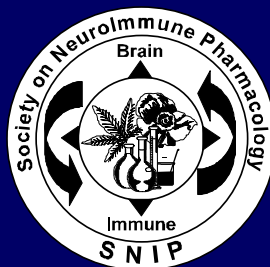
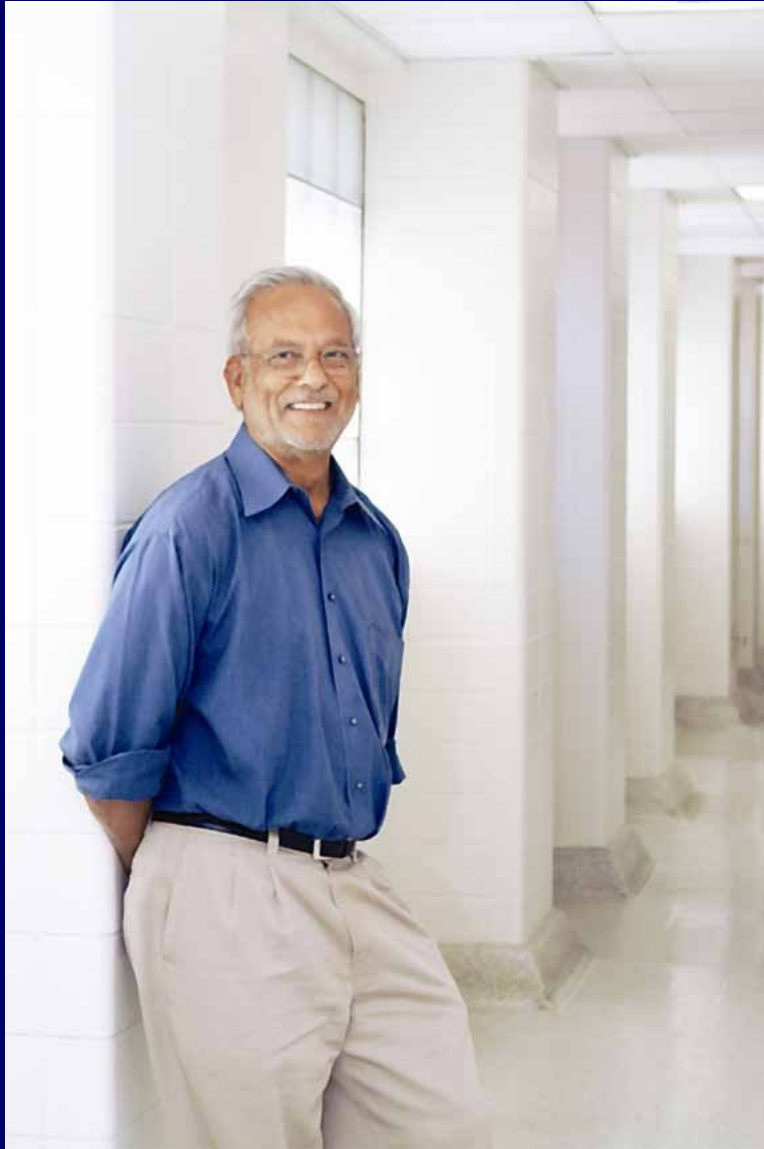


In memory of
Opendra "Bill" Narayan
December 24, 2007



Opendra “Bill” Narayan (1936–2007): A Personal Tribute to a Friend, Teacher, and Colleague

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Globally renowned HIV researcher Opendra “Bill” Narayan, of the University of Kansas Medical Center, died unexpectedly at the age of 71. Bill, a veterinarian and virologist, obtained fame over a decade ago after creating a type of HIV that resulted in a disease in monkeys that resembled AIDS in humans. His outstanding accomplishments and contributions in the field were a testimony to the Pioneer Award in neurovirology that he received in 2006. Reflections from his past trainees about his mentoring and teaching skills and their interactions with him are a small tribute to this larger than life legend.

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Opendra “Bill” Narayan, an internationally recognized scientist and pioneer in AIDS research, died on December 24, 2007 at the age of 71. For those people in so many fields who knew him, his death has left a large void.

Born in Essequibo, Guyana in November 1936, Bill developed a fascination for natural sciences from an early age, and this attraction led him to pursue a career in science. He received his doctorate in veterinary medicine at the University of Toronto, Canada in 1963 and his doctorate in the mechanisms of viral disease at the University of Guelph in 1970. Bill’s interest in animal viruses took him in 1972 to the laboratory of Dr. Richard T. Johnson, a preeminent neurovirologist, in the Department of Neurology at Johns Hopkins University Medical Institutions (JHUMI). It was in 1973 that he initiated and pioneered studies on infection in sheep with slow-moving viruses, called lentiviruses. When it was discovered 15 years later that HIV belonged to the lentivirus family, Bill’s research took on a whole new direction. “When HIV was isolated and it was discovered that it was also a lentivirus, Bill was in an ideal position to play a leadership role,” wrote Diane E. Griffin, Professor and Alfred and Jill Sommer Chair of the Department of Molecular Microbiology and Immunology at Johns Hopkins Bloomberg School of Public Health in Baltimore. It is his pioneering work on visna and subsequently for the development of animal model of AIDS- and HIV-associated dementia with which his name will forever be linked.

