

Editorial

Gerald T. Babcock Publications

1. "Electron Paramagnetic Resonance Signal II in Spinach Chloroplasts: I. Kinetic Analysis for Untreated Chloroplasts," G.T. Babcock and K. Sauer, *Biochim. Biophys. Acta* **325**, 483–503 (1973).
2. "Electron Paramagnetic Resonance Signal II in Spinach Chloroplasts: II. Alternative Spectral Forms and Inhibitor Effects on Kinetics of Signal II in Flashing Light," G.T. Babcock and K. Sauer, *Biochim. Biophys. Acta* **325**, 504–519 (1973).
3. "Kinetics and Intermediates in Photosynthetic Oxygen Evolution," G.T. Babcock, PhD thesis, University of California, Berkeley, USAEC Report LBL-2172 (1973).
4. "The Effect of Bicarbonate on Photosynthetic Oxygen Evolution in Flashing Light in Chloroplast Fragments," A. Stemler, G.T. Babcock, and Govindjee, *Proc. Nat. Acad. Sci. USA* **71**, 4679–4683 (1974).
5. "A Critical Role of Bicarbonate in the Relaxation of Reaction Center II Complex During Oxygen Evolution in Isolated Broken Chloroplasts," Govindjee, A. Stemler, and G.T. Babcock, *Proc. 3rd Int. Congr. Photosyn.* (M. Avron, ed.), Elsevier, Amsterdam, pp. 363–371 (1974).
6. "A Rapid, Light-Induced Transient in Electron Paramagnetic Resonance Signal II Activated Upon Inhibition of Photosynthetic Oxygen Evolution," G.T. Babcock and K. Sauer, *Biochim. Biophys. Acta* **376**, 315–328 (1975).
7. "The Rapid Component of Electron Paramagnetic Resonance Signal II: A Candidate for the Physiological Donor to Photosystem II in Spinach Chloroplasts," G.T. Babcock and K. Sauer, *Biochim. Biophys. Acta* **376**, 329–344 (1975).
8. "Observation of a New EPR Transient in Chloroplasts that may Reflect the Electron Donor to Photosystem II at Room Temperature," R.E. Blankenship, G.T. Babcock, J.T. Warden, and K. Sauer, *FEBS Lett.* **51**, 287–293 (1975).
9. "Kinetic Study of Oxygen Evolution Parameters in Tris-Washed, Reactivated Chloroplasts," R.E. Blankenship, G.T. Babcock, and K. Sauer, *Biochim. Biophys. Acta* **387**, 165–175 (1975).
10. "Flash Kinetics and Light Intensity Dependence of Oxygen Evolution in the Blue-Green Alga *Anacystis nidulans*," A.C. Ley, G.T. Babcock, and K. Sauer, *Biochim. Biophys. Acta* **387**, 379–387 (1975).
11. "Two Electron Donation Sites for Exogenous Reductants in Chloroplast Photosystem II," G.T. Babcock and K. Sauer, *Biochim. Biophys. Acta* **396**, 48–62 (1975).
12. "Reaction Kinetics for Positive Charge Accumulation on the Water Side of Chloroplast Photosystem II," G.T. Babcock, R.E. Blankenship, and K. Sauer, *FEBS Lett.* **61**, 286–289 (1976).
13. "A Model for Cytochrome Oxidase," G. Palmer, G.T. Babcock, and L.E. Vickery, *Proc. Nat. Acad. Sci. USA* **73**, 2206–2210 (1976).
14. "The Electronic State of Heme in Cytochrome Oxidase: I. Magnetic Circular Dichroism of the Isolated Enzyme and Its Derivatives," G.T. Babcock, L.E. Vickery, and G. Palmer, *J. Biol. Chem.* **251**, 7907–7919 (1976).
15. "Electronic States of Heme in Cytochrome Oxidase," G. Palmer, T. Antal, G.T. Babcock, L. Garcia-Iniguez, M. Tweedle, L.J. Wilson, and L.E. Vickery in *Mechanisms of Oxidizing Enzymes* (T.P. Singer and R.N. Ondarza, eds.), Elsevier, Amsterdam, pp. 221–238 (1978).
16. "The Electronic State of Heme in Cytochrome Oxidase: II. Redox Potential Interaction and Heme Iron Spin State Behavior Observed During Reductive Titrations," G.T. Babcock, L.E. Vickery, and G. Palmer, *J. Biol. Chem.* **253**, 2400–2411 (1978).
17. "Raman Spectra of Heme *a*, Cytochrome Oxidase–Ligand Complexes, and Alkaline Denatured Oxidase," I. Salmeen, L. Rimai, and G.T. Babcock, *Biochemistry* **17**, 800–806 (1978).
18. "Heme *a* Models for Cytochromes *a* and *a*₃ in Cytochrome Oxidase—Raman Studies," I. Salmeen, L. Rimai, and G.T. Babcock, in *Frontiers of Biological Energetics: Electrons to Tissues* (A. Scarpa, P.L. Dutton, and J.S. Leigh, Jr., eds.), Academic Press, New York, pp. 905–911 (1978).
19. "Electronic State of Heme in Cytochrome Oxidase: III. The Magnetic Susceptibility of Beef Heart Cytochrome Oxidase and Some of Its Derivatives from 7–200 K. Direct Evidence for an Antiferromagnetically Coupled Fe(III)/Cu(II) Pair," M.F. Tweedle, L.J. Wilson, L. Garcia-Iniguez, G.T. Babcock, and G. Palmer, *J. Biol. Chem.* **253**, 8065–8071 (1978).
20. "Heme *a* Models for Cytochromes *a* and *a*₃ in Cytochrome Oxidase—EPR, MCD and Resonance Raman

Studies," G.T. Babcock, J. Van Steelandt, G. Palmer, L.E. Vickery, and I. Salmeen, in *Developments in Biochemistry, Volume 5: Cytochrome Oxidase* (T.E. King, Y. Orii, B. Chance, and K. Okunuki, eds.), Elsevier, Amsterdam, pp. 105–115 (1979).

21. "Oxygen Binding to Ferrous Heme *a* and a Synthetic Analog," G.T. Babcock and C.K. Chang, *FEBS Lett.* **97**, 358–362 (1979).

22. "Resonance Raman Spectra and Optical Properties of Oxidized Cytochrome Oxidase," G.T. Babcock and I. Salmeen, *Biochemistry* **18**, 2493–2498 (1979).

23. "The Optical Properties of Heme *a*: Resonance Raman Scattering with Visible Excitation," G.T. Babcock, M.R. Ondrias, D.A. Gobeli, J. Van Steelandt, and G.E. Leroi, *FEBS Lett.* **108**, 147–151 (1979).

24. "Photosystem II Oxidation of Charged Electron Donors: Surface Charge Effects," C.T. Yerkes, and G.T. Babcock, *Biochim. Biophys. Acta* **590**, 360–372 (1980).

25. "Chromophore Interactions in Flavocytochrome *c*₅₅₂: A Resonance Raman Investigation," M.R. Ondrias, E.W. Findsen, G.E. Leroi, and G.T. Babcock, *Biochemistry* **19**, 1723–1730 (1980).

26. "Resonance Enhancement of the Vibrations of Cytochrome *a*₃ and Its Conformation in Oxidized Cytochrome Oxidase," M.R. Ondrias and G.T. Babcock, *Biochem. Biophys. Res. Comm.* **93**, 29–35 (1980).

27. "Surface Charge Asymmetry and a Specific Ca²⁺ Effect in Chloroplast Photosystem II," C.T. Yerkes and G.T. Babcock, *Biochim. Biophys. Acta* **634**, 19–29 (1981).

28. "Insights into Heme Structure from Soret Excitation Raman Spectroscopy," P.M. Callahan and G.T. Babcock, *Biochemistry* **20**, 952–958 (1981).

29. "Coordination Geometries and Vibrational Properties of Cytochromes *a* and *a*₃ in Cytochrome Oxidase from Soret Excitation Raman Spectroscopy," G.T. Babcock, P.M. Callahan, M.R. Ondrias, and I. Salmeen, *Biochemistry* **20**, 959–966 (1981).

30. "Kinetic Distinction Between Cytochromes *a* and *a*₃ in Cytochrome *c* Oxidase: Rapid-Scanning Stopped-Flow Study of Anaerobic Reduction by a Neutral and a Negatively Charged Donor," F.G. Halaka, G.T. Babcock, and J.L. Dye, *J. Biol. Chem.* **256**, 1084–1087 (1981).

31. "Static and Dynamic Electrostatic Phenomena in Chloroplast Photosystem II," G.T. Babcock, C.T. Yerkes, and W.J. Buttner, *Photosynthesis, I. Photophysical Properties-Membrane Energization* (G. Akoyunoglou, ed.), Balaban International Science Services, Philadelphia, PA, pp. 637–645 (1981).

32. "Stoichiometry, Inhibitor Sensitivity, and Organization of Manganese Associated with Photosynthetic Oxygen Evolution," C.F. Yocum, C.T. Yerkes, R.E. Blankenship, R.R. Sharp, and G.T. Babcock, *Proc. Nat. Acad. Sci. USA* **78**, 7507–7511 (1981).

33. "Amine-Induced Inhibition of Photosynthetic Oxygen Evolution: A Correlation Between the Microwave Power Saturation Properties of Signal IIf and Photosystem

II-Associated Manganese," C.F. Yocum and G.T. Babcock, *FEBS Lett.* **130**, 99–102 (1981).

34. "A Highly Resolved, Oxygen-Evolving Photosystem II Preparation from Spinach Thylakoid Membranes: EPR and Electron Transport Properties," D.A. Berthold, G.T. Babcock, and C.F. Yocum, *FEBS Lett.* **134**, 231–234 (1981).

