

## **CURRICULUM VITAE**

**Michael N. Sawka, Ph.D., FAPS, FACSM**

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### **Academic Address**

Physiology Group  
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## **Profile Summary**

- More than 40 years of directing exceptionally productive interdisciplinary research / development programs related to human health & performance for government, corporate & international organizations.
- More than 50 years of experience designing, conducting, & publishing biomedical research related to human health & performance.
- Internationally recognized expert on heat stress physiology, exertional heat illness, human hydration, human adaptations to heat, cold, high-altitude, & exercise physiology.
- Author of more than 320 peer-reviewed publications with greater than 40,500 citations.
- Editor of graduate textbooks on Environmental Physiology, & Exercise Physiology.
- Symposia / Keynote speaker at more than 100 national & international meetings.
- Co-Inventor of three patents related to thermoregulatory control & integrating wearable physiological sensor information for biomedical decision aids.
- Served / chaired numerous Scientific Advisory & Review Boards for government, corporate, private foundations & international organizations.
- Department of Army Science & Technology Senior Scientist (SES) Appointee.
- Academic Appointments at Boston University, John B. Pierce Foundation Laboratory at Yale University, Georgia Institute of Technology, Massachusetts General Hospital's Institute of Health Professions, Wright State University School of Medicine.
- Fellow Emeritus of The American Physiological Society, Fellow Emeritus of The American College of Sports Medicine.
- Awarded The American Physiological Society's Environmental & Exercise Physiology Honor Award, The American College of Sports Medicine's Citation Award, & The Order of Military Medical Merit's Military Medical Merit Medallion.

## **Scientific Expertise**

Integrative Physiology of Adaptation / Maladaptation to Environmental Extremes (heat, cold & high altitude), Exercise Physiology, Thermoregulation, Fluid & Electrolyte Balance, Exertional Heat Illness; Google Scholar h-index = 104 with >41,000 literature citations.

## Professional Positions

2013-Present: **Chief Scientific Officer**, Environmental Physiology and Hydration Associates, Canton GA. **Responsibilities**: Provide science / technology / innovation consultation to corporate, government and private organizations. Science and program leadership expertise on topics regarding hydration, exertional heat illness, environmental adaptations (heat, cold high-altitude) extremes, and technology developments related to human health and optimal performance.

2012–2026: **Adjunct Professor / Professor of Practice**, School of Biological Sciences and School of Applied Physiology, College of Sciences, Georgia Institute of Technology, Atlanta, GA. **Responsibilities**: Collaborative research team member integrating physiology, wearable biosensors, and machine learning / artificial intelligence for decision aids to solve health and performance issues; occasional lectures and serve on graduate committees.

2006–2012: **Science and Technology Senior Scientist**, (DB-V, Senior Executive Service for Science & Technology) Appointment by Office Assistant Secretary of the Army for Acquisition, Logistics and Technology (Retired December 2012). **Responsibilities**: Department of Army Senior Scientist for Operational Medicine issues related to human performance optimization, environmental adaptation / maladaptation, and environmental medicine. Leadership in communicating and developing related doctrine, policies, and programs within Department of Army, Department of Defense and North Atlantic Treaty Organization.

1996–2012: **Chief, Thermal & Mountain Medicine Division**, (DB-IV / DB-V) U.S. Army Research Institute of Environmental Medicine, Natick, MA. (Retired December 2012). **Responsibilities**: Direct research program (employing integrated molecular, animal, and human models) focusing on high-altitude (terrestrial) physiology, thermal (heat and cold) physiology, environmental adaptations, and pathophysiology (altitude sickness, heat stroke, hypothermia) and fluid-electrolyte imbalances (dehydration & hyponatremia). Direct the activities of ~40 scientists & technicians. Responsible for obtaining and managing research funding (intramural & extramural) of ~5-8 million dollars per year.

1990–1996: **Chief, Thermal Physiology & Medicine Division**, (GM-15) U.S. Army Research Institute of Environmental Medicine, Natick, MA. **Responsibilities**: Direct research program regarding human thermoregulation and physical exercise / adaptation capabilities during heat and cold stress. Direct activities of ~25 scientists & technicians. Responsible for obtaining and managing research funding (intramural & extramural) of ~2-3 million dollars per year.

1988–1998: **Adjunct Associate Professor**, Department of Physical Therapy, Institute of Health Professions, Massachusetts General Hospital, Boston, MA. **Responsibilities**: Lecture on cardiovascular and exercise physiology to undergraduate and graduate students.

1985–2000: **Adjunct Associate Professor**, Department of Health Sciences and Department of Physical Therapy, Sargent College of Health and Rehabilitation Sciences, Boston University, Boston, MA. **Responsibilities**: Lecture on cardiovascular, exercise and environmental physiology to undergraduate and graduate students and provide research mentorship.

1984–1985: **Visiting Assistant Fellow**, John B. Pierce Foundation Laboratory at Yale University, New Haven, CT. **Responsibilities**: Conduct research on human thermoregulatory control during heat stress and physical exercise.

1980–1990: **Research Physiologist**, (GS-12/13/14/15) Heat Research Division and Military Ergonomics Division, U.S. Army Research Institute of Environmental Medicine, Natick, MA. **Responsibilities**: Obtain funding and conduct research regarding human thermoregulation and integrative physiology adaptations / maladaptation during exposure and physical exercise with heat and cold stress.

1978–1980: **Assistant Professor**, Department of Physiology, School of Medicine, Wright State University, Dayton, OH. **Responsibilities**: Lecture (undergraduate, graduate, nursing, medical

students) on cardiovascular and integrative physiology, serve on graduate student committees, obtain funding, and conduct research on rehabilitation medicine.

1977-1978: **Research Health Scientist**, Dayton Veterans Affairs Medical Center, Dayton, OH. **Responsibilities:** Post-Doctoral fellow to conduct research on health and physical capabilities of wheelchair dependent populations.

