

# Exercise and Sports Science Research Group

## Annual Report 2006

Faculty of Computing, Health and Science



## Table of Contents

INTRODUCTION .....	3
OBJECTIVES .....	3
PRIMARY RESEARCH AREAS .....	4
MEMBERSHIP .....	4
SUMMARY OF RESEARCH ACTIVITY .....	9
GRANTS AWARDED .....	11
GRANTS AWARDED .....	11
PUBLICATIONS .....	12
CONFERENCE PRESENTATIONS .....	15
REPORTS .....	19
BOOK CHAPTERS.....	20
AWARDS.....	20
RESEARCH STUDENT COMPLETIONS.....	20
EXPERT EVALUATIONS OF ACADEMIC THESES .....	20
STRATEGIC RESEARCH ALLIANCES .....	21
VISITING RESEARCH FELLOWS .....	22
Professor David Docherty – University of Victoria, Canada.....	22
APPOINTMENTS TO BOARDS OR EXTERNAL COMMITTEES .....	22
MEDIA COVERAGE .....	24
PATENTS.....	24

## **INTRODUCTION**

The Exercise and Sports Science Research Group (ESSRG) was formed in July 2000 and brought academic staff from multiple disciplines whose research focuses on various aspects of exercise and sport for both athlete performance and health in the general population. Since then, their goals have been to foster high quality research in exercise and sports science; to promote and enhance the teaching of exercise and sports science at ECU; and to establish collaborative links with other research groups and institutes in an effort to contribute to exercise and sports science needs at local, national and international levels. Major areas of specialisation have included: biomechanics; physiology of exercise; psycho-social aspects of sport and leadership; multi-dimensional studies into ageing; motor control and learning; exercise rehabilitation; strength and conditioning science and chronic disease management. Research highlights for 2006 include the initiation of a large randomized clinical trial involving 300 men and women over 65 years of age undertaking exercise comparing clinic versus home based settings. We also completed several intervention studies into the impact of exercise on cancer symptoms and side effects of treatment. An intervention study investigating the effect of resistance training on overweight and obese children was also completed which demonstrated the efficacy of this form of exercise.

Research conducted by staff at the ESSRG has continued to build during 2006 due to the appointment of several key staff and the development and increased activity of existing staff. We have achieved good recognition and research outcomes for sports performance research, exercise and ageing, biomechanics of neck injury, and basic science in the physiology and biomechanics of muscle damage. Publications have increased by 17% and total research output by 6% compared to 2005. Importantly, higher degrees by research student completions increased markedly in 2006.

## **OBJECTIVES**

The objectives of the group are to conduct scientific research and provide postgraduate training in the area of exercise and sports science. The knowledge,

experience and skills gained are then used to inform undergraduate and postgraduate teaching. The specific aims of the research group are:

- To foster high quality research in exercise and sports science at ECU
- To promote and enhance the teaching of exercise and sports science at ECU
- To attract and support honours and postgraduate students
- To establish collaborative links with other research groups and institutes
- To attract research funding from competitive grant agencies and industry
- To contribute to exercise and sports science needs at local, national and international levels

## PRIMARY RESEARCH AREAS

The Exercise and Sports Research Group conducts research into several key areas:

- Development of athlete performance through strength and conditioning.
- Endurance performance and thermoregulation in athletes.
- Application of exercise as medicine for treating and preventing disease, maintaining health, physical and mental function.
- Physiology and biomechanics of delayed onset muscle soreness.
- Biomechanics of neck muscle function, injury, prophylactic and rehabilitation programs.

## MEMBERSHIP

The ESSRG is headed by the Foundation Professor in Exercise and Sports Science who coordinates the team of academic and technical staff, strategic adjunct appointments, honours and postgraduate students.

Co-ordinator:            Professor Robert Newton

Academic Staff:

Assoc. Prof. John Cronin

Dr Dylan Edwards

Dr. Daniel Galvão

Assoc. Prof. Barry Gibson  
Fiona Iredale  
Assoc. Prof. Paul Laursen  
Dr Mike McGuigan  
Dr. Michael Newton  
Assoc. Prof. Ken (Kazunori) Nosaka  
Dr Elizabeth Rose  
Dr. Greig Watson

Adjuncts: Professor William Kraemer (University of Connecticut)  
Professor Michael Stone (USOTC)  
Dr Paul Sacco (University of East London)  
Dr Angus Burnett (Curtin University of Technology)  
Professor Bonnie Berger (Bowling Green State University)  
Associate Professor Kay Cox (Medical Research Foundation,  
Royal Perth Hospital)

Technical Staff: Jon Green  
Nadija Vrdoljak

### **PhD Students and their Research Projects (Supervisors)**

Chris Abbiss: Examination of factors influencing the regulation of exercise intensity in well-trained cyclists (Paul Laursen)

Abdulaziz Al Dayel: Comparison between pulsed current and alternating current in electrical muscle stimulation for muscle function, damage and hormonal responses. (Mike McGuigan, Ken Nosaka).

