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COMPLETE VITA

Robert H. Davis
Dean of the College of Engineering and Applied Science
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Education:

B.S., Chemical Engineering, University of California at Davis, June 1978
M.S., Chemical Engineering, Stanford University, June 1979
Ph.D., Chemical Engineering, Stanford University, September 1982 (January 1983 ceremony)
Dissertation advisor: Andreas Acrivos
Dissertation title: The Operation and Stability of Continuous Inclined Supersettlers

Professional Experience:

Research Technician, Dow Chemical Co., Walnut Creek, California, Summer, 1975
Research Engineer, Cordis-Dow Corporation, Concord, California, Summer 1976
Research Engineer, E.I. du Pont de Nemours, Edgemoor, Delaware, Summer 1977
Summer Professional, Shell Development Co., Houston, Texas, Summers 1978, 1979
Postdoctoral Fellow, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, England, 1982-83
Research supervisors: Professor G. K. Batchelor and Dr. E. J. Hinch
Research topics: Coagulation; Elastohydrodynamic Collisions
Assistant Professor of Chemical Engineering, University of Colorado, Boulder, 1983-88
Associate Professor of Chemical Engineering, University of Colorado, Boulder, 1988-92
Professor of Chemical Engineering, University of Colorado, Boulder, 1992-Present
Chair of Chemical Engineering, University of Colorado, Boulder, 1992-2002
Visiting Professor and Guggenheim Fellow, Massachusetts Institute of Technology, 1990-91
Visiting Professor, University of California at Santa Barbara, 1997-98
Patten Endowed Chair, University of Colorado, 1997-2007
Tisone Endowed Chair, University of Colorado, 2007-Present
Dean, College of Engineering and Applied Science, University of Colorado, 2002-Present

Honors and Awards:

University Medalist, University of California at Davis, 1978
NATO Postdoctoral Fellowship in Science, 1982
NSF Presidential Young Investigator Award, 1985
University of Colorado Junior Faculty Development Award, 1985
Omega Chi Epsilon Outstanding Undergraduate Teaching in Chemical Engineering Award, 1989
Dow Outstanding Young Faculty Award, Rocky Mountain Section of ASEE, 1990
Guggenheim Fellowship, 1990
Outstanding Research Award, College of Engineering and Applied Science, 1993
AIChE Outstanding Paper Award, 1995
Outstanding Graduate Teaching Award, Department of Chemical Engineering, 1996, 2002
University of Colorado Faculty Fellowship, 1997
AIChE Excellence and Service Appreciation Award (Meeting Program Chair), 1999

Outstanding Service Award, College of Engineering and Applied Science, 1999
Outstanding Teaching Award, College of Engineering and Applied Science, 2000
Outstanding Research Award, Boulder Faculty Assembly, University of Colorado, 2000
Joe and Essie Smith Distinguished Lecturer, U.C. Davis, 2002
ASEE Dow Lectureship Award, 2002
Outstanding Service Award, Boulder Faculty Assembly, University of Colorado, 2003
Blue-Green Distinguished Lecturer, University of Michigan and University State University, 2006
Distinguished Engineering Alumnus Medal, University of California, Davis, 2006
ASME Certificate of Appreciation (Plenary Speaker), 2009
AIChE Fellow, 2009
AIChE Excellence and Service Appreciation Award (Awards Committee Chair), 2010

Research Interests:

Fluid Dynamics–particulate, colloidal, and microbial suspensions; sedimentation; filtration; coagulation; hydrodynamic diffusion; particle-fluid separations; composite materials processing, microstructure, and properties; droplet interactions and coalescence; flotation; microfluidics.

Biotechnology–microbial flocculation and sedimentation; aqueous two-phase extraction of cells; continuous fermentations with selective cell recycle; particle electrophoresis; *in vitro* RNA transcription; affinity separations; biomass processing.

Membrane Filtration–ultrafiltration; microfiltration; cell separations; cell debris removal; protein separations; wastewater treatment; fouling; membrane surface modification.

