

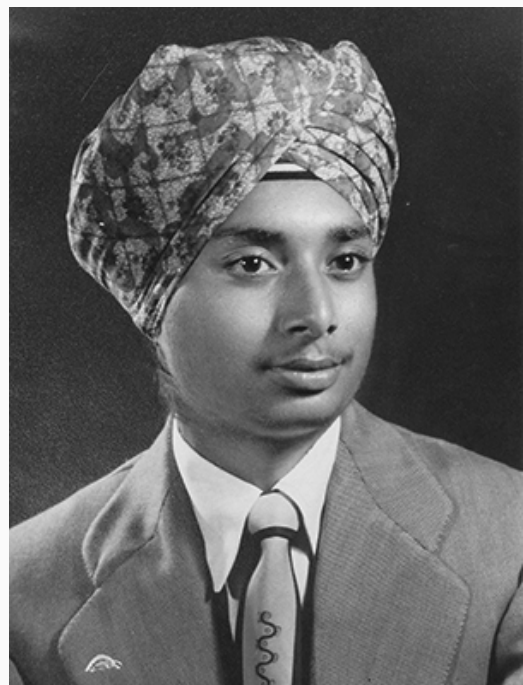
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## May 2014

This month *Who's Who at NIDA* features **Dr. Jag Khalsa**, Chief, Medical Consequences Branch, Division of Pharmacotherapies and Medical Consequences of Drug Abuse, NIDA.

**N2: You are now in your 50<sup>th</sup> year as a researcher. When you were getting your first Bachelor's Degree in Chemistry from Gujarat University, Ahmedabad, in 1960, did you imagine this career?**

I had planned to leave India in the late 1950s. But only after earning a Bachelor's degree in Chemistry, another in Pharmacy, and a Master's degree in Pharmacology/Pharmacognosy (science of using medicines from natural sources), I was able to come to the United States in 1968 where I earned a PhD in neuropharmacology (role of neurotransmitters in the CNS action of morphine and amphetamine). I never imagined that I would be working at this prestigious Institute, have the privilege to work with some of the outstanding world-class researcher/clinicians in addiction and infections,



Dr. Khalsa as a college student in India in 1957, 3 years before receiving his Bachelor's degree.

and then would be receiving awards of distinguished service from professional societies or attending meetings at the White House. It has been an outstanding and rewarding career.

**N2: While in India, you studied herbal pharmacology at the graduate level. How far has the world come in understanding this field?**

In the late 1970s and 80s, many researchers lost interest in the scientific discipline of pharmacognosy (herbal pharmacology) because it is quite resource and time-consuming to identify, isolate, characterize and develop for clinical use one or more of the active chemical constituents of a plant. However, it is being revived now due to high interest in finding herbal-based alternative therapies for cancer, AIDS and other diseases/disorders. An excellent example relevant to us is 'medical marijuana.' Many researchers are engaged in isolating active chemical constituents of cannabis, known as cannabinoids, and determining their medical properties for treatment of conditions such as neuropathic pain, multiple sclerosis, cancer chemotherapy induced nausea/vomiting, improving appetite in AIDS wasting syndrome, epilepsy, glaucoma, or other medical conditions. I am hopeful that scientists at NCI, NIAID, NCCAM and other NIH institutes will support more research in herbal medicine in the future.

**N2: When you came to the U.S. to study at the University of Mississippi in 1968, what kind of a culture change was it for you? Both professionally and personally?**

Frankly speaking, it did not take long to adapt to the American professional culture since the faculty and staff were highly supportive and understanding towards foreign graduate students. In addition, I was fortunate to receive the monetary support from a NIDA grant, DA00018, to conduct research towards my doctoral degree in neuropharmacology. The grant support also afforded me an unforgettable opportunity to receive training in the area of neurotransmitters in the laboratory of Drs. E. Costa and Norton Neff at St. Elizabeth Hospital that set my career on a trajectory that finally brought me to NIDA several years later. Personally, since I was already sort of 'westernized' during my early education in India, and thanks to watching American movies and singing Nat King Cole songs, I had no difficulty in assimilating into the American culture. In Mississippi, being the only guy with a turban, I used to be invited to visit families and churches to talk about India and my religion. Throughout my professional and personal career, I have been fortunate to receive the best support, whether at SmithKline, SRI, NIOSH, FDA or NIDA, all of which have made it easy to adapt to the American culture. In fact, I have lived in this great country for twice as long as I lived in India.

