Keith E. Alley
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Professional Experience:

Current Positions:

2006 -	Executive Vice Chancellor and Provost, University of California-Merced
2002-	Founding Faculty - Professor of Biology, School of Natural Sciences, University of California-Merced

Prior Academic Positions:

1985 - 2002	Professor of Oral Biology, College of Dentistry, Ohio State University
1985 - 2002	Professor, Department of Cell Biology, Neurobiology and Anatomy College of Medicine, Ohio State University
1980 - 1985	Associate Professor, Department of Anatomy School of Medicine, Case Western Reserve University
1980 - 1985	Associate Professor, Department of Oral Biology School of Dental Medicine, Case Western Reserve University
1974 - 1980	Assistant Professor, Department of Anatomy, School of Medicine, Case Western Reserve University

Prior Administrative Positions:

2002 – 2006	Vice Chancellor for Research and Dean of Graduate Studies, UC Merced
2005 – 2006	Interim Vice Chancellor for Administration, UC Merced
2000 - 2002	Senior Associate Vice President, Office of Research, Ohio State University
1999 - 2000	Interim Vice-President for Research, Ohio State University
1999 - 2000	President, the Ohio State University Research Foundation
1991 - 1998	Associate Dean for Research and Graduate Studies, College of Dentistry, Ohio State University
1985 – 2000	Chairman, Section of Oral Biology College of Dentistry, Ohio State University

Education :

University of Illinois	B.S.	Biology
University of Illinois	D.D.S.	Dentistry
University of Illinois	M.S.	Anatomy
University of Illinois	Ph.D.	Anatomy/Neuroscience
University of Iowa	Postdoctoral	Neurobiology

Honors:

Omicron Kappa Upsilon, National Honorary Society
(President, Theta Chapter, 1995 - 1996)
NIH predoctoral NRSA, 1968 - 1972
NIH Special Research Fellow, 1972 - 1974
NIH Research Career Development Award, 1976 - 1981
Teaching Excellence Awards, CWRU, 1975, 1978, 1979, 1980, 1985
NIH, DRG Study Section, 1988-1992

Memberships:

American Association for the Advancement of Science
Federation of American Societies for Experimental Biology
American Association of Anatomists

Educational Responsibilities:

Undergraduate Curriculum

Teaching:

-Program Brain 1976-1984
-Genes, Stem Cells and Human Development, 2006
-Neurobiology, 2007

Professional Curriculum

Teaching:

-Anatomy & Craniofacial Development 1974-1985 (director, 1976-1985)
-Neurobiology 1974 – 1985 (course director, 1975-1984)
-Oral Biology (course director, 1987 – 1993)
-Craniofacial Biology 1993-2002

New Course Development:

-Anatomy and Craniofacial Development
-Integrative Neurobiology
-Oral Histology and Craniofacial Developmental Biology
-Oral Physiology
-Advanced Topics in Oral Biology
-Cell and Molecular Biology of Wound Healing

Curriculum Development:

- Revamped Oral Biology curriculum to focus on modern biological science, problem solving and experimental science
-Integration of basic and clinical sciences
-Critical thinking skills, analysis of case studies, primary literature, writing

Graduate Curriculum

Teaching:

-Functional Morphology of Primates (course co-director), 1976

-Developmental Neurobiology (course director), 1986 - 1997
-Cell and Molecular Aspects of Wound Healing (course director), 1994
-Advanced Topics in Oral Biology (course director), 1991 - 2000

Course Development:
-MS core curriculum: Statistics, Epidemiology, Experimental Design, Wound Healing Modules
-Advanced Oral Biology Ph.D. Course Offerings
-Developmental Neurobiology Course Content

Program Development:
-Oral Biology Ph.D. Program
-Neurobiology Ph.D. Program

Graduate Advising:
-15 Masters Committee - chaired three
-26 Doctoral Dissertation Committees - chaired five
-34 Doctoral Candidacy Exam Committees
-External examiner, Faculte des Etudes Superieures, Universite de Montreal

Service Responsibilities

Case Western Reserve University

Department of Anatomy:
-Departmental Seminar Series, Director, 1975-1977
-Graduate Studies Committee, 1977- 1982

