

Haydee E.P. Bazan, Ph.D.

Professor in Ophthalmology,
Biochemistry and Molecular Biology, and
Neuroscience

Education

1965- MS - Universidad Nacional del Sur,
Argentina

1975- PhD - Universidad Nacional del Sur,
Argentina

Positions

1964

Teaching Assistant,
Department of Chemistry,
Universidad Nacional del Sur,
Bahia Blanca, Argentina
Fellowship, University of
Buenos Aires, Argentina;
Winter International Course.

1965-1966 Research Fellow, College of Physicians and Surgeons, Columbia University, New York

1967-1968 Research Assistant, Department of Biological Chemistry, Harvard University Medical
School, Boston, MA

1970-1977 Instructor, Department of Biology, Universidad Nacional del Sur, Bahia Blanca,
Argentina

1977-1981 Assistant Professor, Department of Natural Sciences, Universidad Nacional del Sur,
Bahia Blanca, Argentina

1981-1988 Assistant Professor in Ophthalmology, Biochemistry and Molecular Biology,
LSU Medical Center, School of Medicine, New Orleans

1988-1993 Associate Professor, in Ophthalmology, Biochemistry and Molecular Biology,
LSU Medical Center, School of Medicine, New Orleans

1993-present Professor, in Ophthalmology, Biochemistry and Molecular Biology,
LSU Medical Center, School of Medicine, New Orleans



Visit of Dr. Edmond H. Fisher, Nobel Laureate in Physiology
or Medicine, 1992. Left to right: Drs. Na Li, Azucena Kakazu,
M. Soledad Cortina, Edmond H. Fischer, Haydee E.P. Bazan,
Jiucheng He, M.K. Sachidananda.

Current Research

Dr. Haydee E.P. Bazan's laboratory studies lipid second messengers in the cornea, particularly platelet activating factor (PAF), a potent lipid mediator of inflammatory and immunological responses and lipoxygenase derivatives from the arachidonic cascade. The laboratory has demonstrated that PAF is generated in retina and cornea after injury (e.g., laser photocoagulation, chemical burns in the eye) and that PAF mediates its action through receptors. Dr. Bazan's laboratory has discovered that this particular lipid induces the expression of selective metalloproteinases (MMPs) – MMP-9, MMP-1 and MT1-MMP – involved in the degradation of components of the extracellular matrix (ECM) that are very important in the process of tissue repair. PAF also induces the expression of genes such as cyclooxygenase-2 (COX-2), increasing the synthesis of prostaglandins and producing sustained inflammation in the eye. On the other hand, 12/15 lipoxygenase derivatives are mediators in the repair action of EGF after corneal injury. Another research interest is the study of cell signal transduction events during corneal wound healing, particularly how specific growth factors (HGF, KGF and EGF) are released during injury activate kinases and phosphatases to communicate their signals from the cell membrane to the nuclei. A third project in the laboratory is the action of lipid mediators derived from docosahexaenoic acid (DHA) in combination with pigment epithelial derived growth factor (PEDF) on nerve regrowth after corneal wounding. Because corneal nerves are important in the maintenance of corneal integrity and prevention of dry eye following surgery, these studies are of clinical significance. Several animal models, as well as cells and organ cultures, are used. Analytical procedures such as liquid chromatography and mass spectrometry, a variety of molecular biology techniques such as real time PCR, siRNAs, Western blot, immunoprecipitations, kinase assays and immunofluorescence are employed.

Research Interests and Goals

Signal transduction mechanisms of lipids and growth factors involved in inflammation and repair during corneal wound healing. Mechanisms of neuroregeneration for the understanding and treatment of complications generated by nerve damage.

Awards

Elected Board member, LSU Medical Center Sigma Xi, 1990-92
Role Model Young Leadership Council, New Orleans, 2003
Honorary Alumnus, LSU School of Medicine, 2008
Excellence in mentoring, 2008

Selected Papers

Kakazu A, Sharma G, **Bazan HE**. Association of protein tyrosine phosphates (PTPs)-1B with c-Met receptor and modulation of corneal epithelial wound healing. *Invest Ophthalmol Vis Sci* 2008;49:2936-45

He J, **Bazan HE**. Epidermal growth factor (EGF) induces corneal keratocyte differentiation via PI-3 kinase activity. Synergism with TGF- β 1. *Invest Ophthalmol Vis Sci* 2008;49:2927-35

Esquenazi S, He J, Li N, Bazan NG, Esquenazi I, **Bazan HE**. Comparative in vivo high-resolution confocal microscopy of corneal epithelium, sub-basal nerves and stromal cells in mice with and without dry eye after photorefractive keratectomy. *Clin Experiment Ophthalmol* 2007;35:545-49

Sharma GD, Kakazu A, **Bazan HE**. Protein kinase C alpha and epsilon differentially modulate hepatocyte growth factor-induced epithelial proliferation and migration. *Exp Eye Res* 2007;85:289-97

Taheri F, **Bazan HEP**. Platelet-activating factor overturns the transcriptional repressor disposition of Sp1 in the expression of matrix metalloproteinase 9 in human corneal epithelial cells. *Invest Ophthalmol Vis Sci* 2007;48:1931-41

He J, **Bazan HEP**. Synergistic effect of platelet-activating factor and tumor necrosis factor-alpha on corneal myofibroblast apoptosis. *Invest Ophthalmol Vis Sci* 2006;47:883-91

He J, Bazan NG, **Bazan HEP**. Prevention of Alkali-induced corneal stromal melting by a novel platelet-activating factor receptor antagonist. *Arch Ophthalmol* 2006;124:70-8

Esquenazi S, **Bazan HEP**, Bui V, He J, Kim D, Bazan NG. Topical combination of NGF and DHA increases rabbit corneal nerve regeneration after PRK. *Invest Ophthalmol Vis Sci* 2005;46:121-7

Bazan HEP. Cellular and molecular events in corneal wound healing: Significance of lipid signaling. *Exp Eye Res* 2005;80:453-63

Funding

“Corneal Lipid Metabolism and Response to Inflammation”

Principal Investigator: Haydee E.P. Bazan, Ph.D.

Agency: NIH, NEI (R01 EY004928). Period: 07/01/03 – 06/30/09

“Mentoring Neuroscience in Louisiana: A Biomedical Program to Enhance Neuroscience”

Principal Investigator: Nicolas G. Bazan, M.D., Ph.D.

Agency: NIH, NCR (P20 RR016816). Period: 02/01/07-01/31/12

Role on Project: Mentor to Junior Investigator

“Mentoring Translational Researchers in Louisiana”

Principal Investigator: Augusto C. Ochoa, M.D.

Agency: NIH, NCR (P20 RR021970). Period: 10/01/05-09/30/10

Role on Project: Mentor to Junior Investigator.

Translational Research Initiative Award,

Principal Investigator and Mentor to Clinician: Haydee E.P. Bazan, PhD

LSUHSC. Period: 2009-2010