**N2: You worked for a while in pharma studying the role of neurotransmitters in hypertension before landing in government. How have public private partnerships evolved over the span of your career?**

During my research career at SmithKline and then for almost 10 years at the FDA, there was a general perception among some in the pharmaceutical industry ('big pharma') that the federal government scientists/regulators were their enemies. But over the years, the relationship between the 'big pharma' and the public sector has greatly improved and rightfully so. This is because it is the right approach when one is engaged in developing medicine for treating illnesses/disease, whether it is drug dependence, heart disease, infectious disease or any other condition. We can achieve the best results if we all work together. At NIH we can support initial basic/clinical research on discovery of new treatments, and the 'big pharma' can then further develop these new pharmacological agents/devices/products for delivery to the patient. Currently, I am proud to see that our unique division in the institute, the Division of Pharmacotherapies and Medical Consequences of Drug Abuse, is actively engaged with a few pharmaceutical companies to develop medications for the treatment of drug dependence.



Dr. Khalsa today. He recently received a Lifetime Contributions Award for his contribution to neuroimmune science from the Society of Neuroimmune Pharmacology, a few weeks before his 50th anniversary in research.

**N2: You joined NIDA in 1987 when it was still ADMHA—how has our Institute changed over the years?**

In those early years, in collaboration with its sister institutes NIAAA and NIMH, also part of ADMHA, NIDA supported a lot of basic, epidemiological and clinical research on illicit drugs of abuse. Frequently NIDA was in the news due to the emerging epidemic of cocaine or heroin use among the young, adolescents and pregnant women. But following re-organization of ADMHA in 1992, when we all became parts of the NIH, we became heavily involved in research on maternal drug abuse, in studying the molecular/genetic basis of drug addiction/dependence, and studying medical and health consequences of drug abuse.

abuse.

We were also developing new techniques (neuroimaging) to study the mechanism of drug action in the brain, and were looking at co-occurring infections (HIV, hepatitis C, tuberculosis, STIs and others) among drug abusers—research that we continue to support today. Currently, we are at the forefront of supporting highly innovative bench-to-bedside research on prevention and treatment of drug addiction, and developing new treatment modalities for which we are recognized all over the world. Of course, the issues of opiate abuse, prescription drug abuse, impact of legalization of marijuana and ‘medical marijuana,’ the emerging epidemic of HCV infection among young injection drug users, and many others will keep us busy and in the news all the time. In my personal opinion, we will never eliminate drug addiction, what we must do is to continue to develop multimodal prevention and treatment interventions to reduce the impact of drug abuse consequences.

**N2: In recent years you have been managing a wide multidisciplinary program on the medical consequences of drug abuse—what are you most proud of in your years here at NIDA?**

As a scientist for the past 50 years and more recently as the Chief of Medical Consequences of Drugs of Abuse and Co-occurring Infections, I am never bored. One day I may initiate a new research project on heart disease in HIV-infected cocaine abusers, on another day a project on liver disease in IDUs with hepatitis C infection, and so on. I marvel at what we have accomplished from this research, including the use of non-invasive CT angiography for coronary artery disease, the use of Fibroscan for following liver disease, infectivity of the hepatitis C virus, and the use of inexpensive anti-oxidant micronutrients like selenium to improve the immune system in HIV/AIDS. Since drugs of abuse and infections impact almost all physiological systems, highly significant clinical research from our grantees that benefits patients makes me feel ‘high,’ in the words of John Denver’s song: ‘sunshine almost always makes me high.’ The beauty of working at NIH is that we are always initiating new research that ultimately benefits the public. Most importantly, I could not have survived for the past 27 years at NIDA without a wonderful and collegial relationship with countless hard working and caring clinician/researchers, colleagues at NIDA, NIMH, NIAID, NIDDK, and HHS, and outstanding support from my superiors and my family. With Almighty’s help, let us march together to deal with drug addiction and associated morbidity.

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