

**TIMOTHY J. COLLIER Ph.D.**

**CURRICULUM VITAE**

**Address:** Michigan State University  
Dept. Translational Science & Molecular Medicine  
333 Bostwick Ave. NE  
Grand Rapids, MI 49503

**Business Phone:** (616) 234-0953

**Business FAX:** (616) 234-0990

**e-mail Address:** timothy.collier@hc.msu.edu

**Date and Place of Birth:** December 17, 1952; Minneapolis, Minnesota.

**Citizenship:** U.S.A.

**EDUCATION**

<b><u>School or College</u></b>	<b><u>Field of Study</u></b>	<b><u>Degree Earned</u></b>	<b><u>Year</u></b>
University of Minnesota Minneapolis, Minnesota	Psychology	B.A.	1974
Northwestern University Evanston, Illinois	Psychology/ Neuroscience	M.S.	1979
Thesis Advisor: Aryeh Routtenberg Thesis Title: Entorhinal Cortex: Anatomical and Behavioral Analyses			
Northwestern University Evanston, Illinois	Psychology/ Neuroscience	Ph.D.	1983
Dissertation Advisor: Aryeh Routtenberg Dissertation Title: Hippocampal Opioid Mechanisms of Memory and Reward: The Granule Cell Mossy Fiber System.			

**POSTDOCTORAL TRAINING**

Postdoctoral Research Fellow, University of Rochester School of Medicine, Department of Neurobiology and Anatomy, 1982-1985. Preceptor: John R. Sladek, Jr.

## ACADEMIC APPOINTMENTS

<b><u>Institution</u></b>	<b><u>Rank</u></b>	<b><u>Year(s)</u></b>
University of Rochester School of Medicine	Scientist	1985-1988
University of Rochester School of Medicine	Assistant Professor	1988-1994
Rush Presbyterian-St. Luke's Medical Center	Associate Professor	1994-2002
Rush University Medical Center	Professor	2002-2005
University of Cincinnati	Professor	2005-2010
Michigan State University	Professor	2010- present

## MEMBERSHIP AND OFFICES IN PROFESSIONAL SOCIETIES

### **Membership:**

American Association for the Advancement of Science

Society for Neuroscience

American Society for Neural Therapy and Repair

### **Offices:**

Chairman, Bylaws Committee, American Society for Neural Transplantation and Repair, 1995-96.

Education Committee, American Society for Neural Transplantation and Repair, 1998-present.

Councilor, American Society for Neural Transplantation and Repair, 1999-2001

Co-Chairman, Program Committee, American Society for Neural Transplantation and Repair, 2002-2003.

Chairman, Program Committee, American Society for Neural Transplantation and Repair, 2003-2004.

President, American Society for Neural Therapy and Repair, 2007-2008.

## RECORD OF FELLOWSHIP AWARDS

### Predoctoral Fellowship Awards

<u>Source of Award</u>	<u>Institution</u>	<u>Year(s)</u>
Walter Dill Scott Fellowship	Northwestern University	1976
Trainee, NIMH Behavioral Neuroscience Training Grant - MH 16097	Northwestern University	1979-1981

### Postdoctoral Fellowship Awards

NIMH Behavioral Neurosciences Postdoctoral Research Fellowship Award 1-F32-MHO8829	University of Rochester	1982-1984
Postdoctoral Fellow, Geriatrics & Neurobiology of Aging Training Grant - 1-T32-AG00107	University of Rochester	1984-1985

## RESEARCH GRANTS OBTAINED

### Active:

NINDS, P50 NS58830, "Aging and Parkinson's Disease: Models of Therapeutics and Neurologic Comorbidity." P.I. \$1,000,000 ADC, 07/31/09-07/30/2014.

NINDS, R01 NS055295, "An Approach to Dopamine Graft Augmentation." P.I. \$1,250,000 TDC, 12/01/06-11/30/2012.

NINDS, R01 NS0586832, "Pleiotrophin Overexpression to Facilitate Repair and Graft Efficacy in Parkinson's." Co-Investigator, P.I.: Caryl Sortwell, Ph.D. \$195,360 ADC, 06/16/07-04/30/2012.

NINDS, RO1 NS045132, "Levodopa Dyskinesias: Impact of Dopamine Neurons." Co-Investigator, P.I.: Kathy Steece-Collier, Ph.D. \$900,000 TDC, 07/01/09-06/30/13.

### Prior:

PSG Retrospective Data-Mining Project in Parkinson's Disease, No Study Number, "Antidepressant-induced delay of symptomology in Parkinson's Disease (AIDS-PD)." \$25,000, 03/01/09-02/27/2010.

Davis Phinney Foundation, No Study Number, "Antidepressant-mediated neuroprotection of the nigrostriatal pathway." P.I. \$75,000, 09/01/09-08/31/09.

Michael J. Fox Foundation, "Small Molecule TNF- $\alpha$  inhibitors as PD neuroprotectant drugs." Co-Investigator. \$412,521 TDC, 2/1/2007 – 1/31/2009.

NINDS, PO1 NS44281, "Improving Neural Graft Function in Parkinsonian Monkeys." P.L., P.I.: D.E. Redmond Jr., M.D. \$5,000,000 TDC, 08/01/03-07/31/08.

Davis Phinney Foundation, No Study Number, "A Nonhuman Primate Model of the Dual-Hit Hypothesis on the Etiology of Parkinson's Disease." P.I. \$40,000 TDC, 07/01/07-06/30/08.

Michael J. Fox Foundation, No Study Number, "Aberrant Striatal Morphology: Impact on Therapeutic Efficacy in PD." Co-I. P.I.: Kathy Steece-Collier, Ph.D. \$68,182, 04/01/07-03/31/08.

Michael J. Fox Foundation, No Study Number, "Gene Transfer of Pleiotrophin to Aged Parkinsonian Rats." Co-I. P.I.: Caryl Sortwell, Ph.D. \$97,499 ADC. 05/01/05-12/31/07.

NINDS, 1 RO1 NS42125, "Neural Progenitor Cell Grafts for Parkinson's Disease." P.I. \$1,000,000 TDC, 08/01/01-07/31/05.

NINDS, "Dyskinesias in Lenti-GDNF Treated Parkinsonian Monkeys." Co-Investigator, P.I.: Jeffrey Kordower, Ph.D. and Kathy Steece-Collier, Ph.D. \$1,784,090 TDC, 04/01/02-03/31/06.

NIA, 1 RO1, AG17092; "Aging and Dopamine Grafts in Parkinsonian Monkeys." P.I. \$2,425,000 TDC, 04/01/00-03/31/04.

NIA, R21 AG21546; "Angiogenic Enhancement of Dopamine Neuron Grafts." Co-Investigator, P.I.: Caryl Sortwell, Ph.D., \$250,000 TDC, 05/01/02-04/30/04.

Department of Defense, DAMD17-98-1-8629; "The Induction of the Dopamine Neuron Phenotype from Progenitor Cells by Hematopoietic Cytokines." Co-Investigator, P.I.: Paul Carvey, Ph.D. \$1,129,311 TDC, 10/01/98-09/30/02.

NINDS, 1 RO1 NS25655; "Cholinergic Grafts and Co-Grafts in Aged Monkeys." Co-Investigator, P.I.: J.H. Kordower., Ph.D. \$935,602 TDC, 04/01/96-03/31/01.

NINDS, 1 RO1 NS35078, "NGF Grafts and Huntington's Disease." Co-Investigator, P.I.: J.H. Kordower, Ph.D. \$635,216 TDC, 04/01/96-03/31/01.

NIA, 1 RO1 AG10851, "Regeneration in the Aged and Injured Dopamine System." P.I. \$706,645 TDC, 12/01/93-11/30/98.

Lucille P. Markey Charitable Trust Award to the University of Rochester, Pilot Grant, "Characterization of Immortalized Cells Derived from Embryonic Rat Ventral Mesencephalon", P.I., \$10,000, 5/1/93-4/30/94.

Lucille P. Markey Charitable Trust Award to the University of Rochester, Equipment Grant, Rota-Dac Automated Rotational Behavior System, \$8,000, 5/1/93-4/30/94.

NIA, R29-AG08133: "Norepinephrine Supplementation in Aging". 70% effort as Principal Investigator, \$329,577 TDC, 5 years, 12/88-11/93.

Research Grant, Cephalon Inc., "Dopaminergic Neurotrophic Factor for Treatment of Parkinson's Disease", J. E. Springer, P.I., Co-P.I. via subcontract from Hahnemann University School of Medicine, \$100,000 TDC, 1/1/92-12/31/93.

