SUMMARY: Multidisciplinary NIH-funded PhD investigator trained in engineering, cardiovascular physiology, bio-fluid dynamics, and imaging physics. I lead a lab contributing to basic and translational cardiovascular imaging sciences (179 publications). Our most recent research uses noninvasive cardiovascular MRI to extract biophysical signals describing cardiac motion, blood flow, vascular remodeling, and cardiovascular disease. I am internationally recognized as a bio-fluids and imaging expert with numerous invited lectures on the topic. My passion for the field is evident as an elected board member of the *International Society of Magnetic Resonance in Medicine Flow & Motion Quantitation Study Group.* Additionally, my physician colleagues and I are proud to have published a large body of highly cited original research and clinical guideline statements on the topic.

1. CURRENT POSITION:

Associate Professor, Department of Radiology & Bioengineering
Director of the Advanced Imaging Lab, Children's Hospital Colorado (CHCO)
University of Colorado, Anschutz Medical Campus

Business Address: Section of Pediatric Radiology
Children's Hospital Colorado
13123 East 16th Avenue, B125
Aurora, CO 80045
Phone: 720-777-5880
Email: alexander.barker@cuanschutz.edu

Citizenship: USA
Web Profile: https://profiles.ucdenver.edu/display/19815986
Pubmed https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/40298806/?sort=date&direction=ascending

2. EDUCATION:

1999	University of Colorado, Boulder, USA	B.S.	Mechanical Engineering
2008	University of Colorado, Boulder, USA	M.S.	Mechanical Engineering (Microsystems)
2008	University of Colorado, Boulder, USA	Ph.D.	Mechanical Engineering (Bioengineering Focus)
2009-2011	University Medical Center, Freiburg, Germany	Postdoc	Medical Physics, Department of Radiology

3. ACADEMIC APPOINTMENTS:

2012-2015 *Research Assistant Professor,* Department of Radiology
Feinberg School of Medicine, Northwestern University

2015-2018 *Assistant Professor (Tenure Track),* Department of Radiology
Feinberg School of Medicine, Northwestern University

2018- *Adjunct Professor, Department of Radiology*
Feinberg School of Medicine, Northwestern University

2018- *Associate Professor,* Department of Radiology & Bioengineering
Director of the Advanced Imaging Lab, Children's Hospital Colorado (CHCO)
University of Colorado, Anschutz Medical Campus

4. OTHER POSITIONS:

1993-1995 *Intern*, Anti-submarine Warfare Unit
Naval Surface Weapons Center, White Oak, Maryland

1997-1998 *Research Assistant*, High Temperature Systems and Materials Lab
Department of Mechanical Engineering, University of Colorado, Boulder

2000-2003 *Semiconductor Design and Process Engineer*
Motorola, Semiconductor Products Sector, Austin, TX

2003-2005 *Graduate Research Assistant,* Low Dimensional Lab

Department of Mechanical Engineering, University of Colorado, Boulder

2005-2008 *T32 & F31 NIH NRSA Pre-Doctoral Fellow,* Cardiac Flow Dynamics Lab
Department of Pediatrics, Section of Cardiology, The Children's Hospital, Denver
Department of Mechanical Engineering, University of Colorado, Boulder

2009-2011 *Fulbright and Whitaker Postdoctoral Fellow,* Medical Physics
Department of Radiology, University Medical Center Freiburg, Germany

5. HONORS AND AWARDS:

A. Elected Society Memberships

2015-2019 *Board, International Society of Magnetic Resonance in Medicine Flow & Motion Quantitation Study Group*

B. International / National / Regional

2001 *Manufacturing Excellence Award*, Motorola Semiconductor, Austin TX

2006 *NIH National Research Service Award*, Ruth Kirschstein Predoctoral Fellowship (F31)

2006 *2nd Place, Best Paper*, Biofluids and Imaging – American Society of Mechanical Engineers (ASME) Summer Bioengineering Conference, Amelia Island, FL

2007 *2nd Place, Best Paper*, Biofluids and Imaging – American Society of Mechanical Engineers (ASME) Summer Bioengineering Conference, Keystone, CO

