS.2021: 253A

- **Engineering the Microenvironment for Heart Muscle Cell Mechanobiology**
  Castillo, E. A., Lane, K., Chirikian, O., Feinstein, S., Blair, C., Schroer, A., Pardon, G., Grancharova, T., Gunawardane, R., Heilshorn, S., Pruitt, B. L.
  CELL PRESS.2020: 154A

- **Hypertrophic Cardiomyopathy Mutations With Opposite Effects on [latin sharp s]-myosin Biomechanics Show Similar Structural and Biomechanical Phenotypes in Human Induced Pluripotent Stem Cell Derived Cardiomyocytes (hipsc-cms)**
  Schroer, A., Jung, G., Kooiker, K., Adhikari, A., Song Linda, Liu Chao, Ruppel, K., Wu Sean, Pruitt, B., Spudich, J., Bernstein, D.
  LIPPINCOTT WILLIAMS & WILKINS.2019

- **Engineering hiPSC cardiomyocyte in vitro model systems for functional and structural assessment** *PROGRESS IN BIOPHYSICS & MOLECULAR BIOLOGY*
  Schroer, A., Pardon, G., Castillo, E., Blair, C., Pruitt, B.
  2019; 144: 3–15

- **Engineering hiPSC cardiomyocyte invitro model systems for functional and structural assessment.** *Progress in biophysics and molecular biology*
  Schroer, A., Pardon, G., Castillo, E., Blair, C., Pruitt, B.
  2018

- **Mechanobiology of Myosin Mutations and Myofibril Remodeling in iPSC-Cardiomyocytes**
  Schroer, A., Kooiker, K., Adhikari, A., Ruppel, K., Bernstein, D., Spudich, J., Pruitt, B.
  CELL PRESS.2018: 496A–497A