

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 ([206 publications](#)). Our most recent research uses noninvasive cardiovascular MRI to extract pediatric and fetal biomarkers of cardiac motion, blood flow, vascular remodeling, and cardiovascular disease. I am [internationally recognized](#) as a cardiovascular MRI expert with numerous [invited lectures](#) and guideline statements on the topic. My passion for the field is evident as the [2nd most cited investigator in the world](#) on the topic of 4D flow MRI (see [Table 3](#)) and as the Vice Chief of Pediatric Radiology Research at my institution. 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: Professor, Department of Radiology & Bioengineering
Vice Chief of Pediatric Radiology Research
Director of the Advanced Imaging Lab, Children's Hospital Colorado (CHCO)
University of Colorado, Anschutz

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

1995-1999	University of Colorado, Boulder, USA	B.S.	Mechanical Engineering
2003-2008	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	<i>Research Assistant Professor</i> , Department of Radiology Feinberg School of Medicine, Northwestern University
2015-2018	<i>Assistant Professor (Tenure Track)</i> , Department of Radiology Feinberg School of Medicine, Northwestern University
2018-2023	<i>Adjunct Professor</i> , Department of Radiology Feinberg School of Medicine, Northwestern University
2018-2025	<i>Associate Professor</i> , Department of Radiology & Bioengineering Director of the Advanced Imaging Lab, Children's Hospital Colorado (CHCO) University of Colorado, Anschutz
2024-	<i>Vice Chief of Pediatric Radiology Research</i> , Department of Radiology University of Colorado, Anschutz
2025-	<i>Professor</i> , Department of Radiology & Bioengineering Director of the Advanced Imaging Lab, Children's Hospital Colorado (CHCO) University of Colorado, Anschutz

4. OTHER POSITIONS:

1993-1995	<i>Science and Engineering Intern</i> , Anti-submarine Warfare Unit Naval Surface Weapons Center, White Oak, Maryland
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- 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, Children's Hospital Colorado
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](https://doi.org/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](https://doi.org/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, I am last author) 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*”
- 2024 Tompkins et al. (Trainee, I am last author) recognized by the International Society of Magnetic Resonance in Medicine as the top 100 abstracts (out of approximately 6000) for “*Retrospective motion correction of fetal 4D flow MRI*”.
- 2024 Browne et al (Physician Collaborator is first author, I am last author) awarded the Society for Pediatric Radiology's (SPR) highest scientific honor ‘*Caffey Award for Best Research Paper*’ for the paper “*Predictive Capability of Fetal 4D Flow and Black Blood Slice to Volume Reconstruction for Prenatal Diagnosis of Coarctation of the Aorta (CoA)*”.

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 Symposium on Biomedical Imaging Colorado School of Public Health
- 2023 *Pediatric Radiology “Researcher of the Year” Department of Radiology, University of Colorado Anschutz*
- 2025 *Nominee for Research Mentor Award Department of Pediatrics, Pediatric Research Awards, University of Colorado Anschutz*
- 2026 *Mentorship Excellence Award Department of Radiology, School of Medicine, University of Colorado Anschutz*

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

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

2024-2025 *Executive Planning Committee*
 2025 SCMR Mid-year Meeting on 'Recent Advances in Imaging for Congenital Heart Disease'
 Munich, Germany

2024-2025 *Executive Planning Committee*
 2025 Society of Pediatric Radiology Workshop on Advanced Cardiac Imaging
 Denver, Colorado

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

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

- 2020- *Regular Reviewer for Faculty Pilot Grants*
Department of Radiology, University of Colorado, Anschutz
- 2024- *Vice Chief of Pediatric Radiology Research*
Department of Radiology, University of Colorado, Anschutz
- 2025- *Department of Radiology Promotions and Tenure Committee*
Department of Radiology, University of Colorado, Anschutz

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"
Role: Research Imaging Lead, Writing group member
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 (2024 Gold Star Reviewer)
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
Reviewer, 2024 Colorado Clinical and Translational Sciences Institute Pilot Awards
Reviewer, 2025 NIH NHLBI R61/R33 Catalyze Product Definition and Tool Development Panel ZHL1 CSR-X M2