2008 *1st Place, Best Paper*, Biofluids and Imaging – American Society of Mechanical Engineers (ASME) Summer Bioengineering Conference, Marco Island, FL

2009 *Fulbright Scholar Award*, Bureau of Educational and Cultural Affairs, United States Department of State

2010 *Whitaker International Fellowship Award*, The Whitaker Foundation

2011 *Best Cardiac Paper*, Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM)

2013 *AHA National Scientist Development Award*, American Heart Association

2013 Truong et al. among Journal of Cardiovascular Magnetic Resonance most "*Highly Accessed*" Articles

2013 *Potchen Young Investigator Award*, for Best Paper, Annual Meeting of the Magnetic Resonance Angiography Club

2013 Barker et. al among Circulation Editors' Picks: "*Most Read Papers on the Topic of Aortic Disease*" Circulation. 2013;128:e207-e215 (doi: 10.1161/CIRCULATIONAHA.113.006096)

2013 Barker et. al among Circulation: Cardiovascular Imaging Editors' Picks: "*Most Important Articles in Cardiovascular Imaging Science, Part II*" Circulation: Cardiovascular Imaging. 2013; 6:e31-e74 (doi: 10.1161/CIRCIMAGING.113.001335)

2018 Bollache et al. (Postdoc Trainee) recognized as "*Highly Cited Article*" by The Journal of Thoracic and Cardiovascular Surgery

2018 2015, 2016, 2017, 2018 Distinguished Reviewer for *Magnetic Resonance in Medicine* and *Journal of Magnetic Resonance Imaging*

2019 Keenan et al (collaborator). "*Top Downloaded Article 2017-2018*" (for the top 20 most downloaded articles) in Magnetic Resonance in Medicine 2017-2018

2022 Ma et al (Trainee). recognized at the 2022 ISMRM for the "*Top Five Most Cited Articles"* in *Journal of Magnetic Resonance Imaging*

2023 Pravdivtseva et al. (collaborator) recognized as the "*Top Downloaded Article"* among work published in *Medical Physics* in 2021

2023 Englund et al. (Faculty trainee) recognized by the International Society of Magnetic Resonance in Medicine as the top 100 abstracts (out of approximately 6000) for *"4D flow MRI for investigation of fetal cardiovascular hemodynamics in healthy development and ductal dependent lesions"*

C. University

1993-1995 *Science and Engineering Apprenticeship Award, George Washington University*

1995-1999 *Undergraduate Merit Scholarship*, University of Colorado, Boulder

2003 *Colorado Commission of Higher Education University Fellowship Award*, University of Colorado, Boulder

2003 *Colorado Merit Award*, Department of Mechanical Engineering, University of Colorado, Boulder

2007 *1st Place, Best Bioengineering Presentation* – Graduate Engineering Annual Research Symposium
College of Engineering, University of Colorado, Boulder, CO

2016 *Outstanding Teacher – Area of Scholarly Concentration*, Feinberg School of Medicine, Northwestern University

2023 *"Best Scientific Talk"*, University of Colorado Anschutz Medical Campus Symposium on Biomedical Imaging
Colorado School of Public Health

2023 *Pediatric Radiology "Researcher of the Year"*
Department of Radiology, University of Colorado Anschutz Medical Campus

6. MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

A. Professional Society Memberships

American Heart Association (AHA)
American Society of Mechanical Engineers (ASME)
International Society of Magnetic Resonance in Medicine (ISMRM)
Society of Cardiovascular Magnetic Resonance (SCMR)
Society of Magnetic Resonance Angiography (SMRA)

B. Leadership and Service

2015-2016 *Executive Planning Committee*
2016 Society of Magnetic Resonance Angiography Annual Scientific Sessions, Chicago, IL

2015-2016 *Executive Planning Committee*
2016 ISMRM Flow and Motion Study Group Workshop, San Francisco, CA

2015-2018 *Chair (2018), Vice-Chair (2017), Secretary (2015-2016),*
Flow and Motion Study Group, International Society of Magnetic Resonance in Medicine

2023- *Executive Planning Committee*
2024 ISMRM Flow and Motion Study Group Workshop, Calgary, Alberta

