



Hand Research Laboratory

Zong-Ming Li, PhD



From left to right: Ugbolue, Dun, Goitz, Davis, Espiritu, Li, Brininger, Kuxhaus, Christophel, Baker, Gustafson

Change is constant! Despite the many changes in our laboratory, our group research focus and enthusiasm remain the same. Under the direction of Zong-Ming Li, PhD, our team employs a multidisciplinary approach to the main subject of study, carpal tunnel syndrome, as well as other basic and clinical subjects related to the hand.

We are very happy to have several multidisciplinary talented additions to our Hand Lab. Robert A. Kaufmann, MD, joins us as an attending hand surgeon after finishing his residency at Temple University and a hand fellowship at Thomas Jefferson University in Philadelphia. He is keenly interested in our laboratory research in addition to his busy clinical work. Michael Espiritu, MD, is our Orthopaedics Surgery research resident for one year. Michael brings his clinical knowledge to our laboratory through his daily interaction with our group members, and demonstrated his versatility with studies ranging from biology to biomechanics. Laurel Kuxhaus, MS, joined us as a doctoral student after earning her Master's degree in Mechanical Engineering from Cornell University. Laurel comes to us with a scholarship from the National Science Foundation, as well as a love of oboe playing. Gregg Davis, MS, joined us most recently with a Master's Degree in Mechanical Engineering from Penn State. He is a research fellow interested in applying our robot and motion analysis system to hand biomechanics research. Erica Xin Guo, BS, a visitor to Musculoskeletal Research Center from her home as a graduate student at Sichuan University in China, worked closely with us for three months on carpal tunnel biomechanics.

The core nucleus of people in our Hand Lab remains robust including our leader, Zong-Ming Li, PhD, Laboratory Director

and Assistant Professor in the Departments of Orthopaedic Surgery, Bioengineering, and Occupational Therapy. On the clinical side, Robert J. Goitz, MD, the Chief of the Division of Hand and Upper Extremity Surgery continues to provide important clinical guidance to our group. Also returning are Nancy A. Baker, ScD, OTR/L, and Norm Gustafson, CHT, both faculty in Occupational Therapy who lend a rehabilitation perspective to our projects. Shouchen Dun, MS, a research fellow originally from Case Western Reserve University with a background in Electrical and Biomedical Engineering, continues his research in finger coordination and motor control as well as develops our robot technology. Chris Ugbolue, after finishing his PhD requirements in bioengineering from the University of Strathclyde, Scotland, has been working with us on repetitive strain injuries using biomechanical and imaging techniques. For clinical research involving individuals with carpal tunnel syndrome, Wendy Gwilliam provides us tremendous help with recruitment. Daniel A. Harkness, BS, while pursuing his new career related to electrical engineering and instrumentation (best wishes to Danny!), continues to assist us on the thumb motor function project. Teresa Brininger, MS, a graduate student in Occupational Therapy, focuses her research on clinical studies of improving carpal tunnel syndrome with various conservative treatments. Thomas Christophel, a Bioengineering undergraduate student has been busy learning and helping set up our new equipment.

Thanks to the generous support of our department, we have acquired new technological tools to enhance our research. A desktop low-payload robot is in place for biomechanical studies of the hand and fingers. A 6-camera VICON motion tracking system is also installed and in use. These recent additions enable us to perform cutting-edge bioengineering studies of the hand and, in particular, carpal tunnel syndrome. While working on our funded research projects from the Whitaker Foundation, the Aircast Foundation, and Albert B. Ferguson, MD, Orthopaedic Fund, we submitted two new NIH grant proposals on carpal tunnel syndrome last year. We believe our research effort will increase the understanding of the underlying mechanisms of carpal tunnel syndrome and further new strategies for its prevention, diagnosis, evaluation, and treatment.

The changes in the Hand Research Laboratory have been positive ones. With our motivated personnel and state of the art facilities, we are heading for another fun and productive year.

Hand Research Laboratory Personnel:

Nancy Baker, ScD, OTR/L	Faculty in Occupational Therapy
Teresa Brininger, OTR/L, CHT	Graduate Student
Thomas Christophel	Undergraduate Student
Gregg Davis, MS	Research Fellow
Shouchen Dun, MS	Research Fellow
Michael Espiritu, MD	Orthopaedic Resident
Robert Goitz, MD	Faculty in Orthopaedic Surgery
Norm Gustafson, OTR/L, CHT	Faculty in Occupational Therapy
Wendy Gwilliam	Clinical Coordinator
Robert A. Kaufmann, MD	Faculty in Orthopaedic Surgery
Laurel Kuxhaus, MS	Graduate Student in Bioengineering
Zong-Ming Li, PhD	Director
Chris Ugbolue	Research Fellow