



Sir Charles
Gairdner Hospital



WEST AUSTRALIAN SLEEP DISORDERS RESEARCH INSTITUTE (INC.)

SUMMARY OF RESEARCH ACTIVITY

July 1 2006 – June 30 2007

Level 5, G Block
Queen Elizabeth II Medical Centre
Hospital Avenue
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Western Australia 6009
Australia

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Fields of Work

1. Sleep-Disordered Breathing
 - Upper airway function during anaesthesia and sleep
 - Computational dynamics of the human upper airway
 - Upper airway imaging using endoscopic optical coherence tomography
 - Upper and lower oesophageal sphincter function during wakefulness and sleep
 - Non-invasive detection of gastric insufflation
 - Intramuscular recording of genioglossus myoelectric activity
 - The relationship between sleep apnoea, vascular function and erectile dysfunction
 - The relationship between travel, sleep quality and elite athletic performance
2. Chronic Lung Disease
 - The role of respiratory muscle training in chronic lung disease
 - Measuring functional capacity in chronic lung disease
 - Defining the burden of disease and benefits of exercise in moderate to severe asthma

Grants

Year	Principle Invest.	Funding Body; Project Title	\$ Awarded
2004-2006	PR Eastwood DR Hillman	<i>NHMRC (303218)</i> Factors determining collapsibility of the human upper airway during sleep and general anaesthesia	\$259 625
2004-2008	PR Eastwood	<i>NHMRC (294404) R Douglas Wright Biomedical Career Development Award</i>	\$417 500
2005-2007	AD Lucey PR Eastwood DR Hillman DD Sampson T Balint	<i>Australian Research Council (DP0559408)</i> Modeling and methods of flow-obstruction dynamics in the human upper airway	\$425 000
2005-2008	JP Kirkness	<i>NHMRC (513716) CJ Martin Fellowship</i> Neurohumoral and neuromuscular control of upper airway patency in obesity and sleep apnoea	\$301 462
2006	KF Smith SC Jenkins PR Eastwood DR Hillman	<i>Physiotherapy Research Foundation. National Cardiothoracic Group Research Grant</i> The effect of arm support during exercise in subjects with chronic obstructive pulmonary disease (COPD)	\$5 000
2006	KF Smith SC Jenkins PR Eastwood DR Hillman	<i>Curtin University of Technology, School of Physiotherapy: Early Career Research Grant</i> The effect of arm support during exercise in subjects with chronic obstructive pulmonary disease (COPD)	\$5 000
2006-2008	PR Eastwood DD Sampson DR Hillman	<i>NHMRC (403953)</i> Mechanisms of pharyngeal collapse in obstructive sleep apnoea defined by optical coherence tomography	\$467 750
2007	PR Eastwood	<i>Medical and Health Research Infrastructure Fund (WA)</i> Department of Health, Government of Western Australia Infrastructure Grant - Round 10	\$31 147
2007	JH Walsh P Platt	<i>Sir Charles Gairdner Hospital Research Foundation</i> The efficacy of head posture modifications in the treatment of obstructive sleep apnoea	\$10 000

2007	K Shepherd PR Eastwood	<i>Sir Charles Gairdner Hospital Research Foundation</i> Mechanisms underlying gastroesophageal reflux in obstructive sleep apnoea	\$10 000
2007	KF Smith DR Hillman	<i>Sir Charles Gairdner Hospital Research Foundation</i> The effect of arm support during exercise in subjects with chronic obstructive pulmonary disease (COPD)	\$10 000

Research Personnel

Dr Jason Kirkness	Postdoctoral Research Fellow
Dr Jennifer Walsh	Postdoctoral Research Fellow
Ms Kathleen Maddison	Research Assistant
Ms Danielle Philippe	Research Assistant
Mr Liam Coffey	Research Assistant (part-time)
Ms Kate Godde	Research Assistant (part-time)
Ms Patricia Ziegler	Administration Clerk (part-time)

Ms Laila Robertson	PhD Candidate
Ms Kelly Shepherd	PhD Candidate
Ms Kate Smith	PhD Candidate
Ms Sian Turner	PhD Candidate
Dr Jonathan Williamson	PhD Candidate