7. MAJOR COMMITTEE AND SERVICE RESPONSIBILITIES

A. University

B. School

2017-2018 *Medical Scientist Training Program, Admissions Committee*
School of Medicine, Northwestern University

C. Department

1998-1999 *Student Quality Council Representative*
Department of Mechanical Engineering, University of Colorado, Boulder

2004- 2006 *Mechanical Engineering Graduate Student Liaison*
Department of Mechanical Engineering, University of Colorado, Boulder

2012-2018 *Management of Radiology CMR Research Informatics*
Department of Radiology, Northwestern University

2018-2020 *Department of Radiology Research Steering Committee*
Department of Radiology, University of Colorado, Anschutz Medical Campus

2022 *Committee Co-Chair: Department of Radiology Research Strategic Plan Writing Group*
Department of Radiology, University of Colorado, Anschutz Medical Campus

2022- *Reviewer for Faculty Pilot Grants*
Department of Radiology, University of Colorado, Anschutz Medical Campus

D. Hospital

2015-2018 *BAV Bridge Program, Radiology Representative*
Northwestern Memorial Hospital, Lurie Children's Hospital, and Northwestern University

2019-2020 *T1-T2 Future of Child Health Research Work Group*
Focus: "Leading in mechanistic clinical research and clinical trials"
Child Health Research Strategic Planning
Children's Hospital Colorado

8. LICENSURE AND BOARD CERTIFICATION: N/A

9. INVENTIONS, INTELLECTUAL PROPERTY AND PATENTS: N/A

10. REVIEW AND REFEREE WORK:

A. Manuscript Reviewer (https://publons.com/researcher/1181313/alex-j-barker/metrics/):

Annals of Biomedical Engineering
Biomechanics and Modeling in Mechanobiology
Cardiovascular Engineering and Technology
European Journal of Cardiothoracic Surgery
Expert Reviews of Medical Devices
Investigative Radiology
Journal of Biomechanical Engineering
Journal of Cardiovascular Magnetic Resonance
Journal of Magnetic Resonance Imaging (**2016 Distinguished Reviewer**)
Journal of Neurointerventional Radiology
Magnetic Resonance in Medicine (**2015, 2016, 2017, 2018 Distinguished Reviewer**)

NMR in Biomedicine
PLoS One

B. Grant Review and Study Sections

Ad Hoc Reviewer, 2015 NIH NIDDK Special Emphasis Review Panel (F and K Fellowships)
Ad Hoc Reviewer, 2017 NIH Special Emphasis Panel (R15 Awards), ZRG1 CVRS-L (80)
Ad Hoc Reviewer, 2018 NIH Special Emphasis Panel (R01 Awards) 2018/05 ZHL1 CSR-N (M1) 1
Ad Hoc Reviewer, 2019 NIH EITA (R01 and R21 Awards)
Reviewer, 2020 Colorado Clinical and Translational Sciences Institute Pilot Awards
Ad Hoc Reviewer, 2022 NIH NHLBI Loan Repayment Program Review Panel 1 ZHL1 CCT-C (S1) 2
Ad Hoc Reviewer, 2023 NIH NHLBI Loan Repayment Program Review Panel
Ad Hoc Reviewer, 2024 NIH NHLBI Loan Repayment Program Review Panel

11. INVITED LECTURES:

April 2008 *"Quantitative Flow Imaging"*
Rocky Mountain Biomagnetic Program
National Institute of Standards and Technology, Boulder, CO, USA

June 2010 *"Cardiovascular Hemodynamics in 4D"*
Heart Institute Lecture
The Children's Hospital, Denver, USA

October 2010 *"Hemodynamics and the Bicuspid Aortic Valve"*
Cardiovascular MRI Workshop
Xuanwu University Hospital, Beijing, China

October 2010 *"Intra-cardiac MR 4D blood-flow: A new functional parameter?"*
Special Lecture: Promising Approaches in Cardiovascular Evaluation
Annual Meeting of the European Society of Cardiac Radiology (ESCR), Prague, Czech Republic

