出國報告（出國類別：國際會議）

13th Annual Congress of the European College of Sport Science

“第十三屆歐洲運動科學會議”

服務機關：國立臺灣體育大學(臺中)
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派赴國家：葡萄牙
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報告日期：**2008** 年 **7** 月 **30** 日

摘要

在葡萄牙艾斯托利爾會議中心 (Estoril Congress Centre, Portugal) 舉辦的「第十三屆歐洲運動科學會議 13th Annual Congress of the European College of Sport Science」由於歐洲運動科學會議已連續舉辦多年，規模盛大，在世界體育運動界享有盛名，共有來自世界各地國家的運動科學相關領域的學者和研究生參加，並進行了數百篇的原創性學術論文發表，論文包含運動力學、運動醫學、運動復健、運動傷害、運動營養、運動生理、運動生化、體重控制、運動訓練、運動適應、特殊體育、幼兒體育、青少年體育、老年體育、婦女與運動、身體活動、體適能、運動心理、運動處方、運動競技、休閒運動、運動管理、運動行銷、運動社會學….等等近百個運動相關項目在不同時段與不同廳堂舉行。此行我們共有教師6位與研究生12位出席，並發表18篇論文，與世界各大學運動科學相關領域的學者和研究生面對面進行學術交流，師生收穫良多。

目次

一、目的

體育相關碩士研究生爲未來體育運動相關研究的專業人員基石，爲了拓展教師與這些基礎學術人員的國際觀與專業研究態度，遂運用本年度改制大學的相關經費參與國際研討會，我們此行共有教師 6 位與研究生 12 位出席「第十三屆歐洲運動科學會議 13th Annual Congress of the European College of Sport Science」，並發表 18 篇論文，交換體育運動學術研究的心得，進而增進各國體育運動學術領域的相互了解。

二、會議過程

「第十三屆歐洲運動科學會議 13th Annual Congress of the European College of Sport Science」的舉辦日期爲 2008 年 7 月 9 日至 7 月 12 日，爲期 4 天。由於我們參與師生屬於不同科系與研究室，再者國際燃油大漲，航班減少，機位不足以及每一參與人員時間因素，爲了全程參與學術活動，6 位教師與 12 位研究生分別不同時間班機，由於出發不同時間班機，因此回程也不同，大多數搭程德航由法蘭克福轉西班牙，再飛葡萄牙，有的經北歐轉機，但皆在 7 月 9 日開幕當天抵達會場葡萄牙艾斯托利爾會議中心 (Estoril Congress Centre, Portugal)。

此次的學術會議主題近百個運動相關項目在不同時段與不同廳堂舉行，包括了下列：

WEDNESDAY, JULY 9TH, 2008

15:15 - 16:45

IS-SH02 Physical Education and Teacher Preparation - Present and Future

OP-BN01 Biomechanics 1

OP-PM01 Physiology 1 – Adaptation

OP-TT01 Training and Testing 1

OP-PE01 Physical Education 1 - Teachers Aspects

OP-HF01 Health and Fitness 1

OP-ML01 Motor Learning 1

OP-NU01

Nutrition 1

IS-SH01 Challenges on children sport

17:15 - 18:45

PS-1 Genetics: The impact of molecular technology on the future of sports

THURSDAY, JULY 10TH, 2008

08:30 - 10:00

IS-SH03 Technology and performance in sport: historical perspectives

IS-PM01 Angiogenesis and exercise

OP-PM02 Physiology 2 – Immunology

OP-MB01 Molecular Biology

OP-RE01 Rehabilitation 1IS-BN02

Neuromechanics in aging

08:30 - 09:45

OP-HF02 Health and Fitness 2

08:30 - 10:00

OP-SM01 Sports Medicine 1

OP-PM03 Physiology 3 –

NeuromuscularIS-PM02 GSK Symposium: Nutrition for running

10:15 - 11:45

IS-PM03 Features of the metabolic syndrome in children

OP-TT02 Training and Testing 2

OP-PM04 Physiology 4 – Neuromuscular

OP-PS01 Psychology 1

OP-SO01 Sociology 1IS-SH04 Physical activity and children's health

OP-PM06 Physiology 6 – Adaptation

10:15 - 11:30

OP-PE02 Physical Education 2 - Training, Coaching

10:15 - 12:00

OP-PM05 Physiology 5 – Conditions

10:15 - 11:45

IS-BN03 Biomechanics and performance in elite sports

12:00 - 13: 15

PS-2 Metabolic syndrome - Obesity & Diabesity14:

15 - 15:15

PP-MB01 Molecular Biology 1

PP-PE01 Physical Education 1

PP-PM01 Physiology 1

PP-PS01 Psychology 1

PP-RE01 Rehabilitation 1

PP-SM01 Sports Medicine 1

PP-TT01 Training and Testing 1

PP-PE02 Physical Education 2

PP-TT02 Training and Testing 2

PP-SO01 Sociology 1

PP-SM02 Sports Medicine 2

PP-BN01 Biomechanics 1

PP-HF01 Health and Fitness 1

PP-ML01 Motor Learning 1

PP-NU01 Nutrition 1

PP-HF02 Health and Fitness 2

PP-PM02 Physiology 2

PP-NU02 Nutrition 2

PP-BI01 Biochemistry 1

PP-SS01 Social Sciences

115:15 - 16:45

IS-BN04 Advances in biomechanical analysis of performance in the field

OP-TT03 Training and Testing 3

OP-PM07 Physiology 7 – Energetics

OP-BI01 Biochemistry 1

OP-PS02 Psychology 2

IS-PM04 Detection of genetic predisposition for performance and disease

OP-HF03 Health and Fitness 3 – Elderly

OP-BN02 Biomechanics 2 - Sports

OP-PM08 Physiology 8 - Chronic conditions

IS-PM05 Exercise and the brain: clinical implications17:15 - 18:45

IS-PM07 Elite triathlon

OP-TT04 Training and Testing 4 – Performance

OP-PM09 Physiology 9 – Cardiovascular

17:15 - 19:00

OP-TT05 Training and Testing 5 – Training

17:15 - 18:45

OP-PS03 Psychology 3 – Motivation

IS-BN05 Talent: identification and promotion

OP-HF04 Health and Fitness 4 – Disease

17:15 - 19:00

OP-SM02 Sports Medicine 2 – General

OP-PM10 Physiology 10 - Thermoregulation1

7:15 - 18:45

IS-PM06 ACSM Exchange Symposium. Clinical sports medicine - pre-participation screening

FRIDAY, JULY 11TH, 2008

08:30 - 10:00

IS-PM08 Intermittent hypoxia for the improvement of performance

OP-PE03 Physical Education 3 - Youth

OP-HF05 Health and Fitness 5 – Children

OP-TT06 Training and Testing 6 – Failure

OP-SM03 Sports Medicine 3 - Elite Athletes IS-SH05 Gender and football

OP-HF06 Health and Fitness 6 – Obesity

OP-PS04 Psychology 4 - General 1

OP-NU02 Nutrition 2IS-BN06 Specificity in training and testing

10:15 - 11:45

IS-BN07 What is controlling muscle tendon output?

