

Otto Yang Story – Covid-19

(As published in The Oak Ridger's Historically Speaking column the week of April 6, 2020)

Benita Albert brings us another story of an Oak Ridge schools graduate. This time she has found someone on the front line of the battle with the unseen enemy, Covid-19. When I learned of this connection, I immediately looked Otto Yang up on the internet. I was amazed by what I saw. The most recent was an interview by the Los Angeles Times. Seeing an Oak Ridge Schools graduate so effectively answering questions about the current situation we face was amazing. You will be amazed too when you read Benita's perspective of our own, Otto Yang:

Dr. Otto Yang is a former Oak Ridge High School (ORHS) student, Class of 1983, now pursuing research studies on the COVID-19 pandemic. He describes himself as a 'physician-scientist' at the University of California Los Angeles (UCLA) David Geffen Medical Center, a position which now places him on the forefront of research as well as patient care.

An internet search under his name provides numerous links to several recent press interviews in print and video. Watching him speak so articulately on the history of coronaviruses, on the scientific challenges of COVID-19, and on cautionary health measures is both reassuring and inspiring. His explanations are offered in an informal and relatable style suitable for general public understanding.

In an April 3, 2020 interview, Otto describes the pervasiveness of the disease: "The coronavirus, like all viruses, is basically just a piece of genetic information that enters into a cell and then hijacks its machinery so that the cell starts producing the virus' genetic materials rather than its own." In a further question that asked why seemingly healthy people are getting very sick and why, Otto answered, "I think of the immune system like the police and the virus like criminals. If the criminals are easily brought under control, then the police don't do much collateral damage to the city. But if there is all-out war with equally matched sides, there is a lot of collateral damage. That's what we are seeing in the sickest patients." <https://www.latimes.com/science/story/2020-04-04/why--kills-some-people-and-not-others>

Otto was my student for two years of Calculus at ORHS, and he continued with several advanced math courses in his undergraduate studies at Brown University. However, Otto planned from an early age for a future in medicine, an educational dream he accomplished by 1990 via a combined program for a BS and MD at Brown.

As I write Otto's story, I am reminded of the eager, bright, and disciplined student he was, and of his great class peers in an ORHS class that counted twenty-five National Merit Scholarship Semi-finalists (Otto included) and fifteen National Merit Commended Scholars. Otto recalls his time at ORHS as being "one of the happiest times of my life." He was immersed not only in all the advanced academic course offerings but also in a variety of extracurricular pursuits. He was a member of numerous clubs: Future Doctors, Computer, French, International Relations, Bridge, and Ski. He played cello in the ORHS orchestra and was a member of the National Honor Society.

The ORHS 1983 yearbook, The Oak Log, describes the Future Doctors Club as an opportunity to encourage students in their medical career choices through hospital visitations and talks from area doctors and veterinarians. The club had fifteen members, and recently viewing a picture of its members, I am aware that most pursued a medical career. I point this out to say that, though this article features only one ORHS graduate, medical studies were a highly rated choice by many students over my teaching career. I would love to be able to recognize all the ORHS graduates who are now deeply involved in the current crisis evoked by COVID-19. Certainly, it brings me solace and hope knowing that ORHS students are on the job as doctors, researchers, nurses, emergency responders, public health service officials, and so many other critical and essential support assignments.

Otto's humility and sense of humor flooded over me when I read his written comments in my '83 Oak Log. I think he would not mind that I share them, and sharing same also speaks to his early dreams. After saying nice things about my course, he continued his writing with the following: "Unfortunately, I am not following the superior doctrine of mathematics, but following science (medicine) in hopes of an MD. I do plan on continuing math, however." He closes with, "Here's my signature, which is unlikely to be of any worth."

His signature in both English and Chinese followed. I now smile at his latter comment, remembering that I instructed my students to please at least sign my yearbook so that I would have proof of their presence in my classroom, and perhaps I

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could 'cash in' on their later fame and fortune by possessing their autograph. Otto's signature is now especially 'priceless' and special to me given the important work he has done and the current, vital research he is leading.

Otto and I connected via email recently, and his response to my request for a story was quickly honored. He described his medical journey after completing degree-work at Brown: "I chose to do a residency in internal medicine at Bellevue Hospital/NYU in New York City, because I wanted a roll-up sleeves training experience, and boy did I get it! This was the height of the AIDS epidemic, 1990-1993, at the epicenter of the epidemic. About half of my patients were HIV+, so I literally treated thousands of patients with this disease and watched most of them die during my training."

He continued, "I always planned on being a physician-scientist, originally in oncology, but in that era, science was more directly applicable to infectious diseases and still distant from application for cancer. So, my interest was steered to HIV and immunology. I then did infectious diseases training at Massachusetts General Hospital/Harvard, which included the usual clinical training plus extra training in laboratory research, from 1993-1997. There I focused my efforts on the immune system and its interactions with the virus, with the goal of developing immune-based treatments and/or vaccines. I guess you could call me a molecular virologist-immunologist in training."

Before his move to California, Otto completed the above-mentioned training, started an independent research career, and joined the junior faculty at Harvard for two years. Otto wrote, "I was recruited by UCLA where I started in 1999 as an Assistant Professor. Here I have had a busy laboratory, continuing research on T-cells and HIV, branching out to touch on other viruses and organ transplantation immunology. I'm the Associate Chief of Infectious Diseases and have a joint appointment in the Department of Microbiology, Immunology, and Molecular Genetics. Through the latter department I am a PhD-granting mentor."