February 2011 *"Hemodynamics and the Bicuspid Aortic Valve: Structure and Function"*
and "*Biofluid Kinematics: Intro to Wall Shear Stress*"
4D Flow Workshop
University of Oxford Centre for Clinical Magnetic Resonance Research, Oxford, UK

March 2011 *"4D Flow Sensitive MRI: Background & Clinical Research Applications"*
Cardiovascular Surgery Seminar
University of Pennsylvania, Philadelphia, Pennsylvania

September 2012 *"MRI of the Aortic Valve"*
Accelerated Magnetic Resonance Imaging, 3rd International Workshop
University Medical Center Freiburg, Germany

April 2013 *"Current State of Bicuspid Aortic Valve Imaging at Northwestern Memorial Hospital"*
Heart Valve Meeting
Department of Cardiac Surgery, Northwestern Memorial Hospital, Chicago, Illinois

April 2013 *"Measuring Blood Forces in the Presence of Aortic Valve Disease"*
Fluids and Transport Seminar Series
Department of Biomedical Engineering, Northwestern University, Evanston, Illinois

September 2013 *"Energy efficiency and viscous losses"*
and *"BAV research in Chicago – multi-center experience and new stratification metrics"*

4D Flow Workshop
University of Oxford Centre for Clinical Magnetic Resonance Research, Oxford, UK

October 2013 *"Mapping Intracardiac Flow and Energy Loss with 4D Flow MRI"*
41st Annual Meeting of the North American Society for Cardiovascular Imaging (NASCI)
Atlanta, GA

November 2013 *"Imaging valve disease with 4D Flow MRI: Experience at NMH"*
Cardiovascular Surgery Seminar
University of Pennsylvania, Philadelphia, Pennsylvania

October 2014 *"Next Ten Years of Imaging: Cardiovascular MRI"*
The Next Ten Years of Cardiovascular Treatment: Thoughts from Future Leaders in the Field
Current Topics in Healthcare
Northwestern Memorial Foundation, Northwestern Medicine, Chicago, Illinois

February 2015 *"4D flow in a Small or Enlarged Aorta"*
Too Small, Too Thick and Too Big: CMR of the Left Heart and Aorta in Congenital Heart Disease
2015 SCMR/Euro CMR Joint Scientific Sessions, Nice, France

June 2015 *"Genetics or Hemodynamics? The search for imaging biomarkers of bicuspid aortic valve aortopathy development"*
Cardiac Grand Rounds
Libin Cardiovascular Institute, University of Calgary, Alberta

July 2015 *"How to Interpret Flow Energetics & Turbulence"*
4D Flow Workshop
University of Oxford Centre for Clinical Magnetic Resonance Research, Oxford, UK

October 2015 *"How imaging biomarkers predict histologic changes & could alter surgical strategy"*
Advanced Symposium on Cardiovascular Imaging
Society of Pediatric Radiology
Lurie Childrens Hospital, Chicago, IL

October 2015 *"4D Flow MRI mapping of regional wall shear stress"*
North American Vascular Biology Workshop
Cape Cod, MA

March 2016 *"The wonders of 4D Flow MRI: Ready for clinical use?"*
2016 Heart Valve Society Meeting
New York, New York

April 2016 *"4D Flow MRI: Ready for clinical translation?"*
2016 Bioengineering Spring Seminar Series
University of Colorado, Anschutz Medical Campus

May 2016 *"Practical Challenges of MRA and Flow"*
Cardiovascular MRI: Vascular Flow & Angiography Weekend Educational Course
2016 Annual Meeting of the International Society of Magnetic Resonance in Medicine
Singapore, Republic of Singapore

February 2017 *"Cardiovascular Flow A – Technical Methods"*
Physician's Pre-Conference Course
2017 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
Washington, D.C.

February 2017 *"4D Flow in Thoracic Aortopathy & Valve Disease"*
Special Session on Thoracic Aortopathy (SMRA Special Session)
2017 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
Washington, D.C.

