

## CURRICULUM VITAE

**Russell P. Bowler M.D., Ph.D.**

### 1. Personal History

#### Current Position Rank:

Professor  
National Jewish Health  
Denver, Colorado

Professor  
University of Colorado, Anschutz Medical Campus  
Denver, Colorado

#### Present Address:

Department of Medicine  
National Jewish Health  
1400 Jackson Street, K715A  
Denver, Colorado 80206  
Telephone: (303) 398-1639; Fax (303) 270-2249  
Email: bowlerr@njhealth.org

#### Citizenship:

United States

#### Born:

March 18, 1966; San Francisco, California

#### Marital Status:

Married to Fara Bowler; Children: Grace, Lilly, Patrick, Kate

### 2. Educational History

1988	B.S.	Stanford University, Palo Alto, California Math-Computer Science with Distinction
1993	M.D.	University of California, San Francisco, California School of Medicine with thesis
1993 – 1996		UCSF, Department of Internal Medicine, Internship and Residency
1996 – 2000		University of Colorado Health Sciences Center Pulmonary and Critical Care Medicine, Fellowship
1999 – 2000		National Jewish Medical and Research Center, Denver, Colorado
2001	Ph.D.	University of Colorado Health Sciences Center Department of Cell and Structural Biology

### 3. Academic Appointments

2000 – 2001		National Jewish Medical and Research Center, Instructor
2000 – 2001		University of Colorado Health Sciences Center, Clinical Instructor
2001 – 2008		National Jewish Medical and Research Center, Assistant Professor
2001 – 2006		University of Colorado Health Sciences Center, Assistant Professor
2006 – 2013		University of Colorado Health Sciences Center, Associate Professor
2008 – 2013		National Jewish Health, Associate Professor
2013 – present		University of Colorado, Anschutz Medical Campus, Professor of Medicine
2013 – present		National Jewish Health, Professor of Medicine

### 4. Hospital or other professional positions

2005 – present	Director, COPD Clinic
2012 – present	Co-Founder, Chief Medical Officer, Lenimen
2013 – present	Director, Personalized Medicine

## 5. Honors, Special Recognition and Awards

1999	Andrew Goodman Fellowship in Medicine
1999	National Research Service Award (NRSA)
2000	Young Investigator Award, Oxygen Society
2001	Young Investigator Award, Society of Critical Care Medicine
2002	American Lung Association Research Grant (declined)
2002	American Heart Association Beginning Grant-in-Aid
2006	Astra Zeneca Young Investigator Travel Award in COPD
2006	European Respiratory Society COPD Award
2006	Best COPD Poster, European Respiratory Society
2008	American Lung Association Career Investigator Award
2008	Best COPD Poster, European Respiratory Society
2011	Ambulatory Care Outstanding Teaching Award (3 <sup>rd</sup> year medical Students)
2012	Best Poster, 2 <sup>nd</sup> Place, Annual FAMRI Conference

## 6. Membership in professional organizations

1996 –	American Thoracic Society
1998 –	Society for Free Radical Biology and Medicine
2010 –	Colorado Biological Mass Spectrometry Society

## 7. Major Committee and Service Responsibilities

### Service at the University of Colorado

2002 – 2004	MICU Quality Assurance Committee
2004 – 2006	National Jewish Proteomics Recruitment Committee
2002 – Present	Internship and Residency Selection Committee (not continuous)
2004 – Present	UCHSC Proteomics Oversight Committee
2012 – Present	Member of Quantitative Biology Program (Biofrontiers Institute, Boulder)

### Service at National Jewish Health

2003	Department of Medicine Research Retreat (Chair)
2004 – 2006	National Jewish Proteomics Recruitment Committee
2006 – 2010	National Jewish COPD Hospital QI Committee
2006 – 2010	National Jewish Faculty Awards Committee
2007 – 2008	National Jewish Transgenic Recruitment Committee
2007 – 2008	Environmental and Oxidant Stress COPD Translational Research Initiative, Co-Chair.
2004 – Present	National Jewish COPD Recruitment Committee
2004 – Present	National Jewish Interdisciplinary Clinical Weekly Meeting (founder)
2006 – Present	COPD Quality Care Committee (run by Gary Cott)