35. "A Ferrous, High-Spin Heme *a* Model for Cytochrome *a*₃ in the Dioxygen Reducing Site of Cytochrome Oxidase," J. Van Steelandt-Frentrop, I. Salmeen, and G.T. Babcock, *J. Am. Chem. Soc.* **103**, 5981–5982 (1981).

36. "The Optical and Vibrational Properties of Cytochromes *a* and *a*₃ in Cytochrome Oxidase," G.T. Babcock, P.M. Callahan, J.J. McMahon, M.R. Ondrias, and I. Salmeen, in *Electron Transport and Oxygen Utilization* (Ho, C., ed.), Elsevier North Holland, Amsterdam, pp. 185–190 (1982).

37. "Properties of 5-Methyl Phenazinium Methylsulfate: Reaction of the Oxidized Form with NADH and of the Reduced Form with Oxygen," F.G. Halaka, G.T. Babcock, and J.L. Dye, *J. Biol. Chem.* **257**, 1458–1461 (1982).

38. "Polycrystalline and Solution Raman Spectra of t-1,2-Bis(4-Pyridyl) Ethylene, Its Dihydrochloride and Its Dideuterochloride," J.J. McMahon and G.T. Babcock, *Spectrochim. Acta* **38A**, 1115–1122 (1982).

39. "The Role of ADPR Reagents in Destabilizing High-Potential Oxidizing Equivalents Generated in Chloroplast Photosystem II," D.F. Ghanotakis, C.T. Yerkes, and G.T. Babcock, *Biochim. Biophys. Acta* **682**, 21–31 (1982).

40. "Optical and EPR Characterizations of Oxygen-Evolving Photosystem II Subchloroplast Fragments Isolated from the Thermophilic Blue-Green Alga *Phormidium laminosum*," B. Ke, H. Inoue, G.T. Babcock, X.-X. Fang, and E. Dolan, *Biochim. Biophys. Acta* **682**, 297–306 (1982).

41. "Evidence for Modulation of the Heme Absorptions of Cytochrome *c* Oxidase by Metal–Metal Interactions," D.F. Blair, D.F. Bocian, G.T. Babcock, and S.I. Chan, *Biochemistry* **21**, 6928–6935 (1982).

42. "Red-Shifts in the Optical Spectra of Porphyrin Schiff's Bases upon Protonation," B. Ward, P.M. Callahan, R. Young, G.T. Babcock, and C.K. Chang, *J. Am. Chem. Soc.* **105**, 634–636 (1983).

43. "The Origin of the Cytochrome *a* Absorption Red-Shift: A pH-Dependent Interaction Between Its Heme *a* Formyl and Protein in Cytochrome Oxidase," P.M. Callahan and G.T. Babcock, *Biochemistry* **22**, 452–461 (1983).

44. "Similarity of EPR Signal IIf Rise and P₆₈₀⁺ Decay Kinetics in Tris-Washed Chloroplast Photosystem II Preparations as a Function of pH," M. Boska, K. Sauer, W. Buttner, and G.T. Babcock, *Biochim. Biophys. Acta* **722**, 327–330 (1983).

45. "Electron Donation to Photosystem II in Reaction Center Preparations," G.T. Babcock, D.F. Ghanotakis, B. Ke, and B.A. Diner, *Biochim. Biophys. Acta* **723**, 276–286 (1983).

46. "Hydroxylamine as an Inhibitor Between Z and P₆₈₀ in Photosystem II," D.F. Ghanotakis and G.T. Babcock, *FEBS Lett.* **153**, 231–234 (1983).
47. "Exogenous vs. Endogenous Acceptors in Photosystem II in Inhibited Chloroplasts," D.F. Ghanotakis, G.T. Babcock, and C.T. Yerkes, *Arch. Biochem. Biophys.* **225**, 248–255 (1983).
48. "Redox-Linked Hydrogen Bond Strength Changes in Cytochrome *a*: Implications for the Cytochrome Oxidase Proton Pump," G.T. Babcock and P.M. Callahan, *Biochemistry* **22**, 2314–2319 (1983).
49. "A Tris-Induced Change in the Midpoint Potential of Z, the Donor to Photosystem II, as Determined by the Kinetics of the Back Reaction," C.T. Yerkes, G.T. Babcock, and A.R. Crofts, *FEBS Lett.* **158**, 359–363 (1983).
50. "Structure and Inhibition of Components on the Oxidizing Side of Photosystem II," D.F. Ghanotakis, P.J. O'Malley, G.T. Babcock, and C.F. Yocum, *The Oxygen-Evolving System of Plant Photosynthesis*, (Y. Inoue et al., eds.), Academic Press, Tokyo, pp. 91–101 (1983).
51. "Electron Transport Activity and Polypeptide Composition of the Isolated Photosystem II Complex," P.O. Sandusky, C.L.S. DeRoo, D.B. Hicks, C.F. Yocum, D.F. Ghanotakis, and G.T. Babcock, *The Oxygen-Evolving System of Plant Photosynthesis* (Y. Inoue et al., eds.), Academic Press, Tokyo, pp. 189–199 (1983).
52. "ENDOR Evidence Supporting a Monomeric Nature for P₇₀₀⁺ in Spinach Chloroplasts," P.J. O'Malley and G.T. Babcock, *Proc. Nat. Acad. Sci. USA* **81**, 1098–1101 (1984).
53. "Powder ENDOR Analysis of the *p*-Benzosemiquinone Anion Radical," P.J. O'Malley and G.T. Babcock, *J. Am. Chem. Soc.* **106**, 817–818 (1984).
54. "The Reduction of Cytochrome Oxidase by 5,10-Dihydro-5-Methylphenazine: Kinetic Parameters from Rapid-Scanning Stopped Flow Experiments," F.G. Halaka, Z.K. Barnes, G.T. Babcock and J.L. Dye, *Biochemistry* **23**, 2005–2011 (1984).
55. "EPR Properties of Immobilized Quinone Cation Radicals and the Molecular Origin of Signal II in Spinach Chloroplasts," P.J. O'Malley and G.T. Babcock, *Biochim. Biophys. Acta* **765**, 370–379 (1984).
56. "Structure and Catalytic Properties of the Oxygen Evolving Complex: Correlation of Polypeptide and Manganese Release with the Behavior of Z⁺ in Chloroplasts and a Highly Resolved Preparation of the PSII Complex," D.F. Ghanotakis, G.T. Babcock, and C.F. Yocum, *Biochim. Biophys. Acta* **765**, 388–398 (1984).
57. "Calcium Reconstitutes High Rates of Oxygen Evolution in Polypeptide Depleted Photosystem II Preparations," D.F. Ghanotakis, G.T. Babcock, and C.F. Yocum, *FEBS Lett.* **167**, 127–130 (1984).
58. "Elucidation of the Principle Hyperfine Tensor Components for the Methyl Group Interaction in Semiquinone Anion Radicals Using Powder ENDOR Spectroscopy," P.J. O'Malley and G.T. Babcock, *J. Chem. Phys.* **80**, 3912–3913 (1984).
59. "Structures and Electron Transfer Reactions on the Oxidizing Side of Photosystem II," G.T. Babcock, W.J. Buttner, D.F. Ghanotakis, P.J. O'Malley, C.T. Yerkes and C.F. Yocum, in *Advances in Photosynthesis Research* (C. Sybesma, ed.), Martinus Nijhoff/Dr. W. Junk Publishers, The Hague, The Netherlands, Vol. I, pp. 243–252 (1984).
60. "Water-Soluble 17 and 23 kDa Polypeptides Restore Oxygen Evolution Activity by Creating a High-Affinity Site for Ca²⁺ on the Oxidizing Side of Photosystem II," D.F. Ghanotakis, J.N. Topper, G.T. Babcock, and C.F. Yocum, *FEBS Lett.* **170**, 169–173 (1984).
61. "Diheme Cytochrome *c*₅₅₄ from *Nitrosomonas*: Soret Resonance Raman Indication of an Unusual Ferric Five-Coordinate Structure," K.K. Andersson, G.T. Babcock, and A.B. Hooper, *FEBS Lett.* **170**, 331–334 (1984).
62. "Spectral Properties of Protonated Schiff Base Porphyrins and Chlorins, INDO-CI Calculations and Resonance Raman Studies," L.K. Hanson, C.K. Chang, B. Ward, P.M. Callahan, G.T. Babcock, and J.D. Head, *J. Am. Chem. Soc.* **106**, 3950–3958 (1984).
63. "The Cationic Plastoquinone Cation Radical of the Chloroplast Water Splitting Complex. Hyperfine Splitting from a Single Methyl Group Determines the Spectral Shape of Signal II," P.J. O'Malley, G.T. Babcock, and R.C. Prince, *Biochim. Biophys. Acta* **766**, 283–288 (1984).
64. "Kinetics of the Oxygen-Evolving Complex in Salt-Washed Photosystem II Preparations," J.P. Dekker, D.G. Ghanotakis, J.J. Plijter, H.J. van Gorkom, and G.T. Babcock, *Biochim. Biophys. Acta* **767**, 515–523 (1984).
65. "Precursors to Microsecond Delayed Luminescence in Oxygen-Evolving and Inhibited Chloroplasts," W.J. Buttner and G.T. Babcock, *Biochim. Biophys. Acta* **767**, 272–287 (1984).
66. "The Oxygen-Evolving Complex of Photosystem II: Polypeptide Structure and Organization of Catalytic Components," C.F. Yocum, D.F. Ghanotakis, P.O. Sandusky, J.N. Topper, and G.T. Babcock, in *Current Topics in Plant Biochemistry and Physiology* (D. Randall et al., eds.), University of Missouri Press, Columbia, Missouri, pp. 51–60 (1984).
67. "Time-Resolved Resonance Raman Spectroscopy of Transient Species Formed During the Oxidation of Cytochrome Oxidase by Dioxygen," G.T. Babcock, J.M. Jean, L.N. Johnston, G. Palmer, and W.H. Woodruff, *J. Am. Chem. Soc.* **106**, 8305–8306 (1984).
68. "Flow-Flash Time-Resolved Resonance Raman Spectroscopy of the Oxidation of Reduced and of Mixed Valence Cytochrome Oxidase by Dioxygen," G.T. Babcock, J.M. Jean, L.N. Johnston, G. Palmer, and W.H. Woodruff, *J. Inorg. Biochem.* **23**, 243–251 (1985).
69. "Raman Characterization of Human Leucocyte Myeloperoxidase and Bovine Spleen Green Heme Protein: Insight into Chromophore Structure and Evidence that the Chromophores of Myeloperoxidase are Equivalent," G.T.

