

Curriculum Vita

Francis Loth, Ph.D.

Professor and F. Theodore Harrington Endowed Chair
Department of Mechanical Engineering
Department of Biomedical Engineering
Director of the Conquer Chiari Research Center
The University of Akron
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RESEARCH INTERESTS

Major research areas are cardiovascular diseases and cerebrospinal disorders. Experimental and computational methods are used in conjunction with medical imaging to characterize the fluid dynamic environment within the human body in order to better understand, diagnose, and treat disease.

EDUCATION

Ph.D., Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA, March 1993

Advisor: Don P. Giddens, Ph.D. (Dissertation Topic: Vascular Graft Fluid Dynamics)

M.S., Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA, September 1990

Diploma, Turbomachinery, von Karman Institute for Fluid Dynamics, Belgium, June 1987

M.S., Aerospace Engineering, University of Cincinnati, Cincinnati, OH, September 1988

B.S., Aerospace Engineering, West Virginia University, Morgantown, WV, May 1984

PROFESSIONAL EXPERIENCE

The University of Akron, College of Engineering, Akron, OH

Executive Director of the Conquer Chiari Research Center, April 2012-present

The University of Akron, Department of Mechanical Engineering, Akron, OH

Professor and F. Theodore Harrington Endowed Chair, 2013-present.

The University of Akron, Department of Biomedical Engineering, Akron, OH,

Joint Appointment, January 2010-present.

The University of Akron, Department of Mechanical Engineering, Akron, OH

Associate Professor and F. Theodore Harrington Endowed Chair, 2008-2012.

The University of Illinois at Chicago, Department of Mechanical and Industrial Engineering, Chicago, IL

Assistant Professor 1996-2002, *Associate Professor* 2002-2008.

The University of Illinois at Chicago, Department of Bioengineering, Chicago, IL,

Adjunct Professor, 1998-2008.

Argonne National Laboratory, Division of Mathematics and Computer Science, Argonne, IL

Summer Faculty Fellowship Program, 1998-2001, 2003, 2009. Contact: Paul Fischer, Ph.D.

Lawrence Berkeley Laboratories, The Center for Functional Imaging, Berkeley, CA

Summer Faculty Fellowship Program, 1996, Contact: Thomas Budinger, M.D., Ph.D.

The Johns Hopkins University, Department of Biomedical Engineering, Baltimore, MD

Post-Doctoral Fellow under Don P. Giddens, Ph.D., May 1994-December 1995.

University of Aix-Marseilles, Fluid Mechanics Institute of Marseilles, Marseilles, France

Post-Doctoral Fellow under Regis Rieu, Ph.D., May 1993-April 1994.

PROFESSIONAL DISTINCTIONS, AWARDS, HONORS

- Publications cited 3819 times (Google Scholar), h-index=34, i100-index=14, i10-index=59, (8/2019)
- External Doctoral Thesis Examiner for Michael Walsh's student at the Centre for Applied Biomedical Engineering Research, University of Limerick, November 2018
- College of Engineering Louis A. Hill, Jr. Award for exceptional dedication and service (2018)
- Outstanding Researcher Award from UA College of Engineering (2013, 2018)
- WVU Distinguished Alumni for the Department of Mechanical and Aerospace Engineering (2016)
- Fellow of the American Society of Mechanical Engineers, ASME (2012)
- Associate Editor for ASME Biomechanical Engineering Journal (2013-2016)
- ASME Bioengineering Division Fluids Committee Chair (2013-2015), Vice-Chair (2010-2012)
- Invited member of the ASME Bioengineering Leadership Retreat, April 2013
- Theme Co-leader for both the Cardiovascular Theme and the Non-Cardiovascular Theme at the ASME Summer Bioengineering Conference (2010, 2011, 2012)
- External Doctoral Thesis Examiner for Paul Fahy at the Galway-Mayo Institute of Technology, Department of Mechanical and Industrial Engineering, June 2013
- Co-founder and Co-PI of the UA Biomimicry Research and Innovation Center (2012-2016)
- Vice Chairman/Co-founder of the International Cerebrospinal Fluid Dynamics Society (2012-present)
- Guest Editor for the Neurological Research Journal Special Issue: Chiari I, Vol. 33, No. 3, 2011
- External Doctoral Thesis Examiner for Kristian Valen-Sendstad at the University of Oslo, May 2011
- Founding Member of the Medical Research Board for the Chiari and Syringomyelia Foundation (May 2008-2011)
- Founding member of the Scientific Advisory Board for the Chiari and Syringomyelia Patient Education Foundation (2004-2009)
- Medical Advisory Board of the Canine Chiari Institute at Long Island Veterinary Specialists (2008-2011)
- External Doctoral Thesis Examiner for Grainne Carroll at the Centre for Applied Biomedical Engineering Research, University of Limerick, December 2007
- Charles C. Guthrie Award for a conference paper at the Midwestern Vascular Surgical Society Annual Meeting, Chicago, IL, 2007
- 2007 ASAP Guiding Star Award in recognition of research contributions to the understanding of Chiari Malformation and Syringomyelia, Presented at the American Syringomyelia Alliance Project's Ninth Annual Black-Tie Ball
- 2006 Teaching Recognition Program Award by the UIC Council for Excellence in Teaching and Learning (CETL)
- 2006 Harold A. Simon Award for Excellence in Teaching in the UIC College of Engineering
- Nominated for the UIC Silver Circle Award for Teaching twice (2002-one of five & 2003-one of six faculty nominated by the senior undergraduate engineering students)
- UIC College of Engineering Faculty Research Award 2005 (elected by faculty awards committee)
- Manuscript reviewer for the Journal of Biomechanical Engineering, Journal of Biomechanics, Annals of Biomedical Engineering, International Journal of Heat and Mass Transfer, Numerical Heat Transfer, Biorheology
- NASA Biofluids Panel for proposals review, NASA Fluid Physics Program (2003 & 2004)
- Panel Member of the Interagency Opportunities in Multi-Scale Modeling in Biomedical, Biological, and Behavioral Systems (NSF, NIH, NASA, DOE) for proposal review (NSF 04-607, 2005)
- *Ad hoc* member of a study section (Cardiovascular Disease) to review a grant submitted to the Tobacco-Related Disease Research Program
- NSF-NATO Postdoctoral Fellowship in Science and Engineering, 1993

RESEARCH GRANTS

External Grants- Total Funding \$5,592K, Total Funding as PI \$2,643K

External Grants – Active (Total Funding \$341K, Total Funding as PI \$271K)

Conquer Chiari (\$23,531, 4/1/2018-5/1/2019) Annual funding to maintain the Conquer Chiari Research Center (CCRC) at The University of Akron, F. Loth (PI).

Conquer Chiari-Supplemental Award (\$70,138, 2/1/2016-12/31/2018), “Biomechanical Assessment of Brain Deformation in Relation to Chiari Malformation,” R. Amini (PI), F. Loth (PI).

Conquer Chiari-Supplemental Award (\$251,799, 11/09/2015-12/31/2018) “Automated Morphometric Analysis for Diagnosis and Research”, F. Loth (PI).

Conquer Chiari-Supplemental Award (\$132,174, 4/2015-08/2019) “MRI Morphometric Traits of Type 1 Chiari malformation Across Age and Gender,” F. Loth (PI), P. Allen, B. Martin.

Conquer Chiari-Supplemental Award (\$245,419, 6/2015-08/2019) “Biomarkers of surgical success in females with Chiari Malformation Type I.,” P. Allen (PI), D. Delahanty, C. Vorster, F. Loth.

External Grants – Completed (Total Funding \$5,250K, Total Funding as PI \$2,372K)

Federal and Foundation Grants

Conquer Chiari-Supplemental Award (\$142,000, 2/1/2013-12/31/2017) Brain Damage in Chiari I Malformation, F. Loth (PI), P. Allen, B.A. Martin, S. Dombroski, M. Luciano.

Conquer Chiari (\$717,493, 4/1/2012-5/1/2018) Annual funding to maintain the Conquer Chiari Research Center (CCRC) at The University of Akron, F. Loth (PI).

Conquer Chiari-Supplemental Award (\$77,000, 6/2015-5/2017) Chiari1000 Web Based Chiari Database, F. Loth (PI).