Lucille P. Markey Charitable Trust Award to the University of Rochester, Equipment Grant, Inverted Light Microscope for Tissue Culture, \$13,886, 12/1/91-11/30/92

Faculty Scholars Award, Alzheimer's Association FSA-85-015: "Aging, Memory and Brain Norepinephrine: Neuron Transplants as an Experimental Replacement Therapy." P.I. , \$104,000 1985-88.

NIA, R01-AG00847-09: "Aging Effects on Peptidergic and Aminergic Neurons." J.R. Sladek, Jr., P.I., Co-Investigator, \$90,850 ADC, 1986-1988.

NIMH, F32-MH08829, "Behavioral Correlates of Neural Transplants in Aged Rats." 1982-1984.

## **TEACHING ACTIVITIES**

### **Lecture and Laboratory Courses:**

#### Northwestern University, Evanston, Illinois:

1974 Teaching Assistant - A12 Introduction to Neuroscience.

1977 Teaching Assistant - C12-1 Neurobiology and Behavior I.

1978 Instructor, Division of Continuing Education - A10 Introduction to Psychology,

1979-80 Teaching Assistant - A12 Introduction to Neuroscience.

#### University of Rochester School of Medicine, Rochester, New York:

1987-1994 Faculty, Cell Structure and Function: Medical Histology.

1989-1991 ANA 522, Anatomy Seminar.

1987-1990 Contributing lecturer, ANA 502, Advanced Neuroanatomy.

#### Rush Medical School, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois:

1995-2005 Faculty, Neurobiology 451.

1995-2005 Faculty, Graduate Neuroscience Proseminar.

The Chicago Medical School, North Chicago, Illinois:

1998-2003 Guest Lecturer, Medical Neuroscience and Graduate Neuroscience courses.

University of Cincinnati, Cincinnati, OH:

2006- 2008 Lecturer, Systems/Behavioral Neuroscience.

2006-2008 Co-director, Neurodevelopment, Regeneration and Plasticity (NS842001).

2007-2009 Lecturer, Fundamentals of Neuroscience II, Neuroscience Graduate Program.

**Students Trained:**

Postdoctoral Fellows:

Caryl Sortwell, Ph.D., Research Center for Brain Repair, Rush-Presbyterian Medical Center, 1996-1998. Professor, Michigan State University, Dept. Translational Science & Molecular Medicine, Grand Rapids, MI.

Mark Pitzer, Ph.D., Research Center for Brain Repair, Rush-Presbyterian Medical Center, 1998-2001. Associate Professor, Dept. Psychology, University of Portland, Portland, OR.

Susan McGuire, Ph.D., Research Center for Brain Repair, Rush-Presbyterian Medical Center, 2000-2002. Associate Professor, Loyola University Medical School, Chicago, IL

Lalitha Madhavan, Ph.D., Department of Neurology, University of Cincinnati, 2006-2010. Assistant Professor, University of Arizona, Tucson, AZ.

Graduate Students:

Patrick Martin, M.D./Ph.D. program, Department of Neurobiology and Anatomy, University of Rochester School of Medicine, Terminal M.S.

Deanna Marchionini, Ph.D. program, Neuroscience, Rush University, 2000-2005. Postdoctoral Training, Post-Doctoral training Dept. Neurology, Columbia University, New York, NY. Director, Early Discovery Initiative, CHDI Foundation, New York, NY.

Nick Kanaan, Ph.D. program, Neuroscience, Rush University, 2001-2007. Postdoctoral training, Northwestern University, Chicago, IL. Assistant Professor, Michigan State University, Dept. Translational Science & Molecular Medicine, Grand Rapids, MI.

Katrina Paumier, Ph.D. program, Neuroscience, University of Cincinnati, 2004-2010. Postdoctoral training, Pfizer, Groton, CT.

Medical Students:

Valerie Bruemmer, Summer Research Project, 1985,1986, University of Rochester School of Medicine.

Helen Barold, Summer Research Project, 1987,1988, University of Rochester School of Medicine..

Paul Danielson, Summer Research Project, 1989, 1990, University of Rochester School of Medicine.

Patrick Martin, Summer Research Project, 1991, University of Rochester School of Medicine.

James Greene, Summer Research Project, 1991, University of Rochester School of Medicine.

David Mungo, Summer Research Project, 1992, University of Rochester School of Medicine.

Undergraduate Students:

David Barold, Summer Research Project, 1989, University of Rochester School of Medicine.

Stephanie Buczala, Independent Study in Neuroscience, Spring 1990, University of Rochester School of Medicine.

John Sun, Independent Study in Neuroscience, Fall 1992, Fall 1993, University of Rochester School of Medicine.

Kha Nguyen, Independent Study in Neuroscience, Fall & Spring 1992, University of Rochester School of Medicine.

David Kvarnberg, Independent Study in Neuroscience, Winter 1996, Spring 1997, University of Illinois at Chicago.

**Thesis Committees:**

Starr H. Pearlman, Ph.D 1991, Department of Neurobiology and Anatomy, University of Rochester School of Medicine.

Eileen Imperato, Ph.D. 1993, Department of Neurobiology and Anatomy, University of Rochester School of Medicine.

Fred Junn, Ph.D. 1994, Department of Neurobiology and Anatomy, University of Rochester School of Medicine.

Jim Greene, M.D./Ph.D., Ph.D. 1996, Department of Neurobiology and Anatomy, University of Rochester School of Medicine.

Kumi Nagamoto, Ph.D. 1996, Department of Pharmacology, University of Rochester School of Medicine.

Vinod Charles, Ph.D. 1998, Neuroscience Program, Rush University, Chicago, IL.  
Rose Hanbury, Ph.D. 2002, Neuroscience Program, Rush University, Chicago, IL.  
Jodi McBride, Ph.D. 2004, Neuroscience Program, Rush University, Chicago, IL  
James Koprach, Ph.D., 2005, Neuroscience Program, Rush University, Chicago, IL  
Deanna Marchionini, Ph.D., 2005, Neuroscience Program, Rush University, Chicago, IL  
Nicholas Kanaan, Ph.D., 2007, Neuroscience Program, Rush University, Chicago, IL  
Jennifer O'Malley, Ph.D., 2009, Neuroscience Program, University of Cincinnati, Cincinnati, OH  
Valerie Thompson, Ph.D., 2010, Neuroscience Program, University of Cincinnati, Cincinnati, OH  
Brian Terpstra, Ph.D., 2011, Neuroscience Program, University of Cincinnati, Cincinnati, OH  
Anne Spieles-Engemann, Ph.D., 2011, Neuroscience Program, University of Cincinnati, Cincinnati, OH  
Katrina Paumier, Ph.D., 2011, Neuroscience Program, University of Cincinnati, Cincinnati, OH  
Sara Gombash, Ph.D., pending, Neuroscience Program, University of Cincinnati, Cincinnati, OH

### **HONORS AND AWARDS**

Walter Dill Scott Fellowship, Northwestern University, 1976.  
Alzheimer's Association Faculty Scholars Award, 1985.  
Edwin A. Brophy Endowed Chair in Central Nervous Systems Disorders, Michigan State University, 2010-present.

### **COMMITTEE AND ADMINISTRATIVE SERVICES**

Rush University neuroscience graduate program admissions committee, 1994-2005.  
Rush University research committee, 1994-2005; Chairman 2000-2002.  
President, American Society for Neural Therapy and Repair, 2007.



Chair, Scientific Advisory Board, Davis Phinney Foundation, 2006-present.

## PEER REVIEW ACTIVITIES

### **Editorial Boards:**

Experimental Neurology, 1997-present.

European Journal of Neuroscience, Associate Editor, 2009-present.

### **Journals Reviewed For:**

Behavioral and Neural Biology, Biological Psychiatry, Brain Research, Brain Research Bulletin, Experimental Neurology, Journal of Neuroscience, Journal of Neuroscience Methods, Nature, Neurobiology of Aging, Neuron, Neuroscience, Restorative Neurology and Neuroscience, Science, Neuroscience Letters, Stem Cells, Neurobiology of Disease.

### **Grants Reviewed For:**

NIH CNNT (formerly BDCN-2) Study Section, 2002-2007, chairperson 2005-2007.