11. INVITED LECTURES:

LOCAL/REGIONAL INVITED LECTURES

1. *"Quantitative Flow Imaging"*
Rocky Mountain Biomagnetic Program, April 9th, 2008
National Institute of Standards and Technology, Boulder, CO, USA
2. *"Cardiovascular Hemodynamics in 4D"*
Heart Institute Lecture, June 8th, 2010
The Children's Hospital, Denver, USA
3. *"4D Flow Sensitive MRI: Background & Clinical Research Applications"*
Cardiovascular Surgery Seminar, March 10th, 2011
University of Pennsylvania, Philadelphia, Pennsylvania
4. *"Measuring Blood Forces in the Presence of Aortic Valve Disease"*
Fluids and Transport Seminar Series, February 19th, 2013
Department of Biomedical Engineering, Northwestern University, Evanston, Illinois
5. *"Current State of Bicuspid Aortic Valve Imaging at Northwestern Memorial Hospital"*
Heart Valve Meeting, April 11th, 2013
Department of Cardiac Surgery, Northwestern Memorial Hospital, Chicago, Illinois
6. *"Imaging valve disease with 4D Flow MRI: Experience at NMH"*
Cardiovascular Surgery Seminar, November 18th, 2013
University of Pennsylvania, Philadelphia, Pennsylvania
7. *"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, October 21st, 2014
Northwestern Memorial Foundation, Northwestern Medicine, Chicago, Illinois
8. *"Genetics or Hemodynamics? The search for imaging biomarkers of bicuspid aortic valve aortopathy development"*
Cardiac Grand Rounds, June 23rd, 2015
Libin Cardiovascular Institute, University of Calgary, Alberta
9. *"4D Flow MRI: Ready for clinical translation?"*
2016 Bioengineering Spring Seminar Series, April 29th, 2016
University of Colorado, Anschutz
10. *"The Search for Imaging Biomarkers of BAV Aortopathy Development"*
Heart Institute Invited Lecture, July 27th, 2017
Children's Hospital Colorado, Aurora, CO
11. *"The Search for Imaging Biomarkers of BAV Aortopathy Development"*
Department of Bioengineering Invited Seminar Series, January 18th, 2018
Georgia Tech, Atlanta, Georgia
12. *"Hemodynamics and MRF"*
Department of Bioengineering Invited Seminar Series, February 8th, 2018
Purdue University
13. *"The Advanced Imaging Lab: Translating Multidimensional Flow MRI to the Clinic"*
2019 Bioengineering Spring Seminar Series, February 15th, 2019
University of Colorado, Anschutz
14. *"Multidimensional imaging and 4D flow MRF"*
National Institute of Standards and Technology Invited Seminar Series, July 30th, 2019

Boulder, CO

15. *"BAV: The Basics and Beyond"*
10th Anniversary of the Martha and Richard Melman Family BAV Program, July 18th, 2022
Northwestern University, Chicago, IL USA
16. *"A Translational Journey: Insights from Fetal & Pediatric Cardiac MRI Technique Development"*
Radiology Research Seminar, March 15th, 2024
University of Colorado, Anschutz
17. *"Translation of Fetal Cardiac MRI to the Clinic"*
Translational Research Seminar, Colorado Children's Health Research Institute, June 16th, 2025
University of Colorado, Anschutz
18. *"Collaborative Science"*
Pediatric Research Day, Colorado Child Health Research Institute (CCHRI), October 7th 2026
University of Colorado, Anschutz
19. *"A Translational Journey: Fetal CMR Technique Development for Assessment of Congenital Heart Disease"*
Grand Rounds, Heart Institute, Cardiology, December 2nd, 2025
Children's Hospital Colorado