Peer-Reviewed and Invited Review Technical Articles:

1. Davis, R. H., E. Herbolzheimer, and A. Acrivos, "The Sedimentation of Polydisperse Suspensions in Vessels Having Inclined Walls," *Int. J. Multiphase Flow* **8**, 571-585 (1982).
2. Acrivos, A., R. H. Davis, and E. Herbolzheimer, "Enhanced Sedimentation in Vessels Having Inclined Walls. The Boycott Effect," in *Theory of Dispersed Multiphase Flow*, ed. R. E. Meyer, Academic Press, 81-95 (1983).
3. Davis, R. H., E. Herbolzheimer, and A. Acrivos, "Wave Formation and Growth During Sedimentation in Narrow Tilted Channels," *Phys. Fluids* **26,** 2055-2064 (1983).
4. Davis, R. H., "The Rate of Coagulation of a Dilute Polydisperse System of Sedimenting Spheres," *J. Fluid Mech.* **145**, 179-199 (1984).
5. Davis, R. H. and A. Acrivos, "Sedimentation of Noncolloidal Particles at Low Reynolds Numbers," *Ann. Rev. Fluid Mech.* **17**, 91-118 (1985).
6. Davis, R. H. and S. Birdsell, "Rapid Sedimentation of Microbial Suspensions," *Developments in Industrial Microbiology* **26**, 627-633 (1985).
7. Davis, R. H., J.-M. Serayssol, and E. J. Hinch, "The Elastohydrodynamic Collision of Two Spheres," *J. Fluid Mech.* **163**, 479-497 (1986).
8. Davis, R. H., "The Effective Thermal Conductivity of a Composite Material with Spherical Inclusions," *Int. J. Thermophysics* **7**, 609-620 (1986).
9. Davis, R. H. and T. P. Hunt, "Modeling and Measurement of Yeast Flocculation," *Biotech. Progress* **2**, 91-97 (1986).
10. Serayssol, J.-M. and R. H. Davis, "The Influence of Surface Interactions on the Elastohydrodynamic Collision of Two Spheres," *J. Colloid Interface Sci.* **114**, 54-66 (1986).
11. Davis, R. H. and D. T. Leighton, "Shear-Induced Transport of a Particle Layer Along a Porous Wall," *Chem. Eng. Sci.* **42**, 275-281 (1987).
12. Davis, R. H. and S. A. Birdsell, "Hydrodynamic Model and Experiments for Crossflow Microfiltration," *Chem. Engng. Comm.* **49**, 217-234 (1987).

