

2017 International Symposium

Evidence-Based Exercise Medicine for the Promotion of Lifelong Health

Friday, May 19th, 2017
Grand Ballroom, Baekyangnuri, Yonsei University, Seoul, Korea



FRICSS
Frontier Research Institute of
Convergence Sports Science



Department of Physical Education
Department of Sport Industry Studies



National Research
Foundation of Korea

IOC Research Centre

YISSEM

Opening Remarks

Director of the FRICSS



As the Director of the Frontier Research Institute of Convergent Sports Science (FRICSS), I sincerely welcome all for coming!

Since the foundation as the “the Research Institute of Physical Education” in 1993, the institute has been devoting to the field of sports science. In 2014, with renaming to the current name, the institution has been revitalized and made its best efforts to pursue sports science-centered convergent researches to resolve health-related social conundrums by collaborating with related research areas.

In 2015, the institute was given a valuable opportunity from the National Research Foundation to perform multidisciplinary researches entitled “Evidence-based Exercise Medicine for Lifelong Health” and our convergent research team, which consists of researchers from exercises, medical and health sciences, has been working hard on it.

Throughout this project, the institute is highly expected to contribute to expand “lifelong health”, the current social issue, and looks forward to open a new horizon for the role of convergent sports science.

In order to enrich this symposium, world class researchers are here with us. Drs. John C. Spence from University of Alberta, Darin A. Padua from University of North Carolina, Yoosik Kim from KAIST, and Sae Yong Jae from University of Seoul. I would like to thank for their fabulous contribution to this symposium.

Lastly, I would like to express my sincere appreciation to Dr. Moon-Gun Choi, the Senior Vice President for Research Affair of Yonsei University, Dr. Shin-Wook Kang, the President of Korean Alliance for Health, Physical Education, Recreation and Dance, Dr. In Sung Yeo, the Dean of the College of Sciences in Education and the National Research Foundation.

May 19, 2017
Hae Dong Lee, Ph.D.
Director of the Frontier Research Institute of Convergent Sports Science
Yonsei University

개회사

Director of the FRICSS

안녕하십니까? 융합체육과학선도연구소 소장 이 해동입니다. 우선 저희 연구소가 “건강 증진을 위한 근거 중심 운동의학적 융합연구”라는 주제로 주최하는 2017 FRICSS 국제심포지엄에 함께 해주심에 깊은 감사를 드립니다.

1993년 체육연구소로 개소하여 체육과학 연구에 매진해온 저희 연구소는 2014년에는 현재의 연구소명으로서의 개칭과 함께 운동과학을 중심으로 관련 학문 분야와의 유기적인 융복합연구 선도를 통한 문제해결형 연구소로의 도약을 위해 최선의 노력을 기울여 오고 있습니다.

감사하게도 지난 2015년 한국연구재단 대학중점연구소 지원 사업에 선정된 저희 연구소는 체육과학-의보건학-공학 융합팀을 구성하여 운동의 의학적 효과에 대한 연구 성과의 축적, 임상으로의 적용 및 사회로의 확산을 위해 노력하고 있으며, 짧은 기간이지만 가시적인 성과를 보이고 있습니다.

본 사업을 통한 저희의 노력이 사회적 욕구에 부응하여 기대수명 증가에 따른 건강수명 연장을 위한 운동과학의 역할에 대한 새로운 지평을 열기를 기대합니다.

본 심포지엄에서 국제적 선도연구 소개 및 교류의 물꼬를 터주시기 위해서 이 자리에 참석해주신 Drs. John C. Spence, Drain A. Padua, 그리고 김유식, 제세영교수님께 감사 드립니다. 더불어 바쁘신 가운데 저희를 격려해 주시기 위해 자리해 주신 연세대학교 최문근 연구부총장님, 강 신욱 한국체육학회 학회장님, 여 인성 교육과학대학 학장님, 그리고 본 사업 수행을 지원해 주신 한국연구재단 인문사회연구본부 문화융복합단에 진심으로 감사 드립니다.

마지막으로, 이 심포지엄이 함께 해주신 모든 분들이 값진 시간이 되시기를 기원합니다.

2017년 5월 19일
융합체육과학선도연구소 소장
이 해 동

Congratulatory Speech

Senior Vice President for Research Affairs, Yonsei University



Good afternoon ladies and gentlemen. I would like to welcome all participants attending the 2017 International Symposium, hosted by the Frontier Research Institute of Convergence Sports Science (FRICSS) at Yonsei University.

Yonsei University is very proud to have such a pioneering research institute like FRICSS, which has been fully committed to develop academics and society through integrated research and promotion since its founding. In 2015, FRICSS set forth new vision, 'Evidence-based Exercise Medicine for the Promotion of Lifelong Health', and it has been supported by the National Research Foundation of Korea (NRF). FRICSS with the NRF support, so far, resulted in 19 international conference presentations, more than 10 research paper published in international journals. Furthermore, the evidence-based exercise program developed by FRICSS has already been used by patients with diverse health conditions such as diabetes, cancer, hypertension and chronic back pain.

Main focus of exercise-related scientific societies has long been the enhancement of athletic performances and the prevention of injury from excessive sports activities. However, these trends have been changing to promote happier and healthier lives of ordinary people. Therefore, there has been a greater interest and higher investment in promoting Quality of Life (QoL). I believe that FRICSS plays a crucial role in meeting and accomplishing these social demands to develop and implement sports science and medicine-based exercise programs. The FRICSS research team, consisting of researchers from the College of Sciences in Education, College of Medicine, and Graduate School of Public Health, will provide the platform for such convergence research. These programs can positively affect the QoL of patients who suffer from cancer, diabetes, hypertension, degenerative osteoarthritis arthritis, back pain, and other diseases.

In this light, I believe this symposium is a wonderful opportunity to actively share ideas and seek cooperative measures of exercise medicine. I believe it will become an important stepping stone for cooperative relationship among researchers, and will help participants consider ways to promote exercise medicine study and build happiness in our society.

Finally, I would like to acknowledge the director of FRICSS and all members of the organizing committee for successfully organizing this wonderful scientific event. In particular, I would like to thank all world-class scholars including, Prof. John Spence, Prof. Darin Padua, Prof. Yoosik Kim, and Prof. Sae Young Jae, who are here today. Once again, I would like to thank and welcome all participants for being here today.

May 19, 2017
Moon Gun Choi, Ph.D.
Senior Vice President for Research Affairs
Yonsei University

축사

Senior Vice President for Research Affairs, Yonsei University

안녕하십니까?

