

## IL-12 shows promise as adjuvant in vaccines

Scientists at the University of Pennsylvania School of Veterinary Medicine and The Wistar Institute have shown that Interleukin-12 (IL-12) dramatically enhances the effectiveness of a vaccine against leishmaniasis in laboratory mice and suggests that IL-12 may be extremely useful as an adjuvant in vaccines against other infectious diseases. An adjuvant is a substance that when added to a vaccine is capable of strengthening its effectiveness in protecting an individual against a disease. The findings were published in the January 14, 1994 issue of *Science*.

"Leishmaniasis is a tropical disease that can cause severe disfigurement and even death, and in the last six years has been targeted by the World Health Organization for the development of a vaccine," says Dr. Phillip Scott, assistant professor at the University of Pennsylvania School of Veterinary Medicine and senior author of the article. "In addition, experimental infections with the protozoan parasite causing this disease, known as *Leishmania major*, have frequently been used to understand basic immunologic responses associated with many different infections."

"IL-12 has a key role in regulating the immune system and may also be involved in several diseases," says Giorgio Trinchieri, M.D., professor at Wistar and a discoverer of IL-12. "It

appears that IL-12 helps to regulate inflammation and the immune response to bacteria and other infectious agents, and possibly to HIV."

The finding is important because, by using IL-12, scientists may be able to boost immune responses to other diseases, such as tuberculosis and leprosy. It has even been suggested by Dr. Jonas Salk (*Science*, May 1993) that IL-12 might be used as an adjuvant in preventive or post-exposure vaccination to AIDS. The work of Dr. Trinchieri has previously shown that in a test tube IL-12 can indeed correct some of the immunological deficiency of blood cells taken from HIV patients (*Journal of Experimental Medicine*, March 1992), and these results have recently been extended by a study at the National Cancer Institute (*Science*, December 10, 1993). Genetics Institute, Inc. in Massachusetts hopes to begin Phase I trials of IL-12 in HIV-positive patients soon (*Science*, October 8, 1993).

Protective immunity induced by vaccination is dependent upon the capacity of the vaccine to elicit the appropriate immune response to either resist, control or eliminate the pathogen (disease-causing organism). Depending upon the pathogen, protection may require very different types of immune responses.

One type of immune response is associated with the development of cells that

destroy the pathogen, and is referred to as cell-mediated immunity, while the other requires the production of antibodies, and is known as humoral immunity.

It is now known that particular CD4+ T cell subsets determine which of these responses develop following immunization. The CD4+ T cells that direct the development of cell-mediated immunity are known as Th1 cells, while those responsible for the development of humoral immunity are known as Th2 cells.

An essential role of adjuvants in vaccines is to direct the development of these CD4+ T cell subsets, such that the appropriate Th subset expands and a protective immune response is generated. However, in the past it has been poorly understood how adjuvants perform this role. Based on the current study, it has now been established that IL-12 primes animals for the cell-mediated type of immune response. Since elimination of the parasite, *Leishmania*, requires cell-mediated immunity, inclusion of IL-12 with the vaccine leads to the development of protection.

IL-12 was first discovered at Wistar in the late 1980's by a research group led by Dr. Trinchieri, and later was purified and cloned in 1989 in collaboration with Genetics Institute. ■

Martha Lubell

## A veterinarian and her clients reach out

From time to time we report on unusual activities of one of our alumnae. Following is a report by Eileen Rowan, V'77, who, together with her clients, has reached out to the Lakota Sioux of South Dakota.

It all started 4 years ago when I visited Taos, New Mexico on a ski trip, and began reading up on the local Pueblo Indian culture. We began sending feathers and an occasional fur pelt to the Taos Pueblo Indians, for use on their Native American dress. It has progressed to our



The five Sioux at Disney's Magic Kingdom

sort of adopting the Lakota Sioux of South Dakota, since they are by far the poorest of all our North American Indians. The reservation runs 85% unemployment and 50% welfare. There are no major cities anywhere close by. Their reservation lacks rich mineral deposits, and there is no tourism. Forget gambling casinos...there is no population to pull from.