13. Davis, R. H., "Elastohydrodynamic Collisions of Particles," *Physico-Chemical Hydrodynamics* **9**, 41-52 (1987).
14. Barnocky, G. and R. H. Davis, "The Effect of Maxwell Slip on the Aerodynamic Collision and Rebound of Two Spheres," *J. Colloid. Interface Sci.* **121**, 226-239 (1988).
15. Davis, R. H. and K. H. Birdsell, "Hindered Settling of Semidilute Monodisperse and Polydisperse Suspensions," *AIChE J.* **34**, 123-129 (1988).
16. Romero, C. A. and R. H. Davis, "Global Model of Crossflow Microfiltration Based on Hydrodynamic Particle Diffusion," *J. Memb. Sci.* **39**, 157-185 (1988).
17. Barnocky, G. and R. H. Davis, "Elastohydrodynamic Collision and Rebound of Spheres: Experimental Verification," *Phys. Fluids* **31**, 1324-1329 (1988).
18. Davis, R. H. and M. A. Hassen, "Spreading of the Interface at the Top of a Slightly Polydisperse Sedimenting Suspension," *J. Fluid Mech.* **196**, 107-134 (1988). Corrigendum, *J. Fluid Mech.* **202**, 598-599 (1989).
19. Davis, R. H. and C. S. Parnham, "Competitive Yeast Fermentation with Selective Flocculation and Recycle," *Biotech. Bioeng.* **33**, 767-776 (1989).
20. Davis, R. H., J. A. Schonberg, and J. M. Rallison, "The Lubrication Force Between Two Viscous Drops," *Phys. Fluids A* **1**, 77-81 (1989).
21. Davis, R. H., X. Zhang and J. P. Agarwala, "Particle Classification for Dilute Suspensions Using an Inclined Settler," *Ind. Eng. Chem. Res.* **28**, 785-793 (1989).
22. Hassen, M. A. and R. H. Davis, "Effects of Particle Interactions on the Determination of Size Distributions by Sedimentation," *Powder Tech.* **58**, 285-289 (1989).
23. Barnocky, G. and R. H. Davis, "The Lubrication Force Between Spherical Drops, Bubbles and Rigid Particles in a Viscous Fluid," *Int. J. Multiphase Flow* **15**, 627-638 (1989).
24. Barnocky, G. and R. H. Davis, "The Influence of Pressure-Dependent Density and Viscosity on the Elastohydrodynamic Collision and Rebound of Two Spheres," *J. Fluid Mech.* **209**, 501-519 (1989).
25. Romero, C. A. and R. H. Davis, "Transient Model of Crossflow Microfiltration," *Chem. Eng. Sci.* **45**, 13-25 (1990).
26. Henry, K. L., R. H. Davis, and A. L. Taylor, "Continuous Recombinant Bacteria Fermentations Utilizing Selective Flocculation and Recycle," *Biotech. Progress* **6**, 7-12 (1990).
27. Rogers, J. R. and R. H. Davis, "Modeling of Coalescence in Microgravity Processing of Zn-Bi Immiscible Alloys," *Met. Trans. A.* **21A**, 59-68 (1990).
28. Bentley, W. E., N. Mirjalili, D. C. Andersen, R. H. Davis, and D. S. Kompala, "Plasmid-encoded Protein: The Principal Factor in the Metabolic Burden Associated with Recombinant Bacteria," *Biotech. Bioeng.* **35**, 668-681 (1990).
29. Henry, K. L., C. S. Parnham, R. H. Davis, and A. L. Taylor, "Competitive Continuous Fermentations with Selective Recycle," *App. Biochem. Biotech.* **24/25**, 651-662 (1990).
30. Rogers, J. R. and R. H. Davis, "The Effects of van der Waals Attractions on Cloud Droplet Growth by Coalescence," *J. Atmos. Sci.* **47**, 1075-1080 (1990).
31. Henry, K. L., R. H. Davis, and A. L. Taylor, "Continuous Fermentations with Selective Cell Recycle," *Dev. Ind. Microbio.* **31**, 53-58 (1990).
32. Ogden, G. E. and R. H. Davis, "Experimental Determination of the Permeability and Relative Viscosity for Fine Latexes and Yeast Suspensions," *Chem. Eng. Comm.* **91**, 11-28 (1990).
33. Davis, R. H. and J. D. Sherwood, "A Similarity Solution for Steady-state Crossflow Microfiltration," *Chem. Eng. Sci.* **45**, 3204-3209 (1990).
34. Yiantsios, S. G. and R. H. Davis, "On the Buoyancy Driven Motion of a Drop Towards a Rigid Surface or a Deformable Interface," *J. Fluid Mech.* **217**, 547-573 (1990).

