Joseph C. Anderson, Ph.D.

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INDUSTRIAL POSITIONS

Owner, Anderson Bioscience, Phoenix, AZ	2022 -
Owner, Anderson Bioscience, Seattle, WA	2014 - 2022
Owner, Anderson Forensic Consulting, Seattle, WA	2009 - 2013
Manager, Clinical Affairs, Uptake Medical Co., Seattle, WA	2012 - 2012
Manager, Clinical Research, Uptake Medical Co., Seattle, WA	2010 - 2012
Pre-clinical Manager, Uptake Medical Co., Seattle, WA	2007 - 2010

ACADEMIC POSITIONS

Affiliate Assistant Professor, Department of Bioengineering University of Washington, Seattle, WA	2010 -
Research Assistant Professor, Department of Bioengineering University of Washington, Seattle, WA	2006 - 2007
Postdoctoral Fellow, Division of Pulmonary and Critical Care Medicine University of Washington, Seattle, WA	2003 - 2006
Postdoctoral Fellow, Department of Biomedical Engineering University of Michigan, Ann Arbor, MI	2001 - 2003

EDUCATION

Ph.D., Chemical Engineering, University of Washington, Seattle, WA	2001
M.S., Chemical Engineering, University of Washington, Seattle, WA	1998
B.S., Chemical Engineering, Arizona State University, Tempe, AZ	1995

AWARDS, PRIZES, HONORS

National Research Service Award (Institutional), U. Washington Cardiovascular Bioengineering Training Grant	2004 - 2006
Treasurer, ACES, University of Washington	1998
Teaching Assistant of the Year, Dept Chem Eng, U Washington	1997
National Society of Professional Engineers, Engineer-in-Training	1995
Alpha Epsilon Delta	1994
Arizona State University Honors College	1991 - 1995
Arizona Regents Scholarship	1991 - 1995
Bird Scholarship	1991

COURSES TAUGHT

Cardiovascular & Respiratory Systems Modeling Workshop, Pulmonary Modeling (2007-2012)
Integrative Physiological Systems Analysis (BIOEN 589), Co-Instructor, UW (2006)
Respiratory System for Medical Students (HUBIO 541), Teaching Assistant, UW (2004)
Graduate Biomedical Engineering Seminar (BME 500), Instructor, UM (2002)
Material and Energy Balances (CHE 310), Teaching Assistant, UW (1996, 1997, 1999)

SOCIETY MEMBERSHIPS

American Physiological Society - Regular member, 2003
Tau Beta Pi Engineering Honor Society, 1992
Golden Key Honor Society, 1992

REVIEW ACTIVITIES

Journals: ACS Sensors
Biomolecules
Chemical Engineering Science
Computational and Mathematical Methods in Medicine
European Medical Journal Respiratory
IEEE Transactions on Biomedical Engineering
Journal of Applied Physiology
Journal of Biomechanical Engineering
Journal of Breath Research
Journal of Healthcare Engineering
Journal of Theoretical Biology
Mathematical Bioscience
Peer J
Physiologic Measurements
PLOS One
Rapid Communications in Mass Spectrometry
Respiratory Physiology and Neurobiology

Grants: European Research Council
National Heart Lung and Blood Institute
National Science Foundation

JOURNAL ARTICLES

1. Mates vanLöbenSels, E., J.C. Anderson, J. Hildebrandt, and M.P. Hlastala. Modeling diffusion limitation of gas exchange in lungs containing perfluorocarbon. *J. Appl. Physiol*. 86: 273-284, 1999.

2. Anderson, J.C., S.L. Bernard, D.L. Luchtel, A.L. Babb, and M.P. Hlastala. Axial and radial distribution of the bronchial vasculature in sheep. *Respir. Physiol. Neurobiol.* 132: 329-339, 2002.

3. Anderson, J.C., A.L. Babb, and M.P. Hlastala. Modeling soluble gas exchange in the airways and alveoli. *Ann. Biomed. Eng*. 31: 1402-1422, 2003.

4. Anderson, J.C., R.C. Molthen, C.A. Dawson, S.T. Haworth, J.L. Bull, M.R. Glucksberg, and J.B. Grotberg. Effect of ventilation rate on instilled surfactant distribution in the pulmonary airways of rats. *J. Appl. Physiol.* 97: 45-56, 2004.

5. Schimmel, C., S.L. Bernard, S. Lakshminarayan, J.C. Anderson, N.L. Polissar, and M.P. Hlastala. Soluble gas exchange in the pulmonary airways of sheep. *J. Appl. Physiol.* 97: 1702-1708, 2004.

