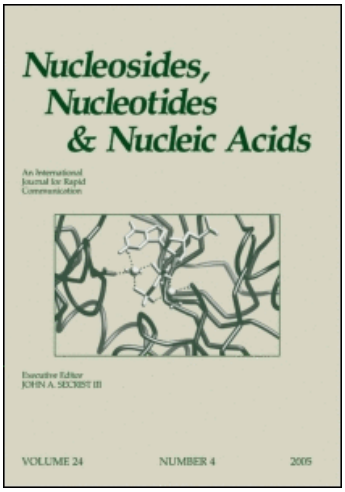

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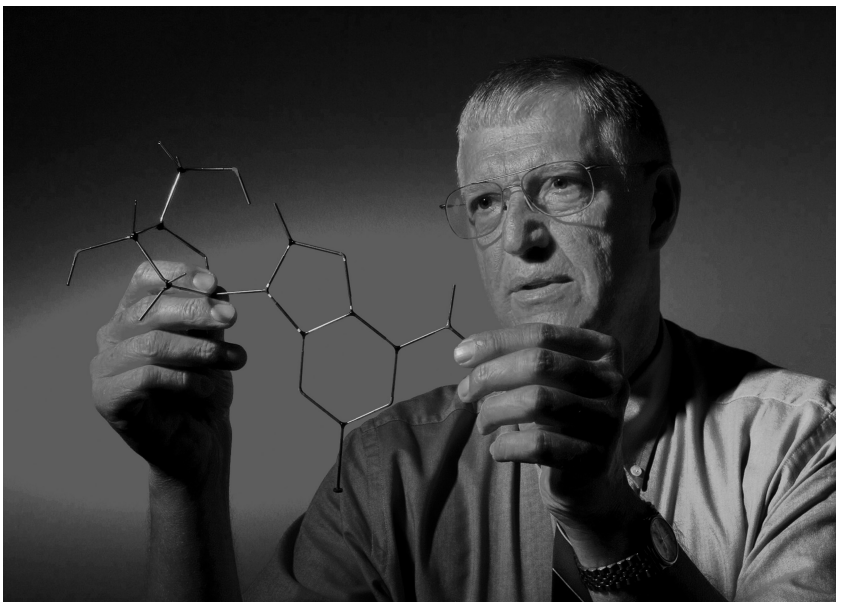
FOREWORD: MORRIS J. ROBINS—TEACHER, MENTOR, SCIENTIST, COLLEAGUE, AND FRIEND



Morris J. Robins was born in Nephi, Utah. He received a B.A. in chemistry from the University of Utah in 1961 and his Ph.D. in organic chemistry with a minor in biochemistry from Arizona State University in 1965. After a year of postdoctoral studies at Roswell Park Memorial Institute in Buffalo and three years as a Research Associate at the University of Utah, he joined the faculty at the University of Alberta in Edmonton, Canada. He rose through the ranks to professor and chair of the Division of Organic Chemistry during 1969–1986. While at the UofA, Professor Robins established a continuing research program on the fundamental organic chemistry of nucleic acid components with applications to biochemistry and in anticancer and antiviral medicine. He moved to Brigham Young University in Provo, Utah, in 1987, and was appointed as the first J. Rex Goates Professor of Chemistry in 1988. He continued active collaborations at the UofA as an adjunct professor in the Faculty of Medicine where he co-directed research on

hepatitis B and nucleoside transport across cell membranes. Work with Professor D. L. J. Tyrrell identified two types of inhibitors of hepatitis B replication. One can block initiation of protein priming of HBV DNA synthesis (such as lubocovir and adefovir) and a second type function primarily as HBV-DNA chain terminators (such as lamivudine, which is now used worldwide for treatment of hepatitis B infected patients). Tyrrell and Robins were awarded the Prix Galien Canada research award in 1998 for their work on the pathogenicity and treatment of viral hepatitis B.

Some of Professor Robins' research highlights include synthesis of cladribine (2-chloro-2′-deoxyadenosine), which is the drug of choice for treatment of hairy-cell leukemia and now is under investigation for treatment of multiple sclerosis; synthesis of 2′,3′-dideoxyadenosine (ddAdo), which is used for DNA sequencing and (after deamination to ddIno) as an anti-HIV drug; substrate functionality mapping of adenosine aminohydrolase (ADA) and its use as an enzymatic deamination reagent; development of direct fluorination procedures for synthesis of the antitumor drug 5-fluorouracil (5-FU) and derivatives; development of radical-mediated deoxygenation of secondary alcohols and application to the first general method for conversion of ribonucleosides to their 2′-deoxy counterparts. The "Barton-Robins deoxygenation" was communicated in 1981 (full account in 1983, *J. Am. Chem. Soc.*) and has been cited nearly 800 times. Other highlights include synthesis of 3-deazauridine (which progressed to human clinical trials as a potential anticancer drug); development of monomethylation of the cis-glycol system of ribonucleosides; development of methodologies for 5-halogenation of pyrimidines and their nucleosides; Sonogashira coupling of such 5-halopyrimidines to give 5-(alkyn-1-yl)pyrimidine derivatives—as well as their cyclization to give furo[2,3-*d*]pyrimidine derivatives (later called BCNAs by those who discovered potent and selective activity against varicella zoster virus); development of non-aqueous diazotization-dediazoniation procedures for conversion of aminopurines and nucleosides into 2- and/or 6-halopurine compounds, and new and improved halodeoxygenation methodologies that made 6-halopurine derivatives readily available; synthesis of a variety of nucleoside analogues and derivatives for collaborative studies of nucleoside transport across cell membranes with Professors A. R. P. Paterson and C. E. Cass at the UofA; development of efficient oxidation-reduction methods for inversion of hydroxyl groups in selectively protected ribonucleosides to produce arabino or xylo diastereomers (applicable for hydrogen-isotope labeling); synthesis of and model studies with nucleoside derivatives that can undergo cascade reactions to produce mechanism-based inactivation of enzymes upon binding and alternative substrate processing at the active site; collaborative studies with Professor R. T. Borchardt on *S*-adenosylhomocysteine hydrolase and with Professor J. Stubbe on ribonucleotide reductases; development of methodologies for coupling guanine derivatives with

