

CURRICULUM VITAE July 2022

Name: Peter Heywood

Position: Professor of Biology, Department of Molecular Biology, Cell Biology and Biochemistry,
Brown University, Providence, RI 02912, U.S.A.

ORCID iD: <https://orcid.org/0000-0002-4604-0249>

Education

1961-1964 University of London (Queen Mary College)
Awarded B.Sc. degree in Botany
Class: First Class Honors
Ancillary subjects: Zoology and Chemistry

Summer 1966 Charles University, Prague, Czechoslovakia
Graduate work under Professor B. Fott

1964-1968 University of London (Queen Mary College)
Awarded Ph.D. Degree in Botany
Thesis Title: "Studies on the Chloromonads"
Mentor: Professor M.B.E. Godward
External Examiner: Dr. J.W.G. Lund, F.R.S.

Professional Appointments

1968-1970 Postdoctoral research with Professor K.R. Porter, Harvard University
1970-1974 Assistant Professor of Microbiology, Yale Univ. School of Medicine
1974-1978 Assistant Professor of Biology, Brown University
1978-1988 Associate Professor of Biology, Brown University
1980-1981 Associate Dean of the College for Academic Affairs, Brown University
Spring 1982 Visiting Fellow, Department of Biology, Salford University, U.K.
1988-1989 Faculty Fellow, World Hunger Program, Brown University
1988-1989 Faculty Fellow, Institute for Research in Information and Scholarship
1988-present Professor of Biology, Brown University
Spring 1998 Visiting Professor of Biochemistry, University of Cape Town

Publications

Book:

Heywood, P., "The Life, Extinction, and Rebreeding of Quagga Zebras: Significance for Conservation" (230 pages) published in the Ecology, Biodiversity and Conservation Series of Cambridge University Press in Spring 2022.

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ISBN 978-1-108-92691-1 Hardback

Chapters in Books

Simmons, T., Heywood, P., Taube, S. and Hodge, L., 1974. Approaches to the study of the regulation of nuclear RNA synthesis in synchronized mammalian cells. In: "Cell Cycle Controls" (G.M. Padilla, I.L. Cameron, A. Zimmerman, Eds.) Academic Press, NY, pp. 289-308.

Heywood, P., 1980. Chloromonads. In "Phytoflagellates" (E.R. Cox, ed.) Elsevier/North Holland, NY, pp. 351-379.

Heywood, P., 1982. Raphidophyceae (Chloromonadophyceae): Introduction and Bibliography. In: "Selected Papers in Phycology" (J.R. Rosowski and B.C. Parker, eds.) Phycological Society of America (Book Division), Lawrence, Kansas, pp.719-722.

Heywood, P., 1983. The genus Vacuolaria (Raphidophyceae). In "Progress in Phycological Research", Vol. 2 (F.E. Round and D. Chapman, eds.). Elsevier Press, NY, pp. 53-86.

Heywood, P. and Leedale, G.F., 1985. Raphidomonadida. In: "Illustrated Guide to Protozoa", (J.J. Lee, S.H. Hutner and E.C. Bovee, eds.) Society of Protozoologists, Lawrence, Kansas, pp. 70-74.

Rothschild, L.J. and Heywood, P., 1987. Protistan phylogeny and chloroplast evolution: conflicts and congruence. "Progress in Protistology", Vol. 2 (D. Patterson and J. Corliss, eds.) Biopress, Bristol, U.K., pp. 1-70.

Heywood, P., 1988. Mentors in Science. In: "Innovations in College Science Teaching" edited by J.E. Penick and J.A. Dunkhase. Published by Society for College Science Teachers, pp. 70-76.

Heywood, P., 1989. Term papers and class presentations enhance critical thinking in biology. In: "Enhancing Critical Thinking in the Sciences " edited by L.W. Crow. Published by the Society for College Science Teachers, page 97.

Heywood, P., 1989 Some affinities of the Raphidophyceae with other chromophyte algae. The Systematics Association of the U.K. in "The Chromophyte Algae: Problems and Perspectives", pages 277-291, (ed. J.C. Green, B.S.C. Leadbetter and W.L. Diver.)

Heywood, P., 1990. Raphidophyceae In: "Handbook of Protoctists: (L. Margulis, J.O. Corliss, M. Melkonian and D.J. Chapman, eds.) Jones and Bartlett Publishers, Boston, MA, pages 318-325.

Crossgrove, W., Egilman, D., Heywood, P., Kasperson, J., Messer, E., and Wessen, A., 1990. Colonialism, International Trade, and the Nation-state. In "Hunger in History. Food shortage, poverty and deprivation", (L.F. Newman, W. Crossgrove, R. W. Kates, R. Matthews, and S. Millman, eds.) Blackwell, Cambridge, MA, pp 215-240.

Heywood, P. and Leedale, G.F. 2000. Order Raphidomonadida. In "An Illustrated Guide to the Protozoa", (J.J. Lee, G.F. Leedale, and P. Bradbury, eds.) Society of Protozoologists, Lawrence, KS, pp 744-751.

