PhD in Rehabilitation and Participation Science

Enhancing health, improving quality of life, and increasing participation
Most occupational scientists begin their careers asking the many unanswered questions related to occupational therapy, rehabilitation and participation. They have an interest in generating knowledge to improve rehabilitation practices and thus people's lives through participation. Our Rehabilitation and Participation Science (RAPS) PhD program began in 2011 to develop rehabilitation scientists whose research questions are chosen based explicitly on their potential to generate fundamental knowledge that will support recovery, enhance health, improve quality of life, and reduce illness and disability. The program draws from rehabilitation science, occupational science, environmental science, neuroscience and other behavioral disciplines.

In addition to meeting basic admissions requirements, there must be a fit between your research interests and one or more RAPS PhD faculty members who are willing to mentor you. The Program in Occupational Therapy has several scientists on faculty (pages 6-17) with research interests that range from chronic diseases, evidence-based care, interventions, cognitive rehabilitation, health promotion, decreasing secondary conditions, and improving physical fitness for people with disabilities. In addition, other mentors (pages 18-19) at Washington University who are dedicated to the development of rehabilitation science and willing to serve as mentors. Your mentor will assist you in forming a Research Advisory Committee and will play a primary role in the selection of courses, supervision of research, independent study and preparation of your dissertation.

Washington University is a comprehensive research doctoral university, and the School of Medicine is highly ranked in regard to National Institutes of Health (NIH) funding and leads research, globally, in a wide range of frontier research arenas across all of its basic science and clinical departments. As noted leaders in education, research and patient care, our faculty have contributed many discoveries and innovations to science and medicine since the school’s founding in 1891. As a RAPS PhD student, you will be surrounded and supported by this outstanding community as you pursue your career as a rehabilitation scientist.

I encourage you to explore the information in this booklet, research the work of our mentors and continue to ask the questions that generate knowledge to understand and inform rehabilitation interventions.

M. Carolyn Baum, PhD, OTR, FAOTA
Elias Michael Executive Director, Program in Occupational Therapy
Professor of Occupational Therapy, Neurology and Social Work
Advanced training for rehabilitation scientists

The Rehabilitation and Participation Science (RAPS) PhD program aims to develop rehabilitation scientists whose research questions are chosen based explicitly on their potential to generate fundamental knowledge that will enhance health, improve quality of life, and reduce illness and disability.

Our doctoral training model is based on that of mentored research, wherein students devote the majority of their time to research activities beginning in the first semester and becoming increasingly independent. Students may choose to study with one of the Program in Occupational Therapy’s scientists (pages 6-17) or other mentors (pages 18-19) at Washington University who are dedicated to the development of rehabilitation science.

A full-time, 12-month commitment to graduate education is expected of all students enrolled in the RAPS PhD program. A tuition stipend and fellowship is provided for four years to accomplish the degree, and an opportunity exists for teaching assistantships.

Graduates of the RAPS PhD program will be prepared for a career as an academic research scientist at a research university, research institute or industry setting.

Students must complete core courses, electives to support their area of study, research in their mentor’s laboratory and a dissertation. Prior graduate courses that explicitly meet the program requirements may be considered (syllabus must be submitted for review and approval of the RAPS PhD Chair).

All RAPS PhD students join faculty in a bi-weekly seminar where rehabilitation research is presented and discussed. Visiting professors are invited to spend time with faculty and students.

Definitions

**Occupation:** The everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupation includes things people need to, want to and are expected to do.

**Rehabilitation Science:** The field of study that encompasses basic and applied aspects of the health sciences, social sciences and engineering to restore functional capacity in a person and improve their interactions with the surrounding environment, and understands the knowledge that supports the enabling-disabling process.

**Participation:** The International Classification of Health, Disease and Disability defines participation as the involvement of people in all areas of life and describes the restrictions they experience as a member of society. Participation requires being part of an activity, context, or social group while having control, choice, and access to opportunities. It has a transactional component requiring the person to manage personal- and environmental-level factors that influence participation.

**Rehabilitation and Participation Science:** The field of study that encompasses basic and applied aspects of the biomedical, occupational, social and environmental sciences to restore functional capacity in a person, improve their interactions with their environments, and foster their capacity to engage in their family, school, work and community life.
Founded in 1853, Washington University is nationally and internationally renowned for teaching, learning, research, service to society, and patient care. The University is composed of seven different schools: Arts and Sciences, Art and Architecture, Business, Engineering and Applied Sciences, Law, Medicine, and Social Work. The university’s mission is to discover and disseminate knowledge, and protect the freedom of inquiry through research, teaching, and learning. Washington University creates an environment to encourage and support an ethos of wide-ranging exploration. Washington University’s faculty and staff strive to enhance the lives and livelihoods of students and the people of the greater St. Louis community, the country and the world.

