David Richard Canning

Home Address:

1260 Todd Road,

Almo, KY 42020

Date of Birth: 08/20/1961

Citizenship: USA

Marital Status: Married, three children

Office Address:

Department of Biological Sciences,

Murray State University,

Murray, KY 42071

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Education

DPhil, University of Oxford, United Kingdom

Department of Human Anatomy, Faculty of Physiological Sciences, 1990

Thesis title: "Mechanisms of formation of the embryonic axis"

BSc (Honours). University of Manchester, United Kingdom

Genetics & Cell Biology, Faculty of Science, 1983

Research Experience

Associate Professor, Murray State University

Department of Biological Sciences, 1996- present, (tenured and promoted from assistant professor 2001)

Research on the role of neural stem cells in embryonic development and neurodegenerative diseases

Senior Research Associate, Case Western Reserve University Medical School

Department of Neurosciences, 1993-1996

Research on the molecular mechanisms of glial cell reactions in Alzheimer's disease

Research Associate, Case Western Reserve University Medical School

Department of Genetics, 1990-1992

Research on neural cell adhesion molecules in embryonic development

Research Assistant. University of Manchester Medical School

Department of Immunology, 1983-1985

Research on the cellular responses to antigen presentation in the immune system

Teaching Experience

Murray State University	500/600 level	Medical Cell Biology Immunology Advanced Cell & Molecular Biology Advanced Cell Metabolism Cell Biology Laboratory
	300/400 level	Vertebrate Embryology Cell Biology: Systems Cell Biology: Mechanisms
	100 level	The Cellular Basis of Life Biological Concepts
Christ Church College, University of Oxford	3rd year pre-clinical medical students	Principles of Experimental Immunology
Manchester University Medical School	2nd year pre-clinical medical students	Immunology

Professional Memberships

Member of the Society for Developmental Biology

Member of the Society for Neuroscience

Fellow Member of Lincare College, Oxford

Honors and Scholarships

NIH:Post-Doctoral Fellowship, $62,000, 1991-94

Medical Research Council Studentship, $32,000, 1985-88

Research Grants

NSF:EPSCoR "Gene Expression Profiles in the Early Chick Embryo" D.R. Canning, $20,226 (2006-2008)

NIH 1P20 RR15576 Centers of Biomedical Research Excellence. "Central Nervous System and Repair" S. Whittemore & D.R. Canning, $184,778 (1999-2004)

NIH: NCRR "Creation of the Kentucky Biomedical Research Infrastructure Network". $187,000. (2000-2004).

NIH: KBRIN Supplemental Research Initiative. Gene Expression of Reactive Astrocytes in Alzheimer's Disease. $100,00. (2002-2004).

HHMI: Collaborative Faculty Development Grant. "Simulation of microchips with embryonic neurons", D.R. Canning & J. Crofton. $20,000 (2002-2003)

NIH: Academic Research Enhancement Award R15 NS38886 "In vitro modelling of reactive gliosis", D.R. Canning, $108,746 (1999-03)

NSF: Course, Curriculum and Laboratory Improvement " Reconstructing the Introductory Biology Curriculum using Inquiry-Based Approaches" T. Derting, D.R. Canning, S. Wright, W. Spencer, C. Fuller. $179, 815. (1999-2002).

NSF: EPSCoR "Extracellular matrix effects during gastrulaton in the avian embryo" D.R. Canning, $21,220. (1998-99)

NSF: EPSCoR "Molecular mechanisms of cell sorting in the chick embryo" D.R. Canning, $19,975. (1997-98)

Gliatech Inc Research Initiative Award, "Molecular modelling of Alzheimer's Disease", D.R. Canning, $86,000, 1994-96

Research Contracts

Pilgrims Pride Incorporated: Research Contract, $15,000. (2005-10).

Seabord Incorporated: Private Research Contract, $12,000 (1996-2000).

