
BIOGRAPHICAL SKETCH

NAME Christopher P. O'Donnell	POSITION TITLE Professor, Department of Medicine, Division of Pulmonary, Allergy, and Critical Care Medicine.		
eRA COMMONS USER NAME CODONNE1			
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Otago University, Dunedin, New Zealand	B.S.	1982	Mathematics
Otago University, Dunedin, New Zealand	BS (Hons 1)	1984	Physiology
Cambridge University, Cambridge, England	Ph.D.	1988	Physiology
University of California, San Francisco, CA	Postdoctoral	1988-91	Postdoctoral Training

A. Personal Statement

As a postdoctoral fellow at UCSF I was trained in integrative physiology of the cardiovascular and endocrine systems. These skills led me naturally into the field of sleep apnea and cardiovascular pathology, with a particular emphasis on the pulmonary circulation, during my first faculty appointment at Johns Hopkins Medical School. After several years of successful study in a chronically instrumented dog model of obstructive sleep apnea I was excited by the experimental power of transgenic mouse models and 'retooled' to work in mice, but again with a strong focus on conducting physiology in behaving animals. Using both dog and mouse models I have trained several MD and PhD fellows in my laboratory, several of which have gone on to receive K-series awards, R01s, and hold tenure track academic appointments. I have been funded continuously by the NIH since 1996 and have had a consistent record of productivity. As Co-Director of the University of Pittsburgh training grant on 'Translational research training in sleep medicine,' I bring perspective and experience to the unique opportunity that the current application provides to train young promising scientists and academic physicians in the field of pulmonary biology and medicine and will help in providing an open dialogue between the two closely related training programs. I will also receive protected time to work closely with Dr. Gladwin as a Co-Director of this Pulmonary T32 and lead multiple aspects of the training program including career development activities, grantsmanship, targeting of milestones, and formal six monthly evaluations of fellows and mentors. Although much of my research has a translational sleep focus, I have previous experience with sepsis research at Johns Hopkins University and more recently have begun studies on the metabolic effects of sepsis. In this capacity I will contribute to the training mission of the ALI Center.

B. Positions and Honors

Academic Appointments

1991-92	Instructor, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins School of Medicine, Baltimore, MD
1992-1997	Assistant Professor, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins School of Medicine, Baltimore, MD
1997-2001	Assistant Professor of Medicine, PCCM, Johns Hopkins School of Medicine, Baltimore, MD
2001-2004	Associate Professor of Medicine, PCCM, Johns Hopkins School of Medicine, Baltimore, MD
2004-2009	Associate Professor of Medicine, Division of PACCM, University of Pittsburgh, Pittsburgh, PA
2009-present	Professor of Medicine, Division of PACCM, University of Pittsburgh, Pittsburgh, PA
2009-present	Awarded tenure, University of Pittsburgh, Pittsburgh, PA

Honors and Public Committee Service

1985-1988	Commonwealth Post-graduate Scholarship to University of Cambridge
1988-1991	American Heart Association Fellowship Award

2003 Special Emphasis Panel, NHLBI
2005 Ad hoc member RIBT study section, NHLBI
2005-present Associated Editor for *Journal of Applied Physiology*
2006-2010 Permanent member RIBT study section, NHLBI
2008-2010 Chairman RIBT study section, NHLBI
2008-present Associate Editor for *Obesity*