Washington University’s graduate and undergraduate schools are highly ranked, and the research profile of the institution is among the best in the nation. The School of Medicine is one of the largest recipients of funding for research and training from the National Institutes of Health, with the majority of the funds awarded for research in cancer, diabetes, cardiovascular disease, infectious disease and genomics; during the 2015 fiscal year, grants and contracts totaling more than $531 million supported faculty research efforts at the School of Medicine.

The student body is competitive with the very finest universities in the country, and the academic departments are increasingly distinguished. Today the university has approximately 7,300 undergraduate students, 6,800 graduate students, 3,300 faculty, and 13,000 employees. The medical school and health science student population includes more than 1,300 students. Two thousand of the university faculty are with the School of Medicine, as are 7,000 members of the staff.

As the 14th chancellor of Washington University, Mark S. Wrighton has served since 1995 and has continued to strengthen the university’s impact and reputation. The physical facilities at both the Danforth and Medical campuses have been transformed; 30 new buildings and important new programs in areas such as biomedical engineering, American culture studies, energy and environment, and public health have been established. The finances of the university, fueled by excellent fundraising and careful stewardship, make it a national first-tier competitor. The endowment has grown to $6.9 billion.

Washington University School of Medicine has benefited from stability of its leadership throughout its history. In December 2015, David H. Perlmutter, MD, was appointed executive vice chancellor for medical affairs and dean, succeeding Larry J. Shapiro, MD, who led the School of Medicine for 12 years.

Dr. Perlmutter previously served as distinguished professor and the Vira I. Heinz Endowed Chair of the Department of Pediatrics at the University of Pittsburgh School of Medicine and as physician-in-chief and scientific director of Children’s Hospital of Pittsburgh. Before joining Pitt in 2001, Dr. Perlmutter spent 15 years as a faculty member in the Department of Pediatrics at Washington University, where he was the first to hold the Donald Strominger Professorship of Pediatrics.

For more than a century, Washington University and Washington University School of Medicine have made remarkable progress, growing from a college educating local men and women to an internationally known research university with students and faculty from approximately 110 countries.

For additional information about Washington University in St. Louis, please visit [http://wustl.edu](http://wustl.edu).
Washington University School of Medicine

Washington University School of Medicine is committed to advancing human health throughout the world. As noted leaders in education, research and patient care, its outstanding faculty has contributed many discoveries and innovations to science and medicine since the school’s founding in 1891. The school pioneered bedside teaching and led in the transformation of empirical knowledge into scientific medicine. From the earliest days, there has been an understanding that “investigation and practice are one in spirit, method and object.”

Nineteen Nobel laureates have been associated with the School of Medicine. Eleven of its present faculty members have been elected to the National Academy of Sciences, and 25 faculty members belong to its Institute of Medicine. Eighty-seven faculty members hold individual career development awards from the National Institutes of Health (NIH), and 69 faculty members hold career development awards from non-federal agencies. The medical school is highly ranked in regard to NIH funding and leads research, globally, in a wide range of frontier research arenas across all of its basic science and clinical departments.

The School has a long and storied history of medical breakthroughs, including serving as a major contributor of genome sequence data to the Human Genome project, developing screening tests used worldwide to diagnose Alzheimer’s disease, creating the first positron emission tomography (PET) scanner, proposing the now-common practice of taking aspirin to help prevent heart attacks, and helping to pioneer the use of insulin to treat diabetes.

Ongoing research strengths include decoding the genomes of hundreds of cancer patients, neurosciences research including Alzheimer’s research and research in infectious diseases, immunology, microbiology, cancer, nanoparticles and molecular imaging. Washington University physicians, researchers and graduate students continue to contribute major discoveries and innovations in the fields of science and clinical medicine.

Education has remained a first-rank priority for the School, a posture it has sustained for over a century. It appeals to students, challenges students and nurtures students. Students have the opportunity to learn from master clinicians and researchers while pursuing their studies in a wide array of academic departments and programs. The faculty, unusual for an academic medical center, is fully invested in its teaching mission.

