## CURRICULUM VITAE

### WILLIAM D. ELDRED

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#### PREVIOUS POSITIONS BOSTON UNIVERSITY

Professor, Department of Biology Professor, Graduate Program in Neuroscience Professor, Molecular Biology, Cell Biology & Biochemistry Program

#### TRAINING AND PROFESSIONAL EXPERIENCE

B.S. in Psychology, University of Colorado, Boulder, Colorado, 1972.

NIH Predoctoral Trainee in Anatomy

Dr. John Nolte - Sponsor, Department of Anatomy, University of Colorado Health Sciences Center, Denver, Colorado, 1972 - 1979.

Ph.D. in Anatomy, Department of Anatomy, University of Colorado Health Sciences Center, Denver, Colorado, 1979.

NRSA Postdoctoral Trainee in Anatomy Dr. Paul Witkovsky - Sponsor, Department of Anatomy, State University of New York at Stony Brook, 1979 - 1980.

NRSA Postdoctoral Trainee in Neurobiology

Dr. Harvey J. Karten - Sponsor, Department of Neurobiology and Behavior, State University of New York at Stony Brook, 1980 - 1981.

Research Assistant Professor, Department of Neurobiology and Behavior, State University of New York at Stony Brook, New York, 1981 - 1982.

## TEACHING

Laboratory instructor, Microanatomy, Department of Anatomy, University of Colorado Health Sciences Center, 1973.

Laboratory instructor, Gross Anatomy (total body dissection), Department of Anatomy, University of Colorado Health Sciences Center, 1973 - 1974.

Laboratory instructor, Gross Anatomy (audiovisual approach with computer assisted instruction), Department of Anatomy, University of Colorado Health Sciences Center, 1974 - 1975.

Course Director, Mammalian Cell and Tissue Structure, Department of Biology, Boston, University, 1982 - 2016.

Course Director, Ultrastructural Biology, Department of Biology, Boston University, 1983 - 2016.

Introductory Biology, Department of Biology, Boston University, 1996 - 2016.

Course Director, Cellular and Systems Neuroscience, Department of Biology, Boston University, 1999 – 2000, 2008-2016.

Faculty Director Biology Department Imaging and Proteomics Facility 1983-2016

### **GRANT SUPPORT**

#### **Previous Research Grants**

National Institute of Health - National Eye Institute "EM of Neural Circuits in Inner Plexiform Layer of Retina". \$301,642 direct costs, 8-1-84 through 7-31-89

National Institute of Health - National Eye Institute "Regional Synaptic Specializations in the Retina". \$702,240 direct costs, 8-1-89 through 7-1-96

National Institute of Health - National Eye Institute "Modulation of cGMP in the Retina". NIH-EY04785 \$513,371 direct costs, 7-1-96 through 6-30-99 \$609,060 direct costs, 7-1-99 through 6-30-03 \$925,000 direct costs, 7-1-03 through 6-30-09

## Previous Large Equipment Grants

NIH- National Center for Research Resources Title- Confocal Scanning Microscope System Award Amount- \$43,989 3/15/99

DBI9870995 NSF- Shared Instrumentation Grant Title- Acquistion of a Laser Confocal Scanning Microscope System Amount Awarded- \$115,422 8/1/98

## **Previous Training Grant**

2 T32 MH020064-06 Eldred-PI Title : NATIONAL RESEARCH SERVICE AWARD Project Title: Training in Neuroscience Project Period: 07/01/2000 - 06/30/2010 Award Amount : \$1,381,000.00 direct costs

#### **Completed Grants**

Investigator Type: PI Grant Number: 9500302898 Title: Informing the Sub-retinal Approach to Electric Stimulation Agency: VA Boston Healthcare System Award Amount to my lab: \$28,567 Dates: 9/15/13 – 3/31/14

Investigator Type: PI Grant Number: 9500301803 Title: Informing the subretinal approach to electrical stimulation Agency: VA Boston Healthcare System Award Amount to my lab: \$51,828.48 Dates: 10/1/12 – 9/14/13

Investigator Type: PI Grant Number : 9500302007 Title : CIRV bioengineering therapy study for retinal prosthesis Agency : Department of Veterans Affairs Award Amount to my lab: \$47,089.00 Dates: 9/29/11 – 12/31/13

Investigator Type: PI Grant Number : 9500300437 Title : CIRV bioengineering therapy study for retinal prosthesis Agency : Department of Veterans Affairs Award Amount to my lab: \$71,444.18 Dates: 9/29/11 – 12/31/13

