Camilla Frost-Brewer talks with star alumnus Charles Rudin, MD, PhD, deputy director of Memorial Sloan-Kettering Cancer Center and thoracic oncologist, about choosing a career path that allowed him to sit on the fence between science and medicine. He also reminisced about how his career has been shaped by his time at the University of Chicago, working alongside mentors who taught him to think critically and creatively. He marveled at the transformation of lung cancer into a survivable disease and predicts that cancer is something we will live with but get better at controlling.
the fence between science and medicine. And I've stayed on that fence. I still do both, and I've always done both. I might not be as good a clinician as I would be if I did full-time clinic, and I'm probably not as good a scientist as I would if I was in the lab the 100% of the time. But I really like being at the interface.

I came to UChicago for training and joined the laboratory of Ursula Storb, who was a molecular immunologist here. She recently died about six months ago. Phenomenal scientist, a wonderful thinker, and just a powerhouse. I really feel like I learned to think and to think critically here. I didn't know that I wanted to do cancer research necessarily. I joined the lab with a pretty open mind about what we were going to do, and it was an immunology lab. But as I was doing my clinical rotations here, I really liked oncology. I really like the intensity of the patient interactions, the one-on-one interaction they had with patients. I think patients get much more deeply involved with their oncologist than you do with, say, the doctor that you're going to for a skin check or for something else more routine. There's a lot of emotional intensity there that I really liked.

I thought about pediatric heme/onc, treating kids with cancer. I thought about that quite a while, but ended up deciding on adult oncology. Pediatric oncology is a phenomenal area and really rewarding area. A lot of the kids survive, which at the time, this was in the late '80s, early '90s, most oncology patients did not survive, but the kids did well. But it was really devastating when they didn't do well. And honestly, as a researcher, there was just a lot more to do in adult oncology and a lot more opportunity there. As a hematology oncology fellow here, I joined the laboratory of Craig Thompson, who had come from the University of Michigan, and I trained with him. I thought I was going to do leukemia, lymphoma, liquid tumors. That's really what his lab was focused on, was really lymphoma.

But I love the lung cancer clinic here, and that was partly Everett Vokes, Phil Hoffman. There was just great clinical training there and great opportunity there. Lung cancer at the time, we had very few drugs. There was an infinite number of patients, and essentially all of them died. And so as somebody who was really interested in trying new therapies, trying something that was out of the box, not just applying the standards of care, it was a huge opportunity because it was ethically justified to try new things and because the standards of care really were not acceptable. There was a wealth of patients. And there was just a tremendous, I think, team spirit among the lung program here at University of Chicago. So I ended up doing lung cancer, and my laboratory is focused on lung cancer. I never looked back after training.

Camilla Frost-Brewer

And what a career. I mean, you're still on the way up, right?

Charles Rudin

I hope so. Yeah, absolutely. I hope so. We'll see. I don't know if we've peaked and started going down yet.

Camilla Frost-Brewer

No, not at all! I'm not sure if you are meeting with Dr. Vokes today.

Charles Rudin

Not today, but we had dinner last night and it was lovely.

Camilla Frost-Brewer

Oh, perfect. Excellent. Excellent. I'm really glad you got to see him. So you've done most of the questions for the podcast. Thank you so much. I want to congratulate you on being nominated and accepting to be part of our Alumni Stars series. We are really excited to have you back, and congratulations on your new position. What an exciting time for you. We're excited to see where you continue to go. I'm curious about your time at UChicago. You said that you were here for about 17 years. That's a long time to be at an academic institution. Can you just talk about what it was like being on campus then, going from a student to a medical student to a resident to a faculty member? What did that feel like? What was happening
around you? It was also a really intense time to be in Chicago. So, yeah, just talk to us about what that looked like.

Charles Rudin

Chicago is the formative period of my life, I think, as a researcher. I was here for a long time, coming as a student and staying all the way through to faculty. UChicago has a well-earned reputation as a center for critical thinking. I think it really taught me how to think very critically. I remember arriving on campus in one of our first big meetings as a medical school class was with Dean Sight-Hammel, who was a legendary figure in medical education, nationally and globally. He was the dean of students at the time. I think he had been dean of students for decades. He was in his 90s, and this was his last year as dean. He was stepping down. I remember him telling us at that first meeting, he told us a number of things, but I remember him saying that we as a class, we're going to learn a lot over the next four years, a lot of facts about medicine. And he said, 50% of what we teach you is going to be wrong. But we don't know which 50%. And that really struck me.