The medical school ranks number six in comprehensive medical schools as rated by U.S. News and World Report and ranks first in the nation in the entering scores of its medical school classes; its graduate medical education programs attract an exceptional group of residents and fellows as trainees. In addition to the highly ranked MD program, programs in occupational therapy, audiology and communication sciences, and physical therapy are among the highest ranked in the country.

For additional information about the School of Medicine, please visit http://medicine.wustl.edu.
The Program in Occupational Therapy

The Program in Occupational Therapy is ranked as the number one occupational therapy program in the nation by *U.S. News & World Report*. The Program offers the finest in occupational therapy education, research and patient care. Each year, approximately 90 students are admitted into the entry-level master’s and doctoral programs, and two to four students in the PhD program in Rehabilitation and Participation Science. Faculty engages in innovative, world class research every day that can enhance individuals and population health. These research initiatives have a direct impact on people with disabilities, chronic health conditions or those at-risk in their jobs and at home. The Program’s clinical arm, known as Community Practice, treats and provides occupational therapy services to adult and pediatric clients whose medical condition is limiting their function in performing activities that are central to maintaining health or returning to family, work and/or community life.

**Mission**

Washington University’s Program in Occupational Therapy will lead in advancing human health by enhancing people’s participation in everyday life activities through evidence-based practice, innovative research, and the education of tomorrow’s leaders in occupational therapy and rehabilitation.

**Vision**

In advancing human health through participation, the Program in Occupational Therapy will:

- Bridge between biomedical and sociocultural health at the person, community and population levels.
- Cultivate excellence, interdisciplinary collegiality and diversity.
- Strive for integration between practice, research and education initiatives.
- Develop and maintain excellent clinical and community programs.
- Support research programs that generate new knowledge about participation within the basic, applied and clinical sciences.
- Deliver an integrated curriculum that prepares students for current and emerging areas of practice.

**Research**

Faculty in the Program in Occupational Therapy at Washington University are involved in research that is changing the way occupational therapy is practiced. In collaboration with colleagues in the School of Medicine, they are involved in projects that encompass many of the challenges facing society. These research initiatives have a direct impact on people with disabilities, chronic health conditions or those at-risk in their jobs and at home. By providing evidence through scientific research, they are validating the profession as an important partner in the health-care team, and by acting as innovators, they are developing new and better ways to provide care.
Education
Each year, approximately 90 students are admitted into the entry-level master’s and doctoral programs, and two to four in the PhD program in Rehabilitation and Participation Science. The Program thrives in providing a diverse and dynamic academic environment, led by faculty who are leaders themselves in advancing the profession forward through their research, community practice and outreach efforts.

Degree Programs
- Master of Science in Occupational Therapy (MSOT)
- Clinical Doctorate of Occupational Therapy (OTD)
  - For entry-level students
  - For post-professional students with bachelor’s or master’s degree in occupational therapy
- Master of Science in Occupational Therapy (MSOT)/Master of Public Health (MPH) Joint Degree
- Rehabilitation and Participation Science (RAPS) PhD Program

Community Practice
The Program in Occupational Therapy includes a clinical arm, known as Community Practice, to treat and provide occupational therapy services to adult and pediatric clients. They help clients whose medical condition is limiting their function in performing activities that are central to maintaining health or returning to family, work and/or community life.

The Community Practice team is composed of highly-experienced occupational therapists who have specialty certifications within their respective fields. Clinicians provide services to a diverse population, ranging from early childhood to aging adults, and see clients in the setting that best meets their needs.

Community Engagement
Our faculty, clinicians and students understand this vital component of occupational therapy, and seek out opportunities to impact people’s lives through community research, engagement and collaboration.

Community engagement is a critical part of the Program’s research, curriculum, collaborations and student activities as we strive to promote healthy communities by enhancing population health. The Program works with more than 100 community organizations in the St. Louis region alone each year and provides more than 105,000 hours of service through fieldwork, engaged research and community outreach projects.

Program Accreditation
The Program in Occupational Therapy is accredited by the Accreditation Council for Occupational Therapy Education (ACOTE) of the American Occupational Therapy Association (AOTA), located at 4720 Montgomery Lane, Suite 200, Bethesda, MD 20814-3449. ACOTE’s telephone number, c/o AOTA, is (301) 652-AOTA, and its web address is www.acoteonline.org.

For additional information about the Program in Occupational Therapy, please visit: http://ot.wustl.edu.