Bill’s dedication and passion for science raised him through the ranks at JHMI to Professor and Director of the Retrovirus Biology Laboratory. His deep sense of social responsibility and his concern about making a worthwhile contribution to benefit mankind were reflected in his choice of research topics in a career spanning almost four decades.

His major research interests were also exceptionally broad in terms of both subject matter and methodology. His critical studies at Hopkins have provided many of the foundational concepts that are currently the gold standards for exploring the pathogenesis of HIV and its effects on the immune and nervous systems. In 1993, Bill was recruited to the University of Kansas School of Medicine as a Distinguished Professor and director of the Marion Merrell Dow Laboratory of Viral Pathogenesis. One of Bill's major contributions came in the mid-1990s, the creation of chimeric KU SHIV, a virus in monkeys that duplicated human HIV. It allowed for quicker testing of potential vaccines to prevent infection. Because of his fervor for service, he accepted in 1999 the added responsibility of chairmanship of the Department of Microbiology, Molecular Genetics and Immunology in the School of Medicine. Bill's restlessness to foster the research program for junior faculty resulted in his procurement of the Center for Biomedical Research Excellence (COBRE) funding. Bill was a towering figure in HIV pathogenesis and vaccine research and had made seminal contributions in the areas of neuroAIDS and therapeutics. Studies from his laboratory have yielded more than 250 peer-reviewed publications and over 50 chapters, as well as national and international recognition.

We can all think of famous scientists who have failed to produce mentees that have gone on to highly successful independent careers. With Bill, the opposite was true. During his distinguished career, he trained countless numbers of graduate students, postdoctoral fellows, clinical fellows, and junior faculty most of whom have gone on to make major contributions in neurovirology and related disciplines. With due credit to Bill, many of his former trainees have become world leaders in the field of neuroAIDS. Some of the striking examples that stand out include Drs. Janice Clements, the Mary Wallace Stanton Professor of Faculty Affairs and Professor of Comparative Medicine, Neurology, and Pathology at the Johns Hopkins Medical Institutions (JHMI); M. Christine Zink, Professor and Interim Chair, Department of Molecular and Comparative Pathobiology and Professor, Department of Pathology and Department of Molecular Microbiology and Immunology, Bloomberg School of Public Health at JHMI; Shilpa Buch, Associate Professor of Molecular and Integrative Physiology, Kansas University School of Medicine; Howard E. Gendelman, Larson Professor of Medicine and Chair, Department of Pharmacology and Experimental Medicine at the University of Nebraska Medical Center among others. Clearly, Bill took special interest in fostering the careers of women in science, long before this issue had the political clout that is now eminent. Certainly, his women trainees holding high-ranking academic positions exemplify his mentorship. He was an inspiring teacher with a particular rapport with young scientists.

Bill's research was widely recognized by various honors including the 2006 Pioneer in NeuroVirology Award for his accomplishments and contributions to the field of neurovirology. Some of these awards included the Chancellor's Club Award in 2003 and the prestigious Jacob K. Javits Award from the National Institute of Neurological Disorders and Stroke in 1986.

Several colleagues, friends, and mentees wrote personal reflections herein included as a tribute.

Shilpa Buch

Bill had been a terrific friend and a great mentor to me for the last 12 years. I joined his group as a research faculty to work on HIV neuropathogenesis. I remember my first encounter with him vividly where his easy and friendly demeanor struck me almost instantly. Bill had an uncanny excitement and passion for science that was infectious as well as refreshing. He was always interested in the biological relevance of scientific findings, which is why he fostered me to take my past experience of antisense therapy and apply it to SHIV-infected macaques. He was very generous with his time and resources and even allowed me to use his macaques to carry out my first set of studies in this area. During our regular lab meetings, he passed on concepts in neurovirology to me that helped me carve my own niche in the area. He instilled in me the ethics of hard work, the process of grant writing and mentoring, and the art of presenting the data simplistically.

