THE VISIONARIES OF UC "EYE"

Orange County is the SILICON VALLEY OF VISION, with the new Gavin Herbert Eye Institute at UCI a focal point. Are cures for blindness next?
The new Gavin Herbert Eye Institute building at UC Irvine that opens this month is designed to intensify the interaction between university scientists and private and public ophthalmology companies that have made Orange County the worldwide center of eye-care research.

Institute Founding Director Dr. Roger Steinert hopes that more effectively blending academic and entrepreneurial DNA in a state-of-the-art $38-million facility stocked with the latest genetic medicines and surgical lasers will accelerate progress toward his goal of ending human blindness.

Steinert's dedication to that goal is apparent in the schedule he keeps as an administrator, professor, author, research scientist, active eye surgeon and, more recently, fundraiser for the Institute's gleaming new 70,000-square-foot research, treatment and teaching center on the Irvine campus.

"I am usually up and doing emails at five in the morning and typically turn off my computer around 11 at night," says Steinert, who came to UCI from Harvard in 2004 to be part of the Orange County ophthalmology action.

"Vision is my passion," Steinert says. "I can't think of a better career than helping people who are blind or going blind who previously had no hope."
Rogier Steinert is the perfect person to lead the eye institute," says Bill Link, whose company, Versant Ventures, has funded 18 ophthalmic startups to the tune of $280 million, including seven in Orange County. "Besides his great strengths as a surgeon and clinician, he understands the ophthalmology industry and has collaborated with it throughout his entire career."

"We have 24 faculty with Ph.D.s or M.D.s or both and virtually all are involved in projects with local companies," says Steinert, who besides being director of the eye institute is also professor of biomedical engineering and chair of the Ophthalmology Department at UCI's School of Medicine.

Steinert's early research helped lay the foundation for LASIK surgery, which uses lasers to reshape the cornea to improve vision, and he later helped develop and put into practice a second generation of ultra-precise cutting lasers used for cataract and cornea-replacement surgery.

The new building where he and his colleagues will continue their ground-breaking discoveries and treatments is a masterpiece of medical architecture built in close consultation with the Braille Institute to be user-friendly for patients with impaired vision.

"When you go blind, your life changes suddenly," says Associate Vice Chancellor Rebekah Gladson, UCI's head of design and construction services. "People fear blindness more than any other disease, so we designed a building where those with impaired vision will feel safe and comfortable.

"The Institute has great expertise to deal with eye disease clinically, but it was very important we also deal with the softer side of patient care, the emotional and physiological side. People who are challenged with sight perceive the world differently, including finishes inside a building. For instance, if you put down flooring with dark and light squares, patients would perceive the dark squares as holes they could fall into. Every element of the building was carefully thought through with patient comfort and security in mind."

Designed in a clean, contemporary style reflective of classic modernism by DES, a San Francisco architectural and engineering firm that has completed 300 healthcare projects, the building includes an 8,000-square-foot eye clinic and 34 exam rooms, including four dedicated to pediatric patients, with child-friendly waiting rooms and restrooms with toddler-height sinks.

There are classrooms where UCI medical students will learn to diagnose and treat eye diseases, a clinical research center for innovative therapy trials, LASIK and plastic surgery facilities, and multiple operating rooms, including one equipped with what Steinert calls "very high-resolution video cameras" for live web casts, which will enable him and his colleagues to demonstrate the use of their revolutionary surgical instruments and techniques to doctors and students around the world, spreading the knowledge of how to prevent and cure the ancient scourge of blindness that afflicts or threatens 300 million people worldwide.

"We love the teaching part," says Steinert. "It is very rewarding to pass the torch and see others learn the skills that allow them to carry forward the fight to eradicate blindness."

The new building was funded entirely by private donations, many brought in by Steinert, who says he seldom has to ask for money directly.

"People tell me they think the fundraising must be the worst part of my job, but I actually enjoy it. All I do is tell people about what we do here. If their vision aligns with ours, if what we are doing matches what they care about, they give their support."
built by Hathaway Dinwiddie, the legendary general contractor that counts Grace Cathedral on Nob Hill, the Transamerica Tower, the Getty Center and the Advanced Health Sciences Pavilion at Cedars-Sinai Medical Center among its marquee projects, the building incorporates 25 miles of steel post-tensioning cable to strengthen the structure, eight miles of copper wire, nearly three of piping, and 50 tons of glass in the sweeping windows that flood the interior with light.

Thin its high-tech yet human-scaled confines, UCI doctors will treat cataracts, glaucoma and more than 100 other eye diseases. will replace and reshape corneas and implant tiny telescopes that restore sight to patients with end-stage, age-related macular degeneration, a technique pioneered at the university.

New technologies such as bionic eyes and genetically engineered chemical delivery vehicles that produce medicine in back of the eye where it is hard to administer are on the horizon.

"Several companies are pretty far along in developing systems that pick up light and convert it to electrical signals that go to optic nerves," says Steinert.

