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POST-EDUCATION

POSTDOCTORAL FELLOW | University of Kansas Medical Center Aug 2019-Present | Kansas City, KS

EDUCATION

PH.D. IN REHABILITATION SCIENCE | University of Kansas Medical Center Aug 2013–Jul 2019 | Kansas City, KS

B.S. IN BIOLOGY | Minnesota State University Aug 2010–May 2013 | Mankato, MN Magna Cum Laude US-Korea Dual Degree

B.S. IN PHYSICAL THERAPY | Daegu Catholic University Mar 2006–May 2013 | South Korea US-Korea Dual Degree

RESEARCH EXPERIENCE

UNIVERSITY OF KANSAS MEDICAL CENTER

POSTDOCTORAL RESEARCH FELLOW (PI: HANNES DEVOS) | Laboratory for Advanced Rehabilitation Research in Simulation Aug 2019-Present

GRADUATE RESEARCH ASSISTANT

Aug 2016-July 2019

- Developing a balance assessment system using virtual reality technology
- Artificial neural network in rehabilitation research
- Classification of Parkinsonian syndromes using artificial neural network
- Population-based assessment of fitness to drive in medical conditions
- Pupillary response to cognitive workload and distraction during driving in breast cancer survivors
- Pupillary response to cognitive workload in Parkinson's disease

GRADUATE RESEARCH ASSISTANT (PI: WEN LIU) | Neuromuscular Research Laboratory Aug 2013–July 2019

- Effects of a mind-body exercise on non-motor symptoms and inflammatory status in patient with Parkinson's disease (Ph.D. dissertation NIH-funded (R21))
- Effect of a high-intensity exercise on immune response in females with fibromyalgia
- Effects of an aerobic exercise on cardiovascular and bone health in non-ambulatory stroke survivors
- Benefits of an aerobic exercise in people with spinal cord injury
- Benefits of a mild exercise on gait, cognition, and sleep in Parkinson's disease
- Altered immune response to exercise in patient with fibromyalgia after a mind-body exercise

STOWER'S INSTITUTE FOR MEDICAL RESEARCH

GRADUATE RESEARCHER (PI: LINGHEN LI) |Linghen Li Laboratory Apr-Aug 2014

• Hematopoietic stem cell niche and leukemia

MINNESOTA STATE UNIVERSITY

UNDERGRADUATE RESEARCHER (PI: NAMYONG LEE) | Mathematics and Statistics Laboratory Aug 2012–May 2013

• Mathematical models for fatigue muscle fiber mechanism

UNDERGRADUATE RESEARCHER (PI: DOROTHY WIGLEY) | Microbiology Laboratory Aug 2012–May 2013

• Effects of amputation on Verminephrobacter in Eisenia fetida

ACADEMIC PUBLICATIONS

PUBLISHED ARTICLES (PEER-REVIEWED)

1. M Kahya, **S Moon**, M Ranchet, R Vukas, KE Lyons, R Pahwa, AE Akinwuntan, H Devos. (2019) "Neurophysiology of cognitive-motor interference in aging and age-related neurodegenerative conditions". Experimental Gerontology. 128, 110756.

☑doi: 10.1016/j.exger.2019.110756

2. AS Alqahtani, R Alajam, **S Moon**, CVM Sarmento, SM Eickmeyer, S Jernigan, IV Smirnova, W Liu. (2019) "Reduction of risk for cardiovascular disease in non-ambulatory stroke survivors using an assisted-walking aerobic exercise: A pilot study". International Journal of Cerebrovascular Disease and Stroke. 2, 118.

doi: 10.29011/IJCDS-118.100018

- 3. S Moon, CVM Sarmento, IV Smirnova, Y Colgrove, K Lyons, SM Lai, W Liu. (2019) "Effects of Qigong exercise on non-motor symptoms in Parkinson's disease: A protocol for a randomized controlled trial". Medicines. 6(1), 13.
 Gdoi: 10.3390/medicines6010013
- 4. JS Myers, M Kahya, M Mitchell, J He, J Dai, **S Moon**, K Hamilton, M Valla, A OʻDea, J Klemp, M Kurylo, AE Akinwuntan, H Devos. (2018) "Pupillary response: cognitive effort for breast cancer survivors". Supportive Care in Cancer. 27(3), 1121-1128