연세대학교 융합체육과학선도연구소가 개최하는 2017년 FRICSS 국제 심포지엄에 참석해주신 국내외 학자 및 내빈 분들께 진심 어린 환영의 인사를 전합니다.

우리대학 융합체육과학선도연구소는 문제 해결형 기초 및 응용 학문으로서의 체육학이라는 새로운 패러다임 아래, 체육학의 세부 영역 간, 더 나아가 타 학문 영역과의 유기적 연대와 협동 연구를 통하여 인류상호간의 이해와 발전에 기여함을 목적으로 설립되었습니다. 그 일환의 하나로 지난 2015년 한국연구재단에서 지원하는 대학중점연구소 사업에 ‘건강 증진을 위한 근거기반 운동의학적 융합연구’라는 주제로 참여하고 있으며, 2016년도에만 19건의 국제학술대회, 10편 이상의 SCI급 논문, 전문인력의 채용 및 양성, 학술 세미나 개최, 운동프로그램의 파급, 확산 등 고무적인 결과를 도출하였습니다.

과거 체육과학은 전문적인 선수들의 경기력 향상에 초점이 맞춰져 있었지만, 최근에는 일반인들도 지대한 관심을 보이고 있습니다. 특히나 “행복한 삶의 추구”가 “운동을 통한 건강 수명 연장”을 통해 성취될 수 있다는 인식이 확산되고 있으며, 더 나아가 가장 안전하고, 경제적이며, 효율적인 방법으로서, 체육과학 및 관련 분야 연구 결과에 근거한 운동 참여를 통해 능동적으로 삶의 질 향상을 도모하고자 하는 사회적 요구가 증대되고 있기 때문이라 생각합니다.

융합체육과학선도연구소가 이러한 사회적 수요에 부응하고, 국가 경쟁력향상을 위한 신성장동력의 핵심적 역할을 잘 수행할 것으로 기대하고 있습니다. 특히 교육과학대학, 의과대학(신촌, 원주), 보건대학원 연구진으로 구성된 융합연구팀은 삶의 질 저하를 유발하는 대표적 근골격계 만성질환의 예방 및 치료를 위한 운동의학적 접근과 근거를 마련, 실질적 해결을 위한 한국형 운동 프로그램 개발 및 보급에 큰 기여를 할 것으로 믿습니다.

끝으로 본 국제 심포지엄이 성황리에 개최될 수 있도록 애써주신 융합체육과학선도연구소 소장님을 비롯한 관계자 여러분의 노고에 진심으로 감사 드리고, 특히 이 행사를 빛내기 위해 오신 Prof. John Spence, Prof. Darin Padua, 김유식 교수님, 제세영교수님께 환영의 말씀을 전합니다.

2017년 5월 19일
연세대학교 연구부총장
최 문 근

Congratulatory Speech

President of KAHPERD, Shin-Wook Kang



Dear the colleagues of physical education and sports in Yonsei University. Good afternoon? I am Shin-Wook Kang, the President of Korean Alliance for Health, Physical Education, Recreation and Dance (KAHPERD), and professor of Dankook University. It is my great honor to be invited to 2017 International Symposium hosted by the Frontier Research Institute of Convergence Sports Science (FRICSS) of Yonsei University.

I know that this symposium is to explore the roles of evidence-based exercise medicine for the promotion of lifelong health. I believe that exploring the future roles of exercise medicine at this moment is very timely because the fourth industrial revolution with artificial intelligence, robot technique and life science is the current topic of the day. It is also because the demands from the individuals and societies on exercise and health have increased as fast as the development of science technology.

Nowadays, convergence is a general trend in the world. I think the nature of this new industrial revolution is a product and fruit of the convergence. Exercise medicine is also a representative case of the convergence studies. In the past meanwhile, I could see academic and professional interests of exercise medicine were limited within athletes' injury and rehabilitation, but now it is enlarging its boundaries to healthy life of the citizens. This academic change is deserving to gain attention and will be mutually beneficial not only to sport science but also medical science.

Faculty members and alumnus in physical education and sports of Yonsei University have played a leading role in sports in Korea. Particularly, they have been leading sport science research, national sport policy and practical sport fields. This is the reason why we could not help showing our best respect and appreciation for the Yonsei colleagues' contributions and efforts.

At this time, having this international symposium hosted by the FRICSS of Yonsei University is very meaningful. I expect to have today's panel discussion be a valuable activity proposing detailed and practical strategies and alternatives for the people's health based on science evidences.

I would like to appreciate Dr. Hae Dong Lee, Director of the FRICSS, and professors at Yonsei University for their effort and devotion in preparing for this wonderful event. Besides, on behalf of the members of KAHPERD, I would specially welcome the invited speakers; Dr. John Spence of University of Alberta, Canada and Dr. Darin Padua of University of North Carolina, U.S.A.

I am sure that your efforts be a significant message to the sport scientists as well as health promotion for Korean people. I hope today's discussion turns out to be academically and professionally very meaningful. Lastly, I wish a continuous development and growth of the FRICSS.

Thank you.

May 19, 2017
Shin-Wook Kang, Ph.D.
President of KAHPERD

축사

President of KAHPERD, Shin-Wook Kang

존경하는 연세대학교 체육인 가족 여러분 안녕하십니까? 한국체육학회장 단국대학교 강신욱교수입니다. 연세대학교 융합체육과학선도연구소에서 개최하는 2017년 국제 심포지엄에 저를 초대해 주셔서 무한한 영광과 감사를 느낍니다.

이번 국제 심포지엄은 작년에 이어 평생 건강 증진을 위한 근거 기반 운동의학의 역할을 모색하는 자리로 알고 있습니다. 인공지능, 로봇기술, 생명과학으로 대변되는 제4차 산업혁명이 화두인 시기에 운동의학 분야의 미래 역할 모색은 매우 시의 적절하다고 봅니다. 과학 기술의 발전 속도나 폭만큼 운동이나 건강에 대한 개인과 사회의 요구는 점차 증가할 것으로 예측하기 때문입니다.

융합이 대세인 시기입니다. 새로운 산업 혁명도 본질은 융합의 산물이자 결정체라고 생각합니다. 운동의학도 융합 학문의 대표적인 사례일 것입니다. 과거에 운동선수들의 부상이나 재활 치료에 국한되어 있던 운동의학 분야의 학문적, 전문적 관심이 이제는 국민 모두의 건강한 삶으로 확산되는 경향을 저는 보고 있습니다. 이러한 학문적 변화는 주목 받을만한 것이고 스포츠과학뿐 아니라 의학 분야에도 상호 유익할 것입니다.