Babcock, R.T. Ingle, W.A. Oertling, J.C. Davis, B.A. Averill, C.L. Hulse, D.J. Stufkens, B.G.J.M. Bolscher, and R. Wever, *Biochim. Biophys. Acta* **828**, 58–66 (1985).

70. “The Use of Principal Component Analysis to Resolve the Spectra and Kinetics of Cytochrome *c* Oxidase Reduction by 5,10-Dihydro-5-Methyl Phenazine,” F.G. Halaka, G.T. Babcock, and J.L. Dye, *Biophys. J.* **48**, 209–219 (1985).

71. “Surface Enhanced Raman Scattering and Photodimerization of Pyridyl-Substituted Ethylenes at a Silver Electrode Surface,” J.J. McMahon, T.P. Dougherty, D.J. Riley, G.T. Babcock, and R.L. Carter, *Surface Science* **158**, 381–392 (1985).

72. “The Axial Ligands of Chloroplast Cytochrome *b*₅₅₉: Identification and Requirement for a Heme-Crosslinked Polypeptide Structure,” G.T. Babcock, W.R. Widger, W.A. Cramer, W.A. Oertling, and J. Metz, *Biochemistry* **24**, 3638–3645 (1985).

73. “Structure of the Oxygen-Evolving Complex of Photosystem II: Calcium and Lanthanum Compete for Sites on the Oxidizing Side of Photosystem II Which Control the Binding of Water-Soluble Polypeptides and Regulate the Activity of the Manganese Complex,” D.F. Ghanotakis, G.T. Babcock, and C.F. Yocum, *Biochim. Biophys. Acta* **809**, 173–180 (1985).

74. “ENDOR Characterization of Hydrogen-Bonding to Immobilized Quinone Anion Radicals,” P.J. O'Malley, T.K. Chandrashekar, and G.T. Babcock, *Springer Series in Chemical Physics* **42**, 339–344 (1985).

75. “Resonance Raman Scattering from Horseradish Peroxidase Compound I,” W.A. Oertling and G.T. Babcock, *J. Am. Chem. Soc.* **107**, 6406–6408 (1985).

76. “On the Role of Water-Soluble Polypeptides (17, 23 kDa), Calcium and Chloride in Photosynthetic Oxygen Evolution,” D.F. Ghanotakis, G.T. Babcock, and C.F. Yocum, *FEBS Lett.* **192**, 1–3 (1985).

77. “The Influence of the Oxidation State of the Oxygen-Evolving Complex of Photosystem II on the Spin-Lattice Relaxation Time of Signal II as Determined by Electron Spin Echo Spectroscopy,” A. deGroot, J.J. Plijter, R. Evelo, G.T. Babcock, and A.J. Hoff, *Biochim. Biophys. Acta* **848**, 8–15 (1986).

78. “EPR Spectroscopy Demonstrates that Cytochrome *b*₅₅₉ Remains Low Potential in Ca²⁺-Reactivated Salt-Washed Photosystem II Particles,” D.F. Ghanotakis, C.F. Yocum, and G.T. Babcock, *Photosyn. Research* **9**, 125–134 (1986).

79. “Powder ENDOR Spectra of *p*-Benzoquinone Anion Radical: Principal Hyperfine Tensor Components for Ring Protons and for Hydrogen-Bonded Protons,” P.J. O'Malley and G.T. Babcock, *J. Am. Chem. Soc.* **108**, 3995–4001 (1986).

80. “One-Electron Oxidation of the Porphyrin Ring of Cobaltous Octaethylporphyrin (Co^{II}OEP). Absorption and Resonance Raman Spectral Characteristics of the Co^{II}OEP⁺ ClO₄ π -Cation Radical,” A. Salehi, W.A. Oertling, G.T. Bab-

cock, and C.K. Chang, *J. Am. Chem. Soc.* **108**, 5630–5631 (1986).

81. “Increase in the C=N Stretching Frequency Upon Complexation of Trans-Retinyldiene-*n*-butylamine with General Lewis Acids,” J.J. Lpez-Garriga, G.T. Babcock, and J.F. Harrison, *J. Am. Chem. Soc.* **108**, 7131–7133 (1986).

82. “Factors Influencing the C=N Stretching Frequency in Neutral and Protonated Schiff's Bases,” J.J. Lpez-Garriga, J.F. Harrison, and G.T. Babcock, *J. Am. Chem. Soc.* **108**, 7241–7251 (1986).

83. “Rehybridization of the C=N Bond upon Protonation of Methylimine Increases the C=N Stretching Force Constant,” J.J. Lpez-Garriga, S. Hanton, G.T. Babcock, and J.F. Harrison, *J. Am. Chem. Soc.* **108**, 7251–7254 (1986).

84. “ENDOR Characterization and D₂O Exchange in the Z⁺/D⁺ Radical in Photosystem II,” T.K. Chandrashekar, P.J. O'Malley, I. Rodriguez, and G.T. Babcock, *Photosyn. Research* **10**, 423–430 (1986).

85. “EPR Lineshape Simulation Program for Oriented and Partially Oriented Systems. An Application to Semiquinone Cation Radicals,” M. Brok, G.T. Babcock, A. deGroot, and A.J. Hoff, *J. Mag. Res.* **70**, 368–378 (1986).

86. “The Photosynthetic Oxygen Evolving Process,” G.T. Babcock, in *New Comprehensive Biochemistry* (Volume **15**): *Photosynthesis* (J. Ames, ed.) Elsevier-North Holland, Amsterdam, pp 125–158 (1987).

87. “Kinetics and Structure on the High Potential Side of Photosystem II,” G.T. Babcock, T.K. Chandrashekar, D.F. Ghanotakis, C.W. Hoganson, P.J. O'Malley, I.D. Rodriguez, and C.F. Yocum, *Progress in Photosynthesis Research* (J. Biggins, ed.), Martinus Nijhoff Publishers, The Hague, The Netherlands, Vol. I, pp 463–469 (1987).

88. “ENDOR Spectroscopy—A Method to Study How Proteins Alter Electron Distribution in Paramagnetic Species to Achieve Specific Function,” W. Lubitz and G.T. Babcock, *Trends in Biochem. Sciences* **12**, 96–100 (1987).

89. “Characterization of Six-Coordinate Ferryl Protoheme by Resonance Raman and Optical Absorption Spectroscopy,” R.T. Kean, W.A. Oertling, and G.T. Babcock, *J. Am. Chem. Soc.* **109**, 2185–2187 (1987).

90. “Resonance Raman Spectroscopic Detection of Demetallation of Metalloporphyrin π -Cation Radicals,” W.A. Oertling, A. Salehi, C.K. Chang, and G.T. Babcock, *J. Phys. Chem.* **91**, 3114–3116 (1987).

91. “Cytochrome *a*₃ Hemepocket Relaxation Subsequent to Ligand Photolysis from Cytochrome Oxidase,” E.W. Findsen, J.A. Centeno, G.T. Babcock, and M.R. Ondrias, *J. Am. Chem. Soc.* **109**, 5367–5372 (1987).

92. “Vibrational, Electronic and Structural Properties of Cobalt, Copper and Zinc Octaethylporphyrin π -Cation Radicals,” W.A. Oertling, A. Salehi, Y.C. Chung, G.E. Leroi, C.K. Chang, and G.T. Babcock, *J. Phys. Chem.* **91**, 5887–5898 (1987).

93. “Tyrosine Radicals are Involved in the Photosynthetic Oxygen-Evolving System,” B.A. Barry and G.T. Babcock, *Proc. Natl. Acad. Sci. USA* **84**, 7099–7103 (1987).