☑doi: 10.1007/s00520-018-4401-0

- 5. M Kahya, S Moon, K Lyons, R Pahwa, AE Akinwuntan, H Devos. (2018) "Pupillary response to cognitive demand in Parkinson's disease: A pilot study". Frontiers in Aging Neuroscience. 10, 90.
 ☐ doi: 10.3389/fnagi.2018.00090
- 6. S Moon, M Ranchet, AE Akinwuntan, M Tant, DB Carr, MA Raji, H Devos. (2018) "The impact of advanced age on driving safety in adults with medical conditions". Gerontology. 64, 291-299.
 ☐ doi: 10.1159/000486511
- 7. **S Moon**, M Ranchet, M Tant, AE Akinwuntan, H Devos. (2017) "Comparison of unsafe driving across medical conditions". Mayo Clinic Proceedings. 92(9), 1341-1350.

☐ doi: 10.1016/j.mayocp.2017.06.003 / ► Youtube (Video Abstract) / ☐ Editorial Comments

- 8. **S Moon**, M Schmidt, IV Smirnova, Y Colgrove, W Liu. (2017) "Qigong may alter TNF-alpha in serum and improve sleep in patients with Parkinson's disease". Medicines. 4(2), 23.
 - ☑doi: 10.3390/medicines4020023
- 9. JS Myers, N Alissa, M Mitchell, J Dai, J He, **S Moon**, A O'Dea, J Klemp, M Kurylo, AE Akinwuntan, H Devos. (2019) "Pupillary response, driving simulation, and increased cognitive load: Assessment of cognitive effort for breast cancer survivors". Oncology Nursing Forum (Accepted; In Press)

SUBMITTED MANUSCRIPTS

- 1. **S Moon**, P Ahmadnezhad, HJ Song, J Thompson, K Kipp, AE Akinwuntan, H Devos. "Artificial neural networks in neurorehabilitation: A scoping review". Archives of Physical Medicine and Rehabilitation (Resubmitted after Revision)
- 2. **S Moon**, CVM Sarmento, Y Colgrove, W Liu. "Complementary and integrative medicine for people with Parkinson's disease". Archives of Physical Medicine and Rehabilitation (In resubmission; Major Revision)
- 3. **S Moon**, M Kahya, K Lyons, R Pahwa, AE Akinwuntan, H Devos. "Cognitive workload during verbal abstract reasoning in Parkinson's disease: A pilot study". BMJ Innovations (Submitted; Under Review)
- 4. CVM Sarmento, **S Moon**, T Pfeifer, W Liu. "The altered immune response to exercise in patients with fibromyalgia before and after a mind-body intervention: A study protocol for a double-blinded randomized clinical trial". BMC Complementary and Alternative Medicine (Submitted; Under Review)

- 5. AS Alqahtani, R Alajam, **S Moon**, CVM Sarmento, IV Smirnova, M Pang, M Phadnis, W Liu. "Changes in bone biomarkers after an 8-week walking exercise in non-ambulatory stroke survivors A pilot study". Osteoporosis International. (Submitted; Under Review)
- 6. CVM Sarmento, **S Moon**, IV Smirnova, SM Lai, Y Colgrove, M Maz, W Liu. "Immune response to a bout of high-intensity exercise in females with fibromyalgia: A pilot study". (In submission)
- 7. **S Moon**, CVM Sarmento, M Steinbacher, IV Smirnova, K Lyons, Y Colgrove, SM Lai, W Liu. "Can Qigong exercise improve non-motor symptoms in people with Parkinson's disease?". (In submission)
- 8. **S Moon**, CVM Sarmento, IV Smirnova, K Lyons, Y Colgrove, SM Lai, W Liu. "Effects of Qigong exercise on inflammatory status in people with Parkinson's disease". (In submission)
- 9. CVM Sarmento, **S Moon**, W Liu. "Low compliance to exercise in patients with fibromyalgia: What to blame, psychological or physiological factors?". (In submission)
- 10. CVM Sarmento, **S Moon**, IV Smirnova, SM Lai, M Maz, W Liu. "The impact of Qigong on immune responses due to a bout of high-intensity exercise". (In submission)