Ms Bethany Indrawan	Honours Candidate
Ms Jane Potter	Honours Candidate

Collaborations

Local

A/Prof G Allison	Centre for Musculoskeletal Studies, University of Western Australia
A/Prof S Jenkins	Department of Physiotherapy, Sir Charles Gairdner Hospital; School of Physiotherapy, Curtin University
A/Prof J Pan	Department of Mechanical Engineering, University of Western Australia
Dr P Platt	Department of Anaesthetics, SCGH
Prof D Sampson	Department of Electronic and Electrical Engineering, University of Western Australia
Mr G Sturdy	Keogh Institute for Medical Research, Queen Elizabeth II Medical Centre
Prof PJ Thompson	Asthma and Allergy Research Institute, Queen Elizabeth II Medical Centre

National

Dr T Amis	Department of Respiratory Medicine, Westmead Hospital, NSW
Dr R Grunstein	Sleep Disorders Centre, Royal Prince Alfred Hospital, NSW
Prof R Holloway	Department of Gastroenterology Hepatology, Royal Adelaide Hospital, SA
Dr D McEvoy	Department of Respiratory Medicine, Repatriation Hospital, SA
A/Prof J Wheatley	Department of Respiratory Medicine, Westmead Hospital, NSW

International

Mr R Brandmeier	MAP Medizin-Technologie GmbH, Martinsreid, Germany
A/Prof A Schwartz	Johns Hopkins Medical School, Asthma and Allergy Centre, Baltimore, Maryland, USA

Techniques

1. Oesophageal impedance
2. Oesophageal manometry
3. Oesophageal pH monitoring
4. Administration of non-invasive ventilation
5. Polysomnography
6. Optical coherence tomography
7. Intramuscular electrodes
8. Respiratory muscle training
9. Portable metabolic gas analyser
10. Cycle ergometry
11. Treadmill ergometry
12. Dual energy X-ray absorptiometry (DEXA)

Presentations and Invited Lectures

Local

1. Walsh J. "Exposing the Upper Airway & Sleep Apnoea - Is It All Just In The Head (Position)?" Department of Anatomical Pathology, Royal Perth Hospital, Perth. July 2006.
2. Maddison K, Walsh J, Philippe D, Platt P, Hillman D, Eastwood P. The effect of presence of an oesophageal catheter on upper airway collapsibility. Thoracic Society of Australia and New Zealand (WA branch), Perth. October 2006.
3. Walsh J, Leigh M, Paduch A, Armstrong J, Philippe D, Maddison K, Sampson D, Hillman D, Eastwood P. Effect of posture on upper airway dimensions in obstructive sleep apnoea. Thoracic Society of Australia and New Zealand (WA branch), Perth. October 2006.
4. Walsh J. Invited speaker: "Exposing the upper airway and sleep apnoea - Is it all just in the head (Position)?" Thoracic Society of Australia and New Zealand (WA branch), Perth. October 2006.
5. Eastwood PR. Invited speaker: "Quantitative determination of tracheobronchial airway calibre using anatomical optical coherence tomography (aOCT) – what can it tell us about lung disease?" Asthma and Allergy Research Institute Annual Scientific Meeting, Margaret River. November 2006.
6. Eastwood P. Invited speaker: "Why does Dad snore?" Siemens Science Experience (Rotary International). January 2007.
7. Walsh J, Leigh M, Paduch A, Armstrong J, Philippe D, Maddison K, Sampson D, Hillman D, Eastwood P. Evaluating the effect of posture on UA shape and size with anatomic optical coherence tomography. Upper Airway Symposium; Rottneest Island. February 2007.
8. Shepherd K, Hillman D, Holloway R, Eastwood P. Impact of CPAP on lower oesophageal sphincter pressure. Upper Airway Symposium; Rottneest Island. February 2007.
9. Maddison K, Walsh J, Philippe D, Platt P, Hillman D, Eastwood P. The effect of presence of an oesophageal catheter on upper airway collapsibility. Upper Airway Symposium; Rottneest Island. February 2007.
10. Shepherd K, Hillman D & Eastwood P. The occurrence of gastroesophageal reflux symptoms in a sleep clinic population. Australian Society for Medical Research Week. June 2007.

11. Kirkness JP. Session Chair: "Population health and Epidemiology". Australian Society for Medical Research Week Student Symposium. June 2007.
12. Kirkness JP. Convenor, Australian Medical Research Week Professional Development Day: "Creating Career Opportunities". Australian Society for Medical Research. June 2007.