Conquer Chiari-Supplemental Award (\$61,064, 5/1/2014-1/31/2017) “A Chiari Malformation MR Image Database,” F. Loth (PI), J. Elias, \$47,764.

American Syringomyelia Alliance Project (\$53,568, 08/2013 – 08/2015), “Multicenter in vitro assessment of 4D PC MRI for quantification of CSF motion,” B.A. Martin BA (PI), F. Loth (Co-I)

Austen BioInnovation Institute in Akron, (\$31,000, 7/1/2011-6/30/2013), “Mechanistic Analysis of Negative Pressure Wound Therapy (NPWT), F. Loth (PI) and W.M. Chilian (ORSSP #:00797).

National Institutes of Health, NINDS R15 (\$484,000,5/1/2010-4-30-2014), “Clinical Utility of MR based Hydrodynamic Parameters in Chiari Malformation,” F. Loth (PI), J. Oshinski, S. Dombroski, M. Luciano, O. Weiben, B. Iskandar (Grant No. 1R15NS071455-01).

Conquer Chiari (\$121,800, 1/1/2008-7/31/2010) “MR Measurement of CSF Wave Speed, Distribution of CSF Velocity and Pressure, Longitudinal Impedance, and Skull Based Geometry in Chiari Patients.” F. Loth (PI), P.F. Fischer, Haughton, J.N. Oshinski, S. Sgouros.

National Institutes of Health, R13 (\$15,000, 6/18/2008 to 5/31/2009), “Chiari Malformation: State of the Research & New Directions,” PIs: R. Lubuda, F. Loth, K. Slavin (Grant No. 1R13NS063446-01).

American Syringomyelia Alliance Project (\$50,000, 10/01/2005-12/30/07), “Importance of the mechanical forces in the development of syringomyelia for patients with Chiari malformation,” F. Loth (PI), J.N. Oshinski, T.J. Royston, D.M. Frim.

National Institutes of Health, RO1 Research Project Grant (\$1,407,621, 8/02-6/07) “Biomechanical mechanisms and venous intimal hyperplasia,” H. Bassiouny (PI), F. Loth, T.J. Royston, P.F. Fischer (Grant No. 2RO1HL55296-04A2).

National Institutes of Health, R21 Exploratory/Development Grant (\$342,630, 9/03-8/05) “A multimode sonic & ultrasonic diagnostic imaging method,” T.J. Royston (PI), F. Loth, (Grant No. 1 R21 EB002511-01).

National Science Foundation (\$251,401, 9/02-8/04), “Information technology in the mechanical engineering curriculum,” B. Collier (PI), M. Scott, U. Buy, F. Loth (EEC-0212201).

American Syringomyelia Alliance Project (\$50,000, 8/02-12/03), “Importance of the mechanical forces in the development of syringomyelia for patients with Chiari malformation,” F. Loth (PI), J.N. Oshinski, C. Holder.

Whitaker Foundation (\$229,000, 9/01-8/03) “An investigation of biomechanical mechanisms in arteriovenous graft failure,” F. Loth (PI), T.J. Royston, P.F. Fischer, H.S. Bassiouny (RG-01-0198).

Labuda Family Foundation (\$70,722, 7/01-6/02), “Investigation of the mechanical forces within and around a syrinx for patients with Chiari malformation,” F. Loth (PI), P.F. Fischer, A. Masud.

National Institutes of Health, Exploratory Development Grant (\$225,163, 8/00-7/02) “New paradigms in tissue vibration for diagnostic methods,” T.J. Royston (PI), F. Loth (NCRR Grant No. 14250).

Ed and Gale Labuda Vanguard Charitable Endowment Program (\$35,000, 10/00-3/01) “Investigation of pressure differences between the cranium and the spinal canal during the cardiac cycle in Chiari malformation: The effect of decompression surgery,” F. Loth (PI).

National Institutes of Health, Innovative Approaches (\$185,390, 7/99-6/01) “Non-invasive measurements of intracranial pressure,” N. Alperin (PI), F. Loth, (Grants No. 1R21RR014242-01).

Industry Grants

Motorola Labs MATC, Illinois MRC Project (\$40,747, 8/20/2004-5/19/2006) “Blood pressure monitoring system,” F. Loth (PI), T.J. Royston (Co-I).

W. L. Gore & Associates, Inc., (\$25,000, 3/00-9/00) “Mechanism and prevention of arteriovenous PTFE graft failure,” H. Bassiouny (PI), F. Loth.

Baxter Healthcare Corporation (\$23,805, 9/01/2007-12/31/07), “Device Development,” F. Loth.

Additional Conquer Chiari Research Center (CCRC) Supplemental Awards for CCRC faculty secured while Loth is CCRC Executive Director (Total Funding \$879K)

Leah Shriver (Chemistry/Biology)

- “Metabolic and Inflammatory Alterations in Patients with Chiari Malformation, 2013, \$60,000.

Nic Leipzig (Chemical and Biomolecular Engineering)

- “Transcriptional Profiling and microCT Assessment of Experimental Syringomyelia,” 2015, \$97,651.
- “Targeting Syrxin Transporters for Syringomyelia Treatment Strategies,” 2013, 2015, \$128,275.

Kevin Kaut (Psychology)

- “The Developmental and Psychoeducational Impact of Chiari Malformation,” 2014, \$53,000.

Malena Español (Math)

- “MRI Based Classification of Chiari Malformation,” 2014, \$33,000.

David Tokar (Psychology)

- “Career Development Experiences of Individuals with CM, 2017,” \$36,602.

Phillip Allen (Psychology)

- Non-invasive therapies for the treatment of chronic pain in CM. Allen (PI), 2016, \$129,974.
- Chiari 1000 Project Manager. Allen (PI), 2015, \$195,912.

Bryn Martin, Aintzane Urbizu (Duke University, Mechanical Engineering)

- “Genetic Traits of CM Across Age and Gender” 2015, \$22,296.

Brain Davis (Biomedical Engineering)

- “Impact of CM on Gait,” 2018, \$6,084.

Ajay Mahajan (Mechanical Engineering)

- “Build Out Cost of Conquer Chiari Research Center in ERC Building,” 2012, \$140,000

Total external research funding for all CCRC faculty in the area of Chiari Malformation since 2008 is \$3,298,205 (includes funding for 12 UA faculty (Loth, Allen, Leipzig, Amini, Mahjan, Martin, Espanol, Shriver, Kaut, Johnson, Ottersteter, Tokar, Davis).

Internal Grants

University of Akron- Completed (Total: \$4.25M)

Biomimicry Research and Innovation Center (BRIC) Recipient of the 2012 Achieving Distinction Initiative Funding.

PIs: F. Loth (Mechanical Engineering), A. Dhinojwala (Polymer Science), M. Kolodziej (Myers School of Art), P.H. Niewiarowski (Integrated Bioscience). Funding for first two years is \$4.25M and consists of two parts. Continuing funds: Year 1: \$1M for new faculty hires and/or staff including salaries and benefits, Year 2: an additional \$1.5M for additional personnel. One-time funds: Year 1: \$1M for equipment, faculty summer salaries, and other expenditures, Year 2: an additional \$0.75M.

University of Illinois -Completed (Total: \$100K)

University of Illinois, Campus Research Board (\$53,000, FY-2007) “Image based patient specific predictive modeling of cerebral circulation,” M. Zhao (PI), M.E. Clark, S. Amin-Hanjani, F. Charbel, F. Loth.

Council for Excellence in Teaching and Learning (CELT) Curriculum and Instructional Grant (\$7,200, FY-2000) “Special topics in mechanical and bioengineering: Biofluid Mechanics (ME494/BioE494),” F. Loth (PI).

University of Illinois, Campus Research Board (\$15,000, FY-1999) “Quantification of patient-specific hemodynamic variables,” F. Loth (PI), N. Alperin, F. Charbel.

University of Illinois, Campus Research Board (\$14,912, FY-1997) “The importance of fluid mechanics on protein/platelet deposition,” F. Loth (PI).

University of Illinois, Campus Research Board (\$10,000, FY-1996) “Experimental simulation of biologically relevant flows,” F. Loth (PI).