Schools of Medicine and Dental Medicine:
-Student Standing and Promotion, 1981-1985
-Research Committee (Chair), 1981-1985
-Faculty Retreat Committee, 1982
-Curriculum Committee (Chair), 1982-1985
-President, Cleveland Chapter IADR, 1982-1984
-Professional's Day Student Research Forum (Chair), 1983-1984
-Accreditation Steering Committee (co-chair), 1984-1985

University:
-Research Committee of the University Senate, 1983-1985
-Ad Hoc Committee on the Future of the Dental School, 1982
-Program Brain, Advisory Committee, 1978-1981
-Society for Neuroscience - Cleveland Chapter (President) 1977-1978

Ohio State University

College of Dentistry:
-Executive Committee, 1985- 2000
-Academic Progress Committee, 1986-2000
-Graduate Studies Committee (Chair), 1991-1999

-Research Committee, 1985-1990, (*ex officio*) 1991-1998
-Strategic Planning Committee (Chair), 1987-1989
-Oral Biology Ph.D. Planning Committee (Chair), 1987-1990
-Accreditation Steering Committee, 1989-1992; 1997-1999
-Promotion and Tenure Committee, 1990-1992; 1999-2002, chair, 01-02
-Basic Science Curriculum Review (Chair), 1997-1998

University:

-Presidential Fellowship Committee (Chair), 1986-1989
-Neuroscience Graduate Studies Committee, 1988-1993
-Central Electron Optic Facility-Steering Committee, 1988-1992
-University Senate, 1989-1992
-Distinguished University Professor Selection Committee, 1990
-Sullivant Award Selection Committee, 1992
-Research Space Advisory Committee, 1992-1994
-Research and Graduate Council (Chair '97-'98), 1994-1998
-OSHA Implementation Advisory Committee, 1996-1999
-Executive Committee of Graduate School, 1995-1996
-Graduate School Curriculum Committee (Chair), 1995-1996
-Search Committee, Associate Dean, Vet Med, 1996-1997
-University Research Commission, 1996-1998
-Academic Enrichment Evaluation Committee, 1998, 1999
-Research Committee, (Chair) 1996-1998
-Council on Academic Affairs, 1999-2000
-Graduate Fellowship Awards Committee, 1999-2000
-Campus Microscopy and Imaging Steering Committee, 1999-2000

University of California

-School of Social Sciences Humanities and Arts, Dean Search Committee, (Chair), 2002
-Council of Grad Deans representative to Coordinating Council on Graduate Education, 2003-2004
-Vice Chancellor for Administration, Search Committee (Chair), 2005
-System wide Task Force on Graduate and Professional Education, 2005
-System wide Planning Group on Affordability, 2007

National and International Service

-Ad Hoc member NINCDS Study Section, 1977
-NIH Site Visits, 1977, 1989, 1990, 1994 (Chair).
-Special Review, Oral Biology and Medicine, 1987-1992
-NSF Grant Reviews, 1987-2000
-NIH, MDCN-5 Study Section, 1999 (chair)
-Satellite Symposium: Molecular Aspects of Synaptogenesis

(co-organizer), 1988
-IADR Neuroscience Group, Symposium Chair, 1990-1993, 1999
1. Myoneural determinants of developing jaw-function Acapulco, 1990
2. Psychoneuroimmunology, Chicago, 1992
3. Neurotropic viruses; Experimental and Clinical Implications, Seattle, 1993
4. Neuronal Modulation of Wound Healing, Vancouver, 1999.

-Graduate Program Review, University of Maryland (chair) 1991
-AADR Student Research Fellowship Committee, 1992-1996
-Review of Dental Basic Sciences, University of Maryland, 1992
-Consultant to Eastman Dental Center, 1993
-Advisory Committee, University of Minnesota DSA program, 1993-2000
-IADR Neuroscience Group, President, 1994-1995
-Edison Biotech Corp, Advisory Council, 1994-1995
-IADR Membership and Recruitment Committee, 1995-1998
-AADR Membership and Recruitment Committee, 1997-2000
-Advisory Committee, Univ. of Maryland NRSA, 1998-

Elected Offices:

-Neuroscience Group - International Association for Dental Research
Program Chairman and President-elect, 1993-1994
President, 1994-1995; Councilor, 1995-1997
-American Association for the Advancement of Science, Section R, Councilor, 2001-2005