Other Funding

HHMI: "Undergraduate Education Research Initiative" Co-author of proposal submitted by K. Alexander, funded to the College of Science & Technology, $1,500,000, 2000-04Publications

Publications

"Microarray Analysis of Reactive Astrocytes in Vitro." WC Spencer & D.R. Canning. (2004) **Gene Expression Omnibus**; GEO accession: GSE856

"Control of Gene Expression by Chondroitin Sulfate in the Presumptive Head Region of Chick Embryos." Satinder K. Sidhu and David R. Canning. (2004) **Developmental Biology** 271, p580.

"Inhibition of Differentiation by Chondroitin Sulfate in the Early Chick Embryo." Satinder Sidhu, Ethan Richard & David R. Canning. (2003) **Developmental Biology** 259 p489.

"Teratogenicity of Positive DUV Photoresist in a Model System of Early Embryonic Development." V. M. Steele, R.J. Keller, R. C. Gupta, and D.R. Canning. (2001), **Journal of Toxicology Methods** 11, p1.

"Teaching the structural nature of biological molecules: Molecular visualization in the classroom and in the hands of students." David R. Canning & James R. Cox. (2001), **Chem. Educ. Res. Prac. Eur.** 2, p109.

"Regulation of epiblast cell movements by chondroitin sulfate during gastrulation in the chick embryo." David Canning, Taneem Amin & Ethan Richard, (2000) **Developmental Dynamics** 219, 545-559.

"The role of chondroitin sulfate in early avian development. Canning, D.R., Abubaker, A. & Amin, T. (1999) **Developmental Biology** 210, p242.

"Developmental Biology - Werner A. Muller" Invited Review. D.R. Canning, (1997) The **Quarterly Review of Biology**, 72, p470.

"A potent inhibitor of neurite outgrowth that predominates in the extracellular matrix of reactive astrocytes." Canning, D. R., Hoke, A. H., Malemud, C. & Silver, J. (1996). International **Journal of Developmental Neuroscience** 14, p153.

"Regional differences in reactive gliosis induced by substrate-bound beta-amyloid." Hoke, A. H., Canning, D. R., Malemud, C. J. & Silver, J. (1994). **Experimental Neurology** 130, p56.

"Glial cell extracellular matrix in Alzheimer's disease." DeWitt, D. A., Canning, D. R., Silver, J. & Perry, G. (1994). In: Non-neuronal cells in Alzheimer's disease.

"ß-amyloid of Alzheimer's disease induces reactive gliosis that inhibits axonal outgrowth." Canning, D. R., McKeon, R. J., Dewitt, D. A.,Perry, G., Wujek, J., Frederickson, R. & Silver, J. (1993). **Experimental Neurology** 124, p289.

"Chondroitin sulfate proteoglycans are associated with the lesions of Alzheimer's disease." DeWitt, D. A., Silver, J., Canning, D. R. & Perry, G. (1993). **Experimental Neurology** 121, p149.

"Dynamic changes in the distribution of chondroitin sulfate in the retina: A key regulator of neural patterning." Brittis, P. A., Canning, D.R. & Silver, J. (1992). **Science** 255, p733.

"Molecular inhibition during retinal development and optic nerve regeneration." Brittis, P. A., Canning, D. R. & Silver, J. (1991). In: Principals and Practice of Opthalmology.

"Origin of cells giving rise to mesoderm and endoderm in the chick embryo." Stern, C. D. & Canning, D. R. (1990). **Nature**. 343, p273.

"Changes in the expression of the carbohydrate epitope HNK-1 associated with mesoderm induction in the chick embryo." Canning, D. R.& Stern, C. D. (1988). **Development** 104, p643.

"Gastrulation in birds: a model system for the study of animal morphogenesis." Stern, C. D. & Canning, D. R. (1988). **Experientia** 44, p651.