OP-BN03 Biomechanics 3 – Neuromuscular

10:15 - 12:00

OP-BI02 Biochemistry 2

10:15 - 11:45OP-TT07

Training and Testing 7 – Testing

OP-PS05 Psychology 5 – Coaching

IS-SH06 Decision-making in soccer

OP-HF07 Health and Fitness 7 - Risk factors.

OP-RE02 Rehabilitation 2 - Lower Limb

OP-PH01 PhilosophyIS-PM09 Mechanisms leading to the metabolic syndrome

12:00 - 13:15

PS-3 Injury prevention & motivated intervention programmes

14:15 - 15:15

PP-HF03 Health and Fitness 3

PP-PM03 Physiology 3

PP-NU03 Nutrition 3

PP-BI02 Biochemistry 2

PP-MB02 Molecular Biology 2

PP-ML02 Motor Learning 2

PP-PS02 Psychology 2

PP-RE02 Rehabilitation 2

PP-SS02 Social Sciences 2 Economics

PP-PE03 Physical Education 3

PP-TT03 Training and Testing 3

PP-BN02 Biomechanics 2

PP-SM03 Sports Medicine 3

15:15 - 16:45

IS-BN08 The point on the electrophysiological methods to study neuromuscular adaptations

OP-BN04 Biomechanics 4 – Injury

OP-PM11 Physiology 11 - Sports

OP-PM12 Physiology 12 – Thermoregulation

OP-ML02 Motor Learning 2 – General

IS-PM10 Methods of measuring body composition in interventions

OP-HF08 Health and Fitness 8 - Testing Protocols

OP-TT08 Training and Testing 8 – Performance

OP-PE04 Physical Education 4 - Physical Activities

IS-PS01 ECSS Position Statement: Testing of the physical condition in a population - how good are the methods?

17:15 - 18:45

IS-PM11 State of the art of molecular techniques and use in sports: sequencing, gene expression and proteomics

OP-BN05 Biomechanics 5 - Muscle, Tendon, Loading

OP-PM14 Physiology 14 – Circulation

OP-PM13 Physiology 13 - Muscle-Tendon

OP-NU03 Nutrition 3 IS-SH07 Moving the body and its effect on the mind!

OP-HF09 Health and Fitness 9 – Adolescents

OP-TT09 Training and Testing 9 – Elite

OP-PS06 Psychology 6 - General 2

IS-PM12 Muscle lipids and insulin resistance

SATURDAY, JULY 12TH, 2008

08:30 - 10:00

IS-PM13 Evidence based sports physiotherapy in injury preventionIS-SH08 Talent development and sports career

OP-PM15 Physiology 15 - General

OP-PM16 Physiology 16 – Muscle

OP-BN06 Biomechanics 6 - KinematicsIS-SH09 (Un)healthy bodies? OP-MB02 Molecular Biology 2

OP-TT10 Training and Testing 10 – Exercise

OP-HF10 Health and Fitness 10 –

SedentaryIS-PM14 EFSMA Exchange Symposium. Cardio-circulatory adaptation and efficiency in response to intensive physical

training

10:15 - 11:45.

IS-SH10 Pain and injury in sport. Social and ethical perspectives

IS-PM16 JSPFSM Exchange Symposium

OP-PM17 Physiology 17 – Performance

OP-PM18 Physiology 18 – Metabolism

OP-BN07 Biomechanics 7 - Elite SportsIS-BN09 Limitations and advantages of musculoskeletal modeling

10:15 - 11:30

OP-RE03 Rehabilitation 3 - General.

10:15 - 11:45

OP-TT11 Training and Testing 11 – General

OP-SO02 Sociology 2 .

IS-PM15 The challenges of exercising in the heat

12:00 - 13:15

PS-4 Limitations in elite sports

14:15 - 15:15

PP-PM04 Physiology 4PP-PE04 Physical Education 4

PP-ML03 Motor Learning 3

PP-PS03 Psychology 3

PP-SO02 Sociology 2

PP-BN03 Biomechanics 3

PP-SM04 Sports Medicine 4

PP-OS01 Other Sciences

PP-HF04 Health and Fitness 4

PP-TT04 Training and Testing 4

PP-NU04 Nutrition 4

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會議的主要行程除了 7 月 9 日的迎賓戶外活動以外，全部的行程包括了開幕、專題演講、學術論文口頭發表、學術論文海報發表以及最後 12 日的閉幕晚宴等。此項研討會已經舉辦 13 屆，與會的國家眾多無法細數，參與數百人，並發表了數百篇專業性的體育運動研究論文。

我們的發表的論文教師參與部份詳列於表 1，如下

表 1 補助教師參與國際研討會情形

教師姓名	研討會名稱	研討會地點(城市與國家)	研討會日期	論文題目
聶喬齡	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	When east meet west: invariance of 2 x 2 achievement goals in two countries
呂學冠	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Acute and chronic effects of cigarette smoking on oxidative stress in Taekwondo athletes
巫錦霖	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Ingesting carbohydrate before exercise did not hugely affected the rate of fat oxidation and maximal oxygen uptake in hypoxia environment
吳昇光	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	INHIBITORY RESPONSE ABILITY IN CHILDREN WITH DEVELOPMENTAL COORDINATION DISORDER: A psycho physiological STUDY OF THE POSNER PARADIGM
方世華	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	The interaction between exercise and cyclosporine-A in antioxidant capacity and oxidative stress in mouse skeletal muscles
洪暐	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Effect of Radix salviae miltiorrhizae (Danshen) on changes of antioxidant status during a 15-day cycling tour

本研討會研究生參與皆以第一作者身份發表論文，增加學生的國際研究視野，並促進師生與國際研究領域之學術交流。發表共 12 人，如表 2。

表 2 補助學生參與國際研討會情形

學生姓名	系所	指導教授	研討會名稱	研討會地點(城市與國家)	研討會日期	論文題目
鍾宜真	競技所	邱彥成	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Anaerobic performance in Taekwondo athetes during entire season
楊佳政	競技所	林華韋	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Effect of sodium bicarbonate supplemeutation on tennis skillperformance after a simulated match
鍾易辰	體育研究所	張振崗	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	The effect of glycemic index breakfast and exercise on the postprandial lipid profile after subsequent fatty meal
謝秉勳	競技所	張振崗	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	The effect of acid-induced-viscosity complex incorporated into glucose drink on postprandial glycemia and subsequent exercise metabolism
張家銘	競技所	張振崗	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Effect of Radix salviae miltiorrhizae (Danshen) on changes in bone formation markers and hormone profiles during a 15-day cycling tour

盧冠邑	體育研究所	張振崗	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Effect of Radix salviae miltiorrhizae (Danshen) on changes of antioxidant status during a 15-day cycling tour
楊璁人	體育研究所	巫錦霖	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Fitness profile before and after 15 days cycling tour in college students
林漢斯	運健所	巫錦霖	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	The influence of ingestion glucose before graded exercise to exhaustion on saliva IgA concentration in hypoxia and normoxia environment
邱志暉	競技所	巫錦霖	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Ingesting carbohydrate before exercise did not hugely affected the rate of fat oxidation and maximal oxygen uptake in hypoxia environment
李欣樺	運健所	洪暐	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Cyclosprorin A differently affects cortical bone and cancellous bone in exercise trained mouse
劉宗翰	運科中心	張振崗	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	Effect of Short-Term Arginine Supplementation on nitric oxide, Vasodilation, and Performance in Athletes