Warren Andrews: Injury risk and functional status of the hamstring muscles: Effects of fatigue under game conditions and evaluation of prophylactic conditioning programmes (Rob Newton)

Brendyn Appleby: An investigation of anthropometric and strength and power performance measures of professional rugby union players (Mike Newton, Mike McGuigan)

Daniel Baker: A series of studies on professional rugby league players (Rob Newton)

Matt Brughelli: The effect of eccentric exercise on the torque-length and force-velocity properties of the hamstrings (John Cronin, Ken Nosaka)

Dale Chapman: The effect of contraction velocity on muscle damage and adaptation of the human elbow flexors (Ken Nosaka, Mike McGuigan)

Prue Cormie: The influence of strength level on the force-velocity relationship and the ability to adapt to power training (Rob Newton, Mike McGuigan)

Stuart Cormack: Neuromuscular fatigue, hormonal profile, immune response and markers of muscle damage in elite Australian footballers (Robert Newton, Mike McGuigan)

Keir Hansen: Predicting supercompensation and readiness to train (John Cronin)

Peter Hope: Contemporaneous fatigues in women undergoing radiation therapy for breast cancer (Rob Newton)

Naruhiko Hori: Effects of weightlifting exercises on the biomechanics of jump, sprint and change of direction performance (Rob Newton, Mike McGuigan, Ken Nosaka)

Naoki Kawamori: Understanding and developing sprint initial acceleration performance of team-sport athletes (Rob Newton, Ken Nosaka)

Matt Kritz: Developing a movement competency based assessment battery and investigating it's effect on long-term athletic development (John Cronin)

Kristie Lee-Taylor: Using critical flicker fusion and kinetic data to predict readiness for training (John Cronin, Michael Newton)

Micheal Lim: Effects of resistance training on ambulatory blood pressure and cardiovascular risk markers in older adults (Rob Newton, Kay Cox)

Nur Ikhwan Mohammad: Kinematics and kinetics associated with hypertrophy training (John Cronin, Ken Nosaka).

Lynda Murray: Effects of peripheral sensory inputs on cortical responses to spike timing dependent plasticity (Dylan Edwards, Gary Thickbroom)

Makii Muthalib: Effects of exercise-induced muscle damage on muscle microcirculation investigated by near infrared spectroscopy (NIRS) (Ken Nosaka, Dylan Edwards)

Sophia Nimphius: Strength, power and muscle architecture – The effects of in-season resistance training and a cross-sectional comparison in female athletes (Rob Newton, Mike McGuigan)

Jeremiah Peiffer: Recovery from exercise in the heat using cold water immersion (Paul Laursen, Ken Nosaka, Greig Watson)

Steve Pratt: Nutrition and physical activity programs for cancer patients (Rob Newton)

Marc Quod: Mathematically modelling the training and performance power outputs of elite cyclists (Paul Laursen: in collaboration with the Australian Institute of Sport and Cycling Australia)

Alastair Stewart: Self-perceptions and motivation changes with a behavioural intervention versus a self-managed program in older adults: The PATH Study (Elizabeth Rose)

Jeremy Sheppard: Testing and training of vertical power in the leg extensors (Rob Newton, Mike McGuigan)

Rodney Siegel: The influence of temperature on eccentric exercise-induced muscle damage (Paul Laursen, Ken Nosaka, Greig Watson)

### **Masters by Research Students and their Research Projects (Supervisors)**

Adam Beard: Load-power relationship in the power clean (Rob Newton, Angus Burnett)

Jack Burns: The effect of PowerCrank™ training on cycling efficiency and performance in cyclists" (Paul Laursen, Greig Watson)

Melissa deKlerk: The use of the jump-landing sequence as a prognostic and diagnostic tool for clinicians and strength and conditioning practitioners (John Cronin)

David Frost: A kinematic and kinetic comparison of pneumatic vs traditional resistance strength training devices in the upper body (Rob Newton, John Cronin)

Tasuku Fujikake: Detection of muscle damage by ultrasound images (Ken Nosaka)

Richard Garrad: Muscle oxygenation during and after lengthening and shortening contractions (Ken Nosaka, Dylan Edwards)

Zoe Gibbs: Keeping the aged healthy, happy and independent through physical and cognitive exercise (Darryl Turner, Rob Newton)

- Sandra Hill-Williamson: Are performance tests able to effectively discriminate between elite, sub-elite and recreational level youth soccer players? (Mike Newton, Ken Nosaka)
- Ben Hinton: Does whole-body vibration elicit the same potentiation response as a heavy strength set? (Mike Newton, Mike McGuigan)
- Kenny Hong: Correlation between performance tests and time motion analysis of youth soccer (Mike Newton, Mike McGuigan)
- Barbara Howard: Self-concept and attraction to physical activity: the effectiveness of an intervention programme to enhance children's level of physical activity (Elizabeth Rose)
- David Kinsella: Acute physiological and performance effects of a high intensity in-season resistance training program on Australian rules footballers (Mike Newton, Mike McGuigan)
- Wing Yin Lau: Effect of vibration on eccentric exercise- induced muscle damage (Ken Nosaka)
- Greg Levin: The effect of concurrent strength and endurance training on physiological and performance parameters of cyclists" (Paul Laursen, Mike McGuigan)
- Karel Madou: Effect of whole body vibration training on functional performance of multiple sclerosis sufferers (John Cronin)
- Travis McMaster: A kinematic and kinetic comparison of pneumatic vs traditional resistance strength training devices in the lower body (John Cronin, Mike McGuigan)
- Cesar Meylan: Effect of eccentric strength training on athletic performance (John Cronin, Ken Nosaka)
- Roger Pegoraro: The influence of stretching with or without proprioceptive neuromuscular facilitation on the onset of muscle cramp (Paul Laursen, Ken Nosaka, Greig Watson)
- Ben Piggott: The relationship between training load and the incidence of injury and illness over a pre-season at an Australian Football League Club. (Mike McGuigan, Mike Newton)
- Sergio Rafael: The effect of cycle pedal rate on cycling time to exhaustion (Paul Laursen, Greig Watson)

Sam Goh Shi Shien: The effect of Skins™ compression garments on running economy, thermoregulation and running performance (Paul Laursen, Ken Nosaka)

Kyle Smith: Keeping the aged Healthy, happy and independent through physical and cognitive exercise (Darryl Turner, Rob Newton)

Melissa Tatasciore: The effects of resistance training interventions in obese children (Mike McGuigan)