### National service (excluding study section membership and participation)

2008 – Present	COPDGene Phenotypes and exacerbation committee
2008 – Present	COPDGene Longitudinal follow up committee
2010 – Present	COPDGene Executive committee
2012 – Present	SPIROMICS Biomarkers committee
2012 – Present	GRADS AAT committee

2012 – Present      ATS Proteomics and Metabolomics working group (co-founder)  
 2012 – Present      COPD Gene systems biology working group (co-founder)  
 2012 – Present      Denver Systems Biology Working Group (co-founder)  
 2012 – Present      Chair ATS Proteomics and Metabolomics Working Group (co-founder)  
 2013 – Present      Member RCMB Assembly Planning Committee

**8. Licensure and Board Certification:**

Licenses

1994-2000      California  
 1996-            Colorado 35928

Board Certifications

1996      American Board of Internal Medicine (#172500)  
 1998      Pulmonary Medicine (#172500)  
 1999      Critical Care Medicine (#172500)  
 2006      Recertification, American Board of Internal Medicine (#172500)  
 2008      Recertification, Pulmonary Medicine (#172500)  
 2009      Recertification, Critical Care Medicine (#172500)

**9. Inventions, intellectual property and patents held or pending**

1. EC-SOD (4G11G6) antibody (Santa Cruz Biotechnology)
2. Gene Expression diagnostic testing in respiratory disease: CU3109H-PPA1 (FCMM 1-42270)
3. Methods for Detection of Respiratory Diseases, PCT/US15/12666

**10. Review and referee work**

Editorial Boards

2009 – 2013      Clinical Respiratory Journal, Editorial Board  
 2013 – pres      European Clinical Respiratory Journal  
 2014 - pres      Journal of the COPD Foundation

Ad hoc reviewer (selected):

American Journal of Pathology: Lung Cellular and Molecular Physiology  
 American Journal of Respiratory and Critical Care Medicine  
 Journal of COPD,  
 Critical Care Medicine,  
 Free Radical Biology & Medicine  
 High Altitude Medicine and Biology  
 Intensive Care Medicine  
 Journal of Pathology  
 Mutation Research  
 Proteome Science  
 Proteomics  
 Respiratory Research  
 Thorax

Grant Reviewer/Service for NIH and Other Study Sections

2014.06.30      NJH Challenge Grants  
 2014.04.18      NIH SEP ZHL1 CSR-B (M1): RFA-HL-14-023: Clinical. HIV- (HLB) Diseases in Adults and Children (R01)  
 2013.12.16      FAMRI Center of Excellence Reviewer  
 2013.12.12      Alpha-1 Foundation Pilot Grant Reviewer  
 2013.12.12      Culpepper Grant Reviewer (Yale)

2013.12.7 CCTSI Pilot Grant Review  
 2013.6.25 IRAP study section member (ad hoc)  
 2013.6.11 NIH SEP ZDE1 JH (15) (RFA RM 12-021: Evaluation of Multi-'omic Data in Understanding ..Microbiome)  
 2012.10.3 IRAP study section member (ad hoc)  
 2012.8.1 NHLBI External Advisory Panel for NHLBI Proteomics Program  
 2012.7.30 NIA (P01 review)  
 2012.6.25 NHLBI SEP (RFA-HL-12-034: Management of HIV-Related Lung Disease and Cardiovascular Mortality (R34))  
 2012.2.1 FAMRI, Flight Attendant Medical Research Institute  
 2010.11.19 NHLBI SEP (RFA-HL-11-002 Common Pathogenic Mechanisms of Lung Cancer and COPD)  
 2009.11.23 NHLBI SEP (American Recovery and Reinvestment Act, RC4)  
 2009.8.7 NHLBI SEP (American Recovery and Reinvestment Act, RC2)  
 2007.11.13 FAMRI, Flight Attendant Medical Research Institute  
 2007.8.7 NCI SEP (RFA-CA-07-046 "Lung Cancer and Inflammation")  
 2006.11.14 FAMRI, Flight Attendant Medical Research Institute

