BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
C. Edward Dixon	Professor and Vice-Chairman, Neurological Surgery; Neurotrauma Chair in Neurosurgery
eRA COMMONS USER NAME (credential, e.g., agency login) edixon	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Virginia Commonwealth University, Richmond, VA	BA	1981	Psychology
Virginia Commonwealth University, Richmond, VA	MS	1984	Physiol Psychology
Virginia Commonwealth University, Richmond, VA	PhD	1985	Physiol Psychology

A. Personal Statement

Dr. Dixon has over 30 years experience in the study of traumatic brain injury and has contributed significantly to the evolution of animal models of traumatic brain injury, including the development and characterization of the first rat fluid-percussion & control cortical impact models of traumatic brain injury, & has published extensively on neurochemical mechanisms of posttraumatic cognitive deficits. Dr. Dixon has mentored & supervised undergraduate and graduate students, & postdoctoral & clinical research fellows in basic and translational research for over 20 years. He has participated in the MSTP for over 6 years.

B. Positions and Honors

1985-1986 NIH National Research Service Award for Postdoc. Fellows, Neurosurgery, Med. Coll, VA
1986-1987 Postdoctoral Fellow, Neurotrauma Group, General Motors Research Laboratories
1987-1989 Assistant Professor, Division of Neurological Surgery, Medical College of Virginia
1989-1991 Assistant Professor, Rehabilitative Medicine, Medical College of Virginia
1991-1995 Assistant Professor, Neurosurgery, University of Texas-Houston
1995-2004 Associate Professor, Neurological Surgery, University of Pittsburgh
1995-present Secondary Faculty Appointments at University of Pittsburgh: Anesthesiology (1995); Neurobiology (2000); and Physical Medicine and Rehabilitation (2003)
2002-present Director, Brain Trauma Research Center, Neurological Surgery, University of Pittsburgh
2004-present Professor and Director of Research, Neurological Surgery, Anesthesiology, Neurobiology & Physical Medicine and Rehabilitation, University of Pittsburgh
2007-present Graduate Faculty Member Ctr. for Neuroscience, School of Medicine, University of Pittsburgh
2008-present Vice Chairman of Research, Neurological Surgery, University of Pittsburgh
2009-present Research Health Scientist, GRECC/Veterans Affairs Pittsburgh Health Care System
2011-present Endowed Neurotrauma Chair in Neurosurgery, University of Pittsburgh

C. Selected Peer-reviewed Publications

1. Dixon CE, Lyeth BG, Povlishock JT, Findling RL, Hamm RJ, Marmarou A, Young HP, Hayes RL. A fluid-percussion model of experimental brain injury in the rat. *J Neurosurg* 1987;67:110-119 [PMID 3598659].
2. Dixon CE, Clifton GL, Lighthall LW, Yaghmai AA, Hayes RL. A controlled cortical impact model of traumatic brain injury in the rat. *J Neurosci Methods* 1991;39:253-262 [PMID 1787745].
3. Dixon CE, Hamm RL Taft WC, Hayes RL. Increased anticholinergic sensitivity following closed skull and controlled cortical impact traumatic brain injury in the rat. *J Neurotrauma* 1994;11(3):275-287 [PMID 7996582].
4. Dixon CE, Bao J, Long DA, Hayes RL. Reduced evoked release of acetylcholine in the rodent hippocampus following traumatic brain injury. *Pharmacol Biochem Behav* 1996;53(3):679-686 [PMID 8866972]. Dixon CE, Flinn P, Bao J, Venya R, Hayes RL. Nerve growth factor attenuates cholinergic deficits following traumatic brain injury in rats. *Exp Neurol* 1997;146(2):479-490 [PMID 9270059].
5. Dixon CE, Kochanek PM, Yan HQ, Schiding JK, Griffith R, Baum E, Marion DW, DeKosky ST. One-year study of spatial memory performance, brain morphology and cholinergic markers after moderate controlled cortical impact in rats. *J Neurotrauma* 1999;16(2):109-122 [PMID 10098956].
6. Wang X, Jung J, Asahi M, Chwang W, Russo L, Moskowitz MA, Dixon CE, Fini ME, Lo EH. Effects of matrix metalloproteinase-9 gene knock-out on morphological and motor outcomes after traumatic brain injury. *J Neurosci* 2000;20(18):7037-7042 [PMID 10995849].
7. Dixon CE, Ma X, Kline AE, Yan HQ, Ferimer H, Kochanek PM, Wisniewski SR, Jenkins LW, Marion DW.