Bradley Wall: The influence of progressive levels of dehydration on core temperature and endurance performance in well trained cyclists” (Paul Laursen, Greig Watson)

### **Honours students and their Research Projects (Supervisors)**

Dom Passalacqua: Effect of an Eastern spinal sequencing strategy to control and increase awareness of proximal movement initiation (John Cronin)

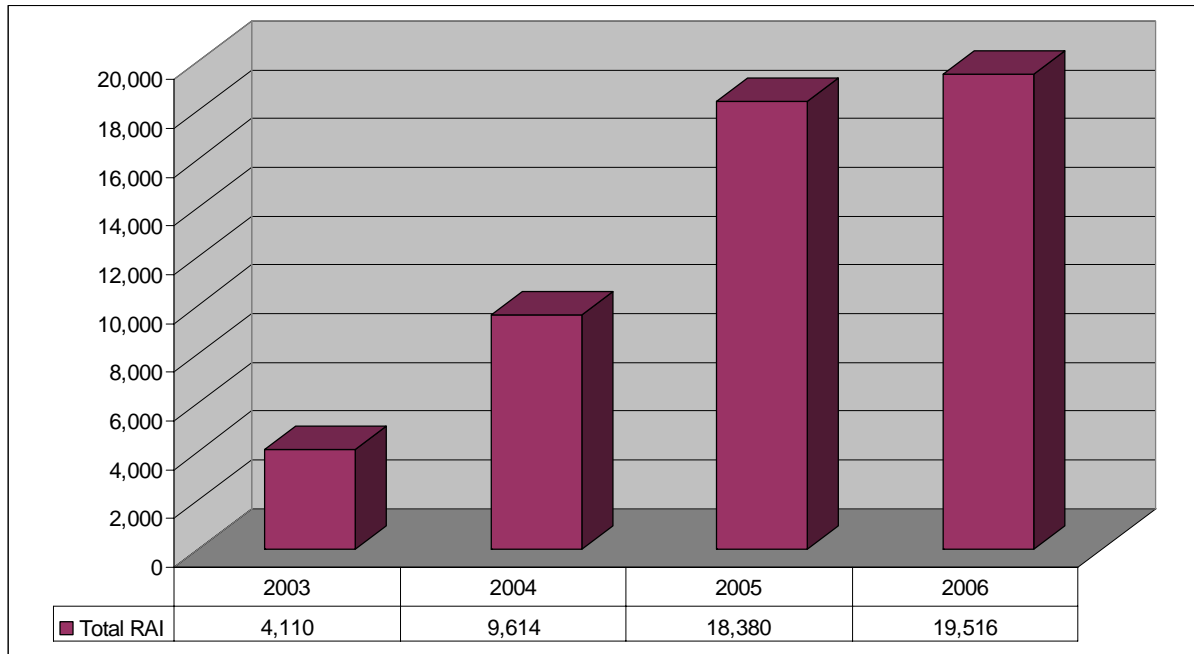
Cailyn Rogers Assessment of static balance ability in an athletic pediatric population (John Cronin)

Tegan Robinson: The differences between children of high and low motor coordination in their physical self-description and attraction to physical activity (Elizabeth Rose)

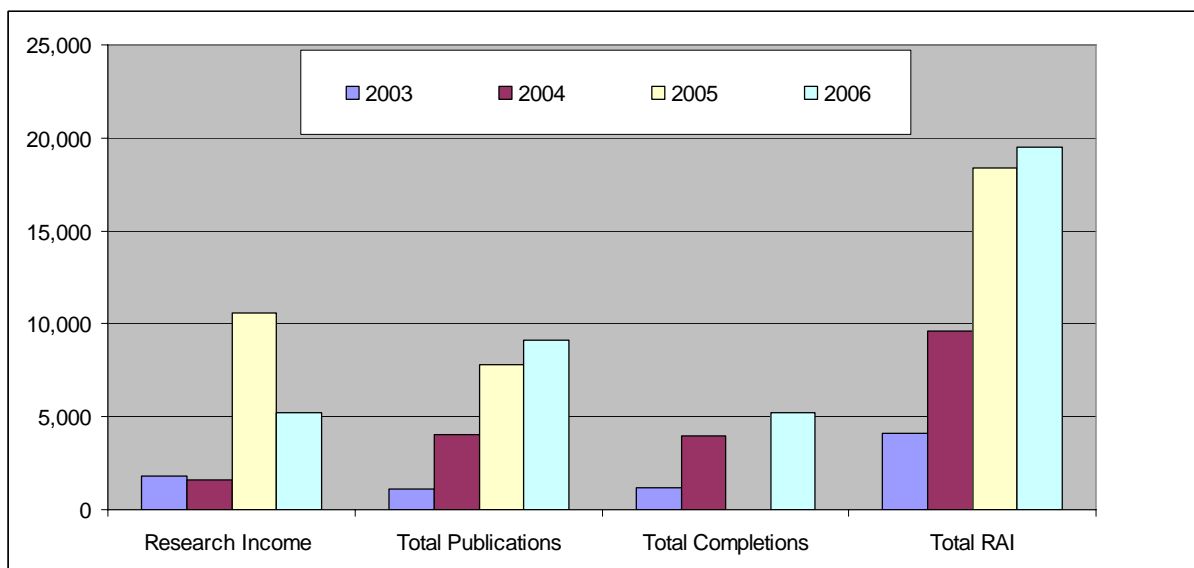
## **SUMMARY OF RESEARCH ACTIVITY**

Key performance indicators in terms of research productivity increased markedly between 2003, 2004 and 2005; this growth continued in 2006. The total RAI for members of ESSRG increased by 134% from 2003 to 2004 and a further 91% from 2004 to 2005. This has flattened somewhat in 2006 with only a 6% rise in total research output however an increase was still evident. Most of the increase between 2005 and 2006 was realised in publications (17%) and HDR completions which increased from zero in 2005 to 5200 RAI points in 2006 and which exceeded our previous record of 4000 points in 2004. Conference publications were down again (-23%) and this may be a reflection of the decreased emphasis by the University on this category of research output. The largest change was a 51% decrease in research income which was due to some grant agencies not being invoiced in 2006.