June 2017 *"MRI Derived Biomarkers of Hemodynamic performance"*
Special Workshop on Advanced Medical Imaging for Assessing Physiological Flows
2017 Summer Biomechanics, Bioengineering, and Biotransport Conference
Tucson, AZ

July 2017 *"The Search for Imaging Biomarkers of BAV Aortopathy Development"*
Heart Institute Invited Lecture
Children's Hospital Colorado, Aurora, CO

January 2018 *"The Search for Imaging Biomarkers of BAV Aortopathy Development"*
Department of Bioengineering Invited Seminar Series
Georgia Tech, Atlanta, Georgia

February 2018 *"Hemodynamics and MRI"*
Department of Bioengineering Invited Seminar Series
Purdue University

November 2018 *"Multidimensional Imaging & 4D flow MRI: The challenging path to clinical translation"*
2018 SJTU Workshop on Medical Imaging and Computational Modeling in Cardiovascular and Pulmonary Diseases
Shanghai Jiao Tong University, Shanghai, China

February 2019 *"The Advanced Imaging Lab: Translating Multidimensional Flow MRI to the Clinic"*
2019 Bioengineering Spring Seminar Series
University of Colorado, Anschutz Medical Campus

May 2019 *"Genetics or Hemodynamics? Bicuspid aortic valve aortopathy development"*
Center for Medical Image Science and Visualization (CMIV)
Linköping University, Linköping, Sweden

July 2019 *"Multidimensional imaging and 4D flow MRI"*
National Institute of Standards and Technology Invited Seminar Series
Boulder, CO

February 2020 *"4D Flow vs 2D Flow: Evaluation of Valve Disease"*
Special Session on Congenital Heart Disease
2020 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
Orlando, FL

August 2021 *"Advanced Imaging Lab: Our experience with Doppler Ultrasound-gating for fetal CMR"*
Northh Medical User Meeting
(Virtual Meeting)

February 2022 *"Novel Insights: Fetal 4D flow MRI"*
Fetal Heart Society Seminar Series
(Virtual Meeting)

June 2022 *"Fetal 4D Flow: wishful thinking or real prospect? What are the Pitfalls and Wins?"*
4D Flow Workshop: Hazelwood Castle
University of Leeds, Oxford, UK

June 2022 *"Fetal 4D Flow: What is possible and how?"*
Northh Medical User Meeting

(Virtual Meeting)

July 2022 *"BAV: The Basics and Beyond"*
10th Annivesary of the Martha and Richard Melman Family BAV Program
Northwestern University, Chicago, IL USA

January 2023 *"Cultivating a Successful Mentor-Mentee Relationship"*
Special Session on Trainee Education
2023 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
San Diego, CA

May 2023 *"Step by Step to Fetal 4D Flow Images"*
Northh Medical User Meeting
(Virtual Meeting)

May 2023 *"Hemodynamic Imaging of the Aorta"*
Society of Magnetic Resonance Angiography Webinar Series
(Virtual Meeting)

October 2023 *"4D flow MRI at Children's Hospital Colorado"*
Philips Medical User Meeting
(Virtual Meeting)

January 2024 *"Initial Reference Values: New Insights for Fetal Cardiac Volumes, Function, and (some) Flow"*
Fetal Cardiac Imaging Using MRI
Northh Medical Educational Webinar Series
(Virtual Meeting)

January 2024 *"MRI Safety, IRB/ethical Approval and Quality Assurance in Fetal CMR"*
2024 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
London, UK

12. TEACHING RECORD:

Teaching

Spring 2004	MCEN 3027 – Engineering Measurements and Statistics	Graduate Teaching Assistant
Fall 2003	MCEN 3043 – Engineering Dynamics	Graduate Teaching Assistant
Spring 2016	2016 ISMRM Annual Educational Course, Singapore	Lecturer
Winter 2017	2017 SCMR Annual Educational Course, Washington DC	Lecturer
Summer 2020	Fellow Core Series: Imaging of Valve Disease	Lecturer
Summer 2021	Fellow Core Series: Practical Challenges: Flow & MRA	Lecturer
Summer 2022	Fellow Core Series: Practical Challenges: Flow & MRA	Lecturer
Winter 2024	Fellow Core Series: Practical Challenges: Flow & MRA	Lecturer