MANUSCRIPTS IN PREPARATION

- 1. **S Moon**, HJ Song, K Kipp, VD Sharma, K Lyons, AE Akinwuntan, H Devos. "Classification of Parkinsonism using artificial neural networks: A retrospective database study". (In preparation)
- 2. VD Sharma, **S Moon**, H Devos, K Lyons, R Pahwa. "Quantitative gait assessment of patients with essential tremor using wireless sensors". (In preparation)

RESEARCH GRANTS

- 1. J Colistra, H Park, H Devos, K Lyons, R Pahwa, S Moon (Postdoc). (2019) "Predictive resident gait monitoring using a smart-floor building system", Michael J. Fox Foundation, \$214,925 (Under Review).
- 2. **S Moon (Postdoc)**, R Nudo, H Devos (2019) "Eye-catching brain-behavior interactions in virtual reality dual tasking for individuals with Parkinson's disease", TL1 Postdoctoral Clnical and Translational Research Training Program, University of Kansas Frontiers, (Under Review).
- 3. J Colistra, J Buzhardt, H Devos, D Irvin, **S Moon (Postdoc)**. (2019) "Smart and Connected Communities Planning Grant: The Impact of Data-Driven Architecture on Population Health Initiatives", National Science Foundation, \$132,912 (Under Review).
- 4. S Moon (PI), H Devos. (2018) "Artificial Brain Mapping", The NSF 2026 Idea Machine, National Science Foundation, \$26,000 (Not funded).
- 5. W Liu, IV Smirnova, SM Lai, K Lyons, J Qiu, S Moon (RA), CVM Sarmento, V Gangeddula. (2018) "Assessment of mind-body intervention in patients with Parkinson's disease", R21HD094003, National Institutes of Health, \$191,250 (Funded).
- 6. H Devos, D Carr, R Mukaila, AE Akinwuntan, S Moon (RA). (2017) "Driving safety in the oldest-old", Evidence for Action: Investigator-Initiated Research to Build a Culture of Health, Robert Wood Johnson Foundation, \$119,159 (Not funded).
- 7. H Devos, **S Moon (Co-I)**, R Mukaila, AE Akinwuntan. (2017) "Driving safety in the oldest-old", Center for Large Data Research and Data Sharing in Rehabilitation, \$25,000 (Not funded).

ACADEMIC PRESENTATIONS

INVITED TALK

- 1. H Devos, AE Akinwuntan, **S Moon** (2019) "Virtual reality applications in rehabilitation". Cerner World Usability Day, Kansas City, MO.
- 2. **S Moon** (2019) "Benefits of Qigong on non-motor symptoms and inflammatory status in people with Parkinson's disease". International Medical Tai Chi and Qigong Association Conference at Massachusetts General Hospital and Harvard Medical School, Boston, MA.

SYMPOSIUM TALK

1. **S Moon**, J Thompson, K Kipp, AE Akinwuntan, H Devos. (2019) "Artificial neural networks: Shaping the future of neurorehabilitation research". American Congress of Rehabilitation Medicine, Chicago, IL. **Curl:** ACRM.org/551435

PLATFORM PRESENTATION

- 1. CVM Sarmento, **S Moon**, IV Smirnova, Y Colgrove, SM Lai, M Maz, W Liu. (2020) "Inflammatory response to a bout of high-intensity exercise in females with fibromyalgia. American Physical Therapy Association Combined Sections Meeting, Denver, CO. (Abstract accepted)
- 2. **S Moon**, P Ahmadnezhad, HJ Song, J Thompson, K Kipp, AE Akinwuntan, H Devos. (2019) "Artificial neural networks: A powerful tool for neurorehabilitation research". Student Research Forum at University of Kansas Medical Center, Kansas City, KS.
- 3. **S Moon**, M Ranchet, M Tant, A Akinwuntan, D Carr, M Raji, H Devos. (2018) "Driving safety in the oldest-old". Student Research Forum at University of Kansas Medical Center, Kansas City, KS.
- 4. **S Moon**, M Schmidt, IV Smirnova, Y Colgrove, W Liu. (2017) "A mind-body exercise for Parkinson's disease: A pilot study". Kansas Physical Therapy Association Conference, Wichita, KS.
- 5. **S Moon**, M Ranchet, M Tant, A Akinwuntan, H Devos. (2017) "Impact of medical conditions on driving safety". Student Research Forum at University of Kansas Medical Center, Kansas City, KS.
- 6. **S Moon**, M Schmidt, IV Smirnova, Y Colgrove, W Liu. (2017) "A mind-body exercise for Parkinson's disease: A pilot study". American Physical Therapy Association Combined Sections Meeting, San Antonio, TX.
- 7. **S Moon**, M Schmidt, W Liu. (2014) "Benefits of a mild exercise on gait, cognition, and sleep in Parkinson's disease". Student Research Forum at University of Kansas Medical Center, Kansas City, KS.