INVITED TALKS

Keynote

1. “Experimental and Numerical Simulation of Biological Flows,” Midwest ASB Regional Meeting, Akron, OH, 2014.
2. “Chiari Malformation Research: Engineering & Imaging Techniques,” Chiari & Syringomyelia Foundation’s Hour of Hope on November 18, 2009 in Twinsburg OH.
3. “The Principles of Hemodynamics,” International Symposium on Flow Measurement in Cerebrovascular Surgery held at the University of Illinois, Chicago in the Department of Neurosurgery, October 6th, 2006.

General

4. “CFD Tools to Assess Chiari Malformation Severity,” The Center for Environmental and Applied Fluid Mechanics (CEAFM) at The Johns Hopkins University October 2015.
5. “Quantitative Assessment of the Differences in the Resistance to Spinal CSF Motion in Chiari Malformation,” 3rd CSF Hydrodynamics Symposium, Amiens, France, July 2015.
6. “CFD in Chiari Malformation to Quantify Patient-Specific Restriction to Cerebrospinal Fluid Motion,” 5th Annual International Conference on Computational Surgery and Dual Training, Organize by Barbara Bass and Marc Garbey, *NIH Cosine 5*, 2015.
7. “Biomimicry: Experimental and Numerical Simulation of Biological Flows,” Department of Biomedical Engineering, Cleveland Clinic Foundation, 2014.
8. “Quantitative Assessment of the Differences in Spinal CSF Dynamics in Chiari Malformation,” 2nd CSF Hydrodynamics Symposium, New York, NY, July 2013.
9. “Clinical Utility of Hydrodynamic Parameters in Chiari Malformation,” 1st CSF Hydrodynamics Symposium, ETH Zurich, Switzerland, July 2011.

10. "Biomechanical Forces in Chiari Malformation: Compliance," 21th Annual American Syringomyelia Alliance Project Conference, Austin, TX, July 2010.
11. "Engineering Analysis of Syringomyelia," 20th Annual American Syringomyelia Alliance Project Conference, Washington D.C., July 2009.
12. "State of the Research & New Directions, Engineering & Imaging Techniques," Conquer Chiari Workshop, Chicago, IL, November, 2008.
13. "Experimental and Numerical Simulation of Biological Flows," Polymer Engineering, University of Akron, OH, invited by Professor Erol Sancaktar, March 2008.
14. "Experimental and Numerical Simulation of Biological Flows," Mechanical Engineering Department, University of Akron, Akron, OH, invited by Professor Celal Batur, Spring 2007.
15. "Engineering Analysis of Syringomyelia," 19th Annual American Syringomyelia Alliance Project Conference, Seattle, WA, July 2007.
16. "CSF Hydrodynamics and Syringomyelia," Chiari Institute, Long Island, NY, invited by Roger Kula, Spring 2007.
17. "CSF Hydrodynamics and Syringomyelia," Long Island Veterinary Specialists, PLLC, Plainview, NY, invited by Dominic J. Marino, Spring 2007.
18. "Experimental and Numerical Simulation of Biological Flows," Department of Mechanical Engineering, Southern Illinois University Edwardsville, IL, Spring 2007.
19. "Experimental and Numerical Simulation of Biological Flows," Department of Mechanical Engineering, Southern Illinois University Carbondale, IL, Spring 2007.
20. "Importance of Hemodynamics on Arteriovenous Graft Failure," Bio-Interest Group (BIG) Seminar, University of Illinois, Urbana, IL, Fall 2006.
21. "Simulation and Measurement of Biological Flows," Department of Neurosurgery, University of Illinois at Chicago, Chicago, IL, August 9, 2006.
22. "Engineering Analysis of Syringomyelia," 18th Annual American Syringomyelia Alliance Project Conference, Denver, CO, July 2006.
23. "Simulation and Measurement of Biological Flows," Department of Neurosurgery, University of Cambridge, Cambridge, England, June 12, 2006.
24. "Simulation and Measurement of Biological Flows," Department of Chemical Engineering, Imperial College, London, England, June 9, 2006.
25. "An Investigation of the Importance of Fluid Dynamics on Arterio-Venous Grafts," Department of Mechanical and Biomedical Engineering, National Centre for Biomedical Engineering and Science (NCBES), National University of Ireland, Galway, Ireland, June 7, 2006.
26. "An Investigation of the Importance of Fluid Dynamics on Arterio-Venous Grafts," Centre for Applied Biomedical Engineering Research, Department of Mechanical and Aeronautical Engineering, University of Limerick, Limerick, Ireland, invited by Professor Tim McGloughlin, June 6, 2006.
27. "Breakthroughs in research," Featured Speaker for the American Syringomyelia Alliance Project's Sustainable Partners "Virtual Reception," March 9, 2006.
28. "CSF hydrodynamics and syringomyelia," Grand Rounds in the Department of Neurosurgery, University of Wisconsin, Madison, Wisconsin, November 3, 2005.
29. "Experimental and Numerical Insights into Biological Flows," Guest Lecture for the undergraduate Biofluids Course, Department of Bioengineering, University of Wisconsin, Madison, Wisconsin, November 3, 2005.
30. "Syringomyelia Hydrodynamics: An In Vitro Study Based on In Vivo Measurements," 17th Annual American Syringomyelia Alliance Project Conference, Cedar Rapids, IO, July 2005.
31. "Simulation and measurement of biological flows," invited seminar in the Department of Mechanical and Aerospace Engineering at West Virginia University, Morgantown, WV, July 18, 2005.

32. "Experimental and numerical simulation of biological flows," invited seminar in the Department of Biomedical Engineering in the Pritzker Institute of Biomedical Science and Engineering, Illinois Institute of Technology, September 28, 2004.
33. "The Engineering Perspective," 16th Annual American Syringomyelia Alliance Project Conference, Key Biscayne, FL, July 2004.
34. "Calculation of unsteady resistance within the spinal canal based on MRI measurements," invited seminar in the Department of Neurosurgery, University Hospital St-Luc, Universite Catholique de Louvain (UCL), Brussels, Belgium, June 8, 2004.
35. "Experimental and numerical simulation of biological flows," invited seminar in the Ecole Nationale Supérieure d'Arts et Métiers (EMT/LPMI) Angers, France, June 28, 2004.
36. "Experimental and numerical simulation of biological flows," invited seminar in the Universidad da Coruna, Escuela Politecnica Superior, Ferrol, Spain, June 23, 2004.
37. "Experimental and numerical simulation of biological flows," invited seminar in the Hospital Juan Canalejo, La Coruna, Spain, June 23, 2004.
38. "Engineering education at UIC", invited seminar in the Ecole Supérieure D'Infomatique Electronique Automatique, Paris/Ivry Site (November 11, 2003) and Laval (November 13, 2003), France.
39. "Importance of mechanical forces in the development of syringomyelia for patients with Chiari malformation," invited talk at the 15th Annual American Syringomyelia Alliance Project Conference, New York City, NY, July 24, 2003.
40. "The importance of hemodynamics on vascular graft failure," invited seminar at St. Jude Medical, Inc., Heat Valve Division, St. Paul, Minnesota, May 21, 2003.
41. "Engineering perspective on diseases related to CSF motion," invited seminar for Grand Rounds in the Department of Neurosurgery, University of Chicago, Chicago, IL, June 6, 2003.
42. "Transitional flow at the venous anastomosis of an arteriovenous graft," invited seminar in the Department of Mechanical Engineering, Drexel University, Philadelphia, PA, March 28, 2003.
43. "Effective hemodynamic diameter: a parameter with predictive value for patency," Fourth World Congress of Biomechanics, Calgary, Canada, August 4, 2002.
44. "Numerical simulation of cerebrospinal fluid motion within a healthy and diseased spinal canal," invited talk at the Fourth World Congress of Biomechanics, Calgary, Canada, August 4, 2002.
45. "The role of mechanical forces in the development of syringomyelia," the ASAP Annual Conference, St. Louis, MO, July 27, 2002.
46. "Experimental and numerical simulation of biological flows," invited seminar at the University of Pittsburgh Medical Center, Department of Neurosurgery, Pittsburgh, PA, July 2002.
47. "Transitional flow at the venous anastomosis of an arteriovenous graft," invited to present this subject as a keynote lecture in the Mini-symposium on "Arterial Flows: In Health and Disease" at the 14th U.S. National Congress of Theoretical and Applied Mechanics, June 23-28, 2002, Blacksburg, VA.
48. "Importance of fluid dynamics and disease," invited seminar for the TAM Seminar Series, University of Illinois at Urbana in the Department of Theoretical and Applied Mechanics, February 21, 2002.
49. "Experimental and numerical simulation of biological flows," invited seminar in the Department of Mechanical and Aerospace Engineering, West Virginia University, October 26, 2001.
50. "Translational research in vascular healing," invited talk at W.L. Gore Inc., Flagstaff, Arizona, August 2000.
51. "Importance of fluid dynamics in vascular disease," invited seminar in the Department of Pharmacology, the University of Illinois at Chicago, April 10, 1998.
52. "Importance of fluid dynamics in vascular disease," invited seminar in the Department of Neurosurgery, University of Illinois at Chicago, June 1997.
53. "Importance of fluid dynamics and vascular disease," invited seminar in the Mathematics and Computer Science Division, Argonne National Laboratory, December 1997.