NATIONAL / INTERNATIONAL INVITED LECTURES

1. *"Hemodynamics and the Bicuspid Aortic Valve"*
Cardiovascular MRI Workshop, October 11th, 2010
Xuanwu University Hospital, Beijing, China
2. *"Intra-cardiac MR 4D blood-flow: A new functional parameter?"*
Special Lecture: Promising Approaches in Cardiovascular Evaluation, October 30th, 2010
Annual Meeting of the European Society of Cardiac Radiology (ESCR), Prague, Czech Republic
3. *"Hemodynamics and the Bicuspid Aortic Valve: Structure and Function"*
and *"Biofluid Kinematics: Intro to Wall Shear Stress"*
4D Flow Workshop, February 18th, 2011
University of Oxford Centre for Clinical Magnetic Resonance Research, Oxford, UK
4. *"MRI of the Aortic Valve"*
Accelerated Magnetic Resonance Imaging, 3rd International Workshop, September 24th, 2012
University Medical Center Freiburg, Germany
5. *"Energy efficiency and viscous losses"*
and *"BAV research in Chicago – multi-center experience and new stratification metrics"*
4D Flow Workshop, September 23rd, 2013
University of Oxford Centre for Clinical Magnetic Resonance Research, Oxford, UK
6. *"Mapping Intracardiac Flow and Energy Loss with 4D Flow MRI"*
41st Annual Meeting of the North American Society for Cardiovascular Imaging (NASCI), October 1st, 2013
Atlanta, GA
7. *"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, February 7th, 2015
2015 SCMR/Euro CMR Joint Scientific Sessions, Nice, France
8. *"How to Interpret Flow Energetics & Turbulence"*
4D Flow Workshop, June 28th, 2015

University of Oxford Centre for Clinical Magnetic Resonance Research, Oxford, UK

9. *"How imaging biomarkers predict histologic changes & could alter surgical strategy"*
Advanced Symposium on Cardiovascular Imaging, October 17th, 2015
Society of Pediatric Radiology
Lurie Childrens Hospital, Chicago, IL
10. *"4D Flow MRI mapping of regional wall shear stress"*
North American Vascular Biology Workshop, October 18th, 2015
Cape Cod, MA
11. *"The wonders of 4D Flow MRI: Ready for clinical use?"*
2016 Heart Valve Society Meeting, March 17th, 2016
New York, New York
12. *"Practical Challenges of MRA and Flow"*
Cardiovascular MRI: Vascular Flow & Angiography Weekend Educational Course, May 7th, 2016
2016 Annual Meeting of the International Society of Magnetic Resonance in Medicine
Singapore, Republic of Singapore
13. *"Cardiovascular Flow A – Technical Methods"*
Physician's Pre-Conference Course, February 1st, 2017
2017 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
Washington, D.C.
14. *"4D Flow in Thoracic Aortopathy & Valve Disease"*
Special Session on Thoracic Aortopathy (SMRA Special Session), February 1st, 2017
2017 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
Washington, D.C.
15. *"MRI Derived Biomarkers of Hemodynamic performance"*
Special Workshop on Advanced Medical Imaging for Assessing Physiological Flows, June 21st, 2017
2017 Summer Biomechanics, Bioengineering, and Biotransport Conference
Tucson, AZ
16. *"Multidimensional Imaging & 4D flow MRI: The challenging path to clinical translation"*
SJTU Workshop on Medical Imaging and Computational Modeling in Cardiovascular and Pulmonary Diseases, Nov. 3rd, 2018
Shanghai Jiao Tong University, Shanghai, China
17. *"Genetics or Hemodynamics? Bicuspid aortic valve aortopathy development"*
Grand Rounds, Center for Medical Image Science and Visualization (CMIV), May 31st, 2019
Linköping University, Linköping, Sweden
18. *"4D Flow vs 2D Flow: Evaluation of Valve Disease"*
Special Session on Congenital Heart Disease, February 13th, 2020
2020 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
Orlando, FL USA
19. *"Advanced Imaging Lab: Our experience with Doppler Ultrasound-gating for fetal CMR"*
Northh Medical, International User Meeting, August 16th, 2021
(Virtual Meeting)
20. *"Novel Insights: Fetal 4D flow MRF"*
Fetal Heart Society Seminar Series, April 14th, 2022
(Virtual Meeting)
21. *"Fetal 4D Flow: wishful thinking or real prospect? What are the Pitfalls and Wins?"*

4D Flow Workshop: Hazelwood Castle, June 13th, 2022
University of Leeds, Oxford, UK