연세대학교 체육교수님들과 동문 체육인들은 현재 한국의 스포츠 현장에서 선도적인 역할을 수행하고 있습니다. 특히 스포츠과학 연구 분야와 국가 스포츠 정책, 그리고 스포츠 현장에서 연세 체육인들은 명실공히 한국 체육을 이끌고 있습니다. 연세 체육인들의 이러한 공로와 노력에 대해 체육인들은 존경과 감사의 마음을 갖고 있습니다.

그러한 여러 시점에서 연세대학교 융합체육과학선도연구소가 개최하는 금번 국제 심포지엄은 의미가 상당히 크다고 생각합니다. 오늘의 이 집단 토론회는 그야말로 과학적 근거를 바탕으로 국민 건강을 위해 구체적이고 실천적인 대안을 제시하는 소중한 자리가 될 것으로 보고 있습니다.

국제 심포지엄 준비에 만전을 기하신 이해동 연구소장님과 연세대 교수님들의 수고와 헌신에 박수를 보냅니다. 특히 학기 중 바쁜 일정에도 불구하고 한국을 방문해 주신 캐나다 앨버타 대학교의 John Spence 박사님과 노스캐롤라이나 대학교의 Darin Padua 교수님을 환영하며 한국체육학회 교수님들을 대신하여 감사의 뜻을 전합니다.

여러분들의 이러한 노력들은 스포츠과학자들에게는 물론 한국인들의 건강 증진에 중요한 메시지가 될 것이라고 확신합니다. 아무쪼록 오늘의 이 집단 토론회가 학문적으로나 전문적으로 매우 의미 있는 시간이 되기를 진심으로 기대합니다. 아울러 융합체육과학선도연구소의 무궁한 발전을 기원합니다. 감사합니다.

2017년 5월 19일
한국체육학회장
강 신 욱

Congratulatory Speech

Dean, College of Sciences in Education, Yonsei University



I would like to welcome all participants attending the 2017 International Symposium of Evidence-based Exercises Medicine for the Promotion of Lifelong Health held by The Frontier Research Institute of Convergence Sports Science (FRICSS) at Yonsei University. Yonsei Campus is the most beautiful in May.

I would like to appreciate and welcome especially the speakers who come across the Pacific Ocean, Professor John C. Spence, University of Alberta and Professor Darin A. Pauda, University of North Carolina at Chapel Hill. And also welcome Professor Yoo Sik Kim, Korea Advanced Institute of Science and Technology (KAIST) and Professor Sae Young Jae, University of Seoul. I look forward to more frequent and dynamic cooperation in research after this symposium.

FRICSS, founded in 1993 as 'the Research Institute of Physical Education', an adjunct to College of Sciences in Education, has developed a lot in the past 25 years. In 2014, 'The Research Institute of Physical Education' was renamed into 'The Frontier Research Institute of Convergence Sports Science(FRICSS)'. And in 2015 it has been chosen one of the Priority Research Centers by the National Research Foundation of Korea, and has started the blended and integrated research in Physical Education and Medicine.

Owing to the support of university headquarters, and the dedication of faculty members, and enthusiasm of the graduate students, the institute has developed as today. I would like to acknowledge faculty members and graduate students of Dept. of Physical Education, and Dept. of Sport Industry Studies, for this wonderful international symposium.

May 19, 2017
In-Sung Yeo, Ph.D.
Dean, College of Sciences in Education
Yonsei University

축사

Dean, College of Sciences in Education, Yonsei University

안녕하세요?

일년 중 연세캠퍼스가 제일 아름다운 5월에, 융합체육과학선도연구소가 개최하는 이번 국제심포지엄에 참석해주신 여러분을 진심으로 환영합니다.

특히, 멀리 해외에서 오늘 심포지엄 발표를 위해 우리 학교를 방문해주신 알버타대 스펜스 교수님과 노스캐롤라이나 대학의 파우다 교수님께 감사드립니다. 또한 서울시립대 제세영 교수님과 KAIST의 김유식 교수님께도 감사 드립니다. 이번 심포지엄을 계기로 앞으로 더욱 활발한 교류가 있기를 기대해 봅니다.

융합체육과학선도연구소는 1993년 교육과학대학 부설 '체육연구소'로 설립되어 지난 25년간 많은 변화와 발전을 거쳐 왔습니다. 2014년 체육연구소가 '융합체육과학선도연구소'로 개칭되었고, 2015년 한국연구재단의 대학중점연구소사업에 선정되어 체육과학과 의학의 융합적 연구를 본격적으로 시작하였습니다.

연구소가 이렇게 발전하게 된 데에는 학교 본부의 지원, 여러 교수님들의 노고, 많은 석박사 연구원들의 열정과 헌신이 있었기 때문입니다. 이 자리를 빌어 감사의 말씀을 드립니다. 오늘 이 국제 심포지엄 개최를 위하여 보이는 곳에서 또는 보이지 않는 곳에서 애쓰신 모든 분들께 감사 인사를 드립니다.

2017년 5월 19일
연세대학교 교육과학대학장
여인성

2017 FRICSS International Symposium

Evidence-Based Exercise Medicine for the Promotion of Lifelong Health

Friday, May 19th, 2017, 13:00 ~ 18:00
Grand Ballroom, Baekyangnuri, Yonsei University, Seoul, Korea

Program and Registration: <http://fricss.weebly.com>

Keynote Speakers



"Exercise is an Unnatural Behavior:
an Examination of the Evidence"

Dr. John C. Spence
Faculty of Physical Education & Recreation,
University of Alberta, Canada



"Return to Sport Testing and Load Management
Following ACL Injury"

Dr. Darin A. Padua
Department of Exercise and Sport Science,
University of North Carolina at Chapel Hill, USA

Invited Speakers



"PKR Activation by Cellular Double-stranded
RNAs and Its Implication on Human
Degenerative Disease"

Dr. Yoosik Kim
Department of Chemical and Biomolecular
Engineering, Korea Advanced Institute of
Science and Technology, Korea



"The Role of Cardiopulmonary Fitness on
Health Outcomes in Obesity Phenotypes"

Dr. Sae Young Jae
Department of Sport Science
University of Seoul, Korea



"Updated Evidence of Exercise Medicine for
Cancer Patients: How and Why Exercise is
Beneficial for Cancer Patients"

Dr. Justin Y. Jeon
Department of Sport Industry Studies
Exercise Medicine Center for Diabetes and
Cancer Patients, ICONS
Yonsei University, Korea



"The Epidemiology of Post-traumatic Knee &
Ankle OA - National Health Insurance Sharing
Service (NHIS) Big Data Analysis"

Dr. Sae Yong Lee
Department of Physical Education
Yonsei Institute of Sports Science and
Exercise Medicine, YISSEM
Yonsei University, Korea