As a RAPS PhD student, you will study with established scientists. The next sections identify the scientists in our program (pages 6-17) and in the university (pages 18-19) that are committed to serving as your mentor for the next stage of your growth.
Laboratory focus

Dr. King is a pediatric hematology and oncology specialist at St. Louis Children’s Hospital who makes her home in occupational therapy. The laboratory studies children with chronic illness, specifically those with sickle cell disease (SCD) or brain tumors. Children in both populations experience cognitive deficits that affect academic achievement. Topics of the lab include implementation of evidence-based care, early intervention, cognitive rehabilitation, transition from pediatric to adult health care, and quality of life for brain tumor survivors and individuals with SCD. In addition, Dr. King currently directs The Heartland Sickle Cell Disease Network, a partnership with SCD care providers and community organizations to improve overall care and quality of life of patients with SCD in a four-state region that includes Missouri, Iowa, Kansas and Nebraska.

Questions explored in laboratory

1. How can we improve implementation of evidence-based care for children with SCD?
2. How can we improve implementation of evidence-based survivorship care for survivors of cancer?
3. What are the educational needs of adolescents with SCD as they transition from pediatric to adult health care and to independent living, and how can we best meet those needs?
4. What role does the environment of children with SCD play in their development in relation to the disease itself?

What is the best method of early intervention and parenting education to improve cognitive and academic outcomes for young children with SCD?

Contributions to rehabilitation science

For the past 10 years, Dr. King has investigated factors that influence cognitive and educational outcomes of children with SCD. Her lab is one of the first in pediatric hematology to focus on parenting and the family's social environment. Dr. King and her associates have reported that the family environment has an equal, if not greater, impact on cognition and educational attainment of this vulnerable population. She also collaborates with a multidisciplinary team to study cognitive and educational outcomes of students with SCD and has contributed to assessments and interventions to improve educational outcomes of this vulnerable population.

Dr. King has also been a site investigator on interventional trials to study the effect of chronic blood transfusions and hydroxyurea on reducing central nervous system injury and improving functional outcomes in patients with SCD. In future studies, Dr. King will continue to evaluate cognitive outcomes of children who undergo stem cell transplant.

Current and recent funding

Title: Heartland/Southwest Sickle Cell Disease Network
Principal Investigator: Allison King, MD, PhD
Funding Source: U1EMC27865 Health Resources & Services Administration (HRSA)
Project Period: 9/1/14-8/31/21
Total Award: $4,659,424

Title: The implementation of cognitive screening and educational support to improve outcomes of adolescents and young adults with sickle cell disease: from clinic to the community and back
Principal Investigator: Allison King, MD, PhD
Funding Source: U01HL133994 NIH - NHLBI
Project Period: 8/5/16-6/30/22
Total Award: $4,321,826

Title: Impacts of the ACA dependent care provision on young adults with cancer
Principal Investigator: Kim Johnson, MPH, PhD
Co-Investigator: Allison King, MD, PhD
Funding Source: WU IPH, Center for Health Economics & Policy Pilot Program
Project Period: 6/1/17-5/31/18
Representative publications


Laboratory focus

The Enabling Mobility in the Community Laboratory conducts community-based research to bridge the gap between services offered to people with disabilities through rehabilitation and in the community. Strong methodological approaches are implemented to examine community-based interventions promoting health, decreasing secondary conditions, and improving physical fitness for people with disabilities that can be offered post-rehabilitation to enhance the participation of people with disabilities in major life activities. The primary study population is people with lower leg mobility limitations (including but not limited to spinal cord injury, multiple sclerosis, and cerebral palsy).

Examples of current studies in the lab include implementing interventions to train manual wheelchair users in propulsion biomechanics using motor learning principles, developing and testing a device (computer controlled wheelchair dynamometer) for use with manual wheelchair users for wheelchair training and exercise, assessing the effectiveness of a 12-week community-based exercise program for people with disabilities and examining the duration and intensity of exercise programs to change the overall physical fitness of people with disabilities.

Questions explored in laboratory

1. How can we build community-based programs to increase the participation and health of people with disabilities?
2. What duration and intensity of exercise is necessary to impact long-term health outcomes in people with disabilities?
3. Can we develop tools to test physical exertion and physical capacity in people with disabilities?
4. How can we improve technology to engage people with disabilities in fitness and exercise programs?
5. How can we explore the role of competitive sports in community re-integration of people with disabilities?