94. "Comparative Structural and Catalytic Properties of Oxygen-Evolving Photosystem II Preparations," D.G. Ghanotakis, C.M. Waggoner, N.R. Bowlby, D.M. Demetrios, G.T. Babcock, and C.F. Yocum, *Photosyn. Res.* **14**, 191–199 (1987).
95. "Iron Porphyrin π -Cation Radicals: Solution Resonance Spectra of $\text{OEP}^+\text{Fe}^{\text{III}}(\text{X})(\text{X}')$," A. Salehi, W.A. Oertling, G.T. Babcock, and C.K. Chang, *Inorg. Chem.* **26**, 4296–4298 (1987).
96. "Site-directed Mutagenesis Identifies a Tyrosine Radical Involved in the Photosynthetic Oxygen Evolving System," R.J. Debus, B.A. Barry, G.T. Babcock, and L. McIntosh, *Proc. Natl. Acad. Sci. USA* **85**, 427–430 (1988).
97. "Raman Scattering by Cytochrome Oxidase and by Heme *a* Model Compounds," G.T. Babcock, in *Biological Applications of Raman Spectroscopy* (T.G. Spiro, ed.) J. Wiley and Sons, New York, pp 294–346 (1988).
98. "Time-Resolved and Static Resonance Raman Spectroscopy of Horseradish Peroxidase Intermediates," W.A. Oertling and G.T. Babcock, *Biochemistry*, **27**, 3331–3338 (1988).
99. "Heterogeneity in an Isolated Membrane Protein. Has the 'Authentic' Cytochrome Oxidase Been Identified?" C.R. Hartzel, H. Beinert, G.T. Babcock, S.I. Chan, G. Palmer, and R.A. Scott, *FEBS Letts.* **236**, 1–4 (1988).
100. "Identification and Properties of an Oxoferryl Structure in Myeloperoxidase Compound II," W.A. Oertling, H. Hoogland, G.T. Babcock, and R. Wever, *Biochemistry* **27**, 5395–5400 (1988).
101. "Electron Transfer Events Near the Reaction Center in O_2 -Evolving Photosystem II Preparations," C.W. Hoganson and G.T. Babcock, *Biochemistry* **27**, 5848–5855 (1988).
102. "Characterization of the Tyrosine Radicals Involved in Chloroplast Photosystem II," B.A. Barry and G.T. Babcock, *Chimica Scripta* **28A**, 117–122 (1988).
103. "Preparations of *trans*-Octaethylchlorin- $\text{d}_2(\alpha, \beta)_1\text{-d}_2(\gamma, \delta)$, and -d_4 as well as Octaethylporphyrin- d_2 Using Acid-Catalyzed Exchange Reaction," A. Salehi, H.N. Fonda, W.A. Oertling, G.T. Babcock, and C.K. Chang, *J. Labeled Comps Radiopharm.* **25**, 1333–1337 (1988).
104. "Resonance Raman Spectra of the π -Cation Radicals of Copper, Cobalt and Nickel Methyloctaethylchlorins: Vibrational Characteristics of Chlorophyll Models," A. Salehi, W.A. Oertling, H.N. Fonda, G.T. Babcock, and C.K. Chang, *Photochemistry and Photobiology* **48**, 525–530 (1988).
105. "Directed Mutagenesis Indicates that the Donor to P_{680}^+ in Photosystem II is Tyr-161 of the D1 Polypeptide," D.J. Debus, B.A. Barry, I. Sithole, G.T. Babcock, and L. McIntosh, *Biochemistry* **27**, 9071–9074 (1988).
106. "The Functional Unit of Oxygen Evolving Activity: Implications for the Structure of Photosystem II," N.R. Bowlby, D.F. Ghanotakis, C.F. Yocum, J. Petersen, and G.T. Babcock in "Light Energy Transduction in Photosynthesis: Higher Plant and Bacterial Models" (S.E. Stevens, Jr. and D. Bryant, eds.) American Society of Plant Physiologists, Rockville, MD, pp 215–226 (1988).
107. "Photoaccumulation in Photosystem I Does Not Produce a Phylloquinone Radical," B.A. Barry, C.J. Bender, L. McIntosh, S. Ferguson-Miller, and G.T. Babcock, *Isr. J. Chem.* **28**, 129–132 (1988).
108. "Resonance Raman Vibrational Analysis of Cu^{II} , Fe^{III} and Co^{III} Porphyrin π -Cation Radicals and Their Meso-Deuterated Analogs," W.A. Oertling, A. Salehi, C.K. Chang, and G.T. Babcock, *J. Phys. Chem.* **93**, 1311–1319 (1989).
109. "Redox Cofactor Interactions in Photosystem II: The ESR Spectrum of P_{680}^+ is Broadened in the Presence of Y_Z^+ ," C.W. Hoganson and G.T. Babcock, *Biochemistry* **28**, 1448–1454 (1989).
110. "Isolation and Characterization of the 47 kDa Protein and the D_1/D_2 /Cytochrome b_{559} Complex," D.F. Ghanotakis, J. de Paula, D.M. Demetriou, N.R. Bowlby, J. Petersen, G.T. Babcock, C.F. Yocum, *Biochim. Biophys. Acta* **974** 44 (1989).
111. "ENDOR Studies of Spin Distributions in Octaethylmetalloporphyrin π -Cation Radicals," P.O. Sandusky, A. Salehi, C.K. Chang, and G.T. Babcock, *J. Am. Chem. Soc.* **111**, 6437–6439 (1989).
112. "Time-Resolved Resonance Raman Detection of $\nu(\text{Fe}-\text{O})$ in an Early Intermediate in the Reduction of Dioxygen by Cytochrome Oxidase," C. Varotsis, W.H. Woodruff and G.T. Babcock, *J. Am. Chem. Soc.* **111**, 6439–6440 (1989); **112**, 1297.
113. "An ENDOR Study of the Tyrosyl Free Radical in Ribonucleotide Reductase from *Escherichia coli*," C.J. Bender, M. Sahlin, G.T. Babcock, B.A. Barry, T.K. Chandrashekar, S.P. Salowe, J. Stubbe, B. Lindstrom, L. Petersen, A. Ehrenberg, and B.-M. Sjöberg, *J. Am. Chem. Soc.* **111**, 8076–8083 (1989).
114. "Properties of the 47 kDa Protein and the D_1 – D_2 –cyt b_{559} Complex," D.F. Ghanotakis, G.T. Babcock, and C.F. Yocum, NATO ASI Ser., Ser. A **168**, 123–126 (1989).
115. "Resonance Raman Spectrum of the Lowest Triplet State of $\text{Zn}(\text{II})$ Tetraphenylporphyrin," V.A. Walters, J.C. dePaula, Gerald T. Babcock, and G.E. Leroi, *J. Am. Chem. Soc.* **111**, 8300–8302 (1989).
116. "Water Oxidation in Photosystem II: From Radical Chemistry to Multielectron Chemistry," G.T. Babcock, B.A. Barry, R.J. Debus, C.W. Hoganson, M. Atamian, L. McIntosh, I. Sithole, and C.F. Yocum, *Biochemistry* **28**, 9557–9565 (1989).
117. "EPR Characterization of CP47 – D_1 – D_2 –Cytochrome b_{559} Complex of Photosystem II," J. Petersen, J.P. Dekker, N.R. Bowlby, D.F. Ghanotakis, C.F. Yocum, and G.T. Babcock, *Biochemistry* **29**, 3226–3231 (1990).
118. " Mn^{2+} Reduces Y_Z^+ in Manganese-Depleted Photosystem II Preparations," C.W. Hoganson, G.T. Babcock, and C.F. Yocum, *Photosyn. Res.* **22**, 285–293 (1989); **26**, 67 (1990).
119. "Structures and Organization on the Oxidizing Side of Photosystem II," G.T. Babcock, B.A. Barry, J.C.