This late income will flow in 2007 so we expect a recovery to 2005 levels. Total RAI Income for members of ESSRG for 2006 was \$36,884 which will be beneficial to the individuals to fund conference attendance, supplement postgraduate research projects, and staff research projects.



**Figure 1.** Total Research Activity Index points for 2003 to 2006 for members of ESSRG.



**Figure 2.** Research Activity Index points for 2003 to 2006 for members of ESSRG by output category.

## GRANTS AWARDED

***9 grants and \$517,574 in total***

1. ARC Linkage Grant #LP0775021: Investigating older Australians' beliefs about and understanding of mental health and their practice of relevant protective behaviours. Simone Pettigrew, Rob Donovan, Duncan Boldy, Rob Newton. \$56,000.
2. Alzheimer's Disease Research and Care: Postdoctoral Fellowship Lifestyle, cognitive function and Alzheimer's disease risk factors. Rob Newton, Darryl Turner, Ralph Martins. \$253,423.
3. Keiser Corporation - Air versus mass: A comparison of the kinetics, kinematics and electromyography between pneumatic and traditional resistance. John Cronin. \$16,287.30.
4. NHMRC Standard Equipment Grant: Telemeter Data Collection System for Electromyography, Goniometry and Accelerometer. John Cronin, Paul Laursen, Robert Newton. \$15,656.
5. Taisho Pharmaceutical Co., Ltd.: Development of methods to assess standing fatigue. Ken Nosaka, Paul Laursen, Dylan Edwards, Greg Watson. \$106,848.
6. Edith Cowan University Early Career Research Grant Scheme: Do current hydration guidelines reduce dehydration and heat strain but induce hyponatremia? Greig Watson, Paul Laursen, Ken Nosaka. \$12,150.
7. Edith Cowan University, Faculty of Computing and Health Science Small Grant: The effects of controlled levels of body water during cycling in the heat. Greig Watson, Paul Laursen, Bradley Wall. \$3,650.
8. Australian Institute of Sport Discretionary Research Scheme: Effect of inertia and resistance on cycle ergometer performance. S. Gardner, Marc Quod, A. Butfield, Paul Laursen, David Martin, T. Ebert, R. Tanner. \$3560.
9. Telstra Foundation: Improving the role of exercise physiologists in overcoming childhood obesity. Mike McGuigan, Robert Newton, Simone Pettigrew. \$50,000.

## PUBLICATIONS

***27 journal publications in total***

1. Sheppard, J.M., W.B. Young, T.A. Doyle, T.A. Sheppard, and R.U. Newton. An evaluation of a new test of reactive agility and its relationship to sprint speed and change of direction speed. *Journal of Science and Medicine in Sport*, 9(4): 342-349, 2006. Impact factor 1.212.
2. Egan, A.D., J.B. Winchester, C. Foster, and M.R. McGuigan. Using session REP to monitor different methods of resistance exercise. *Journal of Sports Science and Medicine*, 5:289-295, 2006.
3. McGuigan, M.R., J.B. Winchester, and T. Erickson. The importance of isometric maximum strength in college wrestlers. *Journal of Sports Science and Medicine*, 108-113, 2006.
4. Wallace, B.J., J.B. Winchester, and M.R. McGuigan. Effects of elastic bands on force and power characteristics during the back squat exercise. *The Journal of Strength and Conditioning Research*, 20:268-272, 2006.
5. Shimano, T., W.J. Kraemer, B.A. Spiering, J.S. Volek, D. Hatfield, R. Silvestre, J.L. Vingren, M.S. Fragala, C.M. Maresh, S.J. Fleck, R.U. Newton, L.P.B. Spreuwenberg, and K. Häkkinen. Relationship between the number of repetitions and selected percentages of one repetition maximum in free weight exercises in trained and untrained men. *Journal of Strength and Conditioning Research*, 20(4): 819-823, 2006. Impact factor 1.336. Times cited 0.
6. Hatfield, D., W.J. Kraemer, B.A. Spiering, K Häkkinen, J.S. Volek, T. Shimano, L.P.B Spreuwenberg, R. Silvestre, J.L. Vingren, M.S. Fragala, A.L. Gomez, S.J. Fleck, R.U. Newton, and C.M. Maresh. The impact of velocity of movement on performance factors in resistance exercise. *Journal of Strength and Conditioning Research*, 20(4): 760-766, 2006. Impact factor 1.336. Times cited 1.
7. Newton, R.U., A. Gerber, S. Nimphius, J. Shim, B.K. Doan, M. Robertson, D.R. Pearson, B.W. Craig, K. Häkkinen, and W.J. Kraemer. Determination of functional strength imbalance of the lower extremities. *Journal of Strength and Conditioning Research*, 20(4): 971-977, 2006. Impact factor 1.336. Times cited 0.
8. Newton, R.U., R.A. Rogers, J.S. Volek, K. Häkkinen, and W.J. Kraemer. Four weeks of optimal load ballistic resistance training at the end of season attenuates