Alzheimer's Association

National Science Foundation

Medical Research Council of Great Britain

## BIBLIOGRAPHY

### **Articles in Peer-Reviewed Journals: (100 total).**

**Collier, T.J.** and Routtenberg, A. (1977) "Entorhinal cortex: Catecholamine fluorescence and nissl staining of identical Vibratome sections." Brain Research 128:354-360.

**Collier, T.J.**, Kurtzman, S. and Routtenberg, A. (1977) "Intracranial self-stimulation derived from entorhinal cortex." Brain Research 137:188-196.

**Collier, T.J.** and Routtenberg, A. (1978) "Entorhinal cortex electrical stimulation disrupts retention performance when applied after, but not during, learning." Brain Research 152:411-417.

Grossman, S.P., Dacey, D., Halaris, A.E., **Collier, T.J.** and Routtenberg, A. (1978) "Aphagia and adipsia after preferential destruction of nerve cell bodies in the hypothalamus." Science 202:537-539.

**Collier, T.J.**, Miller, J.S., Travis, J. and Routtenberg, A. (1982) "Dentate gyrus granule cells and memory: Electrical stimulation disrupts memory for places rewarded." Behavioral and Neural Biology 34:227-239.

Ruth, R.E., **Collier, T.J.** and Routtenberg, A. (1982) "Topography between the entorhinal cortex and the dentate septotemporal axis in rats. I. Medial and intermediate entorhinal projecting cells." Journal of Comparative Neurology 209:69-78.

- Collier, T.J.** and Routtenberg, A. (1984) "Selective impairment of declarative memory following stimulation of dentate gyrus granule cells: A naloxone-sensitive effect." Brain Research 310:384-387.
- Collier, T.J.**, and Routtenberg, A. (1984) "Electrical self-stimulation of dentate gyrus granule cells." Behavioral and Neural Biology, 42:85-90.
- Gash, D.M., **Collier, T.J.** and Sladek, J.R., Jr. (1985) "Neural transplantation: A review of recent developments and potential applications to the aged brain." Neurobiology of Aging, 6:131-150.
- Redmond, D.E., Jr., Sladek, J.R., Jr., Roth, R.H., **Collier, T.J.**, Elsworth, J.D. and Deutch, A.Y. (1986) "Fetal neuronal grafts in monkeys given methylphenyltetrahydropyridine." The Lancet, Vol. I, 8490: 1125-1127.
- Sladek, J.R., Jr., **Collier, T.J.**, Haber, S.N., Roth, R.H. and Redmond, D.E., Jr. (1986) "Survival and growth of fetal catecholamine neurons transplanted into primate brain." Brain Research Bulletin, 17: 809-818.
- Collier, T.J.**, Quirk, G.J., and Routtenberg, A. (1987) "Separable roles of hippocampal granule cells in forgetting and pyramidal cells in remembering spatial information." Brain Research, 409:316-328.
- Felten, S.Y., Bellinger, D.L., **Collier, T.J.**, Coleman, P.D., and Felten, D.L. (1987) "Decreased sympathetic innervation of spleen in aged Fischer 344 rats." Neurobiology of Aging, 8:159-165.
- Phelps, C.J., **Collier, T.J.**, and Bartke, A. (1987) "Effect of chronic hyperprolactinemia on tuberoinfundibular dopaminergic neurons: Histofluorescence in aged and in diethylstilbestrol-treated male rats." Brain Research, 411:108-119.
- Silverman, W.F., Aravich, P.F., **Collier, T.J.**, Olschowka, J.A., and Sladek, J.R. Jr. (1987) "Reinnervation of transplanted hypothalamic neurons by host aminergic fibers in rats." Brain Research, 412: 375-380.
- Bellinger, D.L., Felten, S.Y., **Collier, T.J.** and Felten, D.L. (1987) "Noradrenergic sympathetic innervation of the spleen: IV. Morphometric analysis in adult and aged F344 rats." Journal of Neuroscience Research, 18: 55-63.
- Collier, T.J.**, Redmond, D.E., Jr., Sladek, C.D., Gallagher, M.J., Roth, R.H. and Sladek, J.R., Jr. (1987) "Intracerebral grafting and culture of cryopreserved primate dopamine neurons." Brain Research, 436: 363-366.
- Collier, T.J.**, Gash, D.M. and Sladek, J.R., Jr. (1988) "Transplantation of norepinephrine neurons into aged rats improves performance of a learned task." Brain Research, 448: 77-87.

- Springer, J.E., **Collier, T.J.**, Sladek, J.R., Jr. and Loy, R. (1988) "Transplantation of male mouse submaxillary gland increases survival of axotomized basal forebrain neurons." Journal of Neuroscience Research, 19: 291-296.
- Ruth, R.E., **Collier, T.J.** and Routtenberg, A. (1988) "Topographical relationship between the entorhinal cortex and the septotemporal axis of the dentate gyrus in rats: II. Cells projecting from lateral entorhinal subdivisions." Journal of Comparative Neurology, 270:506-516
- Collier, T.J.** and Sladek, J.R., Jr. (1988) "Neuronal transplantation in animal models of neurodegenerative disease." News in Physiological Sciences, 3: 204-206.
- Redmond, D.E., Jr., Naftolin, F., **Collier, T.J.**, Laranth, C., Robbins, R.J., Sladek, C.D., Roth, R.H., and Sladek, J.R., Jr. (1988) "Cryopreservation, culture, and transplantation of human fetal mesencephalic tissue into monkeys." Science, 242:768-771.
- Collier, T.J.** (1988) "Subpopulations, sites of interaction and therapy." Neurobiology of Aging, 9:729-730.
- Sladek, J.R. Jr., Redmond, D.E. Jr., **Collier, T.J.**, Elsworth, J.D., and Roth, R.H. (1989) "Transplantation advances in Parkinson's disease." Movement Disorders, 4 (Suppl. 1): S120-S125.
- Koh, S., Chang, P., **Collier, T.J.**, and Loy, R. (1989) "Loss of NGF receptor immunoreactivity in basal forebrain neurons of aged rats: correlation with spatial memory impairment." Brain Research, 498:397-404.
- Yurek, D.M., **Collier, T.J.**, and Sladek, J.R. Jr. (1990) "Embryonic mesencephalic and striatal co-grafts: Development of grafted dopamine neurons and functional recovery" Experimental Neurology, 109:191-199.
- Collier, T.J.**, Sladek, C.D., Gallagher, M.J., Gereau, R.W. IV, and Springer, J.E. (1990) "A diffusible factor(s) from adult rat sciatic nerve increases cell number and neurite outgrowth of cultured embryonic ventral mesencephalic tyrosine hydroxylase-positive neurons." Journal of Neuroscience Research, 27:394-399..
- Steece-Collier, K., **Collier, T.J.**, Sladek, C.D., and Sladek, J.R. Jr. (1990) "Chronic levodopa impairs morphological development of grafted embryonic dopamine neurons." Experimental Neurology, 110:201-208.
- Pearlman, S.H., Levivier, M., **Collier, T.J.**, Sladek, J.R. Jr., and Gash, D.M. (1991) "Striatal implants protect the host striatum against quinolinic acid toxicity". Experimental Brain Research, 84:303-310.
- Taylor, J.R., Elsworth, J.D., Roth, R.H., Sladek, J.R. Jr., **Collier, T.J.**, and Redmond, D.E. Jr. (1991) "Grafting of fetal substantia nigra to striatum reverses behavioral deficits induced by

