Gerald Warren Hart, Ph.D.

Professional Title: *DeLamar Professor and Director of Biological Chemistry*
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Vita-->

Born July 16, 1949 in Topeka, Kansas. B.S. (Biology & Chemistry), Washburn Univ., 1971; Ph.D. (Developmental Biology), Kansas State Univ., 1977; Postdoctoral Fellow (Jane Coffin Childs), Johns Hopkins Univ. School of Medicine, 1977-1979; Assistant Prof. (Biological Chemistry), Johns Hopkins Univ. School of Medicine, 1979-1984; Associate Prof., 1984-1988; Professor, 1988-1993; Established Investigator American Heart Assoc., 1983-1988; Chair, Dept. Biochemistry & Molecular Genetics, Univ. Alabama Medical CTR, 1993-1997; DeLamar Professor and Director Dept. Biological Chemistry, Johns Hopkins Univ. School of Medicine, 1997-present; Visiting Prof. Imperial College, London, 2000-2008.

Editorial Boards: J. Biol. Chem., Associate Editor 2011-Pres.; Board member 1989-1994, 1995-2000, 2001-2007; Founding Editor-In-Chief, Glycobiology, 1989-2001;Molecular & Cellular Proteomics, Associate Editor, 2008- present, board, 2001- 2008; J. Biochemistry (Tokyo) Exec. Editor, May 2006 –2009; Board Present; Archives Biochem. & Biophys., 1992-1995; Glycobiology Correspondent, TIBS, 1987-1989.

Honors: NIH Director's Wednesday Afternoon Lecturer (WALS), Dec. 2011, Washington, DC; Opening Lecture, 2011 Society for Glycobiology Meeting, Seattle, WA.; Plenary Lecture 2011 IUBMB Cell Signaling Networks, Merida Mexico 2011 Irwin J. Goldstein Lectureship in Glycobiology, Univ. of Michigan; 20 10 named, Honorary Professor of Shanghai Medical College, Fudan Univ., Shanghai, China; 2008 Alumni Fellow Kansas State University; Hall of Fame, Topeka High School, 2009; 2010-2011 President, International Glycoconjugate Organization (IGO)**;** 2007 Edwin G. Krebs Lecture, UC Davis, CA; 11th Annual Lecture of Institutes Cell & Dev. Biol., Stonybrook, NY; **2006 Karl Meyer Award, Society for Glycobiology**; Opening Lecturer, Glyco XVIII (2005), Florence, Italy; Inaugural B.Conner Johnson-John R. Sokatch Lecturer, Univ. Oklahoma Med. Sch.; Keynote Speaker American Heart Association Keystone Meeting, 2005; IUBMB Lecturer, 20th IUBMB Intl. Congress of Biochem. & Molec. Biol. and 11th FAOBMB Congress, June 2006, Kyoto, Japan; 2003 Adam Nevelle Lecturer, Dundee Scotland; **Merit Award, NICHD NIH**; **First Recipient of Intl. Glycoconjugate Organization Award, 1997 at Zurich***(most prestigious award in the field)*; Keynote Lecture, Soc. Glycobiology, 2001.

Publications: ~250 all in the area of Glycobiology, mostly on O-GlcNAcylation.

Synopsis:

In the early 1980's, the Hart laboratory discovered a new type of protein modification (O-GlcNAc), present on proteins within the nucleus and cytoplasm of cells, in which a glucose-derived sugar (N-acetylglucosamine; simply glucose with a nitrogen and an acetyl group attached) is attached to serine or threonine side chains of proteins, exactly analogous to phosphorylation. After twenty-six years of research, it is now known that this modification (termed O-GlcNAc) is nearly as common as phosphorylation, often competes with it at the same or proximal sites on proteins, and serves to regulate cellular functions in response to nutrients and stress by cycling on and off sites on proteins exactly like phosphorylation. O-GlcNAc is required for life at the single cell level in mammals. Recent studies, have shown that O-GlcNAc plays an important role in diabetes and glucose toxicity, Alzhemier's disease and in the functions of oncogenes and tumor suppressors important to cancer. Since the cycling of O-GlcNAc is similar to phosphate cycling, and since they have similar abundance and distribution in cells, and since they can be attached competitively to the same or proximal sites, it was postulated that O-GlcNAc and phosphate have a 'yin-yang' relationship in the regulation of cellular processes. Very recent studies have established that the crosstalk between GlcNAcylation and phosphorylation is extensive and results not only from competition at the same or proximal sites, but also by the cycling enzymes for each PTM regulating the other's activities.

Recent Reviews: ***Science*** 291, 2376-2378; ***Nature*** 446, 1017-1022; ***Ann. Rev. Biochem.*** 80:825–58*;* **Nature Reviews Cancer** 11, 678-684; **Cell** 143, 672-676