Bill took genuine interest in my work, never failing to show up at the animal necropsies and slide readings. He took profound interest in grant and manuscript writings and always provided valuable feedback; it gave him genuine pride to see his trainees succeed. Bill never allowed anyone to mope over failures, his response being—allow yourself 24 h to feel bad and then chin up and move on. He was refreshingly optimistic with a can-do attitude that was totally devoted to science. His priorities in life were clear—seeking knowledge and answers to relieve human suffering being number one. I will always remember Bill fondly, as he taught me a great deal about science. Although I had learned that it was important in scientific writing to report meaningful information, it was Bill who distilled this down to one sentence that I will never forget—“You have to tell a story.” This message has stayed with me throughout the years and will continue forever.

Despite his significant accomplishments, Bill was extremely humble. He also had a sharp wit and humor that used to be the highlight of our weekly lab meetings—where he never failed to tell a funny story. A job well done would always bring a twinkle in his eye and a smile on his lips—I will miss that. Bill guided me when I was lost,

encouraged me with honesty and kind words when I failed, congratulated me with sincerity and happiness when I succeeded. I feel blessed and honored to have known him. His contributions to science are exemplary and assure his immortality. His legacy and work will not rest.

Janice Clements

Chance and opportunity characterized how I became a postdoctoral fellow with Bill Narayan. Bill was commuting to Hopkins with a colleague, Ken Berns and was telling Ken that he was studying a unique viral model, the visna virus, which would benefit from biochemical and molecular approaches. Ken suggested that he interview me and the rest is history. I started in the Neurovirology Laboratory founded by Dick Johnson in 1975 working with Bill on visna virus in sheep, in studies to understand the remitting, relapsing CNS disease that these sheep developed. Bill provided me with training as a classical virologist, and I combined the virology with my biochemistry expertise and the molecular biology that I had recently learned as a postdoctoral fellow in Daniel Nathan's department. Bill was an inspired mentor, he knew when to be direct, and he knew when to stand back and let you learn by your own mistakes. It was an exciting time in my career as I studied basic virology as well as pathogenesis in sheep infected with visna virus. I will never forget the 6 months of frustrating experiments attempting to adapt visna to newborn mice. In retrospect, it taught us a great deal about lentiviruses and their species specificity. At the time we were doing classic virological experiments attempting to adapt a virus to a new, immature, and naïve host. Bill provided both support and humor as I learned this new research, and he always respected my ideas and input. He taught me to be bold and not to be afraid to try experiments that might not work but to learn from them—he mentored by making you a trusted colleague and also a friend.

Bill was a generous mentor and once I progressed from postdoc to faculty member, he advised on grants but let me build my own areas of research and establish an independent research career. From 1978 until he left Hopkins in 1992, we were colleagues and collaborators, studying first visna virus and then when AIDS was discovered to be a lentivirus, due in large part to Bill's lentivirus research, we began collaborative studies on simian immunodeficiency virus in macaques. I remembering discussing the choice with Bill to study HIV or SIV, he said he wanted to use his expertise in animal models and do what he had always done, to study the pathogenesis of the disease in a way that was not possible in HIV-infected humans. During that time, he continued to mentor PhDs, DVMs, and MDs training

them to undertake novel approaches to viral pathogenesis with a focus on the central nervous system. In 1988, Bill founded the Retrovirus Laboratory and asked me to join him in directing the group that focused on the SIV macaque model. From Bill, I learned not only to do research but also to write grants, to mentor students, and to be a leader by example. Bill lead by giving to all he mentored the opportunity to realize his/her potential. He has left a legacy of over 50 scientists and leaders in neurovirology.

Barry Rouse

Bill and I were graduate students with Gerhard Lang at the University of Guelph; we were his only graduate students having worn him out. We worked on what turned out to be H5N1 strains of avian flu that Bill isolated from barns of turkeys in Ontario where thousands had died mysteriously. For our master's degree, he worked on mainly a virulent strain, which could kill a mature turkey with only a vanishing small dose of infection. I worked on less virulent strains, one of which was a very effective vaccine against the virulent strain. During the course of our studies, we both breathed in an abundance of virus during the many aerosolization experiments we performed, yet neither of them showed any ill effects. We also ate the controls that included sometimes those that survived the virulent challenge!

In recent years during his time in Kansas City, I was fortunate to see Bill often. He urged me to become department head there, but the authorities were wise and thought otherwise. Perhaps as a punishment for his support of me, he was himself appointed the department director! I was a member of the COBRE advisory board where I got to witness yet again Bill's great skill at mentoring junior scientists and making intelligent decisions about research projects.

Bill never got to retire. We talked about this at length but neither of us could think of a more intelligent way to spend our time! Bill's premature departure from the scene has made me realize how fragile our existence is. However, his death was sudden and he left no major problems for others to solve—all in all he had a wonderful life and contributed greatly to the knowledge and experience of others. It was a privilege to know him and have him as a true friend. I shall plant an azalea, his favorite garden plant, in his memory.