Investigator Type: Faculty Associate, PI Tim Gardner Grant Number : 1U01NS090454-01 Title: High-Density Recording and Stimulating Micro-electrodes Agency: NIH Brain Initiative Project Period: 10/01/2014 – 09/30/2017 Total Award Amount: \$1,679,622

### **PROFESSIONAL SOCIETIES**

Society for Neuroscience Association for Research in Vision and Ophthalmology

#### HONORS and SERVICE

Editor- Visual Neuroscience 1992-1994 International Human Frontier Science Program Organization Fellowship Alexander von Humboldt Foundation Research Fellow Visiting Scholar, Vision Science Research Center, University of Alabama, Birmingham, 1998 NIH-NEI Biology and Diseases of the Posterior Eye Study Section 2003-2004 NIH Study Section T32 "Jointly Sponsored Ruth L. Kirschstein National Research Service Award Institutional Predoctoral Training Program in the Neurosciences" 2005-2006 Editorial Board- Open Journal of Nitric Oxide 2008- Present

# CURRENT RESEARCH INTERESTS

My research for the past 15 years has focused on the role of the gaseous neuromodulator nitric oxide (NO) in retinal signal transduction and ocular pathology. We have determined that NO is reciprocally related to many retinal neurotransmitters including GABA, glycine, acetylcholine, and dopamine in that NO modulates their release and they in turn modulate NO production. We have also shown that every cell type in the retina can normally produce NO. Using direct imaging of NO, we have established that in retina and hippocampus that NO is not freely diffusible. We have examined the role that NO plays in the early neuronal cell death seen in diabetic retinopathy. We focused on the role that the signaling peptide adrenomedullin plays in producing the pathological increases in NO found in early diabetic retinopathy. We established and localized all of the biochemical steps in this pathway and we found a pharmacological intervention that inhibits the pathological activation of the adrenomedullin/NO signaling pathway. Since both NO and adrenomedullin are involved in much ocular pathology including glaucoma, ischemia, and uveitis, a better understanding of the adrenomedullin/NO signaling pathways may have broad clinical applicability. More recently we have been focusing on the cellular signaling pathways that are involved in traumatic brain injury using both retina and brain as model systems. We have found a number of neurochemical and pathological markers (calcium binding proteins, GABA, GABAa receptors, etc.) that are modulated by blast in brain or retina. By using the retina, which is extremely well characterized anatomically, physiologically and neurochemically, we can determine the underlying signaling pathways that are responsible for the pathology. This will allow us to develop both prophylactic and post-blast treatment strategies to reduce the pathology produced by blast in both retina and brain. Finally, we have started a new project examining the cell signaling pathways involved in chronic traumatic encephalopathy. In this project we are looking at some of the same markers used in our study of traumatic brain injury in brains from NFL football players which have been diagnosed with chronic traumatic encephalopathy.

# PUBLICATIONS

## Eldred, W.D. and D.T. Moran

Fiber analysis of an insect peripheral nerve: light vs. electron microscopy. <u>Tissue and Cell</u>, 6(4):751-756, 1974.

## Eldred, W.D. and J. Nolte

Pineal photoreceptors: evidence for a vertebrate visual pigment with two physiologically active states. <u>Vision</u> <u>Research</u>, 18:29-32, 1978.

## Eldred, W.D.

Morphological and electrophysiological investigations of the frontal organ in Rana pipiens. Ph.D. Thesis, University of Colorado Health Sciences Center, 1979.

## Jenison, G.L., W.D. Eldred and J. Nolte

A second class of neurons within the retinas of the parietal eyes of *Anolis carolinensis* and *Iguana iguana*. <u>Brain</u> <u>Research</u>, 168:615-618, 1979.

## Eldred, W.D., T.E. Finger and J. Nolte

Central projections from the frontal organ of Rana pipiens, as demonstrated by the anterograde transport of horseradish peroxidase. <u>Cell and Tissue Research</u>, 211:215-222, 1980.

### Eldred, W.D. and J. Nolte

Multiple classes of photoreceptors and neurons in the frontal organ of Rana pipiens. Journal of Comparative Neurology, 203:269-295, 1981.

Hanker, J.S., L. Ellis, A. Rustioni, K.A. Carson, A. Reiner, W.D. **Eldred** and H.J. Karten The ultrastructural demonstration of the retrograde axonal transport of horseradish peroxidase in nervous tissues by transmission and high voltage electron microscopy. <u>Current Trends in Morphological Techniques</u>, J.E. Johnson, Jr., Editor, CRC Press Inc., 1:55-92, 1981.