江季洧	運科中心	張振崗	13th Annual Congress of the European College of Sport Science	Estoril, Portugal	97.7.9-97.7.12	The interaction between exercise and cyclosporine-A in antioxidant capacity and oxidative stress in mouse skeletal muscles

發表摘要分列於下

WHEN EAST MEET WEST: MODEL INVARIANCE OF 2 X 2 ACHIEVEMENT GOALS IN TWO COUNTRIES

Nien, CL. 聶喬齡 pp.408-409

Taiwan National Sport University, Taiwan

The importance of how individuals judged their competence in an achievement setting has been long-term interests when discuss about achievement-related processes and outcome (Roberts, 2001). Different achievement goal theories (Deweck, 1989; Elliot, 1999; Nicholls 1984) have been conducted in educational and sport setting in order to investigate motivation. The aim of the present study is going to test the model invariance of newly created 2 x 2 achievement goals on athletes from two different countries. A large sample of athletes from a far east Asia country is going to be included in this study and is going to compare with a western country sample via SEM to examine the factorial invariance of 2 x 2 achievement goals proposed by Elliot (1999). Several instruments are going to employ to meas ure concepts such as perceived competence, fear of failure as well as motivation regulations. The factorial invariance of four goals as well as the structural invariance of antecedent-goals-consequences model is going to be analyzed. The results should give implications beyond gender invariance based on Nien and Duda (2008) and suggestions will be made according to possible cultural differences.

References.

Dweck, C. S. (1999). Self-theories: Their role in motivation, personality, and development. Philadelphia, PA.: Psychology Press.

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. Educational Psychologist, 34(3), 169-189.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice and performance. Psychological Review, 91(3), 328-346

Nien, C. L., & Duda, J. L. (2008). Antecedents and consequences of approach and avoidance achievement goals: A test of gender invariance.

Psychology of Sport and Exercise, 9(3), 352-372.
Roberts, G. C. (2001). Understanding the dynamics of motivation in physical activity: The influence of achievement goals on motivational
processes. In Advances in motivation in sport and exercise (pp. 1-50). Champaign, IL.: Human Kinetics.

ACUTE AND CHRONIC EFFECTS OF CIGARETTE SMOKING ON OXIDATIVE STRESS IN TAEKWONDO ATHLETES

Lu, HK., Lee, HC. 呂學冠 pp.176-177
Sport Science Research Center, Taiwan

The purpose of this study was to examine the oxidative stress of smoking on Taekwondo athletes. Sixteen volunteers Taekwondo athletes were recruited from 2003 Taiwan National College Games were divided into non-smoking group (n=8) and smoking group (n=8). The subjects of smoking group must be a habitual of smoker for over one year. Subjects of smoking group were asked to smoke a cigarette immediately after competition. Blood sample were obtained before and after competition. The results showed that malondialdehyde (MDA), superoxide dismutase (SOD), glutathione peroxides (GPx), creatine kinase (CK), and the lactate dehydrogenase (LDH) concentrations were no significant differences between groups before and after competition. It was found that all of these values were out of the normal range compared to normal population. It is concluded that there were no acute and chronic effects of smoking on oxidative stress in Taekwondo athletes. This might be a high oxidative stress background before competition.

INGESTING CARBOHYDRATE BEFORE EXERCISE DID NOT HUGELY AFFECTED THE RATE OF FAT OXIDATION AND MAXIMAL OXYGEN UPTAKE IN HYPOXIA ENVIRONMENT

Chih-Hui, C., Chang, CK., Wu, CL. 巫錦霖 pp.364
Taiwan Sport University, Taiwan

Hypoxia environment and carbohydrate ingestion might influence substrate utilization during subsequent exercise. The present study was to investigate the effect of ingesting carbohydrate before a graded exercise to exhaustion on fat oxidation intensity in hypoxia environment. Eight health active college students were recruited to complete two experimental trials. Subjects either ingested glucose drink (75g/250ml) (G) or placebo drink (P) 30 min before exercise on a cycle ergometer in hypoxia (15% O2) chamber. The exercise test started at 75W and the workload was increased by 25W every 3 min until volitional fatigue. Expired gas samples were collected to estimate the rate of fat oxidation and maximal oxygen uptake (VO2max). Fat oxidation rates were calculated using

stoichiometric equation. Heart rates were monitored during exercise. The results showed that there were no significant differences in the rate of fat oxidation and VO2max (G:40.1±4.9ml/kg/min; P: 40.0±7.9ml/kg/min) between trials. The present study suggested that carbohydrate ingestion before graded exercise did not hugely affect the rate of fat oxidation.

INHIBITORY RESPONSE ABILITY IN CHILDREN WITH DEVELOPMENTAL COORDINATION DISORDER: A PSYCHOPHYSIOLOGICAL STUDY OF THE POSNER PARADIGM

Tsai, CL., Hsu, YW., Wu, SK., Chiu, HH. 吳昇光 pp175
National Cheng Kung University, Taiwan

Purpose: The purpose of this study was to identify and compare attentional, decisional, and motor processing stages of brain activity, as revealed by event-related potentials (ERPs) concurring with deficient inhibitory response ability in children with developmental coordination disorder (DCD) and typically developing children Methods: Behavioral performance and ERPs measures were recorded and compared during a variant of the Posner paradigm in 12 typically developing children and 18 DCD children screened with Movement Assessment Battery for Children (Movement ABC). All children reacted to visual targets preceded by a spatial cue. Results: Children with DCD had significantly longer reaction time than typically developing children whatever the cue-target combination, as well as an elongated interval between the N2 ERPs and the motor response. Children with DCD showed significantly slower N1 latency and smaller P3 amplitude evoked after the target stimuli. Finally, the anticipatory process reflected from the slow negativity (contingent negative variation/readiness potential: CNV/RP) that preceded the target was significantly weak in the DCD children. Conclusions: These results demonstrated deficits in inhibitory control and abnormalities in brain processes during the performance of a visuospatial attention shifting paradigm in children with DCD.Key words: developmental coordination disorder, event-related potentials, Posner paradigm

THE INTERACTION BETWEEN EXERCISE AND CYCLOSPORINE-A IN ANTIOXIDANT CAPACITY AND OXIDATIVE STRESS IN MOUSE SKELETAL MUSCLES

Miao-Hua Ko, Chen-Kang Chang, Ching-Lin Wu, Wei Hong, Pei-Yu Shih, Shih-Hua Fang, 方世華 pp277
Taiwan Sport University., Taiwan

