T.M. Ayodele Adesanya
Ph.D. Candidate
Graduate Interdisciplinary Specialization in Biomedical, Clinical, and Translational Science

“MG53 Protects Aortic Valve Interstitial Cells from Membrane Injury and Fibrocalcific Remodeling”

July 31, 2018
DHLRI 165
10:00 a.m.
VITA

1987 ............................................ Born – Dallas, Texas

2005 .......................... Phillips Academy Andover

2009 .............. S.B. (Biological Chemistry), A.B. (Chemistry),
                      A.B. (Biological Sciences); The University of Chicago

2009 – Present ...................... M.D./Ph.D. Candidate;
                                 The Ohio State University College of Medicine
                                 (Biomedical Sciences Graduate Program)

COMMITTEE MEMBERS

Dr. Jianjie Ma (Advisor)

Dr. Joanna Groden

Dr. Peter Mohler

Dr. Joy Lincoln

Dr. Hua Zhu
ABSTRACT

The aortic valve of the heart experiences constant mechanical stress under physiological conditions, and maladaptive valve injury responses contribute to the development of valvular heart disease (VHD). Here, we test the hypothesis that MG53, an essential cell membrane repair protein, can protect valvular cells from physical injury and fibrocalcific remodeling processes associated with VHD. We found that MG53 is expressed in pig and human patient aortic valves and observed aortic valve disease in aged Mg53-/- mice. Furthermore, aortic valves of Mg53-/- mice showed increased uptake of Evans blue dye, indicating compromised cell membrane integrity. In vitro studies demonstrated that MG53 protects primary valve interstitial cells (VICs) from mechanical injury and that, in addition to mediating membrane repair, recombinant human MG53 (rhMG53) can enter VICs and suppress TGF-β-dependent activation of fibrocalcific signaling. Together, our data characterize VIC membrane repair as a novel mechanism of protection against valvular remodeling and assess potential in vivo roles of MG53 in preventing VHD.
RECENT ABSTRACTS AND PRESENTATIONS

  
  2017 Poster – Keystone Symposia Conference: Molecular Mechanisms of Heart Development; Keystone, Colorado
  
  2017 Poster – Biophysical Society Annual Meeting; New Orleans, Louisiana
  
  2016 Oral –Biennial Meeting on Heart Valve Biology and Tissue Engineering; Hilton Head, South Carolina *(meeting cancelled due to Hurricane Matthew)*
  
  2014 Poster – Dorothy M. Davis Heart and Lung Research Institute Research Day; The Ohio State University, Columbus, Ohio
  
  
  2014 Poster – Trainee Research Day; The Ohio State University, Columbus, Ohio

  
  2017 Poster – Biophysical Society Annual Meeting; New Orleans, Louisiana

  
  2016 Poster – American Heart Association Scientific Sessions; New Orleans, Louisiana

  
  2015 Oral – Annual Biomedical Research Conference for Minority Students; Seattle, Washington
  *One of 8 (out of 81) students selected to have an oral presentation in the Physiological Sciences Section*
  
  2015 Poster – Dorothy M. Davis Heart and Lung Research Institute Research Day; The Ohio State University, Columbus, Ohio
  *Second Place (out of 10) in the Undergraduate Section*

2014  Poster – American Heart Association Scientific Sessions; Chicago, Illinois


2013  Poster – Dorothy M. Davis Heart and Lung Research Institute Research Day; The Ohio State University, Columbus, Ohio

*Third Place (out of 54) in the Pre-doctoral Section
RECENT PUBLICATIONS


AWARDS AND HONORS

2016  Biophysical Society Committee for Inclusion and Diversity Travel Award; Biophysical Society
2015  Keystone Symposia/Annual Biomedical Research Conference for Minority Students Travel Award; Keystone Symposia
2015  Sigma Xi Membership; Sigma Xi: The Scientific Research Society
2014  TL1 Mentored Clinical Research Training Program Award (National Institutes of Health Award Number TL1TR001069); Center for Clinical and Translational Science, The Ohio State University
2014  American Medical Association Foundation Seed Grant Research Program Award; American Medical Association Foundation
2013  American Heart Association Basic Cardiovascular Sciences Minority Travel Grant; American Heart Association
2013  Third Place (out of 54) in the Pre-doctoral Section at the Dorothy M. Davis Heart and Lung Research Institute Research Day; The Ohio State University
2013  Physiology Training Program Fellowship; College of Medicine, The Ohio State University
2013  The Albert Schweitzer Fellowship (Doctors in Science; http://www.docsinsci.org); The Albert Schweitzer Fellowship
2012  Association for Academic Surgery Student Travel Grant; Association for Academic Surgery
2010  Carolyn L. Kuckein Student Research Fellowship Award (Awarded); Alpha Omega Alpha

2007  Award for the Best Oral Presentation in the Molecular Biological Sciences Section; Annual Biomedical Research Conference for Minority Students

FUTURE PLANS

I will be returning to medical school as a fourth-year medical student. I plan to practice as a physician-scientist, contributing to the growth of medicine and science and serving the underserved populations from which I have grown.