Erichsen, J.T., H.J. Karten, W.D. Eldred and N. Brecha

Localization of substance P and leucine-enkephalin within preganglionic terminals of the avian ciliary ganglion: light and electron microscopy. Journal of Neuroscience, 2:994-1003, 1982.

Eldred, W.D., C. Zucker, H.J. Karten and S. Yazulla

Comparison of fixation and penetration enhancement techniques for use in ultrastructural immunocytochemistry. Journal of Histochemistry and Cytochemistry, 31:285-292, 1983.

Eldred, W.D. and H.J. Karten

Characterization and quantification of peptidergic amacrine cells in the turtle retina: enkephalin, neurotensin and glucagon. <u>Journal of Comparative Neurology</u>, 221:371-381, 1983.

Brecha, N., W.D. Eldred, R.O. Kuljis and H.J. Karten

Identification and localization of biologically active peptides in the vertebrate retina. <u>Progress in Retinal</u> <u>Research.</u>, Ed. N. Osborne and J. Chader, Pergamon Press, Oxford, Ch. 7, 185-226, 1984.

Witkovsky, P., W.D. **Eldred** and H.J. Karten Catecholeamine-indoleamine containing neurons in the turtle retina. <u>Journal of Comparative Neurology</u>, 228:217-225, 1984.

Reiner, A, J.E. Krause, K.T. Keyser, W.D. **Eldred** and J.F. McKelvy The distribution of substance P in turtle nervous system: a radioimmunoassay and immunohistochemical study. <u>Journal of Comparative Neurology</u>, 226:50-75, 1984.

Eldred, W.D. and H.J. Karten

Ultrastructure and synaptic contacts of enkephalinergic amacrine cells in the retina of turtle (*Pseudemys scripta*). Journal of Comparative Neurology, 232:36-42, 1985.

Reiner, A., W.D. **Eldred**, M.C. Beinfeld and J.E. Krause The co-occurrence of a substance P-like peptide and cholecystokinin-8 in a fiber system of turtle cortex. <u>Journal of Neuroscience</u>, 5:1527-1544, 1985.

Eldred, W.D. and R.E. Carraway

Neurocircuitry of two types of neurotensin containing amacrine cells in the turtle retina. <u>Neuroscience</u>, 21:603-618, 1987.

Gdowski, G.T., W.D. Eldred and H.F. Voight

A simple device for the computer quantification of depth measurements in thick light microscope sections. Journal of Neuroscience Methods, 20:249-260, 1987.

Eldred, W.D., H.B. Li, R.E. Carraway and J.E. Dowling

Immunocytochemical localization of LANT-6-like immunoreactivity within cells in the inner nuclear and ganglion cell layers in vertebrate retinas. <u>Brain Research</u>, 424:361-370, 1987.

Eldred, W.D., T. Isayama, A. Reiner and R. Carraway

Ganglion cells in the turtle retina contain the neuropeptide LANT-6. Journal of Neuroscience, 8:119-132, 1988.

Isayama, T. and W.D. **Eldred** Neuropeptide Y-immunoreactive amacrine cells in the retina of the turtle, *Pseudemys scripta elegans*. Journal of <u>Comparative Neurology</u>, 271:56-66, 1988.

Isayama, T. and W.D. **Eldred** Synaptic analysis of amacrine cells with neuropeptide-Y-like immunoreactivity in turtle retina. <u>Journal of</u> <u>Comparative Neurology</u>, 275:452-459, 1988.

Gaur, V.P., W. Eldred and P.V. Sarthy

Distribution of Müller cells in the turtle retina: an immunocytochemical study. Journal of Neurocytology, 17:683-692, 1988.

Williamson, D. E. and W.D. Eldred

Amacrine and ganglion cells with corticotropin releasing factor-like immunoreactivity in the turtle retina. Journal of Comparative Neurology, 280:424-435, 1989.

Gaur, V., G. Adamus, A. Arendt, W. **Eldred**, D.E. Possin, J.H. McDowell, P.A. Hargrave and P.V. Sarthy A monoclonal antibody that binds to photoreceptors in the turtle retina. <u>Vision Research</u>, 28:765-776, 1989.

**Eldred**, W.D. and K. Cheung Immunocytochemical localization of glycine in the retina of the turtle, *Pseudemys scripta*. <u>Visual Neuroscience</u>, 2:331-338, 1989.