Howard Gendelman

I was scared, worried, and excited all at the same time. Jerry Wolinsky was leaving Hopkins and a new mentor whom I had not met was returning from a sabbatical in Germany. He had pursued many different research direc-

tions but a major one centered on the role of macrophages in lentivirus persistence and pathogenesis. This was the most risky of all, so inside my heart it was the one I wanted to pursue. Bill, I remember as it was yesterday, almost stormed into the laboratory with bristled enthusiasm. Coming home to Baltimore, he did not miss a step. He asked, “Where is my new postdoc?” I said, “You only have to look at me. I haven’t had much research experience, don’t know much about the nervous system, and can’t say much about viruses, but I am a hard worker and determined.” Bill turned around and smiled with that characteristic twinkle in his eye and he said “you don’t need to know anything other than a have a desire to learn and to work hard”—he abruptly left. For the next 6 month, I pursued the work although the methodology was new to me and each and every experiment seemed as one failure after another. However, under Bill’s guidance, the patience of a saint of Janice Clements, and the help of a thoughtful and more experienced postdoc, Tom Moench, the work moved forward with sustained and great success. I stayed in the laboratory day and night as I remember, and Bill directed almost everything with a very thoughtful and watchful eye. He was proud of the progress I was making and of my own growth as a scientist and my love for what I was doing. All Bill seemed to care about throughout his incredible career of his people were dedication, hard work, and determination. This first experience fashioned the rest of my own professional career. All those that followed as my fellows and students were showed the same yardstick.

I felt so blessed to work for such a smart man. I wondered how could he come up with such thoughtful experiments and how he could suggest and devise such important works? I thought again that he must be a genius. I could never be as good as him. How could I learn to think? I remember one day coming again to his office and with great frustration. I said, “I could never be like you, Bill, you are so smart and so visionary.” He laughed again and said, “You can, just be patient my boy, just be patient.” Through years of good and bad and sometimes fights, personal and scientific, I always felt he was in my corner. When difficult problems arose I would ask myself, “What would Bill do in a situation like this?” This really helped.

Last year, I learned that Bill had won the Pioneer in NeuroVirology Award. This is among the most coveted of all honors in our field. I looked at the dates and said “oy, I cannot attend.” I called Bill and asked if I could come to Kansas City and take him to dinner. He said I was crazy, “You mean you are going to drive from Omaha to Kansas to take me to dinner? There is no need, spend the time in the lab.” But there was a need and more. At the end of the dinner he smiled and said, “The celebration and this award are not for me. It’s for those whom I was lucky to have trained and worked with for many years. You know, the

greatest joy a scientist can have is to see those that they train develop and do great things on their own. You made me proud,” and he hugged me. I could barely hold back my own tears. I took a deep breath and could say only two more words “thank you.”

M. Christine Zink

In 1985, Dr. Narayan visited the Ontario Veterinary College at the University of Guelph to see old friends from his Ph.D. days. Although I had just gone without sleep for 37 h working on an experiment to complete my Ph.D., a faculty member insisted that I meet Bill. Once Bill learned that my Ph.D. involved the study of macrophage physiology in response to infectious disease, he immediately invited me to come to Hopkins for a postdoctoral fellowship. Before we had finished the interview, Bill was already plotting how he would help me write a Medical Research Council Fellowship to support my training.

I then visited Hopkins where Bill’s well-equipped facilities and his obvious delight in research impressed me. At dinner that evening, as Bill and his wife Moonie pored over maps of Baltimore with me to help me find a place to live, I became convinced that I would join him. When I arrived in Baltimore, Bill and his family were there, helping me unload the rental truck containing my belongings. This was typical of Bill’s generosity and willingness to work in the trenches. Even when he held positions of leadership, Bill’s first love was to be in the laboratory, gloves on, looking down a microscope, or planning the next experiment.

One of Bill’s major strengths was his incredible facility with the English language. He wrote beautifully, and taught his students and colleagues to do so as well. He was unparalleled as a science writer and had an uncanny ability to captivate the reader. He also had a quick mind for metaphors. For example, when he saw a strongly positive cell under the microscope in a tissue stained by *in situ* hybridization, he said, “That just looks like Jonah in the whale with a flashlight!” Many of Bill’s metaphors are still in use in our laboratory, 15 years after his departure.

Bill was a person who knew how to make things happen. He didn’t like to hear the words, “No, that cannot be done.” That was inevitably a challenge for him to make it happen. And more often than not, he succeeded. What’s more, he also wanted others to succeed, which made him an ideal mentor. He took great pride in those whose careers he impacted, and there were many of us. I will always be grateful that he was willing to meet with a nobody Ph.D. student in 1985. I will forever miss his insightfulness, his generosity, his love of research, his sense of humor, and that twinkle in his eye.