35. Zhang, X. and R. H. Davis, "Particle Classification Using Inclined Settlers in Series and with Underflow Recycle," *Ind. Eng. Chem. Res.* **29**, 1894-1900 (1990).
36. Davis, R. H., W. F. Ramirez, and A. Chatterjee, "Optimal Chemostat Cascades for Periplasmic Protein Secretion," *Biotech. Progress 6*, 430-436 (1990).
37. Batt, B. C., R. H. Davis, and D. S. Kompala, "Inclined Sedimentation for Selective Retention of Viable Hybridomas in a Continuous Suspension Bioreactor," *Biotech. Progress* **6**, 458-464 (1990).
38. Ogden, K. L. and R. H. Davis, "Plasmid Maintenance and Protein Overproduction in Selective Recycle Bioreactors," *Biotech. Bioeng.* **37**, 325-333 (1991).
39. Yiantsios, S. and R. H. Davis, "Close Approach and Deformation of Two Viscous Drops due to Gravity and van der Waals Forces," *J. Colloid Interface Sci.* **144**, 412-433 (1991).
40. Davis, R. H., C.-Y. Lee, B. C. Batt, and D. S. Kompala, "Cell Separations Using Differential Sedimentation in Inclined Settlers," ACS Symp. Ser. 464, *Cell Sep. Sci. Tech*., ed. D. S. Kompala and P. W. Todd, 113-121 (1991).
41. Bentley, W. E., R. H. Davis, and D. S. Kompala, "Dynamics of Induced CAT Expression in *E. coli*," *Biotech. Bioeng.* **38**, 749-761 (1991).
42. Davis, R. H., "Sedimentation of Axisymmetric Particles in Shear Flows," *Phys. Fluids A* **3**, 2051-2060 (1991).
43. Romero, C. A. and R. H. Davis, "Experimental Verification of the Shear-Induced Hydrodynamic Diffusion Model of Crossflow Microfiltration," *J. Memb. Sci.* **62**, 249-273 (1991).
44. Davis, R. H., "Microfiltration: Definitions," in *Membrane Handbook*, ed. W. S. Ho and K. Sirkar, Van Nostrand Reinhold, 457-460 (1992).
45. Davis, R. H. and D. C. Grant, "Theory of Deadend Microfiltration," in *Membrane Handbook*, ed W. S. Ho and K. Sirkar, Van Nostrand Reinhold, 461-479 (1992).
46. Davis, R. H., "Theory of Crossflow Microfiltration," in *Membrane Handbook*, ed. W. S. Ho and K. Sirkar, Van Nostrand Reinhold, 480-505 (1992).
47. Davis, R. H. and N.A. Hill, "Hydrodynamic Diffusion of a Sphere Sedimenting Through a Dilute Suspension of Neutrally-buoyant Spheres," *J. Fluid Mech.* **236**, 513-533 (1992).
48. Zhang, X. and R. H. Davis, "The Collision Rate of Small Drops Undergoing Thermocapillary Migration," *J. Colloid Interf. Sci*. **152**, 548-561 (1992).
49. Ogden, K. L., R. H. Davis, and A. L. Taylor, "An Adjustable Expression System for Controlling Growth Rate, Plasmid Maintenance and Culture Dynamics," *Biotech. Bioeng*. **40**, 1027-1038 (1992).
50. Hawker, D. T. L., R. H. Davis, P. W. Todd, and S. R. Rudge, "Electrokinetic Isolation of Bacterial Vesicles and Ribosomes," *Biotech. Prog.* **8**, 429-435 (1992).
51. Davis, R. H., "Effects of Surface Roughness on a Sphere Sedimenting Through a Dilute Suspension of Neutrally Buoyant Spheres," *Phys. Fluids A* **4**, 2607-2619 (1992).
52. Davis, R. H., "Modeling of Fouling of Crossflow Microfiltration Membranes," *Sep. Pur. Meth.* **21**, 75-126 (1992).
53. Zhang, X., R. H. Davis, and M. F. Ruth, "Experimental Study of Two Interacting Drops in an Immiscible Fluid," *J. Fluid Mech*. **249**, 227-239 (1993).
54. Davis, R. H., "Microhydrodynamics of Particulate Suspensions," *Adv. Colloid Interf. Sci.* **43**, 17-50 (1993).
55. Todd, P., D. T. L. Hawker, R. H. Davis, and R. B. Owen, "Fluid Properties and Phase Equilibria in Aqueous Phase Bioseparations," *Fluid Phase Equilibria* **82**, 225-235 (1993).
56. Loewenberg, M. and R. H. Davis, "Near-contact, Thermocapillary Migration of a Nonconducting, Viscous Drop Normal to a Planar Interface," *J. Colloid Interf. Sci.* **160**, 265-274 (1993).