Cyclosporine-A (CsA) is a commonly used immunosuppressive agent in organ

transplantation. CsA has been reported to reduce antioxidant capacity. Regular exercise training has been shown to increase antioxidant enzyme activities. The purpose of this study was to investigate the effect of exercise and CsA on antioxidant capacity and oxidative stress in mouse skeletal muscle. Forty-eight adult female ALB/c mice were randomly assigned to one of the 6 groups: 0-Ex (no CSA, no exercise), 0+Ex (no CSA, exercise), 10-Ex (10 mg/kg/d CSA, o exercise), 10+Ex (10 mg/kg/d CSA, exercise), 20-Ex (20 mg/kg/d CSA, no exercise), 10+Ex (20 mg/kg/d CSA, exercise). The 3 exercise groups were trained 3 times a week at approximately 75% VO2max for 6 weeks. Activities of antioxidant enzymes, oxidative stress markers and total antioxidant status (TAS) were analyzed in quadriceps with commercial kits. The data were analyzed by two-way ANOVA Data was presented as mean±SD. There were significant exercise, drug, and exercise x drug effects in SOD, GPX, and TAS. In nonexercise roups, CSA significantly reduced activities of SOD (0-Ex: 7.93±2.17, 10-Ex: 7.20±1.42, 20-Ex: 7.40±1.46 U/mg protein) and GPX(0-Ex: 1.84±0.28, 10-Ex: 1.48±0.24, 20-Ex: 1.56±0.26 U/mg protein) and TAS (0-Ex: 0.57±0.15, 10-Ex: 0.44±0.04, 20-Ex: 0.43±0.06nmol/mg protein). On the other hand, exercise prevented the CsA-induced reductions in activities of SOD (0+Ex: 7.25±1.58; 10+Ex:7.20±1.46; 20+Ex: 10.05±1.42 U/mg protein) and GPX (0+Ex: 1.55±0.28, 10+Ex: 1.63±0.30, 20+Ex: 2.03±0.27 U/mg protein) and TAS(0+Ex: 0.43±0.05, 10+Ex: 0.49±0.06, 20+Ex: 0.41±0.08 mol/mg protein). There were significant exercise, drug, and exercise x drug effectin protein carbonyl (PC) concentration. PC levels were similar in the 3 non-exercise groups (0-Ex: 92.9±30.4, 10-Ex: 74.1±50.1, 20-Ex:116.6±44.8 micromol/mg protein). On the other hand, 10+Ex and 20+Ex groups showed significantly higher PC levels than 0+Ex group (0+Ex: 82.0±34.4, 10+Ex: 859.7±218.0, 20+Ex: 641.0±331.5 micro mol/mg protein). GSH/GSSG ratio and 8-isoprostane concentration were not significantly different among the groups. The results suggested that although exercise may increase antioxidant enzyme activities and total antioxidant status, it may enhance oxidative stress in skeletal muscle in mice taking CsA

EFFECT OF RADIX SALVIAE MILTIORRHIZAE (DANSHEN) ON CHANGES IN BONE FORMATION MARKERS AND HORMONE PROFILES DURING A 15-DAY CYCLING TOUR

Chang, CM., Chiang, C., Ku, S., Chiu, Y., Hung, W., Wu, C.., Chang, C. 洪暐 pp383
Taiwan Sport University, Southern Taiwan University of Technology, Taiwan

The potential functions of Radix salviae miltiorrhizae (Danshen) include to enhance procollagen synthesis and fracture healing. In addition, Danshen has been used as an alternative medicine in the treatment for various diseases such as cardiovascular diseases, acute pancreatitis, and cancer. Over the past two decades, multi-day cycling tour has become one of the most popular forms of physical activity. Long-term regular physical

activity, especially weight-bearing types, has been shown to increase bone mass. On the other hand, acute unaccustomed exercise may have negative effect on bone metabolism. The information regarding multi-day endurance exercise on bone metabolism in previously untrained subjects is still lacking. In addition, it has been shown regular resistance training could increase testosterone and dehydroepiandrosterone sulfate (DHEAS). However, the changes of these hormones during endurance training are still unclear. The aims of this study were to investigate the effect of Danshen on the changes in bone formation markers, osteocalcin (OC) and amino-terminal propeptide of type I collagen (PINP), during a 15-day cycling tour in previously untrained participants. In addition, the effect of Danshen on testosterone and DHEAS will also be examined. Twenty-eight male subjects who participated in Cycling Taiwan 2007 were randomly divided into placebo or Danshen group with 14 in each. The Danshen group consumed 4 pills containing Danshen extracts daily during the tour. The control group consumed the equal amount of pills containing starch. The 2 groups were similar in age, height, and body weight. The tour covered approximately 1100 km in 15 days with 80-120 km per day in most of the days. All subjects were in a free feeding style during the tour. Fasting blood samples were collected in the early morning on day 1 (D1), 5 (D5), 10 (D10), and 15 (D15) during the tour and 7 days after completing the tour (P7). The data was analyzed by 2-way repeated measurement ANOVA. There was significant time effect on OC. In the control group, OC concentration was significantly lower in D5 and D10 comparing to D1. In the Danshen group, OC concentrations during and after the tour were similar to D1. The time and group effects were insignificant in PINP.There was significant time effect on testosterone. In the placebo group, testosterone concentrations during and after the tour were similar to D1. In the Danshen group, testosterone concentration was significantly higher in D10, D15, and P7 comparing to D1. The time and group effects were insignificant in DHEAS. The results of this study indicated that Danshen may not have effect on the changes of bone metabolism, testosterone, and DHEAS in during a multi-day cycling tour in previously untrained subjects.

ANAEROBIC PERFORMANCE IN TAEKWONDO ATHLETES DURING ENTIRE SEASON

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A few studies showed that fitness level, mostly related to anaerobic power, might influence Taekwondo performance. The purpose of this study was to explore the Taekwondo athletes' anaerobic power of lower limbs through the entire training programs. Training program consists of three periods, the preparation period, the competition period, and the transition period. Twenty two male college Taekwondo athletes (with an average

age of 20.6±1.6 years old, and an average Taekwondo history of 10.6±1.5 years) participated in this study. A 30 second of the Wingate anaerobic test (0.1kp/kg) and intermittent anaerobic test (0.1kp/kg, one cycle : active for 15 seconds and than rest for 15 seconds) were performed on a cycle ergometer at each stage of training program. Intermittent anaerobic test cycle was simulated the characteristics of intermittent attacks of Taekwondo competition. Peak power, mean power and fatigue index of the Wingate test showed no significant differences during three periods. The peak power fatigue index and average power fatigue index during the intermittent anaerobic test of the transition period was significantly lower than those of the competition period and the preparation period ($p<0.05$) . It is suggested that the intermittent anaerobic power peaked at preparation period and competition period during entire season.