Editorial Responsibilities

Editorial Board:

-Journal of Dental Research, 1995-1999

Editorial Review:

Journal of Comparative Neurology; Neuroscience; Brain Research Bulletin; Journal of Dental Research; Archives of Oral Biology; American Journal of Anatomy; Neuroscience Letters; Cells Tissues Organs; Developmental Biology; Anatomical Record

Corporate and Foundation Boards:

Past: Transportation Research Center, Inc.; Ohio Airospace Institute; SciTech-Ohio; Prologue International; Orton Ceramics; National Research Regulatory Institute; Great Valley Center

Current: The Yosemite Association

Research, Training and Facility Support Grants:

1972-1974	Analysis of Neuronal Clusters in the Mesencephalic Nucleus. NIDR, $33,000, Principal Investigator, FO3 DE-53223.
1974-1976	Development of Brain Stem Motor Centers, CWRU, $50,000, Principal Investigator, University Seed Grant
1976-1982	Ontogenesis of Brain Stem Visuo-motor Neurons, NINCDS, $385,390, Principal Investigator, RO1 NS-12781.
1976-1981	Research Career Development Award, NINCDS, $157,800, Principal Investigator, KO4 NS-00147.
1981-1991	Neural Aspects of Craniofacial Morphogenesis, NIDR, $562,000, Principal Investigator, RO1 DE-05574.
1985-1986	Biomedical Instrumentation Grant, NIGMS, $280,000, Co-Investigator.
1985-1990	Short Term Research Training in the Health Sciences, NIH, $50,320, Principal Investigator, T35 DE-07155.
1987-1988	Multiuser Biomedical Instrumentation Grant, NIGMS, $300,000, Co-I.
1987-1990	Regulation of Metamorphic Myogenesis and Myolysis, NIDR, $93,000, PI
1989-1994	Neuronal Development, Plasticity and Regeneration, NINCDS, Training Grant, Co-Investigator.
1990-1991	Biological Mechanisms of Craniofacial Adaptation, NIDR, Conference Grant, $98,000, Co-Investigator.
1995-1997	Synaptic dynamics in the trigeminal motor complex, AADR, $19,000, P.I.
1999-2002	Ohio Learning Network, State of Ohio, $4,200,000, P.I.
2003-2004	Sierra Nevada Research Institute, Dept. of Education, $250,000, P.I.
2003-2004	Major Research Instrumentation, Dept. of Education, $250,000, P.I.
2004-2009	Alliance for Graduate Education and the Professorate, NSF, $301,000, P.I
2006-2009	Small Business Development Center, SBA, $1,300,000/ yr, PI

2008-2010 California Institute for Regenerative Medicine, Facility grant, Bio-Foundry $4,359,000, PI.

Publications

Alley, K. (1973). Quantitative analysis of the synaptogenic period in the trigeminal mesencephalic nucleus. *Anat. Rec.*, 177: 49-60.

Alley, K. (1974). Morphogenesis of the trigeminal mesencephalic nucleus in the hamster: Cytogenesis and neurone death. *J. Embryol. Exp. Morph.*, 31:99-121.

Simpson, J.I. and K.E. Alley (1974). Visual climbing fiber input to the vestibulo cerebellum: A source of direction specific information. *Brain Res.*, 82: 302-308.

Alley, K., R. Baker and J. Simpson (1975). Afferents to the vestibulo-cerebellum and the origin of the visual climbing fibers in the rabbit. *Brain Res.*, 98:582-589.

Alley, K. (1977). Anatomical basis for the interaction between the cerebellar flocculus and the brain stem. *Devel. in Neurosci.*, 1: 109-117.

Furgeson, J., M. Cole and K. Alley (1977). Is there a decussation of the facial motor root? An experimental neuroanatomical study. *Trans. Am. Neurol. Assoc.*, 102:51-53.

Shaw, M. and K. Alley (1981). Generation of the ocular motor nuclei and their cell types in the rabbit. *J. Comp. Neurol.*, 200:69-82.

Shaw, M. and K. Alley (1982). Generation of motoneurons in the rabbit brainstem. *J. Comp. Neurol.*, 207: 203-207.