22. *"Fetal 4D Flow: What is possible and how?"*
Northh Medical, International User Meeting, June 27th, 2022
(Virtual Meeting)
23. *"Cultivating a Successful Mentor-Mentee Relationship"*
Special Session on Trainee Education, January 27th, 2023
2023 Annual Meeting of the Society of Cardiovascular Magnetic Resonance
San Diego, CA USA
24. *"Step by Step to Fetal 4D Flow Images"*
Northh Medical, International User Meeting, May 3rd, 2023
(Virtual Meeting)
25. *"Hemodynamic Imaging of the Aorta"*
Society of Magnetic Resonance Angiography Webinar Series, May 18th, 2023
(Virtual Meeting)
26. *"4D flow MRI at Children's Hospital Colorado"*
Philips Medical, International User Meeting, October 13th, 2023
(Virtual Meeting)
27. *"Initial Reference Values: New Insights for Fetal Cardiac Volumes, Function, and (some) Flow"*
Fetal Cardiac Imaging Using MRI, January 10th, 2024
Northh Medical Educational Webinar Series
(Virtual Meeting)
28. *"MRI Safety, IRB/ethical Approval and Quality Assurance in Fetal CMR"*
2024 Annual Meeting of the Society of Cardiovascular Magnetic Resonance, January 25th, 2024
London, UK
29. *"Recent Milestones of Flow Imaging: Past, Present & Future of Flow Imaging"*
2024 'ISMRM Advances in MR Flow' Workshop, **Plenary Lecture**
Calgary, Canada
30. *"Setting up a Fetal CMR Service: Insights from Children's Hospital Colorado"*
Society of Cardiovascular Magnetic Resonance Webinar on 'Standing up a Fetal CMR Clinical Service', November 6th 2024
(Virtual Meeting)
31. *"Establishing CMR Normal Values to Aid Fetal CMR Diagnoses"*
Beyond fetal structural anatomy, December 12th, 2024
Northh Medical Educational Webinar Series
(Virtual Meeting)
32. *"Perfusion: 4D flow in Pediatrics and Pregnancy"*
Sunrise Course - Perfusion (Contrast and Non-contrast): Special Topics in the field of Pediatrics, May 12th, 2025
2025 Annual Meeting of the ISMRM
Honolulu, HI USA
33. *"Pro/Con: AI in congenital CMR examinations"*
Recent Advances in Imaging for Congenital Heart Disease, June 28th, 2025
SCMR Mid-year Meeting and Hands-on Imaging Course
Munich, Germany
34. *"Fetal CMR: Scanning and Troubleshooting"*

Society of Pediatric Radiology Advanced CMR Workshop, October 12th, 2025
Denver, Colorado USA

35. *“Phase Contrast MRI in CMR”*

Society of Pediatric Radiology, Special Course in CMR Physics, November 24th, 2025
(Virtual Meeting)

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 2023	Fellow Core Series: Practical Challenges: Flow & MRA	Lecturer
Winter 2025	Fellow Core Series: Practical Challenges: Flow & MRA	Lecturer

Mentees

Students

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)
2015-2017	Ozair Rahman (Medical Student, 3 rd 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, 1 st author paper)
2017-2020	Kevin Lin (Medical Student, Co-author on paper)
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, NIH F30 award)
2019-2022	Alexander Berthussen (MS, Mentor for Research Project, 1 co-authorship published)
2019-2022	Danny Enge (MS Committee, Mentor for Research project)

2023-2025	Vivian Lu (MD student, Awarded the 'top' University of Colorado Anschutz 2023 Research Forum Poster, Travel Award for the 2024 SCMR)
2023-	Nicolas Drysdale (MD, Pediatric Cardiac Surgery Research Resident and PhD candidate)
2024-	Jochen Gerstner Saucedo (Mentor, MD visiting scholar in the Advanced Imaging Lab)
2025-	Imtiaj Nahin Ahmed (Mentor, PhD Candidate)

Residents

2020- 2022	Daniel Sassoon (MD resident, Mentor for Research project, 2 first author publications)
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Fellows and Junior Faculty

