



DISCOVERY

THE DISCOVERY EYE FOUNDATION



The Discovery Eye Foundation supports cutting-edge research related to sight-threatening eye diseases and their treatments.

Thanksgiving 2018

Mitochondrial Revolution: New Hope for AMD and Aging Diseases

How many times have we heard: “This field has been thoroughly studied, and we know all there is to know; there is no reason to continue investigating, because there is nothing more to find out on the subject”? This has been the attitude of some researchers with respect to the importance of mitochondria and diseases. For more than 50 years, we have known that mitochondria, which are the “batteries” of the cell, are critical for energy production. But many believed they did not have other major roles in the health of the cell, so when it came to developing drugs against diseases, mitochondria were overlooked.

That idea has now been turned on its head.

Led by Discovery Eye Foundation Research Director Dr. Cristina Kenney, the Mitochondria Research Group believed that, to really discover something new, you have to look in novel areas. This group has done just that. Using the transmitochondrial cybrid model, which are cell lines with identical nuclei, but with each line containing mitochondria from a different person, they have shown that the mitochondria have major regulation powers over cell behavior and expression of disease-related pathways. This is significant, because the mitochondria then become a target for therapies to combat diseases.

Kenney's group is investigating various drugs and substances that will keep the mitochondria healthy and, ultimately, improve the health of the retinal cells in age-related macular degeneration (AMD). But it does not

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From Apricots to AMD

Gavin Herbert is DEF's newest board member

Gavin Herbert's first business was a roadside fruit stand in the San Fernando Valley. He was 12, and his family had more apricots from their ranch than they knew what to do with. His father, who was in the pharmacy business, told him if he could sell them, he could have the money. Soon, a "You pick 'em" business was born — the first of several successful ventures.



Planning to become a pharmacist, Herbert's path changed when he was in pre-pharmacy school at USC. He decided he was more interested in starting a company making products, and in 1950, he launched Allergan Inc., a pharmaceutical company that, among other things, focuses on ophthalmologic products. He took the company public in 1970.

Herbert became involved in creating the eye institute at University of California, Irvine (UCI), that now bears his name, in part, because his mother was dealing with age-related macular degeneration. "DEF was very helpful in the funding of key research projects at UCI and tremendously helpful in creating the eye institute," he says. "I believe in DEF's ability to raise early money for new concepts. An example is the stem-cell efforts DEF funded at UCI for retinitis pigmentosa; we are planning to use the same technology to address macular degeneration."

In addition to running Roger's Gardens in Newport Beach and Regenesys in San Clemente, Herbert sits on numerous boards, including The Allergan Foundation and the Nixon Foundation, as well as the board of trustees of USC, on which he has served for more than 40 years. He has 12 grandchildren and four great-grandchildren.

Asked why such a busy man joined the DEF board of trustees earlier this year, his answer was simple: "They invited me."

Put DEF on Your List, and Give Someone the Gift of Sight



Give the gift of sight with a tribute donation to DEF. Visit www.discoveryeye.org/you-can-help, or call (310) 623-4466.

The information published in the DEF newsletter is intended to help you better understand various eye diseases and available treatment options. DEF does not sell or endorse products, treatments or procedures. Every effort has been made to ensure the accuracy of the information presented. It is not intended to be a substitute for the advice and recommendations of your professional eye-care providers.

DEF's First Ambassador of Vision

If I'd have been born a couple of years sooner, I would not have lived. And had I been born a few years later, I'd be able to see today," Tom Sullivan says. Born three months premature in 1947, Sullivan developed retinopathy of prematurity from too much oxygen in his incubator and lost his sight. Thanks to translational research, Dr. William Tasman of Wills Eye Hospital later solved the issue of oxygen in the incubator. It's a thread that has woven itself through Sullivan's life, as he has now been named DEF's ambassador of vision, tasked with garnering funding for DEF's translational research efforts.

Sullivan doesn't like being blind. But he has not let it stop him for one second. "I was a driven child, because I didn't want to be lonely," he says. "I didn't want to be on the sidelines; I wanted to be in the game." More than just a metaphor, he used sports as a way of connecting and sharing with others, becoming a wrestling champion — he's in the Wrestling Hall of Fame — as well as a fanatic skier, golfer and triathlete. "I knew if I could overcome physical limits, I could overcome mental limits and emotional limits," he says.