54. “Fluid mechanics and vascular graft failure,” invited speaker for a Special Workshop: *Hemodynamics and bypass graft intimal hyperplasia*, ASME/AICHe/ASCE Summer Bioengineering Conference, 1997.
55. “Engineering at UIC,” invited speaker at the University of Illinois at Urbana-Champaign College of Engineering’s Workshop on Prospective Engineering Students with Disabilities, October 1996.
56. “Fluid mechanics and vascular graft failure,” invited seminar at The University of Chicago, Department of Surgery, Division of Vascular Surgery, 1995.
57. “Velocity and wall shear measurements inside a vascular graft model under steady and pulsatile flow conditions,” invited seminar at the Cardiovascular Research Center, CSIC-Hospital Saint Pau, Barcelona, Spain, March 1994.

CONFERENCE SESSIONS CHAIRED/CO-CHAIR

1. Session Chair at the 3rd CSF Hydrodynamics Symposium, Amiens, France, July 2015.
2. “Atherosclerosis,” 2015 Summer Biomechanics, Bioengineering and Biotransport Conference, Snowbird, UT.
3. Session Chair at the 2nd CSF Hydrodynamics Symposium, New York, NY, July 2013
4. “Cardiovascular Diagnostics,” ASME Summer Bioengineering Conference, Puerto Rico, June 2012.
5. “Computational Fluid Dynamics Challenge,” ASME Summer Bioengineering Conference, Puerto Rico, June 2012.
6. 1st CSF Hydrodynamics Symposium, Zurich, Switzerland, July 2011.
7. “Flow Imaging In Vivo and In Vitro,” ASME Summer Bioengineering Conference, Lake Tahoe, CA, June 2009.
8. “Imaging Modalities and Image Reconstruction in Biofluids,” Summer Bioengineering Conference, Marco Island, FL, June 2008.
9. “Arterial Disease and Thrombosis: in vitro and in vivo studies,” Summer Bioengineering Conference, Marco Island, FL, June 2008.
10. “Flow mechanics of arterial grafts,” Session BED-14C, ASME International Mechanical Engineering Congress & Exposition, Los Angeles, CA, November 2004.
11. “Hemodynamics 3 (Computational Methods)”, 14th European Society of Biomechanics Conference, 's-Hertogenbosch, The Netherlands, July 7 2004.
12. “Tapping the synergies between the Medical & Engineering Communities,” ASAP Annual Conference, SM/CM Physician/Engineer Workshop, St. Louis, MO, July 27, 2002.
13. “Cardiovascular system simulation,” Session 74, ASME Summer Bioengineering Conference, Snowbird, UT, June 2001.
14. “Arterial fluid mechanics,” Session 32, ASME Summer Bioengineering Conference, Snowbird, Utah, July 2001.
15. “Flow mechanics,” Session BIO-13C, Bioengineering Division for The 2000 International Mechanical Engineering Congress & Exposition in Orlando, FL, November 2000.
16. “Biofluid dynamics: blood flow in the aorta and vascular grafts,” Session F13-1, Third World Congress of Biomechanics, Sapporo, Japan, August 1998.
17. “Fluid dynamics of prosthetic heart valves,” Session BIO-12B, ASME Winter Annual Meeting, Chicago, IL, November 1994.
18. “General biofluid mechanics,” Session BIO-15B, ASME Winter Annual Meeting, Chicago, IL, November 1994.

WORKSHOPS ORGANIZED

“*Conquer Chiari Research Conference-Advancing Diagnosis, Management & Understanding*” Akron, OH, November, 2014, a two-day professional workshop designed to bring together the top researchers and clinicians in the field to present their work. Co-organized by Konstantin Slavin (UIC), Francis Loth (UA), and Rick Labuda (C&S Patient Education Foundation).

“*The Clinical Utility of Blood Flow Simulations*”, co-organized by Christof Karmonik and Francis Loth. ASME 2013, Summer Bioengineering Conference.

“*Conquer Chiari Research Conference*” Chicago, IL, November 8-9th, 2012, a two-day professional workshop designed to bring together the top researchers and clinicians in the field to present their work. Co-organized by Konstantin Slavin (UIC), Francis Loth (UA), and Rick Labuda (C&S Patient Education Foundation).

“*Aneurysm CFD Challenge 2012*,” co-organize by David Steinman and Francis Loth. ASME 2012 Summer Bioengineering Conference

“*1st CSF Hydrodynamics Conference*” Zurich, Switzerland, July 8-9th, 2011, a two-day professional workshop designed to bring together the top scientists who conduct research on the simulation of cerebrospinal fluid dynamics. Co-organized by Francis Loth (UA), Vartan Kurtcuoglu (ETH Zurich) and Dimos Poulikakos (ETH Zurich).

“*Conquer Chiari Research Conference, New Developments & Controversies*” Chicago, IL, November 11-12th, 2010, a two-day professional workshop designed to bring together the top researchers and clinicians in the field to present their work. Co-organized by Konstantin Slavin (UIC), Francis Loth (UA), and Rick Labuda (C&S Patient Education Foundation).

“*Chiari Malformation: State of the Research & New Directions*” Chicago, IL, November 6-7, 2008, a two-day professional workshop designed to bring together the top researchers and clinicians in the field to present their work, exchange ideas, and foster a collaborative research environment. Co-organized by Konstantin Slavin (UIC), Francis Loth (UA), and Rick Labuda (C&S Patient Education Foundation). Funded by NIH NINDS.

“*Conquer Chiari Research Symposium*”, Chicago, IL, June 2, 2007, a one-day professional workshop designed to bring together the top researchers and clinicians in the field to present their work, exchange ideas, and foster a collaborative research environment. University of Illinois - Chicago, Neurosurgery Department. Chicago, IL, Co-organized by Konstantin Slavin (UIC), Francis Loth (UIC), and Rick Labuda (C&S Patient Education Foundation).

“*Simulation in Hemodynamics*,” Chicago, IL, March 20-23, 2001, a three-day workshop with 22 speakers focusing on blood flow simulation and its relevance to arterial disease. Held and co-sponsored by Argonne National Laboratory and the University of Illinois at Chicago. Co-organized by Paul Fischer (ANL), Francis Loth (UIC), and Hisham Bassiouny (U. Chicago).