Refereed Journal Articles

Protistology

Heywood, P., 1972. Structure and origin of flagellar hairs in Vacuolaria virescens. J. Ultrastruct. Res. 39:608-623.

Heywood, P. and Godward, M.B.E., 1972. Centromeric organization in the chloromonadophycean alga Vacuolaria virescens. Chromosoma (Berl.) 39:333-339.

Heywood, P., 1973. Nutritional studies on the Chloromonadophyceae: Vacuolaria virescens and Gonyostomum semen. J. Phycol. 9:156-159.

Heywood, P., 1973. Intracisternal microtubules and flagellar hairs of Gonyostomum semen (Ehrenb.) Diesing. Br. Phycol. J. 8:43-46

Heywood, P. and Godward, M.B.E., 1973. Chromosome number and morphology in Vacuolaria virescens (Chloromonadophyceae). Ann. Bot. 37:423-425.

Heywood, P., 1974. Occurrence of microbodies in chloromonadophycean algae. Arch. Microbiol. 99:265-269.

Heywood, P. and Godward, M.B.E., 1974. Mitosis in the alga Vacuolaria virescens. Am. J. Bot. 61:331-338.

Heywood, P., 1974. Mitosis and cytokinesis in the chloromonadophycean alga. Gonyostomum semen. J. Phycol. 10:355-358.

Heywood, P., Weinman, D. and Lipman, M., 1974. Fine Structure of Trypanosoma cyclops in noncellular cultures. J. Protozool. 21:232-238.

Heywood, P., 1976. Algal sexuality. Nature 259:425.

Heywood, P. and Magee, P., 1976. Meiosis in Protists. Some structural and physiological aspects of meiosis in algae, fungi, and protozoa. Bacteriol. Rev. 40:190-240.

Heywood, P., 1976. Ultrastructural characterization of the interphase nucleus of Gonyostomum semen. Cytobios 17:79-86.

Heywood, P., 1977. Chloroplast structure in the chloromonadophycean alga Vacuolaria virescens. J. Phycol. 13:68-72.

Heywood, P., 1977. Evidence from serial sections that some cells contain large numbers of mitochondria. J. Cell Sci. 26:1-8.

Heywood, P., 1978. Intracellular bacteria in Gonyostomum semen (Chloromonadophyceae). J. Phycol. 14:121-122.

Heywood, P., 1978. Ultrastructure of mitosis in the chloromonadophycean alga Vacuolaria virescens. J. Cell Sci. 31:37-51.

Heywood, P., 1978. Osmoregulation in the alga Vacuolaria virescens. Structure of the contractile vacuole and the nature of its association with the Golgi apparatus. J. Cell Sci. 31:213-224.

Heywood, P. and Weinman, D., 1978. Mitosis in the hemoflagellate Trypanosoma cyclops. J. Protozool. 25:287-292.

Coleman, A. and Heywood, P., 1981. Structure of the chloroplast and its DNA in chloromonadophycean algae. J. Cell Sci. 49:401-409.

Tieszen, K., Heywood, P. and Molyneux, D.H., 1983. Ultrastructure and host parasite association of Blastocrithidia gerridis in the ventriculus of Gerris odontogaster (Gerridae: Hemiptera). Can. J. Zool. 61:1900-1909.

Molyneux, D.H. and Heywood, P., 1984. Evidence for the incorporation of virus-like particles into trypanosomatidae. Zeit. Parasitenkunde 70:553-556.

Heywood, P. and Molyneux, D.H., 1985. Ultrastructure of the fibrous matrix surrounding cells of Trypanosoma melophagium in the hindgut of the sheep ked, Melophagus ovinus. Cytobios 44:183-188.

Heywood, P. and Rothschild, L.J., 1987. Reconciliation of evolution and nomenclature among the higher taxa of protists. *Biological Journal of the Linnaean Society* 30:91-98.

Rothschild, L.J. and Heywood, P., 1988. "Protistan" nomenclature: analysis and refutation of some potential objections. *BioSystems* 21:197-202.

Heywood, P., 1988. Ultrastructure of *Chilomonas paramecium* and the phylogeny of the cryptoprotists. *BioSystems* 21:293-298.

Otology

Hilding, D. and Heywood, P., 1971. Ultrastructure of middle ear mucosa and organization of ciliary matrix. *Ann. Otol.* 80:306-312.

Heywood, P., Pujol, R. and Hilding, D., 1973. Early synapse formation in vestibular system of fetal guinea pig. *Brain Res.* 51:337-339.

Van De Water, T., Heywood, P. and Ruben, R., 1973. Development of sensory structures in organ cultures of the 12th and 13th gestation day mouse embryo inner ears. *Ann. Otol.* 82 Suppl. 4:1-18.

Heywood, P., Van De Water, T., Hilding, D. and Ruben, R., 1975. Distribution of microtubules and microfilaments in developing vestibular sensory epithelium of mouse otocysts grown in vitro. *J. Cell Sci.* 17: 171-189.