- MPTP in primates: A comparison with other types of grafts as controls." Experimental Brain Research, 85:335-348.
- Yurek, D.M., Steece-Collier, K., **Collier, T.J.**, and Sladek, J.R. Jr. (1991) "Chronic levodopa impairs the recovery of dopamine agonist-induced rotational behavior following neural grafting." Experimental Brain Research, 86:97-107.
- Collier, T.J.** and Coleman, P.D. (1991) "Divergence of biological and chronological aging: Evidence from rodent studies." Neurobiology of Aging, 12:685-693.
- Collier, T.J.** and Springer, J.E. (1991) "Co-grafts of embryonic dopamine neurons and adult sciatic nerve into the denervated striatum enhance behavioral and morphological recovery in rats." Experimental Neurology, 114:343-350.
- Sladek, J.R. Jr., Elsworth, J.D., Roth, R.H., Evans, L.E., **Collier, T.J.**, Cooper, S.J., Taylor, J.R., and Redmond, D.E. Jr. (1993) "Fetal dopamine cell survival after transplantation is dramatically improved at a critical donor gestational age in non-human primates." Experimental Neurology, 122:16-27.
- Collier, T.J.**, Gallagher, M.J., and Sladek, C.D. (1993) "Cryopreservation and storage of embryonic rat mesencephalic dopamine neurons for one year: Comparison to fresh tissue in culture and neural grafts." Brain Research, 623:249-256.
- Collier, T.J.**, and Martin, P.N. (1993) "Commentary: Schwann cells as a source of neurotrophic activity for dopamine neurons." Experimental Neurology, 124:129-133.
- Sladek, J.R. Jr., **Collier, T.J.**, Elsworth, J.D., Taylor, J.R., Roth, R.H., and Redmond, D.E. Jr. (1993) "Commentary: Can graft-derived neurotrophic activity be used to direct axonal outgrowth of grafted dopamine neurons for circuit reconstruction in primates?" Experimental Neurology, 124:134-139.
- Junn, F., **Collier, T.**, Felten, S.Y., and Gash, D.M. (1994) "Rats with partial unilateral nigrostriatal lesions as a model for studying CNS plasticity." Neuroprotocols, 4:168-176.
- Collier, T.J.**, Elsworth, J.D., Taylor, J.R., Sladek, J.R. Jr., Roth, R.H., and Redmond, D.E. Jr. (1994) "Peripheral nerve-dopamine neuron co-grafts in MPTP-treated monkeys: Augmentation of tyrosine hydroxylase-positive fiber staining and dopamine content in host systems." Neuroscience, 61:875-879.
- Collier, T.J.** and Springer, J.E. (1994) "Neural graft augmentation through co-grafting: Implantation of cells as sources of survival and growth factors." Progress in Neurobiology, 44:309-331.
- Taylor, J.R., Elsworth, J.D., Sladek, J.R. Jr., **Collier, T.J.**, Roth, R.H., and Redmond, D.E. Jr. (1995) "Sham surgery does not ameliorate MPTP-induced behavioral deficits in monkeys." Cell Transplantation, 4:13-26.

- Elsworth, J.D., Sladek, J.R. Jr., Taylor, J.R., **Collier, T.J.**, Redmond, D.E. Jr., and Roth, R.H. (1995) "Early gestational mesencephalon grafts, but not later gestational mesencephalon, cerebellum, or sham grafts, increase dopamine in caudate nucleus of MPTP-treated monkeys." Neuroscience, 72:477-484.
- Steece-Collier, K., Yurek, D.M., **Collier, T.J.**, Junn, F.S., and Sladek, J.R. Jr. (1995) "The detrimental effect of levodopa on behavioral efficacy of fetal dopamine neuron grafts in rats is reversible following prolonged withdrawal of chronic dosing." Brain Research, 676:404-408.
- Yoshimoto, Y., Lin, Q., **Collier, T.J.**, Frim, D.M., Breakefield, X.O., and Bohn, M.C. (1995) "Astrocytes retrovirally transduced with BDNF elicit behavioral improvement in a rat model of Parkinson's disease." Brain Research, 691:25-36.
- Kordower, J.H., Rosenstein, J.M., **Collier, T.J.**, Burke, M.A., Chen, E-Y., Li, J.M., Martel, L., Levey, A.E., Mufson, E.J., Freeman, T.B., and Olanow, C.W. (1996) "Functional fetal nigral grafts in a patient with Parkinson's disease: Chemoanatomic, ultrastructural, and metabolic studies." The Journal of Comparative Neurology, 370:203-230.
- Collier, T.J.**, Redmond, D.E. Jr., Roth, R.H., Elsworth, J.D., Taylor, J.R., and Sladek, J.R. Jr. (1997) "Metabolic energy capacity of dopaminergic grafts and the implanted striatum in parkinsonian non-human primates as visualized with cytochrome oxidase histochemistry." Cell Transplantation, 6:135-140.
- Schauwecker, P.E., Cogen, J.P., Jiang, T., Cheng, H.W., **Collier, T.J.**, and McNeill, T.H. (1998) "Differential regulation of astrocytic mRNAs in the rat striatum after lesions of the cortex or substantia nigra." Experimental Neurology, 149:87-96.
- Sladek, J.R. Jr., **Collier, T.J.**, Elsworth, J.D., Roth, R.H., Taylor, J.R., and Redmond, D.E. Jr. (1998) "Intrastriatal grafts from multiple donors do not result in a proportional increase in survival of dopamine neurons in nonhuman primates." Cell Transplantation, 7:87-96.
- Sortwell, C.E., Blanchard, B.C., **Collier, T.J.**, Elsworth, J.D., Taylor, J.R., Roth, R.H., Redmond, D.E. Jr., Sladek, J.R. Jr. (1998) "Pattern of synaptophysin immunoreactivity within mesencephalic grafts following transplantation in a parkinsonian primate model." Brain Research, 791:117-124.
- Sortwell, C.E., **Collier, T.J.**, and Sladek, J.R. Jr. (1998) "Co-grafted embryonic striatum increases the survival of grafted embryonic dopamine neurons." Journal of Comparative Neurology, 399:530-540.
- Collier, T.J.**, and Sortwell, C.E. (1999) "Therapeutic potential of nerve growth factors in Parkinson's disease." Drugs & Aging, 14(4):261-287.

- Collier, T.J.**, Sortwell, C.E., and Daley, B.F. (1999) "Diminished viability, growth and behavioral efficacy of fetal dopamine neuron grafts in aging rats with long-term dopamine depletion. An argument for neurotrophic supplementation." The Journal of Neuroscience, 19:5563-5573.
- Elsworth, J.D., Taylor, J.R., Sladek, J.R. Jr., **Collier, T.J.**, Redmond, D.E. Jr., and Roth, R.H. (2000) "Striatal dopaminergic correlates of stable parkinsonism and degree of recovery in old-world primates one year after MPTP treatment." Neuroscience, 95:399-408.
- Ling, Z.D., **Collier, T.J.**, Sortwell, C.E., Lipton, J.W., Vu, T.Q., Robie, H.C., and Carvey, P.M. (2000) "Striatal trophic activity is reduced in the aged rat brain." Brain Research, 856:301-309.
- Leventhal, L., Sortwell, C.E., Hanbury, R., **Collier, T.J.**, Kordower, J.H., and Palfi, S. (2000) "Cyclosporin A protects striatal neurons in vitro and in vivo from 3-nitropropionic acid toxicity." Journal of Comparative Neurology, 425:471-478.
- Sortwell, C.E., Daley, B.F., Pitzer, M.R., McGuire, S.O., Sladek, J.R. Jr., and **Collier, T.J.** (2000) "Oligodendrocyte-type 2 astrocyte-derived trophic factors increase survival of developing dopamine neurons through inhibition of apoptotic cell death." Journal of Comparative Neurology, 426:143-153.
- Sortwell, C.E., Pitzer, M.R., and **Collier, T.J.** (2000) "Time course of apoptotic cell death within mesencephalic cell suspension grafts: Implications for improving grafted dopamine neuron survival." Experimental Neurology, 165:268-277.
- Sortwell, C.E., Camargo, M.D., Pitzer, M.R., Gyawali, S., and **Collier, T.J.** (2001) "Diminished survival of mesencephalic dopamine neurons grafted into aged hosts occurs during the immediate postgrafting interval." Experimental Neurology, 169:23-29.
- McGuire, S.O., Ling, Z.D., Lipton, J.W., Sortwell, C.E., **Collier, T.J.**, and Carvey, P.M. (2001) "Tumor necrosis factor alpha is toxic to embryonic mesencephalic dopamine neurons." Experimental Neurology, 169:219-230.
- Carvey, P.M., Ling, Z.D., Sortwell, C.E., Pitzer, M.R., McGuire, S.O., Storch, A., and **Collier, T.J.** (2001) "A clonal line of mesencephalic progenitor cells converted to dopamine neurons by hematopoietic cytokines: A source of cells for transplantation in Parkinson's disease." Experimental Neurology, 171:98-108.
- Collier, T.J.**, Sortwell, C.E., Elsworth, J.D., Taylor, J.R., Roth, R.H., Sladek, J.R. Jr., and Redmond, D.E. Jr. (2002) "Embryonic ventral mesencephalic grafts to the substantia nigra of MPTP-treated monkeys: Feasibility relevant to multiple target grafting as a therapy for Parkinson's disease." Journal of Comparative Neurology, 442:320-330.