And his point was, we're learning, you're learning. Keep your eyes open, keep your mind open, and be thinking critically about the "facts" that we're learning because medicine is always changing and science is always changing, and you got to be attuned to that. His message was really one of keep learning because you're not going to remember everything we taught you, but we want you to be thinking critically. I think that message really resonated with me. It was an eye-opening thought, and I didn't believe him at the time. I didn't think that 50% of what we were learning was going to be wrong. But in retrospect, looking back at it now, he's probably pretty spot on.

I think about lung cancer where I focus now. If I told my students now what we were thinking about then in terms of lung cancer, we didn't know anything. We didn't know anything about targeted therapies. We didn't know anything about immunotherapy. They would think that we didn't know anything, and they're right. It was a way of thinking, a critical way of thinking that stuck with me and that has changed who I am and what I do. So I think that Chicago framework, again, well-earned on undergraduate campus, Department of Economics, all the other great things here, really saturates the place and was a great training environment.

The residency program here is phenomenal. At the time, I started here in 1986 as a student. It was the later years of the AIDS epidemic. We had a lot of patients with HIV in the hospital. That was a big part of the care, actually. That was a very informative experience for me, taking care of those folks who, most of whom, were going to die under our watch. But over the course of my training, the drugs that essentially made this a chronic disease that people could to live with forever came out. Seeing that develop and seeing these patients who actually had months to live then become long-term survivors just showed the power of research to really influence outcome.

There were two large groups of patients at Chicago with HIV/AIDS at the time. One was largely comprised gay men. The other was largely comprised drug abusers. But then there was a smattering of other folks with it as well across the spectrum, didn't respect socioeconomic boundaries or any other boundaries. We watched a lot of those folks die, and that was really difficult. But seeing the change that happened there and thinking about the change that could happen in oncology with research, I think, was also really a formative experience.

Ursula Storb was my PhD mentor, and she was phenomenal. She was German. She was about, I don't know, 6'4, or it seemed like at the time, she was a tall woman and a little bit imposing, a little bit scary.

Camilla Frost-Brewer

Tour de Force.

Charles Rudin

Tour de Force. Super smart, had no patience for idiots. She would tell you if she thought your idea was a bunch of garbage. She was also incredibly sweet and supportive, and we became really close friends.
continued to think about those years and the lessons that I learned in her research group. We didn't have a lot of today's tools thinking back, we were trying to identify how immunoglobulin got made. This was a time when we were really just discovering about how immunoglobulin get re-arranged and combined to create the billions of possible antibodies that your body can produce. And figuring out that biology and figuring out some of the mechanisms there, which her lab really contributed substantially to. It was an exciting time and a really fun time. Again, it wasn't necessarily oncology, but it was learning about how the immune system worked, which ended up 20 years later, being as pretty much how we treat oncology patients now is largely focused around immunotherapy as well. So it ended up applying.

That was a really phenomenal environment. And again, a questioning, critical-thinking environment. My next major mentor here, actually a pair of mentors on the clinical side, Everett Vokes, on the laboratory side, Craig Thompson. Two phenomenal leaders and terrific individuals that I continue to go to for advice and career counseling. We're always learning and we always need our mentors, and they're both really important to me. Everett, unbelievable clinician, super smart clinical investigator. It really transformed the field of head and neck cancer and lung cancer. I remember working with him in the clinic, particularly in head and neck cancer patients, really with him and Ralph Weichselbaum.

The two of them together really changed how we fundamentally treat head and neck cancer, and it really changed it from being a disease where most of the patients died to a disease where most of the patients survive and survive long-term. And that was really through an iteration of advances in both radiation and chemotherapy, using chemotherapy as a radio enhancer, making radiation work better. Initially, the trials, I have to say, were very tough. We would meet people to the hospital for two weeks to give them IV chemotherapy with radiation. And those patients were just incredibly ill, incredibly tough time. Their mucus membranes of the mouths fell apart, and they just really suffered. But Everett and Ralph really had a vision for what it was going to take to get them out the other side.

And we nurse them through this period. And there was a lot of focus on maintaining dose intensity of the radiation, you didn't back off, even if the patient was really tenuous, you pushed through. And the benefit of that was patients healed. And when they healed, a lot of them were free of disease. So that was also one of those lessons in short-term pain, long-term gain approaches to oncology. We now have much better drugs. We now have much more tolerable therapies. We now have strategies that are much more in keeping with maintaining quality of life during treatment. But the lessons learned there were real and very impactful.