Hurd, L.B. and W.D. **Eldred** Localization of GABA- and GAD-like immunoreactivity in the turtle retina. <u>Visual Neuroscience</u>, 3:9-20, 1989.

Gaur, V.P., W.D. **Eldred**, D.P. Possin and P.V. Sarthy A monoclonal antibody marker for the paraboloid region of cone photoreceptors in turtle retina. <u>Cell and</u>

A monoclonal antibody marker for the paraboloid region of cone photoreceptors in turtle retina. <u>Cell an</u> <u>Tissue Research</u>, 257:497-502, 1989.

Caserta, F., H.E. Stanley, W.D. **Eldred**, D. Daccord, R. Hausman and J. Nittmann Physical mechanisms underlying neurite outgrowth: A quantitative analysis of neuronal shape. <u>Physical</u> <u>Review Letters</u>, 64:95-98, 1990.

Pollard, J. and W.D. Eldred

Synaptic analysis of amacrine cells in the turtle retina which contain tyrosine hydroxylase-like immunoreactivity. Journal of Neurocytology, 19:53-66, 1990.

Williamson, D. and W.D. Eldred

The synaptic organization of two types of amacrine cells with CRF-like immunoreactivity in the turtle retina. <u>Visual Neuroscience</u>, 6:257-269, 1991.

Yaqub, A. and W.D. Eldred

Localization of aspartate-like immunoreactivity in the retina of the turtle, *Pseudemys scripta*. Journal of Comparative Neurology, 312:584-598, 1991.

## Eldred, W.D., M. Schutte, D.E. Cochrane and P. Panula

Immunocytochemical and biochemical studies of histamine in the retina of the turtle *Pseudemys scripta*. <u>Cell and</u> <u>Tissue Research</u>, 267:449-454, 1992.

## Caserta, F., R.E. Hausman, W.D. Eldred, C. Kimmel and H.E. Stanley

Effect of viscosity on neurite outgrowth and fractal dimension. Neuroscience Letters, 136:198-202, 1992.

### Zhang, D. and W.D. Eldred

Colocalization of enkephalin-, glucagon-, and corticotropin-releasing factor-like immunoreactivity in GABAergic amacrine cells in turtle retina. <u>Brain Research</u>, 596:46-57, 1992.

### Hurd, L.B. and W.D. Eldred

Synaptic microcircuitry of bipolar and amacrine cells with serotonin-like immunoreactivity in the retina of the turtle, *Pseudemys scripta elegans*. <u>Visual Neuroscience</u>, 10:455-472, 1993.

#### Yaqub A. and W.D. Eldred

Effects of excitatory amino acids on immunocytochemically identified populations of neurons in turtle retina. Journal of Neurocytology, 22:644-662, 1993.

### Zhang D. and W.D. Eldred

Anatomical characterization of retinal ganglion cells that project to the nucleus of the basal optic root in the turtle (*Pseudemys scripta elegans*). <u>Neuroscience</u> 61:707-718, 1994.

Fernandez, E., W.D. **Eldred**, J. Ammermüller, A. Block, W. Von Bloh and H. Kolb Complexity and scaling properties of amacrine, ganglion, horizontal, and bipolar cells in the turtle retina. Journal of Comparative Neurology 347:397-408, 1994.

## Yaqub, A., M. Guimaraes and W.D. Eldred

Neurotransmitter modulation of the expression of c-fos- and c-jun-like proteins in the turtle retina. Journal of Comparative Neurology 354:481-500, 1995.

Caserta, F., W.D. **Eldred**, E. Fernandez, R.E. Hausman, L.R. Stanford, S.V. Bulderev, S. Schwarzer and H.E. Stanley

Determination of fractal dimension of physiologically characterized neurons in two- and three-dimensions. Journal of Neuroscience Methods, 56:133-144, 1995.

Eldred, W.D., J. Ammermüller, J. Schechner, U.D. Behrens and R. Weiler

Quantitative anatomy, biochemistry, synaptic connectivity and physiology of amacrine cells with glucagon-like immunoreactivity in the turtle retina. Journal of Neurocytology, 25:347-364, 1996.

## Reiner, A.J., D. Zhang and W.D Eldred

Use of cholera toxin tracer reveals new details of the retinal central projections in turtles. <u>Brain, Behavior and</u> <u>Evolution</u>, 48:307-337, 1996.

