

June, 2010

## CURRICULUM VITAE

MICHAEL PETER HLASTALA

### Personal:

Born: Uniontown, PA, June 1, 1944  
Married: Margaret Bjornson, 2 children

### Education:

State University of New York at Buffalo  
Ph.D., Physiology, June 1969

University of Washington  
B.S., Physics, June 1966

### Postgraduate Training:

Postdoctoral Fellow 3/1970 - 11/1970  
University of Washington

### Faculty Positions:

Professor of Bioengineering  
10/2009 - present

Professor Emeritus of Physiology and Biophysics and of Medicine  
6/2009 - present

Professor of Physiology and Biophysics and of Medicine  
7/1982 – 6//2009  
University of Washington

Adjunct Professor of Bioengineering  
5/1986 – 6/2009  
University of Washington

Visiting Scientist, 7/1979 - 6/1980  
Abteilung Physiologie, Max Planck Institut für experimentelle Medizin,  
Göttingen, Federal Republic of Germany

Associate Professor of Physiology and Biophysics and of Medicine  
7/1977 - 6/1982  
University of Washington

Assistant Professor of Physiology and Biophysics and of Medicine  
11/1974 - 6/1977  
University of Washington

Research Assistant Professor of Medicine

1/1973 - 10/1974

University of Washington

Acting Instructor of Medicine

11/1970 - 12/1972

University of Washington

Other Professional Experience:

The Boeing Co., Seattle, WA

Senior Human Engineering Analyst, 9/1969-4/1970

Student Engineer, 6/1963 - 8/1966

Secondary Appointments

Consultant, University Hospital, 10/1973 - 9/1994

Associate Director, Pulmonary Function Lab, 10/1973 - 9/1987

Director of Research, Division of Pulmonary and Critical Care Medicine, 7/1986 - 12/1993

Associate Director for Physiological Research, Division of Pulmonary and Critical Care Medicine, 1/1994-2009

Research Affiliate, Regional Primate Research Center, 2/1989 - 2009

Honors:

Phi Beta Kappa

Pi Mu Epsilon

Phi Eta Sigma

Finalist, Mission Specialist Astronaut Selection, NASA, 1977

USPHS Research Career Development Award, 1976 - 1981

John Simon Guggenheim Fellow, 1979 - 1980

National Heart Lung and Blood Institute MERIT Award, 1986

Science in Medicine Lecture, University of Washington, April, 1991

Doctor of Medicine honoris causa (MD h.c. Linköping)

Linköping University, Sweden, May, 1992

Listed in "Book of Honors", Fundamental Library, St. Petersburg State of Medical University I.I. Pavlov, St. Petersburg, Russia

Professional Organizations:

Aerospace Medical Association – past member

American Heart Association – past member

American Physiological Society – Emeritus member

American Thoracic Society – past member

Biomedical Engineering Society - past Senior Member

Comparative Respiratory Society – past member

European Respiratory Society – past member

International Society on Oxygen Transport to Tissue – past member

Scandinavian Physiological Society – past member

Undersea and Hyperbaric Medical Society – past member

Washington Thoracic Society – past member

Editorial Responsibilities:

Associate Editor, Journal of Applied Physiology, 5/1987 - 6/1993

Editorial Board, Journal of Applied Physiology, 4/1976 - 2009

Editorial Board, Undersea Biomedical Research, 7/1980 - 6/1984

Editorial Board, Cardiologia, 2/1995-12/1999

Editorial Board, Italian Heart Journal, 1/2000 – 2002

Editorial Board, DWI Journal: Science and Law, 1/2008 – 4/2010

Co-editor, Handbook of Physiology: Gas Exchange, American Physiological Society

Ad Hoc Reviewer:

Acta Physiol Scand

American Journal of Physiology

American Journal of Veterinary Research

American Review of Respiratory Diseases

Annals of Biomedical Engineering

Blood

Bulletin europeen de Physiopathologie respiratoire:

Clinical Respiratory Physiology

Chest

Circulation

European Respiratory Journal

IEEE Transactions of Biomedical Engineering

Intensive Care Medicine

International Commission of Clinical Chemistry

Journal of Biomedical Engineering

Journal of Clinical Investigation

Journal of Developmental Physiology

Journal of Pharmacology and Experimental Therapeutics

Journal of Sports Medicine

New England Journal of Medicine

Pfluegers Archiv

Respiration Physiology

Science

Undersea Biomedical Research

University Responsibilities:

Admissions Committee, School of Medicine, 1991-1993

Admissions Committee, PBio Department, 1991-1998

Animal Care Committee, UW, 1988-1990, Chair, 1993-1995

Classified and Proprietary Research Review Committee, UW, 1987-1989

Committee for Evaluation and Improvement of Teaching, PBio Department, 1985-1988,  
Chairman, 1987-1988

Committee on a Smoke-Free Environment in the Health Science Center, 1985-1986

Cystic Fibrosis Foundation Research Development Program Advisory Committee,  
1986-1991

Faculty Senate, UW, 1989-1991, 1995-1997

Graduate Faculty Nominations Committee, PBio Department, 1992-2001

Graduate Student Admissions Committee, PBio Department, 2000-2001

Graduate Student Qualifying Exam Committee, PBio Department, 1995-1997

HD Patton Physiological Society Committee, Chairman, PBio Dept., 1986

Pulmonary Program Project Grant Advisory Committee, 1977-present, Chair, 1988-  
present

Pulmonary Specialized Center of Research Advisory Committee, 1971-1975; 1982-  
1987

National Responsibilities:

American Heart Association, Cardiopulmonary Council

Budget Committee, 1987-1988

Executive Committee, 1986-1988

Long Range Planning Committee, 1988 - 1990

American Physiological Society

Long Range Planning Task Force, 1981-1983

Program Advisory Committee, 1993-1995

Program Committee, 1993-1995

Respiration Section

Nominating Committee, 1991-1992

Secretary, 1988-1991

Science Teacher Research Program

Sponsor, 1994

Special Lecture, Experimental Biology 1996

American Thoracic Society

Scientific Assembly on Respiratory Structure, Function and Metabolism

Program Committee, 1981-1982

Canadian Heart Foundation, Ad Hoc Reviewer, 1987

Canadian Medical Research Council, Ad Hoc Reviewer, 1987

Center for Research in Special Environments, SUNY at Buffalo, Center Advisory  
Committee, 1993-1997

Lovelace Medical Foundation, External Scientific Advisory Panel, 1987, 1992

National Aeronautics and Space Administration, Subcommittee on Biomedical and  
Behavioral Research of the Life and Microgravity Sciences and Applications  
Advisory Committee, 1997-2001

National Institutes of Health

Division of Research Grants

Ad Hoc Reviewer, 1976-present

Cardiovascular and Renal Special Study Section, Member, 1990, Chair, 1991  
Lung Biology and Pathology Special Review Group, Member, 1991;  
Chair, 1992, 1993  
Metabolic Pathology Special Study Section, Chair, 1990  
Respiration and Applied Physiology Study Section, Member, 1983-1987  
National Heart, Lung and Blood Institute  
Ad Hoc Reviewer, 1976-present  
Artificial Lung Advisory Panel, Chair, 1990  
Artificial Lung Research and Development Monitoring Board, Member,  
1992-1995  
Hyperbaric Oxygen Workshop, Session Chair, 1989  
Pulmonary Specialized Center of Research, Parent Committee, 1980-1981  
Research Review Committee A, 1988 - 1992  
Special Emphasis Panel, 1992  
National Reviewers Reserve, 1992-1996  
National Science Foundation, Ad Hoc Reviewer, 1983-present  
New Zealand Health Research Council Referee, 2007  
The Wellcome Trust, Ad Hoc Reviewer, 1995  
Undersea Medical Society  
Publications Committee, 1977-1980  
Workshop Committee, 1978-1982  
University of Pennsylvania, Institute for Environmental Medicine  
Research Advisory Board, Member 1999 - 2004

Consultant Activities:

Cascadia Corporation, Seattle, WA, 1991 - 2000  
Medical-Legal Consulting, 1984 - present  
Meridian Medical Corporation, Seattle, WA  
Board of Directors, 1984 - present  
Consultant, 1984 - present  
Pacific Northwest Laboratory, Battelle Memorial Institute, 1982-1984  
Tiarco, 1984-1985  
Pulmonary Interface, Seattle, WA, 1995-1997

Other Activities:

Commercial Pilot License  
Airplane Single Engine Land Rating  
Airplane Multiengine Land Rating  
Instrument Rating

## BIBLIOGRAPHY

1. Van Liew HD and MP Hlastala. Influence of bubble size and blood perfusion on absorption of gas bubbles in tissues. *Respir Physiol* 7:111-121, 1969.
2. Hlastala MP. Absorption of nitrogen bubbles in flowing blood. Ph.D. Thesis, State University of New York at Buffalo, Buffalo, N.Y. 1969.
3. Ryan PW, WE Springer and MP Hlastala. Cockpit Geometry Evaluation, Phase II - Human Data, D162-10126-2. The Boeing Company, Seattle, Washington, February 1970.
4. Hlastala MP. A model of fluctuating alveolar gas exchange during the respiratory cycle. *Respir Physiol* 15:214-232, 1972.
5. Hlastala MP, B Wranne and CJ Lenfant. The single breath method of measuring cardiac output - a re-evaluation. *J Appl Physiol* 33:846-848, 1972.
6. Hlastala MP. Significance of the Bohr and Haldane effects in the pulmonary capillary. *Respir Physiol* 17:81-92, 1973.
7. Hlastala MP, B Wranne and CJ Lenfant. Cyclical variations in FRC and other respiratory variables in resting man. *J Appl Physiol* 34:670-676, 1973.
8. Hlastala MP and LE Farhi. Absorption of gas bubbles in flowing blood. *J Appl Physiol* 35:311-316, 1973.
9. Hlastala MP. Transient state diffusion in subcutaneous tissue. *Aerospace Medicine* 45:269-273, 1974.
10. Papayannopoulou T, CA Finch, G Stamatoyannopoulos, and MP Hlastala. Extracorporeal treatment of blood with cyanate in primates: physiologic and toxicologic observations. *J Lab Clin Med* 84:81-71, 1974.
11. Hlastala MP and RD Woodson. Saturation dependency of the Bohr effect: interactions among  $H^+$ ,  $CO_2$  and DPG. *J Appl Physiol* 38:1126-1131, 1975.
12. Hlastala MP and HD Van Liew. Absorption of in vivo inert gas bubbles. *Respir Physiol* 24:147-158, 1975.
13. Hlastala MP, PS Colley and FW Cheney. Pulmonary shunt: A comparison between oxygen and inert gas infusion methods. *J Appl Physiol* 39:1048-1051, 1975.
14. Hlastala MP, HP McKenna, RL Franada and JC Detter. The influence of carbon monoxide on hemoglobin-oxygen binding. *J Appl Physiol* 41:893-399, 1976.

15. Langer EE, G Stamatoyannopoulos, MP Hlastala, JW Adamson, M Figley, FR Labbe, JC Detter and CA Finch. Extracorporeal treatment with cyanate in sickle cell disease. Preliminary observations in four patients. *J Lab Clin Med* 24:462-472, 1976.
16. Brookens AR and MP Hlastala. 2,3-Diphosphoglycerate and P<sub>50</sub> in patients receiving blood transfusion. *Comm Nursing Res WICHE* 9:146-154, 1976
17. Robertson HT and MP Hlastala. Elevated alveolar PCO<sub>2</sub> relative to predicted values during normal gas exchange. *J Appl Physiol: Respirat Environ Exercise Physiol* 43:357-364, 1977.
18. Hlastala MP, RD Woodson and B Wranne. The influence of temperature on hemoglobin-ligand interaction in whole blood. *J Appl Physiol: Respirat Environ Exercise Physiol* 43:545-550, 1977.
19. Hlastala MP and HT Robertson. Inert gas elimination characteristics of the normal and abnormal lung. *J Appl Physiol: Respirat Environ Exercise Physiol* 44:258-266, 1978.
20. Modell HI and MP Hlastala. Gas exchange under environmental stress. Air Force Technical Report USAFSAM-TR-78-24, 1978.
21. Hlastala MP, T Standaert, RL Franada and HP McKenna. Saturation-dependent hemoglobin-ligand interaction in fetal and maternal sheep blood. *Respir Physiol* 34:185-194, 1978.
22. Robertson HT, A Chait, MP Hlastala and JD Brunzell. Red cell oxygen affinity in severe hypertriglyceridemia. *Proc Soc Exp Biol Med* 159:437-440, 1978.
23. Hlastala MP, HT Robertson and BK Ross. Gas exchange abnormalities produced by venous gas emboli. *Resp Physiol* 36:1-17, 1979.
24. Colley PS, FW Cheney, Jr, and MP Hlastala. Ventilation-perfusion and gas exchange effects on nitroprusside in normal and edematous lungs. *Anesthesiology* 50:489-495, 1979.
25. Ross BK, MP Hlastala and R Frank. On the lack of effect of ozone on hemoglobin-oxygen affinity. *Archiv Environ Health* 34:161-163, 1979.
26. Malmberg PO, MP Hlastala and RD Woodson. Effect of increased blood oxygen affinity on oxygen transport in hemorrhagic shock. *J Appl Physiol: Respirat Environ Exercise Physiol* 47:889-895, 1979.