## 11. Invited extramural lecture, presentations and visiting professorships

### National and International Presentations

Jun 5, 2015 COPD9USA, E-cigarettes  
 Feb 5, 2015 NIEHS INFLAMMATION FACULTY SEMINAR/WEBCAST SERIES  
 Jun 25, 2014 COPD9, Birmingham, England: "COPD Phenotypes"  
 Mar 28, 2014 UCD - Biochem and Mol. Genetics: Genomic, Proteomic And Metabolomic Profiling to Study COPD  
 Mar 12, 2014 MedImmune Invited Speaker – COPD T-cell biology  
 Feb 21, 2014 Proof Centre (UBC) –Omics of COPD  
 Nov 6, 2013 Conn State Lecture (Yale University), "Translating Genetics, Genomics, and Metabolomics in COPD"  
 Oct 10, 2013 Emory University, Atlanta, Ga, "Lung Metabolome in COPD"  
 May 1, 2013 FAMRI, Miami, FL; "The R213G SNP in COPD"  
 Mar 28, 2013 Fudan University, Shanghai, China, First International Respiratory Forum, "COPD"  
 Jan 11, 2013 University of Chicago, "Omics of COPD"  
 Oct 24, 2012 University of Colorado, "Personalized Medicine of COPD"  
 Sep 24, 2012 University of Colorado, Quantitative Biology. "Quantitative Biology of COPD"  
 Jul 25, 2011 MedImmune: "The Role of Immunity and Autoimmunity in the Pathogenesis of COPD Is COPD an autoimmune disease?"  
 Jun 10, 2011 Tom Petty Aspen Lung Conference: "COPD Gene Lung Cancer Longitudinal Follow Up"  
 Jun 8, 2010 Tom Petty Aspen Lung Conference: "Metabolomic Profiles Associated with COPD"  
 Jun 9, 2009 Congon Medical Lecture, Genesys Medical Center, Michigan: "Managing COPD: the importance of early intervention"  
 Jan 15, 2009 Univ. Nebraska, "The role of extracellular superoxide dismutase in attenuating lung injury: from mice to man and back again"  
 May 29, 2008 ATS 2008 Session Genetics and Genomics of Lung Diseases: "Proteomics: What is the state of art of the technology and the applications to lung study?"  
 Jan 18, 2008 Lovelace Respiratory Research Institute: "COPD Phenotypes and their Molecular Basis"  
 Feb 1, 2007 Keystone Update, "Is There a Role for proteomics in the Study of Lung Diseases"  
 Jul 6, 2006 Colorado Academy of Family Practitioners Annual Meeting, "Updates in the diagnosis and management of stable COPD"  
 Aug 10, 2005 University of Colorado Medical Grand Rounds: "Why don't all smokers get COPD"  
 May 2, 2005 Ciphergen Users Meeting, Newport, RI: "Chronic obstructive lung disease (COPD): a SELDI based diagnostic approach"  
 Apr 10, 2005 UTMB Galveston: "EC-SOD in pulmonary inflammation"  
 June 6, 2003 Tom Petty Aspen Lung Conference – "Airway antioxidants and oxidative stress as predictors of sputum atypia and airflow obstruction"  
 Jan 30, 2003 Society of Critical Care Medicine (SCCM) – San Antonio, Texas – "Extracellular Reactive Oxygen Species in Reperfusion Injury of the Lung"  
 Sep 20, 2003 University of Århus, Denmark "Extracellular Superoxide Dismutase in Lung Injury"

Jun 30, 2002 Duke University, North Carolina: "Extracellular Reactive Oxygen Species in Regulating Pulmonary Inflammation"