National

1. Eastwood PR. Invited speaker: "What you don't know might kill you - Probing for the causes of snoring and upper airway collapse during sleep." University of South Australia, Division of Health Sciences, Adelaide, SA. July 2006.
2. Eastwood PR. Invited speaker: "Behaviour of the upper and lower esophageal sphincters during sleep – implications for gastroesophageal reflux." Adelaide Institute of Sleep Health, Adelaide, SA. July 2006.
3. Walsh J, Maddison K, Philippe D, Platt P, Hillman D, Eastwood P. The influence of head position on collapsibility of the hypotonic human upper airway. *Sleep Biol Rhythms* 2006; 4(Suppl 1): A25.
4. Maddison K, Walsh J, Philippe D, Platt P, Hillman D, Eastwood P. The effect of presence of an oesophageal catheter on upper airway collapsibility. *Sleep Biol Rhythms* 2006; 4(Suppl 1): A25.
5. Kirkness JP, Schneider H, Patil SP, McGinley BM, Smith PL, Schwartz AR. Obesity augments passive mechanical loads on the upper airway in men but not women. *Sleep Biol Rhythms* 2006; 4(Suppl 1): A49.
6. Schneider H, Kirkness JP, Patil SP, McGinley BM, Smith PL, Schwartz AR. A novel treatment for obstructed sleep disordered breathing: Treatment with nasal insufflation (TNI). *Sleep Biol Rhythms* 2006; 4(Suppl 1): A24.
7. Hillman DR. Invited speaker: "CPAP- the present." Australasian Sleep Association, Annual Scientific Meeting, Perth, WA. August 2006.
8. Hillman DR. Invited speaker: "OSA diagnostics" (Clinical trials workshop). Australasian Sleep Association, Annual Scientific Meeting, Perth, WA. August 2006.
9. Eastwood PR. Poster Mentor, Poster discussion session: "Respiratory and airways physiology". Australasian Sleep Association Annual Scientific Meeting, Perth, WA. October 2006.
10. Kirkness JP. Session Chair, Oral symposium: "Sleep and Breathing". Australasian Sleep Association Annual Scientific Meeting, Perth, WA. October 2006.
11. Eastwood PR. Session Chair, Symposium: "Vascular Disease and Obesity". Australian Health & Medical Research Congress, Melbourne, VIC. November/December 2006.
12. Hillman DR. Invited Speaker: "Obesity hypoventilation and non-invasive ventilation." Thoracic Society of Australia and New Zealand Annual Scientific Meeting, Auckland 2007.
13. Kirkness JP, Walsh J, Hillman DR, Platt PR, Maddison K, Philippe DL, Schneider H, Schwartz AR, Eastwood PR. Lung deflation decreases the stability of the hypotonic upper airway. *Respirology* 2007; 12(Suppl 1): A19.
14. Maddison K, Walsh J, Philippe D, Platt P, Hillman D, Eastwood P. The effect of presence of an oesophageal catheter on upper airway collapsibility. *Respirology* 2007; 12(Suppl 1): A74.
15. Shepherd K, Hillman D, Eastwood P. The occurrence of gastroesophageal reflux symptoms in a sleep clinic population. *Respirology* 2007; 12(Suppl 1): A74

16. Shepherd K, Chambers D, Gabbay E, Hillman D, Eastwood P. Nocturnal gastroesophageal reflux and sleep disordered breathing after lung transplant. *Respirology* 2007; 12(Suppl 1): A59
17. Walsh J, Leigh M, Paduch A, Armstrong J, Philippe D, Maddison K, Sampson D, Hillman S, Eastwood P. Effect of body posture on velopharyngeal shape and size in obstructive sleep apnoea. *Respirology* 2007; 12(Suppl 1): A19.
18. Walsh J, Maddison K, Philippe D, Platt P, Hillman D, Eastwood P. The influence of head position on collapsibility of the hypotonic upper airway. *Respirology* 2007; 12(Suppl 1): A74.
19. Williamson J, Jankelson D, Krishnan A, Malouf M, Glanville AR. The relationship between obstructive sleep apnoea and gastro-oesophageal reflux in lung transplant patients. *Respirology* 2007; 12 (Suppl 1): A60.