PUBLISHED WORK-Journal Papers

1. Houston JR, Allen PA, Rogers JM, Lien MC, Allen NJ, Hughes ML, Bapuraj JR, Eppelheimer MS, Loth F, Stoodley MA, Vorster SJ, Luciano MG. “Type I Chiari malformation, RBANS performance, and brain morphology: Connecting the dots on cognition and macrolevel brain structure;” **Neuroradiology**. 2019 Sep;61(9):1011-1022. doi: 10.1007/s00234-019-02206-z. Epub 2019 May 22.
2. Houston JR, Allen NJ, Eppelheimer MS, Bapuraj JR, Biswas D, Allen PA, Vorster SJ, Luciano MG, Loth F. “Evidence for sex differences in morphological abnormalities in type I Chiari malformation,” **Neuroradiol J**. 2019 Jun 18:1971400919857212. doi: 10.1177/1971400919857212. [Epub ahead of print]
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38. W. Kalata, B. A. Martin, F. Loth, J.N. Oshinski, "Differences in cerebrospinal fluid motion in Chiari malformation patients and healthy volunteers," 3rd Annual Neural Hydrodynamics Symposium (Cleveland, OH, 5/12-14, 2005) abstract.
39. P.F. Fischer, S.W. Lee, F. Loth, H. Tufo, H.S. Bassiouny, "Simulation of Turbulence in vascular Flows," The International Conference on Parallel Computational Fluid Dynamics, Washington, D.C., May 24-27, 2005
40. Y. Yazicioglu, T. J. Royston, T. Spohnholtz, B. Martin, F. Loth, H. Bassiouny, "Coupled vibration and sound radiation from a fluid-filled and submerged or embedded vascular tube with internal turbulent flow due to a constriction," 149th Meeting of the Acoustical Society of America, Vancouver, Canada, 05/16-20, 2005.
41. D. Murauski¹, J. Cellini¹, S. Lee, F. Loth, S. McCormick, "Use of Novel Co-Culture Fluid Shear Stress Model to Study Vascular Cell Morphology," Biomechanical Engineering Society, BMES 2004 Annual Fall Meeting, Philadelphia, PA, October 13-16, 2004.
42. F. Loth, P.F. Fischer, T.J. Royston, H.S. Bassiouny, "Biomechanical mechanisms in arteriovenous graft failure," Whitaker Foundation's Annual Biomedical Engineering Research Conference in La Jolla, CA, August 12 - 15, 2004.
43. Y. Yazicioglu, T. J. Royston, T. Spohnholtz, B. Martin, F. Loth, "Coupled vibration of a fluid-filled and submerged vascular tube with internal transitional/ turbulent flow due to a constriction," in Proceedings of the 148th Meeting of the Acoustical Society of America, San Diego, CA, November 2004.
44. J.K. Grogan, M. Castilla, L. Lozanski, A. Griffin, F. Loth, H.S. Bassiouny, "Frequency of critical stenosis in primary arteriovenous fistulae prior to hemodialysis access: should duplex ultrasound surveillance be the standard of care?" 58th Annual Meeting of the Society for Vascular Surgery, June 5, 2004, Anaheim, California.

45. S.W. Lee, F. Loth, P.F. Fischer, H.S. Bassiouny, J. Grogan, "Numerical simulation of pulsatile flow in an arterio-venous graft," 14th European Society of Biomechanics (ESB) conference in Hertogenbosch, Holland, July 4-7, 2004.
46. B.A. Martin, W. Kalata, J.N. Oshinski, F. Loth, "The engineering perspective: syringomyelia," ASAP Annual Conference, Key Biscayne, Florida, July 2004.
47. B.A. Martin, W. Kalata, T.J. Royston, J.N. Oshinski, F. Loth, "Experimental Study on Pressure and Hydrodynamic Flow within the Subarachnoid Space," 2nd Symposium of Neural Hydrodynamics, Menlo Park, CA, May 1, 2004.
48. P.F. Fischer, F. Loth, H.S. Bassiouny, S.E. Lee, "Simulation of Transition in Vascular Flows," International Bio-Fluid Symposium and Workshop, December 12-14, 2003, Pasadena, California, Caltech.
49. B.A. Martin, W. Kalata, J.N. Oshinski, F. Loth, "Importance of Mechanical Forces in the Development of Syringomyelia for Patients With Chiari Malformation," ASAP Annual Conference, New York City, NY, July 2003
50. T. J. Royston, Y. Yazicioglu and F. Loth, "Surface and subsurface response of a viscoelastic medium to subsurface distributed acoustic sources with application to medical diagnosis," in Proceedings of 145th Meeting of the Acoustical Society of America, Nashville, TN, April 2003.
51. S.W. Lee, V. Balasubramanian, Z.K. Baldwin, F. Loth, L.B. Schwartz., "The acceptable limits of vein graft taper," Biomedical Engineering Society 2003 Annual Fall Meeting, Nashville, USA, Oct. 2003.
52. F. Loth, M.A. Curi, K. Rajagopal, L.B. Schwartz, "The hydraulic consequences of vein graft tapering," Program Book of the 26th Annual Meeting of the Midwestern Vascular Surgical Society, Madison, WI, September 12-14, 2002.
53. W. Kalata, S.E. Lee, N. Alperin, P.F. Fischer, F. Loth, "Calculation of unsteady resistance within the spinal canal based on MRI measurements," 1st Symposium of Neural Hydrodynamics, Pittsburgh, PA, September 2002.
54. F. Loth, W. Kalata, T. Lichtor, N.J. Alperin "The potential of computer simulations to help in the diagnosis and treatment of syringomyelia" ASAP Annual Conference, SM/CM Physician/Engineer Workshop, St. Louis, MO, July 27, 2002.
55. Y. Yazicioglu, T.J. Royston, F. Loth, "Surface response of a viscoelastic medium to subsurface acoustic sources with application to medical diagnosis," Proceedings of 143rd Meeting of the Acoustical Society of America, Pittsburgh, PA, June 3-7, 2002.
56. F. Loth, T. J. Royston, P. F. Fischer and H. S. Bassiouny, "Transitional flow at the venous anastomosis of an arteriovenous graft," 14 U. S. National Congress of Theoretical and Applied Mechanics, Blacksburg, VA, June, 2002.
57. F. Loth, P.F. Fischer, "Numerical simulation of biological flows," SIAM 50th Anniversary and 2002 Annual Meeting, Philadelphia, PA, July 8-12, 2002.
58. T. Lichtor, M. Foroohar, K. Kulkarni, F. Loth, N.J. Alperin, "Application of noninvasive MRI phase-contrast flow studies in patients with Chiari I malformations," Neurosurgery Conference 2001, Vol. 49, pp. 523.
59. Y. Yazicioglu, T. J. Royston and F. Loth, "Response on the surface of a viscoelastic medium due to subsurface acoustic sources with application to vascular medical diagnosis," in Proceedings of 141st Meeting of the Acoustical Society of America, Chicago, IL, June 2001.
60. N. Alperin, Y. Kadkhodayan, F. Loth, R. Yedavalli, "MRI measurements of intracranial volume change: A phantom study," Proceedings of Society of Magnetic Resonance in Medicine, Vol. 9, pp. 1981, Glasgow, Scotland, UK, May 2001.