## 12. Teaching Record

### Graduate and Medical School Lectures

1998 – 2009 University of Colorado, Pulmonary Physiology, 2nd Year Medical School  
 2001 – 2008 University of Colorado Health Sciences Center, Physical Diagnosis, 2nd Year Medical School  
 2005 – present University of Colorado Medical School Preceptor, 3<sup>rd</sup> year medical students

### House Staff

2001 – 2005 University of Colorado Health Sciences Center, Pulmonary and Critical Care Service

### Mentorship and Graduate School Activities

<u>Dates</u>	<u>Student</u>	<u>Degree</u>	<u>Role</u>	<u>Dept</u>	<u>Current Position</u>
2005 – 2006	Matt Gingo		Post doc thesis mentor	Medicine	Assoc. Prof. U. Pitt.
2006 – 2011	Michael Nicks	Ph.D.	Thesis Mentor	Clinical Sciences	Post-doctoral, National Jewish Health
2006 – 2010	John Arcaroli	Ph.D.	Thesis Committee	Clinical Sciences	Asst. Prof. Univ Colo
2006 – 2010	Adam Friedlander	M.S.	Thesis Mentor	Clinical Sciences	Private Practice, Savannah
2008 – 2009	Jayaji More		Undergrad Project	Medicine	Fulbright Applicant
2008 – 2010	Angella (Tollefson) Zimmerman		Post doc	Medicine	Post-doc Marquette Univ
2009 – 2011	Tim Bahr	M.S.	Thesis Committee	Biostats & Informatics	Medical Student Univ. Iowa
2009 – 2011	Yu Il Kim		Post doc	Medicine	Assoc. Prof, Chonnam National University, Korea
2009 – 2011	Kannan Chamsri	Ph.D.	Thesis Committee	Applied Mathematics	Post-doc, University of Colorado at Denver
2010 – 2012	David Goldstrohm		Post doc	Medicine	National Jewish Health
2011 – 2014	Grant Hughes	M.S.	Thesis Committee	Biostats & Informatics	Student Univ. Colo
2011 – 2014	Jennifer Black-Shinn	Ph.D.	Thesis Committee	Biostats & Informatics	Student Univ. Colo
2011 – 2013	Fabienne Gally		Post doc	Medicine	Instructor National Jewish Health
2012 - 2014	Mustimbo Roberts	Ph.D.	Post doc	Medicine	MedImmune
2014 – pres	Jason Keene	M.D.	Pulmonary Fellow	Medicine	Pulmonary Fellow UCHSC
2013 – pres	Charlotte Siska	M.S.	Thesis Committee	Computational Biology	Student
2014 – pres	Junxiao Hu	M.S.	Thesis Advisor	Biostatistics	Student

## 13. Research Grants, Contracts and Special Grants

### Ongoing Research Support (excludes industry grants for clinical trials)

NIH/NHLBI P20 HL 11-3445 - \$6,006,412 (1<sup>st</sup> percentile) 04/01/12 – 03/31/17  
 (Bowler PI) Metabolic profiles of COPD phenotypes  
 Goal: identifying novel genomic and metabolomic pathways for COPD

NIH/NHLBI R01 HL 11-1288 - \$ 2,056,491 (1<sup>st</sup> percentile) 07/01/12 – 06/30/17  
 (Bowler PI) Investigating the role of the R213G SOD3 polymorphism in lung disease  
 Goal: mechanistic studies of EC-SOD

NIH/NHLBI R01 HL 08-9897 \$1,874,732 09/30/08 – 09/29/17  
 (Bowler Clinical Center PI - Crapo and Silverman overall PI): Genetic Epidemiology of COPD  
 Goal: Enroll smokers in COPD Gene study for GWAS and F/U

NIH/NHLBI RO1 SPIROMICS Center Subsite with UCSF \$1,000,000 (est) 07/01/12 – 04/30/16  
 (Bowler PI Clinical Site) Subpopulations and intermediate outcome measures in COPD study (SPIROMICS)  
 Goal: Molecular Characterization of COPD phenotypes