- declining jump performance of women volleyball players. *Journal of Strength and Conditioning Research*, 20(4): 955-961, 2006. Impact factor 1.336. Times cited 0.
9. Galvão, D.A., K. Nosaka, D.R. Taaffe, N. Spry, L.J. Kristjanson, M.R. McGuigan, K. Suzuki, K. Yamaya, and R.U. Newton. Resistance training reduces treatment side-effects in prostate cancer patients. *Medicine and Science in Sports and Exercise*, 38(12): 2045–2052, 2006. Impact factor 2.909. Times cited 0.
  10. McGuigan, M.R., T.L.A. Doyle, M. Newton, D.J. Edwards, S. Nimphius, and R.U. Newton. Eccentric utilization ratio: Effect of sport and phase of training. *Journal of Strength and Conditioning Research*, 20(4): 992-995, 2006. Impact factor 1.336. Times cited 0.
  11. Baker, D., and R.U. Newton. Discriminative analyses of various upper-body tests in professional rugby league players. *International Journal of Sports Physiology and Performance*, 1:347-360, 2006.
  12. Bishop, D., A. Burnett, D. Farrow, T. Gabbett, and R.U. Newton. Does sports science research influence practice? *International Journal of Sports Physiology and Performance*, 1(2): 161-169, June 2006.
  13. Baker, D., and R.U. Newton. Adaptations in upper-body maximal strength and power output resulting from long-term resistance training in experienced strength-power athletes. *Journal of Strength and Conditioning Research*, 20(3): 541-546, 2006. Impact factor 1.336. Times cited 0.
  14. Stone, M.H., M.E. Stone, W.A. Sands, K.C. Pierce, R.U. Newton, G. Haff, and J. Carlock. Maximum strength and strength training – relationship to endurance? *Strength and Conditioning Journal*, 28(3): 44-53, 2006. Impact factor 0.554. Times cited 0.
  15. Galvão, D.A., R.U. Newton, and D.R. Taaffe. Does sex affect the muscle strength and anabolic response to high intensity resistance training in older adults? *International Journal of Sport and Health Science*, 4: 36-43, 2006.
  16. Kawamori, N., and R.U. Newton. Velocity specificity of resistance training: Actual movement velocity vs. intention to move explosively. *Strength and Conditioning Journal*, 28(2): 86-91, 2006. Impact factor 0.554. Times cited 0.
  17. Hori, N., R.U. Newton, K. Nosaka, and M.R. McGuigan. Comparison of different methods of determining power output in weightlifting exercises. *Strength and Conditioning Journal*, 28(2): 34-40, 2006. Impact factor 0.554. Times cited 0.

18. Doan, B.K., R.U. Newton, W.J. Kraemer, and Y. Kwon. Effects of physical conditioning on intercollegiate golfer performance. *Journal of Strength and Conditioning Research*, 20(1): 62-72, 2006. Impact factor 1.336. Times cited 1.
19. Spreuwenberg, L.P.B., W.J. Kraemer, B.A. Spiering, J.S. Volek, D.L. Hatfield, R. Silvestre, J.L. Vingren, M.S. Fragala, K. Häkkinen, R.U. Newton, C.M. Maresh, and S.J. Fleck. Influence of exercise order in a resistance-training exercise session. *Journal of Strength and Conditioning Research*, 20(1): 141-144, 2006. Impact factor 1.336. Times cited 0.
20. Hatfield, D.L., W.J. Kraemer, J.S. Volek, M.R. Rubin, B. Grebien, A.L. Gómez, D.N. French, T.P. Scheett, N.A. Ratamess, M.J. Sharman, M.R. McGuigan, R.U. Newton, and K. Häkkinen. The effects of carbohydrate loading on repetitive jump squat power performances. *Journal of Strength and Conditioning Research*, 20(1): 167-171, 2006. Impact factor 1.336. Times cited 0.
21. McGuigan, M.R., R.U. Newton, and W.J. Kraemer. Resistance training for better health in older adults. *International Journal of Sport and Health Science*, 4: 19-28, 2006.
22. Kraemer, W.J, N.A. Ratamess, J.S. Volek, K. Häkkinen, M.R. Rubin, D.N. French, A.L. Gómez, M.R. McGuigan, T.P. Scheett, R.U. Newton, B.A. Spiering, M. Izquierdo, and F.S. Dioguardi. The effects of amino acid supplementation on hormonal responses to resistance training overreaching. *Metabolism*, 55(3):282-291, 2006.
23. Suzuki, K., J. Peake, K. Nosaka, C.R. Abbiss, R. Suriano, D. Bishop, M.J. Quod, H. Lee, D.T. Martin, and P.B. Laursen. Changes in markers of muscle damage, inflammation, HSP70 and clinical biochemical variables after an Iron Man triathlon race. *Eur. J. Appl. Physiol.*, 98(6):525-34, 2006. *Epub*, 2006 Oct 10. Impact factor 1.601. Times cited 0.
24. Marsh, S.A., P.B. Laursen, and J.S. Coombes. Effects of antioxidant supplementation and exercise training on erythrocyte antioxidant enzymes. *Int. J.*, 76(5):324-31, 2006. Impact factor 0.862. Times cited 0.
25. Abbiss, C.R., Quod, M.J., Martin, D.T., Netto, K.J., Nosaka, K., Lee, H., Suriano, R., Bishop, D, and P.B. Laursen. Dynamic pacing strategies during the cycle phase of an Iron Man triathlon. *Med. Sci. Sports Exerc.*, 38(4), 726-734, 2006. Impact factor 2.909. Times cited 0.

26. Laursen, P.B., R. Surriano, M. Quod, H. Lee, C. Abbiss, K. Nosaka, D.T. Martin, and D. Bishop. Core temperature and hydration status during an Iron Man triathlon. *Brit. J. Sports Med.*, 40: 320-325, 2006. Impact factor 2.233. Times cited 4.
27. Quod, M.J., D.T. Martin, and P.B. Laursen. Cooling athletes before competition in the heat: Comparison of techniques and practical considerations. *Sports Med*, 36(8):671-82, 2006. Impact factor 3.504. Times cited 0.