Frontier Research Institute of Convergence Sports Science, Tel: 82-2-2123-4759, Email: fricss@yonsei.ac.kr

Presented by



Department of Physical Education
Department of Sport Industry Studies

Sponsored by



Program Agenda

Time	Program	Speaker
13:00~13:30	Registration/ Poster Session	
13:30~13:50	Welcome Address	
13:50~14:20	Project Introduction	Dr. Hae Dong Lee Yonsei University
	Updated Evidence of Exercise Medicine for Cancer Patients: How and Why Exercise is Beneficial for Cancer Patients	Dr. Justin Y. Jeon Yonsei University
	The Epidemiology of Post-traumatic Knee & Ankle OA - National Health Insurance Sharing Service (NHISS) Big Data Analysis	Dr. Sae Yong Lee Yonsei University
14:20~14:30	Coffee Break / Poster Session	
Session I	Evidence-based Exercise Medicine from the Perspective of Musculoskeletal Health	Moderators: Dr. Sae Yong Lee, Dr. Hyunseok Jee Yonsei University
14:30~15:20	Return to Sport Testing and Load Management Following ACL Injury	Dr. Darin A. Padua University of North Carolina at Chapel Hill
15:20~15:50	PKR Activation by Cellular Double-stranded RNAs and Its Implication on Human Degenerative Disease	Dr. Yoo Sik Kim Korea Advanced Institute of Science and Technology
15:50~16:10	Q & A	
16:10~16:20	Coffee Break / Poster Session	
Session II	Evidence-based Exercise Medicine from the Perspective of Metabolic Health	Moderators: Dr. Justin Y. Jeon, Dr. Jihye Park Yonsei University
16:20~17:10	Exercise is an Unnatural Behavior: an Examination of the Evidence	Dr. John C. Spence University of Alberta
17:10~17:40	The Role of Cardiopulmonary Fitness on Health Outcomes in Obesity Phenotypes	Dr. Sae Young Jae University of Seoul
17:40~18:00	Q & A	

Presented by


 Department of Physical Education
 Department of Sport Industry Studies

Sponsored by


 IOC Research Centre
 International Olympic Committee
YISSEM
 Youth Institute of Sports Science & Exercise Medicine

FRICSS

Frontier Research Institute of
Convergence Sports Science



FRICSS

Frontier Research Institute of
Convergence Sports Science

**Introduction to Evidence-Based Exercise Medicine for
Lifelong Health**

Dr. Hae Dong Lee
Yonsei University

**Updated Evidence of Exercise Medicine for Cancer Patients:
How and Why Exercise is Beneficial for Cancer Patients**

Dr. Justin Y. Jeon
Yonsei University

**The Epidemiology of Post-traumatic Knee & Ankle
OA - National Health Insurance Sharing Service
(NHISS) Big Data Analysis**

Dr. Sae Yong Lee
Yonsei University



Current Affiliation

Associate Professor, Department of Physical Education, Yonsei University
Director, Frontier Research Institute of Convergent Sports Science
Director, Sports-Care Techno-Design Research Center, ICONS

Education

2002 Ph.D., Biomechanics, Faculty of Kinesiology, University of Calgary
1999 M.Sc., Biomechanics, Faculty of Kinesiology, University of Calgary
1995 M.Sc., Sports Biomechanics, Department of Physical Education, Yonsei University
1993 B.A., Physical Education, Department of Physical Education, Yonsei University

Career Highlights

2015 - 2018 Principle Investigator, "Evidence-based Exercise Medicine for Lifelong Health", funded by the National Research Foundation
2015 - 2017 Associate Editor, Korean Society of Sports Biomechanics
2011 - 2013 Executive Council, International Society of Biomechanics
2006 - 2010 Research Professor, BK21 Mechatronics Research Group, Chungnam National University
2003 - 2005 Postdoctoral Research Fellow, Radiological Sciences, UCLA

Biography

Dr. Lee's research is focused on the biomechanics of the neuromuscular system. Expertise is in the area of adaptation of skeletal muscle-tendon complex to altered loading environment, aging, rehabilitation from injuries, exercise and training. Within this area, work is carried out experimentally and theoretically at in vivo levels. In addition, he has been collaborating with researchers from various areas, such as biomedical, electrical, and cloth & textile engineering, and orthopedics and rehabilitation medicine, for convergent sports science researches.

Introduction to Evidence-based Exercise Medicine for Lifelong Health

As many other countries, we, Koreans, faces serious social and economic burden, which results from an unprecedented increase in aging population in history. As one of ways to resolve this pending issue, the institution is given to a task by the National Research Foundation (NRF) to promote "Evidence-based Exercise Medicine" as a prevention and treatment option for fatal and chronic diseases.

In order to achieve this object, the institution organized a convergent research team from exercise medicine, and health sciences. After setting forth a vision that "healthier life for happier life", the institution will focus on collecting and accumulating the evidence for supporting the statement that "if exercise could be packed in a pill, it would be the single most widely prescribed and beneficial medicine" by Robert N. Butler (Director, the National Institute on Aging (NIA)).

Specifically, the institution will focus on providing "evidence-based exercise medicine" for the top three life-threatening fatal diseases (cancer, hypertension, and diabetes) and the two most common chronic musculoskeletal diseases (osteoarthritis and low back pain).

Expected Contributions

- Throughout the convergent researches, our efforts will raise the importance of multidisciplinary collaborative researches and create future research collaboration environment. Based on it, the institution is expecting to play important roles as a leading international research institution.
- The outcomes of this project are expected to contribute to create new paradigms in future physical education.
- This effort is expected to influence the formation of new policies and the creation of future sociocultural paradigm.



Current Affiliation

Professor and Chair, Department of Sport Industry Studies, Yonsei University
Professor, Cancer Prevention Center, Yonsei Cancer Center, Yonsei University College of Medicine
Head, Exercise Medicine Center for Diabetes and Cancer Patients (ICONS)

Education

2003 Ph.D., Department of Physical Education & Recreation, University of Alberta,
1998 M.S., Department of Physical Education & Recreation, University of Alberta
1995 B.A., Department of Physical Education, Yonsei University

Career Highlights

2005 - Present Professor, Department of Sport Industry Studies, Yonsei University
2011 - 2012 Visiting Professor, Dana Farber Cancer Institute, Harvard Medical School, Boston, USA
2003 - 2005 Research Fellow, Joslin Diabetes Center, Beth Israel Deaconess Medical Center,
Harvard Medical School, Boston, USA

Biography

Justin has various research experiences on exercise and health from molecular biology, animal science, physiology, endocrinology, clinical and epidemiology studies in three different countries including South Korea, Canada and United States. Justin has either led or been integrally involved with 16 completed trials investigated the effects of exercise on various diseases among people with and without disabilities (Spinal cord injured, Children with Epilepsy, Obese children, Obese adolescents, Obese adults, Type 2 diabetic and Cancer patients) and currently the PI or co-investigator on 6 ongoing trials investigating the role of exercise in cancer population including colorectal, breast, prostate, blood cancer patients. Justin Jeon has also led several epidemiological studies which investigated the effects of fatness and fitness on metabolic diseases among adolescents and adults.

