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Featured Investigator :: Dr. Billy G. Hudson

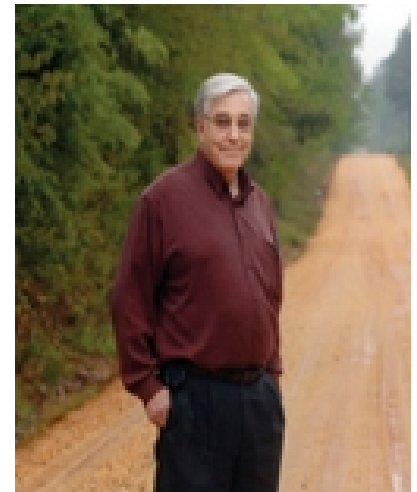
Billy G. Hudson, Ph.D.

**Elliot V. Newman Professor of Medicine, Biochemistry and Pathology
Director of the Center for Matrix Biology at Vanderbilt University**

Research Specialty: The Structure and Function of Type IV Collagen, the Major Constituent of Basement Membranes (BMs)

Research Description:

Billy G. Hudson is the Elliot V. Newman Professor of Medicine, Biochemistry and Pathology, and Director of the Center for Matrix Biology at Vanderbilt University. He received his Ph.D. degree in Biochemistry from the University of Iowa and was a postdoctoral fellow at Harvard Medical School. His appointments have included: Associate Professor of Biochemistry at Oklahoma State University; Professor and Chair of Biochemistry and Dean of Research at Kansas University Medical Center. He served on active duty in the US Army during the Vietnam War and retired as a Colonel from the US Army Reserves.



His research has focused on ancient collagen proteins that compose basement membranes, a specialized form of extracellular matrix. The matrix is essential for the development and maintenance of tissue architecture and function in all multi-cellular organisms from sponge to human. His research group discovered two collagen proteins, and named them alpha-3 and alpha-4 chains of collagen IV, and described how they, together with an alpha-5 chain, assemble into a complex $\alpha3\alpha4\alpha5$ network that functions as a key component of the kidney filtration barrier. The network is directly involved in the pathogenic mechanisms underlying several diseases that cause kidney failure in millions of people: autoimmune Goodpasture syndrome; hereditary Alport syndrome; thin basement membrane nephropathy, Alport post-transplant nephritis, and diabetic renal disease. His work has defined the three-dimensional structure and antibody binding sites of the autoantigen of Goodpasture syndrome, uncovering clues to the pathogenesis of a prototype autoimmune disease. Recently, his team discovered a new chemical bond in biology that fastens the autoantigen together and helps hold tissues together in all animals. He is the coauthor of over 200 scientific publications and 30 patents.

For these seminal discoveries, he received the 2003 Homer W. Smith Award, the highest honor given by the American Society of Nephrology. He is the recipient of other awards and honors, including: the Dolph Simons/Higuchi Research Award; Distinguished Service Citation from the American Society of Biochemistry and Molecular Biology; Distinguished Alumnus of the University of Iowa, Carver College of Medicine; Distinguished Alumnus of Henderson State University; multiple teaching awards from Kansas University Medical Center; the Elliott V. Newman Professorship at Vanderbilt University; 2009 Fellow, American Association for the Advancement of Science; Stanley Cohen Research Award (2010), Vanderbilt University Medical Center; William B. McAllister Visiting Professor (2010), Yale University School of Medicine, and Franklin H. Epstein Fellow (2010), Mount Desert Island Biological Laboratory.

He is a co-founder of NephroGenex, a biotech company that is developing Pyridorin, a drug-candidate which was discovered in his laboratory for the prevention of diabetic kidney disease. A Phase IIb trial was completed in 2010 and a phase III clinical trial is planned for 2012. He is also co-founder of the Aspirnaut Initiative, an educational initiative that encourages students, kindergarten thru undergraduate, to pursue studies and careers in science, technology, engineering and mathematics. The initiative has received national publicity for equipping middle and high school students with laptop computers and broadband internet access to turn long school bus rides into productive learning time.