Heywood, P., Pujol, R. and Hilding, D., 1976. Development of labyrinthine receptors in the guinea pig, cat, and dog. *Acta Otolaryngol.* 82:359-367.

Van De Water, T. and Heywood, P., 1976. The in vitro development of innervated sensory hair cells of a mammal. *Acta Otolaryngol.* 82:337-342.

Heywood, P., 2015. Metal Casts showing the Three-dimensional Structure of the Human Inner Ear were converted into Jewelry. *Otology and Neurotology*, 36.5: 936-940.

Quaggas

Heywood, P., 2013. The quagga and science: what does the future hold for this extinct zebra? *Perspectives in biology and medicine*, 56(1): 53-64.

Heywood, P., 2015. The micro-politics of macromolecules in the taxonomy and restoration of quaggas. *Kronos* 41.1: 314-337.

Heywood, P., 2020. "Ways of seeing nonhuman animals. Some likened zebras to horses, others to asses." Published electronically in October 2020 in the journal *Society and Animals*, 17 pages DOI: <https://doi.org/10.1163/15685306-BJA10027>

Heywood, P. 2020 "Sexual dimorphism of body size in taxidermy specimens of *Equus quagga quagga* Boddaert (Equidae)." *Journal of Natural History* Volume 53, pages 2757-2761.

Heywood, P., and Dietrich, K.H. 2021. "A Quagga Photographed in Africa." *Spixiana* 44(2): 209-211.

Mammalian cells *in vitro*

Simmons, T., Heywood, P. and Hodge, L., 1973. Nuclear envelope-associated resumption of RNA synthesis in late mitosis of HeLa cells. *J. Cell Biol.* 59:150-164.

Simmons, T., Heywood, P. and Hodge, L., 1974. Intranuclear site of replication of adenovirus DNA. *J. Mol. Biol.* 89:423-433.

Hodge, L., Mancini, P., Davis, F. and Heywood, P., 1977. Nuclear matrix of HeLa S3 cells. Polypeptide composition during adenovirus infection and in phases of the cell cycle. *J. Cell Biol.* 72:194-208.

Techniques

Heywood, P., Hodge, L., Davis, F. and Simmons, T., 1977. A simple method for holding electron microscope grids during autoradiography. *J. Microscopy* 110:167-169.

Heywood, P. and Resnick, S., 1981. Application of the thiocarbohydrazide-osmium coating technique to scanning electron microscopy of the inner ear. *Acta Otolaryngol.* 91:183-187.

Pedagogy

Heywood, P. and Yankelovich, N., 1987. Focusing on cell biology using Intermedia. *Proceedings of the 1987 IBM ACIS University Conference*, pp. 380-388.

Heywood, P., 1987., The Science Mentor Program in Undergraduate Science Courses. *J. College Science Teaching* 17:212-214, 242.

Biography

Heywood, P., 2016. "Academic racism" and the neglected scholarship of the anatomist M. Wharton Young MD, PhD (1904-1986). *Journal of Medical Biography*, 26(1): 22-29.

Miscellaneous

Rothschild, L.J., Ragan, M.A., Coleman, A.W., Heywood, P., Gerbi, S.A., 1986. Are rRNA sequence comparisons the Rosetta stone of phylogenetics? *Cell* 47:640.

Heywood, P., 1987., Structure, function and terminology of microtubule- and microfilament-containing structures. *Cell Biology International Reports*, 11:837-847.

Messer, E., and Heywood, P., 1990. Trying Technology. Neither sure nor soon. *Food Policy* 15:336-345.

In multi-authored papers all the authors contributed more or less equally to the research and publication.

Collaborators who were not Brown University faculty include:

Maud Godward	My Ph.D. mentor.
David Hilding	Faculty colleague at Yale (Pujol was his visiting fellow).
Lon Hodge	Faculty colleague at Yale (Davis, Mancini Simmons and Taube were members of his laboratory group).
Gordon Leedale	Protistologist at Leeds University, U.K.
Peter T. Magee	Faculty colleague at Yale.
David Molyneux	Faculty member at University of Salford, U.K., in whose laboratory I spent my 1982 sabbatical (Tieszen was his graduate student).
Mark Ragan	Researcher at Atlantic Research Laboratory, Nova Scotia.
Steven Resnick	Brown undergraduate.
David Ruben	Faculty member at Yeshiva University.
Tom Van De Water	Faculty member at Yeshiva University.
Nicole Yankelovich	Institute for Research in Information and Scholarship.
Kevin Dietrich	Professor at Stellenbosch University, South Africa.

Electron micrographs published in:

“Microbiology Fundamentals and Applications” by R. M. Atlas 1984 (Macmillan Publishing Company)

“Algae” by L. Graham and Wilcox, 1999 (Prentice Hall Publishing Company)

Photographs published in: “Environment, Power, and Injustice: A South African History”. By Nancy Jacobs, 2003 (Cambridge University Press).