One area that posed no limits was music, and he used his natural gifts for singing and acting to forge a lasting career. Growing up, he was part of the chorus at Perkins School for the Blind, singing with the Boston Pops and the Mormon Tabernacle Choir, among others.



“I took the disadvantage of being blind and turned it into an advantage in finding my own vision.”

“While I was at Harvard, I needed money to stay in school, so I played clubs all around Boston,” he says. It was while singing in a Cape Cod club that he was discovered by Betty White and Allen Ludden. “They put me on the *Mike Douglas Show*, brought me to California, helped me find a record company, and the rest is history.”

His career as a singer/songwriter has taken him to concert venues around the world, and his roles as an actor have entertained audiences on TV series such as *Highway to Heaven*, *Touched by an Angel*, *Designing Women*, *Mork*

and *Mindy*, and *WKRP in Cincinnati*. He spent six years as a special correspondent for ABC's *Good Morning America*, where his touching stories on people beating the odds became a Wednesday-morning staple. He is the author of 15 books, and his biography, *If You Could See What I Hear*, was made into a highly successful movie in 1982.

“I took the disadvantage of being blind and turned it into an advantage in finding my own vision, which was in music, sports, lectures, books,” Sullivan says. “I am obsessed with having a purpose in life, and it is exciting to know that at this age, I can still find new challenges.”

Serving on myriad nonprofit boards, Sullivan and his wife of 50 years, Patty (to whom Betty White introduced him), have been involved with the Blind Children's Center of Los Angeles since 1979, raising millions of dollars for the charity. It was while working for Allergan Inc., where he traveled the world talking to doctors about being more patient-centric, that he first learned about Discovery Eye Foundation.

As DEF's first ambassador of vision, Sullivan is charged with calling on foundations and individuals to support the organization's mission of funding translational research. “DEF is trying to eradicate blindness from the face of the earth,” he says. “I want to be part of that. I want my own legacy to be fulfilled by eliminating blindness.”

Revolution

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stop there. This same approach to developing mitochondria-targeting drugs is being pursued for drugs to treat Parkinson's disease, Alzheimer's disease, leukemia, various cancers, heart failure, thrombosis, stroke, diabetic retinopathy, Leber hereditary optic neuropathy, and even liver toxicity from acetaminophen.

The continued support from DEF, especially in the early stages of the mitochondria research, has fostered a new area to be opened up, specifically for AMD and diabetic retinopathy. In turn, this has allowed new collaborations among Kenney and researchers from the eye field, and laboratories studying the brain and neuro-degeneration, cardiology, cancer therapies and methods to reduce side effects from cancer drugs. Kenney's discoveries using cybrids have revolutionized the field of mitochondrial research, showing that mitochondria have wide-ranging biological effects never imagined and opening up the field of mitochondrial therapy to careful investigation.

6 Easy Ways to Help DEF

Discovery Eye Foundation's groundbreaking research needs your help to move forward. Try these easy ways to support DEF and its sight-saving work:

1. Shop using **smile.amazon.com** instead of amazon.com.
2. Celebrate events or honor others with a **tribute donation** to DEF.
3. Enjoy the ease of **monthly donations** charged to a credit card.
4. Maximize your gift by using your employer's **matching program**.
5. **Donate stocks and bonds or cars** in DEF's name.
6. Join our **Vision Legacy** planned-giving society, and leave the gift of sight.

For more details, visit **www.discoveryeye.org/other-ways-you-can-help**.

Allen Posner Leaves Legacy of Research

Allen Posner shared many things with DEF Medical Director Dr. Anthony Nesburn. There was their eye-focused livelihoods: Posner was an optometrist, while Nesburn is an ophthalmologist. There was their paternal grandmother: They were cousins. And there was their passion for age-related macular degeneration (AMD), from which their grandmother suffered.

Posner helped the poor and indigent in his Orange County practice, and he sat on DEF's board of directors for more than 15 years. "He was the kind



of board member anyone would want," Nesburn says. "He was generous with his time and money. He was truly involved. And he left a legacy for us to keep working on AMD research."

Leaving a very significant gift as part of his estate plan made perfect sense for someone as committed to AMD research as Posner, who died in 2016. "The legacy gift has been a godsend for DEF and for research into macular degeneration," Nesburn says. "We are very grateful that Allen planned for DEF's work to live beyond his lifetime."