So now we have an ongoing commitment to send out badly needed warm clothes for the bitter cold winters. Old ski clothes are prized, and given to

teenagers who live in remote areas of the reservation where they have to bring in wood and water. We also send any type of bird feathers, and old fur coats, muffs, etc. Even fake fur is sent for the younger children's dress costumes. To a school art teacher we send costume jewelry that can be taken apart for the beads, tupperware containers for clay, old dense wool blankets for printing projects, and old hair dryers that blow (heat not needed). Hard back books are sent to a middle school library that had practically no books on the shelves during my visit in September 1993. Fiction for the 5-8th grade is needed.

There are 12 Headstart programs where we send wooden puzzles, toys, stuffed animals and clothes for 3-5 year olds. The director of Headstart also distributes clothes to adults and other age children for us, as well as the fur to fancy dancers, since she is a traditional Indian herself and participates in Pow Wow dances.

Our special project for 1993 was to raise the money needed to bring two Lakota Sioux children and a Sioux teacher to Orlando, Florida for a week. The teacher bought another two tickets, one for her husband (also Sioux) and one for her four year old child. We were able to raise \$850 to pay for the food for everyone. I donated a time share condo week just outside Disney World, and paid for the minivan. Clients donated multiday passes to Disney, and Sea World agreed to sign everyone in for a day, thanks to a nudge by their aqua veterinarians. A Florida veterinarian arranged more passes to Disney. I went to Florida with two full suitcases of donated clothes, and another suitcase half full of toys and stuffed animals, bubble bath, candy, etc., they were used to decorate the condo prior to their arrival.

During the week we saw the Magic Kingdom, EPCOT Center, Sea World, the Kennedy Space Center, Merritt Island Wildlife Refuge, the Atlantic Ocean and an outlet mall. We even had two tickets to a Knicks/Orlando basketball game donated by a Florida lawyer we met down there, who liked what we were doing. The same lawyer also took our Sioux father to play golf. Needless to say, they were thrilled with it all.

Our special project for 1994 is to



*Michael and Shawndai Prue with "Chip and Dale."*

bring a Sioux high school student to Long Island for part of the summer. Edy Harrison, a 5'11" girl, wants to be a veterinarian. She has two ponies that live loose on the prairie behind her trailer home, in addition to three dogs, some chickens and many cats. Our clinic counter top cookie jar accepts donations from our clients, and clients also sign up to take Edy to work with them for a day to see other career options. So far we have lined up a day with an M.D. radiologist, a dialysis nurse, a physical therapist, a wildlife biologist, a teacher of retarded and handicapped children, an equine veterinarian and a house appraiser, as well as the time she'll spend at the Bayville Animal Clinic. Other clients have agreed to take Edy into Manhattan, to the ocean, out sailing, fishing and even to a day at the beauty parlor. The University of Pennsylvania School of Veterinary Medicine has offered to give her a tour of the Small Animal Hospital, as well as New Bolton Center. We are still looking for a frequent flyer ticket for Edy, or a sizable donation to purchase one.

For Christmas 1993 we 'adopted' 65 Sioux Indians on the Rosebud Reservation, with presents being sent out of both wrapped new gifts, as well as

clean, good used clothes and toys. We had all ages represented from just born to senior citizens. The thank you notes are coming in now, and we put them up on the clinic walls for everyone to read. The children's pictures are a hit. Pen-pal relationships are starting, and birthday presents are planned to go out next.

Two clients are currently planning a trip to the reservation this summer to look up their new Indian friends. They have been invited to share a sweat lodge ceremony, go to a Pow Wow, and observe a Sun Dance ceremony, a very special event usually closed to non-Indians.

The experience of doing all this has been a great way to learn about another culture and another way of life. By bringing Edy Harrison to Bayville this summer, we will expose her to suburban and urban life for the first time. She will see traffic, crowds, friendly strangers and many different careers. We hope to give her a headstart on college so that when she leaves the reservation for college, she'll finish college with a good career choice, and not return home within months of matriculation, scared off by the 'big city scene'. In our tiny way we are trying to make a difference in one town on the prairie reservation. ■