Justin has published more than 150 research articles (Over 80 journal articles in SCI or SCIE) His research publications have been cited more than 2300 times with h-index 24 and i10-index of 48 (scholar.google.com)

Updated Evidence of Exercise Medicine for Cancer Patients: How and Why Exercise is Beneficial for Cancer Patients

The therapeutic effect of exercise on cancer survivors has been reported. The meaning of therapeutic is 'relating to the healing of disease or the branch of medicine concerned with the treatment of disease and the action of remedial agent'. Due to many scientific research, very few would argue that exercise can be a therapeutic tool for cancer survivor. However, what does it really mean that exercise can be therapeutic for cancer survivors? Is exercise beneficial in preventing cancer or beneficial in improving the prognosis of cancer? Does exercise improve cancer-related and non-cancer related symptom management and eventually improve the quality of life of cancer survivors? The meta-analysis studies consistently reported that the higher level of physical activity participation is associated with reduced risk of various cancers, including colorectal, breast, stomach, lung and prostate cancer. Furthermore, the higher level of physical activity participation is also associated with significant reduction in cancer recurrence and the risk of mortality in various cancer. The mechanism on how exercise participation would prevent cancer and improve cancer prognosis includes exercise-induced change in circulating insulin, growth factors, adipocytokines, immune function, and more recent epinephrine and interleukine-6 dependent NK cell mobilization. Now, there is enough evidence suggesting the benefit of exercise on cancer prevention and cancer prognosis.

On the other hand, most cancer survivors suffer from treatment-related side effects as well as non-treatment related musculoskeletal disorders. These conditions include urinary and bowel incontinence, peripheral neuropathy, low level of physical fitness, reduced range of motion due to surgery, and joint problems. Our surveys at the Cancer Prevention Center showed that up to 80 percent of our cancer survivors complain about joint problems, especially on the knee, lower back, shoulder, and neck. Therefore, we can speculate that cancer survivors would get benefit from strengthening exercises as well as the aerobic type of exercise. Furthermore, the providence of cancer-specific exercise program is necessary since cancer survivors are very different based on the type of cancer and cancer treatments.

In this presentation, I will first discuss about the process of evidence-based exercise development for cancer survivors. Then, I will report the result of recent exercise trial on survivor with prostate cancer, using information technology (IT) device. Lastly, I will talk about relationship between energy balance and tumor development and potential exercise related therapeutic intervention model for cancer prevention.



Current Affiliation

Assistant Professor, Department of Physical Education, Yonsei University
Director, Yonsei Institute of Sports Science and Exercise Medicine

Education

2009 Ph.D., Sports Medicine, Department of Kinesiology, University of Virginia
2005 M.S., Athletic Training, (CAAHEP Accredited Entry-Level Graduate Program), Department of Exercise and Sport Science, University of North Carolina
2002 Ph.D., Sports Biomechanics, Department of Kinesiology, Yonsei University
1998 M.S., Sports Biomechanics, Department of Kinesiology, Yonsei University
1996 B.A., Physical Education, Department of Physical Education, Yonsei University

Career Highlights

2014 - Present Department Chair, Department of Physical Education, Yonsei University
2012 - Present Assistant Professor, Department of Physical Education, Yonsei University
2009 - 2012 Assistant Professor, Department of Kinesiology and Sport Sciences, the University of Miami
2010 - Present Founding Lab Director, Sports Medicine and Motion Analysis Laboratory

Biography

Dr. Lee's research as an athletic trainer has been focusing on recovery from damage of sport players to exhibit their maximal performance, however, the subjects are not limited only within sport players but normal persons. Specifically, work is carried out for the effect of preceded knee damages (especially, anterior cruciate ligament injury) on knee osteoarthritis (OA) by analyzing big data from the National Health Insurance Service (NHIS) and develop prognostic technique utilizing epidemiological data extracted from the NHIS and biomechanical characteristics of OA patients. Another multidisciplinary way of analysis is also about to be done by comparison between the physiological characteristics of OA patients and that of normal persons to extract the risk factors affecting pathogenesis of OA.

The Epidemiology of Post-traumatic Knee & Ankle OA- National Health Insurance Sharing Service (NHIS) Big Data Analysis

The epidemiological study of post-traumatic osteoarthritis after knee or ankle ligament injuries using National Health Insurance Service (NHIS) 514,866 cohort data: Retrospective cohort study.

Various knee and ankle injuries associated with ligament such as cruciate ligament injury (CL) or ankle sprain (AS) have been established as a significant risk factor for developing osteoarthritis (OA). However, research using big cohort sample to examine relationship between traumatic ligament injury and OA have not been conducted yet. The purpose of this study is to examine the impact of knee and ankle ligament injury and other related knee joint structures on the development of OA using National Health Insurance Service (NHIS) cohort data.

The subjects consist of a total of 448,754 randomly selected 514,866 NHIS cohort group (age, 53.06 ± 9.75 years; BMI, 24.02 ± 2.95) between 2002 and 2013. Individual with knee injury regardless of accompany of other knee structural damage and ankle sprains in year 2002 were prospectively followed-up until 2013. To identify the risk of CL injury and other related knee joint structures on the development of OA. Injured patients were divided into three groups: CL injury with multiple knee joint ligament damage (LC); CL injury with meniscus damage (MC); single CL injury (SC). In the case of ankle, to determine whether there were differences of risk depending on time period, two subgroups were divided by the timeline; less than 5 years and more than 5 years from the ankle.

A total of 2,514 CL patients and 7,591 AS patients were found in 2002 and followed-up until 2013. SC (OR, 2.62; CI, 2.23-3.04), MC (OR, 2.57; CI, 1.99-3.33) and LC (OR, 1.95; CI, 1.73-2.21) demonstrated 2.62, 2.57, and 1.95 times greater to exacerbate OA than control group respectively. In addition, LC and MC is approximately 1.3 times greater risk to develop OA than SC (OR, 1.34; CI, 1.47-1.50) and MC (OR, 1.32; CI, 0.99-1.76). However, LC was not a significant factor in developing into OA compared with MC as with SC. In the case of ankle, the patients with ankle ligaments injuries were 2.3 times more likely to develop ankle OA than patients without injuries during whole 11 years (OR: 2.29; CI: 2.12 – 2.50). The patients with ankle ligaments injuries were 2.8 times more likely to develop ankle OA than patients without injuries within 5 years (OR: 2.81; CI: 2.47 - 3.31). Likewise, the patients with injuries were 2.1 times more likely to advance to OA than controls during 2008-2013 (OR, 2.10; CI, 1.91-2.33).