Alley, K. and M. Barnes (1983). Birthdates of trigeminal motoneurons and metamorphic reorganization of the jaw myoneural system in frogs. *J. Comp. Neurol.*, 218: 395-405.

Barnes, M. and K. Alley (1983). Maturation and recycling of trigeminal motoneurons in anuran larvae. *J. Comp. Neurol.*, 218:406-414.

Alley, K. and J. Cameron (1983). Turnover of anuran jaw muscles during metamorphosis. *Anat. Rec.*, 205: 7a-9a.

Davidovitch, Z.,O.Nicolay, K.Alley, R.Lanese, J.Shanfeld (1988). First and second messenger interaction in stressed connective tissue *in vitro.* In: *The Biology of Tooth Movement*, Eds, L.A. Norton and C.J. Burstone, CRC Press: Boca Raton, pg 97-129.

Rosenthal, B. and K. Alley (1988). Trigeminal motoneurons in frogs develop a new dendritic field during metamorphosis. *Neurosci. Lett.*, 95: 53-58.

Alley, K. (1989). Myofiber turn over is used to retrofit frog jaw muscles during metamorphosis. *Amer. J. Anat.*, 184: 1-12.

Alley, K. (1990). Retrofitting larval neuromuscular circuits in the metamorphosing frog. *J. Neurobiol.*, 21: 1092-1107.

Nicolay, O., Z. Davidovitch, J. Shanfeld and K. Alley (1990). Substance P immunoreactivity in periodontal tissue during orthodontic tooth movement. *Bone and Mineral*, 11: 19-29.

Alle, A., K. Alley, et al (1991). Apoptosis: a general comment. *FASEB Journal*, 5: 2127-2129.

Nicolay, O., J. Shanfeld, Z.Davidovitch and K. Alley (1991). SP immunoreactivity in the dental pulp and periodontium during tooth movement. *Ann. N.Y. Acad. Sci.*, 632: 452-454.

Alley, K. (1992). Neurobiology of the Face. In: *Biological Mechanisms of Tooth Movement and Craniofacial Adaptation*, Ed. Z. Davidovitch, EBSCO Media:Birmingham, Alabama, pgs 455-456.

Alley, K., F. Omerza and P. Reiser (1992). Cellular aspects of neuromuscular accommodation during rapid craniofacial morphogenesis. In: *Biological Mechanisms of Tooth Movement and Craniofacial Adaptation*, Ed. Z. Davidovitch, EBSCO Media: Birmingham, Alabama, pgs 531-540.

Omerza, F. and K. Alley (1992). Redeployment of trigeminal motor axons during metamorphosis. *J. Comp. Neurol.*, 325: 124-134.

Alley, K. (1992). Oral Biology: Advanced education in dental research. *OSU Quarterly*, 16: 12-14.

Rosen, S., K.Alley and F. Beck (1994). Outcomes assessment of predoctoral research experience. *J. Dent. Edu.*, 583: 836-839.

Paulson, R., K. Alley, L. Salata and C. Whitmyer (1995). Tongue development in *Rana pipiens*, a scanning electron microscopy study. *Arch. Oral Biol.*, 40:311-319.

Hanken, J., M. Klymkowsky, K. Alley and D. Jennings (1997). Jaw muscle development as evidence for embryonic patterning in the direct developing frogs. *Proc. Biol. Sci./Roy. Soc., Lond.*, Ser. B 264: 1349-1354.

Alley, K. and F. Omerza (1998). Trigeminal motoneurons are reutilized during amphibian metamorphosis. *Brain Res.*, 813 (1): 187-190.

Alley, K. and F. Omerza (1999). Neuromuscular remodeling and myofiber turnover in the jaw muscles of *Rana pipiens*. *Cells Tissues Organs*, 164 (1): 46-58.

Alley, K., J. Cassady, H. Fields, R. Glaser, A. Goodridge, B. Moser, F. Sanfilippo, and W. Yonushonis (2001). Letter – Defining Stress. *Science*, 291, #5513, 2316-2317.

Alley, K., (2007). Creating the Infrastructure for Graduate Education and Research at a New Research University. In: *From rangeland to research university: The birth of the University of California, Merced*, Jossey-Bass: San Francisco, No. 139: 61-68.