Summary of Research Interests

I have long-standing interests in the protists which has led to my publishing a review of meiosis and papers on the structure, function, phylogeny, and nomenclature of the protists. My graduate research centered on the Raphidophyceae, a class of unicellular algae which had previously been neglected in laboratory studies. I isolated Gonyostomum semen from a natural population and developed a defined medium for culturing it and Vacuolaria virescens. I devised a synchronization technique for G. semen and V. virescens and this provided dividing cells from which I described mitosis and cytokinesis. My ultrastructural studies on G. semen and V. virescens at Brown include descriptions of mitosis, chloroplasts, mitochondria, the flagellar roots and cytoskeleton, and the functioning of the contractile vacuole.

Mitosis, ciliary structure and cytoskeleton have been the focus of my interests in other protists for example, Trypanosoma cyclops, Trypanosoma melophagium, Blastocrithidia gerridis, and Chilomonas paramecium.

I have also published papers on the structure and development of the inner ear; nuclear structure and sites of nucleic acid synthesis in HeLa cells, cell biology techniques, pedagogy, animal studies, and biography.

My current scholarship focuses on the biology and environmental history of quaggas, a subspecies of plains zebra, *Equus quagga*. I have published six papers on this subject, and my book, "The Life, Extinction, and Breeding of Quagga Zebras: Significance for Conservation" (230 pages) was published by Cambridge University Press in Spring 2022.

Service to Brown University

I have served on many faculty committees, most recently the Faculty Committee on Equity and Diversity and the Faculty Executive Committee.

My most influential service was in changing the academic calendar. This followed from my writing a position paper analyzing the academic calendar of Brown University and suggesting principles that could be used to change it so that the first semester could finish before Christmas without any significant loss of instructional time. Two previous attempts at calendar reform had been defeated, but in May 1981 President Swearer asked me to formulate concrete proposals for a new academic calendar. In carrying out this charge I consulted widely with different constituencies on campus and stressed throughout that academic issues had to be paramount in determining the new calendar. In November 1981, my proposal for calendar change was overwhelmingly approved by the faculty. The new calendar maintains academic momentum in the first semester, and creates a five-week long winter break which can be used for a combination of personal interests, faculty research, student learning off-campus, administrative planning, etc.

In 1980-1981 while working as an Associate Dean for Academic Affairs, I reorganized the system for scholarship applications such as Marshall and Rhodes Scholarships including: early identification of outstanding students, assistance in helping students prepare their scholarship applications, "mock" interviews so that applicants had experience in answering difficult questions in stressful situations, and debriefing of finalists so that their experiences could be shared with future applicants. This intensive approach was

immediately tested by the Selection Committee for Harry S. Truman Fellowships (which I chaired) and for the first time in many years a Brown student was chosen for this Fellowship.

Within Biomed my most influential service was as Chair of the Plant Biology Committee from 1979-1988. As Chair of the Plant Biology Committee, I worked closely with the horticulturists and the faculty users of the greenhouses to transform the greenhouses into a modern research facility which was used to full capacity. I was also involved in the selection and supervision of the horticulturists, the development of teaching facilities, and the formulation of greenhouse user policies. I organized monthly meetings that brought together faculty, graduate students, and postdocs to discuss our research, journal articles and course offerings in plant biology.

Committee Service to Brown University

1974-1995	Plant Biology Committee (Chairman, 1979-1988)
1974-75	Biomed Year-Round Operation Committee
1974-76	Electron Microscope Facility Committee
1975-80	Board of Editors "Signs and Symptoms"
1975-80	Biomed Representative to Bookstore Liaison
1975-80	Editorial Advisor to "Signs and Symptoms"
1975-89	Pre-Medical Advisory Committee
1976-79	Biomed Library Committee
1976-79	University Library Committee
1976-81	Resource Center Advisory Board
1977	Biomed Undergraduate Curriculum Evaluation Committee
1977, 1978	Admissions Committee, Graduate Program in Molecular & Cell Biology
1978	Search Committee for Assistant Dean of the College
1978-79	EPC Subcommittee on Quality of Course Distribution (Chairman)
1978-79	Search Committee for Plant Physiologist
1979-80	Search Committee for Population Biologist
1979-80	Undergraduate Curriculum Committee (Chairman)
1979-81	Advisory Committee on Foreign Students and Faculty
1979-81	Committee on Nominations
1979-81	Faculty Committee on Student Support Program
1979-88	Biomed Executive Committee
1980-81	Educational Policy Committee
1980-81	Committee on Academic Standing (Co-chairman)
1980-81	Ad-Hoc Committee to Review the 1975 Agreements
1980-81	Sophomore Action Group
1980-81	Selection Committee for Harry S. Truman Fellowship (Chairman)