Contributions to rehabilitation science

The focus of Dr. Morgan’s research is to generate empirical knowledge helpful for guiding community-based and person-based interventions that improve the participation of people with mobility impairments. Her work ranges from community-based participation studies to basic mechanistic studies of biomechanics of the upper extremity for manual wheelchair users during propulsion.

Earlier in her career, Dr. Morgan assisted with the development and testing of standardized measures that assess the quality of participation in major life activities and the environmental facilitators and barriers impacting participation for people with disabilities. In addition, she created a community-based program housed in a local Independent Living Center that provides services for people with disabilities (such as health and wellness programs and assistive technology assessments and training). Dr. Morgan also developed a device (an instrumented wheelchair roller system) to provide health-care professionals evidence-based options for providing wheelchair training and exercise programs.

Current and recent funding

**Title:** Exercise training in a community-based setting for people with spinal cord injuries  
**Principal Investigator:** Kerri Morgan, PhD, OTR/L, ATP  
**Funding Source:** Craig H. Neilsen Foundation, Psychosocial Research Grants  
**Project Period:** 4/30/17-4/29/19  
**Total Award:** $199,844

**Title:** Building capacity to improve community participation for people aging with long-term disability through evidence-based strategies  
**Principal Investigator:** Susy Stark, PhD, OTR/L, FAOTA  
**Co-Investigator:** Kerri Morgan, PhD, OTR/L, ATP  
**Funding Source:** 90DPCP0001 DHHS ACL: NIDILRR Disability Research Projects Community Living & Participation  
**Project Period:** 9/30/17-09/29/22  
**Total Award:** $2,482,013

**Title:** Efficacy of wheelchair propulsion  
**Principal Investigator:** Kerri Morgan, PhD, OTR/L, ATP  
**Funding Source:** HealthSouth Corporation  
**Project Period:** 11/1/17-10/31/18  
**Total Award:** $8,494
Representative publications


Laboratory focus

The primary aim of the Neuroscience and Research Laboratory is to develop and apply techniques to improve rehabilitation of patients with unilateral hand impairment. Dr. Philip approaches this research through the lens of motor lateralization (handedness) as patients face distinct challenges when their disability affects their dominant hand. This line of research bridges the gap between basic, translational and clinical research by applying new knowledge about brain mechanisms and physical function to rehabilitation quests such as hand usage, activity participation and quality of life.

The laboratory addresses the relationship between handedness and rehabilitation via a three-pronged approach: (1) understanding the neural mechanisms of handedness, especially of handedness retraining, wherein patients adapt to use the non-dominant hand after chronic impairment of the dominant hand after nerve damage, stroke or other motor disability; (2) identifying the relationship between laboratory measurements of hand function and post-impairment changes in hand usage quality of life; and, once the characteristics of hand function that matter to patients are identified, (3) applying neurophysiological knowledge to help patients use dominant-hand mechanisms to improve function of the non-dominant hand.

Other current topics of investigation include how resource deprivation affects leisure participation and job performance among astronauts on space simulation missions.

Questions explored in laboratory

1. How does non-dominant hand usage drive quality of life after dominant-hand impairment?
2. What characteristics of intact hand function drive changes in usage, after impairment of one hand?
3. What physical and neurophysiological interventions will promote rehabilitation-relevant characteristics of non-dominant hand function?
4. What neural mechanisms support skilled performance with the non-dominant hand?
5. How does resource deprivation affect job performance during long-duration missions in isolated and controlled environments?

Contributions to rehabilitation science

Dr. Philip’s research program is aimed toward developing effective rehabilitation strategies for patients with impairments to their dominant hands. Studies will identify movement characteristics that affect hand usage and participation, identify underlying neurophysiological mechanisms, and use those mechanisms to develop interventions to facilitate learning of rehabilitation-relevant behaviors and skill.

Current and recent funding

*Title:* Compensation, and quality of life in peripheral nerve patients

*Principal Investigator:* Benjamin Philip, PhD

*Funding Source:* WUSM, The Program in Occupational Therapy, Young Investigator Pilot Award

*Project Period:* 3/01/17-6/30/19

*Total Award:* $130,689
Representative publications


Laboratory focus

The Occupational Therapy Neonatal Intensive Care Unit (NICU) Laboratory is part of a multidisciplinary team working to better understand the effects of the environment, medical conditions and interventions on brain structure and functional outcome of the developing infant. Most of the current work involves premature infants born prior to 30 weeks gestation (2 1/2 months early). Neurobehavioral examinations and feeding evaluations are an important component of measuring early function. Measuring maternal, social, environmental and medical factors are also an important part of the lab’s work. Current topics of investigation include: the effects of language and sound exposure on infant development, reliability and validity testing of a new neonatal feeding assessment, the evaluation of a new program (Baby Bridge) to bridge the gap between NICU therapy services and outpatient therapy, neurobehavioral development, and the use of parent-driven sensory-based interventions in the NICU.

