



In honor of Professor Robert Vince on the occasion of his 80th birthday

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This issue of *Medicinal Chemistry Research* has been organized in honor of Professor Robert Vince on the occasion of his 80th birthday as a celebration of his scientific achievements and contributions to advancing drug design and discovery in the field of medicinal chemistry. His pioneering work in antiviral drug development started when he was a graduate student more than 50 years ago as a member of Professor Howard J. Schaeffer's lab at SUNY Buffalo. While working on adenosine deaminase inhibitors, he became interested in defining the minimal structure of its substrate, and conceived acycloadenosine, which was later found to have antiviral activity by Burroughs Wellcome. This conception on acyclonucleosides led to the eventual development of AcyclovirTM that set the standard of care for

the treatment of herpes infections and is still on the WHO Essential Medicines List. His work on nucleoside-based antivirals continued as a faculty member of the Department of Medicinal Chemistry at the University of Minnesota where he became a true leader of the field. Prof. Vince was one of the first academicians to recognize the advantages of integrating biology with chemistry, enabling great innovation in the development of drug candidates during a time when we desperately needed new antiviral therapeutics to combat emerging pathogens such as human immunodeficiency virus (HIV). His academic lab outpaced the pharmaceutical industry in the design of carbovir antiviral nucleosides, including Abacavir. The carbovir nucleosides were the first agents specifically designed for inhibiting HIV that showed potent antiviral activity. Abacavir was subsequently licensed by the University of Minnesota and went on to be sold under the tradename ZiagenTM by Glaxo Wellcome, and later on was used as a backbone of combination regimens TrizivirTM, EpzicomTM, and TriumeqTM. This accomplishment is remarkable and changed the standard of care for millions of people worldwide in the treatment of HIV. In addition, the synthetic routes developed by Prof. Vince for carbovir and abacavir featured a key lactam intermediate which was later named the Vince lactam by the chemical industry. The Vince lactam, produced on an industrial scale, has been used for the preparation of a wide range of carbocyclic nucleosides, including carbocyclic puromycin, carbocyclic Ara-A, and guanine as well as azaguanine carbocyclic derivatives, and has evolved into a versatile chemical intermediate in organic and medicinal chemistry in general. Notably, Vince lactam was used for the synthesis of various non-nucleoside drugs, such as the influenza virus neuraminidase inhibitor peramivir, as well as inhibitors of glycosidase and GABA aminotransferase.

Due to his contributions to science and the impacts of the drugs he invented, Professor Vince has received numerous recognitions. He was elected Fellow of [The American Association for the Advancement of Science](#) in 2000, and Fellow of the National Academy of Inventors in

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2018. He was inducted into the Medicinal Chemistry Hall of Fame of the [American Chemical Society](#) in 2007, Academy for Excellence in Health Research, University of Minnesota, in 2009, the Minnesota Inventors Hall of Fame in 2010, the Minnesota Science & Technology Hall of Fame in 2011, and the Auburn Alumni Hall of Distinction in 2017. He was awarded Honorary Doctorate of Science Degree by his alma mater SUNY Buffalo in 2010, the Imbach Townsend Award by the International Society for Nucleosides, Nucleotides and Nucleic Acids in 2010, the University of Minnesota Innovation Impact Award in 2014, the Charles W. Hartman Memorial Award by University of Mississippi in 2014, and the Antonín Holý Memorial Award by the International Society for Antiviral Research in 2016.

Prof. Vince's tradition of accomplishment and innovation continues at the University of Minnesota as the founder and director of the Center for Drug Design. Under his leadership, the Center has emerged as a driving force in the

development of new technologies and treatments that address unmet needs in diagnosing and treating diseases. His work on Alzheimer's disease and artificial butter flavorants revealed that the dicarbonyl flavorants, such as diacetyl, connect on a molecular level with Alzheimer's disease progression, which garnered national attention in the fight to find treatments. Their work led to the development of retinal imaging technology to detect biomarkers in the eye that are early predictors of Alzheimer's disease. This technology is being studied in 5 clinical programs in the United States, Canada, and Israel. His team has also developed and advanced an antidote to cyanide poisoning, Sulfanegen, a prodrug of 3-mercaptopyruvic acid that can be formulated as an auto-injectable for quick and safe administration following exposure. At the age of 80, Prof. Vince continues to build on his legacy of innovation and excellence in antiviral research and directs a large team of researchers dedicated to advancing small molecules to the clinic to address unmet needs in health care.