61. N. Alperin, S.B. Lee, B.P. Raksin, F. Loth, K. Ericson, B. Nordell, J. Hennerz, F. Charbel, "Noninvasive ICP measurements using magnetic resonance imaging," Eleventh International Symposium on Intracranial Pressure and Brain Monitoring, ICP2000, p37, 2000.
62. N. Alperin, S. Lee, F. Loth, B. Roitberg, T. Lichtor, F. Charbel, "MRI based noninvasive method for measurements of intracranial compliance and pressure," 2001 American Association of Neurological Surgeons, Toronto, Canada, April 2001.
63. F. Loth, "Hemodynamic investigation by experimental and computational methods" ANL/UIC/UC Workshop entitled "Simulation in Hemodynamics," Chicago, IL, March 20-23, 2001.
64. N. Alperin, F. Loth, F. Charbel, B. Roitberg, "MR-ICP: Automated method for measurements of intracranial pressure (ICP) from MRI of transcranial blood and CSF flow," *Acta Radiologica Supplementum* Vol. 41: Suppl. 422:19, 2000.
65. M. Zhao, F.T. Charbel, F. Loth, N. Alperin, "Improving quantification of blood flow in intracranial vessels with 3D localization and vessel contouring algorithm", International Workshop on Magnetic Resonance Angiography, Park City, Utah, Sept. 1998.
66. F.T. Charbel, M. Zhao, M.E. Clark, F. Loth, N. Alperin, L. Sadler, X. Du, "Choices therapy using a circulation model and phase contrast MR," Presented in the 11th EANS, Copenhagen, Sept. 1999.
67. F.T. Charbel, M. Zhao, M.E. Clark, F. Loth, N. Alperin, L. Sadler, X. Du, "The use of the peripheral gating cine phase contrast MR in the management of the subclavian steal syndrome," Presented in the 11th EANS, Copenhagen, Sept. 1999.
68. S.L. Meyerson, U.M. Shakur, C.L. Skelly, A.J. Farmer, F. Loth, L.B. Schwartz, "Linearity and accuracy of longitudinal impedance and effective hemodynamic diameter measurements of vascular bypass grafts," Chicago 2000 World Congress on Medical Physics and Biomedical Engineering, WE-FXH-73, Chicago, IL, July 2000.
69. C.L. Skelly, S.L. Meyerson, F. Loth, U.M. Shakur, J.F. McKinsey, L.B. Schwartz, "Calculation of pulsatile shear stress in human vein grafts using the method of Womersley," Chicago 2000 World Congress on Medical Physics and Biomedical Engineering, MO-CXH-54, Chicago, IL, July 2000.
70. C.L. Skelly, S.L. Meyerson, F. Loth, U.M. Shakur, J.F. McKinsey, L.B. Schwartz, "The relationship between mean shear stress, shear variation and outflow resistance and its implications for patency in infrainguinal vein grafts," Society for Vascular Surgery 54th Annual Meeting, Toronto, Ontario, Canada, June 2000.
71. S.L. Meyerson, J. Moawad, F. Loth, J.F. McKinsey, H.S. Bassiouny, B.L. Gewertz, L.B. Schwartz, "Significance of the effective hemodynamic diameter of infrainguinal bypass grafts," *Midwestern Vascular Surgical Society 23rd Annual Meeting*. Chicago, IL, Sept. 1999.
72. N. Alperin, F. Loth, W. Betz., T. Lichtor, "Method for non-invasive measurements of ICP," *Second Congress of Int. Soc. for Neurosurgical Instrument Inventors*. ISNTII pp. 38, Las Vegas, Nevada, May 1999.
73. N. Alperin, F. Loth, C. Stelzig, S. Lee, F. Charbel, T. Lichtor, "Determination of intracranial pressure from MRI measurements of blood and CSF volumetric flow rates," *Proceedings of 16th annual meeting European Soc. for Mag. Reson.in Med. and Biology*, *MAGMA*, Vol. 8, Suppl. 1, p89, 1999.
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75. N. Alperin, B. Chuan, F. Charbe, F. Loth, "Characterization of CSF dynamics in Syringomyelia associated with Chiari malformation," *Radiology* 213(P): 145, 1999.
76. F. Charbel, M. Zhao, M.E. Clark, F. Loth, X. Du, J.I. Ausman, "The role of Cine phase contrast MR and computerized modeling in the diagnosis and choices of therapy for complex cerebrovascular disorders." *Program Book of the Joint Meeting of the Section on Cerebrovascular Surgery of The American Association of Neurological Surgeons and Congress of Neurological Surgeons and American Society of Interventional and Therapeutic Neuroradiology*, pp. 143, January 1999.

77. R. Yedavalli, K. Guppy, F. Loth, M. Zhao, N. Alperin, F.T. Charbel: "Wall shear stress in the cerebral vasculature." Program Book of the Joint Meeting of the Section on Cerebrovascular Surgery of The American Association of Neurological Surgeons and Congress of Neurological Surgeons and American Society of Interventional and Therapeutic Neuroradiology, pp. 112, Jan. 1999.
78. N. Arslan, F. Loth, "AniIn vitro study to characterize the hemodynamic environment within an arterio-venous graft," World Congress of Biomechanics, Sopora, Japan, pp.18, August 1998.
79. F. Loth, K. Kang, "Numerical simulation of steady flow inside a vascular graft and comparison with experimental measurements," 17th Southern Biomedical Engineering Conference, San Antonio, TX, February 1998.
80. N. Arslan, F. Loth, H. S. Bassiouny, "Quantification of turbulence inside a human arterio-venous graft under steady flow conditions," 17th Southern Biomedical Engineering Conference, San Antonio, TX, February 1998.
81. D.P. Giddens, F. Loth, S.A. Jones, M. Lei, "Fluid dynamics in vascular grafts," 13th U.S. National Congress of Applied Mechanics, Gainesville, FL, June 1998.
82. F. Loth, S.A. Jones, D.P. Giddens, C.K. Zarins, H.S. Bassiouny, S. Glagov, "Fluid mechanics and vascular graft failure," special Workshop: *Hemodynamics and Bypass Graft Intimal Hyperplasia* at the 1997 ASME/AIChE/ASCE Summer Bioengineering Conference, June 1997.
83. H.S. Bassiouny, F. Loth, C.K. Zarins, S.A. Jones, D.P. Giddens, S. Glagov, "Shear stress modulates anastomotic intimal hyperplasia," The Society for Vascular Surgery/North American Chapter, International Society for Cardiovascular Surgery, 1995.
84. F. Loth, S.A. Jones, D.P. Giddens, C.K. Zarins, H.S. Bassiouny, S. Glagov, "Velocity measurements in a vascular graft model," 1994 Amsterdam, The Netherlands, 2nd World Congress of Biomechanics Abstracts, Edited by L. Blankevoort, J.G.M. Kooloos, pp. 251A, 1994.
85. D.P. Giddens, F. Loth, S.A. Jones, C.K. Zarins, H.S. Bassiouny, S. Glagov, "Fluid dynamics of end-to-side vascular grafts," 1994 Amsterdam, The Netherlands, 2nd World Congress of Biomechanics Abstracts, Edited by L. Blankevoort, J.G.M. Kooloos, pp. 167A, 1994.
86. S.A. Jones, D.P. Giddens, F. Loth, F. Kajiya, I. Morita, O. Hiramatsu, Y. Ogasawara, K. Tsujioka, C.K. Zarins, "In-vivo measurements of blood flow velocity profiles in canine ilio-femoral anastomotic bypass grafts," 1994 Amsterdam, The Netherlands, 2nd World Congress of Biomechanics Abstracts, Edited by L. Blankevoort, J.G.M. Kooloos, pp. 167B, 1994.
87. V. Deplano, R. Rieu, F. Loth, P. Bossuet, F. Cassot, "Etudes numérique et expérimentale de l'hémodynamique vasculaire," presented at the IV^{ème} Colloque "De la Recherche à la Découverte" Section 22 du Comité National du CNRS: Thérapeutique et Médicaments: Concepts et Moyens, Strasbourg, France, 1993.
88. F. Loth, S.A. Jones, D.P. Giddens, C.K. Zarins, H.S. Bassiouny, S. Glagov, "Measurement of velocity and wall shear in a vascular graft model and the relationship to intimal thickening in a canine model," presented at the Association for the Advancement of Medical Instrumentation Cardiovascular Science and Technology Conference, Bethesda, MD, 1992.
89. F. Loth, H.S. Bassiouny, S.A. Jones, D.P. Giddens, S. Glagov, C.K. Zarins, "Velocity and wall shear measurements in an end-to-side vascular anastomosis model," presented at the NATO Advanced Study Institute on "Frontiers in Cardiovascular Engineering," Malaga, Spain, 1991.
90. H.S. Bassiouny, F. Loth, D.P. Giddens, S.A. Jones, S. Glagov, C.K. Zarins, "Measurement of wall shear in an end-to-side vascular anastomosis model: correlation with experimental intimal thickening," presented at The Cardiovascular Science and Technology Conference, Bethesda, MD, 1991.

PUBLISHED WORK (Misc.)

Luciano MG, Martin BA, Allen P, Loth F (2015), "The squeeze of Chiari malformation, clinicians and scientists collaborate to understand its cause and effects." Pediatric Neuroscience Pathways.

F. Loth, "Investigation of pressure gradient between the cranium and the spinal canal in Chiari malformation: the effect of decompression surgery," Progress report submitted to The Ed and Gayle Labuda Charitable Fund of the Vanguard Charitable Endowment Program, May 2nd, 2001.

N.E. Piersol, E.P. Ghengeaua, S.E. Lee, N. Alperin, P.F. Fischer, F. Loth, "Carotid bifurcation hemodynamics," Start-CD Dynamics, The Newsletter of the CD adapco Group, Issue 15, pp. 7-8, Summer 2001.

F. Loth, "Velocity and wall shear stress measurements inside a vascular graft model under steady and pulsatile flow conditions," Georgia Institute of Technology, Ph.D. Dissertation, March 1993.