1974–1977: **Special Doctoral Research Fellow**, Southern Illinois University, Carbondale, IL. **Responsibilities:** For doctoral studies to conduct exercise physiology research and occasionally teach laboratory classes.

1974: **Graduate Intern**, (Summer), Health Center, Aspen Institute, Aspen, CO. **Responsibilities:** Conduct graded exercise tests on cardiac patients and study environmental physiology with Dr. Bruno Balke.

1972–1974: **Technician**, Cardiac Rehabilitation Program, East Stroudsburg University, East Stroudsburg, PA. **Responsibilities:** Provide technical support for graded exercise tests on cardiac patients and help implement their cardiac rehabilitation programs.

## **Education**

**B.S.** (1973) Health & Physical Education / Biology; East Stroudsburg University, East Stroudsburg, PA

**M.S.** (1974) Biophysical Focus - Exercise Physiology; East Stroudsburg University, East Stroudsburg, PA. **Thesis:** *“A Comparison of Residual Lung Volume Measurements on Hydrostatic Weighing Specific Gravity Values in Man”*.

**Ph.D.** (1977) Exercise Physiology; Southern Illinois University, Carbondale, IL. **Dissertation:** *“Cardiovascular and Metabolic Adaptations of Marathon Runners to Repeated Bouts of Prolonged Exercise”*.

**Post-Doctoral Fellow**. (1978) Cardiovascular & Rehabilitation Medicine; Veterans Affairs Medical Center, Dayton, OH

## **Professional Society Activities**

### **American College of Sports Medicine:**

Member, 1973

Fellow Status, 1980

Fellow Emeritus, 2023

Symposia / Keynote Lectures at National Meetings – 21

Symposia / Keynote Lectures at Regional Meetings - 8

Publications in ACSM Journal & Books - 38

**Citation Award**, 2010

**Visiting Scholars Award**, 1982

**Gisolfi Distinguished Lecture**, 2002

**Texas ACSM Visiting Scholar Lecturer Tour**, 2003

Editorial Board, **Medicine & Science in Sport & Exercise**, 2000-2022

Associate Editor-In-Chief for Basic Science, **Medicine & Science in Sport & Exercise**, 2005-2006

Associate Editor-In-Chief for Applied Science, **Medicine & Science in Sport & Exercise**, 2006-2022

Associate Editor, **ACSM Advanced Exercise Physiology Textbook**, 2006 (First Edition)

Diversity Task Force, Chair, 2003-2005

Diversity Action Committee, 2006-2013

Ethics & Professional Conduct Committee, 1998-2002

Project Review Committee, 1989-1996; Chair, 1991-1995

Research Awards Committee, 1983-1985

Position Stand Subcommittees:

Member, Fluid Replacement During Exercise, 1990-1995  
Chair, Blood Doping and Exercise Performance, 1994-1996  
Chair, Fluid Replacement During Exercise, 2004-2006  
Member, Exertional Heat Illness, 2018-2023  
Media Referral Network, 1992-2012

### **American Physiological Society:**

Student Member, 1976  
Regular Member, 1979  
Fellow Status, 2016  
Fellow Emeritus, 2020  
Symposia / Featured Topics / Keynote Lectures at National Meetings - 12  
Symposia / Keynote Lectures at Regional Meetings - 2  
Publications in APS Journals & Books – 91  
Honor Award, 2016 (Environmental and Exercise Section)  
President's Symposium, 2016  
Contributor, Handbook of Physiology: Environmental Physiology, 1996  
Contributor, Comprehensive Physiology, 2011, 2014, 2025  
Associate Editor / Environmental Section Editor, Comprehensive Physiology, 2010-2024  
Editorial Board: American Journal of Physiology: Regulatory, Integrative & Comparative Physiology, 2001-2020  
Editorial Board: Journal of Applied Physiology, 1991-2012  
Consulting Editor: Journal of Applied Physiology, 2011-2022  
Guest Editor, Journal of Applied Physiology, for "Highlighted Topic: Molecular Biology of Thermoregulation", 2002  
Guest Editor, Journal of Applied Physiology, for "Highlighted Topic: The Role of Inflammation in Skeletal Muscle, Connective Tissue, & Exertional Injuries: To Block or Not to Block?", 2013  
Guest Editor, Journal of Applied Physiology, for "Highlighted Topic: Emerging Wearable Physiological Monitoring Technologies and Decision Aids for Health and Performance", 2017  
Councilor for Thermal Physiology, Environmental & Exercise Physiology Section, Elected 1999–2002  
Program Chair for Environmental & Exercise Physiology Section, 2003-2005  
Member APS Joint Program Committee, 2003-2005  
Chair, Environmental & Exercise Physiology Section, Elected 2007-2010  
Member of APS Section Advisory Committee, Elected 2007-2010  
Advisory Committee, Environmental & Exercise Physiology Section, 2010 –2022  
Member, APS Development Program Advisory Task Force, 2017 – 2020  
Member, APS Fellows Committee, 2019 – 2022  
APS Representative, Inter-Association Task Force on Exertional Heat Injury, 2003

### **Editorial Board Appointments**

American Journal of Physiology: Regulatory, Integrative and Comparative Physiology: Editorial Board, 2001-2020  
Aviation, Space & Environmental Medicine: Editorial Board, 1992-1994  
Comprehensive Physiology: Associate Editor / Environmental Section & Editor (Invited >50 Chapters), 2010-2024  
Faculty of 1000: Physiology, 2016-2020  
FASEB Journal: Publications and Communications Committee (member), Editor-In-Chief Advisory Committee (Chair), 2011-2013  
International Journal of Sports Medicine: Editorial Board, 1995-2019  
Journal of Applied Physiology: Editorial Board 1991-2012; Consulting Editor 2011-2022  
Journal of Thermal Biology: Editorial Board 2007-2022