- dePaula, M. El-Deeb, J. Petersen, R.J. Debus, I. Sithole, L. McIntosh, N.R. Bowlby, J. Dekker, and C.F. Yocum, *Prog. Photosyn. Res.* (M. Baltscheffsky, ed.), Kluwer Academic Publishers, Oordrecht, The Netherlands, Vol I, pp. 239–246 (1990).
120. “Functional Alterations of the Photosystem II Core,” L. McIntosh, I. Sithole, B. Barry, R. Debus, M. Kakefuda, N. Bowlby, and G.T. Babcock; *Prog. Photosyn. Res.* (M. Baltscheffsky, ed.), Kluwer Academic Publishers, Oordrecht, The Netherlands, Vol. III, pp. 499–507 (1990).
121. “A Simple Mixer/Jet Cell for Raman Spectroscopic Studies,” C. Varotsis, W.A. Oertling, and G.T. Babcock, *Appl. Spec.* **44**, 742–744 (1990).
122. “Factors Affecting the Iron–Oxygen Vibrations of Ferrous-Oxy and Ferryl-Oxo Heme Proteins and Model Compounds,” W.A. Oertling, R.T. Kean, R. Wever, and G.T. Babcock, *Inorg. Chem.* **29**, 2633–2645 (1990).
123. “Direct Detection of a Dioxygen Adduct of Cytochrome a_3 in the Mixed Valence Cytochrome Oxidase/Dioxygen Reaction,” C. Varotsis, W.H. Wodruff, and G.T. Babcock, *J. Biol. Chem.* **265**, 11131–11136 (1990).
124. “Appearance of the $\nu(\text{Fe}^{\text{IV}}=\text{O})$ Vibration from a Ferryl-Oxo Intermediate in the Cytochrome Oxidase/Dioxygen Reaction,” C. Varotsis and G.T. Babcock, *Biochemistry* **29**, 7357–7362 (1990).
125. “Metal–Ligand Vibrations of Cyanoferric Myeloperoxidase and Cyanoferric Horseradish Peroxidase: Evidence for a Constrained Heme Pocket in Myeloperoxidase,” J.J. Lpez-Garriga, W.A. Oertling, R.T. Kean, H. Hoogland, R. Wever, and G.T. Babcock, *Biochemistry* **29**, 9387–9395 (1990).
126. “The Heme a and a_3 Environments of Plant Cytochrome c Oxidase,” J.C. de Paula, W.E. Peiffer, R.T. Ingle, J.A. Centeno, S. Ferguson-Miller, and G.T. Babcock, *Biochemistry* **29**, 8702–8706 (1990).
127. “Tyrosine Radicals in Photosystem II and Related Model Compounds: Characterization by Isotopic Labeling and EPR Spectroscopy,” B.A. Barry, M.K. El-Deeb, P.O. Sandusky, and G.T. Babcock, *J. Biol. Chem.* **265**, 20139–20143 (1990).
128. “Cell Respiration: Catalytic Intermediates,” M. Wikstrom and G.T. Babcock; *Nature* **348**, 16–17 (1990).
129. “Normal Mode Characteristics of Chlorophyll Models. Vibrational Analysis of Methyl-magnesium-octa-ethylchlorins and Their Selectively Deuterated Analogs,” H.N. Fonda, W.A. Oertling, A. Salehi, C.K. Chang, and G.T. Babcock, *J. Am. Chem. Soc.* **112**, 9497–9507 (1990).
130. “Multinuclear ENDOR Study of Trapped Electrons in the Polycrystalline Sodide $\text{Cs}^+(\text{HMHCY})\text{Na}^-$,” A.S. Ellaboudy, C.J. Bender, J. Kim, O.-H. Shin, M.E. Kuchenmeister, G.T. Babcock, and J.L. Dye, *J. Am. Chem. Soc.* **113**, 2347–2352 (1991).
131. “Resonance Raman Spectra of Cytochrome a in Cytochrome Oxidase: Excitation in the 605 nm Absorption Region,” J.A. Centeno and G.T. Babcock, *J. Raman. Spec.* **22**, 111–117 (1991).
132. “P460 of Hydroxylamine Oxidoreductase of *Nitrosomonas Europaea*: Soret Resonance Raman Evidence for a Novel Heme-Like Structure,” K.-K. Andersson, G.T. Babcock, and A.B. Hooper, *Biochem. Biophys. Res. Comm.* **174**, 358–363 (1991).
133. “EPR and ENDOR Studies of the Metallo-Octaethylporphyrin π -Cation Radical,” P.O. Sandusky, W.A. Oertling, C.K. Chang, and G.T. Babcock, *J. Phys. Chem.* **95**, 4300–4307 (1991).
134. “Photoinhibition of Hydroxylamine-Extracted Photosystem II Membranes: Identification of the Sites of Photodamage,” D.J. Blubaugh, M. Atamian, G.T. Babcock, J.H. Golbeck, and G.M. Cheniae, *Biochemistry* **30**, 7586–7597 (1991).
135. “The Magnetic State of the a_3 Center of Cytochrome c Oxidase and Some of Its Derivatives,” Z.K. Barnes, G.T. Babcock, and J.L. Dye, *Biochemistry* **30**, 7597–7603 (1991).
136. “Denaturation and Renaturation of Myeloperoxidase: Consequences for the Nature of the Prosthetic Group,” R. Wever, W.A. Oertling, H. Hoogland, B.G.J.M. Bolscher, Y. Kim, and G.T. Babcock, *J. Biol. Chem.* **266**, 24308–24313 (1991).
137. “Structure of the Heme o Prosthetic Group from the Terminal Quinol Oxidase of *E. Coli*,” W. Wu, C.K. Chang, C. Varotsis, G.T. Babcock, A. Puustinen, and M. Wikström, *J. Am. Chem. Soc.* **114**, 1182–1188 (1992).
138. “ O_2 Activation and the Conservation of Energy in Cell Respiration,” G.T. Babcock and M. Wikström, *Nature* **356**, 301–309 (1992).
139. “EPR and ENDOR Spectroscopy of the Radical Site in Galactose Oxidase and of Thioether-Substituted Phenol Model Compounds,” G.T. Babcock, M.K. El-Deeb, P.O. Sandusky, M.M. Whittaker, and J.W. Whittaker, *J. Am. Chem. Soc.* **114**, 3727–3734 (1992).
140. “Definition of the Catalytic Sites of Cytochrome Oxidase: The Specific Ligands of Heme a and the Binuclear Metal Center,” J.P. Shapleigh, J.P. Hosler, M.M.J. Tecklenburg, Y. Kim, G.T. Babcock, R.B. Gennis, S. Ferguson-Miller, *Proc. Natl. Acad. Sci. USA* **89**, 4786–4790 (1992).
141. “Evidence from Photoinduced EPR for a Radical Intermediate during Photolysis of Cyclobutane Thymine Dimer by DNA Photolyase,” S.-T. Kim, A. Sancar, C. Essenmacher, and G.T. Babcock, *J. Am. Chem. Soc.* **114**, 4442–4443 (1992).
142. “Radiofrequency Reactance Properties of the Bruker ENDOR Cavity,” C.J. Bender and G.T. Babcock, *Rev. Sci. Instr.* **63**, 3523–3524 (1992).
143. “ O_2 Activation in Cytochrome Oxidase and in other Heme Proteins,” G.T. Babcock, C. Varotsis, and Y. Zhang, *Biochim. Biophys. Acta*, **1101**, 192–194 (1992).
144. “Normal Modes of Metallochlorins Revisited: Comparison of Force Fields and Factors Influencing the Vibrational Eigenvectors,” A.D. Procyk, Y. Kim, E. Schmidt, H.N. Fonda, C.-K. Chang, G.T. Babcock, and D.F. Bocian, *J. Am. Chem. Soc.* **114**, 6539–6549 (1992).

145. "Optical and Resonance Raman Spectroscopy of the Heme Groups of the Quinol-Oxidizing Cytochrome *aa*₃ of *Bacillus subtilis*," M. Lauraeus, M. Wikström, C. Varotsis, M.M.J. Tecklenburg, and G.T. Babcock, *Biochemistry* **31**, 10054–10060 (1992).
146. "Protein–Tyrosyl Radical Interactions in Photosystem II Studied by ESR and ENDOR Spectroscopy: Comparison with Ribonucleotide Reductase and *in vitro* Tyrosine," C.W. Hoganson and G.T. Babcock, *Biochemistry* **31**, 11874–11880 (1992).
147. "Enzyme," G.T. Babcock, *McGraw-Hill Yearbook of Science and Technology*, (S.P. Parker, ed.) McGraw-Hill, New York, pp. 127–130 (1992).
148. "Resolution of the Reaction Sequence during the Reduction of O₂ by Cytochrome Oxidase," C. Varotsis, Y. Zhang, E.H. Appelman, and G.T. Babcock, *Proc. Natl. Acad. Sci. USA* **90**, 237–241 (1993).
149. "Tryptophan Radical Formation in DNA Photolyase: Electron Spin Polarization Arising from Photoexcitation of a Doublet Ground State," C. Essenmacher, S.-T. Kim, M. Atamian, G.T. Babcock, and A. Sancar, *J. Am. Chem. Soc.* **115**, 1602–1603 (1993).
150. "Discrete Steps in Dioxygen Activation—The Cytochrome Oxidase/O₂ Reaction," G.T. Babcock and C. Varotsis, *J. Bioenerg. Biomemb* **25**, 71–80 (1993).
151. "Insight into Active-Site Structure and Function of Cytochrome Oxidase by Analysis of Site-Directed Mutants of Bacterial Cytochrome *aa*₃ and Cytochrome *bo*," J.P. Hosler, S. Ferguson-Miller, M.W. Calhoun, J.W. Thomas, J. Hill, L. Lemieux, J. Ma, C. Georgiou, J. Fetter, J. Shapleigh, M.M.J. Tecklenburg, G.T. Babcock, and R.B. Gennis, *J. Bioenerg. Biomemb* **25**, 121–136 (1993).
152. "Dioxygen Reduction by Cytochrome Oxidase: A Proton-Transfer Limited Reaction," G.T. Babcock and C. Varotsis, *SPIE* (Society of Photo-Optical Instrumentation Engineers) Vol. 1890, Biomolecular Spectroscopy (III), 104–113 (1993).
153. "The Nitrogen Atom of Substrate Methylamine is Incorporated into the Tryptophan Tryptophyl-Semiquinone Catalytic Intermediate in Methylamine Dehydrogenase," K. Warncke, H.B. Brooks, G.T. Babcock, V.L. Davidson, and J.L. McCracken, *J. Am. Chem. Soc.* **115**, 6464–6465 (1993).
154. "Time-Resolved EPR Studies with DNA Photolyase: Excited State FADH[•] Abstracts an Electron from Trp-306 to Generate FADH[•], the Catalytically Active Form of the Cofactor," S.-T. Kim, A. Sancar, C. Essenmacher, and G.T. Babcock, *Proc. Natl. Acad. Sci., USA* **90**, 8023–8027 (1993).
155. "Proteins, Radicals, Isotopes, and Mutants in Photosynthetic Oxygen Evolution," G.T. Babcock, *Proc. Natl. Acad. Sci. USA* **90**, 10893–10895 (1993).
156. "Nanosecond Time-Resolved Resonance Raman Spectroscopy," C. Varotsis and G.T. Babcock, *Methods in Enzymology, Metallobiochemistry*, Volume 226, **Part C**, (J.F. Riordan and B.L. Vallee, eds.), Academic Press, Orlando FL, 409–431 (1993).
157. "ENDOR and ESEEM Studies of Cytochrome *c* Oxidase: Evidence for Exchangeable Protons at the Cu_A Site," A.P. Hansen, D.R. Britt, M.P. Klein, C.J. Bender, and G.T. Babcock, *Biochemistry* **32**, 13718–13725 (1993).
158. "Identity of the Axial Ligand of the High Spin Heme in Cytochrome Oxidase: Spectroscopic Characterization of Mutants in the *bo*-type Oxidase of *Escherichia coli* and the *aa*₃-type Oxidase of *Rhodobacter sphaeroides*," M.W. Calhoun, J.W. Thomas, J.J. Hill, J.P. Hosler, J.P. Shapleigh, M.M.J. Tecklenburg, S. Ferguson-Miller, G.T. Babcock, J.O. Alben, and R.B. Gennis, *Biochemistry* **32**, 10905–10911 (1993).
159. "Analytical Procedures for the Quantification of Isotopic Amino Acid Incorporation into Photosynthetic Proteins of *Synechocystis* P.C.C. 6803," N.R. Bowlby, M. Espe, R. Bhatnagar, J. Wang, C. Hoganson, L. McIntosh, and G.T. Babcock, *Photosyn. Res.* **38**, 379–386 (1993).
160. "Bioinorganic Catalysis in Oxidases," G.T. Babcock in *Inorganic Reactions and Methods*, (Zuckerman, J.J. and Norman, A.D., eds.) VCH Publishing Inc., New York, Vol. 16, pp. 442–454 (1993).
161. "A Predicted Extra-Membrane Region of Subunit I of Cytochrome *c* Oxidase Interacts with both Hemes *a* and *a*₃," J.P. Hosler, J.P. Shapleigh, M.M.J. Tecklenburg, J.W. Thomas, Y. Kim, M. Espe, J. Fretter, G.T. Babcock, J.O. Alben, R.B. Gennis, and S. Ferguson-Miller, *Biochemistry* **33**, 1194–1201 (1994).
162. "Photosystem II," C.W. Hoganson and G.T. Babcock in "Metal Ions in Biological Systems, Volume 30," Metalloenzymes Involving Amino Acid-Residue and Related Radicals," H. Sigel and A. Sigel, eds., Marcel-Dekker, New York, New York, pp. 77–108 (1994).
163. "Resonance Raman Microspectroscopy in Biology," G.T. Babcock, *Biophys. J.* **67**, 5–7 (1994).
164. "Structure of the Topasemiquinone Catalytic Intermediate of Methylamine Oxidase as Revealed by Magnetic Interactions with Exchangeable ²H and ¹H Nuclei," K. Warncke, G.T. Babcock, D.M. Dooley, M.A. McGuirl, and J. McCracken, *J. Am. Chem. Soc.* **116**, 4028–4037 (1994).
165. "Structure of the Y_D Tyrosine Radical in Photosystem II as Revealed by ²H Electron Spin Echo Envelope Modulation (ESEEM) Spectroscopic Analysis of Hydrogen Hyperfine Interactions," K. Warncke, J. McCracken, and G.T. Babcock, *J. Am. Chem. Soc.* **116**, 7332–7340 (1994).
166. "Optical Spectrum of Myeloperoxidase: Origin of the Red-Shift," R. Floris, Y. Kim, G.T. Babcock, and R. Wever, *Eur. J. Biochem.* **222**, 677–685 (1994).
167. "Vibrational Characteristics of Mutant and Wild-Type Carbon-Monooxy Cytochrome *c* Oxidase: Evidence for a Linear Arrangement of Heme *a*, *a*₃, and Cu_B," J.P. Hosler, Y. Kim, J. Shapleigh, R. Gennis, J. Alben, S. Ferguson-Miller, and G.T. Babcock, *J. Am. Chem. Soc.* **116**, 5515–5516 (1994).
168. "Picosecond Time-Resolved Resonance Raman Scattering from Zinc(II) Octaethyl porphyrin," D.H. Kres-