International

1. Kirkness JP, Verma M, Maly JL, Wheatley JR, Amis TC, Smith PL, Schwartz AR, Schneider H. Quantification of inspiratory airflow obstruction using a novel light-weight flowmeter. *Sleep* 2006; 29(Suppl): A340.
2. Leigh MS, Paduch A, Armstrong JJ, Walsh JH, Hillman DR, Eastwood PR, Sampson DD. Anatomical optical coherence tomography: Endoscopic quantitative imaging of the upper airway. 18th International Conference on Optical Fiber Sensors, Cancun, Mexico. October 2006.
3. Hillman DR. Invited speaker: "Economic cost of sleep disorders." International Symposium on Diabetes and Sleep Apnoea, Sydney 2007.
4. Kirkness JP. Invited speaker: "Pathophysiology of upper airway obstruction". World Congress on Sleep Apnea, Bangkok, Thailand. (Organised by the World Association of Sleep Medicine). February 2007.
5. Hillman DR. Invited speaker: "Peri-operative risks associated with sleep disordered breathing". American Thoracic Society Annual Scientific Meeting, San Francisco, USA. May 2007.
6. Hillman DR. Session chair, symposium: Optimal strategies for peri-operative respiratory management. American Thoracic Society Annual Scientific Meeting, San Francisco, USA. May 2007.
7. Eastwood PR. Session chair, major symposium: "Upper airway imaging for sleep apnea: Dynamic imaging of pharyngeal anatomy during wakefulness and sleep using optical coherence tomography". American Thoracic Society Annual Scientific Meeting, San Francisco, USA. May 2007.
8. Eastwood PR. Session chair, mini symposium: "Upper airway biomechanics and function. American Thoracic Society Annual Scientific Meeting, San Francisco, USA. May 2007.
9. Kirkness JP, Walsh J, Hillman DR, Platt PR, Maddison K, Philippe DL, Schneider H, Schwartz AR, Eastwood PR. Lung deflation decreases the stability of the hypotonic upper airway. *Am J Respir Crit Care Med* 2007; 175: A754.
10. Walsh J, Maddison K, Philippe D, Platt P, Hillman D, Eastwood P. The influence of head position on collapsibility of the hypotonic upper airway. *Am J Respir Crit Care Med* 2007; 175: A275.
11. Pichard LE, Kirkness JP, Elsayed-Ahmed AS, Smith PL, Schneider H, Polotsky V, Schwartz AR. The dynamic modulation of upper airway function in murine model. *Am J Respir Crit Care Med* 2007; 175: A810.

12. Walsh J, Leigh M, Paduch A, Armstrong J, Philippe D, Maddison K, Sampson D, Hillman S, Eastwood P. Effect of body posture on velopharyngeal shape and size in obstructive sleep apnea. *Am J Respir Crit Care Med* 2007; 175: A670.

Publications

1. Shepherd KL, Jensen CM, Maddison KJ, Hillman DR, Eastwood PR. Relationship between upper airway and inspiratory pump muscle force in obstructive sleep apnea. *Chest* 2006; 130(6): 1757-64.
2. Eastwood PR, Katagiri S, Sheperd K, Hillman DR. Modulation of upper and lower esophageal sphincter tone during sleep. *Sleep Me* 2007; March 8(2); 135-143.
3. Shepherd KL, Holloway R, Hillman DR, Eastwood PR. Impact of Continuous Positive Airway Pressure on the Lower Esophageal Sphincter. *Am J Physiol: GI and Liver Physiol* 2007 May; 292(5); G1200-G1205.
4. Richmond LK, Dawson B, Stewart G, Cormack S, Hillman DR, Eastwood PR. The effect of interstate travel on the sleep patterns and performance of elite Australian rules footballers. *J Sci Med Sport* 2007; 10(4): 252-8.
5. Panegyres PK, Hillman DR, Dunne JW. Laryngeal dystonia causing upper airway obstruction in progressive supranuclear palsy. *J Clin Neurosci* 2007; 14(4): 380-1.
6. McArdle N, Hillman D, Beilin L, Watts G. Metabolic risk factors for vascular disease in obstructive sleep apnea: a matched controlled study. *Am J Respir Crit Care Med* 2007; 175: 190-5.
7. Jenkins S, Poh H, Eastwood P, Cecins N. Six-minute walk distance in healthy Singaporean adults cannot be predicted using reference equations derived from Caucasian populations – Letter to the Editor. *Respirology* 2006; 11(5): 671-672.
8. Schwartz AR, Kirkness JP and Smith PL. Invited editorial. Extraluminal tissue pressure: What does it mean? *J Appl Physiol* 2006; 100: 5-6.
9. Hill K, Jenkins SC, Philippe DL, Shepherd KL, Hillman DR, Eastwood PR. Comparison of incremental and constant load tests of inspiratory muscle endurance in COPD. *Eur Respir J* 2007; May 15: (Epub ahead of print).
10. Hillman DR, Platt PR, Eastwood PR. Invited review. Sleep, anesthesia and the upper airway. *Sem Anesth, Peri-operative Medicine and Pain* (accepted April 7, 2007).