Medicine & Science in Sports and Exercise: Editorial Board 2000-2022; Associate Editor-In-Chief for Basic Science 2005-2006; Associate Editor-In-Chief for Applied Science 2007-2022  
Oxford Research Forum: Editorial Board, 1999-2016  
Temperature: Editorial Board Scientific Advisor, 2016-Present

## **Honors / Experiences / Certification / Training**

### **Honors:**

- Visiting Scholars Award, American College of Sports Medicine, 1982
- Alumni Achievement Award & Commencement Speaker, (Spring Graduation) Southern Illinois University, 1992
- Alumni Honor Award, East Stroudsburg University, 2001
- Gisolfi Distinguished Lecture, American College of Sports Medicine, 2002
- Commencement Speaker, East Stroudsburg University, (Winter Graduation), 2002
- Military Medical Merit Medallion, Order of Military Medical Merit, 2005
- Science and Technology Senior Scientist (Senior Executive Service), Appointed by Office Assistant Secretary of the Army for Acquisition, Logistics and Technology, 2006-2012
- Superior Civilian Service Award, (by MG George Weightman, Commanding General of US Army Medical Research and Materiel Command), 2008
- Citation Award, American College of Sports Medicine, 2010
- Meritorious Civilian Service Award, (by LTG Patricia Horoho, Surgeon General of US Army), 2012
- President's Symposium, American Physiological Society, Experimental Biology Meeting, 2016
- Honor Award, American Physiological Society (Environmental & Exercise Section), 2016
- Distinguished Lecture Award, Southeastern Coastal Center for Agriculture Health & Safety / Center for Disease Control / National Institute for Occupational Safety and Health, 2018

### **Experiences:**

- Canada Foundation for Innovation, Expert Committee – Physiology (Environmental Stress), 2020-2022
- European Commission, Heat-Shield Project, Ethics Supervisor / Scientific Consultant, 2017-2021
- Heat Resilience & Performance Center, Yong Loo Lin School of Medicine, National University of Singapore, Science & Innovation Consultant, 2024 - 2026
- Massachusetts – Industry, Academic and Government Science and Technology Development Partnership, Advisory Panel, 2010 - 2012
- National Academy of Sciences, Institute of Medicine, Panel for Reference Intakes for Fluid & Electrolytes, Chair of Water Task Group, Washington, D.C., 2002 - 2005
- World Health Organization / World Meteorological Organization, Writing Team for Health Effect of Occupational Heat Stress, 2018- 2023
- The Coca-Cola Company, Science & Innovation Consultant, 2015-Present
- PepsiCo, Inc, Gatorade Sports Science Institute, Expert Advisory Panel Member, 2013-2015
- CSX Transportation, Occupational Health Consultant, 2016-2017
- Epitech Research & Innovation Inc., Consultant, 2023
- Hedgehog Research Inc., Consultant, 2024-2025
- Johnson and Johnson Companies, Science & Technology Consultant, 2016-2018
- MIDE Technology Corporation, Science & Technology Consultant, 2018
- United Parcel Service, Occupational Health Consultant, 2022
- Gerson Lehman Group, Council Member, 2014-Present
- Congressionally Directed Medical Research Programs, Musculoskeletal Injury Risk Panel, 2015

- Congressional Grants & Department of Defense Joint Program, Project Sponsor Representative, Telemedicine & Advanced Technology Research Center – Scientific Consultant for twelve extramural grants (~10 million dollars), 2010-2012
- King Abdullah International Medical Research Center, Peer Review Panel, 2018, 2019
- Multiple Sclerosis Research Australia, External Reviewer, 2016
- National Aeronautics & Space Administration, Peer Review Panel, 2009, 2012, 2019, 2020
- National Aeronautics & Space Administration, Extravehicular Activity Benchmarking Directed Study Review Panel, 2016
- National Space Biomedical Research Institute, External Advisory Council, 2013-2017
- National Institutes of Health, Special Study Section on Physical Activity & Fitness Assessment, Bethesda, M.D., 1986
- Partnership for Clean Competition, Scientific Advisory Board, (Members includes - US Anti-Doping Agency, US Olympic Committee, Major League Baseball, National Football League, National Hockey League, Professional Golf Association), 2008-Present
- Performance Hematology Working Group, Co-Chair, Partnership for Clean Competition, 2018-Present
- Nordic National Anti-Doping Organizations (Norway, Sweden, Finland, Denmark) and Norwegian Doping Control Laboratory, Hematology Consultant, 2017-2021
- Qatar Athlete Passport Unit and Antidoping Laboratory Qatar, Hematology Consultant, 2021
- United States Anti-Doping Agency, Research & Policy Advisory Committee, 2003-2008 (Appointed by Executive Office of The President of The United States)
- United States Anti-Doping Agency, Hematology Consultant, 2004-2008
- World Anti-Doping Agency, Hematology Consultant, 2014-2016
- Department of Army, Member, Joint Service Working Group on Drug Dependent Degradation (JWGD3), member, 1985-1991; Chair, Performance Physiology Committee of JWGD3, 1986-1991
- Department of Army, Environmental Extreme Program Area, Military Operational Medicine Research, Chair, 2004-2008
- Department of Army, Environmental Health & Protection Program Area, Military Operational Medicine Research, Co-Chair, 2009-2012
- Department of Army, Systems Biology & Informatics Committee Task Group, US Army Medical Research & Materiel Command, Member, 2007-2012
- Department of Army, Hydration Sensor Monitor Integrated Product Team, Medical Material Development Decision Gate, US Army Medical Research & Materiel Command, Member, 2010-2012
- Department of Defense Human Performance Advisory Panel, Office of Assistant Secretary of Defense Health Affairs, Member, 2008-2011
- United States Military Delegation, Military Medical Science Summit with China's People's Liberation Army, invited delegation of three Senior Executive Service Scientists & Commanding General (MG James K. Gilman) of Medical Research & Development Command, Arranged by President Barack Obama as first military exchange with Peoples Liberation Army. Beijing, China, 2011
- North Atlantic Treaty Organization, Exploratory Panel on Chemical Defense, Member, 1983-1984
- North Atlantic Treaty Organization, Exploratory Panel on Hydration Issues, Chair, 2002-2003
- North Atlantic Treaty Organization, Exploratory Panel (HFM/R-ET-088) on Thermal Strain Management, Chair, 2007-2009
- North Atlantic Treaty Organization, Research Task Group (HFM-187, RTG) on Thermal Management for Health & Performance, Chair, 2009-2013
- Research Institute of Environmental Medicine, Credentials / Privileges Committee, member, 2002-2003; Chair, 2003-2012