- Counts, S.E., McGuire, S.O., Sortwell, C.E., Crawley, J.N., **Collier, T.J.**, and Mufson, E.J. (2002) "Galanin inhibits tyrosine hydroxylase expression in midbrain dopaminergic neurons." Journal of Neurochemistry, 83:442-451.
- Pitzer, M.R., Sortwell, C.E., Daley, B.F., McGuire, S.O., Marchionini, D., Fleming, M., and **Collier, T.J.** (2003) "Angiogenic and neurotrophic effects of vascular endothelial growth factor (VEGF165): studies of grafted and cultured embryonic ventral mesencephalic cells." Experimental Neurology, 182:435-445.
- Marchionini, D., **Collier, T.J.**, Camargo, M., McGuire, S.O., Pitzer, M.R., and Sortwell, C.E. (2003) "Interference with anoikis-induced cell death of dopamine neurons: implications for augmenting embryonic graft survival in a rat model of Parkinson's disease." Journal of Comparative Neurology, 464:172-179.
- Maries, E., Dass, B., **Collier, T.J.**, Kordower, J.H., and Steece-Collier, K. (2003) "The role of alpha-synuclein in Parkinson's disease: Insights from animal models." Nature Reviews Neuroscience, 4:739-750.
- Collier, T.J.**, Steece-Collier, and Kordower, J.H. (2003) "Primate models of Parkinson's Disease." Experimental Neurology, 183:258-262.
- Steece-Collier, K., **Collier, T.J.**, Danielson, P.D., Kurlan, R., Yurek, D.M., and Sladek, J.R. Jr. (2003) "Embryonic mesencephalic grafts increase levodopa-induced forelimb hyperkinesia in parkinsonian rats." Movement Disorders, 18:1442-1454.
- Collier, T.J.**, Greene, J.G., Felten, D.L., Stevens, S.Y., and Steece-Collier, K. (2004) "Reduced cortical noradrenergic neurotransmission is associated with increased neophobia and impaired spatial memory in aged rats." Neurobiology of Aging, 25:209-221.
- Marchionini, D.M., **Collier, T.J.**, Pitzer, M.R., and Sortwell, C.E. (2004) "Reassessment of caspase inhibition to augment grafted dopamine neuron survival." Cell Transplant., 13:273-282.
- Sortwell, C.E., **Collier, T.J.**, Camargo, M.D., and Pitzer, M.R. (2004) "An in vitro interval before transplantation of mesencephalic reaggregates does not compromise survival or functionality." Experimental Neurology, 187:58-64.
- Collier, T.J.**, Ling, Z.D., Carvey, P.M., Fletcher-Turner, A., Yurek, D.M., Sladek, J.R. Jr., and Kordower, J.H. (2005) "Striatal trophic activity in aging monkeys with unilateral MPTP-induced parkinsonism." Experimental Neurology, 191:S60-S67.
- Ariano, M.A., Grissell, A.E., Littlejohn, F.C., Buchanan, T.M., Elsworth, J.D., **Collier, T.J.**, and Steece-Collier, K. (2005) "Partial dopamine loss enhances activated caspase-3 activity: differential outcomes in striatal projection systems." J. Neurosci. Res., 82:387-396.

- Maries, E., Kordower, J.H., Chu, Y., **Collier, T.J.**, Sortwell, C.E., Oлару E., Shannon K., and Steece-Collier, K. (2006) "Focal not widespread grafts induce novel dyskinetic behavior in parkinsonian rats." Neurobiol. Disease, 21:165-180.
- Kanaan N.M., **Collier, T.J.**, Marchionini, D.M., McGuire, S.O., Fleming M.F., and Sortwell, C.E. (2006) "Exogenous erythropoietin provides neuroprotection of grafted dopamine neurons in a rodent model of Parkinson's disease." Brain Res., 1068:221-229.
- Kordower, J.H., Kanaan, N.M., Chu, Y., Suresh Babu, R., Stansell, J. III, Terpstra, B.T., Sortwell, C.E., Steece-Collier, K., and **Collier, T.J.** (2006) "Failure of proteasome inhibitor administration to provide a model of Parkinson's disease in rats and monkeys." Ann. Neurol., 60:264-268.
- McGuire, S.O., Sortwell, C.E., Shukitt-Hale, B., Joseph, J.A., Hejna, M.J., **Collier, T.J.** (2006) "Dietary supplementation with blueberry extract improves survival of transplanted dopamine neurons." Nutr. Neurosci., 9:251-258.
- Paumier, K.L., Terpstra, B.T., **Collier, T.J.** (2006) "To differentiate, or not to differentiate: An alternative approach to stem cell therapy for Parkinson's disease." Int. J. Neuroprotection and Neuroregeneration, 3(1):20-30.
- Sortwell, C.E., Bowers, W.J., Counts, S.E., Pitzer, M.R., Fleming, M.F., McGuire, S.O., Maguire-Zeiss, K.A., Federoff, H.J., **Collier, T.J.** (2007) "Effects of ex vivo transduction of mesencephalic reagggregates with bcl-2 on grafted dopamine neuron survival." Brain Res., 1134:33-44.
- Collier, T.J.**, Lipton, J., Daley, B.F., Palfi, S., Chu, Y., Sortwell, C., Bakay, R.A., Sladek Jr., J.R., Kordower, J.H. (2007) "Aging-related changes in the nigrostriatal dopamine system and the response to MPTP in nonhuman primates: Diminished compensatory mechanisms as a prelude to parkinsonism." Neurobiol. Dis., 26:56-65.
- Marchionini, D.M., Lehrmann, E., Chu, Y., He, B., Sortwell, C.E., Becker, K.G., Freed, W.J., Kordower, J.H., **Collier, T.J.** (2007) "Role of heparin binding growth factors in nigrostriatal dopamine system development and Parkinson's disease." Brain Res., 1147:77-88.
- Kanaan, N.M., Kordower, J.H., **Collier, T.J.** (2007) "Age-related accumulation of Marinesco bodies and lipofuscin in rhesus monkey midbrain dopamine neurons: Relevance to selective neuronal vulnerability." J. Comp. Neurol., 502:683-700.
- Terpstra, B.T., **Collier, T.J.**, Marchionini, D.M., Levine, N.D., Paumier, K.L., Sortwell, C.E. (2007) "Increased cell suspension concentration augments the survival rate of grafted tyrosine hydroxylase immunoreactive neurons." J. Neurosci. Meth., 166:13-19.
- Sladek, J.R. Jr., Bjugstad, K.B., **Collier, T.J.**, Bundock, E.A., Blanchard, B.C., Elsworth, J.D., Roth, R.H., Redmond, D.E. Jr. (2008) "Embryonic substantia nigra grafts show directional



- outgrowth to cogenerated striatal grafts and potential for pathway reconstruction in nonhuman primate.” Cell Transplantation, 17:427-444.
- Elsworth, J.D., Redmond, D.E. Jr., Leranth, C., Bjugstad, K.B., Sladek, J.R. Jr., **Collier, T.J.**, Foti, S.B., Samulski, R.J., Vives, K.P., Roth, R.H. (2008) “AAV2-mediated gene transfer of GDNF to the striatum of MPTP monkeys enhances the survival and outgrowth of co-implanted fetal dopamine neurons.” Exp. Neurol., 211:252-258.
- Kanaan, N.M., Kordower, J.H., **Collier, T.J.** (2008) “Age and region-specific responses of microglia, but not astrocytes, suggest a role in selective vulnerability of dopamine neurons after 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine exposure in monkeys.” Glia, May 15 Epub ahead of print.
- Kanaan, N.M., Kordower, J.H., **Collier, T.J.** (2008) “Age-related changes in dopamine transporters and accumulation of 3-nitrotyrosine in rhesus monkey midbrain dopamine neurons: relevance in selective neuronal vulnerability to degeneration.” Eur. J. Neurosci., 27:3205-3215.
- Lipton, J.W., Tolod, E.G., Thompson, V.B., Pei, L., Paumier, K.L., Terpstra, B.T., Lynch, K.A., **Collier, T.J.**, Sortwell, C.E. (2008) “3,4-Methylenedioxy-N-methamphetamine (ecstasy) promotes the survival of fetal dopamine neurons in culture.” Neuropharmacol., 55:851-859.
- Soderstrom, K.E., Meredith, G., Freeman, T.B., McGuire, S.O., **Collier, T.J.**, Sortwell, C.E., Wu, Q., Steece-Collier, K. (2008) “The synaptic impact of the host immune response in a parkinsonian allograft rat model: Influence on graft-derived aberrant behaviors.” Neurobiol. Dis., Jul 11 Epub ahead of print.
- Kanaan, N.M., Kordower, J.H., **Collier, T.J.** (2008) “Age-related changes in glial cells of dopamine midbrain subregions in rhesus monkeys.” Neurobiol. Aging, Aug 18 Epub ahead of print.
- Steece-Collier K., Soderstrom K, **Collier T.J.**, Sortwell C.E., and Lad E. (2009) “Impact of levodopa priming on dopamine neuron transplant efficacy and induction of involuntary movements in parkinsonian rats.” J. Comp. Neurol., 515:15-30.
- Madhavan L., Daley B.F., Paumier K.L., and **Collier T.J.** (2009) “Transplantation of subventricular zone neural precursors induces an endogenous precursor cell response in a rat model of Parkinson’s disease.” J. Comp. Neurol., 515:102-115.
- Redmond, D.E., Elsworth, J., Roth, R., Leranth, C., **Collier, T.J.**, Blanchard, B., Bjugstad, K., Samulski, R., Aebischer, P., and Sladed, J.R. Jr. (2009) “Embryonic substantia nigra grafts in the mesencephalon send neurites to the host striatum in non-human primate after overexpression of GDNF.” J. Comp. Neurol., 515:31-40.