On the laboratory side, Craig Thompson, who was recruited here from University of Michigan, a terrific lab scientist, a really creative thinker, someone who I think fit in well at University of Chicago really, really well. I was his first postdoc here at Chicago, and I actually helped set up the lab here before he arrived. And he was just terrific to work with. In the middle of my oncology fellowship where I thought I was going to do lymphoma, I switched to lung cancer. Craig was very supportive of that. And even though his lab didn't really work on lung cancer, he understood the opportunity there for somebody who really wanted to do out-of-the-box drug development as an opportunity. And he has been very supportive. He's been supportive ever since. In fact, he recruiter me to Memorial Sloan-Kettering. 15 years later, when I was at Hopkins, he had been the President and CEO of Memorial and reached out to me when that job came in.

Camilla Frost-Brewer

Wow. I have so many questions in different directions. Let's start with this one. You talked a lot about lessons learned at UChicago and the mentors that you had here. Are there any lessons or experiences you had at UChicago that you've carried through to your current position that you maybe use with people you supervise, people in your lab?

Charles Rudin

There are lots of lessons that I learned at Chicago. As I say, I think these are really the formative years for me. I think one of the important lessons in the clinic was really respect for the individual. There is a huge diversity of patients that are seen here at Chicago. We're serving a community that is diverse and comes from a lot of different backgrounds. I remember rounding with John Ultmann, who was another phenomenal leader in the field, really changed the way we treat lymphoma globally. John was a people
person. He loved sitting and talking to people. He loved teaching. He spent his time at the bedside. He was a scientist, but not a scientist in a laboratory. He was a scientist in a clinic. And he loved sitting down one-on-one with a patient holding their hand at the bedside. Teaching in that way, involving the patient, seeing the patient as a partner, not a subject. And he was phenomenal to work with. He ended up dying of the disease that he studied, which was ironic. He developed a lymphoma himself and, of course, understood exactly what was going on. Was a guy who just had incredible dedication to the institution, dedication to teaching, and dedication to the mission.

His wife was a nurse and is still alive in her 90s now. Ruth, she was also a force here at Chicago and a force for good. She was a Holocaust survivor who had been part of something called the Kinder transport that exported young children out of Germany and Austria. Well, she didn't often talk about it, but I think she felt that that was an important formative experience for her and I think, carried forward into her clinical care, clinical practice, and respect for the individual.

Who else can I talk about? Joe Baron. Joe Baron was the hematology expert here, not in cancer so much as in clotting and in benign hematologic disorders. Just a terrific intellect and a guy who was in the hospital it seemed like all the time. Whenever there was a patient that had a bleeding problem, that had a problem in the OR where they couldn't stop the bleeding or whether there was a problem that related to bleeding or clotting, he was the go-to guy. And Joe would be available in the cafeteria at 10:00 PM to come see a patient. He was just a phenomenal resource here and a terrific educator. Someone super dedicated to the mission.

**Camilla Frost-Brewer**

Wow. This is my third recording with Alums, and it's amazing how many people have interacted, had careers, taught physicians, researched at UChicago, and how much they've changed the oncology landscape. I think you know it being here, but until you sit down and start categorizing it and time-lining it, you don't see the true magnitude. It's astonishing to see the folks who came before us. And I feel so honored to be able to sit with folks who are making those differences, those discoveries now. When you talk about all the people that you were able to learn under, clinic with, round with, I want to know a little bit about your mentees. I saw on your biosketch that mentoring is really important to you. So can you talk about what mentoring means to you, what your mentees have looked like, and where they've gone?

**Charles Rudin**

Yeah, I think one of the things that I learned at UChicago and that has stuck with me is that the research team is a family. The hematology/oncology section here was a family. It wasn't that many doctors, but they were really dedicated to what they did, not only in the clinic, but also at home. We met each other's families and hung out together. That personal interaction, like we're all in this together, was really striking to me. I think that's carried forward, I hope, into my current roles. I mentor in a variety of contexts now. I'm the Chief of Thoracic Oncology at Memorial, and I have 25 faculty members in my service who directly report to me. And then I have a laboratory with trainees, we have high school students in the summer, college students, undergrads, of course, grad students and postdocs in the lab as well as technicians. And they're an incredibly diverse group from really all over the world. I like the mixture of people. I like to have people from different environments joining into the laboratory from a variety of different backgrounds. And I think we learn from each other, and we gain from the exposure to people who come from a very different perspective.

