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Class of 2008 Profile

You Can Go Home Again: Dr. Gus Aguirre Returns to Penn

By Susan I. Finkelstein

A couple of unpacked cardboard boxes placed neatly atop a filing cabinet are the only indication that **Gustavo Aguirre, V'68, GR'75**, professor of medical genetics and ophthalmology, returned to the Ryan Hospital just this July, after a 12-year stint at Cornell. Other than the boxes, the second-floor office appears never to have been inhabited by anyone else: framed covers of journals featuring Dr. Aguirre's work adorn the walls, as do as artistic renderings of eyes in various abstract states, a needlepoint wall-hanging of dog faces, and other assorted pieces. One of the country's foremost veterinary ophthalmological and gene-therapy researchers, Dr. Aguirre—earning his V.M.D. and Ph.D. at Penn, and serving on the faculty here for over 20 years—has truly come home.

Dr. Aguirre's research focuses on inherited diseases of the eye, especially degeneration of the retina in dogs, humans, and other mammals. In 2001, he, his colleagues at Cornell's James A. Baker Institute for Animal Health, and researchers at Penn were the first to restore vision in blind dogs using gene therapy:

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The Class of 2008 arrived on campus for orientation at the end of August. Eighty-seven women and 21 men, ranging in age from 21 to 48 years, with a mean GPA of 3.54, are already hard at work, coping with the heavy course load. The majority of the students, 64 percent, are from Pennsylvania, the balance are from New Jersey (8), Massachusetts (7), New York (5), Connecticut, Illinois and Virginia (3 each), international (2, Bermuda and Japan), and one each from Colorado, District of Columbia, Kentucky, Maine, Maryland, and Oregon. The School received 1,217 applications and made offers to 154 applicants.

The majority of the students' undergraduate degrees is a BS (64); a BA was earned by 43 and BFA by one. Five students have an MS, two an MA, and one an MLAS. Eight students received their undergraduate degrees from Penn and Cornell. In all, 62 undergraduate schools are represented in this class with 35.2 percent of the students having attended top-tier (most competitive) schools, 24.1 percent second-tier (highly competitive) schools, and 21.3 percent third-tier (very competitive) schools.

"Lancelot," a four-year-old briard mix blind since birth, was the first creature ever to recover sight thanks to this revolutionary work, which



Lancelot, the Briard mix whose sight was restored.

also holds promise for curing a similar disease in children, Leber congenital amaurosis. In gratitude, Lancelot has appeared before Congress with the Aguirre team for their testimony on the importance of increased funding for eye research to advance gene therapy—certainly an unusual lobbyist!

In the experiments involving Lancelot and three of his littermates, Dr. Aguirre and his colleagues injected a virus carrying a healthy copy of the defective gene into a part of the retina containing light-sensing cells. The virus "infected" those cells, releasing the normal gene material. Within three to four weeks, cells with the healthy copy began to produce vitamin A that, together with opsin, formed the visual pigment rhodopsin, eventually allowed the dogs to see for the first time in their lives. Work, however, remains to be done in developing and testing gene therapy applications in dogs with other congenital disorders—and, more importantly, in people. "Regardless of how successful the treatment has been for dogs, it is essential that more studies are carried out to establish the long-term safety and efficacy of gene therapy for human patients," Dr. Aguirre notes.

Currently, Dr. Aguirre is involved in research regarding a hereditary, blinding disorder of the retina called progressive retinal atrophy, or PRA as it is commonly known. This disease was first recognized in Gordon setters in Europe in the early twentieth century, but PRA has since been identified in many breeds. In human families, the diseases equivalent to PRA in dogs are termed retinitis pigmentosa.

Siberian huskies and Samoyeds have a unique type of PRA called X-linked PRA, since it is transmitted through the X chromosome of

the mother. X-linked PRA is the "most common severe, inherited disease of the retina," says Dr. Aguirre, who has identified the genetic defect that causes the disease. The test that detects the mutation will allow breeders of huskies and Samoyeds—and eventually other breeds as well—to prevent X-linked PRA in their lines by recognizing the carrier females. Significantly, since dogs and people share such similar genetic makeups, the research has the potential to identify the causes of some cases of X-linked blindness in humans.

Given the growing attention garnered by gene therapy and the entirely new methods of treating disease it is generat-

ing, the return of Gus Aguirre to Penn has been quite a coup for the School. And the benefits are mutual: "It was great coming back to Philadelphia; my family still lives in the area," says Dr. Aguirre—in fact, one of his sons, Dr. Geoffrey Aguirre, GR'98, M'00, is an assistant professor in the Center for Cognitive Neuroscience at Penn Medicine. The two Aguirres are collaborating on a project studying the

brains of dogs before and after gene therapy restored their vision.

Now, if only those last parts for Dr. Aguirre's fluorescent microscope would arrive....



Promotions and appointments

Effective July 1, a number of faculty members were promoted:

Dr. Charles H. Vite to assistant professor of neurology; **Dr. Anna S. Kashina** to assistant professor of biochemistry; **Dr. Amy Kapatkin** to associate professor of surgery; **Dr. Karen L. Rosenthal** to assistant professor of special species medicine and surgery; **Dr. Gabriela S. Seiler** to assistant professor of radiology; **Chick Weisse, V'98**, to assistant professor of surgery; **Dr. Wilfried Mai** to assistant professor of radiology; **Dr. Andras Komaromy** to assistant professor of ophthalmology; **Drs. Danian Gu, Petra Werner, and Barbara Zangerl** to research assistant professors of medical genetics; and **Dr. Robert Poppenga** to professor of toxicology.