- Madhavan, L, **Collier, T.J.** (2009) “A synergistic approach for neural repair: Cell transplantation and induction of endogenous precursor cell activity.” Neuropharmacol. Oct 22 [Epub ahead of print].
- Soderstrom, K.E., O’Malley, J.A., Levine, N.D., Sortwell, C.E., **Collier, T.J.**, Steece-Collier, K. (2010) “Impact of dendritic spine preservation in medium spiny neurons on dopamine graft efficacy and the expression of dyskinesias in parkinsonian rats.” Eur J Neurosci 31(3):478-90.
- Spieles-Engemann, A.L., Behbehani, M.M., **Collier, T.J.**, Wohlgenant, S.L., Steece-Collier, K., Paumier, K., Daley, B.F., Gombash, S., Madhavan, L., Mandybur, G.T., Lipton, J.W., Terpstra, B.T., Sortwell, C.E. (2010) “Stimulation of the rat subthalamic nucleus is neuroprotective following significant nigral dopamine neuron loss.” Neurbiol Dis. 39:105-15.
- Redmond, D.E., Weiss, S., Elsworth, J.D., Roth, R.H., Wakeman, D.R., Bjugstad, K.B., **Collier, T.J.**, Blanchard, B.C., Teng, Y.D., Snyder, E.Y., Sladek, J.R. (2010) “Cellular repair in the parkinsonian nonhuman primate brain.” Rejuvenation Res. 13:188-194.
- Spieles-Engemann, A.L., **Collier, T.J.**, Sortwell, C.E. (2010) “A functionally relevant and long-term model of deep brain stimulation of the rat subthalamic nucleus: advantages and considerations.” Eur. J. Neurosci. 32:1092-9.
- Collier, T.J.**, Kanaan, N.M, Kordower, J.H. (2011) “Ageing as a primary risk factor for Parkinson’s disease: evidence from studies of non-human primates.” Nat. Rev. Neurosci. 12:359-66.
- Kordower, J.H., Dodiya, H.B., Kordower, A.M., Terpstra, B., Paumier, K., Madhavan, L., Sortwell, C., Steece-Collier, K., **Collier, T.J.** (2011) “Transfer of host-derived alpha synuclein to grafted dopaminergic neurons in rat.” Neurbiol. Dis. 43:552-7.
- Spieles-Engemann, A.L., Steece-Collier, K., Behbehani, M.M., **Collier, T.J.**, Wohlgenant, S.L., Kemp, C.J., Cole-Strauss, A., Levine, N.D., Gombash, S.E., Thompson, V.B., Lipton, J.W., Sortwell, C.E. (2011) “Subthalamic nucleus stimulation increases brain derived neurotrophic factor in the nigrostriatal system and primary motor cortex.” J. Parkinsons Dis. 1:123-36.
- Gombash, S.E., Lipton, J.W., **Collier, T.J.**, Madhavan, L., Steece-Collier, K., Cole-Strauss, A., Terpstra, B.T., Spieles-Engemann, A.L., Daley, B.F., Wohlgenant, S.L., Thompson, V.B., Manfredsson, F.P., Mandel, R.J., Sortwell, C.E. (2012) “Striatal pleiotrophin overexpression provides functional and morphological neuroprotection in the 6-hydroxydopamine model.” Mol. Ther. 20:544-54.
- Madhavan, L., Daley, B.F., Sortwell, C.E., **Collier T.J.** (2012) “Endogenous neural precursors influence grafted neural stem cells and contribute to neuroprotection in the parkinsonian rat.” Eur. J. Neurosci., 35:883-95.

Paumier, K.L., Siderowf, A.D., Auinger, P., Oakes, D., Madhavan L., Espay, A.J., Revilla, F.J., **Collier T.J.**, Parkinson Study Group Genetics and Epidemiology Working Group. (2012) "Tricyclic antidepressants delay the need for dopaminergic therapy in early Parkinson's disease." *Mov. Disord.*, 27:880-7.

**Book Chapters: (30 total).**

Sladek, J.R., Jr., Gash, D.M. and **Collier, T.J.** (1984) "Transplantation of peptidergic and aminergic neurons." In: Neuropharmacology and Central Nervous System-Therapeutic Aspects. Alan Liss, Inc., N.Y., N.Y., pp. 211-217.

**Collier, T.J.**, Gash, D.M., Bruemmer, V. and Sladek, J.R., Jr. (1985) "Impaired regulation of arousal in old age and the consequences for learning and memory: Replacement of brain norepinephrine via neuron transplants improves memory performance in aged F344 rats." Homeostatic Function and Aging, B.B. Davis and W.G. Wood (Eds.). Raven Press, New York, pp. 99-110.

Sladek, J.R., Jr., Aravich, P.F., **Collier, T.J.**, Davis, B.J. and Phelps, C.J. (1986) "Plasticity of neuronal interactions: Monoamines and neuropeptides." Neuroregulation of Autonomic, Endocrine and Immune Systems, R.C.A. Frederickson, H.C. Hendrie, J.N. Hingtgen and M.H. Aprison (Eds.). Martinus Nijhoff: Boston, Mass., pp. 89-105.

Sladek, J.R., Jr., Redmond, D.E., Jr., **Collier, T.J.**, Haber, S.N., Elsworth, J.D., Deutch, A.Y., and Roth, R.H. (1987). "Transplantation of fetal dopamine neurons in primate brain reverses MPTP induced Parkinsonism." Progress in Brain Research, F.J. Seil, E. Herbert and B. Carlson (Eds.), 71: 309-323.

**Collier, T.J.**, Gash, D.M. and Sladek, J.R., Jr. (1987) "Norepinephrine deficiency and behavioral senescence in aged rats: Transplanted locus coeruleus neurons as an experimental replacement therapy." Annals New York Academy of Sciences: Cell and Tissue Transplantation into the Adult Brain; E. Azmitia and A. Björklund (Eds.), 495:396-403.

Silverman, W.F., Aravich, P.F., **Collier, T.J.**, Olschowka, J.A., and Sladek, J.R., Jr. (1987) "Catecholamine fibers form synaptic contacts with hypothalamic neurons transplanted adjacent to the medial forebrain bundle in rats." Annals New York Academy of Sciences: Cell and Tissue Transplantation into the Adult Brain; E. Azmitia and A. Björklund (Eds.), 495:788-791.

Sladek, J.R., Jr., **Collier, T.J.**, Haber, S.N., Deutch, A.Y., Elsworth, J.D., Roth, R.H., and Redmond, D.E., Jr., (1987) "Reversal of Parkinsonism by fetal nerve cell transplants in primate brain." Annals New York Academy of Sciences: Cell and Tissue Transplantation into the Adult Brain; E. Azmitia and A. Björklund (Eds.), 495:641-657.

**Collier, T.J.** (1987) "The role of brain opioid systems in perception of reward and anhedonia." In: Anhedonia and Affect Deficit States, D.C. Clark and J. Fawcett (Eds.), PMA Publishing Corp., New York, pp. 147-166.