27. Truog WE, MP Hlastala, TA Standaert, HP McKenna and WA Hodson. Oxygen induced alteration of ventilation-perfusion relationships in rats. *J Appl Physiol: Respirat Environ Exercise Physiol* 47:1112-1117, 1979.
28. Finch GA, PD Gollnick, MP Hlastala, LR Miller, E Dillman and B Mackler. Lactic acidosis due to iron deficiency. *J Clin Invest* 64:127-137, 1979.
29. Hlastala MP. Physiological significance of the interaction between oxygen and carbon dioxide in blood. *Crit Care Med* 7:374-379, 1979.
30. Uvelli DA, MY Lee, JM Manning, MP Hlastala and AL Babb. Measurement of the carbamylation kinetics and anti-sickling mechanism in HbS blood. *J Lab Clin Med* 95:748-758, 1980.
31. Warrenburg WA, RR Pagano, M Woods and MP Hlastala. A comparison of somatic relaxation and EEG activity in classical progressive relaxation and transcendental meditation. *J Behavioral Med* 3:73-93, 1980.
32. Hlastala MP, M Meyer, G Riepl and P Scheid. Solubility of helium, argon and sulfur hexafluoride in human blood measured by mass spectrometry. *Undersea Biomed Res* 7:297-304, 1980.
33. Hlastala MP. Multiple inert gas elimination method: concepts and techniques. In: *Progress in respiration research. Gas exchange function of normal and diseased lungs*. Eds. J Piiper and P Scheid. (S. Karger, Basel 1981) pp. 242-244.
34. Colley PS, FW Cheney and MP Hlastala. Pulmonary gas exchange effects of nitroglycerine in the edematous lung. *Anesthesiology* 55:114-119, 1981.
35. Scheid P, MP Hlastala and J Piiper. Inert gas elimination from lungs with stratified inhomogeneity: theory. *Respir Physiol* 44:299-309, 1981.
36. Hlastala MP. Interactions between O<sub>2</sub> and CO<sub>2</sub>: the blood. *Seminars in Respiratory Medicine* 3:70-75, 1981.
37. Ross BK and MP Hlastala. Increased hemoglobin oxygen affinity does not decrease skeletal muscle oxygen consumption. *J Appl Physiol: Respirat Environ Exercise Physiol* 51:864-870, 1981.
38. Hlastala MP, P Scheid and J Piiper. Interpretation of inert gas retention and excretion in the presence of stratified inhomogeneity. *Respir Physiol* 46:247-260, 1981.