Johnny Carson Foundation (\$300,000) 06/01/14 – 05/31/17  
 (Bowler PI) Personalized Molecular Approach to the Diagnosis and Treatment of COPD  
 Goal: Genomic approaches to identify COPD Phenotypes

CDPHE Marijuana research grant (\$450,000) (Bowler PI) Colorado Cannabis Cohort: Efficacy, Safety, and Usage Patterns of Medical Marijuana for Sleep Establishing a marijuana cohort and observation studies on sleep	06/01/15 – 05/31/18
MedImmune Research Grant (\$100,000) (Bowler PI) T cell phenotyping in COPD	04/01/15 – 12/31/15
BI Investigator initiated grant (\$66,000) (Bowler PI) COPD Gene lung cancer database	02/01/15 – 12/31/16

**Pending Research Support**

**Completed Research Support**

NIH/NHLBI R01 HL 11-4055 (co-investigator) - 5% effort (Martinez PI) Development of Case Finding Methodology in COPD Goal: develop new screening for COPD	04/01/12 – 03/31/15
NIH/NHLBI R01 U01 HL11-2695 (co-investigator) 2.5% effort (Maier PI) GRADS Goal: AAT and Sarcoidosis	04/01/12 – 03/31/15
AHA Beginning Grant-In-Aid (Bowler, PI) \$108,000 The Role of Oxidants and Antioxidative Damage to Epithelial Lining Proteins in Acute Lung Injury	07/01/02 – 6/30/04
National Research Service Award (Bowler, PI) F32 HI 10220-01 \$55,000 Postdoctoral Fellowship	07/01/99 – 6/30/00
NIH/NHLBI 1 K08 HL04407 (Bowler, PI) \$750,000 Regulation of Extracellular Superoxide Dismutase by Proteolytic Cleavage Goal: To determine the regulation and mechanism of proteolytic processing of EC-SOD.	07/01/00 – 6/30/05
Colorado Tobacco Research Project (Bowler, PI) \$140,000 Antioxidant and Oxidative Damage in Smokers with COPD. Goal: To use antioxidants and proteomics to identify early markers of progression in chronic obstructive lung disease (COPD)	07/01/03 – 06/30/05
Emphasys VENT Study (Bowler, PI Colorado) \$35,986 Endobronchial Valve for Emphysema Palliation Trial Goal: Bronchoscopic valve placement to achieve lung volume reduction	01/01/05 – 06/30/06
BI 1222.5 (Bowler PI) \$58,884 Goal: Randomised, double blind placebo-controlled, parallel group study to assess the efficacy and safety of 4 weeks once daily treatment of orally inhaled BI 1744CL (2µg, 5µg, 10µg, 20µg) delivered by Respimat Inhaler in patients with COPD4	04/30/07 – 03/31/08
ALA Career Investigator Award (Bowler, PI) \$58,000 Investigating the role of the EC-SOD heparin binding domain in COPD Goal: Using animal models to determine how EC-SOD decreases inflammation	07/01/08 – 6/30/09
FAMRI Award (Bowler PI) \$800,000	

Molecular Phenotype of Early Emphysema 07/01/05 – 6/30/10  
Goal: Use proteomic approach to identify biologic basis of emphysema phenotypes

ALA Career Investigator Award (Bowler, PI) \$180,000  
Investigating the role of the EC-SOD heparin binding domain in COPD 07/01/08 – 6/30/11  
Goal: Using animal models to determine how EC-SOD decreases inflammation

Colorado Clinical and Translational Science Institute (Bowler PI) \$50,000 01/01/10-12/31/10  
Role of CD4+ Regulatory and T17 Helper T Cells in Emphysema (Co-Pilot)  
Goal: Study the role of TH17 cells in the pathogenesis of COPD

Colorado Bioscience Discovery (Lynch PI) \$63,171 06/01/10 - 05/31/12  
State of Colorado  
Textural Approach to Quantification of Diffuse Lung Disease on CT  
Goal: Automatic quantification of lung disease on CT scans