DR STEWART CULLEN

SLEEP APNOEA

Fields of Work

1. Predictors of sleep apnoea using questionnaires and laser measurements of oral dimensions
2. Treatment of sleep apnoea:
 - Mandibular advancement splints: new models
 - Tongue retaining devices
 - Positional therapy: new appliances
3. Validation of the radical pulse oximeter in the detection of sleep apnoea
4. Sleep studies in the Busselton Health Survey

Collaborations

Local

A/Prof A James	Department of Pulmonary Physiology, West Australian Sleep Disorders Research Institute
Dr N McArdle	Department of Pulmonary Physiology, West Australian Sleep Disorders Research Institute
Mr W Noffsinger	Department of Pulmonary Physiology, West Australian Sleep Disorders Research Institute
Dr S Phung	Department of Respiratory Medicine, Royal Perth Hospital

Techniques

1. Lasers
2. Radical oximeters
3. Mandibular advancement splints and tongue retaining devices

Presentations and Invited Lectures

Local

1. Cullen S. Invited speaker: "Predictors of sleep apnoea using laser measurements of oral dimensions". Upper Airway Symposium, Rottneest. February 2007.
2. Cullen S. Invited speaker: "The importance of sleep disorders". Rotary meeting. June 2007

A/PR ALAN JAMES

AIRWAY REMODELING AND INFLAMMATION

Fields of Work

1. Airway Remodeling
 - Hypertrophy and hyperplasia of airway smooth muscle in asthma
 - Stereological measurement of airway smooth muscle and extracellular matrix in asthma
 - Validation of methods – section orientation and image analysis
 - Relation of changes in airway smooth muscle and extracellular matrix to age and duration and severity of asthma, an international collaborative study
 - Comparison of airway remodeling (smooth muscle, extracellular matrix, reticular basement membrane) in biopsies and transverse sections of airways in control nonfatal and fatal asthma cases.
2. Airway Inflammation
 - Validation study of biopsy to assess airway and lung inflammation
 - Identification of dendritic cells with immunohistochemical labeling (DC-SIGN)
 - Inflammation in allergen-sensitised and exposed mice
3. Population Studies
 - Burden of obstructive lung disease (BOLD)
 - Multi-centre national study
 - Random sample of current Busselton adult population: questionnaires, forced oscillatory technique, exhaled nitric oxide, spirometry, allergy skin tests
 - Busselton Health Survey 2005-2007
 - Random sample of current Busselton population (adults and children)

- Questionnaires; morphometry; blood pressure; spirometry; exhaled nitric oxide; forced oscillation technique; airway responsiveness to methacholine; allergy prick skin tests; collection of blood for full blood counts, stored serum and DNA analysis
 - Collaborative (The Netherlands; Italy; Hungary) study of bronchodilator response of forced oscillatory technique
 - Age and gender stratified
 - Sample of Busselton Survey (1994) attendees
 - Indigenous Health
 - Working Party on Aboriginal Respiratory Health
 - Epidemiology of obstructive sleep apnoea
 - WASDRI Sleep database and genetics study
 - Busselton Health Survey: re-survey of current population
4. Genetic influences on airway disease and allergy
- Single nucleotide polymorphisms
 - Collaborative studies with Canadian and European Consortia to achieve large genome wide associations.
 - Genome screen
 - HLA-DR
5. SIDS
- Influence of parental smoking on airway structure and inflammation.
 - Ethical issues in seeking parental consent.
6. Clinical Trials

Grants

Year	Principle Invest.	Funding Body; Project Title	\$ Awarded
2003-2007	James, AL	<i>NHMRC (26100)</i> Practitioner Fellowship	\$325 000
2004-2006	Upham, J James, AL	<i>NHMRC (303161)</i> Effects of allergens on dendritic cell function in allergic asthma	\$83 500 p.a.
2005-2007	James, AL Carroll, NC	<i>NHMRC (343601)</i> Hyperplasia and hypertrophy of airway smooth muscle in asthma	\$281 000
2005-2007	Musk, AW James, AL Beilby, JP Palmer, LJ Knuiman, MW	<i>NHMRC (353532)</i> The changing prevalence of asthma and chronic obstructive disease in Australia	\$729 380
2006	Lamb, J James, AL	<i>Sir Charles Gairdner Hospital Research Foundation</i> Distribution of the novel smooth muscle relaxation factor, calponin homology-associated smooth muscle protein (CHASM), in airways from asthma cases	\$10 000
2006	Musk, AW James, AL	<i>Asthma Foundation of WA</i> Measurement of respiratory resistance by the forced oscillation technique and asthma in the general population	\$17 743
2006	Elliot, J Carroll, NG James, AL	<i>Asthma Foundation of WA</i> Mast cell degranulation and time to death in fatal asthma	\$45 100