Acute etomidate treatment reduces cognitive deficits and histopathology in rats with traumatic brain injury. *Crit Care Med* 2003;31:2222-27 [PMID 12973183].
8. Wilson MS, Chen X, Ma X, Ren D, Wagner AK, Reynolds IJ, Dixon CE. Synaptosomal dopamine uptake in rat striatum following controlled cortical impact. J Neurosci Res 2005;80:85-91 [PMID 15704194].
9. Bales JW, Wagner AK, Kline AE, Dixon CE. Persistent cognitive dysfunction after traumatic brain injury: A dopamine hypothesis. Neurosci Biobehav Rev 2009;33:981-1003 [PMCID: PMC2806224].
10. Exo JL, Shellington DK, Bayir H, Vagni VA, Janesco-Feldman K, Ma L, Hsia CJ, Clark RS, Jenkins LW, Dixon CE, Kochanek PM. Resuscitation of traumatic brain injury and hemorrhagic shock with polynitroxylated albumin, hextend, hypertonic saline, and lactated Ringer's: Effects on acute hemodynamics, survival, and neuronal death in mice. J Neurotrauma 2009; 26(12):2403-2408 [PMCID: PMC2864460].
11. Bales JW, Ma X, Yan HQ, Jenkins LW, Dixon CE. Expression of protein phosphatase 2B (calcineurin) subunit A isoforms in rat hippocampus after traumatic brain injury. J Neurotrauma 2010;27(1):109-120 [PMCID: PMC2812667].
12. Ochalski PG, Fellows-Mayle W, Hsieh LB, Srinivas R, Okonkwo DO, Dixon CE, Adelson PD. Flumazenil administration attenuates cognitive impairment in immature rats following controlled cortical impact. J Neurotrauma 2010; 27(3):647-651. [PMCID in process; PMID 19929186]
13. Singleton R, Yan H, Fellows-Mayle W, Dixon C. Resveratrol attenuates behavioral impairments and reduces cortical and hippocampal loss in a rat controlled cortical impact model of traumatic brain injury. J Neurotrauma 2010; 27(6):1091-1099. [PMCID: PMC2943501]
14. Bales JW, Ma X, Yan HQ, Jenkins LW, Dixon CE. Regional calcineurin subunit B isoform expression in rat hippocampus following a traumatic brain injury. Brain Res 2010;1358:211-220 [PMCID: PMC2949526]
15. Bales JW, Kline AE, Wagner AK, Dixon CE. Targeting dopamine in acute traumatic brain injury. Open Drug Discovery J 2010;2:119-128. [pending PMCID-submitted to NIH Pub Access 12/20/10 #259600]
16. Shin SS, Bray ER, Zhang CQ, Dixon CE. Traumatic brain injury reduces striatal tyrosine hydroxylase activity and potassium evoked dopamine release in rats. Brain Res 2011; 1369: 208-215 [PMCID: PMC3014391]
17. Shellington DK, Du L, Wu X, Exo J, Vagni V, Ma L, Janesko-Feldman K, Clark RS, Bayir H, Dixon CE, Jenkins LW, Hsia CJ, Kochanek PM. Polynitroxylated pegylated hemoglobin: A novel neuroprotective hemoglobin for acute volume-limited fluid resuscitation after combined traumatic brain injury and hemorrhagic hypotension in mice. Crit Care Med 2011 Mar; 39(3):494-505 [PMID 21169820; PMCID in process].
18. Bales JR, Yan HQ, Ma X, Li Y, Samarasinghe R, Dixon CE. The dopamine and cAMP regulated phosphoprotein, 32 kDa (DARPP-32) signaling pathway: A novel therapeutic target in traumatic brain injury. (Selected by the editor as a newsworthy article to be highlighted with an invited commentary) Exp Neurol 2011 Jun;229(2):300-3007 [PMCID: PMC3110667].
19. Wagner AK, McCullough EH, Niyonkuru C, Ozawa H, Loucks TL, Dobos J, Brett CA, Santarsieri M, Dixon CE, Berga SL, Fabio A. Acute serum hormone levels: characterization and prognosis after severe traumatic brain injury. J Neurotrauma 2011 28(6):871-888. [PMCID: PMC3113446].
20. Garman RH, Jenkins LW, Switzer Iii RC, Bauman RA, Tong LC, Swauger PV, Parks S, Ritzel DV, Dixon CE, Clark R, Bayir H, Kagan V, Jackson E, Kochanek PM. Blast exposure in rats with body shielding is characterized by diffuse axonal injury. J Neurotrauma 2011 28(6):947-959. [PMID 21449683; PMCID in process]
21. Garcia AN, Shah MA, Dixon CE, Wagner AK, Kline AE. Biologic and plastic effects of experimental traumatic brain injury treatment paradigms and their relevance to clinical rehabilitation. PMR 2011 Jun;3(6 Suppl):S18-27. [PMCID: PMC3146549]
22. Kochanek PM, Bramlett H, Dietrich WD, Dixon CE, Hayes RL, Povlishock J, Tortella FC, Wang KKW. A novel multicenter preclinical drug screening and biomarker consortium for experimental traumatic brain injury: operation brain trauma therapy. J Trauma 2011 Jul;71(1 Suppl):S15-S24 [PMID 21795873; pending PMCID].
23. Wagner AK, Amin KB, Niyonkuru C, Postal BA, McCullough EH, Ozawa H, Dixon CE, Bayir H, Clark RS, Kochanek PM, Fabio A. CSF Bcl-2 and cytochrome C temporal profiles in outcome prediction for adults with severe TBI. J Cereb Blood Flow Metab 2011 Sep;31(9):1886-1896. [PMID 21448217; PMCID in process]
24. Shin SS, Dixon CE. Oral fish oil restores striatal dopamine release after traumatic brain injury. Neurosci Lett 2011 496(3):168-171. [PMID 21514362; pending PMCID-submitted to NIH Pub Access on May 23 2011 NIHMSID# 292846]
25. Shin SS, Bray ER, Dixon CE. Effects of nicotine administration on striatal dopamine signaling after traumatic brain injury in rats. J Neurotrauma 2011 (in press).