zowski, G. Deinum, and G.T. Babcock, *J. Am. Chem. Soc.* **116**, 7463–7464 (1994).

169. “Characterization of a Tyrosyl Radical in Prostaglandin Endoperoxide Synthase-2,” L.C. Hsi, C.W. Hoganson, G.T. Babcock, and W.L. Smith, *Biochem. Biophys. Res. Comm.* **202**, 1592–1598 (1994).

170. “Oxygen Chemistry in Biology: Vibrational Spectroscopy, Stable Isotopes, and Future Applications,” G.T. Babcock, in *Proceedings of Stable Isotope Applications in Biomolecular Structure and Mechanisms* (J. Trehwilla, T.A. Cross, C.J. Unkefer, eds.), Los Alamos National Laboratory Reports, LA-12893-C, pp. 15–26 (1994).

171. “Cytochrome Oxidase,” G.T. Babcock, *Encyclopedia of Inorganic Chemistry*, Vol. 2 (ed., R.A. Scott) pp. 950–959, Wiley, New York (1994).

172. “Picosecond Time-Resolved Resonance Raman Spectroscopy of the Charge-Separated State of Mg-free Base Diporphyrins,” H. Zhang, E. Schmidt, W. Wu, C.K. Chang, and G.T. Babcock, *Chem. Phys. Letts.* **234**, 133–140 (1995).

173. “An Examination of the Source of the Tyrosyl Radical in Ovine Prostaglandin Endoperoxide Synthase-1,” L.C. Hsi, C.W. Hoganson, G.T. Babcock, R.M. Garavito, and W.L. Smith, *Biochem. Biophys. Res. Comm.* **207**, 652–660 (1995).

174. “Detecting the Transient ENDOR Response,” C.W. Hoganson and G.T. Babcock, *J. Mag. Res., Series A*, **112**, 220–224 (1995).

175. “Identification of a Non-Redox Active Metal Binding Site Near the Active Site of Cytochrome *c* Oxidase,” J.P. Hosler, M.P. Espe, Y. Zhen, G.T. Babcock, and S. Ferguson-Miller, *Biochemistry* **34**, 7586–7592 (1995).

176. “A CW- and Pulsed-EPR Characterization of the Mn^{2+} Binding Site in *Rhodobacter sphaeroides* Cytochrome *c* Oxidase,” M.P. Espe, J.P. Hosler, S. Ferguson-Miller, G.T. Babcock, and J.L. McCracken, *Biochemistry* **34**, 7593–7602 (1995).

177. “Structure of the Dithionite-Generated Tryptophan Tryptophylquinone Cofactor Radical in Methylamine Dehydrogenase Revealed by ENDOR and ESEEM Spectroscopies,” K. Warncke, H.B. Brooks, H.I. Lee, J.L. McCracken, V.L. Davidson, and G.T. Babcock, *J. Am. Chem. Soc.* **117**, 10063–10075 (1995).

178. “Spin-Density Distribution, Conformation, and Hydrogen Bonding of the Redox-Active Tyrosine Y_Z in Photosystem II from Multiple Electron Magnetic Resonance Spectroscopies: Implications for Photosynthetic Oxygen Evolution,” C. Tommos, X.-S. Tang, K. Warncke, C.W. Hoganson, S. Styring, J. McCracken, B.A. Diner, and G.T. Babcock, *J. Am. Chem. Soc.* **117**, 10325–10335 (1995).

179. “Photolytic Activity of Early Intermediates in Dioxxygen Activation and Reduction by Cytochrome Oxidase,” C.A. Varotsis and G.T. Babcock, *J. Am. Chem. Soc.* **117**, 11260–11269 (1995).

180. “Resonance Raman Spectra of the Heme Groups of Cytochrome *cbb_3* in *Rhodobacter sphaeroides*,” C. Varot-

sis, G.T. Babcock, J.A. Garcia-Horsman, R.B. Gennis, *J. Phys. Chem.* **99**, 16817–16820 (1995).

181. “Raman Detection of a Peroxy Intermediate in the Hydroquinone-Oxidizing Cytochrome *aa_3* of *Bacillus subtilis*,” C. Varotsis, G.T. Babcock, M. Lauraeus, and M. Wikström, *Biochim. Biophys. Acta* **1231**, 111–116 (1995).

182. “A Hydrogen-Atom Abstraction Model for the Function of Y_Z in Photosynthetic Oxygen Evolution,” C.W. Hoganson, N. Lydakis-Simantiris, X.-S. Tang, C. Tommos, K. Warncke, G.T. Babcock, B.A. Diner, J. McCracken, and S. Styring, *Photosyn. Res.* **46**, 177–184 (1995).

183. “Photosystem II as a Metallo-Radical Enzyme,” G.T. Babcock, in *Photosynthesis: from Light to Biosphere*, Vol. II, (P. Mathis et al., eds.) Kluwer Academic Publishers, Dordrecht, The Netherlands (1995) pp. 209–215.

184. “A Proton Relay Pathway in Cytochrome Oxidase,” J.R. Fetter, J. Shapleigh, J.W. Thomas, A. Garcia-Horsman, E. Schmidt, J. Hosler, G.T. Babcock, R.B. Gennis, and S. Ferguson-Miller, *Proc. Natl. Acad. Sci., USA* **92**, 1604–1608 (1995).

185. “A Ligand Exchange Mechanism of Proton Pumping Involving Tyrosine-422 of Subunit I of Cytochrome Oxidase is Ruled Out,” D.M. Mitchell, P. Ädelroth, J.P. Hosler, J.R. Fetter, P. Brzezinski, M.A. Pressler, R. Aasa, B.G. Malmström, J.O. Alben, G.T. Babcock, R.B. Gennis, and S. Ferguson-Miller, *Biochemistry* **35**, 824–828 (1996).

186. “Dioxxygen Activation in Enzymatic Systems and in Inorganic Models,” G.T. Babcock, R. Floris, T. Nilsson, M. Pressler, C. Varotsis, and E. Vollenbroek, *Inorg. Chimica Acta* **243**, 345–353 (1996).

187. “Electron Magnetic Resonance of the Tyrosyl Radical in Ribonucleotide Reductase from *Escherichia coli*,” C.W. Hoganson, M. Sahlin, B.-M. Sjöberg, and G.T. Babcock, *J. Am. Chem. Soc.* **118**, 4672–4679 (1996).

188. “Binding of Nitric Oxide and Carbon Monoxide to Soluble Guanylate Cyclase as Observed with Resonance Raman Spectroscopy,” G. Deinum, J.R. Stone, G.T. Babcock, and M.A. Marletta, *Biochemistry* **35**, 1540–1547 (1996).

189. “Static Conformational Distributions in the Solid State: Analysis and Application to Angular Dispersion in Side Chain Orientation in Model Tyrosine in Aqueous Glass,” K. Warncke, G.T. Babcock, J. McCracken, *J. Phys. Chem.* **100**, 4654–4661 (1996).

190. “Room-Temperature Binding of CO to Cobaltous Porphyrin π Cation Radical: Spectroscopic Characterization of Mono and Bis CO Complexes with Cobaltic Porphyrin,” E. Schmidt, H. Zhang, C.K. Chang, G.T. Babcock, and W.A. Oertling, *J. Am. Chem. Soc.* **118**, 2954–2961 (1996).