6. Anderson, J.C., A.L. Babb, and M.P. Hlastala. A fractal analysis of the radial distribution of bronchial capillaries around large airways. *J. Appl. Physiol.* 98: 850-855, 2005.

7. Suresh, V., J.C. Anderson, J.B. Grotberg, and R.B. Hirschl. A mathematical model of alveolar gas exchange in partial liquid ventilation. *J. Biomech. Eng.*127: 46-59, 2005.

8. Zheng, Y., J.C. Anderson, V. Suresh, and J.B. Grotberg. Effect of gravity on liquid plug transportation through an airway bifurcation model. *J. Biomech. Eng.*127: 798-806, 2005.

9. Anderson, J.C., and M.P. Hlastala. The kinetics of transdermal ethanol exchange. *J. Appl. Physiol.* 100: 649-55, 2006.

10. Anderson, J.C., W.J.E. Lamm, and M.P. Hlastala. Measuring airway exchange of endogenous acetone using a single-exhalation breathing maneuver. *J. Appl. Physiol.* 100: 880-9, 2006.

11. Anderson, J.C., and M.P. Hlastala. Breath tests and airway gas exchange. *Pulm. Pharmacol. Ther.*20: 112-17, 2007.

12. Hlastala, M.P., and J.C. Anderson. The impact of breathing pattern and lung size on the alcohol breath test. *Ann. Biomed. Eng*. 35: 264-272, 2007.

13. Carlson, B.E., J.C. Anderson, G.M. Raymond, R.K. Dash, and J.B. Bassingthwaighte Modeling oxygen and carbon dioxide transport and exchange using a closed loop circulatory system. *Adv. Exp. Med. Biol.* 614: 353-360, 2008.

14. Anderson, J.C. and M.P. Hlastala. Impact of airway gas exchange on the multiple inert gas elimination technique: Theory. *Ann. Biomed. Eng*. 38: 1017-30, 2010.

15. Tuck, S.A., V. Lopes-Berkas, S. Beam, and J.C. Anderson. Bronchoscopic Thermal Vapor Ablation in a canine model of emphysema. *Int J Chron Obstruct Pulmon Dis 7: 21-31, 2012*.

16. Henne, E., J.C. Anderson, and S. Kesten.Thermal effect of endoscopic thermal vapor ablation on the lung surface in human ex vivo tissue. *Int. J. Hypertherm.* 28: 466-72, 2012.

17. Henne, E., J.C. Anderson, N. Lowe, and S. Kesten. Comparison of human lung tissue mass measurements from ex vivo lungs and high resolution CT software analysis. *BMC Pulm. Med.* 12: 18, 2012.

18. Kesten, S., J.C. Anderson, and S.A. Tuck. Rationale for development and mechanism of action of endoscopic thermal vapor ablation (Intervapor™) for the treatment of emphysema. *J Bronchology Interv Pulmonol.* 19: 237-45, 2012.

19. Hlastala, M.P., and J.C. Anderson. Re: Grubb et al., Breath alcohol analysis incorporating standardization to water vapour is as precise as blood alcohol analysis. *Forensic Sci. Int*. 216 (2012) 88–91. *Forensic Sci. Int.* 223: e61, 2012.

20. Hlastala, M.P., F.L. Powell, and J.C. Anderson. Airway exchange of highly soluble gases. *J. Appl. Physiol.* 114: 675-80, 2013.

21. Anderson, J.C. Measuring breath acetone for monitoring fat loss: Review. *Obesity*. 23: 2327-2334, 2015.

22. Hlastala, M.P., and J.C. Anderson. Alcohol breath test: Gas exchange issues. *J. Appl. Physiol.* 121: 367-75, 2016.

23. Anderson, J.C. and M.P. Hlastala. The alcohol breath test in practice: Effects of exhaled volume. *J. Appl. Physiol.* 126: 1630-35, 2019.

24. Anderson, J.C., Mattar, S.G., Greenway, F.L., Lindquist, R.J. Measuring ketone bodies for the monitoring of pathologic and therapeutic ketosis. *Obes. Sci. Pract*. 7(5): 646-56, 2021.

25. Anderson, J.C. A new approach to modeling transdermal ethanol kinetics. *Physiol. Rep*. 12: e70070, 2024.

26. Rebello CJ, Zhang D, Anderson JC, Bowman RF, Peeke PM, and Greenway FL. From starvation to time-restricted eating: a review of fasting physiology. *Int. J. Obes. (Lond).* 49(1): 43-48, 2025.