C. Selected Peer-Reviewed Articles (last 10 years)

1. Polotsky V.Y., M.C. Smaldone, M.T. Scharf, J. Li, C.G. Tankersley, P.L. Smith, A.R. Schwartz, **C.P. O'Donnell**. The impact of interrupted leptin pathways on ventilatory control. *J Appl Physiol*. 96(3):991-8, 2004. PMID: 14578371
 2. Patil S.P., N.M. Punjabi, H. Schneider, **C.P. O'Donnell**, P.L. Smith, and A.R. Schwartz. A Simplified method for measuring critical pressures during sleep in the clinical setting. *Am J Respir Crit Care Med*. 170(1):86-93, 2004. PMID: 15070819
 3. Groeben H., S. Meier, R.H. Brown, **C.P. O'Donnell**, W. Mitzner, C.G. Tankersley. The effect of leptin on the ventilatory response to hyperoxia. *Exp. Lung. Res.* 30(7):559-570, 2004. PMID: 15371092
 4. Campen M.J., Y. Tagaito, J. Li, A. Balbir, C.G. Tankersley, P.L. Smith, A.R. Schwartz, **C.P. O'Donnell**. Phenotypic variation in cardiovascular responses to acute hypoxic and hypercapnic exposure in mice. *Physiol. Genomics*. 20(1):15-20, 2004. PMID: 15494473
 5. Minhas, K.M., S.A. Khan, S.V. Raju, A.C. Phan, D.R. Gonzalez, M.W. Skaf, K. Lee, A.D. Tejani, L.A. Barouch, **C.P. O'Donnell**, C.W. Emala, D.E. Berkowitz, and J.M. Hare. Leptin repletion restores depressed {beta}-adrenergic contractility in ob/ob mice independently of cardiac hypertrophy. *J. Physiol*. 565:463-474, 2005. PMCID: PMC1464532
 6. Campen, M.J., Y. Tagaito, T.P. Jenkins, A. Balbir, and **C.P. O'Donnell**. Heart rate variability responses to hypoxic and hypercapnic exposures in different mouse strains. *J. Appl. Physiol*. 99(3):807-813, 2005. PMID: 15890760
 7. Campen, M.J., L.A. Shimoda, and **C.P. O'Donnell**. The acute and chronic cardiovascular effects of intermittent hypoxia in C57BL/6J mice. *J. Appl. Physiol*. 99(5):1643-1648, 2005. PMID: 16002771
 8. Li, J. D.N. Grigoryev, S.Q. Ye, L. Thorne, A.R. Schwartz, P.L. Smith, **C.P. O'Donnell**, and V.Y. Polotsky. Chronic intermittent hypoxia up-regulates genes of lipid biosynthesis in obese mice. *J. Appl. Physiol*. 99(5):1643-1648, 2005. PMID: 16037401
 9. Polotsky, V.Y., A.E. Rubin, A. Balbir, T. Dean, P.L. Smith, A.R. Schwartz, and **C.P. O'Donnell**. Intermittent hypoxia causes REM sleep deficits and decreases in EEG delta power in NREM sleep in the C57BL/6J mouse. *Sleep Medicine*. 7(1):7-16, 2005. PMID: 16309961
 10. Li, J. L.N. Thorne, N.M. Punjabi, C.K. Sun, A.R. Schwartz, P.L. Smith, R.L. Marino, A. Rodriguez, W.C. Hubbard, **C.P. O'Donnell**, and V.Y. Polotsky. Intermittent hypoxia induces hyperlipidemia in lean mice. *Circ. Res.* 97(7):698-706, 2005. PMID: 16123334
 11. Iiyori, N., Shirahata, M., and **C.P. O'Donnell**. Genetic background affects cardiovascular responses to obstructive and simulated apnea. *Physiol. Genomics*. 24(1):65-72, 2005. PMID: 16249313
 12. Raju, S.V, M. Zheng, K.H. Schuleri, A.C. Phan, D. Bedja, R.M. Saraiva, O. Yiginer, K. Vandegaer, K.L. Gabrielson, **C.P. O'Donnell**, D.E. Berkowitz, L.A. Barouch, and J.M. Hare. Activation of the novel cardiac ciliary neurotrophic factor receptor reverses LVH in leptin deficient and leptin resistant obesity. *P.N.A.S.* 103(11):4222-4227, 2006. PMCID: PMC1449674
 13. Balbir, A., M. Okumura, B. Schofield, J. Coram, C.G. Tankersely, R.S. Fitzgerald, **C.P. O'Donnell**, and M. Shirahata. Genetic regulation of chemoreceptor development in DBA/2J and A/J strains of mice. *Adv. Exp. Med. Biol.* 580:105-109, 2006. PMID: 16683704
 14. Yamaguchi, S., A. Balbir, M. Okumura, B. Schofield, J. Coram, C.G. Tankersely, R.S. Fitzgerald, **C.P. O'Donnell**, and M. Shirahata. Genetic influence on carotid body structure in DBA/2J and A/J strains of mice. *Adv. Exp. Med. Biol.* 580:105-109, 2006. PMID: 16683705
 15. Minoguchi, K., T. Yoko, A. Tanaka, S. Ohta, T. Hirano, G. Yoshino, **C.P. O'Donnell**, and M. Adachi. Association between lipid peroxidation and inflammation in obstructive sleep apnea. *Eur. Respir. J.* 28(2):378-385, 2006. PMID: 16880368
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16. Dean, T. Jr., R.P. Allen, **C.P. O'Donnell**, and C.J. Earley. The effects of dietary iron deprivation on murine circadian sleep architecture. *Sleep Medicine*. 7:634-640, 2006. PMID: 17098470
17. Li, J. V. Savransky, A. Nanayakkara, P.L. Smith, **C.P. O'Donnell**, and V.Y. Polotsky. Hyperlipidemia and lipid peroxidation are dependent on the severity of intermittent hypoxia. *J. Appl. Physiol*. 102(2):557-63, 2007. PMID: 17082365