39. Christopherson SK and MP Hlastala. Pulmonary gas exchange during altered density gas breathing. *J Appl Physiol: Respirat Environ Exercise Physiol* 52:221-225, 1982.
40. Hlastala MP, HP McKenna, M Middaugh and HT Robertson. The role of diffusion-dependent gas inhomogeneity in gas exchange in the dog. *Bull Europ Physiopath Resp* 18:373-380, 1982.
41. Robertson HT, RL Coffey and MP Hlastala. Influence of carrier gas density on gas exchange during high frequency ventilation. *Bull Europ Physiopath Resp* 18:381-387, 1982.
42. Ross BK and MP Hlastala. Reply to Letter to Editor. *J Appl Physiol* 53:1678-1679, 1982.
43. Hlastala MP. Diffusion in lung gas and across alveolar membrane in mammalian lungs. *Fed Proc* 41:2122-2124, 1982.
44. Hlastala MP. Oxygen and carbon dioxide interactions in blood. In: *Oxygen Transport to Human Tissues*. Ed. J.A. Loepky and M.L. Riedesel. Elsevier North Holland, Inc. New York. 1982. p. 92-100.
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51. Hlastala MP. The multiple inert gas elimination technique. *J Appl Physiol: Respirat Environ Exercise Physiol* 56:1-7, 1984.
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56. Hlastala MP. Interactions between O<sub>2</sub> and CO<sub>2</sub> in blood. In: *Advances in the Biosciences: Oxygen Transport in Red Blood Cells*. Proceedings of the 12th Aharon Katzir Katchalsky Conference, Tours, France, April 1985, Pergamon Press, Ed. C Nicolau, pp. 54:95-103, 1986.
57. Robertson HT, J Whitehead and MP Hlastala. Diffusion-related differences in the elimination of inert gases from the lung. *J Appl Physiol* 61:1162-1172, 1986.
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61. Robertson HT and MP Hlastala. Beyond partition coefficients - individual properties of infused inert gases influencing their elimination from the lung. *Prog Resp Res* 21:177-181, 1986.
62. Malvin GM and MP Hlastala. Effects of lung volume and O<sub>2</sub> and CO<sub>2</sub> content on cutaneous gas exchange in frogs. *Am J Physiol: Reg Integ Comp Physiol* 20:R941-R946, 1986.

63. Hlastala MP, J Ohlsson and HT Robertson. Alveolar gas-phase diffusion limitation in the hyperbaric environment. In: Underwater and Hyperbaric Physiology IX. Ed. Bove AA, AJ Bachrach and LJ Greenbaum, Jr. Undersea and Hyperbaric Medical Society, Inc., Bethesda, pp.457-464, 1987.
64. Albert RK, D Leasa, M Sanderson, HT Robertson and MP Hlastala. The prone position improves arterial oxygenation and reduces shunt in oleic acid-induced acute lung injury. *Am Rev Resp Dis* 135:628-633, 1987.
65. Grønlund J, ER Swenson, J Ohlsson and MP Hlastala. Contribution of continuing gas exchange to phase III exhaled PCO<sub>2</sub> and PO<sub>2</sub> profiles. *J Appl Physiol* 62:2467-2476, 1987.
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67. Hlastala MP, DD Ralph and AL Babb. Influence of gas physical properties on pulmonary gas exchange. In: *Oxygen Transfer from Atmosphere to Tissues*, Volume 227:33-38. Eds: N.C. Gonzolez and MR Fedde, Plenum Press, 1988.
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74. Domino KB, MP Hlastala and FW Cheney. Effect of increased intracranial pressure on regional hypoxic pulmonary vasoconstriction. *Anesthesiology* 72:490-495, 1990.
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76. Tsu ME, AL Babb, EM Sugiyama and MP Hlastala. Dynamics of soluble gas exchange in the airways: II. Effects of breathing conditions. *Respir Physiol*. 83:261-276, 1991.
77. Domino KB, BL Eisenstein, FW Cheney and MP Hlastala. Pulmonary blood flow and ventilation-perfusion heterogeneity. *J Appl Physiol* 71:252-258, 1991.
78. Domino KB, FW Cheney, BL Eisenstein and MP Hlastala. Effect of regional alveolar hypoxia on gas exchange in pulmonary edema. *Am Rev Respir Dis* 145:340-347, 1992.
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85. Sato S, MP Hlastala, and J Hildebrandt. Intrapulmonary shunt in excised dog lobes: comparison of oxygen and inert gas methods. *J Appl Physiol.*, 74:951-958, 1993.