EFFECT OF SODIUM BICARBONATE SUPPLEMEUTATION ON TENNIS SKILL PERFORMANCE AFTER A SIMULATED MATCH

Chia-Cheng, Y., Shih, MC., Chiang, CW., Wu, CL., Chang, CK. 楊佳政 pp228-229
Taiwan Sport University,China Medical University and Hospital, Taiwan

The accumulation of H+ is one of the major causes of fatigue. It has been shown that NaHCO3 supplementation may increase extracellular buffer capacity, reduce exercise-induced H+ accumulation, and enhance exercise performance. The aim of this study was to investigate the effect of NaHCO3 supplementation on skilled tennis performance after a simulated tennis match. Nine male college tennis players were recruited (mean age 21.78 years, height 173.11 cm, weight 67.97 kg). Each subject completed a bicarbonate trial (BIC) and a placebo trial (PLA) in a randomized order, separated by one week. Subjects performed 2 tennis skill tests before and after the simulated game in each trial. The skill test evaluated the accuracy and consistency of service and ground stroke to both sides of the court as previously described (Davey et al, 2002). The simulated match consisted of 12 games. Each game contained 36 hit balls, including forehand and backhand ground strokes and volleys. The subjects consumed NaHCO3 (0.3 g/kg) or placebo (NaCl, 0.209 g/kg, equal amount of Na) 70 min before the first skill test. Each subject also ingested 0.1g/kg NaHCO3 or 0.7g/kg NaCl after the third game of the simulated match. Biochemical parameters in arterialized venous blood were measured by autoanalyzers. There were significant time and trial x time effects in plasma lactate concentration. Lactate concentrations were significantly increased after both trials with BIC showing higher increase (pre-match: 1.22±0.54, post-match: 2.17±1.46 in PLA; pre-match: 1.23±0.41, post-match: 3.21±1.89 mM in BIC). The significant trial, time, and trial x time effects were present in bicarbonate concentration. Bicarbonate concentration remained unchanged after PLA but was significantly elevated after BIC (pre-match:

27.99±2.02, post-match: 26.37±3.50 in PLA; pre-match: 28.84±2.16, post-match 37.98±3.95 mM in BIC). Trial, time, and trial x time effects were significant in OxyBE. OxyBE was significantly lower after PLA (pre-match:2.46±1.68, post-match: 0.12±2.15 mM) but was significantly elevated after BIC (pre-match: 3.08±1.47, post-match: 11.36±3.70 mM). The trial, time, and trial x time effects were also significant in blood pH. Blood pH remained unchanged after PLA but was significantly elevated after BIC (pre-match: 7.37±0.32, post-match: 7.37±0.14 in PLA; pre-match: 7.37±0.26, post-match: 7.45±0.63 in BIC). In the skill test, significant trial x time effect was present in service consistency. The service consistency was significantly decreased after the simulated match in PLA (pre-match: 8.56±2.83, post-match: 5.56±3.00), but remained unchanged in BIC (pre-match: 7.00±2.78, post-match: 6.89±3.14). The results suggested that NaHCO3 supplementation could increase extracellular buffer capacity and increase skilled tennis performance after a simulated match.

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Davey PR, Thorpe RD, Williams C. Fatigue decreases skilled tennis performance. J Sports Sci 20: 311-318, 2002.

THE EFFECT OF GLYCEMIC INDEX BREAKFAST AND EXERCISE ON THE POSTPRANDIAL LIPID PROFILE AFTER SUBSEQUENT FATTY MEAL

Yei-Chen, C., Chang, C., Wu, C. 鍾易辰 pp364

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The purpose of this study was to examine the influence of different glycemic index (GI) breakfasts and subsequent exercise on postprandial lipid profile. Eight health active college students participated in this study (age: 22.9±3.0yrs; height: 171.9±5.6cm; weight: 68.2±6.2kg; VO2max52.9±4.9ml/min/kg). Subjects either ingested a high GI meal (HGI, GI=76), a low GI meal (LGI, GI=38) or fast (FAST) 3 hours before running on a treadmill for 60 min at 60%VO2max. Thirty min after the exercise, subject consumed a oral fat tolerance test meal (OFTT, 1.2g/kg fat, 0.33g/kg protein, 1.1g/kg carbohydrate) and was observed blood lipid profile for 5.5h. Blood samples were obtained before and after OFTT for analyzing plasma triacylglycerol (TAG), non-esterfied fatty acid (NEFA), high density lipoprotein (HDL), cholesterol (CHOL), and glucose concentrations. TAG concentrations were significantly different between 3 trials (LGI>HGI>FAST, $p<0.05$) at 1.5h after OFTT. The area under the curve (AUC) of TAG was higher in LGI compared to HGI ($p<0.05$). NEFA concentrations were significantly higher in FAST compared to HGI and LGI at 30 min, 1.5h, 3.5h, 4.5h after OFTT ($p<0.05$). There were no significant differences in HDL, CHOL, and glucose concentrations after OFTT between three trials. The results suggested that LGI meals in addition to exercise increased postprandial

lipemia after subsequent fatty meal.

The effect of acid-induced-viscosity complex incorporated into glucose drink on postprandial glycemia and subsequent exercise metabolism

Bin Shun Shieh , Ching-Lin Wu , Cheng-Kang Chang 謝秉勳 大會冊遺漏補頁

The study was to investigate whether the acid-induced-viscosity complex mixed with glucose drink altered subsequent exercise metabolism. Ten active health volunteers participated in this study. Subjects ingested either glucose (GLU), acid-induced-viscosity complex (containing alginate, citrate, and insoluble calcium) with glucose (GEL), or water (W) 3 hours before exercise on a cycle ergometer at 50%VO2max for 60 min. Plasma samples were obtained at fasting, during postprandial period and during exercise. The results showed that plasma glucose concentrations were significantly different between 3 trials during postprandial period (GLU>GEL>W, $p<0.05$). Plasma free fatty acid (FFA) and glycerol concentrations were higher in W compared to GLU and GEL during postprandial period ($p<0.05$). During exercise, FFA and glycerol concentration were elevated in GLU and GEL compared to postprandial period ($p<0.05$). There were no differences in glucose, insulin, FFA concentrations during exercise. The present data suggested that acid-induced-viscosity complex reduced postprandial glycemia but did not affect subsequent exercise metabolism.

EFFECT OF RADIX SALVIAE MILTIORRHIZAE (DANSHEN) ON CHANGES IN BONE FORMATION MARKERS AND HORMONE PROFILES DURING A 15-DAY CYCLING TOUR

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The potential functions of Radix salviae miltiorrhizae (Danshen) include to enhance procollagen synthesis and fracture healing. In addition, Danshen has been used as an alternative medicine in the treatment for various diseases such as cardiovascular diseases, acute pancreatitis, and cancer. Over the past two decades, multi-day cycling tour has become one of the most popular forms of physical activity. Long-term regular physical activity, especially weight-bearing types, has been shown to increase bone mass. On the other hand, acute unaccustomed exercise may have negative effect on bone metabolism. The information regarding multi-day endurance exercise on bone metabolism in previously untrained subjects is still lacking. In addition, it has been shown regular resistance training could increase testosterone and dehydroepiandrosterone sulfate (DHEAS). However, the changes of these hormones during endurance training are still

unclear. The aims of this study were to investigate the effect of Danshen on the changes in bone formation markers, osteocalcin (OC) and amino-terminal propeptide of type I collagen (PINP), during a 15-day cycling tour in previously untrained participants. In addition, the effect of Danshen on testosterone and DHEAS will also be examined. Twenty-eight male subjects who participated in Cycling Taiwan 2007 were randomly divided into placebo or Danshen group with 14 in each. The Danshen group consumed 4 pills containing Danshen extracts daily during the tour. The control group consumed the equal amount of pills containing starch. The 2 groups were similar in age, height, and body weight. The tour covered approximately 1100 km in 15 days with 80-120 km per day in most of the days. All subjects were in a free feeding style during the tour. Fasting blood samples were collected in the early morning on day 1 (D1), 5 (D5), 10 (D10), and 15 (D15) during the tour and 7 days after completing the tour (P7). The data was analyzed by 2-way repeated measurement ANOVA. There was significant time effect on OC. In the control group, OC concentration was significantly lower in D5 and D10 comparing to D1. In the Danshen group, OC concentrations during and after the tour were similar to D1. The time and group effects were insignificant in PINP. There was significant time effect on testosterone. In the placebo group, testosterone concentrations during and after the tour were similar to D1. In the Danshen group, testosterone concentration was significantly higher in D10, D15, and P7 comparing to D1. The time and group effects were insignificant in DHEAS. The results of this study indicated that Danshen may not have effect on the changes of bone metabolism, testosterone, and DHEAS in during a multi-day cycling tour in previously untrained subjects.