reactive glycosyl donors to give 7- or 9-isomers regioselectively; collaborative studies with Professors E. De Clercq and J. Balzarini on synthesis of nucleoside analogues and derivatives and their evaluation in cancer and virus-infected cell cultures; development of methodologies for fluorination of thioethers and synthesis of nucleoside α-fluoro thioether derivatives; development of methodology for elaboration of exocyclic amino groups on nucleoside bases to give appended heterocyclic rings that undergo organometallic cross-coupling reactions and nucleophilic displacements to provide access to a wide variety of nucleoside and 2′-deoxy analogues; development of methodologies for the preparation of 6-(heteroaryl)purine derivatives and coupling of their sodium salts with glycosyl donors to give 9-glycosylpurine nucleosides regiospecifically; and methods for synthesis of spirocyclopropyl and fused difluorocyclopropyl nucleoside derivatives. His work has been reported in more than 255 reviewed journal publications, 35 book chapters and invited articles, and meeting abstracts. He has presented numerous invited lectures at international meetings, companies, and universities worldwide. Throughout his career he enjoyed continuously generous research support from the Natural Sciences and Engineering Research Council of Canada, National Cancer Institute of Canada, Alberta Heritage Foundation for Medical Research, American Cancer Society, U.S. National Institutes of Health, and several pharmaceutical and biotechnology companies.

Professor Robins has rendered valuable service to the scientific community as a painstaking reviewer for numerous journals and a grants panel member for the National Cancer Institute of Canada, American Cancer Society, and U.S. National Institutes of Health as well as several ad hoc review committees. He played an active role in the initiation of the Gordon Conference on Purines, Pyrimidines, and Related Compounds, and was elected vice chair in 1989 and chair in 1991. He has received several honors including the Karl G. Maeser Research and Creative Arts Award (BYU, 1993), Utah Governor's Medal for Science and Technology (1996), Utah Award (American Chemical Society, 1997), Karl G. Maeser Distinguished Faculty Lecturer (BYU, 1997), Chemistry Department Teacher of the Year (BYU, 1998), Prix Galien Canada Research Award (1998), Wesley P. Lloyd Award for Distinction in Graduate Education (BYU, 2005), Imbach-Townsend Award (International Society for Nucleosides, Nucleotides and Nucleic Acids, 2008), and a Symposium in Honor of Morris Robins was co-sponsored by the Carbohydrate and Medicinal Chemistry Divisions of the American Chemical Society during the 237th National Meeting in March 2009.

Professor Robins has been described as a "truly gifted" scientist. His approaches are characterized by persistence in solving difficult problems and insistence that the entire problem be understood clearly. He "searches for the truth" in the highest traditions of a professor and scientist. Such

qualities have given him an uncommon degree of insight into reaction mechanisms and synthesis pathways in nucleoside and nucleotide chemistry. He has attacked difficult processes and synthetic problems, which sometimes had been subjects of study by others who abandoned their pursuit. He has made major contributions to the art and science of nucleoside chemistry, and has developed methods that are in wide use throughout the scientific community. However, he says that the most satisfying moments have come during mentoring an international team of students, postdoctoral fellows, and visiting scientists because the feeling you get when colleagues achieve is as intense as when you accomplish it yourself. The thrill of discovery—something that has never been done before—has been the ultimate "high" for Professor Robins. Satisfaction is increased when a discovery is applicable to human medical needs. Shaking the hand of someone who would have died without the chemical intervention you helped develop is profoundly rewarding.

Professor Robins also is a highly skilled teacher (he prefers the designation "stimulator of learning") and a warm, caring, and compassionate person. Professional integrity, disciplined thinking, and meticulous research standards made him especially effective as a mentor who attracted students, postdoctoral fellows, and visiting scientists from all over the globe.

Professor Robins is married to the former Jackie Robinson, and their combined family consists of eight children and 22 grandchildren. He grew up with a love for mountains, streams, hunting, and fishing—and volleyball games with his research group. He now has a "hobby farm" where he can direct the search for growing things during warm months and a return to publication of good work by former colleagues when it is cold.

Stanislaw F. Wnuk
Florida International University
Miami, June 2009