86. Swenson ER, HT Robertson, and MP Hlastala. Effects of carbonic anhydrase inhibition on ventilation-perfusion matching in the lung. *J. Clin. Invest.* 92:702-709, 1993.
87. Domino KB, ER Swenson, NL Polissar, YM Lu, BL Eisenstein, and MP Hlastala. Effect of inspired CO<sub>2</sub> on ventilation and perfusion heterogeneity in hyperventilated dogs. *J. Appl. Physiol.* 75:1306-1314, 1993.
88. Hlastala MP, SC George, and AL Babb. Airway heat and gas exchange. *Respiration in Health and Disease: Lessons from Comparative Physiology. Funktionsanalyse biologischer Systeme* 23:53-60, 1993.
89. Hlastala MP and KB Domino. Roles of hypoxia and blood flow in modulating  $\dot{V}_A/\dot{Q}$  heterogeneity in the lungs. *Adv Exp Med Biol* 345:67-73, 1994.
90. Swenson ER, HT Robertson, and MP Hlastala. Effects of inspired CO<sub>2</sub> on ventilation-perfusion matching in normoxia, hypoxia, and hyperoxia. *Amer J Respir Crit Care Med* 149:1563-1569, 1994.
91. Emery MJ, MP Hlastala, and AM Matsumoto. Depression of hypercapnic ventilatory drive by testosterone in the sleeping infant primate. *J Appl Physiol* 76:1786-1793, 1994.
92. Mates EA, JC Jackson, J Hildebrandt, WE Truog, TA Standaert, and MP Hlastala. Respiratory gas exchange and inert gas retention during partial liquid ventilation. In: *Oxygen Transport to Tissue XVI*, M.C Hogan, O. Mathieu-Costello, D.C. Poole, and P.D. Wagner (Eds); Plenum Press, New York; *Adv Exp Med Biol* 361:427-435, 1994.
93. Domino KB, BL Eisenstein, T Tran, and MP Hlastala. Increased pulmonary perfusion worsens ventilation-perfusion matching. *Anesthesiology* 79:817-826, 1993.
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95. Domino KB, and MP Hlastala. Hyperventilation, in treatment of metabolic acidosis, does not adversely affect pulmonary gas exchange. *Anesthesiology* 81:1445-1453, 1994.
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97. Hlastala MP, JE Souders, SC George and AL Babb. A model of pulmonary airway exchange of soluble gases. Proc RC IEEE-EMBS & 14th BMESI:2.3-2.4, 1995.
98. George SC, AL Babb and MP Hlastala. Mathematical modeling of airway gas exchange: IV. Impact of pre-test breathing conditions on the single-exhalation breathing maneuver. Ann Biomed Eng 23:48-60, 1995.
99. Domino KB, ER Swenson, and MP Hlastala. Hypocapnia-induced ventilation/perfusion mismatch: A direct CO<sub>2</sub> or pH-mediated effect. Am J Respir Crit Care Med 152:1534-1539, 1995.
100. Souders JE, SC George, NL Polissar, ER Swenson and MP Hlastala. Tracheal gas exchange: Perfusion-related differences in inert gas elimination. J Appl Physiol 79:918-928, 1995.
101. George SC, AL Babb and MP Hlastala. Modeling steady state inert gas exchange in the canine trachea. J Appl Physiol 79:929-940, 1995.
102. Lamm WJE, T Obermiller, MP Hlastala, and RK Albert. Perfusion through vessels open in zone 1 contributes to gas exchange in rabbit lungs *in situ*. J Appl Physiol 79:1895-1899, 1995.
103. Hlastala MP. Letter to the editor. Forens Sci Internat 73:211-212, 1995.
104. George SC, AL Babb, ME Deffebach, and MP Hlastala. Diffusion of non-electrolytes in the canine trachea: Effect of tight junction. J Appl Physiol 80:1687-1695, 1996.
105. Hlastala MP, SL Bernard, HH Erickson, MR Fedde, EM Gaughan, R McMurphy, MJ Emery, N Polissar and RW Glenny. Pulmonary blood flow distribution in standing horses is not dominated by gravity. J Appl Physiol 81:1051-1061, 1996.
106. Bernard SL, RW Glenny, HH Erickson, MR Fedde, N Polissar, RJ Basaraba and MP Hlastala. Minimal redistribution of pulmonary blood flow with exercise in racehorses. J Appl Physiol 81(3):1062-1070, 1996.
107. Hlastala MP. Ventilation/perfusion: From the bench to the patient. Cardiologia 41:405-415, 1996.
108. Mates EA, P Tarczy-Hornoch, J Hildebrandt, JC Jackson and MP Hlastala. Negative slope of exhaled CO<sub>2</sub> profile. In: Oxygen Transport to Tissue XVII. Ince C, J Kesecioglu, L. Telci and K. Akpir (Eds); Plenum Press, New York; Adv. Exp Med Biol 362:585-597, 1996.

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