Reiser, P. and K. Alley. Myosin heavy chain transitions accompany myofiber turnover in *Rana pipiens* jaw muscles during metamorphosis. *Tissue and Cell*, (in press).

Alley, K. Cellular dynamics during metamorphosis in amphibian jaw muscles. *Cell and Tiss. Res.*, (in press)

Covell, D. and K. Alley. Selected regeneration of the trigeminal nerve in the axolotl jaw. In preparation.

Abstracts

Alley, K. (1971). Masticatory significance of neuronal clusters in the trigeminal mesencephalic nucleus. *Amer. Zool.*, 11:703.

Alley, K. (1972). Neuronal death during metamorphosis of the trigeminal mesencephalic nucleus. *J. Dent. Res.*, 50:206.

Alley, K. and E. DuBrul (1972). Neuronal death in the morphogenesis of the mammalian mesencephalic nucleus. *Anat. Rec.*, 172: 261.

Alley, K. R. Llinas and D. Hillman (1973). Neuronal and synaptic morphology in the optic tectum of the blind cavefish. *Anat. Rec.*, 175: 263.

Alley, K. (1973). Neuronal morphology and synaptic patterns in the hypoglossal nucleus. *J. Dent. Res.*, 51:

Alley, K., R. Baker and J. Simpson (1976). Projections from the perihypoglossal complex to the vestibulocerebellum in the rabbit. *Neurosci. Abst.*, 2, 104.

Barnes, M. and K.Alley (1977). Neuromuscular transformation of the frog jaw during metamorphosis. *Anat. Rec.*, 87: 530.

Shaw, M. and K. Alley (1978). Innervation of the extrinsic ocular muscles in the rabbit. *Neurosci. Abst.*, 3: 168.

Shaw, M. and K. Alley (1979). Birthdates of oculomotor neurons in the rabbit. *Neurosci. Abst.*, 4: 253.

Barnes, M. and K. Alley (1980). Stability in the motor V nucleus during metamorphosis of the jaws in *Rana pipiens*. *Anat. Rec.*, 196: 13.

Alley, K. and M. Shaw (1980). Sequential generation of motoneuronal pools in the oculomotor nucleus of the rabbit: A theory of nuclear construction. *Neurosci. Abst.,6: 781*.

Alley, K. (1983). Development and respecification of trigeminal motoneurons in the frog. *J. Dent. Res.*, 62:194.

Blaszczak, J. and K. Alley (1983). Stability of trigeminal motor pools during jaw reconstruction in frogs. *J. Dent. Res.*, 62: 233.

Alley, K. (1983). Migration and axonal generation of anuran trigeminal motoneurons. *Neurosci. Abst.*, 9: 210.

Nah, H., R. Cederquist, K. Alley and I McQuarrie (1984). Influence of axonal transport on facial musculature in growing rats. *J. Dent. Res.*, 63: 203.

Alley, K and V. Nalbone (1985). Acetylcholine receptor distribution on larval and adult frog jaw muscles. *Anat. Rec.*, 211: 9a.

Alley, K. (1985). Metamorphic turnover of trigeminal neuromuscular contacts in *Rana pipiens*. *Neurosci. Abst.*, 11: 157.

Reisman, A., K. Alley and M. Barnes (1986). Pattern formation and myogenesis in the mandibular arch. *J. Dent. Res.*, 65: 279.

Alley, K (1987). Myofiber turnover and trigeminal neuromuscular plasticity in jaw muscles. *J. Dent. Res.*, 66: 118.

Nicolay, O., M. Ford, K.Alley, J.Shanfeld and Z. Davidovitch (1987). Substance P immunoreactivity in periodontal cells and nerves. *J. Dent. Res.*, 66: 328.

Davidovitch, Z., O. Nicolay, R. Katz, K. Alley and J. Shanfeld (1987). Localization of substance P in stretched periodontium *in vitro. J. Dent. Res.*, 55: 328.

Salata, L., R. Paulson, K. Alley and M. Ismail (1987). Tongue development in

Rana. Pipiens. J. Dent. Res., 68: 240.
Rosenthal, B. and K. Alley (1987). Plasticity in the dendrites of trigeminal motoneurons in *Rana pipiens. Neurosci. Abst.,* 1`3: 1507.