Teaching Awards

2016 *Outstanding Teacher – Area of Scholarly Concentration,* Feinberg School of Medicine, Northwestern University

Trainees

2012 **Krishna Bandi** (Medical Student, work resulted in 6 abstracts and a journal article)

2012-2016 **Nicolas Naro** (Medical Student, Area of Scholarly Concentration, received 'Outstanding Teacher' award for our project – Office of Medical Education; work resulted in 1 abstract and a journal article)

2012-2013 **Riti Mahadevia** (Medical Student, Awarded Outstanding Medical Student 2013 for mentored project)

2012-2017 **Kelly Jarvis** (PhD, Awarded Thomas L. Slovis Best Paper in Pediatric Radiology for 2016)

2013-2014 **Xi Chen** (MS Committee)

2013-2014 **Patrick Magrath** (MS Committee)

2013-2018 **Michal Schafer** (PhD Committee, 18 First Author Peer Reviewed Publications derived from his work)

2013-2015 **Pim van Ooij** (Postdoc, Awarded AHA Postdoctoral Fellowship during mentorship period)

2012-2015 **Julio Garcia** (Postdoc, Awarded AHA Postdoctoral Fellowship during mentorship period)

2014-2017 **Emilie Bollache** (Postdoc, Awarded AHA Postdoctoral Fellowship during mentorship period, ISMRM 2018 Edicational Award, *"2018 Highly Cited Article*" The Journal of Thoracic and Cardiovascular Surgery)

2014-2015 **Ian Murphy** (Radiology Fellow, First author publication)

2015-2016 **Rouzbeh Ahmadian** (Postdoc)

2015-2017 **Ozair Rahman** (Medical Student, 3rd Prize, Society of Magnetic Resonance Angiography 'Passariello Award')

2015-2016 **Brian Trinh** (Medical Student, 2016 RSNA Travel Award Recipient and Podium Presentation, First author publication)

2015-2016 **Lingzi Tashakkor** (MS Committee)

2016-2017 **Xin Shen** (MS Committee, 1st author paper)

2017-2020 **Kevin Lin** (Medical Student, Co-author on paper)

2016-2019 **Hyungkyu Huh** (Postdoc, 2 first author and 4 papers published, Currently an Assistant Professor at Daegu-Gyeongbuk Medical Innovation Foundation, Korea)

2017-2022 **Michael Scott** (M.D., PhD, Mentor, awarded 2020 Society of Cardiovascular Magnetic Resonance 'Best of Moderated E-poster Presentation: Two first author publications)

2018-2020 **Nivedita Naresh** (PhD Assistant Research Professor, Mentor, Society of Cardiovascular Magnetic Resonance Pilot Award, One first author publication)

2019- **Takashi Fujiwara** (Postdoc, 2 first author publications, American Heart Association Postdoctoral Fellowship Award)

2019-2022 **Alexander Berthusen** (MS, Mentor for Research Project, 1 co-authorship published)

2019-2022 **Danny Enge** (MS Committee, Mentor for Research project)

2020- 2022 **Daniel Sassoon** (MD resident, Mentor for Research project, 2 first author publications)

2020- **Erin Englund** (PhD Assistant Research Professor, Mentor, American Heart Association Career Development Award, Institutional NIH KL2 award, two pilot fund awards through CCTSI and Colorado Fetal Care Center)

2023- **Sungho Park** (Postdoc, Awarded American Diabetes Association Postdoctoral Fellowship Award)

2023- **Vivian Lu** (MD student, Awarded the 'top' University of Colorado Anschutz Medical Campus 2023 Research Forum Poster, Travel Award for the 2024 SCMR)

13. GRANT SUPPORT:

A. Active:

2021-2026 *NIH R01 DK129211, "Puberty, diabetes, and the kidneys, when eustress becomes distress"*
National Institutes of Health, NIDDK
$3,100,000, Role: Co-I

2022-2025 *JDRF 3-SRA-2022-1278-M-B. "Efficacy and safety of once weekly semaglutide in adults with obesity and inadequately controlled type 1 diabetes using hybrid closed-loop system"*
Juvenile Diabetes Research Foundation
$1,913,863, Role: Co-I