18. Minoguchi, K., T. Yokoe, T. Tazaki, H. Minoguchi, N. Oda, A. Tanaka, M. Yamamoto, S. Ohta, **C.P. O'Donnell**, and M. Adachi. Silent brain infarction and platelet activation in obstructive sleep apnea. *Am. J. Resp. Crit. Care Med*. 175:612-617, 2007. PMID: 17341649
19. Iiyori, N., L.C. Alonso, J. Li, M.H. Sanders, A. Garcia-Ocana, R.M. O'Doherty, V.Y. Polotsky, and **C.P. O'Donnell**. Intermittent hypoxia causes insulin resistance in lean mice independent of autonomic activity. *Am. J. Resp. Crit. Care Med*. 175:851-857, 2007. PMCID: PMC1899294
20. Alonso, L.C., T. Yokoe, P. Zhang, D.K. Scott, S.K. Kim, **C.P. O'Donnell**, and A. Garcia-Ocana. Glucose infusion in mice: a new model to induce beta-cell replication. *Diabetes*. 56(7):1792-801, 2007. PMCID: PMC2921922
21. McGaffin, K.R., C.K. Sun, J.J. Rager, L.C. Romano, B. Zou, M.A. Mathier, R.M. O'Doherty, C.F. McTiernan, **C.P. O'Donnell**. Leptin signalling reduces the severity of cardiac dysfunction and remodelling after chronic ischaemic injury. *Cardiovas. Res*. 77(1):54-63, 2008. PMID: 18006469
22. Yokoe, T., L.C. Alonso, L.C. Romano, T.C. Rosa, R.M. O'Doherty, A. Garcia-Ocana, K. Minoguchi, and **C.P. O'Donnell**. Intermittent hypoxia reverses the diurnal glucose rhythm and causes pancreatic beta cell replication in mice. *J. Physiol*. 586:899-911, 2008. PMCID: PMC2375607
23. Lee, E.J., M.E. Woodske, B. Zou, and **C.P. O'Donnell**. Dynamic arterial blood gas analysis in conscious, unrestrained C57BL/6J mice during exposure to intermittent hypoxia. *J. Appl. Physiol*. 107(1):290-294, 2009. PMCID: PMC2711795
24. Woodske, M.E., T. Yokoe, B. Zou, L.C. Romano, T.C. Rosa, A. Garcia-Ocana, L.C. Alonso, **C.P. O'Donnell**, and B.J. McVerry. Hyperinsulinemia predicts survival in a hyperglycemic mouse model of critical illness. *Critical Care Medicine*. 37(9):2596-2603, 2009. PMID: 19623043
25. McGaffin, K.R., B. Zou, C.F. McTiernan, and **C.P. O'Donnell**. Leptin attenuates cardiac apoptosis after chronic ischemic injury. *Cardiovas. Res*. 83(2):313-324, 2009. PMCID: PMC2701718
26. Naghshin, J., McGaffin, K.R., W.G. Witham, M.A. Mathier, L.C. Romano, S.H. Smith, A.M. Janczewski, J.A. Kirk, S.G. Shroff, **C.P. O'Donnell**. Chronic intermittent hypoxia increases left ventricular contractility in C57BL/6J mice. *J. Appl. Physiol*. 107(3):787-793, 2009. PMCID: PMC2756000
27. Sikka, G., A. Benjo, A. Camara, E. Baraban, R. Yang, **C.P. O'Donnell**, D.E. Berkowitz, and L.A. Barouch. Leptin is essential in maintaining normal vascular compliance independent of body weight. *Int. J. Obesity*. 34(1):203-6, 2010. PMID: 19806156
28. Ray, N.B., L. Durairaj, B.B. Chen, B.J. McVerry, A.J. Ryan, M. Donahoe, A.K. Waltenbaugh, **C.P. O'Donnell**, F.C. Henderson, C.A. Etscheidt, D.M. McCoy, M. Agassandian, E.C. Hayes-Rowan, T.A. Coon, P.L. Butler, L. S.N. Gakhar, Mathur, J.C. Sieren, Y.Y. Tyurina, V.E. Kagan, G. McLennan, and R.K. Mallampalli. Dynamic regulation of cardiolipin by the lipid pump Atp8b1 determines severity of lung injury in experimental pneumonia. *Nature Medicine*. September, 2010. PMID: 20852622
29. McGaffin, K.R., W.G. Witham, K.A. Yester, L.C. Romano, R.M. O'Doherty, C.F. McTiernan, and **C.P. O'Donnell**. Cardiac specific leptin receptor deletion exacerbates ischemic heart failure in mice. *Cardiovas. Res*. 89(1):60-71, 2011. PMCID: PMC3002875
30. Levitt, H.E., T.J. Cyphert, J.L. Pascoe, D.A. Hollern, N. Abraham, R.J. Lundell, T. Rosa, L.C. Romano, B. Zou, **C.P. O'Donnell**, A.F. Stewart, A. Garcia-Ocaña, and L.C. Alonso. Glucose stimulates human beta cell replication in vivo in islets transplanted into NOD-severe combined immunodeficiency (SCID) mice. *Diabetologia*. 54(3):572-82, 2011. PMCID: PMC3034833
31. Yang, R., G. Sikka, J. Larson, V.L. Watts, X. Niu, C. Ellis, K. Miller, A. Camara, C. Reinke, V. Savransky, V.Y. Polotsky, **C.P. O'Donnell**, D.E. Berkowitz, and L.A. Barouch. Restoring leptin signaling reduces hyperlipidemia and improves vascular stiffness induced by chronic intermittent hypoxia. *Am. J. Physiol. Heart Circ. Physiol*. 300(4):H1467-76, 2011. PMCID: PMC3075029
32. Pascoe, J., D. Hollern, R. Stamateris, M. Abbasi, L.C. Romano, B. Zou, **C.P. O'Donnell**, A. Garcia-Ocana, and L.C. Alonso. Free fatty acids block glucose-induced β -cell proliferation in mice by inducing cell cycle inhibitors p16 and p18. *Diabetes* 61(3):632-41, 2012. PMCID: PMC3282818
33. Alonso, L.C., Y. Watanabe, D. Stefanovski, E.J. Lee, S. Singamsetty, L.C. Romano, B. Zou, A. Garcia-