Omerza, F., K. Alley and B. Rosenthal (1988). Quantitative of neuromuscular sprouts in metamorphic anuran jaw muscles. *J. Dent. Res.,* 67: 162.

Rosenthal, B. and K. Alley (1988). Development of sensory trigeminal afferent projections in *Rana pipiens. Neurosci. Abst.,* 14:1273.

New, D. and K. Alley (1989). Synaptic reorganization in the trigeminal motor nucleus in anuran amphibians. *J. Dent. Res.,* 68:290.

Covell, D. and K. Alley (1989). Regeneration of the trigeminal nerve in axolotol larvae. *J. Dent. Res.,* 68: 289.

Omerza, F. and K. Alley (1989). Neuromuscular junction maturation in the anuran larval jaw muscles. *J. Dent. Res.,* 68: 289.

Covell, D. and K. Alley (1990). Effect of nerve transection on the dendritic arborization of trigeminal motoneurons. *J. Dent. Res.,* 69:252.

Whitmyer, C., R. Paulson, and K. Alley (1990). Early larval tongue development in *Rana pipiens. J. Dent. Res.,* 69: 253.

Omerza, F. and K. Alley (1990). Metamorphic reorganization of trigeminal motoneurons in *Rana pipiens. Neurosci. Abst.* 16: 815.

Reiser, P. and K. Alley (1991). Contractile protein expression and contractile properties in frog jaw myofibers during maturation *J. Cell. Biochem.,* Suppl. 15c:63.

Alley, K. and P. Reiser (1991). Molecular and contractile features of frog jaw myofibers. *J. Dent. Res.,* 70: 420.

Covell, D. and K. Alley (1991). Multiple tracer study of control and regenerated

trigeminal nerve central projections. *J. Dent. Res.,* 70:464.
Grammel, D., R. Paulson, K. Alley and C. Whitmyer (1992). Early tongue development in *Rana pipiens:* SEM and cleared skeletal comparisons. *J. Dent. Res.,* 71: 131.

Younkin, K., R. Nordlander, and K. Alley (1992). Pattern of axonal outgrowth in the peripheral trigeminal sensory pathway. *J. Dent. Res.,* 71: 220

Fortney, J., F. Omerza and K. Alley (1992). Are frog jaw myofibers polyneuronally innervated? *J. Dent. Res.,* 71: 221.

Larj, M. and K. Alley (1992). Marcaine induced degeneration of amphibian jaw muscle. *J. Dent. Res.,* 71: 221.

New, D. and K. Alley (1992). Metamorphic remodeling of trigeminal motor inputs. *J. Dent. Res.,* 71:221.

Omerza, F. and K. Alley (1992). Somatotopic organization of overlapping motor units within a larval frog jaw muscle. *Neurosci. Abst.,* 18: 1113.

Hanken, J., M. Klykowsky, K. Alley, D. Jennings (1992). Evolution of cranial muscle ontogeny in a direct-developing amphibian. *Amer. Zool.,* 32: 811A.

Homan, J., F. Omerza, K.Alley and R. Nordlander (1993). Development of trigeminal motor axons in anuran jaw muscles. *J. Dent. Res.,* 72: 163.

Hicks, K., R. Paulson, R. Rashid and K. Alley (1993). Morphometric analysis of hypobranchial growth in premetamorphic *Rana pipiens. J. Dent. Res.,* 72: 254.

Rosen, S., K. Alley and F. Beck (1994). Impact of predoctoral dental research on career and scholarly activity. *J. Dent. Res.,* 73: 402.

Courtney, A., R. Paulson, P. Ngan, K. Alley, C. Hardy and K. Hicks (1994). Tensor analysis of growth changes in anuran hypobranchial apparatus. *J. Dent. Res.,* 73: 265.

Omerza, F. and K. Alley (1995). Recovery of polyinnervation in frog jaw muscles following trigeminal axotomy. *J. Dent. Res.,* 74: 78

Homon, J, K. Alley and F. Omerza (1995). Acetylcholine receptor fields in *Rana pipiens* jaw muscles. *J. Dent. Res.,* 74:211.