2023-2026 *NIH R01 HL165433, "Type 1 Diabetes Impacts of Semaglutide on Cardiovascular Outcomes (T1-DISCO)"*
National Institutes of Health, NHLBI
$2,501,767, Role: Co-I

2023-2024 *CCTSI TM-T-23-197, "Development of motion robust ultrasound gating to enable fetal cardiovascular MRI of congenital heart disease"*
Colorado Center for Translational Science Institute, CCTSI Translational Methods Grant
$30,000, Role: PI

2023-2026 *KIAT, "Advancement and globalization of medical twin core technology based on medical images"*
Korean Institute of Advanced Technology
$2,160,000, Role: PI

2024-2028 *NIH R01 DK137844-01, "Efficacy and Mechanisms of Dapagliflozin in Promoting Kidney Function and Cardiovascular Health in Kidney Transplant Recipients"*
National Institutes of Health, NIDDK
$3,765,070, Role: Co-I

B. Inactive:

2004- 2006 *Collaborative Seed Grant*, National Institute of Standards and Technology (NIST)
$50,000, Role: Co-PI (PI: Cage, B, NIST)

2004-2005 *Engineering Excellence Fund*, University of Colorado, Boulder
$1000, Role: Co-PI (PI: Zheng, H)

2006-2007 *NIH National Research Service Award (Educational Grant)*, Ruth Kirschstein Predoctoral Fellowship (F31)
National Institutes of Health, NIBIB
$30,972, Role: PI

2009-2010 *Fulbright Award (Educational Grant)*, Bureau of Educational & Cultural Affairs, US Department of State
$35,000 Role: PI

2010-2011 *Whitaker International Scholar Award (Educational Grant)*, The Whitaker Foundation
$60,000, Role: PI

2013-2017 *AHA National Scientist Development Grant*, American Heart Association
$308,000, Role: PI

2014-2016 *AHA Postdoctoral Award (Pim van Ooij, PhD)*, American Heart Association
$100,000, Role: PI

2015-2017 *AHA Postdoctoral Award (Emilie Bollache, PhD)*, American Heart Association
$100,000, Role: PI

2016-2019 *Industry Grant, "Improved Quantitation of Mitral Regurgitation Before and After MitraClip In vitro and Computational Modeling"*
Abbott

$200,000, Role: Co-PI (PI: Thomas)
(Relinquished 5/31/2018 due to transfer to University of Colorado; remain involved as a key collaborator)

2017-2020 *Industry Grant," Investigation of Post-Surgical Aortic Hemodynamics After Aortic Valve Replacement"*
CryoLife
$100,000, Role: PI
(Relinquished PI status 5/31/2018 due to my transfer to University of Colorado; remain involved as a collaborator)

2014-2020 *NIH K25 HL119608 Quantitative Research Career Development Grant*
National Institutes of Health, NHLBI
$732,375, Role: PI

2017-2022 *NIH R01 HL133504, "Role of Valve-Mediated Hemodynamics on Bicuspid Aortopathy"*
National Institutes of Health, NHLBI
$3,329,397, Role: PI

2018-2022 *NIH-R01HL115828, "Functional Cardiovascular 4D MRI in Congenital Heart Disease"*
National Institutes of Health, NHLBI
$2,962,288, Role: Co-PI (PI: Markl)
(Relinquished 5/31/2018 due to transfer to University of Colorado; remain involved as a key collaborator)

2019-2021 *NIH F30 MD PhD Predoctoral Award (Michael Scott, MD PhD Candidate),* National Institutes of Health
$100,000, Role: Mentor

2019-2020 *Co-Pilot Award,* Colorado Center for Translational Science Institute
$20,000, Role: Co-Investigator

2020-2022 *AHA-20IPA202774, "The Effects of Bariatric Surgery on the Cardio-Renal Axis in Youth-onset Type 2 Diabetes"*
American Hearth Association, Innovative Project Grant
$200,000, Role: Co-I

