

Contact Information:

Assistant Professor of Biology
Department of Science & Technology
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Education

- Quincy Senior High School. Quincy, IL
- B.S., Biological Sciences, Quincy University. Quincy, IL
- Molecular and Developmental Biology Graduate Program, University of Cincinnati College of Medicine, Cincinnati, OH- Graduate mentor Katherine E. Yutzey, Ph.D.
- Postdoctoral Fellowship – Washington University School of Medicine, Saint Louis, MO- Postdoctoral mentor Robert P. Mecham, Ph.D.

Courses Taught at QU

- Developmental Biology with Lab includes a basic research or cross-curriculum project for honors students (BIO 330-00, 01, 330-0)
- Journal Club: Groundbreaking Science (BIO 335-00)
- Biology Research (BIO 480-00);
- Life Sciences (BIO 111-02);
- Principles of Biology I with Lab- includes a journal club for honors students (BIO 150-01, 150-LC01, 150L-01, 150L-02, 150L-LC01)
- Human Biology with Lab (BIO 105-00), Quincy University
- Anatomy & Physiology I with Lab- includes a research papers for honors students (BIO 282-00, 01);
- Anatomy & Physiology II with Lab (BIO 283-00, 01)
- Genetics- includes journal club for honors students (BIO 305-00, co-taught with Dr. K. Hale)

Publications

Peer reviewed papers

- P.A. Mehta, M. Eapen, J.P. Klein, S. Gandham, J. Elliott, T. Zamzow, **M.D. Combs**, R. Alpec, M.L. MacMillan, D.J. Weisdorf, E. Petersdorf and S.M. Davies. (2007) Interleukin-1 alpha Genotype and Outcome of Unrelated Donor Hematopoietic Stem Cell Transplantation for Chronic Myeloid Leukemia. *British Journal of Haematology*, **137**, 153-157.
- P.A. Mehta, R.B. Gerbing, T.A. Alonzo, J.S. Elliott, T.A. Zamzow, **M.D. Combs**, E. Stover, J.A. Ross, J.P. Perentesis, S. Meschini, B.J. Lange, S.M. Davies. (2008) FAS promoter polymorphism: outcome of childhood acute myeloid leukemia. A children's oncology group report. *Clinical Cancer Research*. **Dec 1;14(23):7896-9**
- M.D. Combs** and K.E. Yutzey. (2009) VEGF and RANKL regulation of NFATc1 in heart valve development. *Circulation Research*, **105(6)**, 565-574.
- M.D. Combs** and K.E. Yutzey. (2009) Heart valve development: regulatory networks in development and disease (invited review). *Circulation Research*, **105(5)**, 408-421.
- S. Chakraborty, **M.D. Combs**, and K.E. Yutzey. (2010) Transcriptional regulation of heart valve progenitor cells (invited review). *Pediatric Cardiology*, **Apr;31(3)**, 414-21.

M.D. Combs, C.M. Braitsch, A.W. Lange, J.F. James, K.E. Yutzey. (2011) NFATc1 promotes epicardium-derived cell invasion into myocardium. *Development*, **May**;138(9):1747-57.

C.M. Braitsch, **M.D. Combs**, S.E. Quaggin, K.E. Yutzey. (2012) Pod1/Tcf21 is regulated by retinoic acid signaling and inhibits differentiation of epicardium-derived cells into smooth muscle in the developing heart. *Developmental Biology*, **Aug 15**;368(2):345-57.

M.D. Combs, R.H. Knutsen, T.J. Broekelmann, H.M. Toennies, T.J. Brett, C.A. Miller, D.L. Kober, C.S. Craft, J.J. Atkinson, J.M. Shipley, B.C. Trask, R.P. Mecham. (2013) Microfibril-associated glycoprotein 2 (MAGP2) loss-of-function has pleiotropic effects *in vivo*. *Journal of Biological Chemistry*, **Oct 4**;288(40):28869-80.

C.S. Craft, T.A. Pietka, T. Schappe, T. Coleman, **M.D. Combs**, N.A. Abumrad, R.P. Mecham. (2014) The extracellular matrix protein MAGP1 supports thermogenesis and protects against obesity and diabetes through regulation of TGF β . (2014) *Diabetes*, **Jun**;63(6):1858-9.

Abstracts and Presentations

“Does RANKL/ NFATc1 promote cardiac valve elongation and remodeling?”- **M.D. Combs**, A.W. Lange, and K.E. Yutzey- Poster presentation- MDB Graduate Program Student Symposium, Loveland, Ohio, September 20, 2005.

“The role of NFATc1 in cardiac valve elongation and remodeling”- **M.D. Combs** and K.E. Yutzey- Platform presentation- MDB Graduate Program Student Symposium, Loveland, Ohio, September 19, 2006.

“NFATc1 in endocardial cushion elongation and remodeling”- **M.D. Combs** and K.E. Yutzey- Poster presentation – Weinstein Cardiovascular Development Conference, Indianapolis, Indiana, May 10-12, 2007.

“NFATc1 regulation of extracellular matrix remodeling and cell proliferation in heart valve development”- **M.D. Combs** and K.E. Yutzey- Poster presentation- MDB Graduate Program Student Symposium, Loveland, Ohio, September 18, 2007.

“NFATc1 regulation of extracellular matrix remodeling and cell proliferation in heart valve development”- **M.D. Combs** and K.E. Yutzey- Poster presentation- 2007 Graduate Student Research Forum, University of Cincinnati, November 15, 2007.

“VEGF and RANKL regulation of NFATc1 in cardiac valve growth and remodeling”- **M.D. Combs** and K.E. Yutzey- Poster presentation- Weinstein Cardiovascular Development Conference, Houston, Texas, May 17-20, 2008.