EFFECT OF RADIX SALVIAE MILTIORRHIZAE (DANSHEN) ON CHANGES OF ANTIOXIDANT STATUS DURING A 15-DAY CYCLING TOUR

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pp383

Taiwan Sport University, Southern Taiwan University of Technology, Taiwan The potential functions of Radix salviae miltiorrhizae (Danshen) include the elimination of oxygen free radicals and prevention of oxidative stress. It has been suggested that regular exercise could enhance antioxidant defense system. On the other hand, unaccustomed intensive exercise may increase free radical production. Multi-day cycling tours have been gaining significant popularity in recent years. However, the changes in antioxidant status during multi-day endurance exercise were still unclear in untrained recreational participants. In addition, most studies on exercise effects only measured the parameters before and after exercise with little or no information on the changes during the training period. The aims of the present study were to investigate the effect of Danshen on the

changes in activities of antioxidant enzymes and total antioxidant status (TAS) during a 15-day cycling tour in untrained healthy subjects. Twenty-eight male subjects who participated in Cycling Taiwan 2007 were randomly divided into placebo or Danshen group with 14 in each. The Danshen group consumed 4 pills containing Danshen extracts daily during the tour. The control group consumed the equal amount of pills containing starch. The 2 groups were similar in age, height, and body weight. The tour covered approximately 1100 km in 15 days with 80- 120 km per day in most of the days. All subjects were in a free feeding style during the tour. Fasting blood samples were collected in the early morning on day 1 (D1), 5 (D5), 10 (D10), and 15 (D15) during the tour and 7 days after completing the tour (P7). The data was analyzed by 2-way repeated measurement ANOVA. There were significant time and group effects on glutathione peroxidase (GPX) activity. In the placebo group, GPX activity was significantly lower in D10 comparing to D1. GPX activities remained unchanged during the race in the Danshen group. Both groups showed a significant decrease in GPX activity in P7 comparing to D1. There was significant time effect on glutathione reductase (GR) activity. In the placebo group, GR activities during and after the tour were similar to D1. In the Danshen group, GR activity was significantly higher in D5 comparing to D1, then return to basal level in D10 and P7. The time effect was also significant on TAS. TAS remained constant throughout the tour but was significantly increased in P7 comparing to D1 in both groups. The results of this study suggested that Danshen may help to prevent the decrease in GPX activity during the multi-day endurance exercise in previously untrained subjects. However, it may not have effect on GR activity and TAS levels.

FITNESS PROFILE BEFORE AND AFTER 15 DAYS CYCLING TOUR IN COLLEGE STUDENTS

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Long haul cycling tours have been gaining significant popularity in recent years. The aim of the present study was to examine the fitness profile before and after 15 days 1100km cycling tour in college students. Nineteen college students (13 males, 6 female) were recruited from a cycling tour group. Subjects voluntary participated in fitness tests included body composition, grip strength, back strength, and maximal oxygen uptake (VO2max) test within one week before and after the cycling tour. VO2max were test using a graded cycle ergometer starting at 75W for male and 50 W for female and increased 25W every 3 min until volitional fatigue. Results showed that VO2max (pre: 41.3±2.1ml/kg/min, post: 46.8±1.9 ml/kg/min for male; pre: 33.5±1.0ml/kg/min, post: 38.0±1.8 ml/kg/min for female), time to exhaustion (increased male: 17.8±9.9%; female: 31.7±13.9%), maximal watt output (increased male: 11.1±8.9%; female: 24.6±12.1%) ,

and fat free mass (increased male: 1.24±1.97%; female: 3.12±2.85%) were significantly increased in both genders ($p<0.05$). Female subjects showed decreased body weight and male showed decreased in body fat percentage ($p<0.05$). There were no differences in grip strength, back strength, maximal heart rate. The current study suggested that 15 day cycling tour resulted in a better aerobic related fitness in both genders.

THE INFLUENCE OF INGESTION GLUCOSE BEFORE GRADED EXERCISE TO EXHAUSTION ON SALIVA IGA CONCENTRATION IN HYPOXIA AND NORMOXIA ENVIRONMENT

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Purpose: Exercise and environment stress might induce immune system responses. The study was to examine the effect of glucose drink before exercise in hypoxia and normoxia environment on saliva IgA concentration. Methods: Four male college students completed 4 experimental trials. Subjects were asked to ingest either glucose drink (75g/250ml) or placebo drink 30min before exercise on a cycle ergometer either in the hypoxia or normoxia environment. The exercise intensity initiated from 75W and increased 25W every 3 min until volitional fatigue. The hypoxia environment was set at 15%O2 in a normal baric hypoxia chamber. Saliva samples were collected for 2 min at fasting, before exercise, post exercise and 1 hour post exercise. Results: There were no significant differences in saliva IgA concentrations and saliva flow rate between trials. Conclusions: The current data suggested that saliva IgA concentrations did not affect either ingesting carbohydrate or graded exercise to exhaustion in hypoxia environment.

INGESTING CARBOHYDRATE BEFORE EXERCISE DID NOT HUGELY AFFECTED THE RATE OF FAT OXIDATION AND MAXIMAL OXYGEN UPTAKE IN HYPOXIA ENVIRONMENT

Chih-Hui, C., Chang, CK., Wu, CL 邱志暉 . pp364
Taiwan Sport University, Taiwan

Hypoxia environment and carbohydrate ingestion might influence substrate utilization during subsequent exercise. The present study was to investigate the effect of ingesting carbohydrate before a graded exercise to exhaustion on fat oxidation intensity in hypoxia environment. Eight health active college students were recruited to complete two experimental trials. Subjects either ingested glucose drink (75g/250ml) (G) or placebo drink (P) 30 min before exercise on a cycle ergometer in hypoxia (15% O2) chamber. The exercise test started at 75W and the workload was increased by 25W every 3 min until volitional fatigue. Expired gas samples were collected to estimate the rate of fat oxidation

and maximal oxygen uptake (VO2max). Fat oxidation rates were calculated using stoichiometric equation. Heart rates were monitored during exercise. The results showed that there were no significant differences in the rate of fat oxidation and VO2max (G:40.1±4.9ml/kg/min; P: 40.0±7.9ml/kg/min) between trials. The present study suggested that carbohydrate ingestion before graded exercise did not hugely affect the rate of fat oxidation.