27. Rebello CJ, Zhang D, Anderson JC, Bowman RF, Peeke PM, and Greenway FL. Randomized controlled trial of time-restricted eating: Secondary analyses of breath acetone. *Int. J. Obes. (Lond).* 49: 1416–1418, 2025.

BOOKS & CHAPTERS

1. Anderson JC. Modeling the anatomy and physiology of the bronchial circulation: Application to airway gas exchange (MS thesis). Seattle, WA: Dept of Chemical Engineering. Univ of Washington, 1998, p. 88.

2. Anderson JC. Quantification of pulmonary gas exchange: Combined effects of gas solubility and transport mechanisms (PhD thesis). Seattle, WA: Dept of Chemical Engineering. Univ of Washington, 2001, p. 163.

3. Anderson, J.C. and J.B. Bassingthwaighte. Tracers in physiological systems modeling. In: *Mathematical Modeling in Nutrition and Agriculture*, edited by Hanigan M.D. Blacksburg: Virginia Tech, 2007, p. 125-159.

OTHER ARTICLES

1. Hlastala, M.P., and J.C. Anderson. New science behind the alcohol breath test. In: *Understanding DUI Scientific Evidence*, Thomson Reuters, 2013, p. 357-377.

2. Hlastala, M.P., and J.C. Anderson. Using alcohol breath test science to your client's advantage. In: *Understanding DUI Scientific Evidence*, Thomson Reuters, 2014, p. 117-136.

3. Hlastala, M.P., and J.C. Anderson. Alcohol Breath Test: Correcting for Bias. *The Champion*. March: 34-39, 2020.

4. Bernard J.D., and J.C. Anderson. Chapter 5: The Chemical Test. In: Jones SL, Bernard JD (eds). *Massachusetts Practice Series: Drunk Driving Defense*. Thomson Reuters, 2021, p 289-408.

ABSTRACTS

1. Twedt, M.M., J. Anderson, A.L. Babb, and M.P. Hlastala. Effect of solubility on inert gas exchange in the upper airways. *FASEB J.* 10(3): A362, 1996.

2. Anderson, J.C., S. Irantash, S.L. Bernard, D.L. Luchtel, M.M. Twedt, A.L. Babb, and M.P. Hlastala. Bronchial capillary distribution about sheep airways. *Ann. Biomed. Eng.* 24(S1): S17, 1996.

3. Anderson, J.C., M.M. Twedt, A.L. Babb, and M.P. Hlastala. Solubility dependence of gas exchange in pulmonary airways. *FASEB J.* 11(3): A347, 1997.

4. Anderson, J.C., A.L. Babb, and M.P. Hlastala. Airway gas exchange: Modeling the anatomy and physiology of the bronchial circulation. *Ann. Biomed. Eng.* 26(S1): S53, 1998.

5. Anderson, J.C., and J Hildebrandt. Diffusion, perfusion and ventilation resistance to gas exchange in lungs containing perfluorocarbon. *Ann. Biomed. Eng.* 28(S1): S46, 2000.

6. Anderson, J.C., C.A. Dawson, R.C. Molthen, S.T. Haworth, M.R. Glucksberg, and J.B. Grotberg. Effect of ventilation on instilled liquid transport in the pulmonary airways of rats. *Abstracts of the Fourth World Congress of Biomechanics*, Calgary, Canada, August, 2002.

7. Suresh, V, J.C. Anderson, R.B. Hirschl, and J.B. Grotberg. Alveolar gas transport during liquid ventilation. *FASEB J.* 17(4): A146, 2003.

8. Anderson, J.C., C.A. Dawson, R.C. Molthen, S.T. Haworth, M.R. Glucksberg, and J.B. Grotberg. Effect of ventilation rate on instilled liquid transport in the pulmonary airways of rats. *FASEB J.* 17(4): A146, 2003.

9. Suresh, V, J.C. Anderson, R.B. Hirschl, and J.B. Grotberg. Modeling alveolar gas transport during liquid ventilation, *Proceedings of the 2003 Summer Bioengineering Conference*, Key Biscayne, FL, June 25-29, 2003.

10. Anderson, J.C., V. Suresh, and J.B. Grotberg. The effect of gravity on liquid plug transport in a bifurcating airway model. *Proceedings of the 2003 Summer Bioengineering Conference*, Key Biscayne, FL, June 25-29, 2003.