## CONFERENCE PRESENTATIONS

*40 conference presentations in total*

### Keynote Conference Presentations

1. Newton, R.U. Exercise as medicine in the prevention and management of chronic disease. *AAESS 2006 Exercise and Sports Science Conference*, Sydney, 28th September 2006.
2. Newton, R.U. Exercise as medicine for cancer. *Prostate Cancer Foundation of Australia – Men’s Health Symposium*, Melbourne, 12th August 2006.

### Invited Presentations

3. Iverson, D. and R.U. Newton. Exercise and cancer. *AAESS 2006 Exercise and Sports Science Conference*, Sydney, 29th September 2006.
4. Newton, R.U., A.J. Murphy, M.R. McGuigan and D. Driscoll. Strategies to maximise strength & power. *AAESS 2006 Exercise and Sports Science Conference*, Sydney, 30th September 2006.
5. Newton, R.U. and M.R. McGuigan. Workshop: strength and conditioning. *AAESS 2006 Exercise and Sports Science Conference*, Sydney, 1st October 2006.
6. Newton, R.U. Exercise is medicine - preventing and managing chronic disease. *WA Division of the AAG, Bunbury*, Western Australia, 18th August 2006.
7. Newton, R.U. Exercise is a medicine. *Launching Hope Day, MS Society of Victoria*, Ballarat, 4th June 2006.

8. Newton, R.U. Current trends and controversies in athlete conditioning. *4th ISN Sports Medicine & Sports Science International Conference*, Kuala Lumpur, May 2006.
9. Newton, R.U. Exercise – the best medicine. *Strengthen Your Body of Knowledge: A Conference on Strength Training for Older People - COTA Victoria*, Melbourne, 1st May, 2006.
10. Newton, R.U. Lifestyle and chronic disease. *Education Leadership Conference – WA Department of Education*, Fremantle, 10th March, 2006.
11. Newton, R.U. Physical activity and chronic disease. *Population Health & Ambulatory Care Showcase - Building A Healthier Future - “Outside the Square”*, Perth, 2 February, 2006. Exercise. *McCusker Foundation Lecture Series*, Melville, 8th April, 2005.
12. McGuigan, M.R. Strength, conditioning and nutritional strategies to maximize strength and power. *2nd Australian Association for Exercise and Sports Science Conference*, Sydney, 30th September, 2006.
13. McGuigan, M.R. Strength training for endurance athletes: research and practical application. *Strength Training Science for Power, Endurance and Stability Development Symposium*, Hong Kong, 9th September, 2006.
14. McGuigan, M.R. Isometric testing protocols. *Strength and Power Workshop*, Australian Institute of Sport, Canberra, 4-5th July, 2006.
15. McGuigan, M.R. Muscle fibre characteristics of athletes: effects of training and resistance exercise intensity. *4th ISN Sports Medicine and Sports Science International Conference*, Kuala Lumpur, 25th – 27th May, 2006.

### Refereed Conference Proceedings and Abstracts

16. Taaffe D.R., D.A. Galvão, J.E. Sharman and J.F. Coombes. Reduced central blood pressure in older adults following progressive resistance training. *18th Nordic Congress of Gerontology*, Jyvaskyla Paviljonki, Jyvaskyla, Finland, 28th to 31st May 2006.
17. Andrews W.A., N. Hori, D.A. Galvão and R.U. Newton. It is essential AFL draft nominees are familiarised with performance tests prior to attending draft camp or screening programmes. *Commonwealth Sports Science Conference*, Melbourne, 9th to 12th March, 2006.

18. Galvão D.A., N. Spry, D.R. Taaffe, T. Shannon, C. Rowling and R.U. Newton. Changes in muscle, fat and bone mass after 36 weeks of maximal androgen blockade for prostate cancer. *Australian Association for Exercise and Sports Science Conference*, Sydney, 28th September to 1st October, 2006.
19. Galvão D.A., K. Nosaka, D.R. Taaffe, N. Spry, L.J. Kristjanson, M.R. McGuigan, A. Singh and R.U. Newton. Benefits of resistance training in men undertaking androgen deprivation therapy for prostate cancer. *18th Nordic Congress of Gerontology*, Jyväskylä Paviljonki, Jyväskylä, Finland, 28th to 31st May, 2006.
20. Galvão D.A., M.R. McGuigan, K. Nosaka, D.R. Taaffe, R. Galvão, M.A. Wahid, A. Singh, N. Spry, L.J. Kristjanson and R.U. Newton. A pilot study of hydraulic resistance exercise in men receiving androgen deprivation therapy for prostate cancer. *Commonwealth Sports Science Conference*, Melbourne, 9th to 12th March, 2006.
21. Hope, P.A.J., R.U. Newton, P. Sacco, L. Kristjanson and N. Spry. Fatigue and associated changes in activity and fitness during adjuvant breast radiotherapy. *Second Annual Chicago supportive Oncology Conference*, Chicago, Illinois, 28th to 30th September, 2006. Page 429.
22. Hope, P.A.J., R.U. Newton, P. Sacco, L. Kristjanson and N. Spry. Reducing the stress of repeated assessments: A comparison of multidimensional fatigue inventory and visual analogue scales in adjuvant breast radiotherapy. *Second Annual Chicago supportive Oncology Conference*, Chicago, Illinois, 28th to 30th September, 2006. Page 430.
23. Nimphius, S., M.R. McGuigan and R.U. Newton. Changes in strength, power, sport performance variables and muscle architecture in elite level softball players following 14 weeks of in-season resistance training. *2nd Australian Association for Exercise and Sports Science Conference Proceedings*, Sydney, 28th September to 1st October, 2006. Page 94.
24. Frost, D., J. Cronin and R.U. Newton. Air versus mass: A kinetic comparison of pneumatic and traditional free weight resistance using a mathematical model. *Exercise and Sports Science 2006*, Sydney, 28th September to 1st October 2006.
25. Wallis, K., McGuigan, M.R. and R.U. Newton. Monitoring power performance in elite level cyclists using the eccentric utilization ratio. *Journal of Strength and Conditioning Research*. 20(4): E28. 2006.

