“At NEI, the research we do is not solely intended to publish papers or to fight diseases: we’re ultimately trying to fight for the people who have those diseases and improve their lives.”

You’ve made those changes a cornerstone of NEI through a new mission statement. How did that change?

When I started this position, looking carefully at our mission was one of the first things I did. I used to think mission statements were tools used by bureaucrats and bean counters, but I’ve seen firsthand the impact they can make in an organization when you use them to create a North Star.

Our mission statement had not changed since NEI began in 1968. It had to do with protecting and prolonging vision and with managing the special needs of people who have visual impairments. We spent months looking at this with stakeholders within and outside of NEI, and we came up with our new mission: to eliminate vision loss and improve quality of life through vision research.

Vision is so important to people. Surveys have shown that people are really afraid of becoming blind. This is extremely stressful and a source of anxiety and depression in many patients. Vision is one of the primary ways we experience the world; it’s a major gateway to human emotion. And every single one of us will develop a vision problem, including refractive error (which makes it hard to see clearly) and cataracts, if we live long enough.

I think it’s really important to emphasize that at NEI, the research we do is not solely intended to publish papers or to fight diseases; we’re ultimately trying to fight for the people who have those diseases and improve their lives.

Why do you think NEI’s research is important for our modern society when there have been so many improvements in vision treatment?

Many Americans need eyeglasses; refractive error is one of the most basic things that can go wrong with vision. But the diseases that can blind people—things like cataracts, macular degeneration, glaucoma, and diabetic eye disease—those things aren’t as easily reversible, and the risk of those diseases increases exponentially as people get older. This is an enormous public health problem as our entire population gets older.

Vision research also has made a really tremendous scientific impact in regard to methodological research, which we can apply to other parts of the body and other fields. For example, the first self-driving artificial intelligence system in medicine was for diabetic eye disease because there’s so much data we can gather when studying the eye compared to other systems. The first gene therapy approved by the Food and Drug Administration (FDA) for an inherited disease (a disease that’s passed down from parent to child) was for a retinal degeneration (an eye disease that causes the retina to break down) that causes babies to go blind because you can analyze and deliver those therapies very precisely in the eye.

You were an engineer before you became a doctor. What got you interested in science, and what made you pivot to medicine?

I grew up in a family where almost everyone was an engineer. The toys I had as a kid often had an engineering bent, and my father was the stereotypical engineer who couldn’t help taking apart every mechanical or electrical device to try to make it better... even though he often made them worse.
When I went to college, I never seriously considered studying anything except electrical engineering. I loved doing that—in the late 1980s and early 1990s I was at Stanford University in Silicon Valley, and it was a very exciting place to be. I spent one summer working for a startup company that built cardiac ultrasound machines, and I spent another summer working in a lab at the medical school, where my job was to write computer programs that analyzed images from cardiac ultrasound machines to diagnose heart disease. It fascinated me that you could build a machine and treat people with it. That’s what made me want to go into medicine—I thought I would build machines and use them to help treat people. I originally wanted to be a neurosurgeon as I thought I could model the brain using computing devices, then operate on it. I found a lab in the division of neurosurgery research at Massachusetts General Hospital in Boston, and it happened to be work in the rabbit retina. After working in that lab for almost three years, I became fascinated with vision science and decided I wanted to become an ophthalmologist.

**What motivates me is the hope of making a difference. I don’t know that there’s any other place in the country where we can have the potential to make such impact on a broad scale.”**

**What are some of your favorite things about your job at NIH?**

What motivates me is the hope of making a difference. I don’t know that there’s any other place in the country where we can have the potential to make so much impact on a broad scale. What we do touches people throughout the country and potentially throughout the world. That is enormously daunting, and it’s an enormous responsibility.

**What do you enjoy doing when you’re off the clock?**

In August, I will have been married 25 years, and I have two daughters. Like many other people, I have struggled with work-life balance, but one of the things we’ve always done is have dinner as a family every night. I do a fair amount of traveling, and sometimes I’ll get home late or the kids will get home late, and it can get stressful trying to get everybody together. But I’ve always loved being able to connect with my family through those dinners. Also, both of my daughters have been very involved with sports, and I’ve spent a lot of time practicing with them or watching on the sidelines.

Dr. Chiang advances vision research in bioinformatics and data science through his work in the National Library of Medicine (NLM)’s intramural research program. Hear Dr. Chiang talk about using artificial intelligence to improve screening and diagnosis for children with a pediatric retinal disease called retinopathy of prematurity in this YouTube video from NLM.

Michael Chiang is Working to Eliminate Vision Loss – YouTube