57. Davis, R. H. and H. A. Stone, "Flow Through Beds of Porous Particles," *Chem. Eng. Sci.* **48**, 3993-4005 (1993).
58. Zhang, X., H. Wang, and R. H. Davis, "Collective Effects of Temperature Gradients and Gravity on Droplet Coalescence," *Phys. Fluids A* **5**, 1602-1613 (1993).
59. Wang, H. and R. H. Davis, "Droplet Growth Due to Brownian, Gravitational, or Thermocapillary Motion and Coalescence in Dilute Dispersions," *J. Colloid Interf. Sci.* **159**, 108-118 (1993).
60. Loewenberg, M. and R. H. Davis, "Near-contact Thermocapillary Motion of Two Nonconducting Drops," *J. Fluid Mech.* **256**, 107-131 (1993).
61. Romero, C., J. P. Agarwala, and R. H. Davis, "Separation and Classification of Axisymmetric Particles in an Inclined Settler," *I. J. Multiphase Flow* **19**, 803-816 (1993).
62. Redkar, S. G. and R. H. Davis, "Crossflow Microfiltration of Yeast Suspensions in Tubular Filters," *Biotech. Prog.* **9**, 625-634 (1993).
63. Davis, R. H. and H. Gecol, "A Hindered Settling Function with No Adjustable Parameters for Polydisperse Suspensions," *AIChE J.* **40**, 570-575 (1994).
64. Tadikonda, K. and R. H. Davis, "Cell Separations Using Targeted Monoclonal Antibodies Against Overproduced Surface Proteins," *App. Biochem. Biotech.* **45/46**, 233-244 (1994).
65. Arora, N. and R. H. Davis, "Yeast Cake Layers as Secondary Membranes in Deadend Microfiltration of Bovine Serum Albumin," *J. Mem. Sci.* **92**, 247-256 (1994).
66. Wang, H., A. Z. Zinchenko, and R. H. Davis, "The Collision Rate of Small Drops in Linear Flow Fields," *J. Fluid Mech.* **265**, 161-188 (1994).
67. Davis, R. H., "Cell Aggregation and Sedimentation," in *Cell Adhesion: Fundamentals and Biotechnological Applications*, ed. M. A. Hjortso and J. Roos, Marcel Dekker, pp. 135-185 (1994).
68. Tracey, E. M. and R. H. Davis, "Protein Fouling of Track-etched Polycarbonate Microfiltration Membranes," *J. Colloid Interf. Sci.* **167**, 104-116 (1994).
69. Loewenberg, M. and R. H. Davis, "Flotation Rates of Fine, Spherical Particles and Droplets," *Chem. Eng. Sci.* **49**, 3923-3941 (1994).
70. Zinchenko, A. Z. and R. H. Davis, "Gravity-induced Coalescence of Drops at Arbitrary Péclet Numbers," *J. Fluid Mech.* **280**, 119-148 (1994).
71. Belfort, G., R. H. Davis, and A. Zydney, "The Behavior of Suspensions and Macromolecular Solutions in Crossflow Microfiltration," *J. Mem. Sci.* **96**, 1-58 (1994).
72. Loewenberg, M. and R. H. Davis, "Near-contact Electrophoretic Particle Motion," *J. Fluid Mech.* **288**, 103-122 (1995).
73. Arora, N. and R. H. Davis, "Effects of Axial Pressure Drop on the Length-averaged Permeate Flux in Crossflow Microfiltration," *Chem. Eng. Comm.* **132**, 51-67 (1995.)
74. Redkar, S. G. and R. H. Davis, "Cross-flow Microfiltration with High-frequency Reverse Filtration," *AIChE J.* **41**, 501-508 (1995).
75. Davis, R. H., "Large-scale Oligoribonucleotide Production," *Curr. Opinion Biotech.* **6**, 213-217 (1995).
76. Wang, H. and R. H. Davis, "Simultaneous Sedimentation and Coalescence of a Dilute Dispersion of Small Drops," *J. Fluid Mech.* **295**, 247-261 (1995).
77. Marble, H. A. and R. H. Davis, "RNA Transcription from Immobilized DNA Templates," *Biotech. Prog.* **11**, 393-396 (1995).
78. Parnham, C. S. and R. H. Davis, "Protein Recovery from Cell Debris Using Rotary and Tangential Crossflow Microfiltration," *Biotech. Bioeng.* **47**, 155-164 (1995).
79. Zinchenko, A. Z. and R. H. Davis, "Collision Rates of Spherical Drops or Particles in a Shear Flow at Arbitrary Péclet Numbers," *Phys. Fluids* **7**, 2310-2327 (1995).