11. Suresh, V, J.C. Anderson, R.B. Hirschl, and J.B. Grotberg. Alveolar gas transport during partial liquid ventilation. *Ann. Biomed. Eng.* 31(S1): S42, 2003.

12. Anderson, J.C., V. Suresh, and J.B. Grotberg. The effect of gravity on liquid plug transport in a bifurcating airway model. *Ann. Biomed. Eng.* 31(S1): S39, 2003.

13. Suresh, V, Y. Zheng, J.C. Anderson, and J.B. Grotberg. The effect of gravity on liquid plug transport in bifurcating airways: theory and experiment. *AIChE annual meeting*, San Francisco CA, Nov 16-21, 2003.

14. Zheng, Y., V. Suresh, J.C. Anderson, and J.B. Grotberg. The effect of gravity on liquid plug transport in a bifurcating airway model. *American Physical Society, Division of Fluid Dynamics, 56th annual meeting*, East Rutherford, NJ, Nov 23-25, 2003.

15. Zheng, Y., J.C. Anderson, V. Suresh, and J.B. Grotberg. Liquid plug transport through an airway bifurcation. *FASEB J.* 18(4): A326, 2004.

16. Anderson, J.C., and M.P. Hlastala. A Sensitivity analysis of inert gas exchange in the lungs. *Proceedings of the 14th European Society of Biomechanics*. 's-Hertogenbosch, Netherlands, July 4-7, 2004.

17. Hlastala, M.P., C. Schimmel, J. Anderson, S. Bernard and S Laksminarayan. Exchange of highly soluble gases in the lung airways with the bronchial circulation. *Eur. Resp. J.* 24(Suppl 48): 327s, 2004.

18. Anderson, J.C., and M.P. Hlastala. Impact of airway gas exchange on the multiple inert gas elimination technique. *Am J Respir Crit Care Med* 169: A581, 2005.

19. Anderson, J.C., W.J.E. Lamm, and M.P. Hlastala. Measuring endogenous acetone during a single exhalation breathing maneuver. *BMES annual meeting,* Baltimore, MD, Sept 28 – Oct 1, 2005.

20. Hlastala, M.P. and J.C. Anderson. High solubility gas exchange with the bronchial circulation: Development of a non-invasive measure of airway gas exchange. *Proc. Da Vinci Soc.* 2005.

21. Couetil, L.L., M.J. Emery, R. Sahm, J.C. Anderson, J.B. Coad, J.J. Rohleder, D.F. Hogan, and M.E. Cooper. Lung Volume Reduction (LVR) by Bronchoscopic Thermal Vapor Ablation (BTVA) in sheep. *Am J Respir Crit Care Med*. 177: A894, 2008.

22. Anderson, J.C., N. Lowe, and S.A. Tuck. The impact of emphysema heterogeneity on the efficacy of lung volume reduction surgery: a retrospective analysis of the NETT study data. *Chest.* 138(4): 2010.

23. Anderson, J.C., N. Lowe, and S.A. Tuck. The effect of emphysema heterogeneity on durability of benefits following lung volume reduction surgery: a retrospective analysis of the NETT study data. *Am J Respir Crit Care Med.* 183: A4571, 2011.

24. Tuck, S.A., J.C. Anderson, and N. Lowe. The safety and efficacy of Bronchoscopic Thermal Vapor Ablation (BTVA) in an emphysematous canine model. *Am J Respir Crit Care Med.* 183: A1152, 2011.

25. Hlastala, M.P., and J.C. Anderson. Exchange of highly soluble gases by the lungs. *Breath Analysis Summit 2011: International Conference on Breath Research.* Parma, Italy, Sept 11-14, 2011.

26. Emery, M.J., J.C. Anderson, and E.R. Swenson. Ventilation heterogeneity is substantially decreased when breathing 5% carbon dioxide. *Am J Respir Crit Care Med*. 193: A5960, 2016.

27. Anderson, J.C., S.G. Mattar, F.L. Greenway, and R. Lindquist. Monitoring of Pathologic and Therapeutic Ketosis with Ketone Body Measurement. Obesity Society Annual Scientific Meeting. Obesity Society: Interactive at www.obesityweek.org, Nov 2-6, 2020.

28. Anderson, J.C. A Simplified Mathematical Model of Transdermal Ethanol Exchange. *Arizona Physiological Society Annual Meeting*, Scottsdale, AZ, October 21-22, 2022.