DONALD P. GAVER, III, Ph.D.

Alden J. 'Doc' Laborde Chair of Biomedical Engineering

Department of Biomedical Engineering • Tulane University • New Orleans, LA 70118

PROFESSIONAL SUMMARY

Professor and researcher with 35+ years of experience in biomedical engineering, specializing in pulmonary mechanics and ventilator-induced lung injury. Recognized leader in biomedical engineering education with sustained federal funding (>$15M total), 82 peer-reviewed publications, and mentorship of 50+ graduate students and postdoctoral researchers. Current elected Vice-Chair of Tulane University Senate and Chair of BMES Finance Board, demonstrating leadership in academic governance and professional societies.

EDUCATION

Ph.D., Theoretical and Applied Mechanics | Northwestern University, 1988

M.S., Theoretical and Applied Mechanics | Northwestern University, 1985

B.S., Applied Physics | California Institute of Technology, 1982

B.A., Physics | Occidental College, 1982

CURRENT POSITION

Professor | Department of Biomedical Engineering, Tulane University (1999–Present)

Alden J. 'Doc' Laborde Chair of Biomedical Engineering (2006–Present)

Director, Interdisciplinary Ph.D. Program in BioInnovation (2012–Present)

KEY ACCOMPLISHMENTS

Recent Research Impact

- **Published landmark paper in PNAS** on mechanical ventilation energy analysis (Impact Factor: 9.4)
- **Filed provisional patent** for real-time lung injury evaluation during mechanical ventilation
- **Secured NIH R01 renewal** ($2.77M total costs) for ventilator-induced lung injury research through 2028
- **Graduated 2 BioInnovation Ph.D. students in 2025**, now at Yale BME and leading startup Cleaved Diagnostics

Career Highlights

- **Research Funding:** >$15M in competitive grants from NIH, NSF, and NASA
- **Publications:** 82 peer-reviewed articles
- **Graduate Mentorship:** 15 Ph.D. students graduated, 30+ BioInnovation PhD trainees mentored
- **Leadership:** Department Chair (15 years), Elected Faculty Chair of Tulane University Senate, BMES Finance Board Chair

SELECT AWARDS & HONORS

- 2024 BMES Herb Voigt Distinguished Service Award
- 2022 Tulane Special Presidential Award for Academic Leadership
- 2022 BME Council of Chairs Award for Outstanding Service
- Fellow: AIMBE (2002), BMES (2014), AAAS (2016)
- 2010 Tulane President's Award for Excellence in Professional and Graduate Teaching
- Multiple Teacher of the Year Awards (1992, 2005, 2007, 2008)
- 1993-98 NSF National Young Investigator Award

RESEARCH EXPERTISE

- Ventilator-induced lung injury (VILI) mechanisms and prevention strategies
- Pulmonary surfactant transport and physicochemical properties
- Multi-scale computational modeling of lung mechanics
- Biofluid mechanics and interfacial flows in pulmonary airways
- Microfluidic models of pulmonary airway reopening

RECENT PUBLICATIONS

Gaver III, D.P., M. Kollisch-Singule, G. Nieman, J. Satalin, N. Habashi, J.H.T. Bates. (2025). Mechanical ventilation energy analysis: Recruitment focuses injurious power in the ventilated lung. *Proceedings of the National Academy of Sciences (PNAS)*, 122:10, e2419374122. https://doi.org/10.1073/pnas.2419374122

Fujioka, H., Halpern, D., and Gaver, D. (2025). Predictions of Atelectasis-Induced Micro-Volutrauma: a Key Pathway to Ventilator-Induced Lung Injury. *ASME J Biomech Eng*. doi: https://doi.org/10.1115/1.4069073

Bates, J.H., Kollisch-Singule, M., Gaver, D.P. et al. (2025). Toward optimal mechanical ventilation of the injured lung: the role of expiratory duration. *Crit Care* 29, 481. https://doi.org/10.1186/s13054-025-05683-2

Bates, J.H., Kaczka, D.W., Kollisch-Singule, M., Nieman, G.F. and Gaver, D.P., 2024. Atelectrauma can be avoided if expiration is sufficiently brief: evidence from inverse modeling and oscillometry during airway pressure release ventilation. Critical Care, 29(1), p.329, https://doi.org/10.1186/s13054-024-05112-w.