- Research Institute of Environmental Medicine, Research Quality Assurance Committee, member, 2003-2012
- Mentor, Office of Naval Research, Young Investigator Award to Dr. Omer Inan (Georgia Institute of Technology), 2018-2019
- Mentor, National Institutes of Health – Nursing Institute of Nursing Research, K23 Mentor Patient-Oriented Research Career Development Award to Dr. Valerie Mac (Emory University), 2019-2022
- Expert Witness, Shearer vs. Union Pacific Railroad Company (Case No. 1216-CV 10386), Circuit Court of Jackson County, Missouri at Kansas City. Litigation regarding Exertional Heat Illness, 2014
- Expert Witness, Whaley vs. Norfolk Southern Railway Company (Case No. 4:14-CV-00108-HIM). U.S. District Court for District of North Georgia, Litigation regarding Exertional Heat Illness, 2015
- Expert Witness, Mason vs. Union Pacific Railroad Company (Case No. 13CL-CV00239), Circuit Court of Jackson County, Missouri at Kansas City. Litigation regarding Exertional Heat Illness, 2015-2016
- Expert Witness, Marco J. Lujan vs. Chowan University and Lisa Bland, United States District Court for the Eastern District of North Carolina – Northern Division, Litigation regarding Exertional Heat Illness, 2018
- Expert Witness, Maria & Joseph Serrato vs. Pi Kappa Phi Fraternity and The California State University, Los Angeles Superior Court Case No. BC586769, Litigation regarding Dehydration and Exertional Heat Illness, 2018
- Expert Witness, Smith vs. Scott County School, (Court Case No. 72D01-2106-CT-000011), Litigation regarding Exertional Heat Illness, 2024
- Expert Witness, Ekin vs Marine Military Academy (Court Case No. 2023-DCL-05413), Litigation regarding Exertional Heat Illness, 2024

### **Certification / Training:**

- Top Secret Security Clearance (Last Renewed 2011)
- Certified Acquisition Professional (Level III), Department of Army, 1998
- CITI Medical Research Training, annual to 2020
- Contracting Officers Representative Course, 1995, 2007, 2009
- Good Clinical Practices Training, 1992, 1998, 2011
- Hazardous Waste Management Training, annual to 2012
- Organization Leadership for Executive Course, Kansas City, MO., 1994
- Executive Course on Promoting Innovation & Organizational Change, John F. Kennedy School of Government, Harvard University, Cambridge, MA, 2000
- Research Directors Course on Rapidly Emerging Technologies, Trends and Research & Development Strategies, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, MA, 2001
- Executive Course on Congressional Legislative Operations, Government Affairs Institute, Georgetown University, Washington, D.C., 2006

## **Symposia & Media Presentations**

### **Symposium & Keynote Lectures at National / International Meetings**

1. Participant, Wheelchair Exercise Training and Athletes, American College of Sports Medicine Meeting Symposium, Minneapolis, MN, 1982.
2. Participant, Man in the Heat, American Physiological Society Symposium, Federation of American Societies for Experimental Biology Meeting, New Orleans, LA, 1982.