Omerza, F. and K. Alley (1996). Target reduction and reestablishment of polyinnervation on larval myofibers. *J. Dent. Res.,* 75: 109.

Huff, K., K. Alley and P. Reiser (1996). Myosin heavy chain transitions in frog jaw muscles. *J. Dent. Res.,* 75: 120.

Books

Melfi, R, and K. Alley (2000). Permar's Oral Embryology and Microscopy. 10th Ed, Lippincott, Williams and Wilkins: Philadelphia, p 284. (11th edition in preparation)

Invited Lectures, Symposia and Continuing Education Courses

1968 University of Illinois, Symposium on TMJ Disorders
Neural Aspects of Jaw Function

1972 University of Iowa, Department of Physiology
Development of the Trigeminal Mesencephalic Nucleus

1973 Ohio State University, Department of Anatomy
How Do Brains Develop?

1973 Case Western Reserve University, Department of Anatomy
Visual-Vestibular Interactions in the Cerebellar Flocculus

1977 International Congress of Physiology, Abbaye de Royaumont, Paris
Anatomical Basis for Floccular Control of Eye Movement

1978 Case Western Reserve University, Symposium on Occlusal Studies
Neural Correlates of Cyclic Jaw Movements

1978 Washington University, Department of Oral Biology
Neuromuscular Aspects of Jaw Development

1979 Louisiana State University, Department of Anatomy
Development of Eye Motoneurons: A Model for Nuclear Construction

1979 University of Illinois, Department of Oral Biology
Evolutionary Mechanisms for Change of Brain and Target

1980 Northeast Ohio College of Medicine, Department of Neurobiology
Temporal Variables in Neuronal Differentiation

1980 Akron Stomatognathic Society
Cranial Structure and Mechanics

1981 University of Chicago, Department of Anatomy
A Model of Neuronal Respecification

1982 Cleveland Crown and Bridge Study Club
Myths and Facts of TMJ Function and Dysfunction

1984 Emory University, College of Dentistry, Atlanta, Georgia

Neuronal Respecification Mediates Altered Jaw Function

1984 Ohio State University, Department of Anatomy, Columbus, Ohio
Neural Aspects of Craniofacial Morphogenesis

1985 Uniformed Services Health Science University, Department of Anatomy
Cellular Features of Neuromuscular Plasticity

1986 Ohio Academy of Sciences, Toledo, Ohio
Neuroscience: Its Past, Present and Future

1987 National Institute of Dental Research, Bethesda, Maryland
Making the Change: Catalyzing Faculty Research Development

1989 Emory University, Department of Anatomy
Developmental Neuromuscular Plasticity in the Jaw Apparatus

1990 Cold Springs Harbor Laboratory, Apoptosis in Biological Systems
Cell Death: A Developmental Strategy for All Stages

1990 American Society of Zoologists, Anuran Models of Development
Metamorphosis: A Model for Developmental Neuromuscular Accommodation

1991 University of Indiana, Bloomington, Indiana
Cellular Dynamics during metamorphosis of amphibian jaw muscles

1991 IADR Symposium, Acapulco, Mexico
Myoneural Determinants of Jaw Function

1991 UCLA, Department of Oral Biology
Neuromuscular Plasticity and Emergent Oral Behavior

1992 IADR Symposium, San Antonio, Texas
Neurotropic Viruses: Clinical and Experimental Implications

1992 NIH, The NIDR-University Partnership, Bethesda, Maryland
Making the Change: Traditional to Research Orientation

1993 IADR Symposium, Chicago, Illinois
Psychoneuroimmunology: Oral Health Implications

1995 Ohio State University, Post-College Assembly, Columbus, Ohio
Biology of Dentin: Prospects for Biodental Materials

1999 IADR Symposium, Vancouver, British Columbia
Wound Healing: Neurogenic and Neuroendocrine Modulation

1999 Council of Scientific Society Presidents, Washington, D.C.
The University in 2025: Challenges for Chief Research Officers

2000 University of California, Oakland, Ca
California's Research Portfolio: A Valley Left Behind

2002 Great Valley Center, Modesto, California
Research Universities as Regional Economic Drivers

2003 University of California, Council of UC Graduate Deans
What is the Research University of the 21st Century?