

Nicolas Bazan, M.D., Ph.D. Biography

He has been called “a true renaissance man”: research scientist, teacher, mentor, community leader, author, patron of the arts, and entrepreneur. Born in Los Sarmientos, Tucuman, Argentina, Dr. Nicolas Bazan’s defining moment was witnessing an aunt suffer a seizure while walking him to a piano lesson when he was a young boy, putting him on the path to becoming a medical doctor and one of the world’s premier neuroscientists.

Nicolas G. Bazan, M.D., Ph.D., is the founding Director of the Neuroscience Center of Excellence at the Louisiana State University Health Sciences Center, School of Medicine, New Orleans. He is also the inaugural founder of The Ernest C. and Yvette C. Villere Chair for Research in Retinal Degeneration (1984-present) and has been appointed to the highest academic rank in the LSU System, a Boyd Professor (1994-present).

He devoted his life to study fundamental cellular and molecular lipid signaling taking place in early stages of neurodegenerations and other brain and retinal dysfunctions. He has uncovered cellular and molecular principles that reveal novel pro-homeostatic lipid mediators as well as their potential relevance in early stages of Alzheimer’s disease, in experimental stroke, experimental epileptogenesis and on human retinal pigment epithelial cells (relevant to age-related macular degeneration). Dr. Bazan received his medical degree from the University of Tucuman in Argentina in 1965. Afterward, he trained at Columbia University College of Physicians and Surgeons in New York and Harvard Medical School. Then he was appointed faculty at age 26 at the University of Toronto, Clarke Institute of Psychiatry. In the 1970s, he founded a research institute, a new Biology academic unit, and doctorate and Masters’ of Science graduate programs in Biochemistry in Argentina, and in 1981, Dr. Bazan joined the faculty of the LSU Health Science Center, where he later established and now heads the Neuroscience Center of Excellence.

In the late 1960's, in his first laboratory at the Clarke Institute of Psychiatry in Toronto, Canada, Dr. Bazan discovered that brain ischemia, seizures or electroconvulsive shock trigger the rapid release of unesterified essential fatty acids (docosahexaenoic and arachidonic acids) from membranes through phospholipase A2. Soon after, his lab extended these seminal observations to the retina. These findings became a citation classic ("Neural Stimulation or Onset of Cerebral Ischemia Activates Phospholipase A2", Bazan NG, *Current Contents/Life Sciences*, 30:10, 1991). Based upon this early work, he then discovered that release of the lipid mediator, platelet activating factor (PAF), is a major signaling event of inflammatory responses in the eye and brain, and he identified PAF binding sites in synaptic and intracellular membranes.

He then uncovered that DHA supply to the photoreceptors and synapses is liver-regulated (1989), and that in photoreceptor cell renewal, retinal pigment epithelium recycling retains DHA within photoreceptors by a “short loop” (RPE-to-photoreceptors) after the “long loop” (liver-to-retina) (1985). He found that Usher’s Syndrome patients have DHA shortage in the blood, implicating the long loop in retinal degenerations (1986). He discovered enzyme-mediated formation of DHA derivatives in the retina (1984) and coined the term docosanoids. He and his colleagues, in collaboration with Dr. Charles N. Serhan, then

discovered the synthesis and bioactivity of the first docosanoid, neuroprotectin D1 (NPD1, 2003-4), which arrests apoptosis in retinal pigment epithelial cells at the pre-mitochondrial level, and is neuroprotective in brain ischemia-reperfusion and in cellular models of Alzheimer's disease. Then he and his colleagues found a decrease in DHA-derived NPD1 in the CA1 area of Alzheimer's disease patients, and that NPD1 promotes down-regulation of pro-inflammatory genes and of pro-apoptotic Bcl-2 proteins, and neuronal and glial cell survival from A β toxicity.

Among Dr. Bazan's awards and recognitions are the Javits Neuroscience Investigator Award from the National Institute of Neurological Diseases and Stroke (1989); elected to the Royal Academy of Medicine, Spain (1996); elected fellow of the Royal College of Physicians of Ireland, Dublin (1999); President, American Society for Neurochemistry (1999-2001); Doctor Honoris Causa, Universidad de Tucuman, Argentina (1999); Endre A. Balazs Prize, International Society of Eye Research (2000); the Proctor Medal, the highest honor awarded by the Association for Research in Vision and Ophthalmology (ARVO) (2007); the Alkmeon International Prize (2011); the Chevreul Medal, Paris, France (2011); the Excellence Award, Annual European Association for Vision and Eye Research, Nice, France (2013); and the Mossakowski Medal, Polish Academy of Sciences, Warsaw, Poland (2013).

For his contributions to creating a culture that inspires novel ideas and opens a path for translating concepts into reality—from the lab, to the clinic, to the community—he received many recognitions, which include: Role Model, Young Leadership Council of New Orleans (1994); The Alzheimer's Association Greater New Orleans Award (2002); Family Services of Greater New Orleans (Ten Outstanding Persons) Award (2003); and induction into the Junior Achievement Business Hall of Fame of New Orleans (2010).

He is the Founder and Editor-in-Chief of *Molecular Neurobiology* (Springer) (1986-present), a Senate Member (2009-2016) for the German Center for Neurodegenerative Diseases (DZNE), a nationwide research program on Alzheimer's disease in Germany, Member of the Biology of the Visual System Study Section, NIH (2009-2014), and Chairman of the Board of Governors for the Association for Research in Vision and Ophthalmology (ARVO) Foundation (2011-2014).

His civic and artistic community involvement includes being a patron of the New Orleans Opera, and authoring *Una Vida: A Fable of Music and the Mind* (produced as the feature film "Of Mind and Music") as well as *The Dark Madonna: A Fable of Resiliency and Imagination*—novels exploring his lifelong intellectual quest and exploration of a better understanding of the deep beauty and complexity of the human experience.

Dr. Nicolas Bazan is married to Dr. Haydee Bazan, and they have five children: Patricia, Andrea, Nicolas, Hernan and Maria. The children have given his wife and him twelve grandchildren.

Top five publications

Bazan NG. Effects of ischemia and electroconvulsive shock on free fatty acid pool in the brain. *Biochim Biophys Acta.* 1970;218(1):1-10.

Mukherjee PK, Marcheselli VL, Serhan CN, **Bazan NG.** Neuroprotectin D1: a docosahexaenoic acid-derived docosatriene protects human retinal pigment epithelial cells from oxidative stress. *Proc Natl Acad Sci U S A.* 2004;101(22):8491-6.

Lukiw WJ, Cui JG, Marcheselli VL, Bodker M, Botkjaer A, Gotlinger K, Serhan CN, **Bazan NG.** A role for docosahexaenoic acid-derived neuroprotectin D1 in neural cell survival and Alzheimer disease. *J Clin Invest.* 2005;115(10):2774-83.

Calandria JM, Asatryan A, Balaszczuk V, Knott EJ, Jun BK, Mukherjee PK, Belayev L, **Bazan NG.** NPD1-mediated stereoselective regulation of BIRC3 expression through cREL is decisive for neural cell survival. *Cell Death Differ.* 2015;22(8):1363-77.

Rice DS, Calandria JM, Gordon WC, Jun B, Zhou Y, Gelfman CM, Li S, Jin M, Knott EJ, Chang B, Abuin A, Issa T, Potter D, Platt KA, **Bazan NG.** Adiponectin receptor 1 conserves docosahexaenoic acid and promotes photoreceptor cell survival. *Nat Commun.* 2015;6:6228.