3. Participant, Prophylaxis and Treatment of Chemical Poisoning, Society of Toxicology Symposium, San Diego, CA, 1983.
4. Participant, Exploratory Panel on Chemical Defense, (AC/243, Panel VII), North Atlantic Treaty Organization Medical Symposium, Paris, France, 1984.
5. Participant, Environmental Physiology Symposium, Regional Meeting of the International Union of Physiological Sciences, Jerusalem, Israel, 1984.
6. Participant, Circadian Rhythm, Aerospace Medical Association Meeting Symposium, Nashville, TN, 1986.
7. Participant, Critical and Emerging Issues in Biomedical Engineering, IEE/Engineering in Medicine and Biology Society Symposium (Sponsored by National Institutes of Health), Fort Worth, TX, 1986.
8. Participant, Fluid and Electrolyte Distribution in Thermal Stress, American Physiological Society Symposium, Federation of American Societies for Experimental Biology Meeting, Washington, DC, 1987.
9. Participant, Carbohydrate-Electrolyte Solutions for Fluid Replacement. Symposium sponsored by Institute of Medicine, National Academy of Sciences, Washington, DC, 1989.
10. Chair & Participant, Upper Body Exercise: Physiology and Practical Considerations, American College of Sports Medicine Meeting Symposium, Baltimore, MD, 1989.
11. Participant, Fluid Homeostasis During Exercise, Quaker Sports Medicine Review Board Symposium, Kauai, HI, 1989.
12. Chair & Participant, Singular and Interactive Effects of Blood Tonicity and Volume in Dehydration, American Physiological Society Symposium, Federation of American Societies for Experimental Biology Meeting, Washington, DC, 1990.
13. Participant, Ergogenics: Enhancement of Sport Performance, Quaker Sports Medicine Review Board Symposium, Maui, HI, 1990.
14. Chair & Participant, Current Concepts Concerning Thirst, Dehydration and Fluid Replacement, American College of Sports Medicine Meeting Symposium, Orlando, FL, 1991.
15. Participant, Exercise Countermeasures in Permanent Human Space Presence, International Conference on Environmental Systems Symposium (National Aeronautics & Space Administration sponsored), San Francisco, CA, 1991.
16. Participant, Nutritional Requirements in Hot Environments, Symposium sponsored by Institute of Medicine, National Academy of Sciences, Washington, DC, 1991.
17. Keynote Lecture, Ergonomics of Manual Wheelchair Propulsion, Symposium sponsored by European Community Advisory Committee on Medical and Health Research, Vrije University, Amsterdam, Netherlands, 1991.
18. Participant, Exercise While Wearing Biological and Chemical Warfare Protective Clothing, American College of Sports Medicine Meeting Symposium, Dallas, TX, 1992.
19. Participant, Space Operations, Applications and Research, Symposium sponsored by National Aeronautics & Space Administration and US Air Force, Johnson Space Center, Houston, TX, 1993.
20. Keynote Lecture, The Athlete's Environment, Symposium sponsored by British Olympic Association, Lilleshall National Sports Centre, Shropshire, United Kingdom, 1994.
21. Participant, Nutritional Considerations for Stressful Environments, American Society for Clinical Nutrition Symposium, Minneapolis, MN, 1995.
22. Keynote Lecture, Atlanta "96" Olympics: Adaptations to Temperature and Humidity, Symposium sponsored by Instituto do Desporto, Lisbon, Portugal, 1995.
23. Participant, Dehydration, Rehydration and Exercise in the Heat. Symposium sponsored by British Olympic Association and British Association of Sport and Medicine, Nottingham, United Kingdom, 1995.
24. Participant, Performance Enhancing Substances: Physiology, Ergogenicity, and Risks, American College of Sports Medicine Meeting Symposium, Cincinnati, OH, 1996.
25. Participant, Role of Dietary Supplements for Physically Active People, Symposium sponsored by National Institutes of Health, Bethesda, MD, 1996.



26. Keynote Lecture, International Conference on Physical Performance, Coldeportes Antioquia, Division De Medicina Deportiva, Medellin, Colombia, 1996.
27. Keynote Lecture, Performance in the Heat Symposium, International Conference on Environmental Ergonomics Meeting, Jerusalem, Israel, 1996.
28. Participant (with Ethan Nadel), Socratic Debate on Relative Importance of Plasma Volume Expansion for Heat Acclimation and Exercise-Heat Performance, American Physiological Society, Experimental Biology Meeting, New Orleans, LA, 1997.
29. Participant, Changing Needs in Occupational Medicine, Symposium sponsored by Department of Energy, Portland, OR, 1997.
30. Chair & Participant, Physiologic Adaptations during Exercise-Performance in the Heat, Symposium sponsored by World Congress of International Society for Adaptive Medicine, Framingham, MA, 1997.
31. Keynote Lecture, Equine Exercise Physiology Meeting, Sponsored by Michigan State University School of Veterinary Medicine, East Lansing, MI, 1997.
32. Chair & Participant, Blood Volume Adaptations, Importance & Critical Issues, American College of Sports Medicine Meeting Symposium, Orlando FL, 1998.
33. Participant, International Symposium on Hydration, Vittel, France, 1998.
34. Participant, Environmental Issues in Occupational Medicine, Symposium sponsored by Department of Energy, Washington, DC, 1998.
35. Participant, Advances in Heat Stress Monitoring Symposium, Sponsored by Massachusetts Institute of Technology, Cambridge MA, 1999.
36. Participant, Exercise After Spinal Cord Injury: In Memory of Professor Roger M. Glaser, American College of Sports Medicine Meeting Symposium, Seattle, WA, 1999.
37. Chair & Participant, Hydration Status Assessment for Physical Activity, American College of Sports Medicine Meeting Symposium, Seattle, WA, 1999.
38. Keynote Lecture, World Congress of Wilderness Medicine, Sponsored by Wilderness Medicine Association, Whistler, British Columbia, Canada, 1999.
39. Keynote Lecture, Pan-American Congress of Sports Medicine, Medellin, Colombia, 1999.
40. Participant, Challenges to Human Thermoregulation, Symposium sponsored by The British Physiological Society, Glasgow, Scotland, 1999.
41. Keynote Lecture, International Conference on Physiological & Cognitive Performance in Extreme Environments, Sponsored by Australian Government, Canberra, Australia, 2000.
42. Participant, Symposium Honoring Career of Ethan Nadel, American College of Sports Medicine Meeting Symposium, Indianapolis, IN, 2000.
43. Tutorial Lecture, Integrative Biology of Exercise Meeting, American Physiological Society, Portland, ME, 2000.
44. Keynote Lecture, Paralympic Scientific Congress, Sidney, Australia, 2000.
45. Keynote Lecture, Blowing Hot & Cold: Protecting Against Environmental Extremes. Sponsored by North Atlantic Treaty Organization Human Factors & Medicine Panel. Dresden, Germany, 2001. (Presented in absentia because of Operation Enduring Freedom [Afghanistan])
46. Distinguished Lecturer, Forum on Challenges to New Research for the 21<sup>st</sup> Century, Sponsored by Japan Society for the Promotion of Science, Matsumoto, Japan, 2001. (Presented in absentia because of Operation Enduring Freedom [Afghanistan])
47. Gisolfi Distinguished Lecture, American College of Sports Medicine Meeting, St. Louis, MO, 2002.
48. Participant, Metabolic Monitoring of Nutritional Status, Symposium sponsored by Institute of Medicine, National Academy of Sciences, San Antonio, TX, 2003.
49. Chair & Participant, Pathogenesis, Pathobiology and Treatment of Exertional Heat Injury / Stroke, American College of Sports Medicine Meeting Symposium, San Francisco, CA., 2003.