14. BIBLIOGRAPHY: (https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/40298806/?sort=date&direction=ascending)

A. PEER-REVIEWED ORIGINAL INVESTIGATIONS

1. **Barker, A.J.**, Cage, B., Russek, S., and Stoldt, C.R., *Ripening during Magnetite Nanoparticle Synthesis: Resulting Interfacial Defects and Magnetic Properties*. Journal of Applied Physics, 2005. 98(6): p. 063528. (No PMID, link)

2. Zheng, H., **Barker, A.**, and Shandas, R., *Predicting Backscatter Characteristics from Micron- and Submicron-Scale Ultrasound Contrast Agents using a Size-Integration Technique.* IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 2006. 53(3): p. 639-644 (PMID: 16555773).

3. Cage, B., Russek, S.E., R., S., **Barker, A.J.**, Stoldt, C., Ramachandarin, V., and Dalal, N.S., *The utility of the single-molecule magnet Fe8 as a magnetic resonance imaging contrast agent over a broad range of concentration.* Polyhedron, 2007. 26(12): p. 2413-2419. (No PMID, link)

4. **Barker, A.J.**, Lanning, C., and Shandas, R., *Quantification of Hemodynamic Wall Shear Stress in Patients with Bicuspid Aortic Valve Using Phase-Contrast MRI.* Annals of Biomedical Engineering, 2010. 38(3): p. 788-800. (PMID: 19953319)

5. Zhang, F., Lanning, C., Mazzaro, L., **Barker, A.J.**, Gates, P.E., Strain, W.D., Fulford, J., Gosling, O.E., Shore, A.C., Bellenger, N.G., Rech, B., Chen, J., Chen, J., and Shandas, R., *In Vitro and Preliminary In Vivo Validation of Echo Particle Image Velocimetry in Carotid Vascular Imaging.* Ultrasound in Medicine & Biology, 2011. 37(3): p. 450-464. (PMID: 21316562)

6. Bock, J., Frydrychowicz, A., Lorenz, R., Hirtler, D., **Barker, A.J.**, Johnson, K.M., Arnold, R., Burkhardt, H., Hennig, J., and Markl, M., *Optimized Assessment of 4D Aortic Pressure Difference Maps.* Magnetic Resonance in Medicine, 2011. 65(5): p. 1335-1345. (PMID: 26409245)

7. **Barker, A.J.,** Staehle, F., Bock, J., Jung, B.A., and Markl, M., *Analysis of Complex Cardiovascular Flow using Three-Component Acceleration-Encoded MRI.* Magnetic Resonance in Medicine, 2012. 67(1): p. 50-61. (No PMID, link)

8. Bürk, J., Blanke, P., Stankovic, Z., **Barker, A.**, Russe, M., Geiger, J., Frydrychowicz, A., Langer, M., and Markl, M., *Evaluation of 3D blood flow patterns and wall shear stress in the normal and dilated thoracic aorta using flow-sensitive 4D CMR*. Journal of Cardiovascular Magnetic Resonance, 2012. 14(1): p. 84. (PMID: 23237187)

9. **Barker, A.J.**, Markl, M., Burk, J., Lorenz, R., Bock, J., Bauer, S., Schulz-Menger, J., and von Knobelsdorff-Brenkenhoff, F., *Bicuspid Aortic Valve Is Associated with Altered Wall Shear Stress in the Ascending Aorta*. Circulation: Cardiovascular Imaging, 2012. 5(4): p. 457-66. ***(Circulation Editors' "Most Read" articles on Aortic Disease and Circulation Cardiovascular Imaging Editors' "Most Important Articles in Cardiovascular Imaging Science")*** (PMID: 22730420)

10. McGarvey, J.R., Kondo, N., Takebe, M., Koomalsingh, K.J., Witschey, W.R., **Barker, A.J.**, Markl, M., Takebayashi, S., Shimaoka, T., Gorman, J.H., 3rd, Gorman, R.C., and Pilla, J.J., *Directed epicardial assistance in ischemic cardiomyopathy: flow and function using cardiac magnetic resonance imaging*. The Annals of Thoracic Surgery, 2013. 96(2): p. 577-85. (PMID: 23810178)

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