F. Loth, "Reynolds stress measurement downstream of an annular turbine cascade," von Karman Institute for Fluid Dynamics, Research Project, VKI-DP-25-1987, June 1987.

Two articles that describes the collaborative work of Fischer, Loth, and Bassiouny:

Scott Jenkins, "Diseased blood vessel simulations provide valuable tool for doctors," Argonne National Laboratory LOGOS, Vol. 20, No. 2, pp. 11-13, Summer 2002.

Stroke Busters in Turbulent Flow, Pittsburgh Super Computing Center, 2002.

http://www.psc.edu/science/2002/tufo/stroke_busters_in_turbulent_blood.html

PATENTS AND INVENTION DISCLOSURES

D. Biswas, F. Loth, S. Thyagaraj, "Device and Method for Modulation of Intracranial and spinal canal Pressure," Invention Disclosure filed April 2011.

F. Loth, B. Martin, "Device and Method for Measurement of Tension and Elastic Properties of the Sprinal Cord and Filum Terminal," Invention Disclosure, MDCC project # 030018, 2009.

D. Biswas, F. Loth, S. Thyagaraj, "A new design of prosthetic venous valve," Invention Disclosure, UA 825, 2010.

T.J. Royston, Spohnholtz, F. Loth, Y. Yazicioglu, B.A. Martin, "A multimode sonic & ultrasonic diagnostic imaging method," Invention Disclosure filed March 2004.

T.J. Royston, Spohnholtz, F. Loth, B.A. Martin, "New acoustic skin-contact hydrophone sensor array pad for medical diagnosis and monitoring", Invention Disclosure filed March 2004.

F. Loth, T.J. Royston, H.S. Bassiouny, "Para-Anastomotic Venous Cuff for Reduction of Vein Wall Vibration", Invention disclosure filed through UIC October 1999.

F. Charbel, M.E. Clark, L. Sadler, N. Alperin, M.E. Clark, F. Loth, M. Zhao, "Circulation Model and Applications," Patent #EP1222627, 1998.

J.L. Loth, E. Loth, F. Loth, "Isolated combustion and dilution expansion (ICADE) piston engine," Patent #5239959, filed June 22, 1992, received July 31, 1993.

STUDENT THESES

1. N. Arslan, "Experimental characterization of transitional unsteady flow inside a graft-to-vein junction," PhD Dissertation in M.E., University of Illinois at Chicago, 1999.
2. K. Kang, "Computational analysis of blood flow inside an end-to-side vascular graft model under steady flow conditions," MS Thesis in M.E., University of Illinois at Chicago, 2000.
3. N.E. Piersol, "Numerical simulation of carotid bifurcation hemodynamics," MS Thesis in M.E., University of Illinois at Chicago, Summer 2001.
4. E.P. Ghengeaua, "Velocity measurements inside of a healthy carotid bifurcation model," MS Thesis in M.E., University of Illinois at Chicago, Fall 2001.
5. Seung Eun Lee, "Solution method for transitional flow in a vascular bifurcation based on in vivo medical images," MS Thesis in M.E., University of Illinois at Chicago, Fall 2002.
6. Wojciech Kalata, "Numerical simulation of cerebrospinal fluid motion within a healthy and Chiari malformed spinal canal," MS Thesis in M.E., University of Illinois at Chicago, Fall 2002.

7. Ramana Yedavalli, "Carotid Artery Bifurcation Hemodynamics: Magnetic resonance imaging of a realistic *in vitro* flow model," MS Thesis in M.E., University of Illinois at Chicago, Summer 2003.
8. Yoke Kong Kuan, "Radial basis functions for blood vessel lumen reconstruction from medical images," MS Thesis in M.E., University of Illinois at Chicago, Summer 2004.
9. Bryn Martin, "An Experimental Investigation of the Hydrodynamic and Biomechanical Environment Present in Syringomyelia," MS Thesis in M.E., University of Illinois at Chicago, Spring 2005
10. Sang-Wook Lee, "Importance Of Hemodynamics On An Arteriovenous Graft Failure: A Numerical Study," Ph.D. Thesis in M.E., University of Illinois at Chicago, Summer 2005,
11. David Smith, "Experimental Investigation of Transition to Turbulence in Arteriovenous Grafts," PhD Thesis in M.E., University of Illinois at Chicago, Summer 2008
12. Bryn Martin, "An Experimental Investigation of the Hydrodynamic and Biomechanical Environment Present in Syringomyelia," PhD Thesis in M.E., University of Illinois at Chicago, Fall 2008
13. Nicholas Shaffer, "A Study of Impedance to Cerebrospinal Fluid Flow in Type I Chiari Malformation," M.S. in Biomedical Engineering, The University of Akron, Spring 2011.
14. Wojciech Kalata, "Effects of Chiari Malformation on Cerebrospinal Fluid Dynamics within the Spinal Canal," PhD Thesis in M.E., University of Illinois at Chicago, Spring 2012.
15. Nicholas Shaffer, "Magnetic resonance image-based hydrodynamic analysis of cerebrospinal fluid motion in Type I Chiari malformation," Ph.D. in Biomedical Engineering, The University of Akron, Spring 2011.
16. Dipankar Biswas, "Transition to turbulence in non-Newtonian fluids : an in-vitro study using pulsed Doppler ultrasound for biological flows / Dipankar," PhD Thesis in M.E., Fall 2014.
17. Ganesh Swaminathan, "Evaluation Of Adult Stem Cell Derived Smooth Muscle Cells For Elastic Matrix Regenerative Repair ," PhD Thesis in Integrated Bioscience, Fall 2014, Loth served only as academic advisor.
18. Suraj Thyagaraj, "In Vitro Investigation Of Cerebrospinal Fluid Dynamics In Chiari Malformation By 4D Phase Contrast MRI ," PhD Thesis in M.E., Fall 2015
19. Seyyed Amirreza Hashemi, "Transition To Turbulent Flow In Finite Length Curved Pipe Using Nek5000," MS Thesis in M.E., Fall 2015
20. David Casey "Characterization of transition to turbulence for blood in an eccentric stenosis under steady flow conditions," MS Thesis in M.E., Fall 2015
21. Soroush Heidari Pahlavian, "Non-Invasive Assessment of Cerebrospinal Fluid and Brain Tissue Biomechanics Using MRI and Computational Modeling," PhD Thesis in M.E., Spring 2018

PHD STUDENTS

1. Nurullah Arslan, PhD, 1999, *Fatih University, Istanbul, Turkey, Industrial Engineering Department, Professor and Graduate Dean of Sciences and Engineering.*
2. Sang-Wook Lee, PhD, Summer 2005, *School of Mechanical and Automotive Engineering, University of Ulsan, South Korea, Associate Professor.*
3. David Smith, PhD, Spring 2008, *College of DuPage, Glen Ellyn, IL, Professor, Engineering.*
4. Bryn Martin, PhD, Fall 2008, *Assistant Professor at University of Idaho, Moscow, ID.*
5. Wojciech Kalata, Spring 2012, *Spray Analysis & Research Services, Wheaton, IL, Engineer.*
6. Nick Shaffer, PhD, Fall 2014, *Research Engineer at the Invacare Corporation, Akron, OH*
7. Dipankar Biswas, PhD, Fall 2014, *Assistant Professor of Research at the UA, Akron, OH*
8. Ganesh Swaminathan, PhD, Fall 2014, *Post Doctoral Fellow at Rice University, Dallas, TX*
9. Suraj Thyagaraj, PhD, Fall 2016, *Post Doctoral Fellow at Case Western University, Cleveland, OH.*
10. Soroush Heidari Pahlavian, Spring 2018, *Post Doctoral Fellow at USC, Los Angeles, CA.*
11. Paul Bishop, PhD., *expected completion date: Spring 2019*
12. Maggie Eppelheimer, *expected completion date: Fall 2019*
13. Blaise Simplicite Talla Nwotchouang, *expected completion date: Fall 2019*