80. Nichols, S. C., M. Loewenberg, and R. H. Davis, "Electrophoretic Particle Aggregation," *J. Colloid Interf. Sci.* **176**, 342-351 (1995).
81. Davis, R. H., "Introduction and Basic Principles of Suspensions," in *Mobile Particulate Systems*, (eds. E. Guazzelli, E. and L. Oger), Kluwer Academic Publishers (1995), pp. 23-38.
82. Davis, R. H., "Interaction of Two Suspended Particles," in *Mobile Particulate Systems*, (eds. E. Guazzelli and L. Oger), Kluwer Academic Publishers (1995), pp. 39-56.
83. Davis, R. H., "Pairwise Aggregation in Dilute Suspensions," in *Mobile Particulate Systems*, (eds. E. Guazzelli and L. Oger), Kluwer Academic Publishers (1995), pp. 79-92.
84. Davis, R. H., "Hydrodynamic Dispersion in Sedimenting Suspensions," in *Mobile Particulate Systems*, (eds. E. Guazzelli and L. Oger), Kluwer Academic Publishers (1995), pp. 93-104.
85. Davis, R. H., "Velocities of Sedimenting Particles in Suspensions," in *Sedimentation of Small Particles in a Viscous Fluid* (ed. E. M. Tory), CM Publications, 161-198 (1996).
86. Davis, R. H., "Hydrodynamic Diffusion of Suspended Particles: A Symposium," *J. Fluid Mech.* **310**, 325-335 (1996).
87. Wang, H. and R. H. Davis, "Collective Effects of Gravitational and Brownian Coalescence on Droplet Growth," *J. Colloid Interf. Sci*. **178**, 47-52 (1996).
88. Davis, R. H. and H. Gecol, "Classification of Concentrated Suspensions Using Inclined Settlers," *Int. J. Multiphase Flow* **22**, 563-574 (1996).
89. Mueller, J. and R. H. Davis, "Protein Fouling of Surface-modified Polymeric Microfiltration Membranes," *J. Mem. Sci.* **116**, 47-60 (1996).
90. Zhou, H. and R. H. Davis, "Axisymmetric Thermocapillary Migration of Two Deformable Viscous Drops," *J. Colloid Interf. Sci*. **181**, 60-72 (1996).
91. Zeng, S., E. T. Kerns, and R. H. Davis, "The Nature of Particle Contacts in Sedimentation," *Phys. Fluids* **8**, 1389-1396 (1996).
92. Wang, H. and R. H. Davis, "Experiments on Phase Separation of Dilute Dispersions of Coalescing Drops," *J. Colloid Interf. Sci*. **181**, 93-98 (1996).
93. Parnham, C. S. and R. H. Davis, "Protein Recovery from Bacterial Cell Debris Using Crossflow Microfiltration with Backpulsing," *J. Mem. Sci.* **118**, 259-268 (1996).
94. Redkar, S. G., V. Kuberkar, and R. H. Davis, "Modeling of Concentration Polarization and Depolarization with High-frequency Backpulsing," *J. Mem. Sci.* **121**, 229-242 (1996).
95. Güell, C. and R. H. Davis, "Membrane Fouling during Microfiltration of Protein Mixtures," *J. Mem. Sci.* **119**, 269-284 (1996).
96. Davis, R. H., "Particulate Flows and Sedimentation," in *Research Trends in Fluid Dynamics* (ed. J. L. Lumley, A. Acrivos, L. G. Leal, and S. Leibovich), American Institute of Physics, Woodbury, NY, pp. 60-68 (1996).
97. Wang, H., S. Zeng, M. Loewenberg, and R. H. Davis, "Particle Aggregation Due to Combined Gravitational and Electrophoretic Motion," *J. Colloid Interf. Sci*. **187**, 213-220 (1997).
98. Zinchenko, A Z., M. A. Rother, and R. H. Davis, "A Novel Boundary-integral Algorithm for Viscous Interactions of Deformable Drops," *Phys. Fluids* **9**, 1493-1511 (1997).