CYCLOSPRORIN A DIFFERENTLY AFFECTS CORTICAL BONE AND CANCELLOUS BONE IN EXERCISE TRAINED MOUSE

Lee, HH., Hung, W., Fang, SH., Wu, CL., Chang, YW., Chiang, CW., Chiu, YC, Chang, CK. 李欣樺 pp485

National Taiwan Sporst University, Taiwan

Immunosuppressive drugs like cyclosporin A (CsA) and FK506 had become a lifesaving treatment after allograft organ transplantation. Immunosuppressive drugs like cyclosporine A and tacrollimus potently inhibit calcineurin activity which plays an important role in modulate osteoclast activity and calcified tissues homeostasis. Systematic administration of calcineurin inhibitor such as Cyclosporin A usually performed severe osteoporosis in rat and human. The purpose of this study is to investigate the effects of Cyclosporin A administration on bone mechanical properties and whether exercise can alter such effect.

Methods: Forty-eight BALB/c mouse randomly assign into six groups which treat with 0, 10 or 20mg of CsA daily combine with or without exercise training, respectively. At 8 weeks of age, mouse of exercise groups began running 3 days per week on motor-driven treadmill with initial speed of 10 m/min, 0% grade for 10 min/day. Training intensity gradually increased to 18m/min and maintain 0% grade for 60 min/day within three weeks and maintain such training intensity until the end of training period. After eight weeks of exercise training, left femur and L4 vertebrate of all mouse were dissected and removed all connective tissues for mechanical test. The mechanical strength of the cortical bone tested by three-point bending at the mid-diaphyseal region of the femora and L4 vertebrate were tested by vertical compression test. Load-displacement curve was created for every sample and stiffness, maximal failure load, failure displacement and energy to failure were determined.Results: Maximal failure load of femora were adjust by body weight. Mouse treated with CsA have higher maximal load/bodyweight ratio (10mg: 72.609±2.651 kgf/kg-bw, 20mg: 81.197±2.651 kgf/kg-bw) compared with untreated groups (0mg: 63.346±2.683 kgf/kg-bw).Stiffness and total energy absorption of femora also affected by CsA administration but only slightly affected by exercise training. Maximal failure load of vertebrate slightly decreased in mouse treated with CsA (10mg: 3.6164±0.7979Kgf, 20mg: 3.3931±0.7014Kgf) compared with untreated groups (0mg: 3.7977±0.8591 Kgf). Energy to failure significantly and dose-dependently decreased by CsA administration.

Conclusions: Administration of Cyclosporin A shows controversial effects in different bone tissues and such effects are not altered by exercise training.

EFFECT OF SHORT-TERM ARGININE SUPPLEMENTATION ON NITRIC OXIDE, VASODILATION, AND PERFORMANCE IN ATHLETES

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It has been shown that supplementation of arginine could induce vasodilation via increased nitric oxide (NO) production. The purpose of this study was to investigate the effects of short-term oral supplementation of arginine on endothelium-dependent vasodilation (EDVD) and exercise performance in well-trained athletes. This study used a cross over design. Ten male college judo athletes completed arginine trial (ARG, 6 g/d for 3 d) and placebo trial (CON) in a random order. Sixty minutes after consumption of the last dose of arginine or placebo, the subjects underwent a repeated high-intensity anaerobic test on a cycle ergometer (resistance 0.05 kp/kg BW, each set contains 20 sec all-out exercise and 15 sec rest, total 13 sets). Blood samples were obtained via an indewelling cannula before, during and 0, 3, 6, 10, 30 and 60 min after exercise. EDVD were measured using a photoplethysmography before and after exercise. There was no significant difference in peak and average power in each set of exercise between the two trials. Nitrate and nitrite (NOx) concentrations were significantly higher during and 6 min after exercise compared to pre-exercise levels in both trials. ARG showed significantly higher stiffness index than CON at 3 min after exercise. No significant difference was found between the two 2 trials in plasma NOx, reflection index, stiffness index, and heart rate at other time points. The results suggested that short-term arginine supplementation had no effect on NO production, EDVD, and anaerobic exercise performance in well-trained male athletes.

THE INTERACTION BETWEEN EXERCISE AND CYCLOSPORINE-A IN ANTIOXIDANT CAPACITY AND OXIDATIVE STRESS IN MOUSE SKELETAL MUSCLES

Chi-Wei, C., Yei-Chun, C., Pei-Yu, S., Wei, H., Shih, H., Chen-Kang, C. 江季洧 pp277
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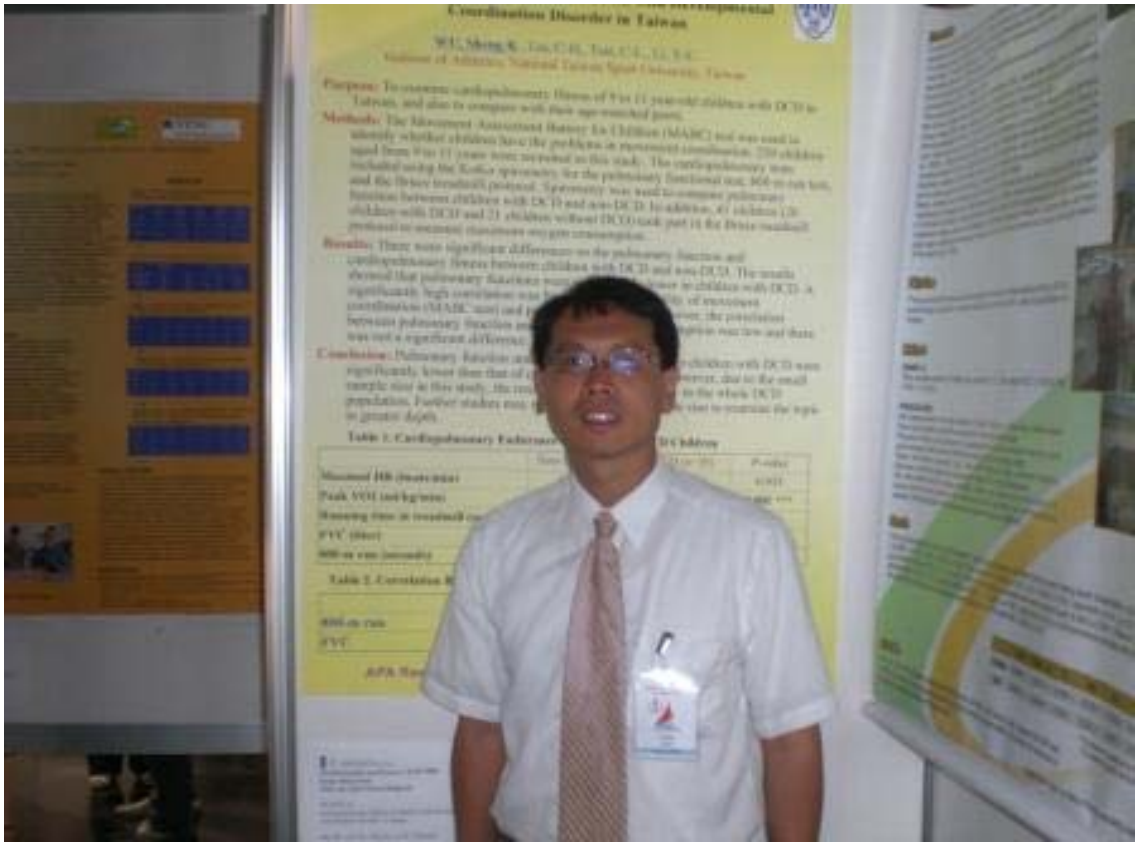
Cyclosporine-A (CsA) is a commonly used immunosuppressive agent in organ transplantation. CsA has been reported to reduce antioxidant capacity. Regular exercise training has been shown to increase antioxidant enzyme activities. The purpose of this study was to investigate the effect of exercise and CsA on antioxidant capacity and