2006	James, AL	<i>Rebecca Cooper Foundation</i> Hyperplasia and hypertrophy of airway smooth muscle in asthma	\$14 900
2007-2009	James, AL Carroll, NG	<i>NHMRC (446800)</i> Assessment of airway smooth muscle hypertrophy in asthma and chronic obstructive pulmonary disease (COPD)	\$286 325
2007-2009	Marks, G Abramson, M James, AL Maguire, G Toelle, B Wood-Baker, R	<i>NHMRC (457385)</i> Burden of obstructive lung disease in Australia	\$737 788 \$122 835 (WA)
2007	Carroll, N James, AL	<i>Asthma Foundation of WA</i> Can endobronchial biopsy be used as a tool to evaluate airway smooth muscle (ASM) remodeling in patients with asthma?	\$45 346
2007	James, AL	<i>Sir Charles Gairdner Hospital Research Foundation (0707)</i> Assessment of extracellular matrix deposition and smooth muscle hypertrophy in asthma and COPD	\$10 000
2007	James, AL	<i>Medical and Health Research Infrastructure Fund (WA)</i> Department of Health, Government of Western Australia Infrastructure Grant - Round 10	\$15 173

Research Personnel

Mr John Elliot	Research Officer
Ms Jasmine Lamb	Research Officer (part-time)
Ms P Maxwell	Research Officer (part-time)
Ms Robyn Jones	Research Assistant
Mr Mark Carroll	PhD candidate
Dr Andreas Fiene	Respiratory Trainee

Collaborations

Local

Prof Adrian Baddeley	School of Mathematics, University of Western Australia
Dr K Bill Finucane	Department of Pulmonary Physiology, Sir Charles Gairdner Hospital
Dr Graham Hall	Institute for Child Health Research
Dr David Hillman	Department of Pulmonary Physiology, Sir Charles Gairdner Hospital
Dr Anthony Kicic	Institute for Child Health Research
Dr Peter McFawn	Department of Physiology, University of Western Australia
Dr Graeme Maguire	WA Country Health Service
Prof Howard Mitchell	Department of Physiology, University of Western Australia
Prof AW Bill Musk	Department of Respiratory Medicine, Sir Charles Gairdner Hospital
Dr Peter Noble	Department of Physiology, University of Western Australia
Mr W Bill Noffsinger	Department of Pulmonary Physiology, Sir Charles Gairdner Hospital
Prof P Sly	Institute for Child Health Research
A/Prof Stephen Stick	Institute for Child Health Research
Dr Debra Turner	Institute for Child Health Research
Dr Sally Young	Department of Pulmonary Physiology, Sir Charles Gairdner Hospital

National

A/Prof Michael Abramson	Department of Epidemiology and Preventive Medicine, Monash Medical School, Alfred Hospital, Victoria
Dr Greg King	Woolcock Institute of Medical Research, University of Sydney, New South Wales
A/Prof Rakesh Kumar	School of Pathology, University of New South Wales
Dr Karen MacKay	Department of Respiratory Medicine, Children's Chest Research Centre, Children's Hospital at Westmead, NSW
A/Prof Guy Marks	Woolcock Institute of Medical Research, New South Wales
A/Prof Phil Robinson	Department of Thoracic Medicine, Royal Children's Hospital, Victoria
Dr Brett Toelle	Woolcock Institute of Medical Research, New South Wales
Prof John Upham	Princess Alexandra Hospital, Queensland
Prof Haydn Walters	School of Medicine, University of Tasmania
Dr Richard Wood-Baker	Respiratory Medicine, University of Tasmania

International

Prof Tony Bai	MacDonald Research Laboratory, St Paul's Hospital, Vancouver, Canada
Prof Marisa Bonsignore	Instituto di Fisopatologia, Palermo, Italy
Prof W Bill Cookson	Imperial College London, England
Dr Marisa Dohnikof	Department of Pathology, Sao Paulo University Medical School, Brazil
Dr Francis Green	Faculty of Medicine, University of Calgary, Canada
Prof Jim Hogg	James Hogg iCAPTURE Centre, University of British Columbia, Vancouver, Canada
Dr Darryl Knight	James Hogg iCAPTURE Centre, University of British Columbia, Vancouver, Canada
Dr Thais Mauad	Department of Pathology, Sao Paulo University Medical School, Brazil
Prof Peter Pare	MacDonald Research Laboratory, St Paul's Hospital, Vancouver, Canada
Prof Eliot Spindel	Oregon Regional Primate Research Centre, Oregon, USA
Ellie Oostve'en	University Hospital, Antwerp, Belgium
Zoltan Hantos	University of Szeged, Szeged, Hungary