99. Mueller, J., Y. Cen, and R. H. Davis, "Crossflow Microfiltration of Oily Water," *J. Mem. Sci.* **129**, 221-235 (1997).
100. Rother, M. A., A. Z. Zinchenko, and R. H. Davis, "Buoyancy-driven Coalescence of Slightly Deformable Drops," *J. Fluid Mech.* **346**, 117-148 (1997).
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106. Ramirez, J. A., A. Zinchenko, M. Loewenberg, and R. H. Davis, “The Flotation Rates of Fine Spherical Particles Under Brownian and Convective Motion,” *Chem. Eng. Sci.* **54**, 149-157 (1999).
107. Zeng, S., A. Z. Zinchenko, and R. H. Davis, "Electrophoretic Motion of Two Interacting Particles,” *J. Colloid Interf. Sci.* **209**, 282-301 (1999).
108. Güell, C., P. Czekaj, and R. H. Davis, “Microfiltration of Protein Mixtures and the Effects of Yeast on Membrane Fouling,” *J. Mem. Sci.* **155**, 113-122 (1999).
109. Davis, R. H. and N. C. Breckenridge, “Modeling of Repeated-batch Transcription for Production of RNA,” *J. Biotech.* **71**, 25-37 (1999).
110. Davis, R. H., “Buoyancy-Driven Viscous Interaction of a Rising Drop with a Smaller Trailing Drop,” *Phys. Fluids* **11**, 1016-1028 (1999).
111. Kern, J. A. and R. H. Davis, “Application of a Fed-batch System to Produce RNA by *in vitro* Transcription,” *Biotech. Prog.* **15**, 174-184 (1999).
112. Kuberkar, V. T. and R. H. Davis, “Effects of Added Yeast on Protein Transmission and Flux in Crossflow Membrane Microfiltration,” *Biotech. Prog.* **15** 472-479 (1999).
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114. Ramirez, J. A. and R. H. Davis, “Mass Transfer to a Surfactant-covered Bubble or Drop,” *AIChE J.* **45**, 1355-1358 (1999).
115. Rother, M. A. and R. H. Davis, “The Effect of Slight Deformation on Thermocapillary-driven Droplet Collisions and Growth,” *J. Colloid Interf. Sci.* **214**, 297-318 (1999).
116. Zeng, S., P. Todd, and R. H. Davis, “Migration of Polystyrene Latex Particle Bands in Density-gradient Electrophoresis”, *J. Colloid Interf. Sci.* **218**, 585-587 (1999).
117. Davis, R. H., “New Developments in Biotechnology-Bioreactor Design, Membrane Separation, Drug Delivery,” *Chem. Eng. Australia* **24**(4), 17-19 (1999).
118. Ramirez, J. and R. H. Davis, “Water Treatment by Microflotation or Backpulsed Microfiltration,” *Can. Chem. News* **51**(1), 19-20 (1999).
119. Mores, W. D., C. N. Bowman, and R. H. Davis, “Theoretical and Experimental Flux Maximization by Optimization of Backpulsing,” *J. Mem. Sci.* **165**, 225-236 (2000).
120. Ma, H., R. H. Davis, and C. N. Bowman, “A Novel Sequential Photoinduced Living Graft Photopolymerization,” *Macromolecules* **33**, 331-335 (2000).
121. Ramirez, J. A., R. H. Davis, and A. Z. Zinchenko, “Microflotation of Fine Particles in the Presence of a Bulk-insoluble Surfactant,” *Int. J. Multiphase Flow* **26**, 891-920 (2000).
122. Kuberkar, V. T. and R. H. Davis, “Modeling of Fouling Reduction by Secondary Membranes,” *J. Mem. Sci.* **168**, 243-258 (2000).
123. Zinchenko, A. Z. and R. H. Davis, “An Efficient Algorithm for Hydrodynamical Interaction of Many Deformable Drops,” *J. Comp. Phys.* **157**, 539-587 (2000).
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Patents