1980-81 Screening Committee for Marshall Scholarships
 1980-81 Screening Committee for Arnold, Baker, and Emery Fellowships
 1980-81 Scholarship Advisory Committee (Chairman)
 1980-81 Internship Review Committee (staff representative)
 1980-81 Resumed Undergraduate Education Admission Committee
 1980-82 Faculty Committee on Academic Advising (Chairman)
 1980-82 EPC Subcommittee on Independent Concentrations (Chairman, 1981 Sem. II)
 1980-82 Committee on Environmental Responsibility
 1981 Proposed new academic calendar
 1981-82 Scholarship Advisory Committee
 1981-87 Francis Wayland Collegium for Liberal Learning (1981-84, Board of Fellows; 1983, Advisory Committee on Grants; 1984-87, Executive Committee)
 1982-2002 Faculty Committee on Rhodes and Marshall Scholarships
 1982-83 Search Committee for Vertebrate Morphologist
 1982-85 Divisional United Way Representative
 1982-85 Committee on Science and Technology in the Liberal Arts (Chairman)
 1982-96 Department library representative
 1983 Search Committee, Assoc. Dean for Curricular Affairs (Chairman)
 1983 Selection Committee for Women Peer Counselors
 1983-84 Search Committee for Ecologist
 1983-86 Resource Center Advisory Board
 1983-86 Faculty Supervisory Committee for Programs of Foreign Study
 1984-85 Search Committee for Horticulturist (Chairman)
 1984 Affirmative Action Monitoring Committee
 1984, 1986 Selection Committee for Henry Merritt Wriston Fellowships and Grants
 1984, 1986 Committee on Special Undergraduate Assistantships
 1984-86 Council on Teaching
 1984-86 Program Director of the Science Mentor Program
 1985-86 Keep Brown Beautiful Board of Trustees
 1985-86 Search Committee for Assistant Horticulturist (Chairman)
 1985 Search Committee for Director of the Third World Center
 1985 Search Committee for Pembroke Campus Coordinator
 1985 Search Committee for Pembroke Faculty Fellows
 1985-88 Greenhouse Advisory Committee (Chairman)
 1986-87 Search Committee for Physiologist
 1986-87 Director of Electron Microscope Facility
 1986-87 MCB Graduate Program Seminar and Colloquium Committee
 1986-87 Sexual Harassment Prevention Resource Person

1986-88 Committee on Prizes and Premiums

1986-88 Brown Institute for Secondary Education Program Committee

1986-94 Tougaloo Student Exchange Committee

1987-88 MCB Graduate Program Curriculum Committee

1987-88 Committee to Review Counseling and Advising (Chairman)

1988 Search Committee for Assistant Dean of the College.

1988-89 Biomed contact person for New England Consortium for Undergraduate Science Education

1988-93 Advisory Committee for Starr Fellowships

1988-94 Board of Religious Affairs (Chair from 1991-1994)

1988-96 World Hunger Awards Coordinating Committee

1988-2000 Speaker for Admission Office in California, Colorado, Illinois, Missouri, Ohio, Ontario, and Pennsylvania

1998-2002 MCB Department Safety Committee

1989-90 Council for Residential Student Counseling Programs

1989-94 Howard Hughes Grant Executive Committee

1990-94 Sexual Harassment Prevention Resource Person

1990-99 Speaker for Alumni Relations in Arizona, Connecticut and New York

1990-2005 Selection Committee for Brown Study Abroad Programs in the United Kingdom

1991-92 Committee on Prizes and Premiums

1991-93 Academic Awards Committee

1991-94 Biomed Curriculum Committee

1991-94 Executive Committee of the Center for Environmental Studies

1991-94 Board of Environmental Studies

1991-95 Agenda Committee of the Biomed General Assembly

1992 Howard Hughes Preceptorship Selection Committee

1992-96 Faculty Campaign Committee

1992-96 Summer Studies Advisory Committee (Chairman, 1995-96)

1994 Search Committee for Director of Institute for Secondary Education

1995 Academic Awards Committee

1995-97 Campus Planning Committee (Chairman, 1995-96)

1995-97 Faculty Mentor for the Sheridan Center for Teaching and Learning

1995-98 MCB Faculty Liaison to the Sheridan Center for Teaching and Learning

1996-97 Program Director for Brown Study Abroad Programs in the United Kingdom

1997 Teaching Awards Committee

1998-01 Committee on Prizes and Premiums

1999 Committee on Electronically Mediated instruction

1999 Search Committee for Vice President for Campus Life and Student Services

1999-2013 Advisory Board of the Sheridan Center for Teaching and Learning
 2000 Campus Advisory Committee on the Presidential Search
 2000 Architectural Evaluation Committee, Life Sciences Building
 2001 Faculty Scholars Selection Committee
 2001-2013 Faculty Liaison for MCB Biology to the Sheridan Center for Teaching and Learning
 2000-03 Committee on Nominations
 2002-10 Watson Institute Faculty Associate
 2004-05 Chief of Police Search Committee
 2004-2005 Brown Police Arming Oversight Committee
 2006-2008 Grievance Committee (Chair)
 2009-2012 Committee on Faculty Equity and Diversity
 2015-2017 Faculty Executive Committee
 2016-2020 Public Safety Oversight Committee
 2019-2022 University Grievance Committee
 2018-2019 Chair of the MCB Department Promotions Committee for the promotion of Richard Freiman to Full Professor
 2020-present MCB Curriculum Committee
 2020-present MCB Space Committee

Service to the Profession

Reviewed research proposals for the National Science Foundation.