Techniques

1. Morphometry and stereology
2. Immunohistochemistry
3. Physiology - airway responsiveness; forced oscillation technique
4. Exhaled nitric oxide
5. Atopy
6. Induced sputum
7. Population surveys

Presentations and Invited Lectures

Local

1. Mark Carroll. "Orientator, Fractionator, Navigator, Disector – 'or' stereology tools, mast cells and lungs". Lung Research Group, February 2007.
2. A James. Respiratory Update: "Interpretation of Respiratory Function Tests". Hollywood Hospital Junior Medical Staff.

3. A James. "Opinionated Guide to Sabbatical" West Australian Lung Club.

National

1. Elliot J, Abramson M, Walters H, James A. Mast cell degranulation and time to death in fatal asthma. *Respirology* 2007; 12 (Suppl 1); A33.
2. Elliot J, Carroll N, James A. Area of airway smooth muscle estimated by planimetry: Effect of tissue thickness. *Respirology* 2007; 12(Suppl 1); A33.
3. James A, Bai T, Mauad T, Abramson M, McKay K, Maxwell P, Elliot J, Green F. Thickness of airway smooth muscle: Effects of sex, age, smoking and duration and clinical severity of asthma. *Respirology* 2007; 12(Suppl 1); A32.

International

1. James A. Invited Speaker: "Hyperplasia and hypertrophy of airway smooth muscle in asthma". Research Rounds University of Calgary Respiratory Group, Calgary, Canada. September 2006.
2. James AL. Invited Speaker: "Hyperplasia and hypertrophy of airway smooth muscle in asthma". Structure and function weekly presentation, Pulmonary Research Laboratory, St Paul's Hospital, Vancouver, Canada. October 2006.
3. James AL. Invited Speaker: "Airway hyperresponsiveness – Have we answered Dr Woolcock's question?" Ann Woolcock Memorial Lecture, APSR, Kyoto Japan. November 2006.
4. Carroll M, James A, Carroll NG. Comparison of 2-dimensional with 3-dimensional mast cell densities in endobronchial biopsies and transverse airway sections. *Eur Respir J* 2006; 28(Suppl 50): P1337.
5. Carroll ML, Carroll NG, James AL. Comparison of mast cell densities in endobronchial biopsies and adjacent airway sections. *Eur Respir J* 2006; 28(Suppl 50): P1384.
6. Elliot J, Carroll N, James A. Hyperplasia of airway smooth muscle cells in fatal and non-fatal asthma. *Eur Respir J* 2006; 28(Suppl 50): P3182.
7. Mukherjee S, Fedson A, Palmer LJ, Love G, Singh B, James A, Cullen SC, McArdle N, Hillman D. The Western Australian Sleep Health Study: A resource for clinical, epidemiological and genetic population-based research. 2006 *Sleep and Biological Rhythms*; 4: P29.
8. James A, Bai T, Mauad T, Abramson M, McKay K, Maxwell P, Elliot J, Green F. Thickness of airway smooth muscle: Effects of sex, age, smoking and duration and clinical severity of asthma. *Am J Respir Crit Care Med* 2007; 175: A56.
9. J Hui, A Oka, LJ Palmer, A James, AW Musk, J Beilby, H Inoko. Genome wide association study for asthma and atopy in a general Australian population. Hugo's 12th Human Genome Meeting, Montreal, Canada, May 2007.

Publications

1. Green FHY, Butt JC, James AL, Carroll NG. Abnormalities of the bronchial arteries in asthma. *Chest* 2006; 130(4): 1025-33.
2. Panizza J, James A, Ryan G, de Klerk N, Finucane KE. Mortality and airflow obstruction in asthma: a 17-year follow-up study. *Int Med J* 2006; 36(12): 773-780.
3. Carroll ML, Carroll NG, James AL. Do bronchial biopsies represent mast cell density in airways? A stereological study. *Eur Respir J* 2006; 28(3): 612-21.
4. Knuiman MK, James AL, Divitini ML, Bartholomew HC. Longitudinal study of risk factors for habitual snoring in a general adult population: The Busselton Health Study. *Chest* 2006; 130: 1779-1783.
5. James AL, Wenzel S. Clinical relevance of airway remodelling in airway diseases.