Questions explored in laboratory

1. Can the use of parent-driven sensory-based interventions improve outcomes of preterm infants who are hospitalized in the NICU?
2. Psychometric testing of the Neonatal Eating Outcome (NEO) assessment and using measures of feeding to define pathways to oral motor and feeding problems.
3. Can the continuity of services following NICU discharge be improved?
4. What evaluation tools used during the neonatal period can predict childhood outcome?
5. What therapeutic interventions applied during the neonatal period can improve outcomes?

Contributions to rehabilitation science

Dr. Pineda’s current research focuses on the effects of the NICU environment on preterm infant development. Her work investigates the impact of an intervention aimed at fostering parent-infant interaction while ensuring daily positive multi-modal sensory exposures in the NICU. Such work informs the rehabilitation team in the NICU on types, timing and duration of specific sensory experiences to optimize outcomes. It also sets the stage for parent education that can foster early engagement in the NICU to lay the foundations for the important parent-child relationship. Dr. Pineda has also contributed to measurement and early identification of developmental impairment with her work identifying developmental changes prior to term-equivalent age, as well as her development of a new neonatal feeding assessment, the NEO Assessment.

Current and recent funding

**Title:** Engaging families in NICU Care to optimize outcomes of preterm infants  
**Principal Investigator:** Bobbi Pineda, PhD, OTR/L  
**Funding Source:** Gordon and Betty Moore Foundation  
**Project Period:** 12/1/15-11/30/18  
**Total Award:** $502,503

**Title:** The Preemie-Pacer: an innovative bottle to promote safe and efficient oral feeding in preterm infants  
**Principal Investigators:** Tom Oleksy, MBA, and Bobbi Pineda, PhD, OTR/L  
**Funding Source:** R43HD092210 US NIH NICHD  
**Project Period:** 4/1/17-12/31/17  
**Total Award:** $149,917

**Title:** Reliability and validity of a developmental feeding assessment for the high risk infant  
**Principal Investigator:** Alan Jette, PhD  
**Pilot Project Investigator:** Bobbi Pineda, PhD, OTR/L  
**Funding Source:** R24HD065688 NIH NICHD  
**Project Period:** 7/1/14-6/30/16  
**Total Award:** $32,400
Representative publications


Laboratory focus

The research of the Participation, Environment and Performance Laboratory (PEPL) focuses on the unique contribution that the environment can make toward improving the performance, participation and quality of life for persons living with functional limitations. Dr. Stark and her team study how the environment accounts for the differences between what individuals are capable of doing and their actual participation in society. An exploration of the physical environment as influencing behavior is the basis of research questions designed to explore the impact of the person/environment interface. The lab studies older adults living in the community.

The lab collaborates with interdisciplinary research scientists in the Knight Alzheimer's Disease Research Center, the Institute for Clinical Translational Science and the Friedman Center for Aging. The lab has a strong community-engaged component, including a strong network of community partners.

Mechanisms explored in laboratory

1. Fall prevention
2. Home modifications
3. Medication management
4. Aging
5. Participation

Contributions to rehabilitation science

Dr. Stark's work in the community focuses on the development and implementation of evidence-based behavioral interventions to prevent falls and improve community participation. Her federally and privately funded studies explore how functional decline and environmental barriers interact to influence the performance of frail older adults with chronic conditions. The interventions she develops from these studies allow older adults to age in place independently and safely at home.

Dr. Stark is committed to translating and disseminating research findings to clinicians to implement evidence-based interventions. She was a collaborator on the revision of the International Classification of Functioning, Disability and Health (ICF), with specific expertise in the domains of activity, participation and environment. Dr. Stark also contributed to the development of a set of instruments to measure the ICF domains of activity, participation and environmental in the home and community. She is a strong proponent of inter-professional education to improve health and research outcomes and has worked on and led several successful inter-professional research teams.