Reviewed manuscripts for Science, J. Phycology, J. Microscopy, Cancer Research, J. of College Science Teaching, J. of Experimental Zoology, J. Cell Biology, Phycological Research.

Reviewed books for Plant Science Bulletin.

1966-69 Foreign Language Editor of "Studies in Phycology" (B. Fott, ed.; Publishing House of Czechoslovak Academy of Sciences).
 1973 Reader of Doctoral Dissertation: Dr. H. Roy (University of Ranchi, India).
 1975 Reader of Doctoral Dissertation: Dr. R. Keswani (University of Ranchi, India).
 1977 Reader of Doctoral Dissertation: Dr. A. Fulton (Brown University).
 1977-80 Member, Editorial Board of Plant Science Bulletin.
 1980 Reader of Doctoral Dissertation: Dr. A. Abbott (Brown University).
 1980 Nominating Committee, Phycological Section, Botanical Society of America.
 1982 Organized the Rhode Island Botanists Conference at Brown University.
 1983 Co-convenor, 22nd Northeast Algal Symposium.
 1983-85 Taught College Success Skills in Brown Learning Community.
 1984-87 Executive Committee, Northeast Algal Symposium.

- 1985 Reader of Doctoral Dissertation: Dr. L. Rothschild (Brown University).
- 1985-87 Taught in Rhode Island-Brown Science Collaborative Seminar.
- 1986-89 Editorial Review Board of Journal of College Science Teaching.
- 1986 Chaired a session at the Psychological Society of America Annual Meeting.
- 1986 Chaired a session at the Society of Protozoologists Annual Meeting.
- 1986 Taught at The Brown Biology Summer Institute.
- 1986-88 Judge at the Wheeler School Science Fair.
- 1987 Reader of Doctoral Dissertation: Dr. L. Spear-Bernstein (Brown University).
- 1988 Evaluator of Smith College for the New England Association of Schools and Colleges
- 1987-89 Member of Editorial Advisory Board of Scott, Foresman Little, Brown College Division.
- 1988 Nominating Committee, Northeast Algal Symposium.
- 1988-96 Member of the Advisory Board for BioQUEST (an Annenberg/CPB-funded Consortium for Quality Undergraduate Educational Simulations and Tools in Biology).
- 1988-94 Nominations Committee for Alan Shawn Feinstein Award.
- 1989-94 Co-Director of "Bookshelves in Biology" funded by N.S.F.
- 1990 Member of N.S.F. Grant review panel.
- 1990 Evaluator of Philips Academy for the New England Association of Schools and Colleges
- 1990-94 Associate of the Northeastern University Center for the Advancement of Science Education.
- 1991 Search Committee Member, Rhode Island Office of Higher Education.
- 1992-93 Advisory Committee for the Higher Education Component of the Rhode Island Statewide Systemic Initiative in Mathematics and Science.
- 1992-94 Speaker to community groups through Options Program.
- 1994-98 Co-Director of "Zooscope: focus on middle school science teaching" funded by N.S.F.
- 1995 Member of N.S.F. Grant Review Panel for Instructional Materials Development Program.
- 1995 Reader of Doctoral Dissertation: Dr. A. Nerozzi (Brown University).
- 1995-2001 Member of Content Advisory Team for a new education center at the Roger Williams Park Zoo.
- 1997 Speaker at Wheeler School and Burrillville Middle School.
- 1997 Speaker at Model United Nations held at Brown University.
- 1999 Member of N.S.F. Grant Review panel for Instructional Materials Development.
- 2000 Member of N.S.F. Grant Review Panel for Teacher Enhancement.
- 2000-03 Member of the Local Arrangements Committee for the March 2003 Annual Conference of the American Society for Environmental History.

Academic honors

- 1961-64 Awarded State Scholarship by Ministry of Education, England.
- 1964 Received First Class Honors degree in Botany, University of London.
- 1964-67 Awarded Research Studentship by Science Research Council, England.
- 1968-70 Awarded Maria Moors Cabot Research Fellowship in Botany, Harvard University.