POSTER PRESENTATION

- 1. **S Moon**, CVM Sarmento, M Steinbacher, SM Lai, Y Colgrove, K Lyons, IV Smirnova, W Liu. (2020) "Qigong to improve sleep quality and inflammation in people with Parkinson's sisease: Potentials and challenges". American Physical Therapy Association Combined Sections Meeting, Denver, CO. (Abstract accepted)
- 2. S Moon, P Ahmadnezhad, HJ Song, J Thompson, K Kipp, A Akinwuntan, H Devos. (2019) "Scoping review on artificial neural networks in neurorehabilitation research: Current status and future avenues". American American Congress of Rehabilitation Medicine. Chicago, IL.

 Gdoi: 10.1016/j.apmr.2019.08.353
- 3. V Sharma, S Moon, H Devos, K Lyons, R Pahwa (2019) "Quantitative gait assessment of patients with essential tremor using wireless sensors". International Congress of Parkinson's Disease and Movement Disorders, Nice, France.
 ☑ doi: 10.1002/mds.27795
- 4. C Sarmento, T Pfeifer, **S Moon**, M Steinbacher, M Maz, SM Lai, Y Colgrove, IV Smirnova, W Liu. (2019) "The efficacy of Qigong on the main symptoms of fibromyalgia. A randomized clinical trial". American College of Sport Medicine, Orlando, FL.

☑url: acsmannualmeeting.org/ACSM19Abstract

- 5. **S Moon**, M Kahya, KE Lyons, R Pahwa, AE Akinwuntan, H Devos. (2019) "Can we detect early cognitive declines in people with Parkinson's disease using an eye-tracker?". Kansas Physical Therapy Association Conference, Wichita, KS.
- 6. **S Moon**, M Kahya, KE Lyons, R Pahwa, AE Akinwuntan, H Devos. (2019) "The eyes as a window to understanding abstract reasoning in Parkinson's disease". Annual Rare KC Meeting. Kansas City, MO.
- 7. S Moon, M Schmidt, IV Smirnova, Y Colgrove, W Liu. (2018) "Can a mindfulness exercise make your sleep better and change your inflammatory status in Parkinson's disease?". American Congress of Rehabilitation Medicine. Dallas, TX. Color. 10.1016/j.apmr.2018.09.014
- 8. S Moon, M Kahya, KE Lyons, R Pahwa, AE Akinwuntan, H Devos. (2018) "The eyes as a window to understanding abstract reasoning in Parkinson's disease". American Congress of Rehabilitation Medicine. Dallas, TX. Cdoi: 10.1016/j.apmr.2018.09.082
- 10. **S Moon**, M Schmidt, IV Smirnova, Y Colgrove, W Liu. (2018) A mindfulness exercise may improve sleep quality and change inflammatory biomarker level in Parkinson's disease: A pilot study". 2nd Pan American Parkinson's Disease and Movement Disorder Congress, Miami, FL.

☑doi: 10.1002/mds.27434

11. M Kahya, **S Moon**, K Lyons, R Pahwa, AE Akinwuntan, H Devos. (2018) "Increased mental effort during abstract thinking and verbal reasoning in Parkinson's disease: A pilot study". 2nd Pan American Parkinson's Disease and Movement Disorder congress, Miami, FL.

doi: 10.1002/mds.27434

12. **S Moon**, M Ranchet, M Tant, A Akinwuntan, H Devos. (2017) "Comparative analysis of unsafe driving risk in medical conditions". American Congress of Rehabilitation Medicine, Atlanta, GA.