He reports being both a thesis advisor to eight of his own students as well as serving on thesis committees for many more. Otto continued describing his assignments: "On the medical front, I spend about 5-10% of my time seeing patients in the hospital, during which I train infectious disease physicians under my wing."

Of his current, urgent assignment he says: "I am up to my eyeballs in the response of the UCLA Medical Center to COVID-19. I'm in charge of experimental therapeutic trials in our division, and (I) have coordinated the Remdesivir trial. I'm also working on developing antibody-based treatments, and collaborating on immune-modulating treatments. My unique niche as a physician-scientist has put me in the forefront of our research response since my interests straddle the spectrum from treating patients to molecules in the lab."

Researching 'Remdesivir trial' for this story, I found that, with approval of the European Medical Agencies, certain European countries have recommended Remdesivir treatment of COVID-19 patients under compassionate-use rules. Such treatment is offered, outside of ongoing clinical trials, to COVID-19 patients with extreme breathing difficulties. An April 3, 2020 press release from *UCLA Health* states, "UCLA is one of seventy-five sites around the globe participating in a (Remdesivir) clinical trial sponsored by the National Institutes of Health."

In a recent online interview, Otto provided a summary of coronaviruses, including mention that at least four coronaviruses are found in 30% of common colds. He described COVID-19 as 86% genetically similar to the 2002 SARS virus, but it is even more mysterious and concerning due to its greater capacity to spread. He scoffs at internet postings on various "miraculous treatments," advising the public to be cautious, to check informational sources, and to understand that: "There is no magic pill or solution at present."

He suggests that if he were in charge, and if his fantasy could be honored, he would recommend that everyone be tested for COVID-19. He concurs that ongoing limitations insist that the medical community prioritize testing for those persons most at risk and/or symptomatic. When queried as to whether COVID-19 recovered patients have immunity, his answer was: "The immune system is a big black box." He observed that it is strange how the immune system can be effective against some viruses and not others, also noting that some COVID-19 cases may be showing reinfection and/or short immune periods after recovery. He poses that these uncertainties could suggest bad news for a possible vaccine.

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As a part of his closing comments, Otto offered a take home lesson, proposing that if you understand how the virus spreads then you can protect yourself and others. He strongly advocates for the Center for Disease Control's Covid-19 guidelines of frequent hand washing and social distancing.

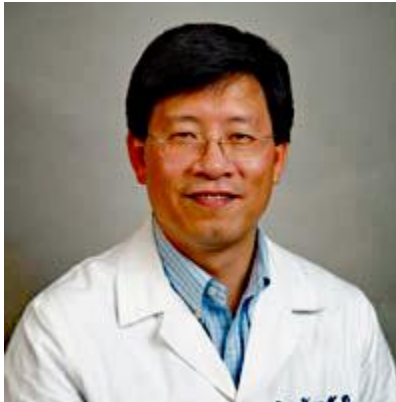
Otto ends the interview with a hopeful message: "Don't panic, we will get through this." To view more of his interview, entitled, "Understanding the -Infectious Disease Expert Dr. Otto Yang Explains Fact From Fiction," go online to: <https://www.youtube.com/watch?v=tFvEDk7W1Rg>

In a follow-up email correspondence, Otto wrote of his hometown: "I have to admit to you, high school comprised the happiest years of my life. I was surrounded by wonderful friends and teachers...in an insulated bubble. College was a rude awakening, to learn that smart kids were ostracized as 'nerds' and 'geeks' in their high schools and even at (college), and that being smart wasn't a popular quality like at ORHS."

As a former teacher of Otto's and so many other bright and service minded students on the forefront of this crisis, it is my humble opinion that we have never needed 'nerds' and 'geeks' more. More importantly, we all need each other's respect and caring to prevail.

I am grateful to Otto for his willingness to share this story with his hometown, for his dedicated medical career, and for the excessively long hours and the undying determination he now brings to the race for treatments and a cure for COVID-19. Public support, cooperation, and resoluteness is essential in both the race to save lives and for uplifting a medical community under enormous stress.

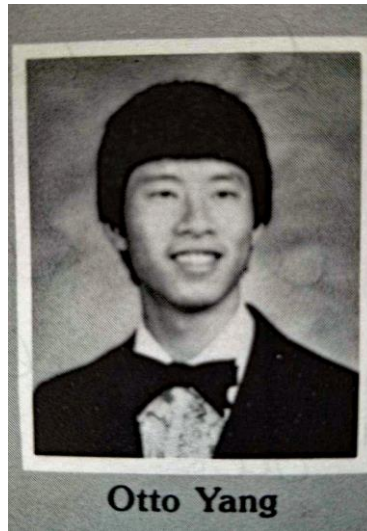
Well, there you have it. An amazing story brought to us by Benita Albert. Otto Yang is right in the front line of Covid-19 struggle. With his skills which began to be developed in Oak Ridge Schools, I am sure you are convinced as I am convinced that we are in the best of hands when it comes to the war we are in with the invisible enemy of Covid-19!



Dr. Otto Yang

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Otto Yang in Oak Ridge High School



1983 ORHS National Merit Semifinalists, Otto is third from left in the back row

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Future Doctors Club with Otto in the back far left