Wetzel, R.K. and W.D. Eldred

Specialized neuropeptide Y- and glucagon-like immunoreactive amacrine cells in the peripheral retina of the turtle. <u>Visual Neuroscience</u>, 14, 867-877, 1997.

Blute, T.A., B. Mayer and W.D. Eldred

Immunocytochemical and histochemical localization of nitric oxide synthase in the turtle retina. <u>Visual</u> <u>Neuroscience</u>, 14:717-729, 1997.

### Haverkamp, S.H., W.D. Eldred, O.P. Ottersen and J. Ammermüller

Synaptic inputs to identified color-coded amacrine and ganglion cells in the turtle retina. <u>Journal of</u> <u>Comparative Neurology</u>, 389:235-248, 1998.

Haverkamp, S.H. and W.D. Eldred

Localization of the origin of retinal efferents in the turtle brain and the involvement of nitric oxide synthase. Journal of Comparative Neurology, 393:185-195, 1998.

Blute, T.A., P. Velasco and W.D. Eldred

Functional localization of soluble guanylate cyclase in turtle retina: Modulation of cGMP by nitric oxide. <u>Visual Neuroscience</u>, 15:485-498, 1998.

Haverkamp, S.H. and W.D. Eldred

Localization of nNOS in photoreceptor, bipolar and horizontal cells in turtle and rat retinas. <u>NeuroReport</u>, 9:2231-2235, 1998.

Blute, T.A., J. De Grenier and W.D. Eldred

Activation of NMDA or kainate receptors modulates cGMP-like immunoreactivity in the turtle retina: involvement of nitric oxide synthase. Journal of Comparative Neurology, 404:75-85, 1999.

Haverkamp, S.H., H. Kolb, T.A. Blute, L. Cao and W.D. **Eldred** Gamma-atrial natriuretic peptide 1-25 is found in bipolar cells in turtle and rat retinas. <u>Visual Neuroscience</u>, 16:771-779, 1999.

Cao, L., T.A. Blute and W.D. **Eldred** Localization of heme oxygenase-2 and modulation of cGMP levels by carbon monoxide and/or nitric oxide. <u>Visual Neuroscience</u>, 17:319-329, 2000.

Blute, T.A., H.K. Lee, T. Huffmaster, S. Haverkamp and W.D. **Eldred** Localization of natriuretic peptides and their activation of particulate guanylate cyclase and nitric oxide synthase in retina. <u>Journal of Comparative Neurology</u>, 424:689-700, 2000.

Blute, T. A., M. R. Lee and W.D. **Eldred** Direct imaging of NMDA-stimulated nitric oxide production in the retina. <u>Visual Neuroscience</u>, 17:557-566, 2000.

Cao, L., T.A. Blute and W.D. **Eldred** Subcellular localization of neuronal nitric oxide synthase in turtle retina: electron immunocytochemistry. <u>Visual Neuroscience</u>, 18:949-960, 2001.

Blute, T.A., S. Strang, K.T. Keyser and W.D. Eldred

Activation of the cGMP/nitric oxide signal transduction system by nicotine in the retina. <u>Visual</u> <u>Neuroscience</u>, 20:165-176, 2003.

Cao, L., T.A. Blute and W.D. Eldred

Inhibitors of nitric oxide synthase block carbon monoxide induced increases in cGMP in retina. <u>Brain</u> <u>Research</u>, 988:78-83, 2003.

Yu, D. and W.D. Eldred

 $GABA_A$  and  $GABA_C$  receptor antagonists increase retinal cyclic GMP levels through nitric oxide synthase. <u>Visual Neuroscience</u>, 20:627-638, 2003.

Yu, D. and W.D. Eldred

Nitric oxide stimulates GABA release and inhibits glycine release in retina. Journal of Comparative Neurology, 483:278-291, 2005.

Eldred, W.D. and T.A. Blute

Imaging of nitric oxide in the retina. Vision Research, 45: 3469-3486, 2005.

Yu, D. and W.D. **Eldred** Glycine and GABA interact to regulate the nitric oxide/cGMP signaling pathway in the turtle retina. <u>Visual</u> <u>Neuroscience</u>. 22:825-838, 2005.

Xie, Z., W.O. Adamowicz, W.D. **Eldred**, A.B. Jakowski, R.J. Kleiman, D.G. Morton, D.T. Stephenson, C.A. Strick, R.D. Williams & F.S. Menniti

Cellular and subcellular localization of PDE10A, a striatum-enriched phosphodiesterase. <u>Neuroscience</u>, 139:597-607, 2006.

