William C. Gordon, PhD
Associate Professor, Research

Department of Ophthalmology and Neuroscience Center of Excellence

Education

1977-1980	Postdoc (Ophthalmology); Baylor College of Medicine, Houston, TX
1970-1977	PhD (Biology); University of South Florida, Tampa, FL
1968-1970	MSc (Biology) (all but thesis); SUNY, Fredonia
1966-1968	BSc (Biology); SUNY, Fredonia, NY
1964-1967	ASc; Jamestown Comm College, Jamestown, NY

Positions

2004 – present	Associate Professor, Research; Ophthalmology and Neuroscience, LSU Health Sciences Center, New Orleans, LA
1994-2004	Assistant Professor, Research; Department of Ophthalmology and Neuroscience Center of Excellence, LSU Health Sciences Center, New Orleans, LA
1987-1994	Instructor; Department of Ophthalmology and Neuroscience Center of Excellence, LSU Medical Center, New Orleans, LA
1981-1987	Assistant Professor; Department of Physiology & Cell Biology, University of Kansas, Lawrence, KS
1980-1987	Assistant Professor; Department of Entomology, University of Kansas, Lawrence, KS
1977-1980	Postdoctoral Fellow; Department of Ophthalmology, Baylor College of Medicine, Houston, TX
1975-1977	Instructor; Department of Biology, Hillsborough Community College, Tampa, FL
1970-1977	Graduate Research Assistant; Dept of Biology, University of South Florida, Tampa, FL
1968-1970	Graduate Research Assistant; Archbold Biological Station, Lake Placid, FL; Summer 1968, 1969 Smithsonian Tropical Research Institute, Barro Colorado Island, Panama Canal Zone; Summer 1970
1966-1970	Director of Planetarium; State University of New York, Fredonia, NY

Current Research

<u>Retinal Inflammation and Neovascularization in a Murine Model of Age-related Macular Degeneration</u>

Age-related Macular Degeneration (AMD) is a disease in which photoreceptors in the central region of the human retina begin to degenerate. As the disease slowly progresses, the resulting central blind spots expand, fuse, and eventually lead to clinical blindness. A hallmark of this disease is the compromise of Bruch's membrane behind the retina and its associated monolayer of retinal pigment epithelial (RPE) cells, which leads to the growth of capillaries (neovascularization) from the choriocapillaris at the back of the eye into the spaces between the RPE and photoreceptors. This spreading disruption triggers photoreceptor cell death. There are at least two components of this disease: *inflammation* (both initial and chronic) and *neovascularization*. Our working hypothesis is that regulation or inhibition of these processes will attenuate or halt the spread of photoreceptor death across the retina.

We induce choroidal neovascularization (CNV) in the mouse retina by producing a small hole through the RPE and Bruch's membrane with an ophthalmic laser. Initial inflammatory processes are observed, followed by the invasion of new capillaries into the retina. We follow these events by measuring the amount of blood leakage into the retina at the lesion sites with angiography. After two weeks, the retina/RPE/choroidal complex is collected as a whole mount and immunolocalization performed to delineate new retinal endothelial cells. Image stacks through each lesion site are collected by confocal microscopy, three-dimensional reconstructions are made, and total capillary volumes calculated.

A group of metabolic metabolites, derived from two omega-3 fatty acids, eicospentaenoic acid and docosahexaenoic acid (EPA and DHA), produce a series of compounds, the resolvins, in the presence of specific lipoxygenases. These are anti-inflammatory and anti-neovascular. Our study involves treatment with these compounds throughout the two-week CNV interval, followed by analysis of the new capillary volumes within the retina at each lesion site, and comparisons with untreated controls.

Research Interests

Retinal morphology, physiology, and biochemistry - Mitochondrial response during photoreceptor stress - Mechanisms of photoreceptor cell death and protection - Information processing for retinal maintenance

Awards/Recognitions

2006	Distinguished Alumnus Award; Jamestown Community College, Jamestown, NY
1987	Nominated *Teacher of the Year*; University of Kansas, Lawrence, KS
1977-1980	NRSA Postdoctoral Fellowship; Baylor College of Medicine, (SF Basinger, preceptor)
1967	Inducted into Beta Beta Beta, the Biological Honor Society; SUNY, Fredonia, NY

Relevant Papers and Chapters

Belayev L, Khoutorova L, Atkins K, **Gordon WC**, Alvarez-Builla J, Bazan NG. 2008. LAU-0901, a novel platelet-activating factor antagonist, is highly neuroprotective in cerebral ischemia. Exp Neurol. 214:253-258.

Mukherjee, P.K., Marcheselli, V.L., Vaccari, J.CdR., **Gordon, W.C.**, Jackson, F., Bazan, N.G. 2007. Photoreceptor outer segment phagocytosis selectively attenuates oxidative stress-induced apoptosis with concomitant neuroprotectin D1 synthesis. PNAS, USA. 104:13158-13163.

Cortina, M.S., **Gordon, W.C.**, Lukiw, W.J., Bazan, N.G. 2005. Oxidative stress-induced retinal damage up-regulates DNA polymerase gamma and 8-oxoguanine-DNA-glycosylase in photoreceptor synaptic mitochondria. Exp Eye Res. 81:742-750.

Colangelo, V., **Gordon, W.C.**, Mukherjee, P.K., Trivedi, P., Ottino, P. 2004. Downregulation of COX-2 and JNK expression after induction of ischemic tolerance in the gerbil brain. Brain Res. 1016:195-200.

Cortina, M.S., **Gordon, W.C.**, Lukiw, W.J., Bazan, N.G. 2003. DNA repair in photoreceptor survival. Molecular Neurobiol. 28:111-122.

Gordon, W.C., Casey D.M., Lukiw, W.J., Bazan, N.G. 2002. DNA damage and repair in light-induced photoreceptor degeneration. Invest Ophthalmol Vis Sci. 43:3511-3521.

Gordon, W.C. and Bazan, N.G. 1997. Retina. In: *Biochemistry of the Eye.* John J. Harding (ed). Chapman and Hall, London. pp. 144-275.

Recent Funding

Defense Advanced Research Projects Agency (DARPA). Bio-magnetics interfacing concepts: A microfluidic system using magnetic nanoparticles for quantitative detection of biological species. University of New Orleans, Advanced Materials Research Institute College of Science (PI, C.J. O'Connor), LSU Neuroscience Center of Excellence (PI, N.G. Bazan), LSU Center for Advanced Microstructures and Devices (PI, F. Hormes). LSU Neuroscience Center - Nanobiotechnological approaches to laser-induced retinal damage. *Retinal protection against laser-induced injury*. (April 2003, a 5 year program).

National Institutes of Health/National Eye Institute. *Retinal pigment epithelium messengers, transcription, and photoreceptor renewal*. (Co-PI with N.G. Bazan)