

RESEARCH LETTER

Title: Understanding the physiological endotypes responsible for co-morbid OSA in ILD patients

Authors:

Simon A Joosten^{1,2,3}

Shane A Landry^{4,5}

Dwayne L Mann⁶

Scott A Sands^{7,8}

Christopher J Ryerson⁹

Calvin Sidhu¹⁰

Garun S Hamilton^{1,2,3}

Mark E Howard^{5,11,12,13}

Bradley A Edwards*^{4,5}

Yet H Khor*^{11,12,13,14}

**denotes equal senior authorship*

Affiliations:

¹ Monash Lung, Sleep, Allergy and Immunology, Monash Health, Victoria, Australia

² School of Clinical Sciences, Monash University, Victoria, Australia

³ Epworth Partners

⁴ Sleep and Circadian Medicine Laboratory, Department of Physiology, Biomedicine Discovery Institute, Monash University, Victoria, Australia

⁵ School of Psychological Sciences and Turner Institute for Brain and Mental Health, Monash University, Victoria, Australia

⁶ School of Information Technology and Electrical Engineering, The University of Queensland, Brisbane, Australia

⁷ Division of Sleep and Circadian Disorders, Departments of Medicine and Neurology, Brigham & Women's Hospital & Harvard Medical School, Boston, MA, USA

⁸ The Alfred and Monash University, Melbourne, VIC, Australia

⁹ Centre for Heart Lung Innovation and Department of Medicine, Providence Health Care and University of British Columbia, Vancouver, BC, Canada

¹⁰ School of Health Sciences, Edith Cowan University, Western Australia, Australia

¹¹ Department of Respiratory and Sleep Medicine, Austin Health, Heidelberg, Victoria, Australia

¹² Institute for Breathing and Sleep, Heidelberg, Victoria, Australia

¹³ Faculty of Medicine, University of Melbourne, Melbourne, Victoria, Australia

¹⁴ Respiratory Research@Alfred, Central Clinical School, Melbourne, Victoria, Monash University

ANALYSIS OF COVARIANCE – ADJUSTING FOR HOSPITAL SITE

We performed an analysis of co-variance in which we compared the endotype values across groups (ILD vs control group) while adjusting for the hospital at which the patient was recruited (Austin vs Monash). Results of this comparison are displayed in Table R1 below. Co-linearity of the co-variate was explored by way of variance inflation factor which was 1.860.

Table R1. Endotype comparison – adjusting for hospital site of recruitment.

OSA Endotypes NREM Sleep			
Variable	ILD Group (n=67)	Control Group (n=134)	ANCOVA P value
Loop gain	0.423 ± 0.150	0.492 ± 0.148	0.223
Arousal threshold, %eupnea	117.1 ± 21.6	132.8 ± 33.3	<u>0.029</u>
VRA, %eupnea	25.4 ± 22.4	35.5 ± 24.9	<u>0.011</u>
Vpassive, %eupnea	92.8 ± 10.4	87.7 ± 16.3	0.360
Vactive, %eupnea	102.2 ± 20.1	98.0 ± 30.1	0.393
Vmin, %eupnea	60.0 ± 21.4	45.5 ± 27.2	<u>0.019</u>

Values are model adjusted means ± standard error. Abbreviations: OSA: obstructive sleep apnea, NREM: non-rapid eye movement, ODI: oxygen desaturation index, VRA: ventilatory response to arousal, ILD: interstitial lung disease.