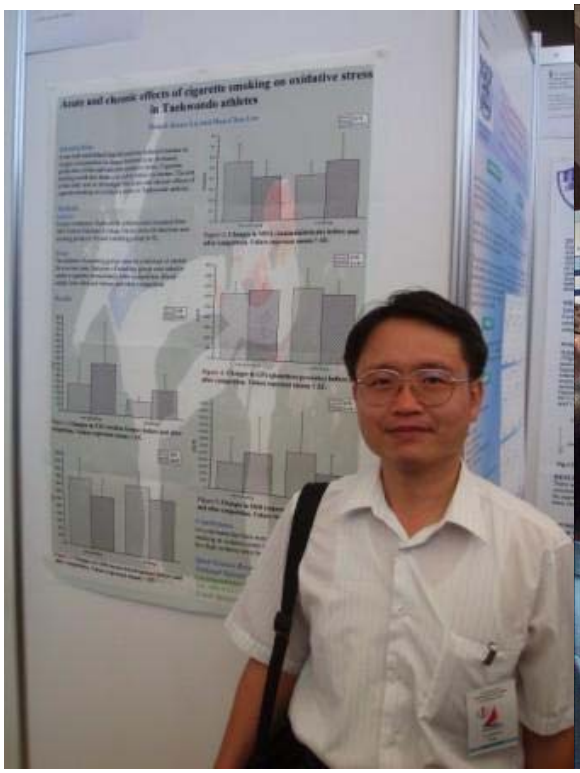
oxidative stress in mouse skeletal muscle. Forty-eight adult female BALB/c mice were randomly assigned to one of the 6 groups: 0-Ex (no CSA, no exercise), 0+Ex (no CSA, exercise), 10-Ex (10 mg/kg/d CSA, no exercise), 10+Ex (10 mg/kg/d CSA, exercise), 20-Ex (20 mg/kg/d CSA, no exercise), 10+Ex (20 mg/kg/d CSA, exercise). The 3 exercise groups were trained 3 times a week at approximately 75% VO2max for 6 weeks. Activities of antioxidant enzymes, oxidative stress markers, and total antioxidant status (TAS) were analyzed in quadriceps with commercial kits. The data were analyzed by two-way ANOVA. Data was presented as mean±SD. There were significant exercise, drug, and exercise x drug effects in SOD, GPX, and TAS. In nonexercise groups, CSA significantly reduced activities of SOD (0-Ex: 7.93±2.17, 10-Ex: 7.20±1.42, 20-Ex: 7.40±1.46 U/mg protein) and GPX (0-Ex: 1.84±0.28, 10-Ex: 1.48±0.24, 20-Ex: 1.56±0.26 U/mg protein) and TAS (0-Ex: 0.57±0.15, 10-Ex: 0.44±0.04, 20-Ex: 0.43±0.06 nmol/mg protein). On the other hand, exercise prevented the CsA-induced reductions in activities of SOD (0+Ex: 7.25±1.58; 10+Ex: 7.20±1.46; 20+Ex: 10.05±1.42 U/mg protein) and GPX (0+Ex: 1.55±0.28, 10+Ex: 1.63±0.30, 20+Ex: 2.03±0.27 U/mg protein) and TAS (0+Ex: 0.43±0.05, 10+Ex: 0.49±0.06, 20+Ex: 0.41±0.08 mol/mg protein). There were significant exercise, drug, and exercise x drug effects in protein carbonyl (PC) concentration. PC levels were similar in the 3 non-exercise groups (0-Ex: 92.9±30.4, 10-Ex: 74.1±50.1, 20-Ex: 116.6±44.8 micromol/mg protein). On the other hand, 10+Ex and 20+Ex groups showed significantly higher PC levels than 0+Ex group (0+Ex: 82.0±34.4, 10+Ex: 859.7±218.0, 20+Ex: 641.0±331.5 micromol/mg protein). GSH/GSSG ratio and 8-isoprostane concentration were not significantly different among the groups. The results suggested that although exercise may increase antioxidant enzyme activities and total antioxidant status, it may enhance oxidative stress in skeletal muscle in mice taking CsA.

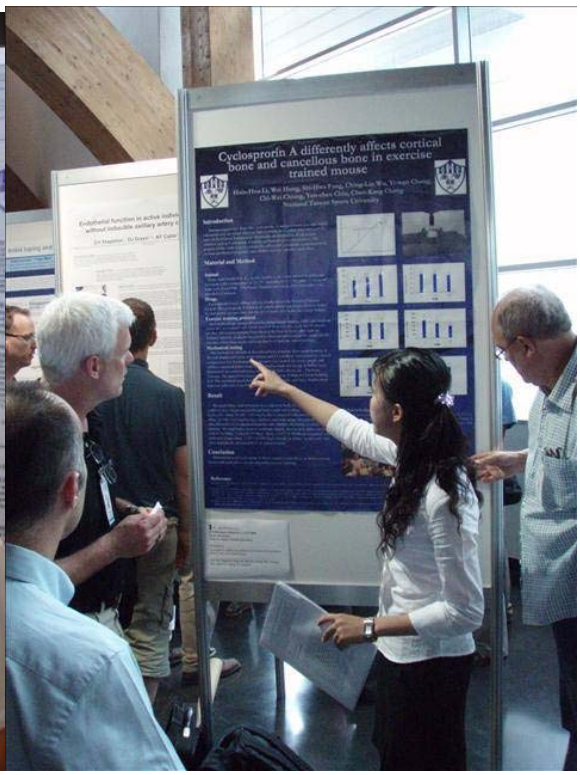
三、心得及建議

本次會議相關經費由教育部補助，使得增廣研究生參與及見識國際大型研討會的機會。本次會議的規模不小，光是會議論文集就厚達 721 頁，且內文用的是 9pt 縮小字型，與國內研討會相比，前者高報名費參與者爆滿，國內研討會無論在報名費、參與國家數或參與人數上就相形見絀了。此行我們共有教師 6 位與研究生 12 位出席，並發表 18 篇論文，與世界各大學運動科學相關領域的學者和研究生面對面進行學術交流，師生收穫良多，尤其對初次出國參加國際大型研討會的研究生而言，更是難得的國際學術交流經驗。

附錄一：會議期間的相關照片








Cyclosproin A differently affects cortical bone and cancellous bone in exercise trained mouse

附錄二：攜回重要相關資料

1. 會議論文摘要集
2. 會議論文摘要集 DVD
3. 各國學術研討會相關資訊
4. 會議期間相關照片