191. “Structure, Dynamics, and Energy Conversion Efficiency in Photosystem II,” B.A. Diner and G.T. Babcock, in “Advances in Photosynthesis,” Vol. 4, *Oxygenic Photosynthesis: The Light Reactions* (D. Ort and C. Yocum, eds.), Kluwer, Dordrecht, The Netherlands, pp. 213–247 (1996).

192. "Polar Residues in Helix VIII of Subunit I of Cytochrome *c* Oxidase Influence the Activity and the Structure of the Active Site," J.P. Hosler, J.P. Shapleigh, Y. Kim, M. Pressler, C. Georgiou, G.T. Babcock, J.O. Alben, S. Ferguson-Miller, and R.B. Gennis, *Biochemistry* **35**, 10776–10783 (1996).
193. "Distal Pocket Polarity in the Unusual Ligand Binding Site of Soluble Guanylate Cyclase: Implications for the Control of NO Binding," S. Kim, G. Deinum, M.T. Gardner, M.A. Marletta, and G.T. Babcock, *J. Am. Chem. Soc.* **118**, 8769–8770 (1996).
194. "Cytochrome *o*₃ Hemepocket Relaxation Subsequent to Carbon Monoxide Photolysis from Fully Reduced and Mixed-Valence Cytochrome *bo*₃ Oxidase," C. Varotsis, D.H. Kreszowski, and G.T. Babcock, *Biospectroscopy* **2**, 331–338 (1996).
195. "Identification of Histidine as an Axial Ligand to P₇₀₀⁺," M. Mac, X.-S. Tang, B.A. Diner, J. McCracken, and G.T. Babcock, *Biochemistry* **35**, 13288–13293 (1996).
196. "Vibrational Analysis of a Molecular Heme–Copper Assembly with a Nearly Linear Fe^{III}–CN–Cu^{II} Bridge: Insight into Cyanide Binding to Fully Oxidized Cytochrome *c* Oxidase," M.T. Gardner, G. Deinum, Y. Kim, G.T. Babcock, M.J. Scott, and R.H. Holm, *Inorg. Chem.* **35**, 6878–6884 (1996).
197. "Heme–Copper Terminal Oxidases," S. Ferguson-Miller and G.T. Babcock, *Chem. Rev.* **96**, 2889–2907 (1996).
198. "Potential Metal Ligands in Photosynthetic Water Oxidation Identified by Site-Directed Mutagenesis of *Synechocystis* sp. PCC 6803," N.R. Bowlby, I. Sithole, G.T. Babcock, and L. McIntosh, *Berichte der Bunsen Gesellschaft* **100**, 1978–1986 (1996).
199. "Aspartate-407 in *Rhodobacter Sphaeroides* Cytochrome *c* Oxidase is not Required for Proton Pumping or Mn Binding," J. Qian, W. Shi, M. Pressler, C. Hoganson, D. Mills, G.T. Babcock, and S. Ferguson-Miller, *Biochemistry* **36**, 2539–2543 (1997).
200. "Tyrosyl Radicals in Enzyme Catalysis: Some Properties and a Focus on Photosynthetic Water Oxidation," G.T. Babcock, M. Espe, C.W. Hoganson, N. Lydakis-Simantiris, J. McCracken, W. Shi, S. Styring, C. Tommos, and K. Warncke, *Acta Chem. Scand.* **51**, 533–540 (1997).
201. "A Quantum Chemical Study of Hydrogen Abstraction from Manganese Coordinated Water by a Tyrosyl Radical: A Model for Water Oxidation in Photosystem II," M.R.A. Blomberg, P.E.M. Siegbahn, S. Styring, G.T. Babcock, B. Åkermark, and P. Korall, *J. Am. Chem. Soc.* **119**, 8285–8292 (1997).
202. "Low-Power ps Resonance Raman Evidence for Histidine Ligation to Heme *a*₃ after Photodissociation of CO from Cytochrome Oxidase," J.P.M. Schelvis, G. Deinum, C.A. Varotsis, S. Ferguson-Miller, and G.T. Babcock, *J. Am. Chem. Soc.* **119**, 8409–8416 (1997).
203. "A Metalloradical Mechanism for the Generation of Oxygen from Water in Photosynthesis," C.W. Hoganson and G.T. Babcock, *Science* **277**, 1953–1956 (1997).
204. "Ligand Dynamics in the Binuclear Site in Cytochrome Oxidase," G.T. Babcock, G. Deinum, J. Hosler, Y. Kim, M. Pressler, D. Proshlyakov, H. Schelvis, C. Varotsis, and S. Ferguson-Miller, in *Oxygen Homeostasis and Its Dynamics*, (Y. Ishimura, H. Shimada, M. Suematsu, Eds.) Springer-Verlag, Tokyo, pp. 47–56 (1997).
205. "Determination of the Electron Spin Density on the Phenolic Oxygen of Tyrosyl Radical, Y_D[•], of Photosystem II," F. Dole, B.A. Diner, C.W. Hoganson, G.T. Babcock, and R.D. Britt, *J. Am. Chem. Soc.* **119**, 11540–11541 (1997).
206. "Electronic and Magnetic Properties of Neutral and Charged Quinone and Plastoquinone Radicals," L.A. Eriksen, F. Himo, P.E.M. Siegbahn, and G.T. Babcock, *J. Phys. Chem. A* **101**, 9496–9504 (1997).
207. "Kinetic Isotope Effects on the Reduction of the Y_Z Radical in Oxygen-Evolving and Tris-Washed Photosystem II Membranes by Time-Resolved EPR," N. Lydakis-Simantiris, D.F. Ghanotakis, and G.T. Babcock, *Biochim Biophys. Acta* **1322**, 129–140 (1997).
208. "Oxygen Production in Nature: A Light-Driven Metalloradical Enzyme Process," C. Tommos and G.T. Babcock, *Accs. Chem. Res.* **31**, 18–25 (1998).
209. "Cyanide Binding and Active Site Structure in Heme–Copper Oxidases: Normal Coordinate Analysis of Iron–Cyanide Vibrations of a₃²⁺–CN[−] Complexes of Cytochromes *ba*₃ and *aa*₃," Y. Kim, G.T. Babcock, K.K. Surens, J.A. Fee, R.B. Dyer, W.H. Woodruff, and W.A. Oertling, *Biospectroscopy* **4**, 1–15 (1998).
210. "Spectroscopic Characterization of Metal Binding by *Klebsiella aerogenes* UreE Urease Accessory Protein," G.J. Colpas, T.G. Brayman, J. McCracken, M.A. Pressler, G.T. Babcock, L.-J. Ming, C.M. Colangelo, R.A. Scott, and R.P. Hausinger, *Bioinorg. Chem.* **3**, 150–160 (1998).
211. "Manganese and Tyrosyl Radical Function in Photosynthetic Oxygen Evolution," C. Tommos, C.W. Hoganson, M. Di Valentin, N. Lydakis-Simantiris, P. Dorlet, K. Westphal, H.-A. Chu, J. McCracken, and G.T. Babcock, *Current Opinion in Chemical Biology* **2**, 244–252 (1998).
212. "Identification of Histidine 105 in the β1 Subunit of Soluble Guanylate Cyclase as the Heme Proximal Ligand," Y. Zhao, J.P.M. Schelvis, G.T. Babcock, and M.A. Marletta, *Biochemistry* **37**, 4502–4509 (1998).
213. "Kinetic and Spectroscopic Properties of the Y_Z Radical in Ca²⁺- and Cl[−]-Depleted Photosystem II Preparations," N. Lydakis-Simantiris, P. Dorlet, D.F. Ghanotakis, and G.T. Babcock, *Biochemistry* **37**, 6427–6435 (1998).
214. "From Water to Oxygen and Back Again: Mechanistic Similarities in the Enzymatic Redox Conversions between Water and Dioxygen," C.W. Hoganson, M.A. Pressler, D.A. Proshlyakov, and G.T. Babcock, *Biochim. Biophys. Acta* **1365**, 170–174 (1998).
215. "Dioxygen Activation and Bond Cleavage by Mixed-Valence Cytochrome *c* Oxidase," D.A. Proshlyakov, M.A. Pressler, and G.T. Babcock, *Proc. Natl. Acad. Sci., USA* **95**, 8020–8025 (1998).