D. Research Support

ACTIVE

5P01 NS030318 (Dixon) 09/30/91 – 06/30/12 Program Director
NIH – NINDS
Emerging Therapeutics for TBI – Acute to Chronic Targets (PPG)
TBI initiates pathological biochemical cascades that can persist long after survival. An increased understanding of the mechanisms of these cascades and their attenuation by translatable therapies are the primary scientific goals of our program project. These include the study of (1) nitrosative stress and PARP activation, (2) statins therapies and their interaction with Aβ in cell death, (3) effects of calcineurin inhibition on neuronal death and plasticity, (4) Fas-mediated cell death, and (5) mechanism(s) underlying the endogenous beneficial effects of iNOS. Our investigations will attempt to correlate findings in the laboratory with patients who have suffered severe traumatic brain injury through recovery of CSF, dialysis samples as well as brain tissue at surgery.

5P01 NS030318 (Dixon) 09/30/91 – 06/30/12
NIH – NINDS
Emerging Therapeutics for TBI – Acute to Chronic Targets; *Project #3 – Calcineurin Inhibition as a Therapeutic Target for TBI*
This project will determine the effects of TBI on CN and its substrates that are associated with regulators after controlled cortical impact (CCI) in rats. We will also investigate whether CN's role in the BAD dephosphorylation induced caspase-3 activation after CCI. To further establish whether CN acts as an inhibitory constraint on postinjury memory, we will examine the effects of genetically inhibiting CN using a doxycycline-dependent rtTA system to express a CN inhibitor reversibly in the mouse brain. Lastly, we will examine the relationship between CN levels in human TBI tissue samples and injury severity and outcome.

5P01 NS030318 (Dixon) 09/30/91 – 06/30/12
NIH – NINDS
Emerging Therapeutics for TBI – Acute to Chronic Targets; *Core A: Administrative and Biostatistics*
The Administrative and Biostatistics Core: 1) provides support to the five primary projects and the clinical and animal cores by helping with budgetary issues and organizing the monthly investigators meetings through which research problems and future directions are addressed; 2) is responsible for organizing meetings with the internal and external monitoring committees, and for the integrity of the research conducted at the Center; and 3) serves as a common Biostatistics resource available to the five primary investigators.

5P01 NS030318 (Kochanek/Dixon) 09/30/91 – 06/30/12
NIH – NINDS
Emerging Therapeutics for TBI – Acute to Chronic Targets; *Core C: Animal Modeling and Outcomes*
The major goals of this project are to operate a core facility that performs the following procedures in mice and rats in a strictly standardized, efficient and highly reproducible fashion: anesthesia; surgery; traumatic brain injury, function outcome assessment, histological outcome assessment, MRI; hypothermic treatment; and quality control. Dr. Dixon is Co-PI with Dr. Kochanek on this project.

N66001-10-C-2124 (Kochanek) 03/19/10 – 03/18/12
SPAWAR Systems Center Pacific
Understanding The Biochemical, Physiological & Functional Consequences of Blast Injury to the Human Brain
This grant will fund continuation of work for DARPA on the PREVENT blast injury program which is focused on understanding the pathobiology of blast-induced traumatic brain injury and development of new therapies relevant to combat casualty care.