- Ocana, R.N. Bergman, and **C.P. O'Donnell**. Simultaneous measurement of insulin sensitivity, insulin secretion and the disposition index in conscious unhandled mice. *Obesity*, 20(7):1403-1412, 2012. PMID: PMC3378770
34. Naghshin, J., R.H. Rodriguez, E.M. Davis, L.C. Romano, K.R. McGaffin, and **C.P. O'Donnell**. Chronic intermittent hypoxia exposure improves left ventricular contractility in transgenic mice with heart failure. *Journal of Applied Physiology*, 113:791-798, 2012. PMID: PMC3472476
35. Witham, W., K.A. Yester, **C.P. O'Donnell**, and K.R. McGaffin. Restoration of glucose metabolism in leptin-resistant mouse hearts after acute myocardial infarction through the activation of survival kinase pathways. *Journal of Molecular and Cellular Cardiology*, 53:91-100, 2012. PMID: 22507542
36. Watanabe Y., S. Singamsetty, B. Zou, L. Guo, L.C. Alonso, D. Stefanovski, A. Garcia-Ocana, **C.P. O'Donnell**, and B.J. McVerry. Exogenous glucose administration impairs glucose tolerance and pancreatic insulin secretion during acute sepsis in non-diabetic mice. *PLOS One*, 8(6):e67716, 2013. PMID: PMC3691245
37. Lee, E.J., L.C. Alonso, D. Stefanovski, H. Strollo, L.C. Romano, B. Zuo, S. Singamsetty, K.A. Yester, K.R. McGaffin, A. Garcia-Ocana, and **C.P. O'Donnell**. Time-dependent changes in glucose and insulin regulation during intermittent hypoxia and continuous hypoxia. *European Journal of Applied Physiology*, 113(2):467-78, 2013. PMID: PMC3590809
38. McDowell, A.L., A.B. Filippone, B.S. Balbir, A. Germain, **C.P. O'Donnell**. Mild transient hypercapnia as a novel fear conditioning stimulus allowing re-exposure during sleep. *PLOS One*, 8(6):e67435, 2013. PMID: PMC3693948
39. Davis, E.M., L.W. Locke, A.L. McDowell, P.J. Strollo, and **C.P. O'Donnell**. Obesity accentuates circadian variability in breathing during sleep in mice, but does not predispose to apnea. *Journal of Applied Physiology*, 115(4):474-482, 2013. PMID: PMC3742947
40. Kaczmarek, E., J.P. Bakker, D.N. Clarke, E. Csizmadia, O. Kocher, A. Veves, F. Tecilazich, **C.P. O'Donnell**, C. Ferran, A. Malhotra. Molecular biomarkers of vascular dysfunction in obstructive sleep apnea. *PLOS One*, 8(7):e70559, 2013. PMID: PMC3726633
41. Chalacheva, P., J. Thum, T. Yokoe, **C.P. O'Donnell**, and M.C. Khoo. Development of autonomic dysfunction with intermittent hypoxia in a lean murine model. *Respiratory Physiology and Neurobiology*. 188(2):143-151, 2013. PMID: PMC3729633