2013-2015	Pim van Ooij (Postdoctoral Fellow, Awarded AHA Postdoctoral Fellowship during mentorship period)
2012-2015	Julio Garcia (Postdoctoral Fellow, Awarded AHA Postdoctoral Fellowship during mentorship period)
2014-2017	Emilie Bollache (Postdoctoral Fellow, Awarded AHA Postdoctoral Fellowship during mentorship period, ISMRM 2018 Educational Award, "2018 Highly Cited Article" The Journal of Thoracic and Cardiovascular Surgery)
2014-2015	Ian Murphy (Radiology Advanced Imaging Fellow, First author publication)
2015-2016	Rouzbeh Ahmadian (Postdoctoral Fellow)
2016-2019	Hyungkyu Huh (Postdoctoral Fellow, 2 first author and 4 papers published, Currently an Assistant Professor at Daegu-Gyeongbuk Medical Innovation Foundation, Korea)
2018-2020	Nivedita Naresh (PhD Assistant Research Professor, Mentor, Society of Cardiovascular Magnetic Resonance Pilot Award, One first author publication)
2019-	Takashi Fujiwara (Postdoctoral Fellow, 2 first author publications, American Heart Association Postdoctoral Fellowship Award)
2020-	Erin Englund (PhD Assistant Professor of Radiology, Mentor, American Heart Association Career Development Award, Institutional NIH KL2 award, two pilot fund awards through CCTSI and Colorado Fetal Care Center)
2022-	Ben Frank (MD Assistant Professor of Pediatrics-Cardiology, Mentor, awarded NIH K23 Training Grant)
2023-	Jen Romanowicz (MD Assistant Professor of Pediatrics-Cardiology, Mentor, awarded AHA Career Development Award and the Research and Innovation Scholar Award from Children's Hospital Colorado)
2023-	Sungho Park (Postdoctoral Fellow, Awarded American Diabetes Association Postdoctoral Fellowship Award)
2024-	Sayantan Bhattacharya (PhD Assistant Professor of Mechanical Engineering, University of Maryland, Baltimore County)

13. GRANT SUPPORT:**A. Active:**

2026-2031	<i>NIH R01 HL178618, "Prenatal Diagnosis of Coarctation of the Aorta using CMR"</i> National Institutes of Health, NHLBI \$3,009,797, Role: PI
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- 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
- 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
- 2023-2026 *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
- 2024-2027 *NIH R42 HL174259-01A1, "Anatomic Imaging Derived 4D Hemodynamics using Deep Learning"*
National Institutes of Health, NHLBI
\$656,751 (2024-2025), Role: Site PI
- 2025-2026 *Advanced Industries Proof of Concept Grant (digiSPARK), "Automated Deep Learning Approach to Enable Detection of In-utero Disease"*
Colorado Office of Economic Development and International Trade
\$75,000, Role: PI
- 2025-2030 *NIH R01HL180406 'AI Driven End-to-End 4D flow MRI Pipeline for Hemodynamic Assessment in BAV Disease'*
National Institutes of Health, NHLBI
\$3,521,170, Role: Site PI
- 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
(Relinquished 5/31/2018 due to transfer to University of Colorado; remained involved as a key collaborator)
- 2018-2019 *Novel Method Development Grant, “Pilot Study to quantify GFR by Phase-Contrast MRI”*
Colorado Center for Translational Science Institute (CCTSI)
\$30,000, Role: Co-Investigator
- 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, “Evaluation of skeletal muscle microvascular dysfunction in adult- and youth-onset type 2 diabetes with time-resolved, quantitative MRI”*
Colorado Center for Translational Science Institute (CCTSI)
\$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 Heart Association, Innovative Project Grant
\$200,000, 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
- 2023-2024 *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

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F. BOOK CHAPTERS

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3. Markl, M., Fedak, P.W., and **Barker, A.J.**, *Impact of Aortopathy and Aortic Valve Disease on 3D Blood Flow and Wall Shear Stress in the Thoracic Aorta: As Assessed by 4D Flow MRI*, in *Surgical Management of Aortic Pathology*, O.H. Stanger, J.R. Pepper, and L.G. Svensson, Editors. 2019, Springer-Verlag: Vienna, Austria. p. 447-464.

G. PEER REVIEWED SCIENTIFIC PRESENTATIONS (Selected)

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