MS STUDENTS

1. Kai Kang, MS, 2000, *Parsons Brinckerhoff, New York, NY, Research Engineer*
2. Nicole E. Piersol, MS, Summer 2001, *CD adapco, Plymouth, MI, Technical Support Engineer*
3. Emil Ghengeaua, MS Fall 2001, *New Trier High School, Winnetka, IL, Technical Support*
4. Seung E. Lee, MS Fall 2002, *Dept. of ME, MIT, Boston, MA, Ph.D. Student*
5. Wojciech Kalata, MS Fall 2002, *Spray Analysis & Research Services, Wheaton, IL, Engineer.*
6. Ramana Yedavalli, MS Summer 2003, *Radiologist, St. Mary Medical Center, Hobart, IN*
7. Yoke Kong Kuan, MS Summer 2004, *PhD student at Singapore University of Technology and Design (SUTD)*
8. Bryn Martin, MS Spring 2005, *Associate Professor at University of Idaho, Moscow, ID.*
9. Nick Shaffer, MS Spring 2010, *Research Engineer at the Invacare Corporation*
10. David Casey, MS, Fall 2014, *Timken, Canton, OH*
11. Sean Davis, MS, Fall 2014, *Ridgid, Elyria, OH*
12. Seyyed Amirreza Hashemi, MS, Fall 2015, *Ph.D Student at University of Pittsburgh.*
13. Alaaddin Ibrahimy, MS, *expected Summer 2019*

BS INDEPENDENT STUDY PROJECTS

UA Undergraduate Research: Kevin Seng, Kenneth Smith, Kevin Razavet, Natalie Allen, Audry Braun, Ian Kay, Robert Kenyon, Michael Majcher, Venessa Traviso,

UIC Undergraduate Research (ME396): Jennifer Kufa, Spring 2007, Justin Stevens, Fall 2006 and Spring 2007, Hardik Shah, Spring 2006, Mike Remke, Fall 2005, Piotr Stolarczyk, Summer 2005, Samantha Steinberg, Fall 2004, Edith K. Gómez, Spring/Fall 2004, Anastasios “Tom” Kotsakos, Fall 2003/Spring 2004, Rex Villasin, summer 2004, Richard Paulsen, Fall 2002/Spring 2003, Bryn Martin, Spring/Fall 2002, Ionut Ghengeaua, Fall 2001, Maciej Fudala, 2000, Grzegorz Nowobilski, 2000, Rafal Myslak, 1999-2000, Gil Magana, 2000, George Lara, 2000, Joel Vega, 1999, Dennis Montgomery, 1998, Brenda Teaster, 1998, Brian Bullock, 1997, Jay Auskainis, 1997, Gita Bhagat 1996

Internship (UG students from France): Steven Cespedes Summer 2004, Sebastien Nicolaon Summer 2004, Cedric Montarou, Summer 1997

Independent Research (not for credit): David G. Ingram, 2003

Internship (High School Students): Shefali Mathur, IMSA Student 1999-2000, Ji Yoon Kim (Jenny)

POST DOCTORAL FELLOWS

1. Bryn Martin, PhD, 2008-2009, *Associate Professor at University of Idaho, Moscow, ID.*
2. Dipankar Biswas, PhD, 2014-2018, *Post-Doctoral Fellow at Florida International University*
3. James Houston, PhD, 2015-2018, *Assistant Professor at Middle Tennessee State University, Murfreesboro, TN.*

STUDENT FELLOWSHIPS/AWARDS

Sang-Wook Lee, UIC Graduate College Fellowship, 2004-2005
 Wojciech Kalata, Brig. General Casimir Pulaski Scholarship for Advanced Studies, 2003
 Seung Lee, UIC Graduate College Fellowship, 2001-2002
 Seung Lee, DOE Computational Science Graduate Fellowship, 2001-2004
 Seung Lee, DOE Argonne National Laboratory Undergraduate Fellowship, 1999-2001
 Wojciech Kalata, DOE Argonne National Laboratory MS Fellowship, Summer 2000
 Nicole Piersol, DOE Argonne National Laboratory MS Fellowship, Summer 1999
 Soroush Heidari Pahlavian, 3rd Place for PhD Paper at the 2017 Summer Biomechanics, Bioengineering, and Biotransport Conference.
 Nicholas Shaffer, 1st Place for PhD Paper award at the ASME 2013 Summer Bioengineering Conference.

PUBLICITY AND MEDIA COVERAGE

Conquer Chiari Research Center Open House, July 2018. This event consisted of 13 podium presentations, 31 posters, breakfast and lunch for >200 people from across the US (18 different states were represented). In addition, two research experiments were conducted during the Open House. The CCRC team of volunteers, students, and professors included 34 people. We also had a computer game based on Chiari image processing and 3D printed models of the brain.

National Public Radio Interview about the UA Conquer Chiari Research Center, WKSU, Exploradio, “Engineering a Chiari breakthrough,” (Jeff St. Clair, Kent, OH, 3/4, 2013, <http://bit.ly/16Jdlut>), re-aired several times in 2014.

Conquer Chiari Research Center Open House, May 2013. This event consisted of 5 podium presentations, 11 posters, breakfast and lunch for >100 people from across the US. In addition, one research experiment was conducted during the Open House that led to journal paper on cognitive effects of Chiari malformation.

Akron Beacon Journal, front page above the fold about the UA Conquer Chiari Research Center “UA tackles brain disorder,” (Cheryl Powell, Akron, OH, 6/25, 2012, <http://bit.ly/ZTdjiv>).

University of Akron Online Newsroom, “When does a headache need an engineer to fix it?,” (6/24, 2012, <http://bit.ly/ZKeJxl>).

Scicasts, “University receives funding for research center to treat patients with Chiari malformation,” (6/27, 2012, <http://bit.ly/OvrlpE>).

Chiari and Syringomyelia Foundation, New Researchers Feature, “The influence of coughing on cerebrospinal fluid pressure in an in vitro syringomyelia model with spinal subarachnoid space stenosis,” (6/1, 2009, <http://bit.ly/13buPpY>).

A video entitled “Stroke: Plaque Fracture in the Carotid Artery” was included as the multimedia portion of a New York Times article by Gina Kolata “Lost Chances for Survival, Before and After Stroke” 5/27/2007 (<http://www.nytimes.com/2007/05/28/health/28stroke.html>)

Interviewed by Rick Labuda, the Editor for Chiari & Syringomyelia News. “In The Spotlight” Transcript available at www.chiari-syringo-news.com, Volume 1, Number 2, 9/2003

UNIVERSITY SERVICE

- UA Chair for BME Full Professor RTP Committee, 2019
- UA Chair/Member of ME Faculty Search Committee, 2018
- UA Graduate Committee for Program Review 2017
- UA ME RTP Committee Chair for Full Professors, 2016
- UA Chair for BME Full Professor RTP Committee, 2015
- UA Dean Review Committee 2014
- UA Student Advisor for Akron Cricket Club 2011-2017
- UA Student Advisor for *Akronauts* - Rocket Design Team 2014-present
- UA Student Advisor for The Integrated Bioscience Association 2013-present
- UA ME RTP Committee Chair for Associate Professors, 2012
- UA Representative of Faculty Senate to the Graduate Council, 2012-2015
- UA Search Committee for Assistant Provost for Online Learning, 2013
- UA Ad Hoc Online Committee, 2012-2013
- UA Faculty Senate Committee, 2011-2014
- UA Created the University of Akron Bioengineering Research Forum (UABRF), 2010
- UA Search Committee for Assistant Professor position in Biomedical Engineering Dept., 2010
- UA ME Chair of the ME Strategic Plan Committee, 2009
- UA Search Committee for Margaret F. Donovan Endowed Chair Position, 2009
- UA Search Committee for Robert Iredell Chair Endowed Chair Position, 2009
- UIC Director of Undergraduate Studies: 2002-2006
- UIC MIE Undergraduate Committee Chair, 2002-2006
- UIC MIE Undergraduate Student Advisory Board Chair, 2003-2006
- UIC Education Policy Committee, ME Department representative: 2002-2006
- UIC Elected Member of MIE Department Advisory Committee: 2001-2003, 2005-2008
- UIC Student Appeals Board: 1998-2001
- UIC Faculty advisor for Pi Tau Sigma (National Honor Society for Mechanical Engineers), 2001
- UIC Faculty advisor for ASME (American Society of Mechanical Engineers), 2002-2006
- UIC Task Force to examine possibility of creating a new Bioengineering Department, 1997