- Review. *Eur Respir J* 2007; 30: 134-155.
6. Tebbutt S, Pare PD, James AL. Single nucleotide polymorphisms and lung disease: Clinical implications. Review. *Chest* 2007; 131(4): 1216-1223.
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DR NIGEL MCARDLE

SLEEP APNOEA

Fields of Work

1. Sleep Apnoea and vascular disease
2. Treatment of Sleep apnoea
3. Diagnostic strategies for Sleep apnoea

Grants

Year	Principle Invest.	Funding Body; Project Title	\$ Awarded
2005-06	N McArdle B Singh K Gain M Murphy D Hillman	<i>ResMed Pty Ltd</i> Automatic compared to manual CPAP titration for obstructive sleep apnoea	\$58 913 pa

Collaborations

Local

Prof L Beilin	Royal Perth Hospital
Dr K Gain	Royal Perth Hospital
Dr S Mukherjee	West Australian Sleep Disorders Research Institute
Prof L Palmer	Western Australian Institute for Medical Research
Prof G Watts	Royal Perth Hospital

Presentations and Invited Lectures

Local

1. McArdle N. Invited speaker: "Current CPAP research". Australasian Sleep Technologists Association (WA Branch) - Education program, Perth. March 2007.
2. Mukherjee S, Fedson A, Palmer LJ, Love G, Singh B, James A, Cullen SC, McArdle N, Hillman D. The Western Australian Sleep Health Study: A resource for clinical,

- epidemiological and genetic population-based research. *Sleep and Biological Rhythms* 2006; 4: P29.
2. McArdle N, Singh B, Gain K, Murphy M, Hillman D. Cost comparisons of automatic (home and laboratory) and manual continuous positive airway pressure (CPAP) titration for obstructive sleep apnoea (OSA). 2006 *Sleep and Biological Rhythms*; 4: P89.
 3. Singh B. Case presentation – mitochondrial myopathy. Clinical Meeting. West Australian Sleep Disorders Research Institute. Sir Charles Gairdner Hospital, July 2006.
 4. Singh B. An uncommon cause of exercise limitation. TSANZ (WA) Lung Club, July 2006.
 5. Singh, B. NIPPV and tracheostomy care. Tutorial. Department of Respiratory Medicine, Sir Charles Gairdner Hospital, July 2006.
 6. Singh B. Respiratory Physiology. FRACP Tutorial, Department of Medicine, Sir Charles Gairdner Hospital, July 2006.
 7. Singh B. Obesity & health. Clinical meeting, West Australian Sleep Disorders Research Institute, Sir Charles Gairdner Hospital, September 2006.
 8. Singh B. Lactate stress test. Clinical Meeting Department of Pulmonary Physiology, Sir Charles Gairdner Hospital, October 2006.
 9. Singh B. Case presentation. Clinical Meeting Department of Pulmonary Physiology, Sir Charles Gairdner Hospital, November 2006.
 10. Singh B, Finucane KE. Function of the diaphragm as a pump in health and disease. Research Seminar. Department of Pulmonary Physiology, Sir Charles Gairdner Hospital, November 2006.
 11. Singh B. Arterial blood gases and case studies. Educational Meeting, Department of Speech Pathology, Sir Charles Gairdner Hospital, November 2006.
 12. Leong J, Singh B. Gastrointestinal Problems in Duchenne Muscular Dystrophy. Clinical Meeting, West Australian Sleep Disorders Research Institute, Sir Charles Gairdner Hospital, February 2007.
 13. Singh B. NIPPV. Tutorial. Department of Respiratory Medicine, Sir Charles Gairdner Hospital, February 2007.
 14. Singh B. Literature review. Clinical meeting, West Australian Sleep Disorders Research Institute, Sir Charles Gairdner Hospital, April 2007.
 15. Singh B. Selecting patients for lung resection. Clinical meeting. Department of Respiratory Medicine, Sir Charles Gairdner Hospital, April 2007.
 16. Singh B. The role of lung function testing during bleomycin therapy. Clinical Meeting, Department of Pulmonary Physiology, Sir Charles Gairdner Hospital, June 2007.

SUMMARY OF RESEARCH ACTIVITIES

Number of research staff	
Full-time	12
Part-time	7
Total	19
Number of students	
Honours	2
PhD	7
Total	9
Number of publications 2006/07	19
Number of presentations	
Local	40
National	22
International	21
Total	83
Grants awarded to WASDRI Researchers:	
Total of all current grants	\$4 221 699
Total for 2006/2007	\$1 211 473