Current and recent funding

**Title:** COMPASS: A Novel Transition Program to Reduce Disability after Stroke  
**Principal Investigator:** Susy Stark, PhD, OTR/L, FAOTA  
**Co-Investigator:** Alex Wong, PhD, DPhil, BSOT  
**Funding Source:** R01HD092398 NIH's NICHD and NCMRR  
**Project Period:** 8/28/17-5/31/22  
**Total Award:** $1,354,946

**Title:** Building capacity to improve community participation for people aging with long-term disability through evidence-based strategies  
**Principal Investigator:** Susy Stark, PhD, OTR/L, FAOTA  
**Co-Investigator:** Kerri Morgan, PhD, OTR/L, ATP  
**Funding Source:** 90DPCP0001 DHHS ACL: NIDILRR Disability Research Projects Community Living & Participation  
**Project Period:** 9/30/17-9/29/22  
**Total Award:** $2,482,013

**Title:** Removing Home Hazards for Older Adults (HARP)  
**Principal Investigator:** Susy Stark, PhD, OTR/L, FAOTA  
**Funding Source:** US HUD MOHHU0024-14  
**Project Period:** 11/14/14-11/16/17  
**Total Award:** $724,996
Representative publications


Laboratory focus
Dr. Wong’s research focuses on using innovative technologies and data to identify psychological, behavioral, and environmental influences on daily life participation with the goal of developing effective rehabilitation. His current work uses ambulatory assessments and wireless health systems as efficient and objective measures of daily, cognitive, and emotional functioning among people after a stroke or with other neurological conditions. Dr. Wong is involved in interdisciplinary collaborations with investigators from computer science and engineering, informatics, psychiatry, public health, and vascular neurology to further develop mobile health (mHealth) strategies for precision health and rehabilitation. Internationally, his lab collaborates on projects in China, Hong Kong, Singapore, Korea and Australia.

Mechanisms explored in laboratory
1. Cognition and everyday functioning
2. Depression
3. Engagement and motivation
4. mHealth
5. Ecological momentary assessment and intervention

Contributions to rehabilitation science
Dr. Wong has worked with NIH- and NIDLIRR-funded outcomes measurement initiatives, including development and implementation of the NIH Toolbox, the Neuro-QoL, and the PROMIS, which are administered via a computerized adaptive testing (CAT) platform for neurorehabilitation and cancer treatments. Other research efforts include investigating patient engagement, environmental influences on participation, and chemotherapy-related cognitive impairment. He is also part of the team building a rehabilitation outcomes database in China, and the stroke registry at Washington University. Currently, Dr. Wong specializes in the use of innovative mobile technologies and data science methods to continuously monitor and enhance daily, cognitive, and emotional functioning for people after a stroke or with other neurological conditions.

Current and recent funding

**Title:** COMPASS: A Novel Transition Program to Reduce Disability after Stroke  
**Principal Investigator:** Susy Stark, PhD, OTR/L, FAOTA  
**Co-Investigator:** Alex Wong, PhD, DPhil, BSOT  
**Funding Source:** R01HD092398 NIH’s NICHD and NCMRR  
**Project Period:** 8/28/17-5/31/22  
**Total Award:** $1,354,946

**Title:** Evaluating cognitive function in breast cancer survivors who received chemotherapy  
**Principal Investigators:** Jay F. Piccirillo, MD, FACS, and Alex Wong, PhD, DPhil, BSOT  
**Funding Source:** Alvin J. Siteman Cancer Center’s Siteman Investment Program (SIP), Multi-PI Pre-R01  
**Project Period:** 01/01/17-12/31/18  
**Total Award:** $419,100

**Title:** Stroke Management and Rehabilitation Team (SMART) Stroke Registry  
**Principal Investigators:** Alex Wong, PhD, DPhil, BSOT, and Carolyn Baum, PhD, OTR, FAOTA  
**Funding Source:** WUSM, Program in Occupational Therapy, Program in Physical Therapy and Department of Neurology Collaborators  
**Project Period:** 7/1/14-present
Representative publications


**John Constantino, MD**

Blanche F. Ittleson Professor of Psychiatry and Pediatrics  
Director, William Greenleaf Eliot Division of Child and Adolescent Psychiatry

Dr. Constantino's research focuses on social development in children (infancy through early adulthood), including autism, abnormally aggressive behavior, personality disorder, and psychiatric complications of neurodevelopmental disorders.

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**Nico Dosenbach, MD, PhD**

Assistant Professor of Pediatric Neurology and Occupational Therapy

Dr. Dosenbach is a pediatric neurologist and systems neuroscientist who treats children with brain injury at St. Louis Children’s Hospital as part of the Pediatric Neurorehabilitation Program. Dr. Dosenbach’s research focuses on using multimodal MRI to study use-dependent neural plasticity following pediatric brain injury; he is particularly interested in identifying unique movement patterns in the child’s life to serve as an early marker for neurological impairment.