This study clearly provide evidence that knee and ankle joint injuries are as high as approximately 2.5 times greater risk of exacerbating OA than control group. Therefore, in addition to strategies for OA prevention, traumatic injury prevention strategies that can develop the OA should be considered, and clinicians should consider appropriate treatment options for patients with traumatic injuries and adjustment of patients' exercise frequency to prevent progression to OA.

FRICSS

Frontier Research Institute of
Convergence Sports Science



FRICSS

Frontier Research Institute of
Convergence Sports Science

**Evidence-Based Exercise Medicine from
the Perspective Musculoskeletal Health**

Moderators

Dr. Sae Yong Lee, Dr. Hyunseok Jee
Yonsei University

**Return to Sport Testing and Load
Management Following ACL Injury**

Dr. Darin A. Padua

University of North Carolina at Chapel Hill

**PKR Activation by Cellular Double-stranded
RNAs and Its Implication on Human Degenerative
Disease**

Dr. Yoosik Kim

Korea Advanced Institute of Science and
Technology



Current Affiliation

Professor and Chair, Department of Exercise and Sport Science, University of North Carolina at Chapel Hill
Director, Sports Medicine Research Laboratory

Education

2001 Ph.D., Sports Medicine, School of Medicine, University of Virginia
1998 M.A., Sport Medicine, Department of Exercise and Sport Science, University of North Carolina at Chapel Hill
1996 B.S., Athletic Training, School of Exercise and Nutritional Sciences, San Diego State University

Career Highlights

2013 - Present Chair, Department of Exercise and Sport Science, University of North Carolina at Chapel Hill
2001 - Present Professor, Department of Exercise and Sport Science, University of North Carolina at Chapel Hill

Biography

Dr. Padua serves as a Professor and Chair of Exercise and Sport Science and Director of the Sports Medicine Research Laboratory. He is an adjunct faculty member in the following Departments at UNC: Orthopaedics, Biomedical Engineering, and Allied Health Sciences. Over the past 15 years, Dr. Padua's research has focused on the prevention of sport-related musculoskeletal injuries. Specifically, his research centers on understanding the role of movement quality and biomechanics in ACL and other lower extremity injuries. In addition his work seeks to develop effective interventions to prevent ACL and other lower extremity injuries during sport.

In support of this research, Dr. Padua has been the recipient of multiple research grants, and has published over 100 journal articles and textbook chapters related to the prevention of sport-related musculoskeletal injury. In 2006, Darin was awarded the Young Investigator Award by the National Athletic Trainers' Association. In 2008 he was awarded the O'Donoghue Sports Injury Research Award for the most outstanding sport injury related research paper by the American Orthopaedic Society for Sports Medicine. He attained Fellow status in the American Academy of Kinesiology in 2013 and in 2015 he was received the Most Distinguished Athletic Trainer Award by the NATA. In 2017 he received the highest form of research recognition from the National Athletic Trainers' Association in being the 14th individual ever awarded the Medal for Distinguished Research in Athletic Training.

Summary of the project

Dr. Darin A. Padua, University of North Carolina at Chapel Hill

Return to Sport Testing and Load Management Following ACL Injury

Injuries to the Anterior Cruciate Ligament are common, costly and often lead to long term disability due to the early development of knee osteoarthritis. Recent research demonstrates that secondary ACL injury occurs in over 1/3 of those individuals who return to sport, which further increases the risk of early onset knee osteoarthritis and reduced lifelong physical activity. As such, there is a great need to identify strategies to reduce the risk of secondary knee injury and subsequent knee osteoarthritis.

Utilization of systematic and multi-component return to sport testing protocols may help to better identify when an individual is ready to safely return to sport following ACL injury and subsequent reconstruction. The focus of this presentation will be to outline a systematic approach for return to sport testing that may be implemented in both laboratory and clinical settings.



Current Affiliation

Assistant Professor, Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology (KAIST)

Education

2011 Ph.D., Chemical and Biological Engineering, Department of Chemical and Biological Engineering, Princeton University

2008 M.A., Chemical and Biological Engineering, Department of Chemical and Biological Engineering, Princeton University

2006 B.E., Chemical and Biochemical Engineering, Thayer School of Engineering, Dartmouth College

2006 A.B., Engineering Sciences modified with Chemistry, Thayer School of Engineering, Dartmouth College

Career Highlights

2016 - Present Assistant Professor, Department of Chemical and Biomolecular Engineering, KAIST

2011 - 2015 Postdoctoral Researcher, School of Biological Sciences, Seoul National University

Biography

Dr. Kim's research is focused on identifying cellular double-stranded RNAs (dsRNAs) and investigating their function as a new class of signaling molecules. dsRNAs are originally believed as a signature of virus and induce immune response when introduced to human cells. His previous research, however, showed that human cells naturally express cellular dsRNAs that can provide signaling cues to govern cellular processes such as the cell cycle. His research lab combines experimental (molecular biology) and computational (bioinformatics) approaches to examine physiological function of cellular dsRNAs. Specifically, they are interested in establishing dsRNAs as a biomarker that detects early sign of degenerative disease and in developing novel therapeutics that targets these noncoding RNAs.

PKR Activation by Cellular Double-stranded RNAs and Its Implication on Human Degenerative Disease

Protein kinase RNA-activated (PKR) is a ubiquitously expressed enzyme well known for its roles during immune response. Upon binding to viral double-stranded RNAs (dsRNAs), PKR undergoes dimerization and autophosphorylation. Phosphorylated PKR (pPKR) then suppresses global translation and regulates multiple signaling pathways in infected cells. However, growing evidence suggests that PKR can be activated even in uninfected cells. Moreover, pPKR is commonly observed in patients with degenerative diseases such as Alzheimer's disease. Consistent with this, recent findings reveal that human cells naturally express cellular dsRNAs that can lead to PKR phosphorylation. In this talk, we present our recent effort to identify cellular dsRNAs using high-throughput sequencing. We find that various noncoding RNAs interact with PKR. Surprisingly, the majority of the PKR-interacting RNA repertoire is occupied by mitochondrial RNAs (mtRNAs). Owing to bidirectional transcription of mitochondrial genome, mtRNAs can form intermolecular dsRNAs that are recognized by PKR. In addition, PKR activation by cellular dsRNAs is counteracted by PKR phosphatases, disruption of which causes apoptosis from PKR over activation without any external stimuli. Our work unveils dynamic regulation of PKR where fine balance between PKR activation by cellular dsRNAs and PKR deactivation by phosphatases is required to ensure cell survival. In this talk, we try to connect PKR activation by cellular dsRNAs and the onset of human degenerative disease.