Ma, H., H. Fujioka, D. Halpern, J. H. T. Bates, and D. P. Gaver III, Full-lung simulations of mechanically ventilated lungs incorporating recruitment/derecruitment dynamics. Frontiers in Network Physiology, Vol 3, 11/2/2023, https://doi.org/10.3389/fnetp.2023.1257710.

Yamaguchi, E.; Yao, J.; Aymond, A.; Chrisey, D.; Nieman, G.; Bates, J.; Gaver, D. Electric Cell-Substrate Impedance Sensing (ECIS) as a Platform for Evaluating Barrier-Function Susceptibility and Damage from Pulmonary Atelectrauma. *Biosensors* 2022, 12(6), 390; https://doi.org/10.3390/bios12060390. https://www.mdpi.com/2079-6374/12/6/390

Gaver III, D. P., G. F. Nieman, L. A. G., M. Cereda, N. M. Habashi, and J. H.T. Bates, The POOR Get POORer: A Hypothesis for the Pathogenesis of Ventilator-Induced Lung Injury. *Am J Respir Crit Care Med* Vol 202, Iss 8, pp 1081–1087, Oct 15, 2020; https://doi.org/10.1164/rccm.202002-0453CP

Complete publication list (82 total): See full CV or ResearcherID: http://www.researcherid.com/rid/G-5347-2010

CURRENT RESEARCH FUNDING

Active Grants

NIH R01 HL142702-05A1 (PI)

Title: Preserving Epithelial Barrier Integrity in Ventilator-Induced Lung Injury

Total Costs to Lab: $858,580 | Duration: 5/24-4/28

Co-PIs: Jason Bates (Vermont), Gary Nieman (SUNY)

NIH T32 EB027632-01 (PI)

Title: Interdisciplinary Pre-doctoral Training in BioInnovation

Total Costs: $1,578,420 | Duration: 5/19-12/25

Pending

NSF ART Track 2 (Co-PI)

Title: Success Model to Advance Research Translation at Tulane (SMART Tulane)

Total Project: $5,967,100 | Direct to Lab: $676,126 | Duration: 7/26-6/30

LEADERSHIP & SERVICE

University Leadership

- Vice-Chair, Tulane University Senate (2026-2028, elected)
- Chair, Department of Biomedical Engineering (2006-2021, 15 years)
- Director, BioInnovation Ph.D. Program (2012-Present)

Professional Society Leadership

- Chair, BMES Finance Board (2018-Present)
- Member, BMES Executive Committee (2018-Present)
- Chair, Council of Chairs of Bioengineering and Biomedical Engineering (2016)
- Chair, BMES Education Committee (2014-2018)

Editorial & Review Service

- Associate Editor, Frontiers in Physiology (2021-Present)
- Associate Editor, BMES Biomedical Engineering Education (2021-2023)
- Reviewer for NIH, NSF, NASA, PNAS, and major biomedical engineering journals

GRADUATE STUDENT MENTORING

Recent Ph.D. Graduates

- **Haoran Ma** (2024) - Current position: Research Scientist, United Therapeutics
- **Katelynn Montgomery** (2024, BioInnovation) - Current position: Research Scientist
- **Jae McKee** (2025, BioInnovation) - Current position: Postdoc at Yale BME
- **Chandler Monk** (2025, BioInnovation) - Current position: Leading startup Cleaved Diagnostics

Career totals: 15 Ph.D. graduates, 45+ BioInnovation trainees mentored

Complete CV with full publication list, detailed service history, and conference presentations available upon request.