☑doi: 10.1016/j.apmr.2017.08.141

- 13. **S Moon**, M Schmidt, W Liu. (2016) "A meditative exercise for Parkinson's disease". Student Research Forum at University of Kansas Medical Center, Kansas City, KS.
- 14. **S Moon**, S Son, T Hong, N Lee. (2013) "Mathematical models for fatigue muscle fiber mechanism". National Conference of Undergraduate Research at University of Wisconsin, La Crosse, WI.
- 15. **S Moon**, S Son, T Hong, N Lee. (2013) "Mathematical models for fatigue muscle fiber mechanism". Undergraduate Research Symposium at Minnesota State University, Mankato, MN.

TEACHING EXPERIENCE

GRADUATE TEACHING ASSISTANT

PTRS 703 - Applied Anatomy	Summer 2019
PTRS 750 - Research in Evidence-Based Physical Therapy Practice	Spring 2019
PTRS 711 - Applied Kinesiology and Biomechanics	Fall 2018
PTRS 703 - Applied Anatomy	Summer 2018
PTRS 750 - Research in Evidence-Based Physical Therapy Practice	Spring 2018
PTRS 711 - Applied Kinesiology and Biomechanics	Fall 2017
PTRS 704 - Physical Therapy Intervention I	Fall 2017
PTRS 817 - Ethics in Health Care	Summer 2017
PTRS 703 - Applied Anatomy	Summer 2017
PTRS 853 - Neurologic Physical Therapy and Rehabilitation II	Spring 2017
PTRS 703 - Applied Anatomy	Summer 2016
PTRS 817 - Ethics in Health Care	Summer 2016
PTRS 785 - Orthopedic Physical Therapy	Spring 2016
REHS 962 - Advanced Studies in Rehabilitation Science	Fall 2015
PTRS 855 - Pharmacology for Physical Therapists	Fall 2015
PTRS 855 - Pharmacology for Physical Therapists	Summer 2015
PTRS 817 - Ethics in Health Care	Summer 2015
PTRS 846 - Musculoskeletal Physical Therapy III	Spring 2015
PTRS 855 - Pharmacology for Physical Therapists	Fall 2014
PTRS 845 - Musculoskeletal Physical Therapy II	Fall 2014
PTRS 828 - Medical Imaging for Physical Therapists	Summer 2014
PTRS 745 - Musculoskeletal Physical Therapy I	Spring 2014
PTRS 711 - Applied Kinesiology and Biomechanics	Fall 2013

INVITED LECTURER

Pathophysiology of Parkinson's disease
University of Saint Mary, Leavenworth, KS

AWARDS & ACHIEVEMENTS

Certificate of Contribution Cerner World Usability Day 2019	Nov 2019
 Scientific Inquiry Award for the Best Overall Poster Presentation Kansas Physical Therapy Association Research Committee 	Apr 2019
Best PTRS Presentation Award (\$200) Department of Physical Therapy and Rehabilitation Science, University of Kansas Medical Cerea.	Apr 2019 nter
Student Governing Council Travel Award (\$200) Student Governing Council, University of Kansas Medical Center	Oct 2018