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**Gammon Earhart, PT, PhD**

Director, Program in Physical Therapy  
Professor of Physical Therapy, Neurology and Neuroscience

The goal of Dr. Earhart’s work is to investigate how the human nervous system controls movement in health and in neurological and neurodegenerative disease. She employs kinematic, kinetic, electromyographic, videooculographic and neuroimaging techniques to study the neural control of movement.
Catherine Lang, PT, PhD
Professor of Physical Therapy, Neurology and Occupational Therapy

Dr. Lang’s research is aimed at developing effective and efficient, individualized rehabilitation for people with neurological injury, particularly those with stroke. Her studies focus on characterizing neurobehavioral changes over the course of stroke recovery, developing new and optimizing current motor interventions, and improving clinical practice.

Eric Lenze, MD
Professor of Psychiatry

The focus of Dr. Lenze’s research in the Healthy Mind Laboratory is to enhance medical rehabilitation, a new approach designed to encourage patients to more intensely engage in physical and occupational therapy; to investigate the benefits of mindfulness, health education and exercise (MEDEX) for older adults; and to examine new medications for patients with treatment-resistant depression.

Joel Perlmutter, MD
Professor of Neurology, Radiology, Occupational Therapy and Physical Therapy

The Perlmutter Laboratory is engaged in several studies of Parkinson disease (PD) ranging from patient-oriented research to translational preclinical studies in animal systems. The lab also investigates mechanisms of action of deep brain stimulation, a dramatic symptomatic treatment for motor manifestations of PD.
Students pursue the RAPS PhD degree because of their desire to generate knowledge to improve rehabilitation practices and thus people's lives through participation. Students with a clinical degree at the bachelor’s, master’s or doctoral level are welcome to apply. Prior research experience is strongly encouraged.

In addition to meeting basic admissions requirements, there must be a fit between a candidate’s research interests and one or more RAPS PhD faculty members who are willing to guide the student’s program. Please review the listing of our RAPS PhD faculty mentors in this booklet to explore a potential match that will meet your training goals and needs.

Applications to the RAPS PhD program must be submitted by December 15 to the Graduate School at Washington University at https://applyweb.com/wustl/.

Applicants must submit all of the following:

1. A completed Graduate School at Washington University application form
2. $45 application fee
3. An essay that details why you are choosing this program of study and Washington University to prepare for a scientific career. Please address your motivation for study in rehabilitation and participation science, prior research and/or clinical experience, short- and long-range career goals and the specific area of your interest.
4. An example of your scholarly writing such as a publication or college research paper
5. Official transcripts of all post-secondary academic work. Applicants holding transcripts from institutions outside the United States are required to have the transcripts evaluated by a credentialing agency (names of agencies may be obtained by contacting the Program in Occupational Therapy). The evaluation must include course names, grades and credits in American terms. No international transcripts will be accepted without an evaluation from a credentialing agency.
6. Three letters of recommendation describing your capabilities for PhD studies
7. Official Graduate Record Exam (GRE) scores for an exam taken within the past five years. GRE score reports must be sent directly from the Educational Testing Service to the Washington University Program in Occupational Therapy.
   - For international candidates whose native language is not English, the tests below must have been taken within 12 months of the date on the application:
     - Test of English as a Foreign Language (TOEFL) scores; Minimum acceptable score = 600 (250 for computer-based test and 100 for iBT)
     - Test of Written English (TWE) scores; Minimum acceptable score = 5
     - WUSTL accepts the International English Language Testing System (IELTS) Academic module. We require a minimum score of 6.5 on the IELTS Academic module for applicants to be considered.

For more information about the Rehabilitation and Participation Science (RAPS) PhD program, please contact Abby King at 314-286-1619 or abigailking@wustl.edu.
Washington University encourages and gives full consideration to all applicants for admission, financial aid and employment. The University does not discriminate in access to, or treatment or employment in, its programs and activities on the basis of race, color, age, religion, sex, sexual orientation, gender identity or expression, national origin, veteran status, disability or genetic information. Inquiries about compliance should be addressed to the University’s Vice Chancellor for Human Resources, Washington University, Campus Box 1184, One Brookings Drive, St. Louis, MO 63130.

The School of Medicine is committed to recruiting, enrolling and educating a diverse student body.