“VEGF and RANKL regulation of NFATc1 in valve development”- **M.D. Combs** and K.E. Yutzey- Platform presentation- Molecular Cardiovascular Biology Division Retreat, Loveland, Ohio, May 27, 2008.

“VEGF and RANKL regulation of NFATc1 in cardiac valve growth and remodeling”- **M.D. Combs** and K.E. Yutzey- Poster presentation- 30th International Society for Heart Research North American Section Meeting, Cincinnati, Ohio, June 17-20, 2008.

“NFATc1 in cardiac valve and epicardium development”- **M.D. Combs** and K.E. Yutzey- Platform presentation- MDB Graduate Program Student Symposium, Loveland, Ohio, September 23, 2008.

“The role of NFATc1 in epicardial derived cells (EPDCs)”- **M.D. Combs**, C.M. Braitsch, and K.E. Yutzey- Poster presentation- American Society for Matrix Biology Meeting, San Diego, California, December 7-10, 2008.

“The role of NFATc1 in proepicardium and epicardium-derived cells”- **M.D. Combs** and K.E. Yutzey- Poster presentation- Weinstein Cardiovascular Development Conference, San Francisco, California, May 7-9, 2009.

“NFATc1 in epicardium-derived cells” - **M.D. Combs**, C.M. Braitsch, and K.E. Yutzey- Platform and Poster presentation- Vanderbilt University Postdoctoral Symposium, Nashville, Tennessee, March 8, 2010.

“NFATc1 in epicardium-derived cells is required for fibrous skeleton and intramyocardial coronary vessel development”- **M.D. Combs**, C.M. Braitsch, and K.E. Yutzey- Platform and Poster presentation- Weinstein Cardiovascular Development Conference, Amsterdam, Netherlands, May 20-22, 2010.

“NFATc1 in cardiac valve development and epicardium-derived cell (EPDC) invasion”- **M.D. Combs**, C.M. Braitsch, A.W. Lange, J.F. James, K.E. Yutzey- Thesis Defense- University of Cincinnati/ Cincinnati Children’s Hospital Medical Center, Cincinnati, OH

“Mutation of the extracellular matrix binding domain of murine Magp2 results in altered blood pressure and hematopoiesis *in vivo*”- **M.D. Combs**, R.H. Knutsen, H.M. Toennies, C.S. Craft, M.C. Curtis, J.J. Atkinson, R.P. Mecham- Poster Presentation- 8th Annual Postdoc Scientific Symposium, Saint Louis, Missouri, March 29, 2012.

“Matrix-associated glycoprotein 2 (MAGP2) binds TGF β superfamily ligands and MAGP2 loss-of-function has pleiotropic effects *in vivo*”- **M.D. Combs**, R.H. Knutsen, T.J. Broekelmann, H.M. Toennies, T.J. Brett, C.S. Craft, J.J. Atkinson, J.M. Shipley, R.P. Mecham- Platform presentation- American Association for Matrix Biology and Society for Glycobiology 2012 Conference, San Diego, California, November 11-14, 2012.

“Matrix-associated glycoprotein 2 (MAGP2) binds TGF β superfamily ligands and MAGP2 loss-of-function has pleiotropic effects *in vivo*”- **M.D. Combs**, R.H. Knutsen, T.J. Broekelmann, H.M. Toennies, T.J. Brett, C.S. Craft, J.J. Atkinson, J.M. Shipley, R.P. Mecham- Platform presentation- Gordon Research Conference, Elastin, Elastic Fibers & Microfibrils, Biddeford, Maine, July 25-31, 2013.

“Finding and Establishing a Successful Career”- M.D. Combs, D. Milewicz, F. Ramirez, G. Sengle- Panel Discussion- Gordon Research Seminar Elastin, Elastic Fibers & Microfibrils, Biddeford, Maine, July 25-31, 2015.

Research Support

- 07/05-06/07 Training Program in Pediatric Cardiopulmonary Research – Ref. #5T32 HL007256.
07/07-06/09 American Heart Association- Great Rivers Affiliate, Predoctoral Fellowship Award- Ref. #0715107B NFATc1 regulation of extracellular matrix remodeling and cell proliferation in heart valve development. M.D. Combs, Fellow. K.E. Yutzey, Sponsor. Total direct costs \$42,000.
02/11-2013 Developmental Cardiology and Pulmonary Training Program- Ref. #5T32HL7873.

Awards and Honors

- 1992- 1996 Solano Grant, Quincy University
1992- 1996 Presidential Scholarship, Quincy University
2006 Richard A. Akeson Fellowship Award
2007 Top Presenter – MDB Graduate Program Student Symposium
2007 Richard A. Akeson Fellowship Award

2008 Richard A. Akeson Fellowship Award
2008 Weinstein Cardiovascular Development Conference Travel Award
2009 Richard A. Akeson Fellowship Award
2010 Richard A. Akeson Fellowship Award
2010 Weinstein Cardiovascular Development Conference: Platform Presentation and Travel Award
2011 Gordon-Kenan Research Seminar: Elastin & Elastin Fibers- Co-chair and Travel Award
2012 American Association for Matrix Biology and Society for Glycobiology 2012 Conference: Platform presentation and Travel Award
2013 Gordon Research Conference Elastin, Elastic Fibers & Microfibrils 2013: Platform Presentation, Best Poster Award and Travel Award
2015 Gordon Research Seminar Elastin, Elastic Fibers & Microfibrils 2015: Invited Panelist

Membership in Professional Organizations

2008- present American Association for the Advancement of Science
2010- present Society for Developmental Biology
2012-2016 American Society for Matrix Biology