- 1976 Awarded a Henry Merritt Wriston Grant.
- 1978 Received Senior Class Citation, Brown University
(This award is usually presented to two faculty or administrators annually "for outstanding support, guidance and teaching").
- 1978 Invited speaker at the Phycological Society of America Annual Meeting.
- 1979 Appointed Danforth Associate.
- 1979 Awarded A.M. ad eundum, Brown University.
- 1980 Received Senior Class Citation.
- 1981-84 Appointed Fellow of the Wayland Collegium for Liberal Learning.
- 1982 Received Senior Class Citation.
- 1984-87 Appointed to Executive Committee of the Wayland Collegium for Liberal Learning.
- 1986 Chaired sessions at The Society of Protozoologists and Phycological Society of America Annual Meetings.
- 1987 Selected as one of ten National Science Teacher Association delegates to the NSTA-ASE Conference on Science Education.
Received NSTA-Ohaus award for innovations in College Science Teaching (one of two people nationwide to share the top award in the undergraduate college division)
Elected a Fellow of the Linnean Society of London.
Selected as Evaluator for the New England Association of Schools and Colleges.
Honorable mention in the Hawkhill Awards Competition for ideas on new ways of teaching science/technology/society using audiovisual media. (One of six prizewinners nationwide).
Received Hazeltine Award from graduating class at Brown.
- 1995 Received Hazeltine Award from graduating class at Brown.
- 1996 Received Elizabeth Leduc Award for Teaching Excellence in the Life Sciences.
- 1998 Received Harriet W. Sheridan Award for Distinguished Contribution to Teaching and Learning.
- 2007, 2008 Received Dean's Teaching Excellence Award from the Brown Medical School.
- 2008 Awarded a Pembroke Center Faculty Research Fellowship to participate in the Pembroke Seminar in 2008-09.
- 2017 Elected a Fellow of the Royal Society of Biology.
- 2020 Recipient of the President's Award for Excellence in Faculty Governance at Brown University.

Teaching

I have taught in a variety of courses ranging from introductory biology, plant biology and developmental biology to advanced courses in cell biology. I include writing assignments in most of my courses to teach students to communicate critically and clearly. I meet frequently with students to discuss academic difficulties and challenges.

I have taught several cell biology courses, for example, BIOL 0500, BIOL 1050 and BIOL 1060, "Cell Biology and Biotechnology." I also taught the latter to graduate-level employees at Pfizer; the course relied

heavily on critical analysis of original papers and familiarity with research techniques. From 2007-2017, I taught cell biology to first year medical students in IMS-1.

In 1985 my cell biology course was one of two courses chosen by the Institute for Research in Information and Scholarship at Brown for its Educational Software Project sponsored by the Annenberg/Corporation for Public Broadcasting Project and IBM. I helped develop the software so that the course could be taught using Intermedia, a hypermedia system which enabled students to make their own scholarly connections in a matrix of information consisting of text, light and electron micrographs, diagrams, and three-dimensional models.

In 1990, I designed BIOL 0160, "Plants, Food and People" which I teach most years. The course details the basic biology of food plants and the agricultural systems that are used to grow them. In 2014, I designed a First-Year Seminar, "The Lives of Plants" (BIOL 0109U), that is taught each fall and that focuses on development, structure, and function.

In 1984 my interests in science teaching and in collaborative learning led me to obtain a grant from the Association of American Colleges to initiate the Science Mentor Program. This experimental program sought to address the needs of three overlapping categories of students: those with restricted backgrounds in science, those who were apprehensive about science courses, and those who wished to discuss science and technology in a small group. These students participated in an extra weekly session led by a science mentor of an existing introductory science course. Science mentors organized activities that supplemented those in the course, for example, additional laboratory sessions and demonstrations, field trips, review sessions, and discussions of some of the broader issues raised by the scientific discipline, etc.

My work with the Science Mentor Program won one of the two 1987 National Science Teacher Association-Ohaus award for innovations in College Science Teaching. At Brown, my teaching has been recognized by receiving the Elizabeth Leduc Award for Teaching Excellence in the Life Sciences, and the Harriet W. Sheridan Award for Distinguished Contribution to Teaching and Learning.

Courses taught

Biomed 1	Introduction to Biology (1974-76)
Biomed 5	Dynamics of Living Systems (1983-85)
Biomed 51	Plant Organism (1974-76)
Biomed 82	Histology (1974-80)
Biomed 96	Independent Study in Science Writing (1994-95)
Biomed 105	Eukaryotic Cell Biology (1986-87), (1989-90), (1996-97)
Biomed 106	Cell Biology and Biotechnology (1976-80, 1982-1997, 1999-2005, 2007S)
Biomed 106 S01	Cell Biology (at Pfizer) in 1997, 2001, 2005, 2009
Biomed 109	Cell Biology (1981)
Biomed 195/196	Independent Study (1976-82, 1985-86, 1987-88; 1993-95)
BIOL 0160	Plants, Food and People (1990-present)

BIOL 0190U	The Lives of Plants (2014-present)
BIOL 0310	Introduction to Developmental Biology (2006-2012)
BIOL 0500	Cell and Molecular Biology (2008-2021)
GISPs	2003, 2005, 2007, 2008
IMS-1	Integrated Medical Science (2007-2017)
Modes of Thought 16	Plants and Civilization (1979-80)
STT 39	Studies in World Interdependence (1981-85)
UC 106	The Biological Revolution in the Developing World (1989-90)
WA 191, 192	Wayland Seminar "World Agriculture" (1985-86)