1. Marble, H.A. and R.H. Davis, "Strategy for Production of RNA Using Immobilized Templates," U.S. Patent No. 5,700,667 (1997).

Reviewed Teaching and Course-Related Articles:

1. Davis, R. H. and R. I. Gamow, "Bringing Biotechnology Into the Classroom," *1985 Frontiers in Educ. Conf. Proc.*, ed. J. M. Biedenbach, 436-439 (1985).
2. Davis, R. H. and D. S. Kompala, "A Course in Biotechnology Laboratory Methods," *Chem. Eng. Educ.* **23**, 182-187 (1989).

3. Davis, R. H., “A Course in Fluid Mechanics of Suspensions,” *Chem. Eng. Educ.* **23**, 228-235 (1989).
4. Davis, R. H., “Industrial Involvement in Graduate Research,” *Chem. Eng. Educ.* **28**, 274-277 (1994).
5. Davis, R. H., “Helpful Hints for Effective Teaching," *Chem. Eng. Educ.* **32**, 36-39 (1998).
6. Davis, R. H. and L.-S. Fan, “Teaching Fluid-Particle Processes: A Workshop Report,” *Chem. Eng. Educ.* **32**, 94-97 (1998).

Nonreviewed Conference Proceedings and Other Articles: (53 articles total; list available by request)

Books, Manuals, and Proceedings Edited:

1. Davis, R. H., editor, *Proceedings of the 18th Annual Biochemical Engineering Symposium*, April 22-23, 1988, Estes Park, Colorado, 129 pages (1988).
2. Davis, R. H. and D. S. Kompala, *Biotechnology Laboratory Manual*, University of Colorado, 66 pages (1989).
3. Davis, R. H., editor, *Proceedings of the 24th Annual Biochemical Engineering Symposium*, September 9-10, 1994, Estes Park, Colorado, 154 pages (1995).
4. Davis, R. H., editor, *Program and Extended Abstracts - IUTAM Symposium on Hydrodynamic Diffusion of Suspended Particles*, July 22-25, 1995, Estes Park, Colorado, 129 pages (1995).

Selected Service Activities:

AIChE Fluids Area Program Committee, 1988-97
AIChE Fluids Area Vice Chair, 1992-96
IUTAM Symposium Organizer, 1995
ASEE ChE Summer School Workshop Organizer, 1997
Guest Editor, Special Issue of *Chemical Engineering Education*, 1998
AIChE Annual Meeting Program Chair, 1999
NAMS Meeting Program Chair, 2000
ASEE ChE Summer School Co-Chair, 2002
AIChE Awards Committee, 2005-2010, Chair 2007-2010
Co-Director, Colorado Institute for Research in Biotechnology, 1987-2001
Director, University of Colorado Biotechnology Training Program 1989-2003
Director, Colorado RNA Center, 1992-2001
Chair, Department of Chemical Engineering, University of Colorado, 1992-2002
Dean, College of Engineering and Applied Science, University of Colorado, 2002-

Grants Received by Robert H. Davis:

Total number: 82 (PI); 17 (co-PI) ***Total amount:*** $18,209,724 (PI); $4,463,979 (co-PI); list available by request

Current external research funding:

ConocoPhillips, “Enhanced Flocculation and Sedimentation for Harvesting Algae,” $235,459, 1/1/11-12/31/13.

ConocoPhillips, “Extractive Photobioreactor,” $524,819, 1/1/11-12/31/13 (with J. Pellegrino, PI, and Barbara Deming-Adams, co-PI).

NSF CBET-1064132, “Microstructured and Rheology of Highly-concentrated Emulsions,” $338,067, 5/1/11-4/30/14 (with A. Zinchenko, PI).

Student Research Supervision (list available upon request):

PhD students graduated: 29
MS students graduated: 28
Postdoctoral Associates: 12
Undergraduate Research Assistants: 146

PhD students current: 4
MS students current: 0
Postdocs current: 1