NIH/NHLBI RO1 HL 09-5432 \$1,566,658 05/01/09 – 04/30/14  
(Bowler PI) Metabolome and proteome profiles of emphysema and airway disease  
Goal: Proteomics in COPD Gene Cohort

FAMRI 09\_2050 Career Investigator \$325,500 07/01/10 - 06/30/13  
(Bowler PI) Cigarette smoke induces endogenous oxidant injury  
Goal: To determine the role of EC-SOD in COPD

#### 14. Bibliography

##### Papers Published in Refereed Journals

1. **Bowler, R.P.** and C.E. Becker. Computer searching for occupational medicine. *J Occup Med*, 28:370-2, 1986.
2. **Bowler, R.P.** and A. Ablin. Severe abdominal pain followed by sudden death in a 15 year-old boy. *UCSF School Med Student J*, 2:2-5, 1992.
3. DeArmond, S.J., K. Kristensson, and **R.P. Bowler**. PrPSc causes nerve cell death and stimulates astrocyte proliferation: A paradox. *Prog Brain Res*, 94:437-46, 1992.
4. DeArmond, S.J., S.L. Yang, A. Lee, **R.P. Bowler**, A. Taraboulos, D. Groth, and S.B. Prusiner. Three scrapie prion isolates exhibit different accumulation patterns of the prion protein scrapie isoform. *Proc Natl Acad Sci USA*, 90:6449-53, 1993.
5. **Bowler, R.P.**, J. Durham, and M.I. Schwarz. Massive hemoptysis from a pulmonary artery aneurysm associated with an emphysematous bulla. *Chest*, 113:1130-1, 1998.
6. Schwarz, M.I., M.R. Zamora, T.N. Hodges, E.D. Chan, **R.P. Bowler**, and R. M. Tuder. Isolated pulmonary capillaritis and diffuse alveolar hemorrhage in rheumatoid arthritis and mixed connective tissue disease. *Chest*, 113:1609-15, 1998.
7. **Bowler, R.P.**, J. Arcaroli, J.D. Crapo, A. Ross, J.W. Slot, and E. Abraham. Extracellular superoxide dismutase attenuates lung injury after hemorrhage. *Am J Respir Crit Care Med*, 164(2):290-4, 2001.
8. Pineda, J.A., M. Aono, H. Sheng, J. Lynch, J.C. Wellons, D.T. Laskowitz, R.D. Pearlstein, **R. Bowler**, J.D. Crapo, and D.S. Warner. Extracellular superoxide dismutase overexpression improves behavioral outcome from closed head injury in the mouse. *J Neurotrauma*, 18(6):625-34, 2001.