Guest lectures in: Biomed 1, 6, 11, 12, 32, 33, 44, 80, 81, 111, 132, 189, 216
 Environmental Studies 11
 IMS 374
 UC 100

Supervision of internships, independent concentrations, and theses:

Internship of Laura Ward (1979-80)
 Internship of Bonnie Shope (1990-91)
 Co-Sponsor of John Jewett, Independent Concentration "Community Development and the Human Environment" (1981)
 Co-Sponsor of Susan Katz, Independent Concentration "The Communication of Scientific ideas" (1983)
 Co-Sponsor of Ricardo Bayon, Independent Concentration "The Ecological Applications of Science and Technology in Development" (1989)
 Co-sponsor of Sarah Jay, Independent Concentration "Science Writing" (1990)
 Co-sponsor of Stephanie Cooper, Independent Concentration "Literature and the Environment" (1992)
 Co-sponsor of Amy Lieberman, Independent Concentration "The Science and Culture of Sustainable Living" (2001)
 Co-sponsor of Emma Buck, Independent Concentration "Gastroanthropology" (2011)
 Co-sponsor of Christina Skonberg, Independent Concentration "Food Policy and Agricultural Sciences" (2012)
 Thesis of Penel Houghton (1993)
 Honors Thesis of Jeffrey Brown (1976-77)
 Honors Thesis of Catherine McKegney (1976-77)
 Honors Thesis of Steven Resnick (1977-78)
 Honors Thesis of Ben Williams (1980-81)
 Honors Thesis of Mark Rast (1981-82)
 Honors Thesis of Ricardo Bayon (1988-89)
 Honors Thesis of Cheryl Cho (1989-90)

M.A. Thesis of Roch Nakajima (1991-92)
 Honors Thesis of Joshua Kanner (1993-94)
 Honors Thesis of Frans Johanson (1994-95)
 Honors Thesis of Dorian Solot (1994-95)
 Honors Thesis of Scott Maslansky (1995)
 Honors Thesis of Zandra Kambysellis (2001)
 Honors Thesis of Daizaburo Shizuka (2001)
 Honors Thesis of Alissa Detz (2002)
 Honors Thesis of Courtney Stewart (2002)

Summary of Academic Advising Activities

I have been active in academic advising – which I view as an integral part of teaching - throughout my time at Brown. Most of the advising roles are well known but two require additional explanation: Associate Dean of Academic Affairs, and resident faculty fellow.

From 1980-1981, I was Associate Dean of the College for Academic Affairs. I advised students (including independent concentrators, premed and biology students, and readmit students), chaired the Committee on the Academic code, interviewed and trained resident counselors, directed the Randall Counseling Program, and supervised the Resource Center and the Internship and Venture Programs.

As a resident faculty fellow from 1976 to 2010, I organized programs to promote intellectual life and a sense of community in the dormitories including weekly study breaks that frequently had guests such as faculty, administrators, chaplains, and members of the Providence community. Other activities included: organizing open houses, for example, for parents, and corporation members; hosting student dinners at my apartment with faculty guests; informal advising of students in the dormitory; interviewing applicants to the Resident Counseling Program, etc. Wherever appropriate, I worked closely with peer counselors in the dormitories to help promote shared community values, and to deal with issues that cause discord, for example, racial or sexual harassment. Speakers whom I invited generated much discussion and were a catalyst for a lively intellectual atmosphere within the dormitory.

Academic Advising Assignments

1976-77	Resident Faculty Fellow, Appleby Dormitory
1976-78	Biomed A.B. Advisor for Class of 1978
1976-79	Randall Counselor
1977-81	Faculty Advisor in Student Support Program
1977-95	Faculty Fellow, Emery-Woolley, Morriss-Champlin and New Pembroke Dormitories
1995-2010	Faculty Fellow, Gregorian Quad
1978-79	Freshman Advisor
1979-80	Biomed A.B. Advisor for Class of 1980
1980-81	Associate Dean of the College for Academic Affairs

1982-83 Academic Advisor for Liberal Learning
1983-2005 Biomed Advisor for Foreign Study
1983-86 Academic Advisor, Curriculum Advising Program
1986-89 Concentration Advisor for A.B. Biology, Class of 1988 and 1989
1987-89 Concentration Advisor for A.B. Biology, Class of 1989
1992-2014 Sophomore Advisor
1992-95 Concentration Advisor for A.B. Biology, Class of 1995
1995-98 Concentration Advisor for A.B. Biology, Class of 1998
1998-2001 Concentration Advisor for A.B. and Sc.B. Biology, Class of 2001
2001-2004 Concentration Advisor for A.B. and Sc.B. Biology, Class of 2004
2007- 2012 Advisor for transfer students and Resumed Undergraduate Education students
2004 – 2014 Concentration Advisor for Sc.B. Human Biology, Classes of 2007 to 2014
2004 - 2021 Concentration Advisor for A.B. Human Biology, Classes of 2007 to 2022.
2004 - 2021 Freshman Advisor and Sophomore Advisor