26. Hinton, B., W.A. Andrews and R.U. Newton. Are performance test results more important than skill level in high school-aged ARF players? *Commonwealth International Sport Conference*, Melbourne, 10th to 13th March, 2006,
27. Harris, N., Cronin, J. and W. Hopkins. Squat jump training at maximal power – does it improve sprint ability? *Sport and Exercise Science New Zealand Conference*, Hamilton, 8th to 10th November, 2006.
28. Harris, N., Cronin, J. and W. Hopkins. Relationship between kinetic and kinematic outputs of a machine jump squat and sprint times. *Sport and Exercise Science New Zealand Conference*, Wellington, 16th to 18th November, 2006.
29. Abdulaziz, A., McGuigan, M.R. and D. Tod. The use of the OMNI perceived exertion scale for resistance exercise and session RPE by overweight children. *2nd Australian Association for Exercise and Sports Science Conference Proceedings*, Sydney, 28th September to 1st October, 2006. Page 172.
30. Levin, G.T., Peiffer, J., McGuigan, M.R. and P.B. Laursen. The 5 minute stage graded exercise test as predictor of cycling performance. *2nd Australian Association for Exercise and Sports Science Conference Proceedings*, Sydney, 28th September to 1st October, 2006. Page 159.
31. Cormack, S., McGuigan, M.R. and R.U. Newton. Reliability of a repeated countermovement jump test. *Commonwealth International Sport Conference*, Melbourne, 2006. Proceedings p. 46.
32. Peake, J., C. Abbiss, J. Peiffer, K. Nosaka, K. Ogawa, M. Okutsu, P. Laursen and K. Suzuki. The influence of core temperature on stress hormone and immune responses to cycling. *Proceedings of the XIIIth Annual International Exercise Biochemistry Conference*, Seoul, South Korea, 20th to 23rd October, 2006. Page 134.
33. Brisswalter, J., D. Bentley, P. Laursen and G. Cox. Maximising triathlon performance. *Proceedings of the 2nd Australian Association for Exercise and Sports Science Conference and the 4th Sports Dieticians Australia Update*, Sydney, 2006. Pages 26-27.
34. Levin, G., J. Peiffer, M.R. McGuigan and P. Laursen. The 5 minute graded exercise test as a predictor of cycling performance. *Proceedings of the 2nd Australian Association for Exercise and Sports Science Conference and the 4th Sports Dieticians Australia Update*, Sydney, 2006. Page 159.

35. Abbiss, C., J. Peiffer, J. Peake, K. Nosaka, K. Suzuki and P. Laursen. The influence of carbohydrate ingestion and environmental temperature on pacing strategy during a 16.1 km time trial in well trained cyclists. *Proceedings of the XIth Annual Congress of the European College of Sports Science*, Lausanne, Switzerland, 2006. Page 60.
36. Laursen, P., G. Francis, C. Abbiss and M. Newton. Comparison of the reliability of open- versus closed-loop treadmill running tests in well-trained runners. *Proceedings of the XIth Annual Congress of the European College of Sports Science*, Lausanne, Switzerland, 2006. Page 214.
37. Peiffer, J., C. Abbiss, J. Peake, K. Nosaka, K. Suzuki and P. Laursen. Effect of cold water immersion on core body temperature, muscle function, and lower limb blood flow following prolonged endurance cycling in the heat. *Proceedings of the XIth Annual Congress of the European College of Sports Science*, Lausanne, Switzerland, 2006. Page 262.
38. Esfarjani, F. and P. Laursen. Manipulating high-intensity interval training: Effects on VO<sub>2</sub>max, the lactate threshold and 3000m running performance in moderately trained males. *Proceedings of the XIth Annual Congress of the European College of Sports Science*, Lausanne, Switzerland, 2006. Page 262.
39. Peake, J., C. Abbiss, J. Peiffer, K. Nosaka, P. Laursen and K. Suzuki. The influence of carbohydrate consumption on alterations in leukocytes and cytokines following exercise in temperate and hot conditions. *Proceedings of the XIth Annual Congress of the European College of Sports Science*, Lausanne, Switzerland, 2006. Pages 488-489.
40. Marsh, S., P. Laursen, B. Pat, G. Gobe and J. Coombes. Exercise training, antioxidant supplementation and endothelial cell protection. *American College of Sports Medicine Annual Meeting*, Denver, CO., 31st May to 3rd June, 2006. *Medicine and Science in Sports and Exercise* 38(5): S481, 2006.

## REPORTS

1. Newton, R.U. An investigation of recruitment and retention to the Living Longer, Living Stronger program in Western Australia with evaluation of physical and

psychological changes accompanying participation. *Council of the Ageing, Western Australia*. September 2006. 17 pages.

## BOOK CHAPTERS

1. McGuigan, M.R. and M.J. Sharman. Skeletal muscle structure and function. *Physiological Assessment of Human Fitness*, 2nd Ed. Maud, P.J. and Foster, C. (Eds), Human Kinetics, Champaign, IL. 2006.
2. Tod, D. and M.R. McGuigan. The Efficacy of Psyching-Up on Strength Performance. In T. B. Selkirk (Ed.), *Focus on Exercise and Health Research* (pp.163-179). New York: Nova Publishers. 2006.

## AWARDS

1. Newton, R.U. Awarded Fellow of the Australian Association of Exercise and Sports Science, Sydney Australia, AAESS National Conference, 28th September 2006.