Ringle Health Professions Scholarship (\$4,000) School of Health Professions, University of Kansas Medical Center	Aug 2018
 One University Open Access Fund at KU (\$ 1,250) KU Libraries, University of Kansas & University of Kansas Medical Center 	May 2018
 Graduate Student Professional Development Award (\$250) Office of Graduate Studies, University of Kansas Medical Center 	Apr 2018
 Student Governing Council Travel Award (\$300) Student Govenring Council, University of Kansas Medical Center 	Feb 2018
 Ringle Health Professions Scholarship (\$5,200) School of Health Professions, University of Kansas Medical Center 	Aug 2017
 School of Health Professions Dean's Diversity Scholarship (\$500) School of Health Professions, University of Kansas Medical Center 	Jul 2017
 Scientific Inquiry Award for the Best Presentation Kansas Physical Therapy Association Research Committee 	Apr 2017
 Best PTRS Presentation Award (\$200) Department of Physical Therapy and Rehabilitation Science, University of Kansas Medical Cen 	Apr 2017 ter
 Graduate Student Professional Development Award (\$500) Office of Graduate Studies, University of Kansas Medical Center 	Oct 2016
 Student Governing Council Travel Award (\$400) Student Governing Council, University of Kansas Medical Center 	Oct 2016
 Bittel Family Scholarship (\$300) Department of Physical Therapy and Rehabilitation Science, University of Kansas Medical Cen 	Oct 2016 ter
 Ringle Health Professions Scholarship (\$4,400) School of Health Professions, University of Kansas Medical Center 	Aug 2016
 Outstanding Graduate Teaching Assistant Award Department of Physical Therapy and Rehabilitation Science, University of Kansas Medical Cen 	Oct 2015 ter
 Ringle Health Professions Scholarship (\$7,000) School of Health Professions, University of Kansas Medical Center 	Aug 2015
 Undergraduate Research Grant (\$100) Undergraduate Research Council, Minnesota State University 	Oct 2012
 Certificate of Appreciation Kearney International Center, Minnesota State University 	Jan 2012, Aug 2012
 Who's Who Among Students Who's Who Among Students in American Universities & Colleges 	May 2012
 Certificate of Recognition Department of Ethnic Studies, Minnesota State University 	Oct 2010
 Dean's List College of Science, Engineering & Technology, Minnesota State University 	2010, 2011, 2012, 2013
US-Korea Dual Degree Scholarship (\$100,000) Daegu Catholic University, South Korea	2006-2007, 2010-2013
ACADEMIC MEMBERSHIP	
American Congress of Rehabilitation Medicine (ACRM)	Since 2018
American Association for the Advancement of Science (AAAS)	Since 2017
International Parkinson and Movement Disorder Society	Since 2017

WORK EXPERIENCE	
 Republic of Korea Armed Forces Hospital, Gangneung, South Korea Sergeant Army Medic at Department of Internal Medicine and Surgery 	Feb 2008-Jan 2010
 Namsan Rehabilitation Hospital, Daegu, South Korea Internship at Department of Musculoskeletal Physical Therapy 	Jun-Aug 2007
CERTIFICATION	
 Neural Networks and Deep Learning deeplearning.ai (Credential ID: 3NRXPPU5SLKA) 	Aug 2019
LEADERSHIP & VOLUNTEERING	
 University of Kansas Medical Center, Kansas City, KS Vice president of Mindfulness in Medicine - Student Interest Group 	Aug 2018-July 2019
 University of Kansas Medical Center, Kansas City, KS Social network manager of the PhD program in Rehabilitation Science 	Aug 2013-July 2019
 Greater Kansas City Science & Engineering Fair, Kansas City, MO Judge at the event held by Science City Kansas City 	Apr 2019
 Student Research Forum, Kansas City, KS Volunteer at the event held by University of Kansas Medical Center 	Apr 2019
 Helen Gold 5K/10K 2017, Overland Park, KS Volunteer at the event held by KU Parkinson's Disease Center 	Sep 2018
 Head for the Cure Run/Walk 2018, Overland Park, KS Volunteer at the event held by Head for the Cure Foundation 	Aug 2018
 Student Research Forum, Kansas City, KS Volunteer at the event held by University of Kansas Medical Center 	Apr 2018
 Greater Kansas City Race for the Cure, Overland Park, KS Volunteer at the event held by Susan G. Komen Greater Kansas City 	Oct 2017
 Walk to End Lupus Now, Shawnee, KS Volunteer at the event held by Lupus Foundation of America 	Sep 2017
 Helen Gold 5K/10K 2017, Overland Park, KS Volunteer at the event held by KU Parkinson's Disease Center 	Sep 2017
 Stroke Walk 2017, Kansas City, MO Volunteer at the event held by American Stroke Foundation 	Sep 2017
Student Research Forum, Kansas City, KS Volunteer at the event held by University of Kansas Medical Center	Apr 2017
 Stroke Walk 2016, Kansas City, MO Volunteer at the event held by American Stroke Foundation 	Sep 2016

Aug 2011-Aug 2012

• Minnesota State University, Mankato, MN Vice president of Korean Student Association