Second Sight Medical Products, a company funded by Versant Ventures, received the first FDA approval in February for a system that includes implanting a light-transmitting chip in the eyes of patients blinded by retinitis pigmentosa, a hereditary disease that destroys the light-sensitive cells in the eye.

"I have spoken with doctors and patients after the operation," says Link. "They perceive the results as a miracle."

"Our program is expanding rapidly and the building gives us more space for treatment and translational research, the process of taking new technologies and medicine from the laboratory to clinical trials to human use," says Steinert.

"Orange County has become the center of eye research in the world, with more than 20 companies operating here," says Gavin Herbert, Jr., the man the eye institute is named for. "The new building consolidates that research. It will greatly benefit the people of Orange County and people from around the world who come to be treated by top-notch doctors like Roger Steinert."
The industry might not exist here at all if Herbert had not moved his company, Allergan, to Orange County in 1961 so he could indulge his passion for sailing in Newport Harbor.

Hebert conceived of the idea for the new building in 2007 and was an early donor, but his influence on ophthalmology in Orange County goes far beyond that.

In fact, the industry might not exist here at all if Herbert had not moved his company, Allergan, to Orange County in 1961 so that he could indulge his passion for sailing in Newport Harbor.

The company had been founded 11 years earlier, in 1950, by Herbert’s father, Gavin S. Herbert, and chemist Stanley Bly, in the backroom of Herbert’s drugstore in the Wilshire Professional Building in Los Angeles. In that backroom two blocks west of the Wiltern Theater the men compounded the first antihistamine eye drop in the U.S. to treat eye inflammation.

Herbert Jr. was a pharmacology and marketing student at USC at the time and was involved with the company from its early days. When Bly died in 1953 and his father was injured in an accident, he kept the company going, even after he was drafted into the Navy as a corpsman during the Korean War.

“It was damn difficult,” he recalls. “I was fulltime in the Navy and had to commute to Los Angeles on the weekends to take care of company business.”

Herbert Sr. passed the reins of what was then a $100,000-a-year company to his son in 1957.

When the growing business needed more space a few years later, Herbert Jr. bought a house in a new Back Bay neighborhood and moved his manufacturing operation and 25 employees to a 30,000-square-foot building at 1000 South Grand in Santa Ana.

“I chose Orange County for our new location because I loved to sail and wanted to be near Newport Harbor,” Herbert says.

Proud possessor of a 33-foot Rhodes sailboat, an elegant wooden craft he named “Madness,” Herbert enjoyed the harbor and open ocean during his spare time while building his company into a billion-dollar enterprise over the next 35 years.

Allergan was the first ophthalmology company in the county and it remains the center of the industry here today, with 1,100 researchers on the 26-acre Irvine campus it moved to in 1966.

As it grew into a diversified medical products company employing 10,000 worldwide, Allergan acted as a magnet that attracted talented scientist and other eye-care companies in a dynamic similar to the growth of other technology centers.

Herbert chuckles as he recalls leveraging the climate and lifestyle of SoCal to lure talent away from pharmaceutical companies in the Northeast.

“There was big ophthalmology meeting in Philadelphia each year and there are some major pharmaceutical companies there, including Merck and Smith Kline. I would go to the annual meeting each winter to recruit scientists and researchers. It wasn’t too hard to bring them from Philly to Orange County in February in the 1960s,” he says.

“Allergan was the foundation,” says Link. “Then in the 1970s you had American Hospital Supply Corporation involved in creating AMO, which gave the county two major corporate ophthalmology anchors.”
THE PRESENCE OF UCI HELPS OC COMPANIES RECRUIT TOP SCIENTISTS AS EMPLOYEES BECAUSE SOME INCOMING HIRES ARE PROFESSORS AT OTHER UNIVERSITIES WHO WANT TO CONTINUE TEACHING EVEN THOUGH THEY ARE MOVING TO PRIVATE INDUSTRY.

Founded as American Medical Optics, now known as Abbot Medical Optics after being acquired by healthcare giant Abbot Laboratories in 2009, AMO is a technology company that developed some of the earliest eye-surgery lasers in the U.S., balancing Allergan's pharmaceutical approach to eye-care.

"Starting in the 1980s there were a number of eye-care start-ups that joined the two big companies and the thing snowballed the same way the tech industry did in Silicon Valley," Link says.

Herbert says a group of intraocular lens companies in and around Monrovia migrated down to join the party, in part to take advantage of UCI's eye-research brainpower.

"I would say Allergan initiated the industry in Orange County and then UCI came along about the same time and accelerated the process," says James Mazzo, former president and CEO of AMO, who is now head of Irvine ocular implant company Acufocus and an operating partner at Versant Ventures. "The companies would not have been as successful without the university.