- Collier, T.J.**, Redmond, D.E., Jr., Roth, R.H., and Sladek, J.R., Jr. (1988) "Neural cell replacement in a primate model of Parkinsonism." Banbury Center Report 27: Molecular Neuropathology of Aging; Cold Spring Harbor Laboratory, pp. 125-136.
- Sladek, J.R. Jr., Redmond, D.E. Jr., **Collier, T.J.**, Blount, J.P., Elsworth, J.D., Taylor, J.T., and Roth, R.H. (1988) "Fetal dopamine neural grafts: Long term reversal of MPTP induced Parkinsonism in monkeys." In: Transplantation into the Mammalian CNS; Progress in Brain Research, D.M. Gash and J.R. Sladek Jr. (Eds.), Elsevier, Amsterdam, 78:497-506.
- Collier, T.J.**, Sladek, C.D., Gallagher, M.J., Blanchard, B.C., Daley, B.F., Foster, P.N. Redmond, D.E. Jr., Roth, R.H., and Sladek, J.R. Jr. (1988) "Cryopreservation of fetal rat and non-human primate mesencephalic neurons: Viability in culture and neural transplantation." In: Transplantation into the Mammalian CNS; Progress in Brain Research, D.M. Gash and J.R. Sladek Jr. (Eds.), Elsevier, Amsterdam, 78:631-636.
- Springer, J.E., **Collier, T.J.**, Notter, M.F.D., Loy, R., and Sladek, J.R. Jr. (1988) "Central nervous system grafts of nerve growth factor-rich tissue as an alternative source of trophic support for axotomized cholinergic neurons." In: Transplantation into the Mammalian CNS; Progress in Brain Research, D.M. Gash and J.R. Sladek Jr. (Eds.), Elsevier, Amsterdam, 78:401-407.
- Springer, J.E., **Collier, T.J.**, Notter, M., Loy, R., and Sladek, J.R., Jr. (1988) "Transplants of NGF-rich tissue increases survival and regeneration of axotomized cholinergic neurons in the basal forebrain." Neural Development and Regeneration, A. Gorio et. al. (Eds.), NATO ASI Series, Vol. H22: 683-685.
- Redmond, D.E. Jr., Sladek, J.R. Jr., Roth, R.H., **Collier, T.J.**, Elsworth, J.D., Taylor, J.R., Deutch, A.Y., and Haber, S.N. (1988) "Transplanted fetal dopamine neurons: A future treatment for Parkinson's disease?" In: Progress in Catecholamine Research, Part B: Central Aspects, Alan Liss Inc., N.Y., N.Y., pp. 117-123.
- Collier, T.J.**, Redmond, D.E. Jr., Roth, R.H., Elsworth, J.D., and Sladek, J.R. Jr. (1988) "Reversal of experimental parkinsonism in African green monkeys following fetal dopamine neuron transplantation." In: Progress in Parkinson's Research, F.F. Hefti and W.J. Weiner (Eds.), Plenum Publishing, New York, pp. 211-218.
- Collier, T.J.** and Sladek, J.R. Jr. (1989) "Can fetal cell grafts be expected to ameliorate the symptoms of human neurodegenerative disorders? Evidence from animal models." In: Neuronal Grafting and Alzheimer's Disease, F. Gage, A. Privat and Y. Christen (Eds.), Springer-Verlag, Berlin, pp. 120-129.
- Collier, T.J.** (1989) "Neural transplantation in Alzheimer's disease: The evidence from animal models." In: Alzheimer's and Parkinson's Diseases. Recent Advances in Research and Clinical Management, H.J. Altman and B.N. Altman (Eds.), Plenum Press, New York, pp. 291-324.

- Elsworth, J.D., Redmond, D.E. Jr., Sladek, J.R. Jr., Deutch, A.Y., **Collier, T.J.** and Roth, R.H. (1989) "Reversal of MPTP-induced parkinsonism in primates by fetal dopamine cell transplants." In: Function and Dysfunction of the Basal Ganglia, A.J. Franks, J.W. Ironside, R.H.S. Mindham, R.J. Smith, E.G.S. Spokes and W. Winlow (Eds.), Manchester University Press, Manchester and New York, pp. 161-180.
- Sladek, J.R. Jr., **Collier, T.J.**, Elsworth, J.D., Taylor, J.R., Roth, R.H., and Redmond, D.E. Jr. (1990) "Neural transplantation for experimental parkinsonism." In: *Molecular Neurobiology and Neuropharmacology*, 9, Miami Bio/Technology Winter Symposium Conference Proceedings, ICSU Press.
- Steece-Collier, K., Yurek, D.M., **Collier, T.J.**, and Sladek, J.R. Jr. (1991) "Neuropharmacological interactions of levodopa and dopamine grafts: Possible impaired development and functions of grafted embryonic neurons." In: *Intracerebral Transplantation in Movement Disorders*, O. Lindvall, A. Bjorklund and H. Widner (Eds.), Elsevier, Amsterdam, pp. 325-331.
- Collier, T.J.** (1994) "Neural graft augmentation through co-grafting of cells as sources of important molecules: Studies in animal models of Parkinson's disease." In: *Neural Transplantation, CNS Neuronal Injury and Regeneration, Recent Advances*, J. Marwah, H. Teitelbaum and K.N. Presad (Eds.), CRC Press, Boca Raton, FL, pp. 39-46.
- Collier, T.J.** and Kordower, J.H. (1995) "Fetal nigral transplants for Parkinson's disease. A preclinical and clinical prospectus." In: *Therapy of Parkinson's Disease*, W.C. Koller and G. Paulson (Eds.), Marcel Dekker Inc., New York, pp. 403-421.
- Sladek, J.R. Jr., Elsworth, J.D., Roth, R.H., Blanchard, B.C., Taylor, J.R., **Collier, T.J.**, and Redmond, D.E. Jr. (1995) "Co-grafts in dopamine-depleted primates: Preliminary results and theoretical issues related to human applications for Parkinson's disease." In press.
- McNeill, T.H., **Collier, T.J.**, and Hefti, F. (1997) "Neurotransmitter and neurotrophic factors/" In: *Encyclopedia of Gerontology*, J.E. Birren et al. (Eds.), Academic Press, New York.
- Collier, T.J.**, and Sladek, J.R. Jr. (1997) "Parkinson's disease: Biological basis and therapy." In: *Encyclopedia of Human Biology*.
- Collier, T.J.**, and Kordower, J.H. (1998) "Neural transplantation for the treatment of Parkinson's disease: Present day optimism and future challenges." In: *Parkinson's Disease and Movement Disorders, Third Edition*, J. Jankovic and E. Tolosa (Eds), Williams and Wilkins, Baltimore, MD., pp. 1065-1083.
- Kordower, J.H., and **Collier, T.J.** (1999) "Cholinergic basal forebrain grafts in rodent and nonhuman primate models of Alzheimer's disease." In: *CNS Regeneration: Basic Science and Clinical Advances*, M.H. Tuszynski and J.H. Kordower (Eds.), Academic Press, San Diego, CA., pp. 555-580.

Sladek, J.R. Jr., **Collier, T.J.**, Elsworth, J.D., Roth, R.H., Taylor, J.R., and Redmond, D.E. Jr. (1999) "Fetal grafts in Parkinson's disease. Primate models." In: CNS Regeneration: Basic Science and Clinical Advances, M.H. Tuszynski and J.H. Kordower (Eds.), Academic Press, San Diego, CA., pp.321-364.

**Collier, T.J.**, and Sladek, J.R. Jr. (2001) "Transplantation." In: Encyclopedia of the Human Brain, V.S. Ramachandran (Ed.), Academic Press, San Diego, CA., Vol. 4, 623-634.

**Collier, T.J.**, Steece-Collier, K., McGuire, S.O., and Sortwell, C.E. (2003) "Cellular models to study dopaminergic injury responses." In: Parkinson's Disease. The Life Cycle of the Dopamine Neuron, H.J. Federoff, R.E. Burke, S. Fahn, and G. Fiskum (Eds), Annals of the New York Academy of Sciences, 991:140-151.

### **PATENTS**

United States Patent Number 5,215,969, "Dopaminergic neurotrophic factor for treatment of Parkinson's disease", issued June 1, 1993, expires May 31, 2010.

United States Patent Number 7,459,152, "Erythropoietin administration to improve graft survival", issued December 2, 2008.

United States Patent Number 7,595,295, "Use of pleiotrophin to promote neurogeneration", issued September 29, 2009.

### **SELECTED INVITED PRESENTATIONS**

"Entorhinal cortex (EC): Catecholamine fluorescence and nissl staining of identical sections." Platform presentation, Society for Neuroscience, Toronto, Canada, 1976.

"Electrophysiological guidance of hippocampal electrodes for intracranial self-stimulation (ICSS) in angular bundle, perforant path and dentate gyrus." Platform presentation, Society for Neuroscience, Cincinnati, OH, 1980.