50. Chair & Participant, Round Table on Hydration and Physical Activity, sponsored by American College of Sports Medicine, Boston, MA, 2003.
51. Chair & Participant, HFM Specialists Meeting on Maintaining Hydration: Issues, Guidelines and Delivery, Symposium sponsored by North Atlantic Treaty Organizations, Boston, MA, 2003.
52. Participant, Dietary Reference Intakes for Water, Potassium, Sodium, Chloride and Sulfate, American Society for Nutritional Sciences Symposium, Experimental Biology Meeting, Washington, D.C., 2004.
53. Participant, New Dietary Reference Intakes for Fluid and Electrolytes: Implications for Active People, American College of Sports Medicine Meeting Symposium, Indianapolis, IN., 2004.
54. Participant, Hydration and Physical Activity, American College of Sports Medicine Meeting Symposium, Indianapolis, IN., 2004.
55. Participant, Heat-Related Illness and Thermoregulatory Failure, Symposium at Physiology and Pharmacology of Thermal Biology and Temperature Regulation meeting, Rhodes, Greece, 2004.
56. Participant, Molecular and Cellular Responses to Heat Stress, Symposium at Physiology and Pharmacology of Thermal Biology and Temperature Regulation meeting, Rhodes, Greece, 2004.
57. Participant, Roundtable on Critical Issues in Thermoregulation, Physiology and Pharmacology of Thermal Biology and Temperature Regulation meeting, Rhodes, Greece, 2004.
58. Participant, International Hydration Symposium, Nestlé Corporation, Lausanne, Switzerland, 2004.
59. Participant, Mineral Dietary Requirements for Military Performance, Symposium sponsored by Institute of Medicine, National Academy of Sciences, Washington, DC, 2005.
60. Participant, International Consensus Symposium on Sports Nutrition, Federation International of Football Association, Zurich, Switzerland, 2005.
61. Keynote Lectures, Expo Motricidad, Coldeportes Antioquia, Division De Medicina Deportiva, Medellin, Colombia, 2005.
62. Participant, Multidisciplinary Examination of Dehydration, American Physiological Society Symposium, Experimental Biology Meeting, San Francisco, CA, 2006.
63. Participant, Thermoregulation and Is There a Safety Break in the Brain?, American College of Sports Medicine Meeting Symposium, Denver, CO, 2006.
64. Participant, Dietary Guidelines 2010: The Year We Get It Right, Symposium sponsored by Tufts Friedman School of Nutrition, Boston, MA, 2006.
65. Participant, Science and Medicine of The Marathon Symposium, Sponsored by American College of Sports Medicine and American Medical Road Race Society, Chicago, IL, 2006.
66. Participant, Heat, Cold and Fluid ACSM Position Statements, American College of Sports Medicine meeting symposium, New Orleans, LA, 2007.
67. Keynote Lectures, International Symposium of Exercise Physiology, Sponsored by Argentine Association of Sports Medicine, Rosario, Argentina, 2007.
68. Keynote Lectures, International Symposium of Sports Nutrition and Sports Training, Sponsored by Argentine Association of Sports Medicine, Rosario, Argentina, 2007.
69. Keynote Lectures, International Symposium of Physical Fitness, Rio de Janeiro, Brazil, 2007.
70. Chair and Participant, Iraq and Afghanistan Operations: Environmental and Physiological Challenges, American College of Sports Medicine Meeting Symposium, Indianapolis, IN., 2008.
71. Participant, Science of Nijmegen Marches: Largest Athletic Event in the World, American College of Sports Medicine Meeting Symposium, Indianapolis, IN., 2008.
72. Participant, Acquired Cross Tolerance Symposium, Shores Conference, Baltimore, MD, 2008.

73. Participant, Rehydration and Specimen Integrity Collected for Doping Control, Symposium sponsored by United States Anti-Doping Agency, Colorado Springs, CO, 2008.
74. Participant, Round Table on Exertional Heat Stroke: Return to Play, Sponsored by American College of Sports Medicine, Bethesda, MD, 2008.
75. Chair & Participant, Molecular Biology of Heat Stroke: Modern Approaches. American College of Sports Medicine Meeting Symposium, Seattle, WA, 2009.
76. Participant, Enhancing Performance Through Increased Oxygen Transport, Symposium sponsored by United States Anti-Doping Agency, Vancouver, BC, 2009.
77. Participant, Return to Play from Heat Stroke, American College of Sports Medicine Symposium, Baltimore, MD, 2010.
78. Participant, Consensus Symposium on Sports Nutrition, Sponsored by International Olympic Committee, Lausanne, Switzerland, 2010.
79. Participant, Performance Physiology in the Heat: New Concepts and Controversies, American Physiological Society Symposium, Experimental Biology Meeting, Washington DC, 2011.
80. Participant, Symposium to Honor Scientific Career of Elsworth Buskirk, American Physiological Society Symposium, Experimental Biology Meeting, Washington DC, 2011.
81. Chair, New Insights Into The Role of Cytokines on Pathophysiology of Heat Stroke. American College of Sports Medicine Meeting Symposium, Denver, CO, 2011.
82. Keynote Lecture, Military Medicine Collaboration and Development Symposium, Academy of Military Medical Sciences, Beijing, China, 2011.
83. Plenary Lecture, The Biomedical Basis of Elite Performance, The Physiological Society and The British Pharmacological Society, London, United Kingdom, 2012.
84. Plenary Lecture, Inside the Individual: Refining the Measurement of Biological Variability, Symposium sponsored by United States Anti-Doping Agency, Indianapolis, IN, 2013.
85. Plenary Lecture, 1<sup>st</sup> International Hydration Conference, Sponsored by Spanish Nutrition and Dietetic Societies and Foundations. Madrid, Spain, 2013.
86. Plenary Lectures, Training and Competing in the Heat Conference, Sponsored by Aspetar-Qatar Orthopaedic and Sports Medicine Hospital, Doha, Qatar, 2014.
87. Participant, Hematological Passport Workshop. Sponsored by World Anti-Doping Agency, Montreal, Canada, 2014.
88. Participant, Expert Panel on Nutrition and Performance. Sponsored by Gatorade Sports Science Institute, Park City, UT, 2014.
89. Plenary Lecture, International Conference on Science in Movement: From Health to High Performance. Sponsored by National Autonomous University of Mexico, Federation of Mexican Nutrition and Sport, Mexico City, Mexico, 2014.
90. Plenary Lecture, Stimulation of Erythropoiesis and Oxygen Utilization Conference, Sponsored by United States Anti-Doping Agency, Phoenix, AZ, 2014.
91. Participant, Innovation and Implementation in Anti-Doping. Symposium Sponsored by Major League Baseball and Partnership for Clean Competition. New York City, 2015.
92. Participant, Next Generation Athlete Longitudinal Biological Data Analyses. Sponsored by Anti-Doping Switzerland & United States Anti-Doping Agency, Bern, Switzerland, 2015.
93. Keynote Lecture, Presidents Lecture Series, University of Arkansas, Fayetteville, AK, 2015.
94. Participant, Unique Features of Human Skin Symposium, Center for Academic Research and Training in Anthropogeny, Salk Institute, La Jolla, CA., 2015.
95. Plenary Lecture, 2<sup>nd</sup> International Hydration Conference, Sponsored by Spanish Nutrition and Dietetic Societies and Foundations. Toledo, Spain, 2015.
96. Participant, President's Symposia on Physiological Mechanisms Responsive to Behavioral and Environmental Challenges, American Physiological Society Symposium, Experimental Biology Meeting, San Diego, CA., 2016.