9. **Bowler, R.P.**, M. Nicks, K. Warnick, and J.D. Crapo. The role of extracellular superoxide dismutase in bleomycin induced pulmonary fibrosis. *Am J Physiol Lung Cell Mol Physiol*, 282(4):L719-26, 2002.
10. **Bowler, R.P.** M. Nicks, D.A. Olsen, I.B. Thøgersen, Z. Valnickova, P. Højrup, A. Franzusoff, J.J. Enghild, and J.D. Crapo. Furin proteolytically processes the heparin binding region of extracellular superoxide dismutase. *J Biol Chem*, 277(19):16505-11, 2002.
11. **Bowler, R.P.**, and J.D. Crapo. Oxidative stress in allergic respiratory diseases. *J Allergy Clin Immunol*, 110(3):349-56, 2002.
12. **Bowler, R.P.** H. Sheng, J.J. Enghild, R.D. Pearlstein, D.S. Warner, and J.D. Crapo. A catalytic antioxidant (AEOL 10150) attenuates expression of inflammatory genes in stroke. *Free Radic Biol Med*, 33(8):1141-52, 2002.
13. Sheng, H., R.D. Pearlstein, J.J. Enghild, **R.P. Bowler**, J.D. Crapo, and D.S. Warner. Effects of metalloporphyrin catalytic antioxidants in experimental brain ischemia. *Free Radic Biol Med*, 33(7):947-61, 2002.
14. **Bowler, R.P.**, and J.D. Crapo. Oxidative stress in airways: Is there a role for extracellular superoxide dismutase. *Am J Respir Crit Care Med*, 166(12 Pt 2):S38-43, 2002.
15. **Bowler, R.P.**, J. Arcaroli, E. Abraham, M. Patel, L-Y. Chang and J.D. Crapo. Evidence for extracellular superoxide dismutase as a mediator of hemorrhage-induced lung injury. *Am J Physiol Lung Cell Mol Physiol*, 284(4):L680-7, 2003.
16. Wang, W., S. Jittikanont, S.A. Falk, P. Li, L. Feng, P.E. Gengaro, B.D. Poole, **R.P. Bowler**, B.J. Day, J.D. Crapo and R.W. Schrier. Interaction among nitric oxide, reactive oxygen species, and antioxidants during endotoxemia-related acute renal failure. *Am J Physiol Renal Physiol*, 284(3):F532-7, 2003.
17. **Bowler R.P.**, L.W. Velsor, B. Duda, E.D. Chan, E Abraham, L.B. Ware, M.A. Matthay and B.J. Day. Pulmonary edema fluid antioxidants are depressed in acute lung injury. *Crit Care Med*, 31(9):2309-15, 2003.
18. **Bowler, R.P.**, R. C. Balkissoon and J.D. Crapo. Oxidative stress in chronic obstructive pulmonary disease. *Minerva Pneumologica*, 42(2):101-14, 2003.
19. **Bowler, R.P.**, B. Duda, E.D. Chan, J.J. Enghild, L.B. Ware, M.A. Matthay, and M.W. Duncan. Proteomic analysis of pulmonary edema fluid and plasma in patients with acute lung injury. *Am J Physiol Lung Cell Mol Physiol*, 286(6):L1095-104, 2004.
20. Petersen, S.V., T.D. Oury, L. Ostergaard, Z. Valnickova, J. Wegrzyn, I.B. Thøgersen, C. Jacobsen, **R.P. Bowler**, C.L. Fattman, J.D. Crapo, and J.J. Enghild. Extracellular superoxide dismutase (EC-SOD) binds to type I collagen and protects against oxidative fragmentation. *J Biol Chem*, 279(14):13705-10, 2004.
21. **Bowler R.P.**, Oxidative stress in the pathogenesis of asthma. *Curr Allergy Asthma Rep*, 4(2):116-22, 2004.
22. Olsen D.A., S. V. Petersen, T.D. Oury, Z. Valnickova, I.B. Thøgersen, T. Kristensen , **R.P. Bowler**, J.D. Crapo, and J. J. Enghild. The intracellular proteolytic processing of extracellular superoxide dismutase (EC-SOD) is a two step event. *J Biol Chem*, 279(21):22152-7, 2004.
23. **Bowler, R.P.**, P.J. Barnes, J.D. Crapo, The role of oxidative stress in chronic obstructive pulmonary disease. *COPD*, 1(2):255-277, 2004.
24. Sutherland, E.R., R.J. Martin, **R.P. Bowler**, Y. Zhang, M.D. Rex, M. Kraft. Physiologic correlates of distal lung inflammation in asthma. *J Allergy Clin Immunol*, 113(6):1046-50, 2004.