216. "Modeling Electron Transfer in Biochemistry: A Quantum Chemical Study of Charge Separation in *Rhodobacter sphaeroides* and Photosystem II," M.R.A. Blomberg, P.E.M. Siegbahn, and G.T. Babcock, *J. Am. Chem. Soc.* **120**, 8812–8824 (1998).
217. "Stepwise Disintegration of the Photosynthetic Oxygen-Evolving Complex," C. Tommos, J. McCracken, S. Styring, and G.T. Babcock, *J. Am. Chem. Soc.* **120**, 10441–10452 (1998).
218. "Structural Changes in the Heme Proximal Pocket Induced by Nitric Oxide Binding to Soluble Guanylate Cyclase," Y. Zhao, C. Hoganson, G.T. Babcock, and M.A. Marletta, *Biochemistry* **37**, 12458–12464 (1998).
219. "An Ultra-Wide Passband 5–30 μm Filter for FTIR Studies of Photosystem II," G.J. Hawkins, R. Hunneman, M.T. Gardner, and G.T. Babcock, *Infrared Physics and Technology* **39**, 297–306 (1998).
220. "Monomeric Spin Density Distribution in the Primary Donor of Photosystem I as Determined by Electron Magnetic Resonance: Functional and Thermodynamic Implications," M. Mac, N.R. Bowlby, G.T. Babcock, and J. McCracken, *J. Am. Chem. Soc.* **120**, 13215–13223 (1998).
221. "Interaction of Y_Z with Its Environment in Acetate Treated Photosystem II Membranes and Reaction Center Cores," P. Dorlet, M. Di Valentin, G.T. Babcock, and J. McCracken, *J. Phys. Chem. B* **102**, 8239–8249 (1998).
222. "Resonance Raman Characterization of the Heme Domain of Soluble Guanylate Cyclase," J.P.M. Schelvis, Y. Zhao, M.A. Marletta, and G.T. Babcock, *Biochemistry* **37**, 16289–16297 (1998).
223. "Kenneth Sauer: A Short Personal and Scientific Biography," G.T. Babcock, *J. Phys. Chem. B* **102**, 8134–8143 (1998).
224. "The Proton Environment about Y_Z as a Function of Metal Content in Photosystem II," G.T. Babcock, M. DiValentin, P. Dorlet, C. Hoganson, J. McCracken, S. Styring, C. Tommos, and K. Westphal, in *Photosynthesis: Mechanisms and Effects* (G. Garab, ed.), Vol. II, pp. 1351–1355, Kluwer Academic Publishers, Dordrecht, The Netherlands (1998).
225. "The Origin of the Transient EPR Signals in DNA Photolyase," Y.M. Gindt, E. Vollenbroek, K. Westphal, H. Sackett, A. Sancar, and G.T. Babcock, *Biochemistry* **38**, 3857–3866 (1999).
226. "Low Frequency Fourier Transform Infrared Spectroscopy of the Oxygen-Evolving and Quinone-Acceptor Complexes in Photosystem II," H.-A. Chu, M.T. Gardner, J.P. O'Brien, and G.T. Babcock, *Biochemistry* **38**, 4533–4541 (1999).
227. "Conformational Analysis of Quinone Anion Radicals in Photosystem II and Photosynthetic Bacteria," F. Himo, G.T. Babcock, and L.A. Eriksson, *J. Phys. Chem. A* **103**, 3745–3749 (1999).
228. "Lipoic Acid Biosynthesis: LipA is an Iron-Sulfur Protein," R.W. Busby, J.P.M. Schelvis, D.S. Yu, G.T. Babcock, and M.A. Marletta, *J. Am. Chem. Soc.* **121**, 4706–4707 (1999).
229. "Structural Dynamics in the Guanylate Cyclase Heme Pocket after CO Photolysis," J.P.M. Schelvis, S. Kim, Y. Zhao, M.A. Marletta, and G.T. Babcock, *J. Am. Chem. Soc.* **121**, 7397–7400 (1999).
230. "Electron and Proton Transfer in Heme–Copper Oxidases," Y. Zhen, D.A. Mills, C.W. Hoganson, R.L. Lucas, W. Shi, G.T. Babcock, and S. Ferguson-Miller, in *Frontiers of Cellular Bioenergetics: Molecular Biology, Biochemistry, and Physiopathology* (S. Papa, F. Guerrieri, and J.M. Tager, eds.), pp. 157–178, Plenum Press, New York (1999).
231. "Tyrosyl Radical in Galactose Oxidase not Strongly Perturbed by Cysteine Cross-Link," F. Himo, G.T. Babcock, and L.A. Eriksson, *Chem. Phys. Lett.* **313**, 374–378 (1999).
232. "How Oxygen is Activated and Reduced in Respiration," G.T. Babcock, *Proc. Natl. Acad. Sci. USA* **96**, 12971–12973 (1999).
233. "The Role of Magnesium and Its Associated Water Channel in Activity and Regulation of Cytochrome Oxidase," L. Florens, C. Hoganson, J. McCracken, J. Fetter, D.A. Mills, G.T. Babcock, and S. Ferguson-Miller, in *The Phototropic Procarvates* (G. Peschek, ed.), pp. 329–339, Plenum Press, New York (1999).
234. "Spectroscopic Characterization of the Heme-Binding Sites in *Plasmodium falciparum* Histidine-Rich Protein 2," C.Y.H. Choi, J.F. Cerda, H.-A. Chu, G.T. Babcock, and M.A. Marletta, *Biochemistry* **38**, 16916–16924 (1999).
235. "Definition of the Interaction Domain for Cytochrome *c* on Cytochrome *c* Oxidase: I. Biochemical Spectral and Kinetic Characterization of Surface Mutants in Subunit II of *Rhodobacter Sphaeroides* Cytochrome *aa*₃," Y. Zhen, C.W. Hoganson, G.T. Babcock, and S. Ferguson-Miller, *J. Biol. Chem.* **274**, 38032–38041 (1999).
236. "Mechanistic Aspects of the Tyrosyl Radical–Manganese Complex in Photosynthetic Water Oxidation," C.W. Hoganson and G.T. Babcock, in *Manganese and Its Role in Biological Processes*, Vol. 37 of Metal Ions in Biological Systems (H. Sigel and A. Sigel, eds.), pp. 613–657, M. Dekker, New York, (2000).
237. "Proton and Hydrogen Atom Currents in Photosynthetic Water Oxidation," C. Tommos and G.T. Babcock, *Biochim. Biophys. Acta* **1458**, 199–219 (2000).
238. "EPR and ENDOR Spectroscopic Identification and Characterization of the Tyrosyl Radicals in Prostaglandin H Synthase-1," W. Shi, C.W. Hoganson, M. Espe, C.J. Bender, G.T. Babcock, G. Palmer, R.J. Kulmacz, and A.-L. Tsai, *Biochemistry* **39**, 4112–4121 (2000).
239. "Interaction of Soluble Guanylate Cyclase with YC-1: Kinetic and Resonance Raman Studies," J.W. Denninger, J.P.M. Schelvis, P.E. Brandish, Y. Zhao, G.T. Babcock, and M.A. Marletta, *Biochemistry* **39**, 4191–4198 (2000).
240. "Concerted Hydrogen-Atom Abstraction in Photosynthetic Water Oxidation," K.L. Westphal, C. Tommos, R.I. Cukier, and G.T. Babcock, *Curr. Opin. Plant Biol.* **3**, 236–242 (2000).

241. "Peroxidase Activity in Prostaglandin Endoperoxidase H Synthase-1 Occurs with a Neutral Histidine Proximal Heme Ligand," S.A. Seibold, J.F. Cerda, A.M. Mulichak, I. Song, R.M. Garavito, T. Arakawa, W.L. Smith, and G.T. Babcock, *Biochemistry* **39**, 6616–6624 (2000).
242. "Inhibition of Soluble Guanylate Cyclase by ODQ," Y. Zhao, P.E. Brandish, M. DiValentin, J.P.M. Schelvis, G.T. Babcock, and M.A. Marletta, *Biochemistry* **39**, 10848–10854 (2000).
243. "Light-Induced FTIR Difference Spectroscopy of the S₂-to-S₃ State Transition of the Oxygen-Evolving Complex in Photosystem II," H.-A. Chu, W. Hillier, N.A. Law, H. Sackett, S. Haymond, and G.T. Babcock, *Biochim. Biophys. Acta* **1459**, 528–532 (2000).
244. "O–O Splitting Mechanism in Cytochrome *c* Oxidase," M.R.A. Blomberg, P. Siegbahn, G.T. Babcock, and M. Wikström, *J. Inorg. Biochem.* **80**, 261–269 (2000).
245. "Oxygen Activation and Reduction in Respiration: Involvement of Redox-Active Tyrosine 244," D.A. Proshlyakov, M.A. Pressler, C. DeMaso, J.F. Leykam, D.L. DeWitt, and G.T. Babcock, *Science* **290**, 1588–1591 (2000).
246. "Identification of a Mn–O–Mn Cluster Vibrational Mode of the Oxygen-Evolving Complex in Photosystem II by Low-Frequency FTIR Spectroscopy," H.-A. Chu, H. Sackett, and G.T. Babcock, *Biochemistry* **39**, 14371–14376 (2000).
247. "Interaction of Nitric Oxide with Prostaglandin Endoperoxide H Synthase-1: Implications for Fe–His Bond Cleavage in Heme Proteins," J.P.M. Schelvis, S.A. Seibold, J.F. Cerda, R.M. Garavito, and Gerald T. Babcock, *J. Phys. Chem. B* **104**, 10844–10850 (2000).
248. "The Effects of Sr²⁺-Substitution on the Reduction Rates of Y_Z^S in PSII Membranes—Evidence for Concerted Hydrogen-Atom Transfer in Oxygen Evolution," K.L. Westphal, N. Lydakis-Simantiris, R.I. Cukier, and G.T. Babcock, *Biochemistry* **39**, 16220–16229 (2000).
249. "Modeling Cytochrome Oxidase—A Quantum Chemical Study of the O–O Bond Cleavage Mechanism," M.R.A. Blomberg, P.E.M. Siegbahn, G.T. Babcock, and M. Wikström, *J. Am. Chem. Soc.* **122**, 12848–12858 (2000).
250. "Low-Frequency Fourier Transform Infrared Spectroscopy of the Oxygen-Evolving Complex in Photosystem II," H.-A. Chu, M.T. Gardner, W. Hillier, and G.T. Babcock, *Photosyn. Res.* **66**, 57–63 (2000).
251. "Photosynthetic Reaction Centers," W. Hillier and G.T. Babcock, *Plant Physiol.* **125**, 33–37 (2001).
252. "Vibrational Spectroscopy of the Oxygen-Evolving Complex and of Manganese Model Compounds," H.-A. Chu, W. Hillier, N.A. Law, and G.T. Babcock, *Biochim. Biophys. Acta* **1503**, 69–82 (2001).
253. "S-State Dependent FTIR Difference Spectra for the Photosystem II Oxygen-Evolving Complex," W. Hillier and G.T. Babcock, *Biochemistry* **40**, 1503–1509 (2001).
254. "Resonance Raman Detection of the Fe–S Bond in Endothelial Nitric Oxide Synthase," J.P.M. Schelvis, V. Berka, G.T. Babcock, and A. Tsai, *Biochemistry* **41**, 5695–5701 (2002).