"A comparison between antigen-laden cells and dendritic cells in afferent and efferent lymph." Drayson, MT, Canning, DR & Bell, EB. (1985). Advances in Experimental Medicine and Biology. 186, p401

Presentations

Gene Expression Quantification in Reactive Astrocytes. Tyler Clark & David Canning, (2006) Posters at the Capitol, Frankfort, KY

Control of Gene Expression by Chondroitin Sulfate in the Presumptive Head Region of Chick Embryos. (2004) Satinder Sidhu & David Canning, Annual Meeting of the International Society of Developmental Biology, Calgary, Canada

Inhibition of differentiation by chondroitin sulfate in the early chick embryo. Satinder Sidhu & David Canning, (2004) Posters at the Capitol, Frankfort, KY

Modulation of Astrogliosis in Preparation for Stem Cell Transplantation. W.C. Spencer and D.R. Canning. (2003) 89th Annual Meeting of the Kentucky Academy of Sciences, Bowling Green, KY.

In vitro Modeling of Reactive Gliosis. W.C. Spencer and D.R. Canning. (2003), Morphogenesis and Regenerative Medicine Symposium, University of Virginia, Charlottesville, VA.

Responses of Neuronally-Restricted Precursor Cells to Gliosis in vitro. D.R. Canning (2002), Spinal Cord Research Center, University of Louisville, KY

The R15 Process in Neuroscience.D.R. Canning (2002), Northern Kentucky University, KY

Enhancing Biomedical Research at Murray State University. D.R. Canning, (2003), KBRIN Symposium. University of Louisville

Analysis of astrocyte gene expression by cDNA microarrays. D.R. Canning, (2002), KBRIN Symposium. Eastern Kentucky University, KY

Positive DUV Photoresist-induced Teratogenicity in Chick Embryo. V.Steele, R.J. Keller, R.C. Gupta, D.R. Canning. Society of Toxicology, (2001) Proceedings of the 40th Annual Meeting, San Francisco, CA.

Teratogenicity in Avian Embryos Upon Exposure to Positive Photoresist. V. Steele & D.R. Canning, (2000) In: Semiconductor Safety Issues, Proceedings of the International Conference on Semiconductor Safety, Washington DC.

Cytodifferentiation in the CAPE of the Early Chick Embryo. Ethan Richard & David R. Canning, (2000) Annual Conference of the South Eastern Society for Developmental Biology, Atlanta, GA

Dispersal of Primitive Streak Precursors following removal of Chondroitin Sulfate. Taneem Amin & David R. Canning, (2000) Annual Conference of the South Eastern Society for Developmental Biology, Atlanta, GA

Teratogenicity Exposure Assessment using an Avian Embryo Model System, (2000) Proceedings of the American Industrial Hygiene Conference and Exposition, Orlando, FL.

Extracellular Matrix Effects During Early Avian Development (1999), Taneem Amin, Ethan Richard & David R. Canning, Kentcuky Academy of Sciences Annual Meeting, Richmond, KY.

Extracellular Matrix Effects on Cell Sorting During Primitive Streak Formation, (1998), Kevin Harned & David Canning, Annual Conference of the South Eastern Society for Developmental Biology, Atlanta, GA

Molecular analysis of differentially reactive astrocytes. Bethea, J. , Canning, D.R., Silver, J. (1996). Neuroscience Abstracts, 22:1231

Significant Committee Memberships

Chair of the University Research Policy Commitee

Member of the Kentucky Scientific Advisory Board for the Kentucky Biomedical Research Infrastructure Network

Member of the University Institutional Review Board, Murray State University (2000-2006)

Member of the College Pre-Med Evaluation Committee

Chaired Departmental Search Committees, and been a member on several other Search committees

Faculty Senate Finance Committee (1998-2000)

Graduate Students Mentored

Jessica Etheridge, thesis: Chondroitin Sulfate Effects on Embryonic Cell Adhesion

Veronica Ingland, thesis: Annexin VI Expression and Possible Function in the Early Chick Embryo

Ethan Richard, thesis: Differentiation Potencies of the CAPE of the Avian Embryo

William Clay Spencer, thesis: Differential Gene Expresson of Reactive Astrogliosis

Satinder Sidhu - transferred to PhD program, University of Alberta

Tyler Clark - transferred to Ohio State University graduate program

Taneem Amin - presently research assistant at Vanderbilt Medical School

Other

Editorial Board of the journal “Frontiers in Bioscience”

Grant Reviewer for the Wellcome Trust, United Kingdom
Reviewer of the journal Developmental Biology