25. **Bowler, R.P.**, M. Nicks, K. Tran, G. Tanner, L-Y. Chang, S.K Young, G.S. Worthen. Extracellular superoxide dismutase attenuates lipopolysaccharide-induced neutrophilic inflammation. *Am J Respir Cell Mol Biol*, 31(4):432-9, 2004.
26. **Bowler, R.P.**, M.C. Ellison, B. Duda, K. Tran, M. Nicks, C. Cool, K. Greene, J.D. Crapo. Lung inflation with direct injection of agarose: A technique for simultaneous molecular and morphometric measurements. *Exp Lung Res*, 30(6):673-86, 2004.
27. Heijnen, H.F., S. Waaijenborg, J.D. Crapo, **R.P. Bowler**, J.N. Akkerman, J.W. Slott. Colocalization of eNOS and the catalytic subunit of PKA in endothelial cell junctions: A clue for regulated NO production. *J. Histochem Cytochem*, 52(10):1277-86, 2004.
28. **Bowler R.P.**, B. Duda, K.O. Vu, T. Byers, W. Franklin, E.D. Chan, Y.E. Miller. Airway antioxidants and oxidative stress as predictors of sputum atypia and airflow obstruction. *Chest*, 125(5 Suppl):127S-8S, 2004.
29. Regan, E., J. Flannelly, **R.P. Bowler**, K. Tran, M. Nicks, B. Carbone, D. Glueck, H. Heijnen, R. Mason, J. Crapo. Extracellular Superoxide Dismutase and Oxidant Damage in Osteoarthritis. *Arthritis Rheum. 2005*; 52(11):3479-3491. PMID: 2755499.
30. Qian, Z., M. Haessler, J. Lemos, J. Arsenault, J. Aguirre, J. Gilbert, R.P. Bowler, F. Park. Targeting Vascular Injury Using Hantavirus-Pseudotyped Lentiviral Vectors. *Mol Therapy*, 13(4):694-704, 2006.
31. **Bowler, R.P.**, M.E. Canham, M.C. Ellison Surface Enhanced Laser Desorption/Ionization (SELDI) Time-Of-Flight Mass Spectrometry to Identify Patients with Chronic Obstructive Pulmonary Disease. *COPD*, 3(1):41-50, 2006.
32. Sharma, S., O. Dewald, J. Adroque, R.L. Salazar, P. Razeghi, J.D. Crapo, **R.P. Bowler**, M.L. Entman, and H. Taegtmeyer. Induction of antioxidant gene expression in a mouse model of ischemic cardiomyopathy is dependent on reactive oxygen species. *Free Radic Biol Med*, 40(12):2223-31.
33. Morimoto, K., J. Kench, Y. Xiao, **R. Bowler**, K. McPhillips, V. Borges, W. Janssen, P. Henson. Lovastatin Enhances Clearance of Apoptotic Cells (Efferocytosis) with Implications for Chronic Obstructive Pulmonary Disease. *J Immunol*, 176(12): 7657-65, 2006.
34. **Bowler, R.P.**, M.C. Ellison, N. Reisdorph. Proteomics in Pulmonary Medicine. *Chest*, 130(2):567-574, 2006.
35. Sutherland, E.R., J.D. Crapo, **R.P. Bowler**. N-acetylcysteine and exacerbations of chronic obstructive pulmonary disease. *COPD*, 3(4)195-202, 2006.
36. Bowler, R.M., H.A. Roels, S. Nakagawa, M. Drezgic, E. Diamond, R. Park, W. Koller, **R.P. Bowler**, D. Mergler, M. Bouchard, D. Smith, R. Gwiazda, R.L. Doty. Dose-effect relationships between manganese exposure and neurological, neuropsychological and pulmonary function in confined space bridge welders. *Occup Environ Med*, 64:167-177, 2007.
37. Chu, H.W., J. Thaikoottathil, J.G. Rino, G. Zhang, Q. Wu, T. Moss, Y. Refaeli, **R. Bowler**, S.E. Wenzel, Z. Chen, J. Zdunek, R. Breed, R. Young, E. Allaire, R.M. Martin. Function and regulation of SPLUNC1 protein in mycoplasma infection and allergic inflammation. *J Immunol*, 179(6)3995-4002, 2007.
38. Friedlander, A.L., D. Lynch, L.A. Dyar. **R.P. Bowler**. Phenotypes of chronic obstructive pulmonary disease. *COPD*, 4(4)355-84, 2007.
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