"Remembering rewards in the environment: Endogenous hippocampal opiates modulate reinforcement-memory associations." Platform presentation, Society for Neuroscience, Los Angeles, CA, 1981.

"Behavioral senescence and brain norepinephrine systems: Transplanted noradrenergic neurons as replacement therapy in aged rats." Conference on Homeostatic Functions in the Elderly, St. Louis, MO, 1984.

"Transplantation of norepinephrine-containing neurons: Amelioration of behavioral deficits related to brain norepinephrine deficiency in aged rats." Conference on Neural Grafts and Potential Therapeutic Approaches to Neurological Disease, Los Angeles, CA, 1986.

"Norepinephrine deficiency and behavioral senescence in aged rats: Transplanted locus coeruleus neurons as an experimental replacement therapy." New York Academy of

Sciences Conference on Cell and Tissue Transplantation into the Adult Brain, New York, NY, 1986.

"Cryopreservation of fetal rat and non-human primate mesencephalic neurons: Viability in culture and neural transplantation." Platform presentation, Schmitt Symposium: Transplantation into the Mammalian CNS; Rochester, NY, 1987.

"Intracerebral grafting and culture of cryopreserved primate and rat dopamine neurons." Platform presentation, Society for Neuroscience, New Orleans, LA, 1987.

"Neural cell replacement in a primate model of parkinsonism." Banbury Center Conference on the Neurochemistry of Aging, Cold Spring Harbor, NY, 1987.

"Neural transplantation as a treatment for experimental parkinsonism." Conference on Neural Plasticity, Colgate University, 1987.

"Reversal of experimental parkinsonism in African green monkeys following fetal cell transplantation." First National Parkinson's Foundation Meeting on Parkinson's Research, Miami, FL, 1988.

"Brain graft reversal of benign forgetfulness in senescent rodents and lesion-induced degeneration in non-human primates." Gordon Research Conference on the Biology of Aging, Ventura, CA, 1988.

"Intracerebral tissue grafts in animal models of aging and dementia." Invited presentation, and chairman of the session on Treatment Strategies, The Third National Conference on Alzheimer's Disease and Dementia: Problems, Prospects and Perspectives, Wayne State University, Detroit, MI, 1988.

"Reversal of age-related transmitter dysfunctions by neural transplants." American Physiological Society/American Society for Pharmacology and Experimental Therapeutics, Montreal, Canada, 1988.

"Can neural grafts be effective in treatment of human neurodegenerative disease? Evidence from animal models." University of Southern California Neurobiology Graduate Student Association Lecturer, University of Southern California, Los Angeles, CA, 1989.

"Progress in brain cell transplantation as an experimental therapy." First Annual Parkinson's Disease Symposium, PEP/UPS-APDA, University of Rochester Medical Center, Rochester, NY, 1989.

"Factors promoting survival and growth of dopamine neurons: Applications for neural grafting in the basal ganglia". Cajal Club Symposium on Integration in the Basal Ganglia, American Association of Anatomists annual meeting, Philadelphia, PA, 1990.

- "Dopamine neuron grafts: Reduced viability with concurrent levodopa treatment; enhancement by a peripheral nerve factor". Invited presentation (with K. Steece-Collier), Neurology Grand Rounds, University of Rochester Medical Center, Rochester, NY, 1990.
- "Neural graft augmentation through co-grafting of cells as sources of important molecules: Studies in animal models of Parkinson's disease." Division of Research Grants-National Institutes of Health Workshop on Recent Advances in Neural Transplantation, CNS Neural Injury, and Regeneration, San Pedro, CA, 1992.
- "Cell transplantation therapies in Alzheimer's disease." International Business Communications sponsored symposium on: Alzheimer's Disease, Advances in Understanding and Treatment, Philadelphia, PA, 1993.
- "Experimental therapeutics in animal models of aging and neurodegeneration: Cells as sources of important molecules." Neurological Sciences Grand Rounds, Rush Medical School, Chicago, IL, 1993.
- "Neural transplantation in animal models of human neurodegenerative disease." Department of Anatomy and Neurobiology, Saint Louis University School of Medicine, St. Louis, MO, 1993.
- "Are there viable animal models of neurodegenerative diseases?: MPTP." Workshop, American Society for Neurochemistry, Albuquerque, NM, 1994.
- "Cell transplantation therapies for the injured dopamine system." Finch University for Health Sciences, Department of Neuroscience, The Chicago Medical School, North Chicago, IL, 1995.
- "The MPTP model of Parkinson's disease: Development of new therapeutic strategies." Annual meeting of the the Chicago Chapter Society for Neuroscience, Chicago, IL, 1995.
- "The schwann cell neurotrophic cocktail: A tool for treatment of Parkinson's disease?" Department of Anatomy and Neurobiology, Texas A&M University College of Medicine, College Station, TX, 1996.
- "Age-related changes in the locus coeruleus noradrenergic system: Aged rats benefit from norepinephrine replacement." Department of Anatomy, University of Illinois-Chicago, Chicago, IL, 1996.
- "The use of genetically engineered cells and stem cells in neural transplantation." 11th Annual Meeting of the American Academy of Clinical Neurophysiology, Chicago, IL, 1996.
- "28 month old rats with a 16 month history of unilateral nigrostriatal lesion: Drug-induced behavior and response to grafted dopamine neurons and Schwann cells." Platform presentation, Society for Neuroscience, Washington, D.C., 1996.



- “Neural grafting for Parkinson’s disease: Remaining challenges.” Neurological Sciences Grand Rounds, Rush Medical School, Chicago, IL., 1997.
- “Strategies for augmentation of dopamine graft viability during the first week after transplantation.” American Society for Neural Transplantation and Repair, Clearwater, FL, 2000.
- “Experimental Therapeutics for Parkinson’s Disease.” Parkinson’s Disease Foundation Patient Symposium, University of Illinois-Chicago, Chicago, IL, 2001.
- “Neural stem cells: An overview.” AstraZeneca CNS advisory board meeting, San Juan, P.R., 2002.
- “The effects of aging on the response to experimental therapeutics for Parkinson’s disease.” Society for Neuroscience, Chicago Chapter, Chicago, IL, 2002.
- “The impact of aging on the therapeutic environment: The features of parkinsonism in in adult and aged MPTP-treated monkeys.” International Society for Neural Transplantation and Repair, Keystone, CO, 2002.
- “Cellular models to study dopaminergic injury responses.” New York Academy of Sciences, New York, NY, 2002.
- “Inhibition of microglial activation by minocycline treatment enhances survival of grafted embryonic dopamine neurons.” American Society for Neural Transplantation and Repair, Clearwater, FL, 2003.
- “Animal models of neurodegeneration: How far do they go?” 3<sup>rd</sup> Cincinnati Translational Neuroscience Symposium,” Cincinnati, OH, 2005.
- “Can cell transplantation be a viable therapy for Parkinson’s disease?” University of Louisville, Louisville, KY, 2005.
- “Can cell transplantation be a viable therapy for Parkinson’s disease?” Iowa State University, Ames, IA, 2005.
- “Nature, nurture, and cell transplantation for Parkinson’s disease.” University of Kentucky, Lexington, KY, 2007.
- “Exercise neurobiology and Parkinson’s disease.” Exercise and the Brain Symposium, Stanford University, Palo Alto, CA, 2008.
- “Aging and Parkinson’s disease: Models of therapeutics and neurologic comorbidity.” Michigan State University, East Lansing, MI., 2008.

“Aging and Parkinson’s disease: The connection revisited.” Presidential Lecture, American Society for Neural Therapy and Repair, Clearwater, FL, 2008.

“The impact of lifestyle on the biology of Parkinson’s disease.” Davis Phinney Foundation Victory Summit, Denver, CO, 2008.

“Aging and Parkinson’s disease: A continuum of cellular mechanisms involved in dopamine neuron viability.” Society for Neuroscience, Washington, D.C., 2008.

“The impact of lifestyle on the biology of Parkinson’s disease.” Davis Phinney Foundation Victory Summit, Tucson AZ, January 2010.

“Dopamine system plasticity in parkinsonism and experimental therapeutics.” Vanderbilt University, Neuroscience Graduate Program Invited Speaker, April 2011.

“The amitriptyline antidepressant neuroprotection effect in an animal model of Parkinson’s disease.” Grand Challenges in Parkinson’s Disease: Targets for Disease Modifying Therapies, Grand Rapids, MI, September 2012