D. Research Support

Ongoing Research Support

ADA 7-11-BS-04

07/1/11 – 06/30/14

Free Fatty Acids, p16, and Pancreatic Beta Cell Proliferation

The major goal of this study is to determine the mechanisms by which free fatty acids increase levels of the cell cycle inhibitor p16 in the pancreas cells to attenuate proliferation of beta cells in a high glucose environment.

Role: Co-Investigator

DOD11293006

03/01/12 – 02/28/17

Effects of Dose-Dependent Sleep Disruption on Fear and Reward Responses

The objective of this proposal is to study and probe the relationship between sleep disruption and neural networks underlying fear responses and reward processing that contribute to psychological resilience when intact, or poor stress-related psychological outcomes that are highly prevalent and comorbid in combat-exposed military veterans, such as posttraumatic stress disorder (PTSD), major depressive disorder (MDD), suicidality, and addictive disorders (including alcohol and substance misuse disorders).

Role: Co-Investigator

T32-HL082610/NIH

12/1/07 – 01/31/12

Translational research training in sleep medicine

The goal of this program is to train the future generation of clinical and basic researchers in a translational approach to Sleep Medicine.

Role: Co-Director

This grant received a fundable score (20) and it is expected to be renewed for 5 more years

COMPLETED (Last 3 years)

DM102174-DMRDP/DoD

12/1/10 – 12/31/13

Sleep resilience, comorbid anxiety, and treatment in a murine model of PTSD

The major goal of this project is to determine the role of sleep disturbances, stressful environments, and serotonergic treatment options in minimizing acquisition and maximizing extinction of fear conditioning in a variety of inbred and transgenic mouse strains.

Role: PI

2R01 HL077785/NIH

04/5/06 – 03/31/12

Sleep apnea links obesity to cardiovascular disease

The major goal of this project is to determine the role of the nitric oxide, TNF alpha, and leptin signaling pathways in the development of ventricular hypertrophy and altered contractility of the heart in response to intermittent hypoxia at both the organ and cell level.

Role: PI

N30 Pharmaceuticals

02/1/11 – 01/31/12

A Translational Assessment of Nitrite and GSNO Regulation through GSNOR Inhibition

We propose that administration of a GSNOR inhibitor to animals will increase levels of both GSNO and nitrite in the blood and tissues (lung, heart and liver). We propose to test this hypothesis by first characterizing the kinetics of the GSNOR inhibitor in vitro in a pure chemical model and in cell culture, this use this information to determine the pharmacokinetics of the inhibitor in a murine model.

Role: PI

2R01 HL063767/NIH/NHLBI

12/01/05 – 11/30/11

Sleep apnea and mechanisms of insulin resistance

The major goal of this project is to determine whether the role of the leptin melanocortin/pathway signaling pathways and the sympathoadrenal axis in the development of insulin resistance in response to intermittent hypoxia and sleep fragmentation.

Role: PI

RC1 DK085852/NIH

09/30/10 – 08/31/11

Dietary nitrate activation of PPARgamma improves insulin sensitivity

The major goal of this project is to examine whether nitrate, a bioactive dietary nutrient, can be converted to species that modulate oxidative inflammatory reactions and metabolism, thereby increasing insulin sensitivity.

Role: Co-Investigator