And science is very much a team sport. Increasingly, there's none of us who really have the capacity to understand all the aspects of what goes into a science paper these days, with computational biology, with animal-based science, with pharmacology, with all the parts that actually contribute immunology and others. Nobody has that full spectrum of knowledge. And so we work very much as a team. I really value team sciences. And when we recruit new people to the lab and to our program, we're always looking to see not only are they smart, not only are they competent, but are they going to work as part of a team? And are they going to have that respect for other people with other approaches and other histories and come to the table with open arms and open eyes and open minds to embrace that.

**Camilla Frost-Brewer**
Yeah, I think that's so critical, the dedication to mentoring the next large set of researchers and clinicians. I love that your lab welcomes high school students in the summer all the way through postdocs and technicians. I think that is such a critical piece of moving science and medicine forward.

**Charles Rudin**

Agreed. Yeah, I think training the next generation is really a critical part of the mission. That's what we're here for. That's what I learned here, and that's what I hope it to carry forward. And this is really, I think, something that Craig used to speak about a lot, Craig Thompson. He would say, the mark of a scientist isn't actually what they did. It's what their trainees did. And the really important people in science are the people who have trained an army that's actually gone out and done additional stuff.

**Camilla Frost-Brewer**

Yes. I love that. We need that on a T-shirt somewhere. So this is my last formal question for you, but where do you see or where do you hope to see cancer research, care, discoveries, and advancements go in the next 50 years?

**Charles Rudin**

Fifty years. Fifty years is a long time.

**Camilla Frost-Brewer**

It is a long time. It is. So if your answer isn't immediately cure…

**Charles Rudin**

Yeah. This is a super, super exciting time in oncology. The field is changing incredibly quickly. The advances are really exponential at this point. It's such an exciting time to be watching what's going on. I don't think we're going to be free of cancer, honestly. I think cancer is a process. It's a genetic disease where as mutations accumulate with replication of cells, mistakes are made, and those mistakes can favor the growth of cells.

And, ultimately, that leads to cancer. And I think that's a process that is going to be with us. It's part of biology. It's part of the natural cycle of the existence of life. But given that cancer is not going to go away, I think we're going to get better and better at controlling it and living with it and living well with it. And we've seen that in a variety of diseases. We're beginning to see the survival curves for many of these diseases that have been particularly tough to treat, lift up, that there are long-term survivors, even diseases like the disease that I mostly focus on, small cell lung cancer, a particularly aggressive form of lung cancer, very lethal.

We have long-term, disease-free survivors with that disease now that are cured. We didn't used to talk about cure very much. Certainly when I started, a patient with metastatic lung cancer, we were instructed, do not talk about cure. Cure is not a part of the picture here. We're talking about quality of life. Maybe duration of survival is a secondary endpoint, but not cure. We're talking about cure now. And there are cured patients, even with metastatic, widely disseminated solid tumors. That's a phenomenal change. That's a fundamental change in the thinking about how we approach patients with disease.

Because even though the majority of the patients with many of these diseases continue to die of their disease, the fact that there are long-term survivors is a paradigm shift. It tells us this is a potentially survivable condition, if we better understand it. And that is super motivating, super exciting for people across the research spectrum, from the very basic to the clinically-applied researcher. We're changing the outcome for these patients. Over the course of my life as a researcher, I've seen this transformation happen, and I'm super excited to see where it goes. I think those survival curves are going to continue to improve.
Again, we're not going to be living in a world that is free of cancer. I wish we were, but I don't think that's the reality of humanity and our existence. But I think increasingly people are living well with cancer. People are surviving with cancer. And if we live long enough to die of something else, that's a success.

**Camilla Frost-Brewer**

I love it. A realistic optimist or an optimistic realist. I think that is a good amount of hope and trust in science and medicine that we can help folks live longer and better. And I look forward to it. I don't do the research, but I'm here to write about it, help researchers along the way, and physicians. Oh, my gosh. Let me not forget them, obviously. Well, is there anything else you'd like to impart on our audience?

**Charles Rudin**

I'm thrilled to be back at University of Chicago. I spent the day yesterday walking around Hyde Park. It's really fun to see the transformation of the neighborhood where I lived and where I had so many great experiences. It's really great to be back. I've had an incredibly fortunate life and career, and I'm thrilled to come back to where it all started.

**Camilla Frost-Brewer**

We are so thankful to have you, and we look forward to your future successes. So thank you for joining us.

**Charles Rudin**

Thank you. Thank you so much.