Founded in 1965, UC Irvine is recognized as one of the country's leading public research universities. Allergan began collaborating with UCI scientists in 1974, according to Herbert, and Mazzo says the synergy between ophthalmology researchers at the school and OC companies is strong and multi-dimensional.

Today, company scientists often go to the university with a product idea to get the clinical perspective of UCI's doctors and to collaborate on a design. Other times university scientists take an idea for a nascent medicine or device to a company to see if it wants to develop a therapeutic product.

University doctors have founded ophthalmology companies in the county and company researchers accelerate the growth of knowledge at the university by sharing discoveries with students and scientists.

The presence of UCI helps OC companies recruit top scientists as employees because some incoming hires are professors at other universities who want to continue teaching even though they are moving to private industry. They have that opportunity in Orange County.

The school is also a deep pool of talent local companies can tap into.

"It is a feeding system for us that provides biomedical engineers, optical engineers, physicists, physicians and all kinds of highly-trained people we need," Mazzo says, speaking for his company and the entrepreneurial community.

Companies and the academic community also have complementary funding capabilities.

"The university will fund the beginning stage of research that is too early for venture capital" Link says.

"Then, as research advances to the point where it needs to be moved to products and processes, that is when venture capital" or corporations with cash can step in and move new technologies and therapies forward.

"When we do well, we can get in the path of progress and deliver value to patients and our investors," Link says.

OC companies also cross fertilize each other, with employees from large companies launching startups, and entrepreneurs taking their energy and expertise inside corporations when their companies are acquired.

Steinert got in the OC ophthalmologic mix in the 1980s when Gavin Herbert invited him out from Harvard to participate in occasional meetings of a kind of industry brain trust.

"There were about two dozen in the group and Roger stood out from his peers," Herbert says.
Steinert, who lives in Laguna Beach and likes to snowboard and paddleboard when he can find the time, says there were several reasons why he decided to move to Orange County full time, leaving Harvard to head the Ophthalmology Department at UCI.

"First, it was a wonderful opportunity to connect with a great university with an eye department with potential to grow rapidly where I could have an positive impact on growth," he says. "There was also a kind of personal allure. I'd been coming to OC two or three times a year to do research and connect with the many eye technology companies here and I liked it a lot.

"Moving here meant I would have a chance to interact on a daily basis with OC researchers instead of a couple of times a year. I felt like that would enable a marked increase in productivity in research projects that are important to me.

"The third thing that influenced my decision was when I discovered there was the concept of an eye institute at the university. When I found out that was a goal, it was like, now we are really talking. The chance to be in on the creation of an institute that could become the center of eye technology research and development in Orange County was very attractive."

It adds to the sense of symbiosis at play in OC ophthalmology that UC Irvine got a new chancellor, Michael Drake, the year after Steinert arrived, who just happened to be an ophthalmologist.

"I've known Roger Steinert for more than 30 years, since we met while doing our ophthalmologic training at Massachusetts Eye and Ear Infirmary," Drake wrote in an e-mail. "Since then he has risen to national and international prominence as a clinician, research scientist, and leader, and I am proud to have him as a friend and colleague. The Gavin Herbert Eye Institute represents a great advance in ophthalmologic research and eye care delivery, benefiting Orange County, our nation, and the world, and I can think of no better person than Roger Steinert to lead it."

The feeling is mutual.

Steinert, who is the author of the leading cataract surgery textbook and whose list of peer-reviewed scientific papers, book chapters and other publications goes on for 16 single-spaced pages, says Drake has been powerfully instrumental in making the new eye institute building a reality.

"Having Michael Drake as chancellor has been a big, big help in this process," says Steinert. "In fairness to him, he did not play favorites or give us resources to the disadvantage of somebody else, but he recognized the importance of the eye institute instantly. We didn't have to spend time educating him the way we would have with almost anybody else because he already understood what we were doing. He and his staff have been enormously important to the effort."

Steinert, who is 62, says he is looking forward to slowing down just a little bit now that the Institute is up and running—but not too much. "Some of the 50 to 100 issues a day I was dealing with will go away [now that the new building is open] but I love everything else I am doing. I love to teach and do research. I love treating patients. We are working on a fourth edition of the cataract textbook. I would be very sad if I had to give any of it up."

The speed of innovation in eye care technology and treatment is quickening, with multiple approaches to the main diseases being developed and perfected at a rapid pace. With the awesome new Institute facility, Orange County and UC Irvine will likely become even more central in the worldwide process in coming years.

"We are at the point where any serious academic ophthalmology department or program knows about us and what our talents are," says Steinert. "Our visibility has been much higher in past year and a half and we are widely respected as a rapidly growing department."

"From our earliest days, our partnership with R&D companies has been very close," Drake writes. "Even when the university was new, and continuing right to this day, faculty in our Department of Ophthalmology have been among the world's leaders in their respective fields. The partnership between these world-class physician/scientists and the cutting-edge companies that have developed here has helped make the industry a vital part of the Orange County economy and a global force in vision care and improvement."