FRICSS

Frontier Research Institute of
Convergence Sports Science



FRICSS

Frontier Research Institute of
Convergence Sports Science

**Evidence-Based Exercise Medicine from
the Perspective Metabolic Health**

Moderators
Dr. Justin Y. Jeon, Dr. Jihye Park
Yonsei University

**Exercise is an Unnatural Behavior:
An Examination of the Evidence**

Dr. John C. Spence
University of Alberta

**The Role of Cardiopulmonary Fitness on Health
Outcomes in Obesity Phenotypes**

Dr. Sae Young Jae
University of Seoul



Current Affiliation

Professor & Vice Dean, Faculty of Physical Education & Recreation, University of Alberta
Adjunct Researcher, Canadian Fitness and Lifestyle Research Institute

Education

1998 Ph.D., Science, School of Graduate Studies, Concordia University
1991 M.S., Psychology of Sport, Department of Physical Education, McGill University
1987 B.A., Psychology, Department of Psychology, McGill University

Career Highlights

2016 - Present Vice Dean, Faculty of Physical Education and Recreation, University of Alberta
2011 - Present Professor, Faculty of Physical Education and Recreation, University of Alberta
2004 - 2011 Associate Professor, Faculty of Physical Education and Recreation, University of Alberta
2001 - 2004 Assistant Professor, Faculty of Physical Education and Recreation, University of Alberta

Biography

Dr. Spence has expertise in the area of behavioural medicine and research methods. His research focuses on both the benefits and determinants of physical activity and how physical inactivity and sedentary behaviour are related to obesity. Dr. Spence has studied the broad social determinants (e.g., SES) and population physical activity patterns. More recently, he has focused on (a) the physical environment and how it may influence physical activity choices and risk for obesity among both children and adults (e.g., urban form, location of food establishments); and (b) the role of policy initiatives such as tax credits for promoting physical activity. Dr. Spence has a strong background in physical activity measurement, meta-analysis, and ecological models of behaviour and health.

Summary of the project

Dr. John C. Spence, University of Alberta

Exercise is an Unnatural Behavior: An Examination of the Evidence

Humans did not evolve to make rational choices about what to eat (energy intake) or to be physically active (energy expenditure) in conditions of abundance. Thus, to understand engagement in physical activity and sedentary behaviour, we need to recognize the conditions and environments that humans experienced over the past 250,000 years. In this presentation I discuss the biological and cultural factors that influence movement behaviour and our drive to seek efficiencies in energy expenditure. Finally, I present several options for addressing physical inactivity in a modern world.



Current Affiliation

Professor, Department of Sport Science, University of Seoul
Director, Health and Integrative Physiology Laboratory

Education

2003 Ph.D., Sports Science, College of Sport Science, Sungkyunkwan University
1994 M.E., Sports Science, College of Sport Science, Sungkyunkwan University
1989 B.E., Physical Education, College of Education, Sungkyunkwan University

Career Highlights

2007 - Present Professor, Department of Sport Science, University of Seoul
2007 - Present Associate Dean, College of Art and Physical Education, University of Seoul

Biography

Dr. Jae is currently a Professor of Sport Science and the director of the Health and Integrative Physiology Laboratory at the University of Seoul, South Korea. Dr. Jae served 11 years as a Clinical Exercise Physiologist in the Center for Health Promotion and Sports Medicine at Samsung Medical Center, Seoul, South Korea. Dr. Jae was a postdoctoral Research Fellow supported by the American Heart Association in Cardiovascular Exercise Research Laboratory of the Kinesiology and Community Health Department at the University of Illinois at Urbana-Champaign, USA. Dr. Jae's research interests are in the areas of physical inactivity and exercise with a specialization on vascular structure and function in health, disease and disability throughout the human lifespan. In addition, His research is focused on the interaction of risk factors and cardiorespiratory fitness on incident hypertension, metabolic syndrome, type 2 diabetes and cardiovascular mortality in the areas of physical activity epidemiology. He has published extensively on the role of exercise or cardiorespiratory fitness on modulating cardiovascular function in various high-profile journals within the areas of cardiology, physiology, and rehabilitation. Dr. Jae has received several awards for research from the Pulse of Asia Society, Korean Diabetes Association and Korean Circulation Society. Dr. Jae serves as an Editorial Board Member of the *Medicine & Science in Sports & Exercise*.

The Role of Cardiopulmonary Fitness on Health Outcomes in Obesity Phenotypes

Obesity is associated with an increased risk of morbidity and mortality from cardiometabolic diseases, but not all obese individuals are at increased risk. This phenotype of obesity is referred to as “metabolically healthy obesity (MHO).” MHO describes a cohort of the obese population with relatively low risk of cardiovascular and metabolic diseases. Although MHO has favorable metabolic profiles such as insulin sensitivity, low inflammatory markers, and low body fat, there remains a substantial unexplained variance. Lifestyle factors may play a large role in why a subset of the obese individuals do not present the obesity-related cardio-metabolic outcomes.

Several studies have shown that levels of physical activity and cardiopulmonary fitness increase in MHO when compared to the metabolically unhealthy obese individuals. Cardiopulmonary fitness has a strong protective effect against cardiovascular disease and is inversely associated with obesity and metabolic risk factors. Moreover, high cardiopulmonary fitness attenuates the risk of mortality in individuals with a greater body mass index or adiposity, using either fatness, or the obesity paradox. Therefore, high cardiopulmonary fitness may provide protection against adverse cardiovascular health outcomes in MHO individuals. Despite the strong and consistent evidence supporting that a high cardiopulmonary fitness is a major predictor of a healthier metabolic profile, major studies related to the metabolically healthy obesity phenotype have overlooked the impact of cardiopulmonary fitness when examining this phenotype and its prognosis. In this presentation, the available scientific evidence regarding the favorable influence of cardiopulmonary fitness on the health outcomes in individuals with MHO will be introduced.