97. Keynote Lectures, 14<sup>th</sup> Congress of Nephrology / 1<sup>st</sup> Congress of Hydration, Sponsored by Nephrologists of the Rio La Plata (Argentina / Uruguay), Buenos Aires, Argentina, 2016.
98. Participant, Emerging Technologies in Baseball: Implementation and Implications Symposium, Major League Baseball Academic Agenda, Winter Meetings, National Harbor, MD., 2016.
99. Participant, Beyond Research: Translating Scientific Discovery Into Impact. Symposium Sponsored by Partnership for Clean Competition. New York City, 2017.
100. Chair, The Integrated Physiological Response to Heat Stress in Vulnerable Populations. American Physiological Society Featured Topic, Experimental Biology Meeting, Chicago, IL., 2017.
101. Participant, Anti-Doping and Human Exercise Performance. Symposium sponsored by University of Copenhagen, Faculty of Sciences, Copenhagen, Denmark, 2017.
102. Participant, Too Hot to Handle: Controversies in Exertional Heat Stroke Prevention and Treatment. American Physiological Society Symposium, Experimental Biology Meeting, San Diego, CA., 2018.
103. Distinguished Lecturer, Heat Related Illness: State of The Science Conference, Sponsored by Southeastern Coastal Center for Agriculture Health & Safety, Center for Disease Control / National Institute for Occupational Safety and Health. St. Petersburg Beach, FL., 2018.
104. Participant, Life Cycle of Anti-Doping. Symposium Sponsored by Partnership for Clean Competition and King's College. London, United Kingdom, 2019.
105. Participant, Anti-Doping – A Scientific Approach. Symposium sponsored by University of Copenhagen, Faculty of Sciences, and Novo Nordisk Foundation. Holte, Denmark, 2019.
106. Participant, The Science and Application of Hydration Principles for Athletes. Symposium podcast sponsored by Gatorade Sports Science Institute, 2022.
107. Participant, Impact of Global Anti-Doping Scientific Research: Innovation & Advancement. Symposium sponsored by Partnership for Clean Competition. New York City, NY., 2023.
108. Keynote Lecture, Demystifying Medicine Series: Global Warming and Human Adaptation, sponsored by National Institutes of Health. Bethesda, MD, 2024.
109. Participant, Future of Drug Sport Testing: Innovation in Detection & Deterrence. Symposium sponsored by Partnership for Clean Competition. New York City, NY., 2025.
110. Participant, Sweat Rate Prediction for Hydration Management: History and Current Status, American College of Sports Medicine Symposium, Atlanta, GA, 2025.

## Media Videos & Podcasts

- How Does The Human Body Cope With The Heat, Talk of The Nation. Posted by National Public Radio, 2007. <https://www.npr.org/2006/08/11/5637692/how-does-the-human-body-cope-with-heat>
- Human Heat Acclimation: Physiological Mechanisms and Impact on Aerobic Performance. Posted by Aspetar Hospital, 2014. <https://www.youtube.com/watch?v=CKIV3lgQ420>
- Hydration: Physiological Consequences & Human Performance Implications. Posted by University of Arkansas, 2014. <https://www.youtube.com/watch?v=RHbUy3qIPz8>
- Unique Features of Human Skin: Thermoregulation and Water Balance. Posted by University of California at San Diego, 2015. <https://www.youtube.com/watch?v=t9Rr4D0I0IM>
- Exertional Heat Illness: Physiology, Pathophysiology and Modifying Factors. Posted by Centers for Disease Control and Prevention, 2018. [https://www.youtube.com/watch?v=w4ggjuJ6\\_bo](https://www.youtube.com/watch?v=w4ggjuJ6_bo)
- Dr. Michael Sawka, Career Reflections. Environmental and Occupational Physiology Journal Club. Posted by American College of Sports Medicine, 2019. <https://www.himalaya.com/episode/dr-michael-sawka-environmental-and-occupational-physiology-journal-club-himalaya-55179953>
- Hydration Assessment Techniques. Gatorade Sports Science Institute University Podcast, Posted by Gatorade, July 2022. <https://www.gssiweb.org/en/gssiu/All>