## RESEARCH STUDENT COMPLETIONS

### Graduating Honours Students

Graeme Francis "Repeatability of open- vs. closed-loop treadmill running tests in well-trained runners".. Supervisor Paul Laursen.

### Graduating Masters Students

Lynda Murray "The effects of combined creatine monohydrate supplementation and physical training on body composition and muscular function in patients with inflammatory myopathies". Supervisor Michael McGuigan.

### Graduating PhD Students

Daniel Galvão, "Resistance exercise in men receiving androgen deprivation therapy for prostate cancer". Supervisors Robert Newton, Ken Nosaka, Michael McGuigan and Linda Kristjanson.

## EXPERT EVALUATIONS OF ACADEMIC THESES

1. Newton, R.U. Examination of Doctor of Philosophy Thesis, Lian-Yee Kok, University of Western Australia. Thesis topic: "Comparing linear and undulating

periodisation for improving and maintaining muscular strength qualities in women”, May 2006.

2. Galvão DA: Examination of Honours Thesis, Murdoch University, Thesis topic: Shin-Nyi Cheah. Assessing the toxicity of Alzheimer's beta amyloid in zebrafish embryos.
3. Paul Laursen Examination of Doctoral Thesis, Jonathan Dugas, University of Cape Town, Thesis topic: Temperature responses to exercise and performance.

## **STRATEGIC RESEARCH ALLIANCES**

Centre for Neuromuscular and Neurological Disorders (UWA)

Dept of Exercise Science and Human Movement (UWA)

School of Physiotherapy (Curtin)

Australian Institute of Sport

West Australian Institute of Sport

Australian Institute of Aviation Medicine

Star Sport Alliance – Auckland University of Technology

Singapore Sport School

University of Calgary

University of Wales in Cardiff

University of Verona

No 79 Squadron RAAF Pearce

Cycling Australia

University of Edinburgh (UK)

University of Massachusetts (USA)

University of New Mexico (USA)

Yokohama City University (Japan)

University of Connecticut (USA)

The College of New Jersey (USA)

Appalachian State University (USA)

United States Olympic Training Centre (USA)

United States Ski and Snowboard Association (USA)

United States Air Force

Dr. Katsuhiko Suzuki (Waseda University, Japan)

Dr. Thanasis Jamurtas (University of Thessaly, Greece)

Dr. Maffioletti (Université de Bourgogne, France)

Dr. Trevor Chen (National Chiayi University, Taiwan)

Dr. Di Hooper (Curtin University)

Dr. Bill Sheel (University of British Columbia, Canada)

Dr Jonathan Peake (University of Queensland)

University of Notre Dame, Australia, Department of Sport and Recreation, Disability Education Programme

Prof Kamal Alameh – COMPS, ECU

Dr David T. Martin – Australian Institute of Sport

### **VISITING RESEARCH FELLOWS**

Professor David Docherty – University of Victoria, Canada

Dr Jonathan Peake – Faculty of Human Sciences, Waseda University, Tokorozawa, Japan

### **APPOINTMENTS TO BOARDS OR EXTERNAL COMMITTEES**

Assoc. Prof. John Cronin

- Physical Conditioning Committee – Sport and Exercise Science NZ

Assoc. Prof. Professor Barry Gibson

- Member of Curriculum Council - Outdoor Education Committee

Dr. Paul Laursen

- Journal of Science and Medicine in Sport – Sports Medicine Australia, Editorial Board.

Dr Mike McGuigan

- National Sport Science Quality Assurance Strength-Power Working Group, Australian Institute of Sport
- Associate Editor, Journal of Strength and Conditioning Research

Professor Robert Newton

- Healthway - Research Committee.

- Technical Reference Group, National Children's Nutrition and Physical Activity Survey, Australian Government Department of Health and Ageing
- National Obesity Taskforce – Scientific Reference Group
- Australian Association for Exercise and Sports Science, University Accreditation (NUCAP) committee.
- AVCC Athlete Education Committee
- International Journal of Sports and Health Science, Associate Editor.
- Journal of Strength and Conditioning Research, Associate Editor
- Board of the Western Australian Centre for Cancer and Palliative Care
- Steering Committee, Living Longer, Living Stronger, Council on the Ageing – WA.
- National Sport Science Quality Assurance Strength-Power Working Group, Australian Institute of Sport

Assoc. Prof. Ken Nosaka

- International Journal of Sports and Health Science, Associate Editor.
- Journal of Science and Medicine in Sport, Editorial Board.
- Japanese Training Science Association, Editorial Board.
- Medicine and Science in Sports and Exercise, Editorial Board.

Dr. Elizabeth Rose:

- Adapted Physical Activity – International Federation for Adapted Physical Activity
- Malaysian Journal of Sports Science and Recreation
- Recreation Network: Department of Sport and Recreation
- Fitness Institute of Western Australia

## MEDIA COVERAGE

1. Michael McGuigan - 17th April Channel 7 Today Tonight "Overcoming Childhood Obesity"
2. Michael McGuigan - 8th June SBS Radio "Sports Science and Soccer"
3. Michael McGuigan - 1st Sept ABC Stateline "Childhood Obesity"
4. Paul Laursen – 21st Dec. Pearson, H. Physiology: freaks of nature? Nature. 2006;444(7122):1000-1.
5. Paul Laursen – 10<sup>th</sup> May. "Fluid loss in triathlon doesn't harm elite athletes" Reuters UK Online.

## PATENTS

1. Laursen, P.B., K. Alameh, M. Newton and M.J. Quod. Creation of a 'smart' lightweight heat-transfer fabric to control human body temperature using microphotonics technology. Australian Provisional Patent (April 2006).