FRICSS

Frontier Research Institute of
Convergence Sports Science

Poster Exhibition

No.	Title
1	Reduced Plantar Cutaneous Sensation Alters Static Postural Control with Chronic Ankle Instability Tae Gyu Kang, Kyeon Tak Song, Sung Cheol Lee, Sae Yong Lee 2016 ACSM Annual Meeting, 2016, May 31~Jun 4, Boston, Massachusetts, USA
2	Ankle Biomechanics and Jump Performance on Healthy and Chronic Ankle Instability Individuals during Landing: A Triple Blind Randomized Clinical Trial of Ankle Taping Efficacy Hyung-pil Jun, Youngmin Chun, Jinah Kim, Russell Baker, Jeff Seegmiller, Sae Yong Lee IOC World Conference on Prevention of Injury and Illness in Sport, 2017, March 15-18, Grimaldi Forum, Monaco
3	Ethnic Differences in Lower Extremity Dynamic Postural Measures as Potential Risk Factor for Anterior Cruciate Ligament (ACL) Injury Chang-Young Kim, Young-Min Chun, Sae Yong Lee IOC World Conference on Prevention of Injury and Illness in Sport, 2017, March 15-18, Grimaldi Forum, Monaco
4	Comparison of Static Lower Extremity Alignment between Korean and Caucasian Youngmin Chun, Sae Yong Lee National Athletic Trainer's Association, Clinical Symposia & AT Expo, 2016, Jun 22~25, Baltimore, Maryland, USA
5	Characteristics of Static and Dynamic Lower Extremity Posture in Patients with Patellofemoral Pain: A Meta-Analysis. Jung S, Chun Y, Shenavai N, Lee SY National Athletic Trainer's Association, Clinical Symposia & AT Expo, 2016, Jun 22~25, Baltimore, Maryland, USA
6	Immediate Effects of Therapeutic Tappings on Pain, Muscle Activation, and Kinematics in Patellofemoral Pain during Stair Descent Jun H, Kuenze C, Lee SY, Eltoukhy M, Signorile J National Athletic Trainer's Association, Clinical Symposia & AT Expo, 2016, Jun 22~25, Baltimore, Maryland, USA
7	Characteristics between Osteoarthritis and No-Osteoarthritis after Anterior Cruciate Ligament Injury: A Systematic Review and Meta-Analysis Boae Son, Soyoung Lee, Jinah Kim, Sae Yong Lee National Athletic Trainer's Association, Clinical Symposia & AT Expo, 2016, Jun 22~25, Baltimore, Maryland, USA

Poster Exhibition

No.	Title
8	Organized Sports, Self-Rated Health and Psychological Well-Being among South Korean Adolescents Yoon Kyung Song, Eun-Young Lee, Justine Y. Jeon The 6th ISPAH Congress, 2016, Nov 16- 19, Bangkok, Thailand
9	Sedentary Behavior and Health Indicators in South Korean Children and Youth: A Systematic Review Hyuk In Yang, Eun-Young Lee, Yoonkyung Song, Justin Y. Jeon The 6th ISPAH Congress, 2016, Nov 16-19, Bangkok, Thailand
10	South Korea's 2016 Report Card on Physical Activity for Children and Youth Yoonkyoung Song, Hyuk In Yang, Eun-Young Lee, Mi-Seong Yu, Min Jae Kang, Yeon Soo Kim, Hyun Park, Han Joo Lee, Sang-Hoon Seo, John C. Spence2, Justin Y. Jeon The 6th ISPAH Congress, 2016, Nov 16-19, Bangkok, Thailand
11	Handgrip Strength as Potential Predictor for Metabolic Syndrome Ji Yong Byeon, Mi Kyung Lee, Yoon Kyung Song, Justin Y. Jeon 2016 ACSM Annual Meeting, 2016, May 31~Jun 4, Boston, Massachusetts, USA
12	Characteristics of Physical Activity and Psychological Factors in Colorectal Cancer Patients Undergoing Chemotherapy Hyuna Park, Min-Jae Kim, Ji Hee Min, Junga Lee, Min Kyu Jung, Joong Bae Ahn, Justin Y. Jeon 2016 ACSM Annual Meeting, 2016, May 31~Jun 4, Boston, Massachusetts, USA
13	Effect of inpatient Exercise Program on Colorectal Cancer Patients after Surgery: A Randomizes Controlled Trial Ji hee Min, Ki-yong Ahn, Hyuna Park, Wonhee Cho, Nam-kyu Kim, Justin Y. Jeon 2016 ACSM Annual Meeting, 2016, May 31~Jun 4, Boston, Massachusetts, USA
14	Resting Heart Rate as a Prognostic Factor for Mortality in Patients with Breast Cancer Dong Hoon Lee, Seho Park, Sung Mook Lim, Mi Kyung Lee, Edward L. Giovannucci, Joo Heung Kim, Seung Il Kim, Justin Y. Jeon Breast Cancer Res Treat (2016), 159(2), 375-384, doi: 10.1007/s10549-016-3938-1
15	Meta-Analysis of Influence of Participation of Elderly Athletic Academy Jung-sup Bae, Hyun Byun 2017 FRICSS International Symposium, 2017, May 19, Seoul, Korea

Poster Exhibition

No.	Title
16	<p>Relations among Service Quality, Customer Satisfaction, Loyalty, and Perception of Safety at Korean Water Theme Parks</p> <p>Han, Uri Ro, Han, Jee Hoon, Park, Kwang Won, Kim, Min Jeong, Lee, Chul Won The 2th International Water Safety Symposium, 2016, June 22~ 24, Songdo, Incheon, Korea</p>
17	<p>Gender Difference Affects Physiological Markers more than Different Exercise Modalities in ACL Patients: Big Data Analysis from NHISS</p> <p>Hyunseok Jee, Sae Yong Lee 2017 FRICSS International Symposium, 2017, May 19, Seoul, Korea</p>
18	<p>Association between The Level of Self-Reported Physical Activity and Quality of Life and among Cancer Survivors</p> <p>Ji-Hye Park, Seung Il Kim, Nam Kyu Kim, Justin Y. Jeon, 2017 FRICSS International Symposium, 2017, May 19, Seoul, Korea</p>
19	<p>Expression of T-Lymphocyte Markers in Human Epidermal Growth Factor Receptor 2-Positive Breast Cancer</p> <p>Changro Lee, Seho Park, Joo Heung Kim, Sung Mook Lim, Hyung Seok Park, Seung Il Kim, Byeong-Woo Park Journal of Breast Cancer (2016),19(4), 385-93, Doi: https://doi.org/10.4048/jbc.2016.19.4.385</p>

※ The above abstracts are from the researches partially supported by NRF-2015S1A5B8036349 and presented elsewhere in 2015~2016.



FRICSS

Frontier Research Institute of
Convergence Sports Science