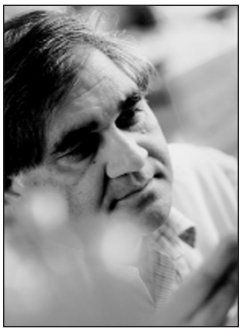
Inder Verma, Ph.D.

Professor
The Salk Institute
Laboratory of Genetics
10010 North Torrey Pines Blvd.
La Jolla, CA 92186
United States



1964-1966	M.Sc. Biochemistry, Lucknow University, India
1967-1971	Ph.D. Biochemistry, The Weizmann Institute of Science, Rehovot, Israel
1971-1974	Postdoctoral Fellow, Department of Biology, Massachusetts Institute of Technology, Cambridge, MA (with D. Baltimore)
1974-1979	Assistant Professor, The Salk Institute, La Jolla, CA
1979-1983	Associate Professor, The Salk Institute
1979-1983	Adjunct Associate Professor, Department of Biology, University of California, San Diego
1983-1985	Senior Member, Molecular Biology and Virology Laboratory, The Salk Institute
1985-1995	Professor, Molecular Biology and Virology Laboratory, The Salk Institute
1983-present	Adjunct Professor, Department of Biology, University of California, San Diego
1995-present	Professor, Laboratory of Genetics, The Salk Institute

Honors

1985	Medal for Outstanding Scientist, North American Scientists of Indian Origin
1986	NIH Merit Award
1993	Annual Award, Thrombosis Research Institute, London, UK
1995	Charaka Award, The Association of Indians in America
1997	Member, The National Academy of Sciences
1998	Associate Member, European Molecular Biology Organization
1999	Member, Institute of Medicine of The National Academy of Sciences

Lentiviral Vectors

The "bottleneck" of current gene therapy approaches is the lack of an efficient gene delivery system. Retroviral vectors have been very useful for ex vivo gene delivery, but suffer two major limitations: (1) inability to infect post-mitotic cells, and (2) following implantation of the transduced cells, the expression of the transgene is "shut off". The adenoviral vectors can be generated at high titers (>10^{11}-10^{12} pfu/ml) but also have two major limitations: (1) Generation of CTLs to viral proteins, and (2) humoral response to viral proteins precluding repeat infection. The adeno-associated viral (AAV) vectors have not been exploited extensively partly due to inability to generate high titer helper free recombinant viruses. Furthermore, the size of the transgene that can be accommodated to generate viable vectors is limited.

To overcome some of these difficulties we have constructed lentiviral vectors based on HIV and pseudotyping with VSVG protein. We show that high titer helper free recombinant HIV vectors (~10^{8}-10^{9} CFU/ml) can be generated which can infect non-dividing cells in vitro. Furthermore, they can efficiently transduce monocyte-derived macrophages. We will show that HIV based vectors in contrast to the traditional retroviral vectors can be used to deliver genes directly in the brain, muscle, lung, liver, eye and islets. The efficiency of gene delivery is very high [over 70-80% of the neuronal cells at the site (~2.5-3.0 mm) of injection] Furthermore, expression of the transgene is detected for over a six-month period of time, the longest time point tested so far. We believe lentiviral-based vectors will prove to be extremely valuable for in vivo gene delivery.