Pong, W.W., R. Stouracova, N. Frank, J.P. Kraus & W.D. **Eldred** Comparative localization of cystathionine beta-synthase and cystathionine gamma-lyase in retina: Differences between amphibians and mammals. <u>Journal of Comparative Neurology</u>, 505: 158-165, 2007.

Cimini, B.A., C.E. Strang, V.E. Wotring, K.T. Keyser KT & W.D. **Eldred** The role of acetylcholine in nitric oxide production in the salamander retina. <u>Journal of Comparative</u> <u>Neurology</u>, 507: 1952-1953, 2008.

Pong, W.W. & W.D. **Eldred** Interactions of the gaseous neuromodulators nitric oxide, carbon monoxide, and hydrogen sulfide in the salamander retina. <u>Journal of Neuroscience Research</u>, 87:2356-2364, 2009.

Blom, J.T., T.A. Blute & W.D. **Eldred** Functional localization of the nitric oxide/cGMP pathway in the salamander retina. <u>Vision Neuroscience</u>, 26:275-286, 2009.

Giove, T.J., M.M. Deshpande & W.D. Eldred

Identification of alternate transcripts of neuronal nitric oxide synthase in the mouse retina. <u>Journal of</u> <u>Neuroscience Research</u>, 87: 3134-3142, 2009.

Giove, T.J., M.M Deshpande, C.S. Gagen & W.D. Eldred

Increased neuronal nitric oxide synthase activity in retinal neurons in early diabetic retinopathy. <u>Molecular</u> <u>Vision</u>, 15:2249-2258, 2009.

Giove, T.J., M. Sena-Esteves & W.D. Eldred

Transduction of the inner mouse retina using AAVrh8 and AAVrh10 via intravitreal injection. <u>Experimental</u> <u>Eye Research</u>, 91:652-659, 2010.

Blom, J.J., T. Giove, T. L. Favazza, J. D. Akula & W. D. **Eldred** (2011) Inhibition of the adrenomedullin/nitric oxide signaling pathway in early diabetic retinopathy. J. Ocular Biol. Diseases and Informatics, 4:70-82.

Blom J., T. Giove, M Deshpande & W.D **Eldred** (2012) Characterization of the nitric oxide signaling pathways in the mouse retina. J Comp Neurol. 520:4204-4217.

Blom J, T.J. Giove, W.W. Pong, T.A. Blute and W.D. **Eldred** (2012) Evidence for a functional adrenomedullin signaling pathway in the mouse retina. Mol. Vis. 18:1339-1353.

DeWalt G.J., B Mahajan, A.R. Foster, L.D.E. Thompson, A.A. Marttini, E. V. Schmidt, S. Mansuri, D. D'Souza, S. B. Patel, M. Tenenbaum, K. I. Brandao-Viruet, D. Thompson, B. Duong, D. H. Smith, T. A. Blute and W.D. **Eldred** (2017) Region-specific alterations in astrocyte and microglia morphology following exposure to blasts in the mouse hippocampus. Neuroscience Letters, 664:160-166

DeWalt G.J., W.D. **Eldred** (2017) Visual system pathology in humans and animal models of blast injury. J Comp Neurol. 525(13):2955-2967.

Hansen, K.R., G.J. DeWalt, A.I. Mohammed, H. Tseng, M.E. Abdulkerim, S. Bensussen, V. Saligrama, B. Nazer, W.D. **Eldred** and X. Han (2018) Mild Blast Injury Produces Acute Changes in Basal Intracellular Calcium Levels and Activity Patterns in Mouse Hippocampal Neurons. J Neurotrauma. 35(13):1523-1536.

Witkowski E.D., Y. Gao, A.F. Gavsyuk, I. Maor, G.J. DeWalt, W.D. **Eldred**, A. Mizrahi and I.G. Davison (2019) Rapid Changes in Synaptic Strength After Mild Traumatic Brain Injury. Front. Cell. Neurosci. 13:166

### BOOK CHAPTERS

#### Eldred, W.D.

Nitric oxide in the retina. Functional neuroanatomy of the nitric oxide system, in Handbook of Chemical Neuroanatomy. Eds. H.W.M. Steinbusch, J. De Vente and S.R. Vincent. Elsevier, 17:111-145, 2000.

Eldred, W.D.

Real time imaging of the production and movement of nitric oxide in the retina, in Progress in Brain Research, Eds. H. Kolb, H. Ripps and S.Wu. 131:109-122, 2001.