1R21 NS070003 (Jackson/Kochanek) 07/01/10 – 06/30/12
NIH – NINDS
Role of CNPase in TBI
The purpose of this exploratory project is to begin to characterize the significance of 2',3'-cAMP in TBI by testing the innovative concept that 2',3'-cAMP is involved in a "CNPase Neuroprotection Mechanism" in which brain injury leads to release of 2',3'-cAMP from mRNA, and 2',3'-cAMP is then metabolized to 2'-AMP by CNPase followed by conversion of 2'-AMP to adenosine.

W81XWH-09-2-0187 (Kochanek) 09/30/09 – 09/29/12
USAMRAA
Inhalation of O2 & Hyperventilation Early After Injury May Be deleterious to casualties with closed-head TBI
This project will assess the effect of hyperventilation and/or hyperoxia on outcome after combined traumatic brain injury and hemorrhagic shock in mice.

R01 NS060005 (Kline) **02/01/09 – 01/31/13**
NIH – NINDS
Environmental Enrichment and Cholinergic Mechanisms After TBI
The proposed studies will test the hypothesis that cholinergic neurons are important mediators of EE-induced change after TBI and that there are gender differences in this mediation.

RR&D B6761R (Dixon) **04/01/10 – 03/31/13**
Department of Veterans Affairs
DARPP-32 Mediation of Chronic TBI Pharmacotherapy
The purpose of the proposed research is to evaluate drugs that modulate dopamine signaling when administered during the chronic, rehabilitative phase following experimental traumatic brain injury (TBI).

1R01 NS061817 (Bayir) **07/01/08 – 06/30/13**
NIH – NINDS
Oxidative Lipidomics in Pediatric Traumatic Brain Injury
This project will identify oxidative phospholipids functioning as signaling molecules in neuronal death after TBI using state of the art lipidomics approach.

M2010-0041 (Ikonomovic) **12/01/10 – 11/30/13**
Pittsburgh Foundation
Novel Amyloid-Targeting Therapies for Preserving Cognitive Function in AD
This study will investigate the effects of our two lead SMABBA compounds, alone and in combination with passive AB immunization, on improving cognitive function and reducint synaptic abnormalities in a transgenic mouse model of Alzheimer's disease.

1R01 NS060672 (Dixon) **02/15/09 – 01/31/14**
NIH – NINDS
Dopamine Signaling Mechanisms of Traumatic Brain Injury
This study will test the hypothesis that TBI causes dysfunction of the DARPP-32 phosphorylation in striato-cortical neurons which may contribute to alterations in ERK1/2 cascades and working memory deficits.

1R01 NS069247 (Clark) **09/30/09 – 06/30/14**
NIH – NINDS
Overcoming Membrane Transporters to Improve CNS Drug Therapy
Our hypothesis is that combinational strategies that include therapies that overcome membrane transport barriers will synergistically improve bioavailability and efficacy of both clinically used and novel therapies after TBI.

RR&D B7347R (Graham/Dixon) **01/01/11 – 12/31/13**
Department of Veterans Affairs
Role of Cyclopentenone Prostaglandins in Promoting Recovery after TBI
In these proposed studies, we will further characterize the production of and metabolism of CyPGs after TBI. We will also determine the role of PPARg activation and restoration of UCH-L1 activity in determining recovery after TBI and long term behavioral outcome.

W81XWH-10-1-0623 (Kochanek) **09/30/10– 07/31/15**
USAMRRA
Operation Brain Trauma Therapy
The objective of this proposal is to establish Operation Brain Trauma Therapy (OBTT), a consortium of five of the top experimental TBI centers in the world to rapidly screen potential TBI therapies and evaluate TBI biomarkers and translate them ultimately to combat casualty care.

1 U44 NS070324 (Hsia) **04/01/11 – 03/31/13**
SynZyme Technology via NIH Prime
Polynitroxylated Pegylated Hemoglobin for Traumatic Brain Injury (Phase I)
Our objective is to develop a neuroprotective, super colloid, oxygen therapeutic for pre-hospital resuscitation in the setting of traumatic brain injury (TBI).

RR&D O7681I (Ikonomovic) **10/01/11 – 09/30/15**
Department of Veterans Affairs
Memantine Therapy Intervention for Improved Functional Recovery After TBI
This study will determine if chronic memantine therapy is an effective way of improving long-term recovery after traumatic brain injury in rats, allowing for its translation into clinical practice for treatment of injured veterans.