- Supporting Anti-Doping Careers and Advancing Hematology Research, Anti-Doping Podcast. Partnership for Clean Competition, December 2023. <https://antidoping.libsyn.com/115-supporting-anti-doping-careers-and-advancing-hematology-research-mike-sawka-phd>
- Physiological Adaptations, Maladaptations & Bioengineering Interventions with Extreme Hot Weather. Demystifying Medicine Series: Global Warming and Human Adaptation, National Institutes of Health, February 2024. <https://videocast.nih.gov/watch=54029>
- Sweat Rate Calculator to Block Heat Illness & Boost Athletic Performance. American Physiological Society Video, July 2024. <https://www.physiology.org/detail/news/2024/07/11/sweat-rate-calculator-blocks-heat-illness-boosts-athletic-performance?SSO=Y>
- Careers in Anti-Doping Research. American Physiological Society Webinar, October 2024. [https://us06web.zoom.us/rec/play/vuQ591v5NNq1-99GG7K00gegfuirS2gp2Yz7pyjGGETK\\_avdiyJ5MIOQ5MCyHBrm6617eK7MbQYY1Gr.OliDe7-YgaPofoll?canPlayFromShare=true&from=share\\_recording\\_detail&continueMode=true&tk=OwcaNFladYKQ8Kyju5Q2Y3DYY8jZMoBVZqkhY3HbcBo.DQcAAAAUEmxNsRZ5VGI1aXkxcll4Q1hDN2dsb2NydFdnAA&uuiid=WN\\_dwx\\_RsSKR0u\\_uSH1h9xdyw&componentName=rec-play&originRequestUrl=https%3A%2F%2Fus06web.zoom.us%2Frec%2Fshare%2FHoPvLOMQ6lgZDINWRYai96mjk5wBKq719TloOVljeFQHwzEZ4t4sRZLIkIheAcAO.dTEXh2selZD-H-Fx%3Ftk=OwcaNFladYKQ8Kyju5Q2Y3DYY8jZMoBVZqkhY3HbcBo.DQcAAAAUEmxNsRZ5VGI1aXkxcll4Q1hDN2dsb2NydFdnAA%26uuiid=WN\\_dwx\\_RsSKR0u\\_uSH1h9xdyw%26\\_x\\_zm\\_rtaid=Z-Hek6p0Ro6mliFAUtMvgg.1729116384875.66277ef5ca52213fce9d1d2540f96041%26\\_x\\_zm\\_rtaid=402](https://us06web.zoom.us/rec/play/vuQ591v5NNq1-99GG7K00gegfuirS2gp2Yz7pyjGGETK_avdiyJ5MIOQ5MCyHBrm6617eK7MbQYY1Gr.OliDe7-YgaPofoll?canPlayFromShare=true&from=share_recording_detail&continueMode=true&tk=OwcaNFladYKQ8Kyju5Q2Y3DYY8jZMoBVZqkhY3HbcBo.DQcAAAAUEmxNsRZ5VGI1aXkxcll4Q1hDN2dsb2NydFdnAA&uuiid=WN_dwx_RsSKR0u_uSH1h9xdyw&componentName=rec-play&originRequestUrl=https%3A%2F%2Fus06web.zoom.us%2Frec%2Fshare%2FHoPvLOMQ6lgZDINWRYai96mjk5wBKq719TloOVljeFQHwzEZ4t4sRZLIkIheAcAO.dTEXh2selZD-H-Fx%3Ftk=OwcaNFladYKQ8Kyju5Q2Y3DYY8jZMoBVZqkhY3HbcBo.DQcAAAAUEmxNsRZ5VGI1aXkxcll4Q1hDN2dsb2NydFdnAA%26uuiid=WN_dwx_RsSKR0u_uSH1h9xdyw%26_x_zm_rtaid=Z-Hek6p0Ro6mliFAUtMvgg.1729116384875.66277ef5ca52213fce9d1d2540f96041%26_x_zm_rtaid=402)

## Publications & Patents

### Scientific Journals & Book Chapters

1. Knowlton, R.G., **M.N. Sawka** and D.T. Deutsch. Varied Intensity Treadmill Protocols for the Measurement of Maximal Oxygen Uptake. *Journal of Sports Medicine*. 17:263-269, 1977.
2. **Sawka, M.N.**, H. Weber and R.G. Knowlton. The Effects of Total Body Submersion on Residual Lung Volume and Body Density Measurements in Man. *Ergonomics*. 21:89-94, 1978.
3. Knowlton, R.G. and **M.N. Sawka**. Cardiorespiratory Adaptations of an Obese Individual to Graded Exercise with Implications to Exercise Therapy. *American Corrective Therapy Journal*. 32:112-115, 1978.
4. Thirer, J., R.G. Knowlton, **M.N. Sawka** and T.J. Chang. Relationship of Psycho-Physiological Characteristics to Perceived Exertion and Levels of Anxiety in Competitive Swimmers. *Journal of Sports Behavior*. 1:169-173, 1978.
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6. Glaser, R.M., D.M. Foley, L.L. Laubach, **M.N. Sawka** and A.G. Suryaprasad. An Exercise Test to Evaluate Fitness for Wheelchair Activity. *Paraplegia*. 16:341-349, 1978-79.
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## Post-Doctoral Fellows & Thesis / Dissertation Committees

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- Stephen R. Muza, University of Kentucky
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- John W. Castellani, University of Connecticut
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- Samuel N. Cheuvront, Florida State University
- Robert Carter III, North Texas University
- David DeGroot, The Pennsylvania State University

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